Early Makuria Research Project
El-Zuma Cemetery

Edited by
MAHMOUD EL-TAYEB
and
EWA CZYŻEWSKA-ZALEWSKA

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Volume 1

Harvard Egyptological Studies

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This work is dedicated
to the soul of the great "Guru" (El Faki—الفكي)
– Patrice Lenoble

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Cover illustration: View of the tunnels in tumulus 6, photo A. Kamrowski

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PART 4
The El-Zuma Necropolis—Final Remarks

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The term "Early Makuria" was coined with the help of Prof. Włodzimierz Godlewski, to whom I owe much for his unwavering support and encouragement, while the idea of the Early Makuria Research Project came to life as a natural outcome of the surveys and excavations undertaken in the Dongola Reach and as part of the Fourth Nile Cataract Salvage Campaign. It would not have been possible to implement the project in the field without the approval, cooperation, and steadfast support of both the Polish Centre of Mediterranean Archaeology of the University of Warsaw (PCMA) and the National Corporation for Antiquities and Museums in Khartoum (NCAM). I am, therefore, extremely grateful to the former directors of the PCMA, Prof. Michał Gawlikowski, Prof. Piotr Bieliński, Prof. Tomasz Waliszewski and the present director, Assist. Prof. Artur Obłuski, as well as to the former directors of the NCAM, Dr. Hassan H. Idris and Dr. Abedelrahman A. Mohamed.

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Isotope Analysis and Radiocarbon Dating of Human Remains from El-Zuma
This research was conducted as part of the *Environmental Changes and the Collapse of the Kingdom of Meroe* project, which received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement no. 665778, and the National Science Centre, Poland, under the POLONEZ grant agreement no. 2016/21/P/HS3/00893.

Paleogenomic Analysis of El-Zuma Samples
These data were collected and analysed as part of a larger project, *Paleogenomic Investigation of Ancient Nubian Populations in the Past 3,000 Years*, funded by the National Geographic Society EC-224R-18, GR-000039064.

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Ornaments and Personal Adornments
The study of the El-Zuma objects is part of a broader research project aimed at the interdisciplinary analysis of Nubian personal adornments funded by the National Science Centre, Poland, grant agreement no. DEC-2013/09/D/HS3/04508.

The local community in El-Zuma was always extremely welcoming and supportive of our mission. Our heartfelt thanks go to them for their unfailing help, friendship, and warm hospitality. They made all members of the team feel at home, which made our work a great pleasure.

Mahmoud El-Tayeb
Warsaw, 2020

Foreword

The elite tumuli cemetery at the village of El-Zuma in the Dongola Reach, the cradle of ancient Nubian civilization, is at the centre of this three-volume study. The site, which is inscribed on UNESCO's World Heritage List, has been excavated since 2004 by the Polish Centre of Mediterranean Archaeology University of Warsaw in collaboration with the National Corporation of Antiquities and Museums of Sudan.

The investigation of the burials representing different classes of the Nubian elite has brought into the limelight a long understudied period in ancient Nubian history, that is, the centuries preceding the rise of the Christian kingdom of Makuria. Hence the moniker "Early Makuria", which refers to a broader programme of research, as well as to the political and social entity that the elites buried in El-Zuma were part of.

The three-volume monograph ***Early Makuria Research Project. El-Zuma Cemetery*** is a comprehensive presentation of the results of the excavation project. Volume I discusses the excavation of the tombs (Mahmoud El-Tayeb, Ewa Czyżewska-Zalewska and Ewa Skowrońska with a methodological section by Szymon Lenarczyk, Zofia Kowarska and Magdalena Antos) and the bioarchaeological research that was carried out on the skeletal remains, both human and faunal, giving insight into funerary traditions set in a broader historical and economical background of the site and region (Robert Mahler, Iwona Kozieradzka-Ogunmakin, Abagail Breidenstein, Urszula Iwaszczuk). It also draws plans for an archaeological park to be established at the site (Jolanta Juchniewicz, Mahmoud El-Tayeb).

Volumes II and III have been dedicated to studies of the artifacts found in burial contexts. In Volume II, Ewa Czyżewska-Zalewska discusses details of the pottery typology, classification, manufacturing techniques, fabric and ware descriptions with a separate section on oil lamps (contributed by Aneta Cedro). Small finds are the theme of Volume III, opening with a study by Joanna Then-Obłuska of personal adornments and ornaments, such as beads, jewellery and toilet containers. The second part of the volume is a presentation, by Łukasz Zieliński and Ewa Czyżewska-Zalewska, of the metal artifacts as a category, focused on weaponry and personal accessories, as well as miscellaneous burial equipment.

Mahmoud El-Tayeb
Ewa Czyżewska-Zalewska

Figures and Tables

Figures

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List of Field Team Members

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- Urszula Wicenciak—archaeologist, pottery specialist
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- Neamat Mohamed El-Hassan—NCAM inspector

Since the beginning of the Early Makuria Research Project, the cemetery site has been successively guarded by three local guards employed by the Sudan Antiquities Service (The National Corporation for Antiquities and Museums):
- El-Hussein Mohamed Hamad
- Seifeldeen El-Hussein Mohamed
- Mahgub Mohamed Usuf
- Awad Idris Ahmed Idris—foreman of the mission

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CHAPTER 1

Dongola Reach: A Historical, Geographical and Economic Overview

Mahmoud El-Tayeb

1 El-Zuma and Early Makuria in the Dongola Reach—General Information

Ancient Nubia [**Fig. 1.1**], in contrast to ancient Egypt, does not boast a wealth of documentary evidence to tell us about its history, nor has its archaeological record been as extensively investigated. The earliest information concerning Ancient Nubia is derived from a Pharaonic rock inscription relating to King Djer (according to Walter B. Emery, the name of this king was Jer, whilst William Adams cites two versions of the king's name: Zer or Jer.) of the First Dynasty, found at Jebel El-Sheikh north of Buhen (now exhibited in the Garden of the Sudan National Museum, Khartoum) (Adams 1977, 66–67; Emery 1965, 125).

Interest in Nubian history began to grow at the onset of the 20th century, among archaeologists working in Egypt and Sudan, when George A. Reisner took to the field to conduct the first archaeological survey in southern Lower Nubia prior to the construction of the Aswan Dam. Reisner (1910) designated the unfamiliar archaeological material culture he discovered there as X-Group culture. In the first decade of the 20th century, Leonard Woolley and David Randall-MacIver (1910) inaugurated Meroitic studies in Nubia with their excavation at Karanog. Other excavations at sites of the same culture were also undertaken at Karanog and Gemmai (Bates and Dunham 1927). Further upstream, in the heart of the Meroitic kingdom, John Garstang (1911) started excavating the Royal City and the West Cemetery.

The following decades witnessed a great decline in interest, especially in the so-called post-Meroitic studies. Emery wrote:

> Before the building of the original Aswan Dam in 1898 Nubia had received scant attention from the archaeologist. This was because, only a short time before, large parts of the country had been the battleground of the Mahdi's army and the British and Egyptian forces, and because then, as now, Egypt offered to the excavator the possibility of more spectacular discoveries and far richer rewards in objects for private collections and museums. In those days the antiquarian and not the archaeological viewpoint was still paramount, and it must be admitted that many excavations were conducted with the primary objective of the discovery of *objets d'art*. Therefore Nubia, with its unknown history, held little attraction for the explorer, and although its great temples were visited and admired, its poverty-stricken cemeteries and ruined town sites, so rich in the secrets of the past, were ignored.
>
> EMERY 1965, 35

In fact it was not only the ruined town sites that were ignored, as the same fate befell almost all the necropolises of the Meroitic kingdom, including the royal ones (Bonnet and Mahmoud El-Tayeb 1991; Mahmoud El-Tayeb 1994; Garstang 1911; Shinnie 1954).

The aforementioned growing interest in archaeological sites upstream of the Third Nile Cataract is attested by several projects undertaken by various missions during the last decades of the 20th century. In Northern Sudan these included, for instance, Vila's excavations at Aksha (1967) and his survey at the Dal Cataract, as well as Jacquet-Gordon's and Bonnet's work at Tabo (1971), the significant work done by a Swiss mission from Geneva University at Kerma Ancient town (Bonnet and Vallbelle 2014), and the salvage excavation conducted by the French Unit in Khartoum at El-Kadada in the Shendi Reach north of Khartoum (Geus 1982). Accordingly, research on the last chapters of Meroitic culture slowly began to develop, though it was limited to casual finds or salvage interventions, without any specific excavation programmes or planned studies (Emery 1932). To the best of our knowledge, the only exception was the major research programme set up by the French Archaeological Unit attached to the Sudan Antiquities Service, led by Patrice Lenoble, to study the so-called post-Meroitic remains at El-Kadada and other sites of the Shendi Reach on both sides of the Nile (Lenoble 1987).

Since the 1980s numerous salvage interventions have been carried out in Sudan, especially in the central and northern parts of the country, necessitated by dam and road construction projects as well as agricultural and housing schemes. For instance, major surveys were undertaken by Krzysztof A. Grzymski (1987), of the Royal Ontario Museum, in 1986 between El-Debba and

El-Khandag; by Bogdan Żurawski (2003), of the Polish Academy of Sciences and the Polish Centre of Mediterranean Archaeology of the University of Warsaw, in the Southern Dongola Reach in 1998; and by an expedition from the Gdańsk Archaeological Museum in 1995 between Shendi and Begrawiya (Paner 1997) and surveys and excavations in the Fourth Cataract region in 1996–2010 (Paner and Borcowski 2005). Also in 1995 a mission from the Sudan Archaeological Research Society conducted excavations at a Meroitic and post-Meroitic cemetery at Gabati in the Shendi Reach (Edwards 1998, 69–82). The Fourth Cataract salvage campaign, conducted by several missions from the international community between 1996 and 2010, yielded some important results despite the campaign's limited timespan.

The results of these excavations, especially the ones at Meroitic and post-Meroitic sites, revealed the archaeological potential of the Dongola Reach in the area between the Third and the Fourth Nile Cataracts. Among the main issues are the question of the continuity and discontinuity of Meroitic culture, the unconvincing use of the term post-Meroitic and the conventional theories on the demise of Meroitic central power. In consequence, more attention was drawn to the Dongola Reach and the heart of the Makurian kingdom. The results of this work, although quite limited, were the first steps towards the launching of the Early Makuria Research Project. This is a comprehensive research programme realized jointly by the Polish Centre of Mediterranean Archaeology of the University of Warsaw and the National Corporation for Antiquities and Museums in Khartoum, created to study the burial evidence of the period between the 3rd and 7th centuries AD. The main aim of the study is to resolve many ambiguous issues concerning a period of political decline that was followed by economic deterioration and social unrest, which in turn led to the disintegration of the kingdom into a number of independent political entities that became known after their conversion to Christianity.

Inspired by the earlier excavations at Tanqasi (Shinnie 1954), Tabo (Jacquet-Gordon and Bonnet 1971), El-Ghaddar (Mahmoud El-Tayeb 1994), Hammur-Abbassiya (Mahmoud El-Tayeb 2003) and El-Hobagi (Lenoble 2004; Lenoble et al. 1994), the project chose to start in the tumulus field at El-Zuma. The village and the cemetery lie on the right bank of the Nile, about 20 km downstream from Karima and Jebel Barkal (the Holy Mountain and cradle of the Kushite Napatan kingdom) [see **Fig. 1.1**]. This cemetery had been mistakenly referred to as the "El-Zuma Pyramids" since at least the 19th century, when it was visited and recorded by Karl R. Lepsius (1852). Later investigations at this site were conducted by E.A. Wallis Budge in 1907 (Budge 1907), then Reisner in 1919 (Reisner 1919a, 1919b) and finally Żurawski in 2003 (Żurawski 2003). None of these were major archaeological missions, and their work was restricted to compiling basic records and writing descriptive accounts. The first season of the planned comprehensive study programme at the El-Zuma cemetery was carried out by a mission from the Polish Centre of Mediterranean Archaeology, University of Warsaw. A thorough reconnaissance revealed an accurate picture of the state of the tumuli. As a result of this survey the tumuli, which are still visible on the ground surface, were divided into three categories. The largest eight mounds, characterized by a conical shape, were classified as type I, while the eleven medium-size, flat-topped mounds were designated as type II, and the nine smallest, flat-topped mounds were classified as type III. Excavation revealed that each of these types has a different substructure. Although since then only two type I tumuli (T.2 and T.5) have been fully excavated, most probably all of them conceal a U-shaped shaft provided with a minimum of two side chambers and an underground tunnel aligned north–south, while type II tumuli have a similar shaft, but without the underground tunnel. The smallest, type III tumuli have a rectangular, vertical shaft provided with a single burial chamber cut into the west wall of the shaft. The burial construction of the three types is quite homogenous, except in three cases: T.11, T. 13 and T.16, which are classified as a subtype of type II burials.

Excavation of the 28 tumuli at this cemetery started in 2004/2005 and lasted till 2017 [**Fig. 1.2**]. However, the end of excavation work did not mark the end of on-site activity. A number of the tombs have been provided with temporary protective covers, since the mission is committed to protect the cemetery field and turning it into an archaeological park. The idea behind the creation of such a park was born during early discussions with members of the local community eager to keep the excavated tombs open to visitors. Thereafter, two designs for the reconstruction of type I and type II burials were prepared. The next consideration was how to raise awareness of cultural heritage in the local community and work on some kind of integration of the ethnic groups inhabiting the wider area. It was the architect Prof. Abdalla Sabbar, who came up with the ready project of building a cultural centre; the plan awaits realization in the near future (see Chapters 9–10 in this volume).

The scarceness of documentary evidence relating to Ancient Nubia has already been stated and its archaeological record has not been examined to the extent it deserves. To better understand the cultural changes and customs pivotal to this study of the El-Zuma necropolis, one should look at a chronological outline and a brief his-

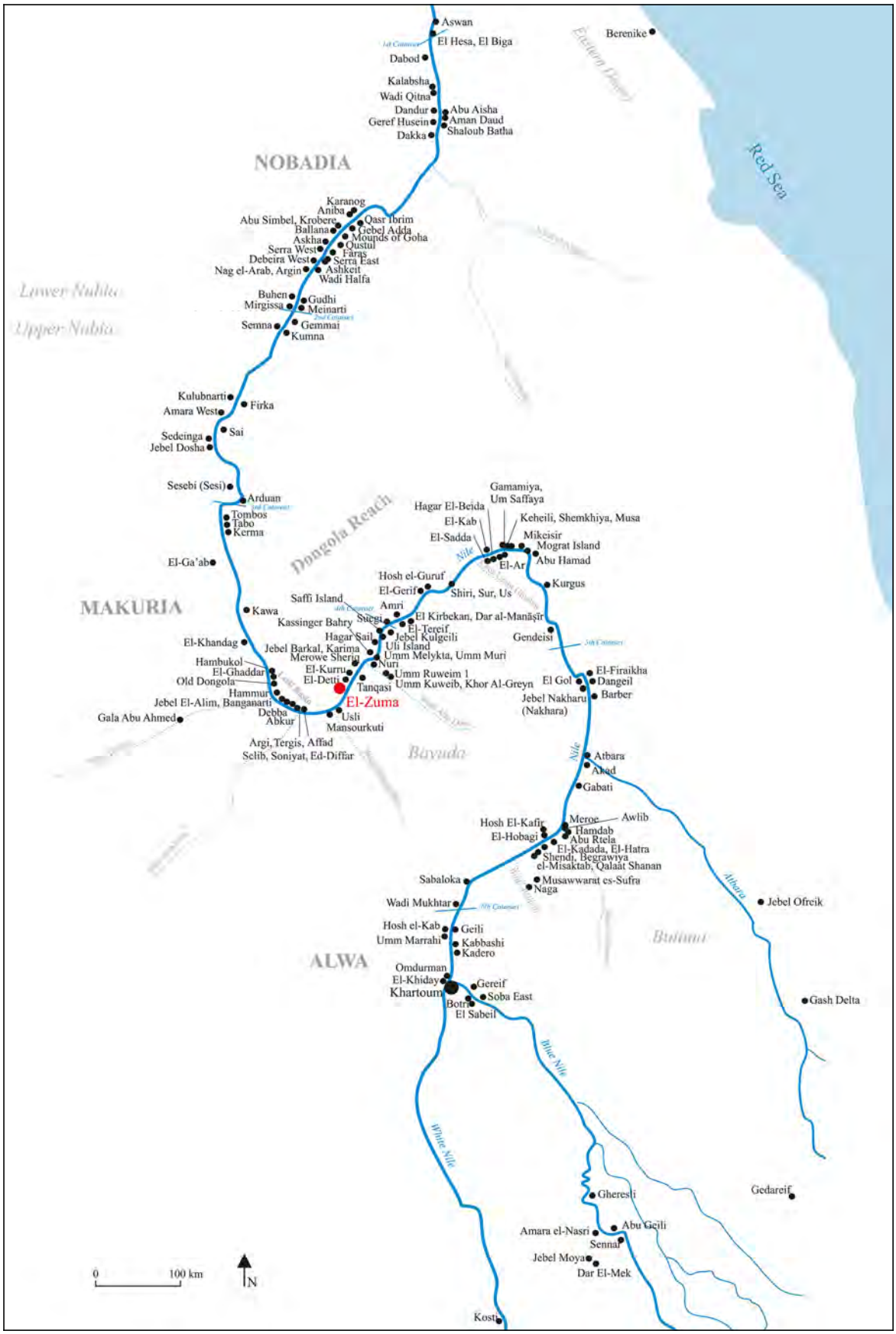

FIGURE 1.1 Map of the Ancient Nubia archaeological sites mentioned in the publication
DRAWN BY E. CZYŻEWSKA-ZALEWSKA

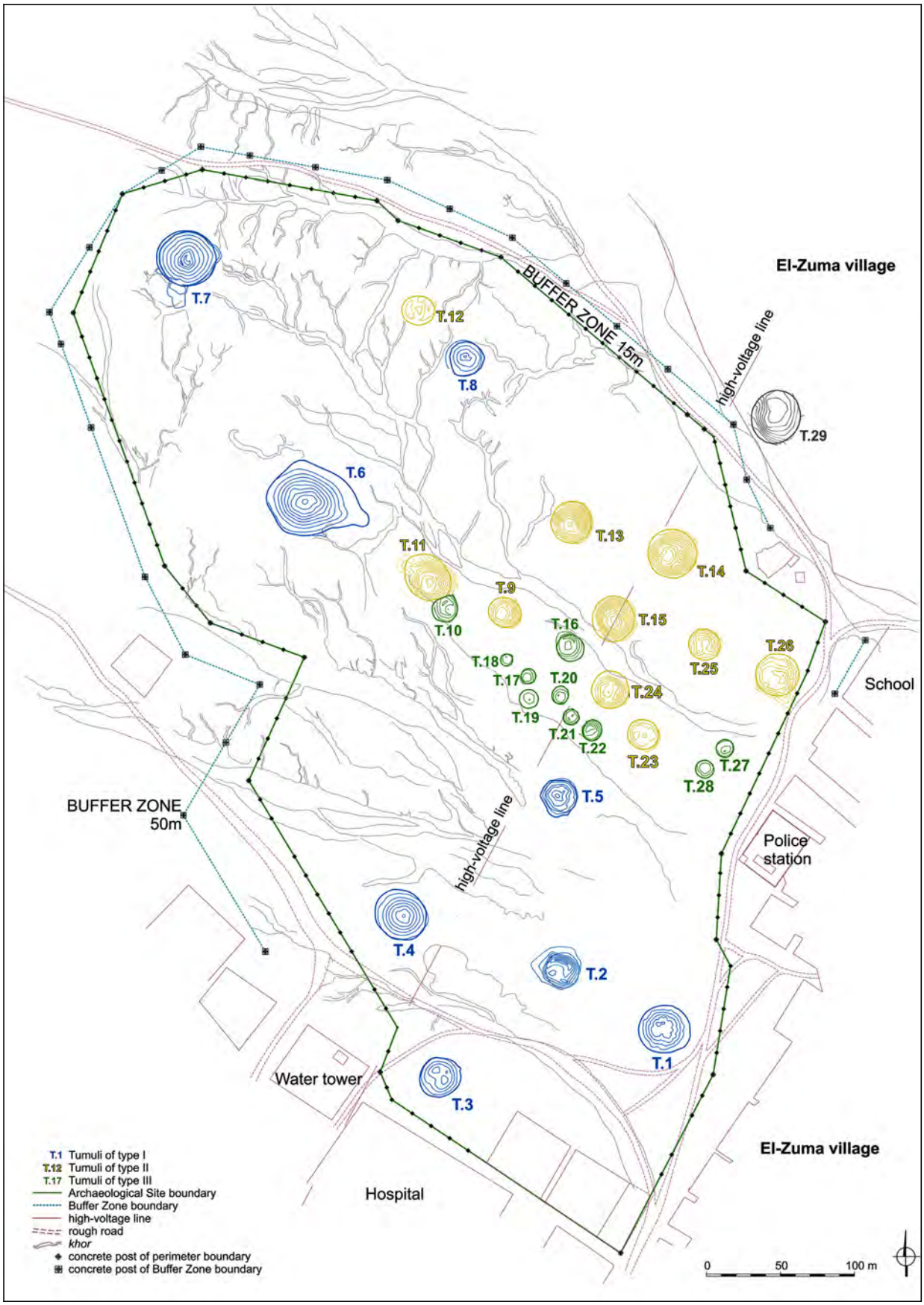

FIGURE 1.2 Topographic plan of the cemetery in El-Zuma
DRAWN BY J. JUCHNIEWICZ, Z. KOWARSKA, S. LENARCZYK

torical overview of Ancient Nubia (see Chapter 1.2 below). The chronology [**Fig. 1.3**] primarily concerns the territory of the Dongola Reach, in particular the period that followed the demise of the central royal authority of the Meroitic kingdom. Historical records show that during the period between the fall of the kingdom in about AD 350 and the conversion to Christianity during AD 550–600, Meroe was forgotten by the outside world. The end of the 2nd / beginning of the 3rd century AD was a twilight of the days of glory and the Kingdom of Meroe slowly slipped into a dark age culminating in the final demise of central royal authority (Adams 1977: 382–330). The kingdom at its peak of power and prosperity controlled the Nile Valley from Qasr Ibrim in the north as far south as Sennar on the Blue Nile and Kosti on the White Nile. Yet, the definite collapse of the once-united state occurred in the mid-4th century AD. Thereafter, the famous kingdom disappeared from the collective memory of the classical world. The disintegration of the Meroitic kingdom coincided with a period of social change and political instability. All this led to the rise of three political entities: Nobadia in the north, occupying Lower Nubia; Makuria, in the Dongola Reach between the Third and Fourth Nile Cataracts; and Alodia, extending from the Fifth Cataract region to the territory of the Blue Nile with its capital at Soba, some 30 km south of Khartoum. The interest of the Mediterranean world in these entities began only when they converted to Christianity in the mid-6th century AD, almost two hundred years after their rise as independent states (Török 1988; Edwards 2004, 182–195; Mahmoud El-Tayeb 2012, 9, 27–40).

Unfortunately, Meroitic culture left no written sources or other documents explaining what happened after the final collapse of central power in Meroe. All that is known is that the once-unified kingdom passed from glory to disintegration. Although research into the ancient past of Lower and Upper Nubia has been ongoing since the early days of the 20th century, little attention has been paid to this later phase of Meroitic culture, particularly in the territory of the Dongola Reach. The first investigations into the last chapter of Meroitic culture came with Shinnie's excavation of the tumuli at Tanqasi in 1953 (Shinnie 1954), which was followed by some more limited fieldwork. By the end of the 20th century far more archaeological projects were underway, specifically at major sites in the region between the Third and Fourth Nile Cataracts. Among these sites, cemetery fields excavated in the Letti Basin, such as El-Ghaddar (Mahmoud El-Tayeb 1994), Hammur-Abbassiya (Mahmoud El-Tayeb 2003), El-Zuma, and Tanqasi (Shinnie 1954), appeared to be the main source of information, further evidence also being discovered at burial grounds in the Fourth Cataract region, best represented by the cemetery of El-Kassinger Bahry (Kołosowska and Mahmoud El-Tayeb 2007). These later excavations shed more light on the period in question, which led to a better understanding of the events that had taken place. One of the most significant results of this work was that it demonstrated a continuity of Meroitic culture at these sites shown to be a process of continuous evolution. This cultural evolution is quite evident in grave construction and mortuary traditions, as well as in pottery and other burial goods. The same phenomenon can be seen at other cemetery sites in Lower Nubia, for instance, Ballaña and Qustul (Emery and Kirwan 1938), or El-Hobagi (Lenoble 2004) in the Shendi Reach, upstream of the Fifth Cataract: nothing new occurred to replace Meroitic culture after the fall of the Kingdom of Meroe. Therefore, the term 'post-Meroitic,' which has been used in relation to this period for over a hundred years, seems to be far less appropriate than 'Terminal Meroitic.'

This study is mainly concerned with the last chapter of Meroitic culture in the Dongola Reach. To date, little is known about the transitional period (in this region) which is designated 'Early Makuria.' The term is considered as more appropriate than 'post-Meroitic' and enables in the meantime a differentiation between it and the later Christian kingdoms of Makuria (Mahmoud El-Tayeb 2012, 12). There has not been much research into this period, and there are few cultural relics and written sources relating to it. The only reliable source of evidence comes from cemetery sites. For about 200 years nothing was known about what had happened after the collapse of the Meroitic kingdom. Yet, sometime around the 6th century AD, historical sources record three political entities in Nubia that had converted to Christianity, mentioning them by name, which means that these states had been formed before the adoption of the Christian faith. One of these states, which occupied the Dongola Reach, was Makuria. Hence, to avoid any confusion in the study of the pre-Christian state it is necessary to introduce a new term—Early Makuria, used in reference to the political state rather than just the historical period.

The Dongola Reach contains several cemeteries of various size: Tabo near Kerma (Jacquet-Gordon and Bonnet 1971), El-Ghaddar north and south (Mahmoud El-Tayeb 1994), El-Kassinger Bahry in the Fourth Cataract region (Kołosowska and El-Tayeb 2007) and Tanqasi (Shinnie 1954) on the left side of the Nile, but so far little comprehensive research has been undertaken on these cemeteries. Close scrutiny of the material culture recovered from excavations conducted in the Dongola Reach revealed that the Terminal Meroitic (or so-called

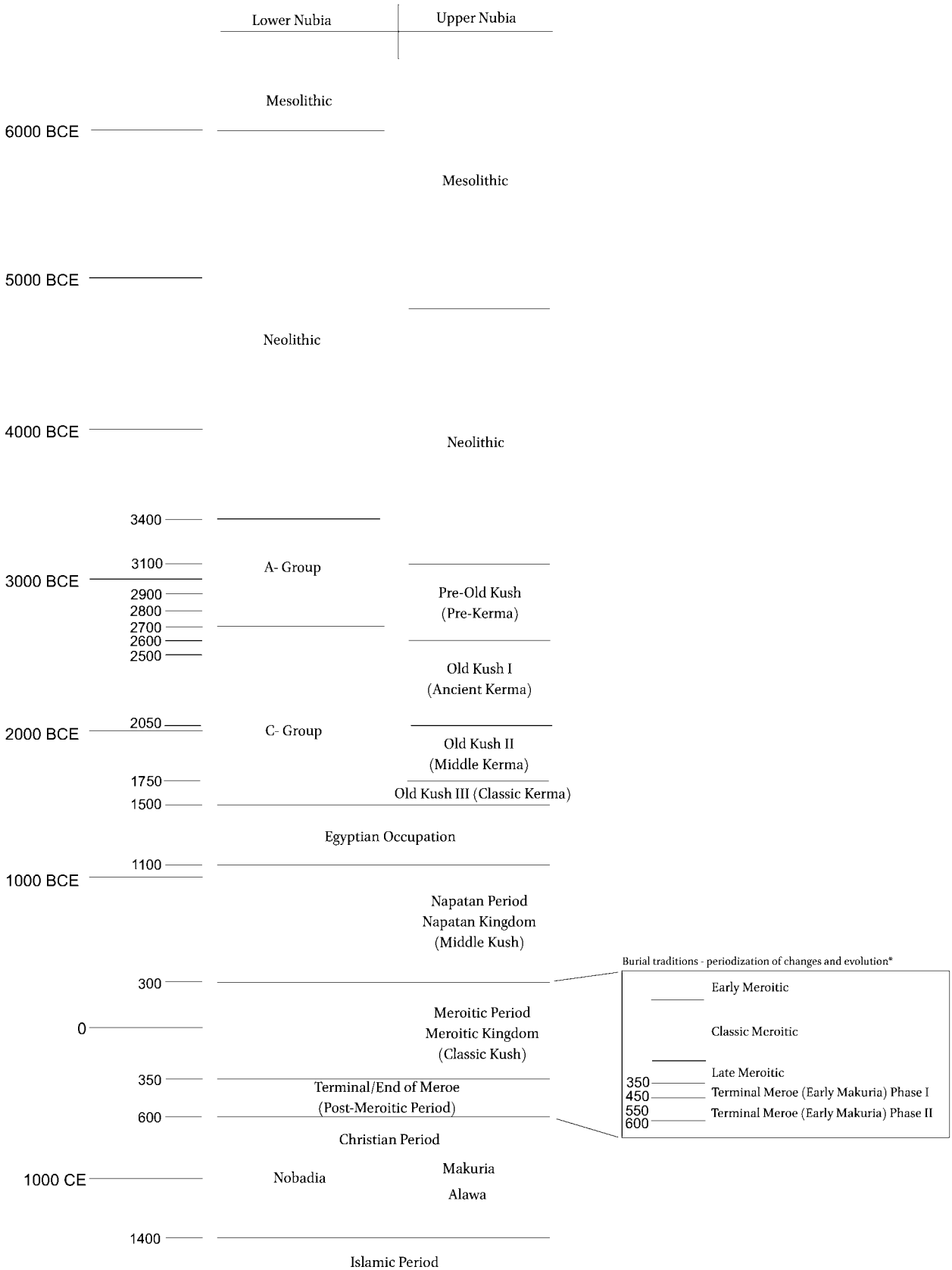

FIGURE 1.3 General chronological table based on the chronology of Mesolithic and Neolithic Sudan (David and Salvatori 2019, Fig. 2) and the timeline of Kush and Christian Nubia (Emberling and Davis 2019, x–xi; Obłuski 2014, 9). * The inset with the periodization of changes in the burial tradition according to Mahmoud El-Tayeb's (2012, 41–75) periodization

post-Meroitic) period has two phases (see Fig. 1.3). This has been confirmed by the study and analysis of finds from various cemeteries in the Reach and by ^{14}C dates obtained from samples taken by the Gdańsk Archaeological Museum mission from sites in the Fourth Cataract region. The cemetery of El-Kassinger Bahry has provided the best dates. For instance, burial HP45/1 was dated to AD 480–540 (at 95.4% probability) and burial HP47/3 to AD 130–340 (at 95.4% probability). The results of radiocarbon dating of material from a long list of sites excavated by the Gdańsk mission within their concession on the Fourth Cataract have not been published as a whole in one place, but are available to researchers.

In this context, the extensively excavated cemetery at El-Zuma has provided significant insight into this controversial period, particularly regarding the evolution of Meroitic culture. There are strong arguments, based on analysis of the material culture, in favour of dating it to the second phase of Early Makuria (AD 450–650).

2 Geography and Economy

The main subject of this study are the results from the excavation of elite tumuli at El-Zuma village, which lies almost in the middle zone of the Dongola Reach. To begin with, it is necessary to throw some light on this important territory and its rich history as a cradle of ancient Nubian civilization. The significant role of this Reach in the Nubian past stems mainly from its geographical location between the Third and Fourth Nile Cataracts. Accordingly, a brief review of the Dongola Reach, its geography and economy is fundamental in understanding the bases on which the potentiality of the region was built (Adams 1981; Barbour 1961; Edwards 1989; Whiteman 1971).

The Dongola Reach is a strategic section of the Sudanese Nile Valley, where important ancient waterways and desert roads leading from north to south and east to west converged. The river here is wide, tranquil, and relatively easily navigable. The Reach was connected with lands to the south-east, south, and west by routes that followed the course of major wadis, providing safe passage for trade caravans through the Bayuda semi-desert to the Shendi Reach (via Wadi Abu Dom), to the south-west steppes of Kordofan (via Wadi Muqaddam and Wadi El-Malik) and to Darfur (via Wadi El-Howar) in the far west (Adams 1981, 7–8; Shinnie 1991). Covering a distance of some 500 km, the Dongola Reach extends from the Third to the Fourth Nile Cataract [see **Fig. 1.1**]. The Fourth Cataract region is one of the most inhospitable and inaccessible parts of the Nile Valley, where the river has to force its way through the solid geology of the Basement Complex (Barbour 1961; Whiteman 1971). There are practically no cultivable lands in this area, and so most of its sparse population lives in small villages located on the islands of the Nile and along both banks of the river. However, in the rest of the Dongola Reach downstream from the Fourth Cataract, the river winds its way through the soft rocks of the Nubian Series (Whiteman 1971), forming a broad alluvial valley providing fertile soils ideal for cultivation. As a result, the lands around Karima, Letti, and Kerma have always been far more densely populated.

Up until the 1950s, traditional agriculture in the Dongola Reach involved cultivating the Nile floodplain, both on islands and along the riverbanks within narrow strips of land known locally as *guruf* (sing. *gerif*), and mistakenly referred to as *seluka* land in various publications. In fact, the use of the *seluka* (a digging tool) has never been limited solely to riverbanks, and is seen in areas that rely on natural irrigation provided by sources other than rivers. Similar cultivation methods that did not need any special irrigation system were used in dried-out basins and channels after the annual floodwaters had receded.

An ancient means of mechanically irrigating the lands along the Nile was to use a simple, manually operated water-lifting device known as a *shadoof* or counterpoise lift. Innovation came during the Meroitic period with the introduction of the *saqiya*—a waterwheel that was installed on the river bank and made it possible to irrigate higher grounds located further away from the river, thus enabling wider-scale cultivation.

Although there has been some discussion about past land use in Nubia (Bradley 1992; Edwards 1989; Ahmed 1984), it is undoubtedly a topic that requires further research, particularly in relation to the Meroitic period. It appears that only certain parts of the inundated basins and small islands were cultivated, a technique still employed to this day in some parts of the Letti Basin, whenever floodwaters are sufficiently high. This type of floodwater farming may have been practised in the region prior to the advent of the *saqiya*, and could have been what Adams (1981, 3) had in mind when referring to limited-scale agriculture in the Kerma and Letti Basin. It is widely acknowledged that the *saqiya* played a vital role in the Nubian economy. Its use in the Dongola Reach meant that lands much further away from the river could be made arable, but also that cultivation was no longer restricted exclusively to the winter period. However, exactly when the *saqiya* first appeared in Nubia is unclear. Adams (1977, 346–348) contends that its introduction coincided with the resettlement in the north which began in the 2nd cen-

tury AD, whereas Edwards (1989, 144) believes that the *saqiya* was not introduced until sometime in the 4th century.

The *saqiya* was generally used in conjunction with rivers, but in Nubia a method was devised for using it to raise water from wells (known locally as *matara*), so that not only riverside sites could be irrigated. We know that this combination of *saqiya* and *matara* was common in the Dongola Reach thanks to the 19th-century travel journal written by George Waddington and Barnard Hanbury (1822, 43), who reported that one example still survived in the Kerma Basin: "... three hundred years ago, all the land was cultivated by sakies erected over wells of water found in the ground ... and one such sakie is now in existence at more than half a mile from the river". Arkell (1948, 16) also noted that the *saqiya* was used to draw water from wells during the Meroitic period in the Letti Basin and parts of Wadi El-Khowi. A team from the Polish Academy of Sciences, led by Bogdan Żurawski, recorded a *matara* with very well preserved red brickwork at Selib (near Old Dongola), close to a church site not far from a newly discovered Meroitic settlement that now lies almost a kilometre away from the riverbank (Żurawski et al. 2013). The *matara*-and-*saqiya* system may well have been developed during the Meroitic period in the Dongola Reach, particularly given how suitable the natural environment was, boasting both fertile land and a relatively shallow water table, and the fact that manpower was readily available.

The mention of manpower prompts an issue raised by Adams (1981, 3), who suggested that there was a dearth of Meroitic settlements in the Kerma and Letti Basins. However, new evidence of a significant Meroitic presence in the northern Dongola Reach has come to light at numerous sites. The work of the Swiss mission at Kerma, directed by Charles Bonnet, the Royal Ontario Museum's archaeological reconnaissance project in the Letti Basin, led by Krzysztof Grzymski, and the ongoing Polish excavations at Selib, directed by Żurawski, have all shown that this area was settled during the Meroitic period, and had been continuously occupied since at least the times of Ancient Kerma (Bonnet and Mahmoud El-Tayeb 1991; Bonnet and Valbelle 2004, 2005; Grzymski 1987; Salah Eldin Mohammed Ahmed 1999). Evidence of Meroitic communities was also discovered for the first time at the opposite end of the Reach, in the area around the Fourth Cataract, where a number of cemetery sites were recorded as part of the Hamdab Dam Archaeological Survey Project conducted by the Gdańsk Archaeological Museum mission led by Henryk Paner (Paner and Borcowski 2005; Welsby et al. 2005).

Although the scale of traditional agriculture based on the type of floodwater and irrigation farming outlined above must have been quite limited, it was nonetheless sufficient to meet household needs for food and to satisfy local market trade. This is borne out by the economic history of the Reach, which shows that agricultural products were never the mainstay of the region's economy. The wealth amassed by local rulers that enabled them to remain independent of the central authority in Meroe throughout the 3rd and 4th centuries AD was probably based on their control of certain local resources, as well as transit trade—a privilege they enjoyed because of the strategic location of the Dongola Reach. We do not know whether the Early Makurians traded directly with Pharaonic Egypt and beyond, or simply served as intermediaries, and there is very little to indicate the scale of this trade. The few pottery imports from Upper Egypt and Lower Nubia noted in the Reach have been found at burial sites in its central part, such as El-Ghaddar Northern cemetery, Hammur-Abbassiya, El-Zuma and El-Kassinger Bahry (Mahmoud El-Tayeb 1994; Mahmoud El-Tayeb and Kołosowska 2007; Phillips and Mahmoud El-Tayeb 2003). However, the archaeology of this region remains largely uncharted, particularly in terms of the Terminal Meroitic (AD 450–600), making it difficult to draw any conclusions about the extent of trade with other parts of the Nile Valley during this period.

The absence of pasture lands in the Dongola Reach suggests that cattle were not critical to the economy of the region, though limited numbers may have been kept to power the waterwheels and plough the fields associated with them. The most popular sources of meat were small animals such as sheep and goat, but these were not the only food species. It is possible that cattle may have been reared in the neighbouring Bayuda semi-desert, where conditions were more favourable for this type of animal husbandry and better suited to a semi-nomadic lifestyle. This theory is supported by the recent discovery of several Terminal Meroitic (post-Meroitic) settlements located relatively far away from the left bank of the Nile, heading towards the Bayuda. The archaeologists who excavated these sites identified their inhabitants as pastoralists (Wolf and Nowotnick 2005). The ancient subsistence strategy of pastoralism is still pursued by members of the Busharyia tribe around the village of El-Widay in the heart of the Fourth Cataract region, and by the Hawawir and Hassanyia nomads who live near El-Kassinger Bahry, some 20km upstream of Karima. The Bayuda Desert has witnessed considerable human activity throughout Nubian history, and evidence of cattle husbandry having been practised there is provided by the abundant cattle

depictions found on rock outcrops dotted along various routes leading to the Nile.

The continuous exploitation of this desert region from prehistoric times to the present day is further attested by the culturally diverse sites discovered as part of Gdańsk Archaeological Museum's ongoing Bayuda Project. Cemeteries attributable to the Old Kush culture (Kerma culture, 2500–1500 BC) [see **Fig. 1.3**] are particularly well represented, even though none had previously been noted in this region. Survey work has also led to the identification of Meroitic, Terminal Meroitic (post-Meroitic) and Christian period burial sites in the Bayuda (Paner and Pudło 2010).

3 Historical Overview

Ancient Nubia experienced numerous ups and downs in its long history, not least during the Kushite era, and for three successive periods (Old Kush Phase I, Kerma, 2500–1500 BC / Phase II, Napata, 900–500 BC / Phase III, Meroe, 350 BC–AD 550) the details of this history remain hazy. After Egypt had been unified by King Ahmose of the Eighteenth Dynasty, his successors began to extend the borders of Egypt further southwards, bringing an end to the old Kingdom of Kush (2500–1500 BC), and seizing its capital. Following the Egyptian New Kingdom occupation of Nubia [see **Fig. 1.3**], local native chieftains laid the foundations for the rise of the Napatan kingdom (900–500 BC) and the might of the Twenty-fifth Dynasty (Morkot 2000, 293–304).

The capital of this new, Middle Kushite, kingdom was Napata, nestling at the foot of the Holy Mountain, Jebel Barkal, in the heart of the Dongola Reach. Gradually, the golden age of the Twenty-fifth Dynasty came to an end, and in the early 6th century BC, Napata fell to the forces of King Psammetik II of the Twenty-sixth Dynasty, after which the Kushite capital was relocated further south to Meroe, in the rainy savannah zone (Morkot 2000, 293–304), and the Kushites were forced to withdraw from Egypt. There has been some debate as to why they chose Meroe as their new political and administrative centre. The Egyptian military campaign against Napata, probably launched in response to an attempted Kushite invasion during the reign of Analamani (623–593 BC), has been put forward as one of the possible reasons why the Kushites moved their capital further south. The accession stele of Aspelta (593–568 BC) tells us that an attack on Egypt was carried out by Analamani (Arkell 1961, 144–145; Macadam 1955, 238–240), but rebuffed by the armies of Psammetik II. Some archaeologists, including Arkell (1961, 144–146) and Shinnie (1967, 32–33), regard the destruction of royal statues of the Kushite kings Taharqo (690–664 BC), Tanwetamani (664–653 BC), Senkamanisken (643–623 BC), Analamani (623–593 BC) and Aspelta (593–568 BC) as further evidence of a foreign invasion that prompted the relocation of the capital to the relative safety of Meroe.

Reisner believed that Kushite interest in Meroe dated as far back as the reign of Piankhy (Piye 747–716 BC), when a branch of the royal family had been installed there to claim the lands in the south for the king. According to Reisner it was internal family rivalry that led to the destruction of the aforementioned royal statues (Reisner 1919a). Excavations at Dokki Gel, Kerma, and Dangeil [see **Fig. 1.1**] revealed evidence of similar incidents involving the smashing of statues portraying some of the same kings (Anderson and Salah eldin Mohamed Ahmed 2009; Bonnet and Valbelle 2004, 109–113). The discoveries at Dangeil are somewhat surprising given that there are no records of Egyptian incursion into Nubia beyond Kurgus in the Abu-Hamed Reach, where kings Thutmose I and Thutmose III of the Eighteenth Dynasty left rock inscriptions at Hagar El-Merwa. The fact that two deliberately broken statues of Late Meroitic date were found in the same context as the earlier sculptures at Dangeil (Anderson and Salah eldin Mohamed Ahmed 2009, 83–84, Pls. 9, 10) suggests that it may not have been royal family enmity but internal conflict between the eastern desert tribes that led to their destruction. This theory brings us back to the subject of other possible reasons for the relocation of the Kushite capital to Meroe.

A great deal of what we know about the events of this period comes from historical inscriptions. They attest to the fact that hostilities existed between the Kushite kings and the tribes of the eastern and western deserts for some 300 years. The earliest recorded mention of this turbulent relationship is provided by an inscription of King Analamani (623–593 BC), discovered in Taharqo's temple at Kawa. Analamani's stele (Kawa VIII) includes a passage that tells of the king's coronation journey along the Nile from Meroe to Napata and thence on to Kawa (Eide et al. 1994, 216–224). It also recounts that Analamani mounted an armed expedition against the western desert tribes in retaliation for raids on Kawa and other neighbouring settlements (Eide et al. 1994, 216–228; Nachtigal 1889, 141, 161). Another inscription from Kawa records that King Amaninete-yerike (431–405 BC) quashed several tribes inhabiting the northern lands of the 'island of Meroe' (Eide et al. 1996, 400–420), and information along the same lines appears in an inscription of Harsiotef (404–369 BC) found at Jebel Barkal (Eide et al. 1996, 457–464). The long-lasting conflict between the Kushites and vari-

ous desert tribes is also attested by the latest inscription from Jebel Barkal, which records that King Nastasen (335–315 BC) (Eide et al. 1996, 467–500) waged war against these nomadic groups as well as other invaders from the north (Eide et al. 1994, 1996). Was it perhaps the threat posed by these tribal hostilities that led to the capital being transferred to Meroe? In all likelihood, they were probably not the principal reason, although the disruption they caused to the caravan trade doubtless had a damaging effect on the Kushite economy. Arkell (1961, 148) and Tylecote (1982, 29) suggested that radical climate change may also have undermined the kingdom's economic stability. The aforementioned inscription (No. IX) of King Amaninete-yerike, in which we learn that as part of the restoration work he initiated at Kawa, windblown sand was cleared away from the approach to the temple, hints at the fact that the climate was changing in the Dongola Reach. Evidence recorded during the Fourth Cataract salvage campaign also supports the idea of regional climate change, given that nearly all of the Napatan to Islamic period burial sites recorded in the region were found in low-lying areas and in the dried-up beds of ancient branches of the Nile, in stark contrast to the locations used for earlier cemeteries of the Old Kush culture (Kerma period). These changes in climate probably led to desert encroachment and consequent loss of grazing land across the whole of the Dongola Reach. It is probable that all of the issues outlined above (Egyptian aggression, tribal raids, economic instability and climate change) were contributory factors in deciding to relocate the capital to Meroe.

When exactly this relocation took place remains a mystery. It is widely agreed that the Meroitic period, which was the final phase of Kushite rule, lasted from the 4th century BC to the 6th century AD. Thus, when King Nastasen died in around 308 BC (by Reisner's calculations), Napata was no longer the political capital of the kingdom, though this does not clarify when the move to Meroe was made. Nastasen had resided at Meroe despite being the last of the Kushite kings to be buried at Nuri (Eide et al. 1996, 471–501). Three of Nastasen's successors were buried at Jebel Barkal, whilst the final resting place of a further two is unknown. There is also no information about whether their royal courts had been at Napata or Meroe. Arkamani (Ergamenes) (295–275 BC) (Shinnie 1996, 118), whose tomb was found at the Begrawiya South Cemetery (Shinnie 1996, 104), was the first king to be buried at Meroe. Reisner believed that the capital had been transferred to the south in 453 BC, during the reign of Malowiebamani (463–435 BC), and that all subsequent Kushite kings had resided at Meroe (Reisner 1919b). In contrast, Dunham initially estimated that the relocation had taken place in the mid-6th century BC, following the death of King Malonaqen, though he later revised this date based on evidence from excavations at the royal cemeteries of El-Kurru and Nuri, ultimately concluding that the move had been made around 538 BC (Dunham 1947; Smith 1955, 21–22). The earliest written evidence of the capital having been moved is provided by the coronation stele of King Amaninete-yerike (Kawa IX), which tells us that the king made a journey from his residence in Meroe to Napata, before proceeding further downstream to Kawa and Pnubs in the northern Dongola Reach (Eide et al. 1996, 400–428).

The city of Meroe stood on the right bank of the Nile, in a strategic location between the Fifth and Sixth Cataracts. The terrain surrounding the new capital was quite unlike that around Napata, for Meroe lay in the lush savannah lands at the western end of the Butana steppe [see **Fig. 1.1**]. The conditions provided by this fertile landscape, fed by three major wadis (El-Hawad, El-Awlib and Wadi El-Awateb), were excellent both for raising livestock and growing crops, thus ensuring a reliable supply of food for the local population. Standing at the crossroads of numerous important caravan trails, the city was able to control several key trade routes: leading from south to north, bringing exotic goods from tropical Africa to Egypt; from west to east via the Red Sea Mountains and onward to the gold mines at Wadi El-Allaqi and Wadi Gabgaba; and across the Bayuda semi-desert, passing through Napata and proceeding further north to Kawa and beyond (Shinnie 1991).

Both Reisner and Dunham believed that a branch of the Kushite royal dynasty had been installed at Meroe before it was made the kingdom's new administrative centre (Dunham 1947, 7–8; Reisner 1923a, 34), indicating that the Kushites were conscious of the economic advantages and significance of the southern lands between the Nile and the Atbara. Reisner's work at the Begrawiya South Cemetery provided evidence of the fact that Meroe had been founded long before it became the Kushite capital. The earliest graves excavated at this burial ground were dated to the reign of Piankhy, and Reisner argued that this site had served as a cemetery for the Napatan officials who managed the southern region of the kingdom on behalf of the Napatan kings (1923a, 34–35). The results of Garstang's excavations at Meroe led Dunham (1947) to conclude that Taharqo had erected at least one building there. Even though this theory was rejected by Smith (1955, 21), evidence from a Napatan temple at Dangeil, where a number of broken statues of Kushite kings (including one of Taharqo) were found, suggests that there had been a Kushite presence upstream of the Fifth Cataract (Anderson and Salah eldin Mohamed Ahmed 2009, 79–82).

Napata appears to have ceased functioning as the political centre of Kushite power sometime in the 4th century BC, when its royal cemetery also witnessed the last burial of a Kushite king (Nastasen). However, the temple complex surrounding Jebel Barkal remained the kingdom's principal religious centre. The subsequent centuries saw the Kingdom of Meroe thrive and expand, ultimately gaining control of an area stretching from Qasr Ibrim in the north as far south as Sennar and Kosti on the Blue and White Niles respectively, and probably extending westward into Kordofan (Mahmoud El-Tayeb 2002). The kingdom flourished both culturally and politically, its heyday falling between the 1st century BC and the 1st century AD. The archaeological record of this period shows that there were numerous developments in material culture, most of them rooted in local tradition, though with evident influences from Greco-Roman Egypt.

Iron production was central to the prosperity of the Meroitic kingdom, and the vast mounds of iron slag found at Meroe attest to large-scale iron-smelting operations. It has even been postulated that ironworking know-how spread from Meroe to all parts of sub-Saharan Africa (Humphris, Bussert, et al. 2018; Humphris, Charlton, et al. 2018; Humphris and Scheibner 2017). The subject of the iron industry in Meroe has received considerable attention since the first archaeological evidence of it was discovered in the early 1900s. However, a number of key issues, such as where this metallurgical technology came from and how it reached Meroe, have not yet been resolved.

The emergence of Meroitic writing was a major cultural milestone of this period. There has been much debate about the origins of the Meroitic language, which have variously been linked to Beja, Nubian, and other groups of the Southern Blue Nile (Shinnie 1967, 132), but both this question and that of when Meroitic first appeared in written form remain unanswered (Rilly and de Voogt 2012). An inscription concerning Queen Shanakdakhete, dated to the 2nd century BC (180–170 BC), and found in a temple at Naga, provides the earliest known example of written Meroitic (Eide et al. 1996, 660–662; Harkless 2006, 146). At the other end of the scale, the last inscriptions in Meroitic hieroglyphs include the name of King Tarekeniwal (*c.* AD 155–170), recorded on the pylon of his pyramid (Beg. 19) (Eide et al. 1998, 939), and one relating to King Yesbokheamani (AD 283–300) (Hallof 2003), inscribed on a lion statue at Qasr Ibrim in Lower Nubia. The only example of Meroitic writing dating from the Terminal Meroitic (post-Meroitic) period was recorded on a bronze bowl (HBG III/1/135) recovered from tumulus III at El-Hobagi, engraved with the Meroitic title *Qore*, meaning 'king' (Lenoble 1999, 179–180, 197, Fig. 29; Lenoble and Nigm ed Din Mohammed Sharif 1992, 634–635). Commenting on the late date of the bowl from El-Hobagi, Welsby (1996, 191) made the entirely credible observation that "if the bowl was not being reused, and in the light of the associated Kushite funerary practices this seems unlikely, it indicates that this system of writing continued into the post-pyramidal age."

The period between the 3rd century BC and 1st century AD was the high point of a vibrant Meroitic cultural renaissance. Egyptian traditions had taken root in Nubia during the New Kingdom occupation, and by the time of the Twenty-fifth Dynasty, Amon, the chief deity of the Egyptian pantheon, had also become the principal god of the Kushite state, and the funerary cult of Isis, Osiris and Horus had been fully adopted and continued to be practised until the end of the Meroitic period (Shinnie 1967, 141–146; Welsby 1996, 77–79). However, a local religious development occurred in the 3rd century BC, after the capital had been moved to Meroe, with the appearance of a new Meroitic god named Apedemak. Temples dedicated to this new deity were raised at Musawwarat es-Sufra and Naga. The reliefs decorating these buildings often depicted Apedemak as a lion-headed warrior god clutching a bow and quiver in his right hand, on which he wore a thumb-ring. In time, Apedemak supplanted Amon as the most important god of the Meroites (Shinnie 1967, 141–146; Welsby 1996, 77–79).

Egyptian religious and artistic influences are very evident in early Napatan relief and figurative sculpture. Despite the fact that these Egyptian traditions were upheld throughout the Meroitic period, they were enriched by the addition of various indigenous motifs as well as elements of Hellenistic and Roman art. Relief decoration adorning offering tables, pyramid chapels and temples provides a multitude of valuable insights into various aspects of Meroitic society, culture, and religious beliefs (Shinnie 1967, 99–114; Welsby 1996, 177–182).

Welsby has proposed that Meroitic art can be divided into five groups, each of which displays stylistic traits inspired by different cultural influences. The first group exhibits a continuation of earlier Kushite traditions; the second is characterized by a revival of Egyptian forms, the third by the introduction of new traits regarded as Meroitic, the fourth by the appearance of Hellenistic trends, and the fifth by the addition of features inspired by the Roman artistic canon (Welsby 1996, 181). Both Meroitic reliefs and sculptures in the round are marked by a notable degree of realism and creativity that had never been seen during the Napatan period. For example, the Meroitic version of the *Ba* statue, an ancient Egyptian symbolic representation of the human soul (Bun-

son 2002, 62), took on a far more human form than its bird-like Pharaonic counterpart. In another innovative twist, Meroitic portrayals of kings and princes waging war against their enemies sometimes included a lion or a hound at the ruler's side. Various sculpted images of elephants—animals which the Meroites trained and used in battle as well as royal ceremonies—also frequently feature in the Meroitic repertoire. Two particularly interesting reliefs were discovered at the Meroitic temple complex in Awlib. One of them comprises multiple representations of a seated woman, probably the Egyptian goddess Isis, holding a *Was* sceptre (symbol of power and domination), whilst the other depicts the Egyptian god Horus, whose traditional falcon head has been replaced with a solar disc (Pinch 2011, 181, 193, 231). The depiction of folds on the neck of this figure is a Meroitic characteristic that was probably of African origin (Borcowski and Paner 2005, 49–51, Fig. 7; Sander 2010, 155, Fig. 5), and inspiration from local African sources is clearly reflected in the new trends evident in Meroitic art.

A comprehensive study of the pottery recovered from El-Zuma, detailing its evolution from the Early Meroitic to the end of Phase II of the Terminal Meroitic period (late post-Meroitic, AD 450–600) is presented in Volume II of this monograph, therefore only a brief synopsis of the most distinctive characteristics of the pottery of this period is given below. The Egyptian conquest of Nubia during the New Kingdom period not only brought about the demise of the first known African kingdom and its capital at Kerma, but also led to the abandonment of indigenous pottery-making practices. Subsequently, early Napatan pottery became so strongly inspired by New Kingdom wares that it is often difficult to tell the two apart. Conversely, it seems that Napatan ceramics had barely any influence on Early Meroitic pottery.

There is just as much mystery about the origins of Meroitic pottery production as there is concerning the origins of Meroe itself and various other aspects of Kushite culture. Early Meroitic handmade black pottery is notable for an original ware inspired by the Neolithic ceramic tradition (David and Salvatori 2019, 4–6). This black ware was decorated using a variety of impressed dot motifs, often forming geometrical patterns. The African savannah also served as a source of inspiration for designs used on these vessels (see also Volume II, Chapter 2).

A wide range of wheel-made painted pottery, varying in size and form from small cups and bowls to large bottles and beer jars, was produced during the Classic Meroitic period (3rd century BC–2nd century AD). These vessels are distinctively decorated with intricate patterns made up of impressed dot motifs, as well as depictions of religious ceremonies and designs inspired by the natural world. Adams (1977, 368) observed that Classic Meroitic painted pottery "gives the appearance of having sprung up full-blown"; however, the techniques used in its production and the forms of the vessels themselves clearly point to Ptolemaic and Roman influences. Egyptian-inspired decoration on painted pottery is limited primarily to religious motifs of Pharaonic Egypt, such as the uraeus, ankh symbol, and lotus flower design (Adams 1986, 13–14; Edwards 1998, 170–173; Shinnie 1967, 114–122; Welsby 1996, 163–168).

The golden age of Meroe came during the Classic period, when the kingdom stretched from the First Cataract region in the north, down to the areas around Sennar on the Blue Nile and Kosti on the White Nile in the south. Evidence from excavations in Hillat Saeed, east of Kawa (Geus 1984, 73), suggests that the western periphery of the Meroitic kingdom was marked by the eastern bank of the White Nile, which divided the Meroitic state from the extensive lands of Kordofan. Archaeological remains, ranging from a handful of artefacts to entire sites, also bear witness to the spread and scale of Meroitic influence in the west (Arkell 1961, 136–137; Newbold 1924, 79; Seligman 1916; Wainwright 1947, 11–18).

The late 2nd and early 3rd centuries AD marked the beginning of the end for the Meroitic kingdom, which gradually spiralled into a decline that culminated in the mid-4th century AD with the collapse of the central royal authority in Meroe. Although many scholars, among them Kirwan (1960b), Hintze (1959, 1967), Arkell (1961) and Shinnie (1955, 1967; Mahmoud El-Tayeb 2002), have argued that the fall of Meroe came as a sudden blow inflicted either by King Ezana of Axum or by the Noba, in reality Meroitic decline was a process that played out over a lengthy period of time, precipitated by economic and political turmoil. Adams highlighted the three major economic factors involved in this process: the rapid depletion in wealth of Egypt, which had been the main consumer of Nubian exports; the threat posed by desert nomads, whose increased mobility and military strength posed a serious threat to trade along the lengthy and exposed caravan route linking Meroe with Egypt; the fact that by the beginning of the Christian era, Kush no longer held a monopoly on civilization and trade in the African interior (Adams 1977, 383–390).

The diverse ethnic composition of Meroitic society also had an impact on the fortunes of the kingdom. As pointed out elsewhere, it is highly unlikely that a state covering an expanse extending from Qasr Ibrim in the north to Roseires in the south, and from the foot of the Abyssinian plateau in the east to the banks of the White Nile in the

west, would have been peopled by a single ethnic group (Mahmoud El-Tayeb 2002, 35). Artefacts found at sites in Sennar District and Hillat Saeed near Kawa (ancient Alis—أليس) demonstrate that Meroitic culture did reach these regions of the Blue and White Niles. However, so far, none of the archaeological evidence tells us whether these sites were inhabited by Meroites or by other groups who were influenced by them.

Although we do not know the details of its societal composition, the population of the Meroitic kingdom was most probably made up of at least two major groups and a number of minor ones. Authority and land was concentrated in the hands of the dominant group, the Meroitic Kushites, who had founded the kingdom and who maintained an iron grip on trade, particularly at the height of Meroe's heyday. The other main group consisted of Noba tribes, though exactly when they first settled within the Meroitic realm is not known. The earliest information about these tribes comes from the Greek historian Eratosthenes (3rd century BC), as quoted by Strabo (1st century BC/1st century AD) in Book XVII, Chapter 1.2 of his *Geography* (Eide et al. 1998, 818–835). According to Eratosthenes, the Noba were a populous tribe who lived on the left side of the Nile, distributed among several kingdoms. In a later source, the Byzantine historian Procopius (AD 490–562) reported that Noba occupation extended as far as the Kharga Oasis (Török 1988), and that the Noba tribes had come to Lower Nubia in the 3rd century AD at the invitation of Diocletian, who hoped that they would protect the Roman Empire's southern frontier from incursions by the Eastern Desert Blemmyes. A quite different picture is presented by an inscription of King Ezana (DAE11), which relates that the Noba invaded the Nile Valley during the 4th century AD (see the revised German translation in Littmann 1950 and the English translation of the same revised German translation in Kirwan 1960a). Yet another theory contends that Noba tribes had already infiltrated parts of the Meroitic Nile Valley at an earlier date. Trimingham (1949, 36) recounts that this premise was based on linguistic analysis carried out by Ernst Zyhlarz, who thought that the Nubian language had been introduced into the Nile Valley from southern Kordofan by the Nuba in the 3rd century BC, and that if this had been the case, then Nubians and Meroites must have co-existed in the island of Meroe.

In addition to these two main groups, the Meroitic kingdom may also have been inhabited by other ethnic minorities, who gradually gained a degree of autonomy, establishing something akin to local chiefdoms by the late 1st century AD. Kirwan offers an example of this having been the scenario in the northern regions when describing the kingdom's progressive demise: "… the ending of Meroitic sovereignty appears not to have been uniform in either time or place. Archaeological evidence, for example, from such sites as Kawa and Sanam between the Third and Fifth Cataract suggests that Meroe may have lost control over much if not all of the Nile Valley well before the end of Meroe's royal dynasty and the final disintegration of the kingdom in the fourth century AD" (Török 1988, 9). An account in Seneca's *Naturales quaestiones* (VI 8, 3) (Eide et al. 1998, 891–894) suggests that the situation upstream of the Sixth Cataract may have been similar to that encountered in the north. The relevant passage relates that the Roman emperor Nero sent a group of legionnaires to explore the source of the Nile in about AD 65, mentioning that the men were helped in their mission by the Meroitic king, who furnished them with letters of introduction to tribal chieftains south of Meroe, so that they were able to reach as far as the Sudd region, located near the confluence of the White Nile and the Sobat (Barbour 1961). Thus, the Meroitic kingdom was clearly a socially differentiated, multi-ethnic society (Kirwan 1957a).

The final period of Meroitic history is dogged by the contentious issue of King Ezana's campaign against Meroe and its putative role in the fall of the kingdom. The idea that the Axumites had invaded Meroe is based on the interpretation of a mid-4th century AD inscription of King Ezana (DAE11) (Kaplan 1982). This inscription is of considerable significance as there is very little concrete evidence concerning the demise of Meroe, which has been a keenly debated topic ever since Reisner's early 20th-century excavations of the royal cemeteries at Begrawiya, and the publication of his chronology of royal burials (Dunham 1957; Reisner 1923b, 34–79). Reisner believed that the collapse of the Meroitic kingdom had taken place in the mid-4th century AD, an opinion shared by other scholars, such as Haycock (1967) and Hintze (1967). In contrast, Monneret de Villard dated this event to the late 3rd or early 4th century. Given the conflicting views about when and how the Kingdom of Meroe came to an end, it is worth re-examining the potential evidence offered by the aforementioned inscription. The text of DAE11 gives Ezana's reasons for his campaign: "… Through the might of the Lord of All I took the field against the Noba, when the people of the Noba revolted, when they boasted and He will not cross over the Takkaze …." Thus, the Axumite offensive was launched in response to the rebellion of a Noba tribe who broke their oath to the king and "did violence" on multiple occasions to their neighbours, actions which ultimately resulted in Ezana's forces slaying some

of the Noba and taking others captive, before going on to mete out similar punishment to another enemy "at the junction of the rivers Seda and Takkaze."

But who were these Noba? And where exactly was the confluence of the Takkaze and the Seda, where the inscription goes on to tell us that Ezana also erected a throne? Was this in fact a reference to the place where the Atbara joins the Nile? The general consensus is that the Noba referred to in this inscription were a barbarian people, identified as the Noba tribe of Kordofan, who it is thought invaded the Nile Valley long before the Axumite campaign, and thus instigated the collapse of the Meroitic kingdom. However, Peter Behrens (1986) has put forward a number of arguments that undermine this long-held belief.

Kirwan (1960a) and Hintze (1967, 2000, 52) were unanimous in identifying Alwa (which, according to the inscription, was captured by the Axumites) as the city of Meroe. Although the general perception of the Noba is that they were poor, primitive nomads, the image that emerges of them from the Ezana inscription is that of a distinctly more sophisticated society. It records that the Noba had temples, and owned gold, iron, copper, and bronze, as well as cattle and stocks of crops including cotton, millet, and corn. It also tells us that they had towns of masonry and of straw (Török 1988). Far from being the hallmarks of barbarian nomads, all of these details point to a wealthy, civilized, and sedentary population. The term "towns of straw" was erroneously regarded as an indication of impoverished communities, when in reality settlements of this type simply reflected local conditions and indigenous building traditions. They were perfectly suited to the climate and natural environment that still prevails in this part of Africa, and were not indicative of their inhabitants' material or social status.

Behrens attempts to untangle the sometimes contradictory statements made in the inscription. The tribes that had been beleaguered by the Noba, and in whose defence Ezana launched his campaign, were the Mangurto, Khasa, and Barya. To this day, the latter two tribes continue to dwell in the borderlands between Ethiopia, Eritrea, and eastern Sudan (Behrens 1986). Unlike Hintze (1967, 79, 83–84), who believed that the Axumite military action had been centred around the southern Blue Nile and the Butana steppe, Behrens contends that it appears to have been "confined to Ethiopia proper" (Behrens 1986, 123–124). Based on the premise that the campaign had not been directed against Meroe, and that it had taken place within the territory of Ethiopia, he also concludes that Ezana's throne may well have been located at the confluence of the lower Takkaze (also known as the Settite) and the Atbara, at the foot of the Ethiopian highlands, and not, as has traditionally been thought, at the point where the Atbara joins the Nile (Behrens 1986, 123).

Another widely accepted interpretation concerning the Ezana stele has been brought into doubt by Marianne Bechhaus-Gerst (1991), who questions the identification of the "Kasu" mentioned in the inscription. Pointing out that Ezana calls himself king of Kasu, but also fights against a people of the same name and takes them prisoner, Bechhaus-Gerst wonders why it has always been assumed that Ezana is referring to the Meroites in this passage, especially given that there is absolutely no allusion to Meroe anywhere in the inscription. She goes on to remark that if the confluence of the Takkaze and the Atbara is treated as a reliable identification of Kasu's location, then the idea that the Kasu and the Meroites are one and the same becomes all the more improbable. "They might as well be identified with the Kusha/Kersa/Kursa/Kursi (all alternative readings) mentioned by Arab geographers like Ibn Hawqal as living one month's journey away along the Nile from Dongola" (Bechhaus-Gerst 1991, 20; Vantini 1975, 163). In her discussion, Bechhaus-Gerst also examines various other ethnic, linguistic, and geographical issues raised by the Ezana inscription, including the identity and place of origin of the Noba rebels referred to therein, concluding that they were of Ethiopian origin, which tallies with the inferences made by Behrens (Bechhaus-Gerst 1991, 17–25).

Uncertainty also surrounds the identity of a group of people referred to in the inscription as "the Red Noba," who were attacked by Ezana's troops, some being killed and others being taken into captivity. Based on an Old Abyssinian graffito on one of the walls of Temple T at Kawa, and on archaeological evidence indicating that fire had ravaged the Kawa and Sanam temples, Kirwan (1957b, 37–41, 1960b, 169) conjectured that the enigmatic "territory of the Red Noba" was synonymous with the Kawa–Dongola region. However, neither piece of evidence convincingly supports this claim.

As previously mentioned, the Kingdom of Meroe appears to have entered a phase of decline in the late 2nd/early 3rd century AD. The discovery of contemporaneous handmade and wheel-thrown pottery in graves excavated at El-Kadada in the Shendi Reach (Geus and Lenoble 1985), hence at the heart of the Meroitic state, provided the first ever indications that a transitional period had existed between the Late and Terminal Meroitic (post-Meroitic) periods (Edwards 2011, 509–512; Geus and Lenoble 1985).

Further evidence has come to light in the Dongola Reach, due in no small part to the results of the Fourth Cataract salvage campaign, which has contributed sig-

nificantly to our knowledge of the period in question. The archaeology of the Fourth Cataract reveals the process of cultural evolution that took place throughout the course of Meroitic history, as reflected in the changing burial customs and grave types from the Early Meroitic through the late and transitional phases, culminating in the Terminal Meroitic (post-Meroitic) period. The theory that the appearance of handmade pottery in non-elite graves points to ethnic change seems entirely unfounded. Regionalism appears to have been a major factor in the emergence of a diverse range of Early Meroitic burial traditions, in which the deposition of grave goods did not follow a uniform pattern. Several undisturbed Meroitic burials of the 3rd century BC excavated in the Fourth Cataract area contained no burial goods at all; however, surface pottery scatters around these graves suggest that this is where the offerings had been deposited, though their highly fragmented nature made it difficult to say what vessels they represented (Mahmoud El-Tayeb and Kołosowska 2005, 62–66). In contrast, the excavation of Early Meroitic burials at two cemeteries in Central Sudan—at El-Ahamda (Mahmoud El-Tayeb and Gar El-Nabi 1998) north of Khartoum, and Gabati north of Meroe in the Shendi region (Edwards 1998)—revealed that they not only contained grave goods, but that these included both wheel- and handmade pottery, large handmade beer jars among them (Edwards 1998, 142–177; Mahmoud El-Tayeb and Gar El-Nabi 1998). Notably, large beer jars were also recovered from the storerooms of the Meroitic royal residence at Wad Ban Naga, located at the mouth of the Wadi El-Awateb (Vercoutter 1962, 291, Pl. XXc). What we can conclude from these discoveries is that, contrary to long-held archaeological opinion, the production of handmade vessels, specifically large beer jars, began in the Meroitic period. This production process continued to develop until the late phase of the Terminal Meroitic period (450–550 AD) due to cultural rather than ethnic changes (see Volume II, Chapters 2 and 6).

The decline and ultimate disintegration of the Meroitic state was brought about by the economic and political problems that engulfed the kingdom in its latter stages. The collapse of central power triggered the breakdown of all other institutions and industries connected to it; therefore, the disappearance of wheel-made pottery production in the Meroitic heartland should be linked to the upheavals affecting the royal court, rather than surmising that the appearance of handmade pottery marked the arrival of a new ethnic group to the Nile Valley. Archaeological evidence demonstrates that the turmoil in the south of the kingdom did not affect its northern territories, as both regions had already embarked on a process of transformation that would lead to them becoming independent political entities.

Unlike the southern and central parts of the Meroitic realm in the Dongola Reach and Lower Nubia (see Meroitic sites in Lower Nubia; Adams 1977, Fig. XX), there does not appear to have been a royal monopoly on the manufacture of wheel-thrown pottery in the north. This prompts a number of questions concerning the end of the Kingdom of Meroe and the issue of cultural continuity and discontinuity. It seems that previous attempts at analysing the demise of Meroitic civilization, which dominated the culture of the Middle Nile Valley for over a thousand years (450 BC–AD 600), relied on a very limited pool of evidence. The reconstruction of events set out by Reisner, and subsequently by Kirwan, Arkell, Hintze, Shinnie, and others, was in each case centred around two perceived facts: King Ezana's military campaign and the acts of aggression perpetrated by people of an inferior culture from the south-west. Given how much more we now know about the Terminal Meroitic (post-Meroitic) period, it is high time to revise and reject these earlier theories. Most of the archaeological evidence analysed to date has come from cemetery sites, presenting an opportunity to seek out valuable insights into the origins of numerous cultural features relating to burials and their attendant rites and rituals. It is the quest for information about these origins that has given rise to several decades' worth of discussions on continuity and discontinuity between the Meroitic and so-called post-Meroitic periods. If we give credence to the idea that Meroe was invaded by a foreign ethnic group, or groups, who proceeded to overrun the entire kingdom, becoming the dominant cultural presence in the Nile Valley for around 200 years, we must ask ourselves what culture these people brought with them, and what impact did it have. Examining the available archaeological evidence shows that all of the burial practices witnessed in 'post-Meroitic' (i.e. Terminal Meroitic) graves are rooted in traditions dating from the Meroitic and Late Meroitic or even earlier periods (see Chapter 4, this volume, and Volume II, Chapters 2 and 6). In terms of grave types, we know that tumulus burials had been used in Nubia since the early days of Kushite culture (Welsby 1996). Pyramid chapels and temples, which had been a feature of earlier Meroitic periods, were also noted in the Terminal Meroitic, as was the custom of depositing weapons in graves, illustrated by discoveries of swords, spears, bows, metal arrows, and stone archers's thumb rings, variously interpreted as symbols of military power or the insignia of elite or royal individuals (Mahmoud El-Tayeb 2012, 76–84). Some religious practices appear to have endured up to

the end of the Meroitic period, among them the libation rite associated with the veneration of the Pharaonic goddess Isis (Hart 2005, 79–83). A particularly interesting example of a bronze libation bowl (HBG III/1/135) engraved with the word *Qore* (i.e. 'king') in Meroitic hieroglyphs was discovered at El-Hobagi. This word survived into the early 20th century in an Arabic term used by certain Butana tribes (e.g. the Shukriya). It took the Arabic form كِير (*Keyr*), meaning chief or *Mekk* (Lenoble 2018, 85–86).

Analysing archaeological assemblages from sites in the Shendi region—El-Kadada (Lenoble 1987; Lenoble and Nigm ed Din Mohammed Sharif 1992), Jebel Makbour, El-Sheiteb (Lenoble 1999) and El-Hobagi (Lenoble 2004)—and comparing them with finds from various other Meroitic sites, Patrice Lenoble concluded that in all probability there had been "continuous evolution over the 4th and 5th centuries AD, leading the same Nilotic people from one political system to another, from the single Meroitic Empire to the three Christian kingdoms of the 6th century" (see also Shinnie and Robertson 1993; Török 1999).

4 El-Zuma Today

A few words about the modern village of El-Zuma might be of interest to the general reader. The site comprises three parts: El-Zuma Gubli (قبلي South), El-Zuma Wasat (وسط Centre), and El-Zuma Bahry (بحري North). Notably, the inhabitants of this region between Abu-Hamad and El-Debba perceive the River Nile as running due north, while its geographic orientation is from north-east to south-west. Thus, the names of the three parts of the village mentioned above are based on the local understanding of the river's direction and not on true geographic directions. El-Zuma Gubli seems to be the oldest part, mentioned by Lepsius in the mid-19th century. "Kalat An Negil" (Castle of Negil) is the name of the castle ruins which were recorded by Lepsius, who associated the castle with an old king called Negil (Lepsius 1852, 248). Nowadays the name is pronounced Karat-Negil or Karadegil. Lepsius, cited by Budge, states that the front walls were "only destroyed and thrown down about fifty or sixty years ago, i.e. about 1780, when the inhabitants of Zûma settled there" (Budge 1907, 129). Today El-Zuma Gubli has one primary school for girls and boys, one cultural club and two kindergartens. The south-west side of El-Zuma Gubli is occupied by the ancient cemetery which constitutes the subject of this study. To safeguard the cemetery, a tourist police station has been located nearby.

The part of the village known as El-Zuma Bahry actually lies downstream, due south-west of the other two parts. Here also there is one primary school for both girls and boys, as well as three kindergartens and one Quran school for children. It also has its own cultural and social club. The north-east side of the village is occupied by the main police station and a central market that serves all three parts of El-Zuma two days a week.

The local authorities estimate that since the 1960s the population of El-Zuma has risen to about 1,200 (there are no accurate census records), so the need for various social and administrative services in addition to educational institutions has grown, leading to the development of the central part of the village, El-Zuma Wasat, to meet these needs. Two primary schools, one for girls and the other for boys, were opened, as well as two co-educational secondary schools. In the last three decades two universities have opened branches at El-Zuma Wasat. These are Omdurman Islamic University and Sudan Open University. Apart from these educational institutions, one central hospital is based here. Sports events and both cultural and social activities are organized by members of the El-Zuma Sport, Cultural and Social Club.

At present all three parts of El-Zuma village are growing rapidly. El-Zuma is inhabited mainly by members of the Shaiggyia tribe, with some Hassanyia and Hawawir newcomers (both originally nomadic tribes), who settled there in the mid-20th century, thus turning it into a multi-ethnic village.

Historically, the inhabitants of El-Zuma have depended on traditional agriculture as their main source of economy, as they have extensive fertile lands and suitable conditions for cultivation on some islands in the Nile.

PART 1

Excavations

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CHAPTER 2

Archaeological Site Recording

Zofia Kowarska and Szymon Lenarczyk with a contribution by Magdalena Antos

Archaeological research at the El-Zuma site was started in 2004/05 (Mahmoud El-Tayeb 2005; Godlewski 2005). As part of the research project, the first contemporary geodetic survey of the site was carried out (using a theodolite) by Yassin Mohamed Saeed, mapping the cemetery together with the topography of the surrounding area (Mahmoud El-Tayeb 2005, 390, Fig. 1) [**Fig. 2.1**]. Further geodetic work took place in 2007/08, when the topographical map of the cemetery was modified using data from a Total Station survey conducted by Wiesław Małkowski (Mahmoud El-Tayeb 2010, 469, Fig. 2).

Detailed topographical recording, an inventory of all structures and completion of documentation from previous seasons was performed between 2014 and 2017. The data was collected using different, complementary, or overlapping information retrieval techniques. This work was carried out using surveying instruments (a Total Station) and photographic equipment (for aerial and traditional photography). A new architectural plan of the Early Makurian El-Zuma cemetery, complemented with previously missing data, was created, and a record was made of individual tumuli, including their cross-sections and, where possible, the dimensions of chambers, tunnels and shafts (see Chapter 3, in this volume).

Field documentation of particular archaeological sites within the Early Makuria Research Project, which, among others, included El-Zuma and El-Detti, was compiled in keeping with a scheme developed over several years (Mahmoud El-Tayeb et al. 2016).

An important operation aimed at protecting the El-Zuma site was the construction of a perimeter fence. The site had been endangered by continuous degradation for many years, resulting from the frequent use of roads and paths that cut across it. The remains of many tumulus superstructures had been badly damaged by vehicle traffic. Additionally, the village of El-Zuma had been growing dynamically, though chaotically, for many years, and new houses had been erected ever closer to the archaeological site, or even within its boundaries.

The locations of the tumuli do not suggest that the cemetery was laid out according to a specific plan. All of the tumuli are located on higher ground between several water courses that run from the west towards the river. Apart from a cluster of more than ten tumuli identified in the central part of the site, a few single structures in its north-west and south-east parts can also be observed. It is notable that the largest mounds are located at the edges of the site, while the smaller ones are situated in the middle.

A review of written sources and earlier documentation formed an important part of the site recording process.

1 Sources

There are only a few mentions in written records about the area of today's El-Zuma site. The cemetery was described by 19th-century and early 20th-century travellers, such as Karl Richard Lepsius and E.A. Wallis Budge (Lepsius 1852; Żurawski 2003, 45–46; Mahmoud El-Tayeb 2012, 18; Budge 1907, vol. I, 127, 129, 170; vol. II, 116; 1912, 866–867). Lepsius mentioned the areas neighbouring the modern-day village of El-Zuma, comparing the tumuli he saw in El-Zuma to the pyramids from El-Kurru and Tanqasi. The map drawn by him is extremely detailed, and it constitutes an important cartographic source providing information about the state of the site in the 19th century (Lepsius 1852, 248–249) [**Fig. 2.2**]. Comparing the 19th-century map with the present state of the site reveals that the number of recognized tumuli has decreased. Some tumuli have been destroyed over the years by the growing village of El-Zuma. On his map, Lepsius marked structures, probably walls, surrounding some of the entrances to the tunnels on the south side of the tumuli.

None of the architectural elements mentioned by Lepsius have survived to this day. However, an analysis of particular tumuli marked on the aforesaid map suggests the existence of entrances leading directly to the tunnels and burial chambers of individual structures.

Lepsius also referred to the existence of El-Zuma fort (Karat Negil, known today as Karadegil or Galat Negil, which is part of El-Zuma Gubli; Żurawski 2002, 84; Lepsius 1852, 248); however, no trace of it can currently be found.

This is how Lepsius described his visit to El-Zuma:

> Three quarters of an hour down the stream on the right, lies the little village of Zûma. Near it, towards the mountains, rises an old fortress, with towers of defence, called Kárat Négil, the outer walls of which

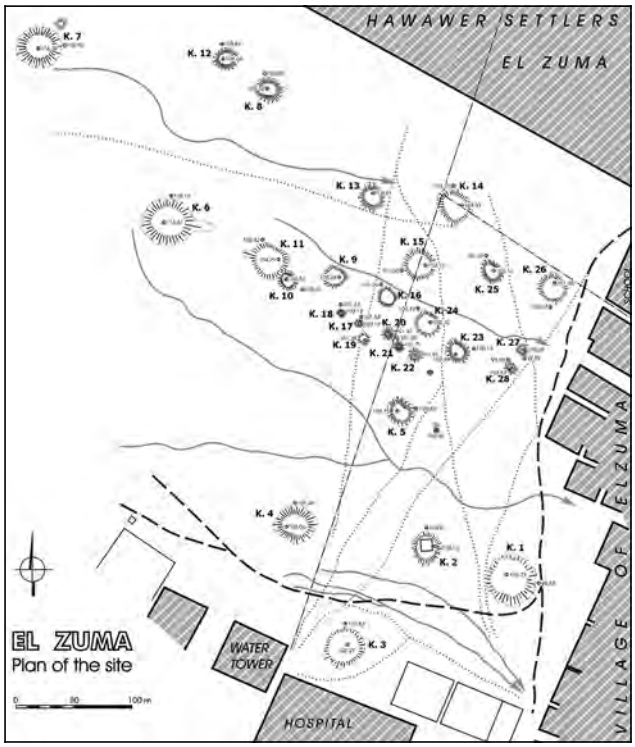

FIGURE 2.1
Topographic plan of the cemetery in El-Zuma
DRAWN BY YASSIN MOHAMED SAEED, DIGITISED BY M. PUSZKARSKI, AFTER MAHMOUD EL-TAYEB 2005, 390, FIG. 1

were ruined and destroyed about fifty or sixty years ago, when the present inhabitants of Zûma settled there. The name is derived from that of an old king of the country, called Négil, in whose time the surrounding land, which is now barren, was still reached and fertilized by the Nile.

The first discovery on the road to the fortress was another number of pyramids, of which eight were yet about twenty feet high; including the ruined ones, which seemed to have been as usual the most massive, there were altogether thirty; to the southwest the old quarries are yet to be seen, which had furnished the materials for the pyramids.

Whilst these three pyramid fields, Tangassi, Kurru, and Zûma, or Kárat Négil, lying so near to each other, and whose situation has been carefully paced off and marked by Erbkam, show that the neighbourhood had a numerous and flourishing population in the heathen times, we discovered in the adjoining country and more or less through the whole province of Dongala, the remains of Christian churches.

LEPSIUS 1852, 257–258

By superimposing an appropriately scaled version of Lepsius's 1852 plan onto a contemporary one drawn up during 2014–2015, it was possible to carry out a comparative analysis of the two [**Fig. 2.3**]. The details compared included the number and distribution of tumuli at the site and the base diameter measurements of the individual superstructures [see **Table 2.1**]. There are evident differences between the plan of the cemetery recorded in the 19th century and the one produced by the recent survey in terms of the shapes, sizes, and outlines of the tumuli, as well as the distances between them. The discrepancies in the diameters of the same tumuli recorded using various methods in the 19th and 21st centuries are particularly obvious.

Despite these significant differences, Lepsius's plan is still an important and interesting historical source.

The base diameters of the same tumuli, as recorded in the 1850s and in the early 2000s, are listed alongside one another in **Table 2.1**. Most of the tumuli on Lepsius's plan have smaller base diameters than those on the modern-day one. Seven of the tumuli on the 19th-century map are larger in diameter than they appear today, and in one case (T.27) the dimensions recorded on both plans are almost identical. These inconsistencies may stem from the use of different measurement techniques and different approaches to defining the maximum extent of the burial mounds. Their perimeters are only very faintly visible from the ground. Using modern recording methods, in particular kite aerial photography and the orthophoto map of the site produced by processing the images captured from the air, it was possible to roughly define the edges of the mounds. Another potential reason for the discrepancies in the recorded diameters of the tumuli is that these dimensions may have changed over the years. The

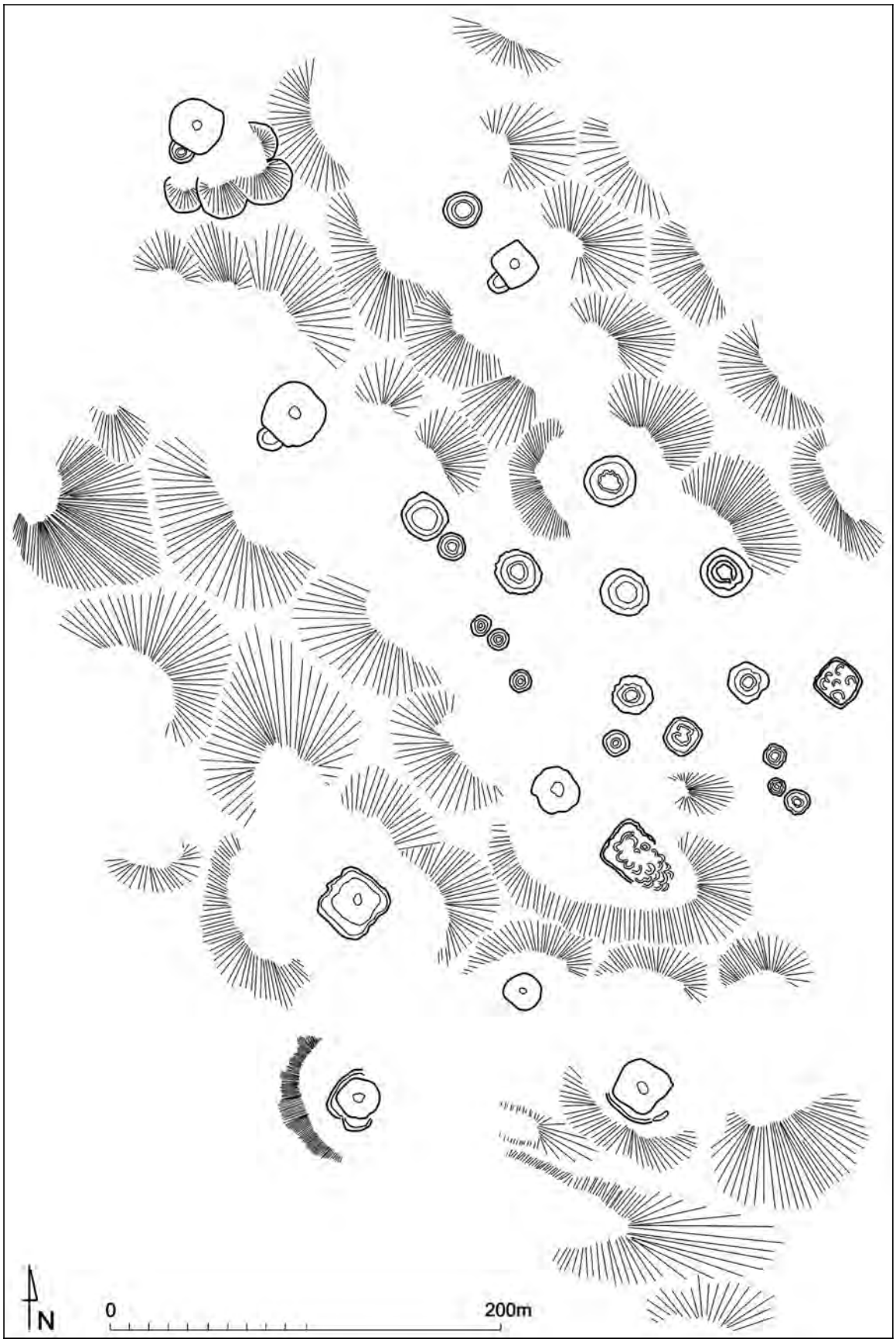

FIGURE 2.2 Redrawing of Lepsius's plan
DRAWN BY S. LENARCZYK AFTER LEPSIUS 1852

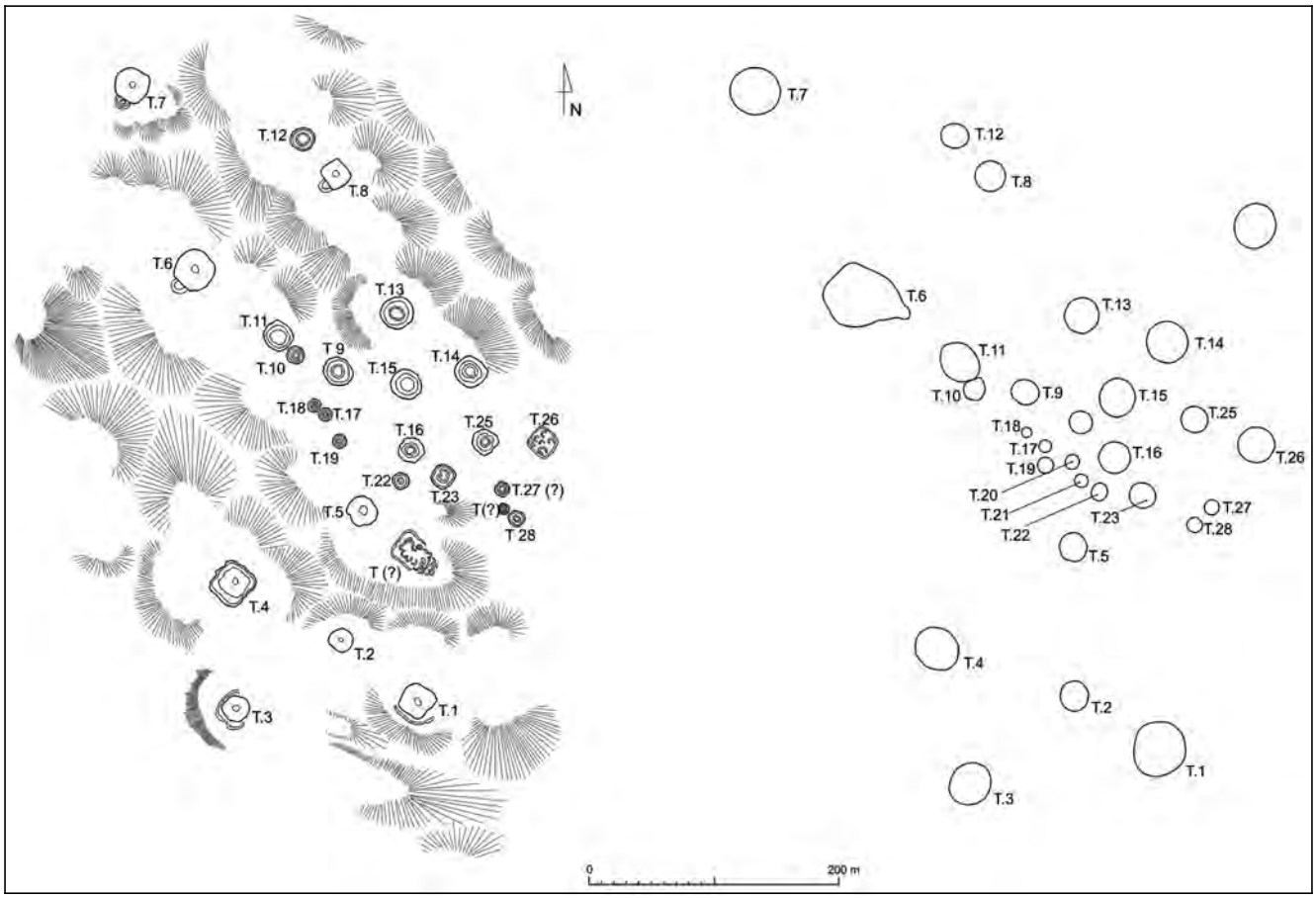

FIGURE 2.3 Comparison of plans made in the 19th (left) and 21st century (right)
DRAWN BY S. LENARCZYK

edges of the tumuli may have spread further outwards as a result of rainfall or subsidence of the earth and stones from which the mounds were built [see **Fig. 2.5**]. Frequent robber activity has also had a detrimental effect on the state of these structures.

The differences in distance between specific tumuli is attributable to a surveying error. A comparison of the two plans suggests that the mounds on the 19th-century one are marked around 5–7 degrees further south-west in relation to their real positions.

It is also worth taking a closer look at the individual tumuli recorded on both plans. On the 19th-century plan, the outline of a narrow structure(?) is marked to the south and south-west of T.1 and T.3. These 'structures' appear to surround the tumuli. There is no record of their height or function, and we do not know whether they were integral parts of the tombs or simply built to protect the mounds from being buried by sand. In the case of T.26 and T(?), lines denoting similar 'structures' are shown encircling each tumulus on the 19th-century plan. No trace of any such structure around any of the tumuli can be found today [**Table 2.1**].

Analysis of Lepsius's plan revealed significant details about T.6, T.7, and T.8. Features marked alongside these mounds proved to be the external shafts that led directly to the burial access tunnels. Their existence was confirmed by modern-day excavation. Interpreting the evidence provided by this 150-year-old map helped identify the location of these external shafts [**Fig. 2.4**].

Travellers who visited El-Zuma in the 19th century did not identify T.20 and T.21, both of which are currently visible on the ground surface.

A line of tumuli identified in the field by Lepsius (today's T.27 and T.28) appears to have been mapped at the wrong angle on his plan. Moreover, Lepsius recorded three tumuli of small diameter, whereas only two are currently visible. In the case of T.28 it seems almost certain that the superstructures shown on the two respective plans are one and the same; however, in the case of T.27 it seems likely that the mound recorded on the contemporary plan does not correspond to the one mapped in the 19th century.

Tumulus 30 appears on Lepsius's plan as a square structure with evident damage to its south-east side, but there

TABLE 2.1 Comparison of base diameter measurements of the tumuli recorded by Lepsius and by the PCMA team

Tumulus	Lepsius's measurements (1852)	Contemporary measurements (2014–2015)
T.1	34.50 m	40.70 m
T.2	18.95 m	22.30 m
T.3	27.60 m	32.70 m
T.4	32.20 m	34.10 m
T.5	24.40 m	21.80 m
T.6	32.80 m	*c.* 44 m
T.7	26.65 m	37.56 m
T.8	24.05 m	23.60 m
T.9	22.80 m	22.07 m
T.10	14.10 m	16.65 m
T.11	22.60 m	30.08 m
T.12	19.60 m	22.30 m
T.13	26.10 m	27.31 m
T.14	25.70 m	31.50 m
T.15	24.75 m	28.48 m
T.16	18.05 m	18.25 m
T.17	10.75 m	9.98 m
T.18	10.10 m	8.10 m
T.19	11.10 m	12.54 m
T.20	not recorded	11.20 m
T.21	not recorded	10.55 m
T.22	13.44 m	13.05 m
T.23	19.50 m	20.70 m
T.24	20.35 m	25.25 m
T.25	20.80 m	21.05 m
T.26	23.95 m	29.60 m
T.27	11.60 m(?)	11.63 m
T.28	13.10 m	12.40 m
T.29	27.70 m	not recorded
T.30	8.85 m	not recorded

S. LENARCZYK

is currently no evidence of it in the field. The same is true of T.29, a small tumulus marked on Lepsius's map. We can assume that this mound has been destroyed during the course of the past 150 years.

Further notes and sketches concerning El-Zuma were made by Budge (1907, vol. I, 127, 129, 170; vol. II, 116; 1912, 866–867) and Wilkinson (Żurawski 2003, 382), and Reisner (1918, 67) also mentioned this site.

Archaeological research in El-Zuma was accompanied by interviews with the local community about craft and building traditions as well as about the settlement itself. According to locals, the name El-Zuma means a bend of the Nile (oral information).

Within the last few decades, the village settlement has significantly changed its location, moving further to the north-west and north-east. This was prompted by two factors:

1. The construction of a new asphalt road (from Karima to Wadi Nawa), running north of the village. Before this, the main road (which was the transport route along which settlements were concentrated) ran along the Nile, at the southern borders of the village. Relocating the road made the centre of village life move to the north-west part of the settlement.
2. The flood in 1946 (Żurawski 2003, 382), which caused destruction in the southern part of the village and

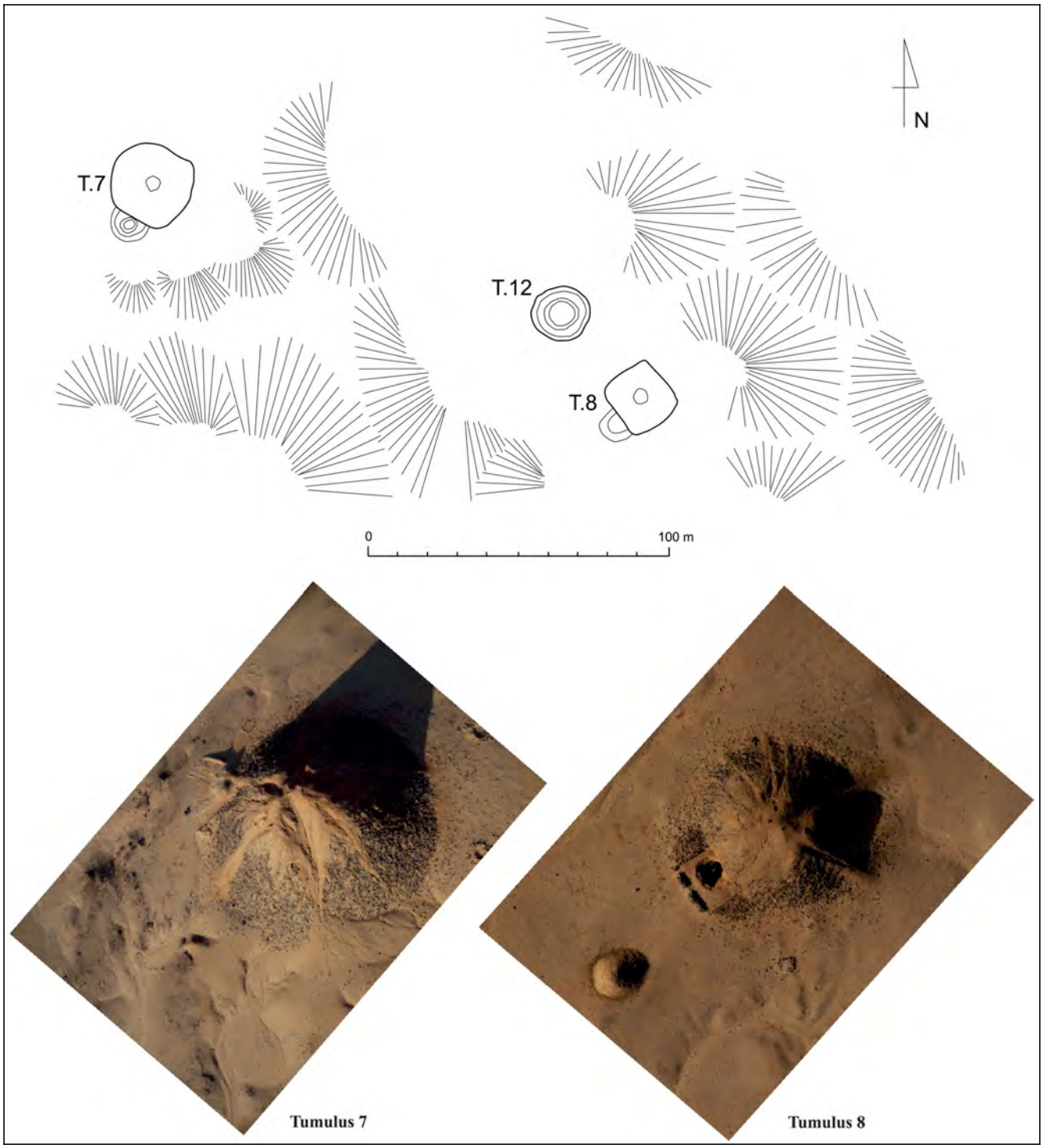

FIGURE 2.4 Comparison of tumuli featuring external structures(?) recorded on Lepsius's plan with the same tumuli as seen during excavations in 2014/15
PHOTOS BY A. KAMROWSKI, DRAWN BY S. LENARCZYK

FIGURE 2.5 The site of Ali El-Karar in 2016
PHOTO BY Z. KOWARSKA

made many families move to higher-lying areas in the northern part of the settlement.

Unfortunately, in interviews with the oldest members of the local community, it turned out that their memories stretched back only 20–30 years, which significantly impeded the collection of additional information.

There are also some archival photographs taken in El-Zuma village during Breasted's expedition at the beginning of the 20th century (https://oi.uchicago.edu/gallery/zuma#II7F11_72dpi.png).

2 Archaeological Survey

One of the first points of fieldwork was conducting an archaeological survey to find and record any traces of the past visible on the surface. These operations were run based on the prior desk-based assessment of historical sources, texts, maps, and photographs taken from the air. The site had previously been examined during the Sudanese-Italian Magashi-Barkal survey in 1992, led by Irena Liverani Vincentelli (Żurawski 2003, 90). Further surveys were performed by Bogdan Żurawski within the SDRS project (Southern Dongola Reach Survey), held during 1997–2002. Fieldwork carried out between 2000 and 2002 led to the identification of five archaeological sites (Żurawski 2002, 73–75, 84; 2003, 90–91, 95):

- **Ez-Zuma 1**—a round structure with a diameter of about 4–6 m, of unknown origin and date, known as Ali El-Karar in the local oral tradition [**Fig. 2.5**];
- **Ez-Zuma 2**, the so-called "**Anchorite Grotto**"—a chamber carved into the rock below Ali El-Karar, dated to the Pharaonic or Kushite period (Żurawski 2002, 84; 2003, 379, Figs. 10–11; cf. Monneret de Villard 1935–1957). The inscriptions from the 'cave' were documented during the SDRS project (Łajtar 2003, 512–517). The cave of Ali El-Karar is situated in a wadi [**Fig. 2.6**];
- **Ez-Zuma 3**—a tumulus cemetery; pottery found on the surface was dated to the early Christian period;
- **Ez-Zuma 3a**—according to Żurawski, the likely location of the "fortress" seen in 1844 by Lepsius (Żurawski 2003, 382, Fig. 8);
- **Ez-Zuma 4**—a destroyed and looted cemetery dating from Early Dongola to the present, located close to the road along the Nile, in the direction of El-Detti.

In the first season of the Early Makuria Research Project, an area within a radius of about 1 km of the tumuli was divided into smaller sections and a more detailed field-walking survey was conducted (Obłuski 2005). Based on the results of this work it was possible to define the extent of the El-Zuma site.

3 Topographical Work

Topographical work[1] was divided into phases:

1. Creating complete geodetic maps of the site (vector maps, contour maps, 3D visualizations of each tumulus, and of the site topography).
2. Recording grave substructures excavated over a number of research seasons. Drawing up plans and cross-sections of all tunnels and tumulus chambers in

1 Measurement and photographic documentation during this period was prepared by: Szymon Lenarczyk, Zofia Kowarska, Jolanta Juchniewicz and Adam Kamrowski in 2014; Lenarczyk, Kowarska and Kamrowski in 2015; and by Magdalena Antos and Kamrowski in 2017.

FIGURE 2.6 The so-called "Anchorite Grotto," Ali El-Karar, 2016
PHOTO BY Z. KOWARSKA

AutoCAD and Corel. Some walls and cross-sections together with soil layers were additionally documented using photogrammetry. Based on photographs, a partial 3D model was made in Agisoft and 3D Max. The biggest problem was taking measurements and photographs inside the tunnels leading to the tumulus chambers. Narrow and low spaces impeded the setting up of equipment, and internal structural divisions (partition walls, pillars) made it necessary to move the equipment from place to place multiple times. Photographic recording was also hampered to a large extent by insufficient lighting and by not being able to move far enough away from the photographed area. Low levels of oxygen, high temperatures, and dust clouds, especially in the farthest parts of the tunnels, resulted in frequent interruptions to the tasks at hand.

3. Installation of a perimeter fence around the tumulus field and demarcation of a buffer zone.[2] Until recently the site had been used by the inhabitants of El-Zuma village as a shortcut to the main road, which was destroying the remains of archaeological features. The fence has prevented cars from entering the cemetery area, and has limited the encroachment of the village of El-Zuma onto the archaeological site.
4. Schematic architectural documentation of the outline of the street grid and buildings of the modern village. The archaeological site was marked on a present-day map of the dynamically growing village. To achieve these aims, a series of closely related fieldwork tasks was undertaken. The effect was the creation of precise orthophotos, vector maps and raster maps of the whole area, as well as aerial photographs correlated with contour measurements and visualizations of selected tumuli.

The success of the actions taken depended not only on selecting an appropriate methodology for the site but also on weather conditions. Thus, a wide variety of topographical recording methods, adapted to the specificity of the area being examined, was used (Bogacki 2015).

3.1 *Topographical Survey of El-Zuma Site*

The documentation and inventory of ancient structures was divided into two stages: a geodetic survey performed on the site, and graphic presentation of the data retrieved in the field. A Leica FlexLine TS02 Total Station plus R500 EDM was used for geodetic measurements, together with a handheld Garmin GPS device. A local site grid was set up. Detailed raster maps of the excavated area and a 3D

2 Work on the perimeter fence, designed by Jolanta Juchniewicz, started in 2014.

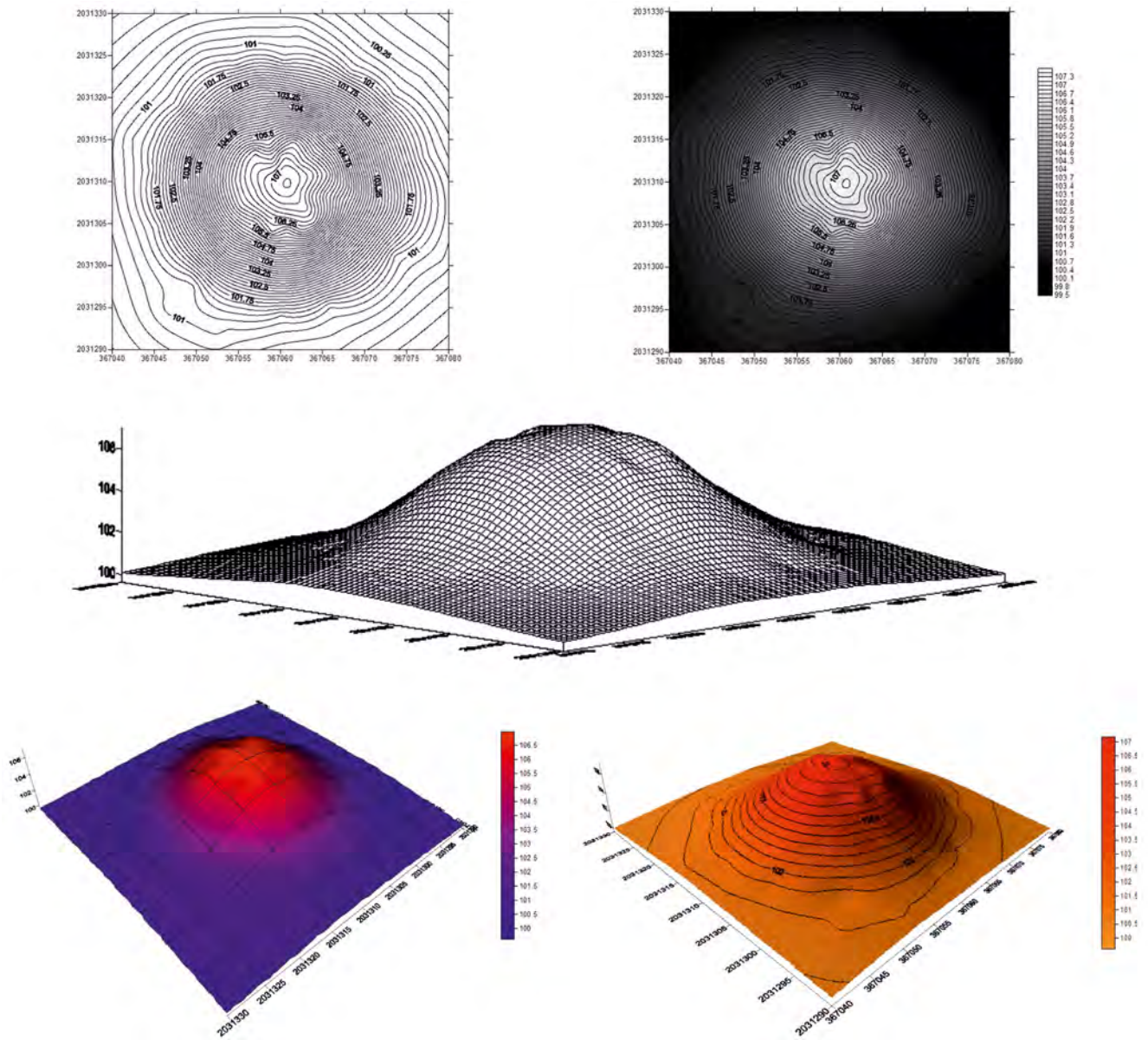

FIGURE 2.7 Example of documentation of one of the tumuli PRODUCED BY Z. KOWARSKA, S. LENARCZYK

contour map of the area were produced from the measurements taken on site.

Twenty-eight tumuli were plotted on topographical maps. A separate survey was made of each tumulus, the level of detail recorded depending on its characteristics and state of preservation. All structures were measured from base to top, and N–S and E–W cross-section drawings were prepared which enabled the height, volume, and extent of the mounds to be calculated [**Fig. 2.7**].

3.2 *Kite Aerial Photography*

A significant part of the topographical work was based on images taken from various altitudes above the site. Aerial photographs facilitated the analysis of the researched area and made it possible to discern the remains of ancient constructions invisible from the ground.

The first aerial photos of the surroundings of El-Zuma were taken in the 1930s by RAF pilots (Żurawski 2002, 84; 2003, 380–381, Figs. 13–14). The next pictures were taken from a small aircraft at the beginning of the 1990s, and although these images cannot be described as documentary material, they do provide evidence of the gradual degradation of the tumuli. A series of kite aerial photographs documenting the site was taken in February 2002 during the Southern Dongola Reach Survey project (Żurawski 2003, 381, Fig. 15). Another series of kite photographs of the El-Zuma area was taken in February 2012 by Miron Bogacki and Wiesław Małkowski.

FIGURE 2.8 Examples of aerial photos of tumuli, 2014/15
PHOTOS BY A. KAMROWSKI

Comparison of archival photos with contemporary images illustrates the scale of the change and destruction to the archaeological structures caused by the expansion of the modern village.

Using a combination of different methods it was possible to compile a complete record of the site and compare current data with the archival data. A composite map was produced using all of the data acquired in the field combined with calibrated ancient maps.

During the archaeological works, Adam Kamrowski and Szymon Lenarczyk took a series of new photographs of the site from a kite. These images, taken from an appropriate height, in various lighting conditions and at different times of day, provided valuable information [**Fig. 2.8**]. The

photos were taken with a remotely controlled Nikon D 600 camera mounted on a WoBie's KAP'n'Hook rig, suspended from a Didakite Explorer kite. The process of taking photos and the quality of the images depended on many factors, such as the time of day and sunlight levels, therefore the photographic sessions were repeated multiple times.

The use of kite aerial photography in El-Zuma was a complicated process because of weather conditions. Strong, predominantly northerly, winds at specific times of the day—between 10 a.m. and 12 p.m. and 4–6 p.m., when the sunlight is optimal for photographic documentation—dictated extremely precise timeframes for taking pictures during the day. Windborne sand made it necessary to change the working hours to avoid damage to the lens or the camera. Conversely, a too-weak afternoon wind was not able to carry the kite (7–9 m^2 surface area). High temperatures also determined the timeframes of individual sessions. As all of the archaeological missions took place between January and March, it was not possible to conduct kite sessions during different seasons of the year. Another problem was the electric grid in the village of El-Zuma. The proximity of high-voltage posts and cables significantly limited the ability of the kite to reach the required altitude of several hundred meters above the ground surface.

Tens of so-called photo-points were defined and documented during the recording of individual tumuli to prepare further field documentation (aerial photographs). Traditional photography was used to record the details which could not be captured by kite photography.

4 Results

The combination of different methods discussed above enabled the creation of an orthophoto map of the whole archaeological site [**Fig. 2.9**]. Based on the maps and descriptions found in 19th-century written sources, and on aerial photos from the 20th and 21st centuries, as well as precise topographical measurements, full field documentation of the El-Zuma site could be prepared.[3]

A series of perpendicular kite photos, a contour map, raster maps, a 3D model of the site and of individual tumuli, made it possible to create a partial three-dimensional visualization of the surrounding areas of the archaeological site and the tumuli. All of the data from this fieldwork has been collated in a database to which fresh information obtained using new surveying techniques can be added.

3 The software used for graphic processing of the collected data is: AutoCAD (for initial processing of data retrieved in the field), Corel DRAW X5 (for graphic and aesthetic data digitization), AgiSoft, 3D Max and Zephyr Aerial 3D or Unity (for creating 3D models and for photogrammetric operations), Surfer (for developing a contour area profile).

FIGURE 2.9A Orthophoto map of archaeological site at El-Zuma, 2014/15
PRODUCED BY A. KAMROWSKI, S. LENARCZYK

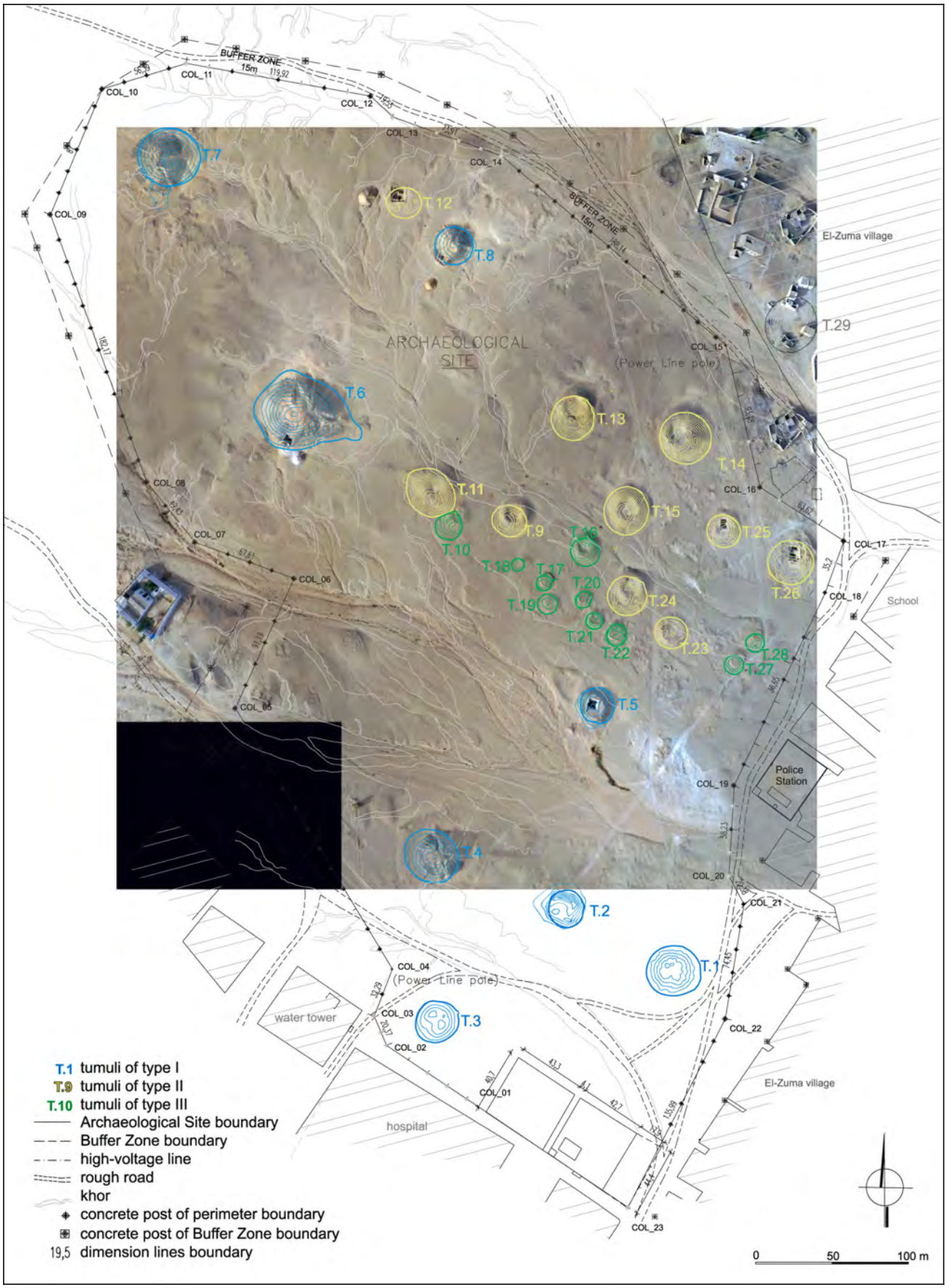

FIGURE 2.9B Orthophoto map of archaeological site at El-Zuma, 2014/15, with superimposed site plan
PRODUCED BY A. KAMROWSKI, S. LENARCZYK

CHAPTER 3

The Excavations

Mahmoud El-Tayeb with contributions by Ewa Czyżewska-Zalewska and Ewa Skowrońska

As mentioned in the introduction, the first season of the Early Makuria Research Project was launched in 2004–2005 with a preliminary reconnaissance survey followed by a test excavation at the cemetery field in El-Zuma. The survey revealed that the cemetery contains 29 burial mounds which are still visible on the ground surface (Obłuski 2005). The tumuli are situated in groups on a plateau, and are separated from one another by some minor watercourses running downwards from the west due east towards the river floodplain. The burials are characterized by superstructures of various sizes and in various states of preservation. Classified as large (type I), medium (type II), and small (type III), it was expected that each type of mound would conceal a different form of substructure. In order to verify this assumption, three different tumuli of types I, II, and III were chosen for excavation during the 2004–2005 season: T.2, representing type I; T.23, representing type II; and T.22, representing type III. Since then 28 tumuli have been successively excavated and investigated in different ways over a period of 12 years (2005–2017).

1 Methods of Excavation

In some cases, the methods of excavation used were not strictly textbook. Various unexpected factors and the specific conditions encountered on the ground dictated more suitable and practical approaches. It must be noted that the archaeological site at El-Zuma has been inscribed on the UNESCO World Heritage List since 2003. Accordingly, the excavation licence issued by the Sudanese Antiquities Service, which granted the project team permission to excavate the cemetery, was based on two clear conditions. Firstly, the panorama and the site landscape should be carefully preserved. Secondly, the site should be well protected, especially given that it is located in the middle of a modern-day village. Moreover, the large conical tumuli classified as type I should not be excavated so as not to remove or damage their superstructures. Other factors that prompted certain changes in the excavation methods stemmed from a modest budget and lack of sufficient time to conduct and complete the planned work.

In order to meet the conditions set out by the Antiquities Service, the mission's preparations for its first season started with a site inspection to examine and evaluate the state of preservation of all of the tumuli at the cemetery. This revealed that the summits of T.2 and T.5, two of the largest mounds, classified as type I, were severely damaged. This was a great pity, but at the same time it offered a unique opportunity for the mission to excavate these two disturbed mounds. T.2 was the first to be investigated. The extant superstructure stands to a height of only about 3 m above the present-day ground level, whereas its original height was estimated at 5–6 m. A square trench measuring 6 × 6 m was opened at the top centre of the mound, revealing a U-shaped shaft. Its excavation led to the discovery of a 9-m-long underground tunnel, starting from the rear of the main burial chamber, which had been cut into the southern wall of the shaft. At the opposite, southern, end of the tunnel there was an external shaft that exited at the edge of the mound's foot. T.5 was excavated in the same manner, and here again another tunnel in a similar location and also aligned north–south was encountered. The discovery of these two tunnels was significant because it gave rise to an idea about how to examine the other six large type I tumuli without disturbing their superstructures. Thereafter, searches on the southern side of these mounds in each case resulted in successful pinpointing of the external shaft of a tunnel that led directly to the main burial chamber [**Fig. 3.1**].

Tumuli types II and III are generally characterized by a visible depression at the top centre [**Fig. 3.2**]. They were usually excavated from the top of the mound, although the method used was not identical for each tumulus. In the case of the medium-size, type II burials, the choice of method mainly depended on the size and height of the mound. Nine tumuli out of eleven were excavated from the top to the bottom of the shaft [**Fig. 3.3**]. Meanwhile, the other two mounds were investigated by excavating a rectangular rather than square trench, which was cut into the top centre of the mound and extended southwards.

The smallest mounds in the field are nine in number. Only three of them were explored through a square trench cut into the top centre of the tumulus. The remaining six mounds were dissected by clearing the southern half to examine the grave shaft and look for any evidence of

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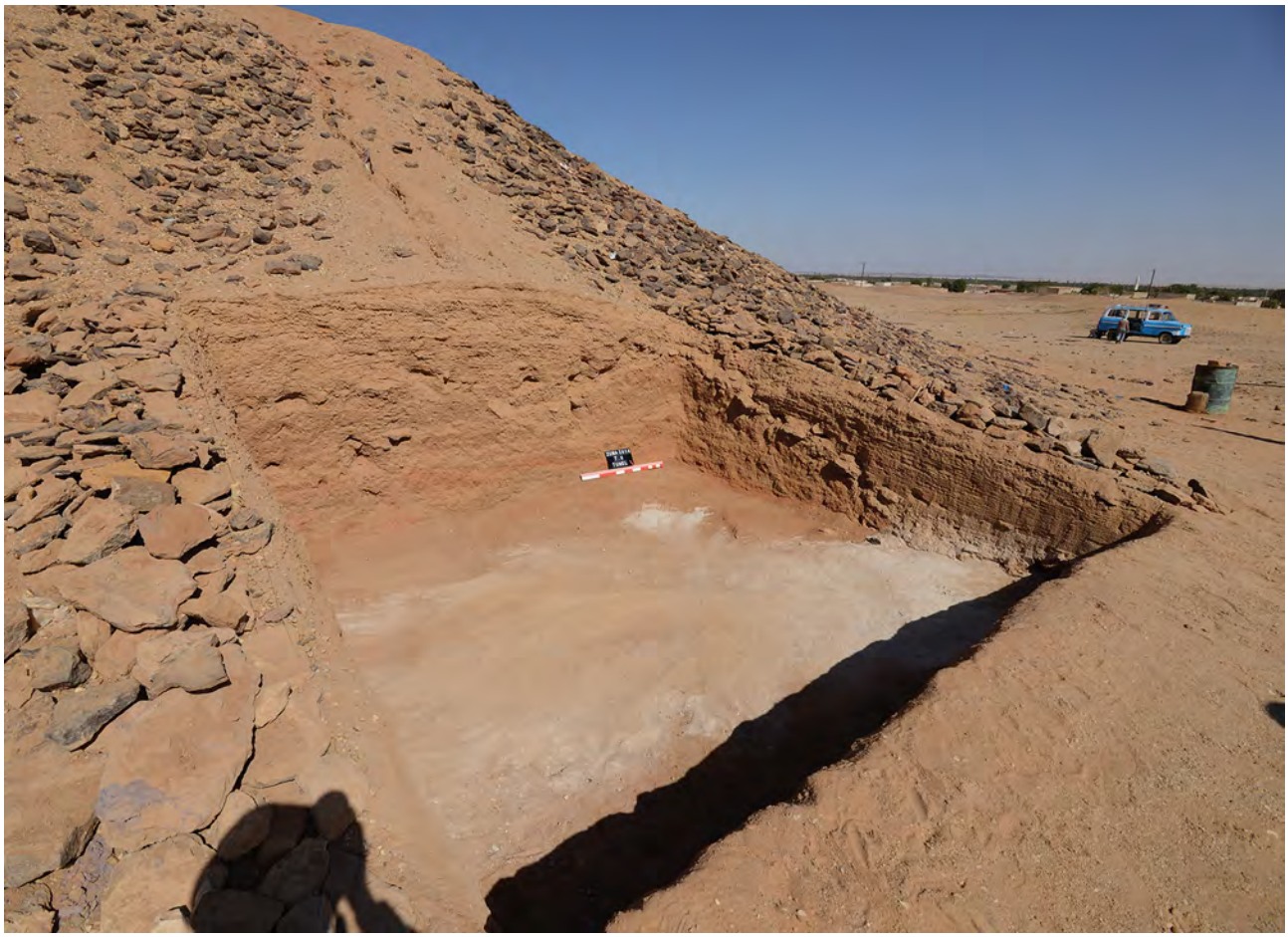


FIGURE 3.1 Tumulus 6, excavation of the external shaft
PHOTO BY A. KAMROWSKI

FIGURE 3.2 Tumulus 10, depression at the top of the mound
PHOTO BY K. KOTLEWSKI

FIGURE 3.3 Tumulus 25, excavated from the top of the superstructure
PHOTO BY K. KOTLEWSKI

FIGURE 3.4 Tumulus 17, excavation of type III tumuli
PHOTO BY O. BIAŁOSTOCKA

funerary rites which might have been performed on the ground surface near the shaft before it was finally filled in [**Fig. 3.4**].

The protection plan for the cemetery was accomplished by erecting about 1,200 concrete posts around the 2 km perimeter of the site and its buffer zone [see **Fig. 1.2**]. As a result, no more buses, trucks, or cars will be able to drive across the site, as long as these posts remain in place.

2 Type 1 Tumuli

2.1 *Tumulus 2*

Tumulus 2 lies in the south-eastern part of the cemetery surrounded by another four of the large tumuli (T.1, T.3, T.4 and T.5) constituting our first type. Together, they appear to form a separate group in the cemetery [see **Fig. 1.2**]. T.2 measures about 24 m in diameter with an estimated original height of at least 6 m; however, the preserved height does not exceed 2 m at the highest point above the surrounding ground level. The superstructure is heavily disturbed, with most of the top having disappeared because it provided a source of readily available building material rather than as a result of grave plundering. This kind of destruction is fairly common today and does not necessarily mean that the substructure was penetrated. A test pit of 6×6 m was dug into the top centre of the superstructure, reaching the original fill of the burial shaft at a depth of 0.70–1 m below the ground surface. The shaft presents a roughly rectangular outline (its sides measuring 4.50 m, 4.40 m, 3.50 m, and 2.40 m respectively, and narrowing towards the bottom), and it is aligned north–south, with a substantial, buttress-like 'pier' projecting from the east wall, dividing the shaft into two halves and affording it a U-shaped plan [**Fig. 3.5**].

The real function of this pier—for it is certainly not a buttress—remains obscure. The fill, which consisted of whitish sand, appeared to be undisturbed except for a pit not exceeding 1 m in diameter, located in the south-west corner of the shaft, which possibly attests to an aborted robbery attempt. The shaft proved to be about 2.50 m deep. A step had been carved in the north-east corner of the shaft, about 1.30 m below ground level, allowing easy descent to the bottom. Another small step, about 0.30 m high, was at the foot of the pier, on its south-west corner. Opening off this shaft were three chambers. The southern chamber was sealed with a solid wall of unbonded mud bricks [**Fig. 3.6**], about 3.03 m long and 0.50 m wide, built to a height of about 0.75 m. The size of the bricks ranges between: 37–50 cm × 22–25 cm × 9–12 cm. Evidence of attempted looting was noted in the form of the previously mentioned pit observed in the shaft fill. The second chamber, on the west side of the shaft, had an intact blocking wall which was 2.00 m long, with a height ranging from 0.55 m to 0.65 m. The third blocking wall, in the north-west corner of the shaft, was built of six courses of bricks and was also found untouched. Further mud bricks covered the entire floor of the shaft (up to a height of about 0.30 m). Two of the three chambers appeared to be designated for grave goods. Both were found intact. The north-western chamber (Ch. 3), which is the smallest of all, is of a rare type of construction [**Fig. 3.7**]. It is hewn into the north-west corner of the shaft and accessed through an entrance about 1.10–1.50 m wide and about 0.70 m high. The grave offerings appeared to be arranged in a specific order, presumably reflecting a local rite so far unknown in the region. Two large cattle bones were found at the far eastern side of the chamber, followed by three beer jars (two of which were large, with cups covering their mouths). Seven small red bowls and fragments of small and large animal bones had been placed together next to the beer jars. The last group comprised one small red bowl and fragments of large animal bones. This specific arrangement has never been observed in graves of the period elsewhere in Nubia. The other chamber containing grave goods, chamber 2, was hewn into the longest, west side of the shaft. Its maximum length is about 2.60 m and it is 1.20 m wide and up to 0.70 m high. The entrance measures 2.17 m in length, with a height of 0.55–0.65 m. A certain order in the deposition of the grave goods appears to have been followed here. Two large beer jars had been placed as one group in the northern part of the chamber. Then came nine small red bowls, another two beer jars next to them, a medium-sized table amphora, and a group of 13 small red bowls, which were deposited in an area at the southern end of the chamber. Animal bones from both large and small animals (identified as cattle and sheep/goat) were found near the first group of bowls in the middle of the chamber, and they were also associated with the second group of bowls at its southern end [**Fig. 3.7 bottom**].

Interestingly, chambers 2 and 3 were connected through a hole (*c.* 0.15–0.20 m) made in the wall between them. These passages could have been of symbolic significance, allowing the soul of the grave occupant to move freely between the chambers. The nearest analogy for these holes could be from the burials at Ballana and Qustul, which have multiple chambers interconnected by doorways rather than holes, also to provide the soul of the deceased easy access to the grave goods. Chamber 2 was also indirectly connected via an external niche with chamber 1, which was the main burial. This chamber is cut into the southern wall of the shaft. It is about the same

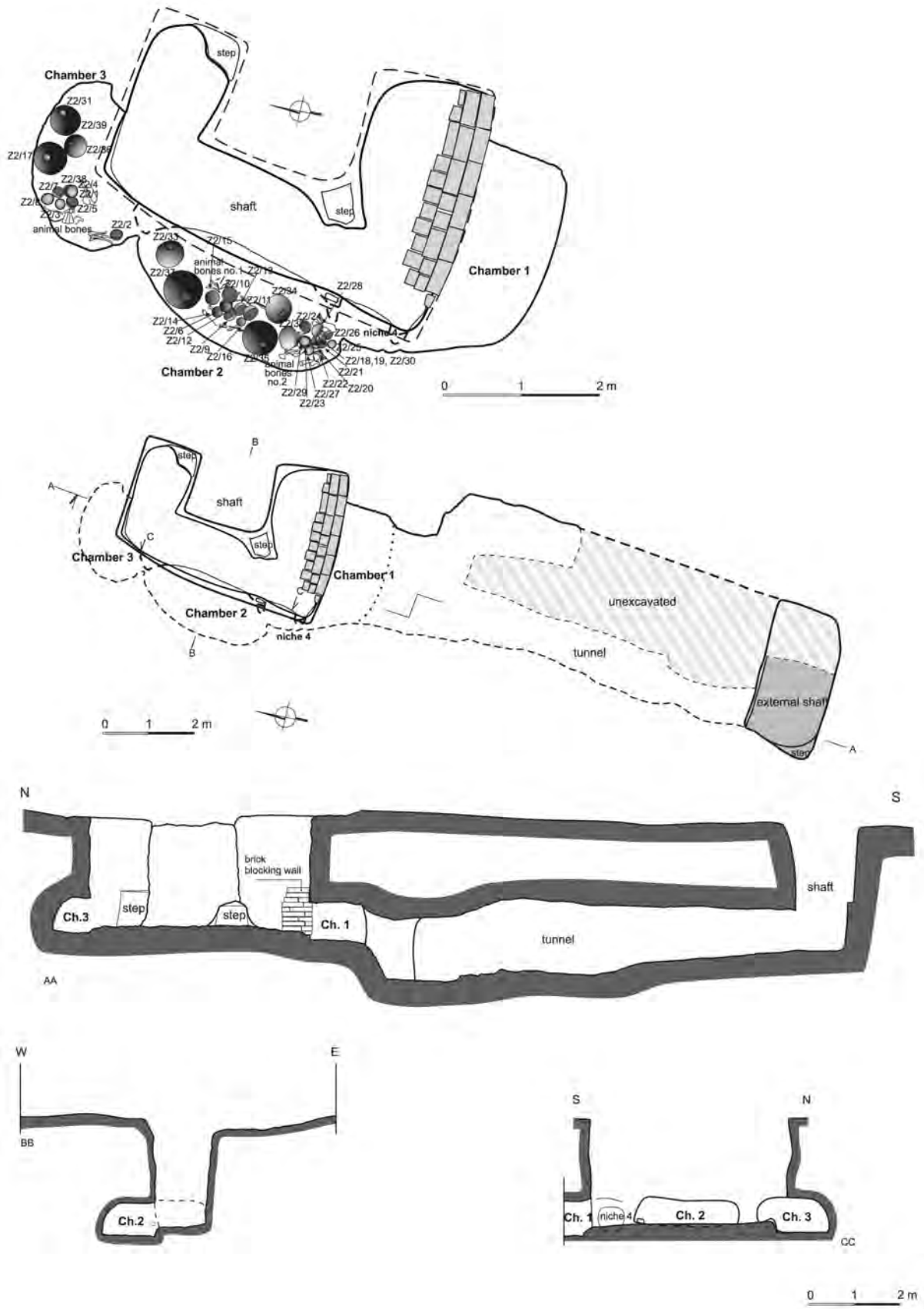


FIGURE 3.5 Tumulus 2, general plan and cross-sections
DRAWN BY U. WICENCIAK, A. OBŁUSKI, DIGITISED BY M. PUSZKARSKI

FIGURE 3.6 Tumulus 2, mud-brick blocking wall of chambers 1 and 3
PHOTOS BY A. OBŁUSKI

size as chamber 2 (maximum length 2.30 m; width 1.20 m; height *c.* 0.78 m). Unfortunately, it was found totally rifled. A dark brown/black residue of what might have been the leather straps of a bier was the sole evidence still visible on the eastern side of the burial chamber. Many white and blue tubular faience beads were found in the same area around the black residue. The rear of the chamber opens onto a wide N–S tunnel, its floor located about 0.70 m below the floor level of the chamber. Thorough exploration of the tunnel was not an easy task due to the soft, fragile sandstone of the roof, which threatened to collapse because of the humidity and changes in interior environment [**Fig. 3.8**]. However, nothing of note was found in the section that was cleared of the sediments filling it, only a fragment of human skull, a cattle bone, some pottery sherds, and several small, rusted iron fragments—a nail and probably some arrowheads. The tunnel was about 9.00 m long, 2.00–3.20 m wide and about 0.70–1.30 m high. It terminated in an external shaft (3.00 m × 1.20 m × 2.00 m) at the southern edge of the tumulus. The devastation of the burial and the tunnel, not to mention the huge quantities of sediment inside them, suggested that this tomb had been repeatedly plundered and left open for long periods. The chamber could have been broken into from above through the robber pit as well as through the underground tunnel. For more detailed information see Mahmoud El-Tayeb 2005, 390–394.

2.2 *Tumulus 3*

Tumulus 3 is located at the southern end of the cemetery, just a few metres from the northern wall of El-Zuma Hospital. As already mentioned, this tumulus is attributed to type 1, as are those adjacent to it, namely T.4, located a short distance roughly north, and T.1, which lies a short distance north-east of T.3 [see **Fig. 1.2**]. These three mounds are identified as a group representing the smallest of the type 1 tumuli. Their diameters at the time of excavation ranged between 30 m and 35 m, with a maximum preserved height of about 3.50 m [**Fig. 3.9**]. The conical mound (although its top is disturbed) is built from a mixture of earth and gravel, covered from top to bottom by densely packed pieces of black ferruginous sandstone. Most probably, the original height of the mound was not less than 6 m. Over time it has been exposed to different forms of destruction caused by natural factors, such as wind and rainwater erosion, and human factors, such as grave robbing and scavenging for building materials, resulting in severe damage to the tumulus (the same thing can be said about the other tumuli at the cemetery).

As already mentioned above, the site is inscribed on the UNESCO World Heritage List. Therefore, the NCAM approved the mission's work there on condition that the eight large tumuli should only be investigated in a manner that would not cause any kind of destruction. Therefore, only limited trial trenching could be conducted to gain some data which could help in understanding the nature, function, and date of these enigmatic monuments. In accordance with these constraints, investigations were directed to the southern side of T.3, where some traces of whitish sandstone had been noted. Based on previous experience, whitish sandstone remains at the southern foot of a mound usually denote the exact location of the external shaft of a tunnel of the type described above. Consequently, a large rectangular trench of about 8 m × 4 m was set out on this spot. After removal of accumulated sediment to a depth of about 0.50 m, the examined area was reduced to form a square of about 5 m × 5 m when the outline of the external shaft became visible. The shaft had a rectangular ground plan measuring 2.72 m × 1.60 m with a depth of 1.40 m. Access to the bottom of the shaft

FIGURE 3.7 Tumulus 2, view of chamber 3 before excavation (top) and view of chamber 2 (bottom), with details of grave offerings (inset)
PHOTOS BY U. WICENCIAK

FIGURE 3.8 Tumulus 2, view of the burial chamber and the tunnel fill (top); view of the partly excavated tunnel, facing south
PHOTOS BY A. OBŁUSKI

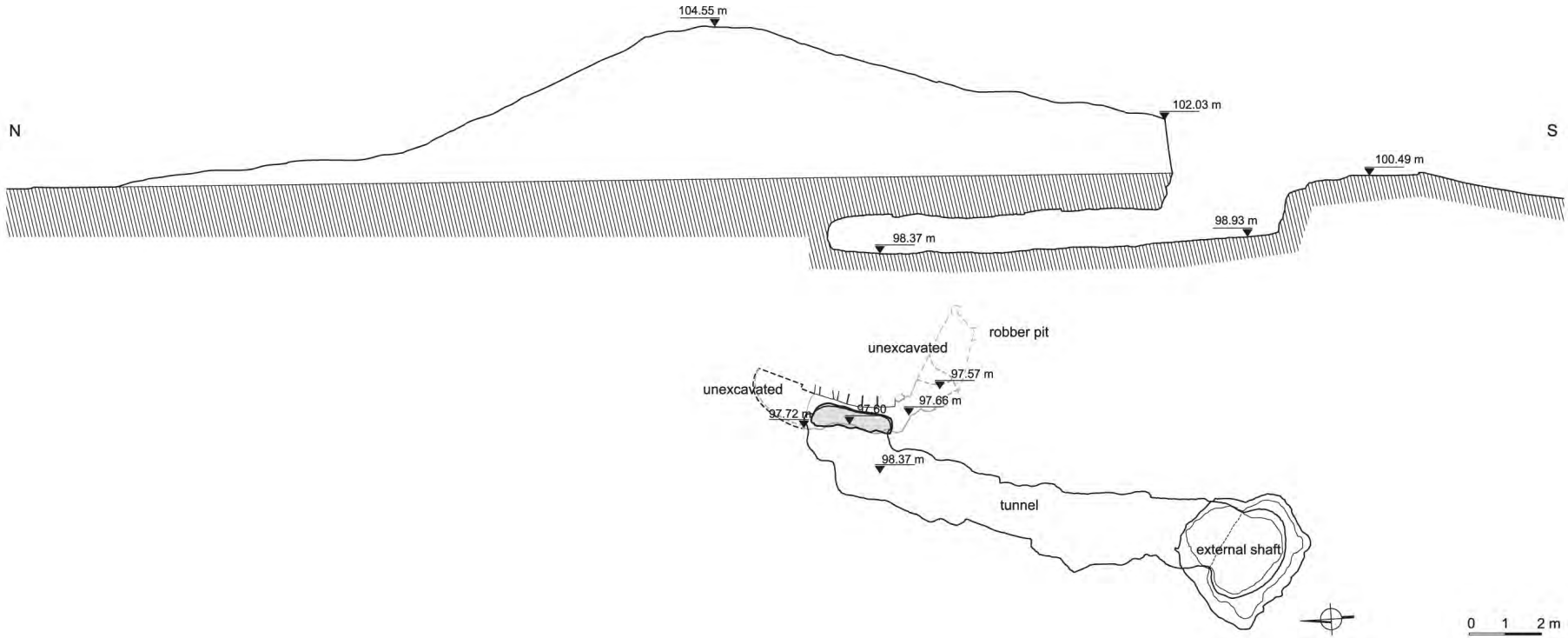
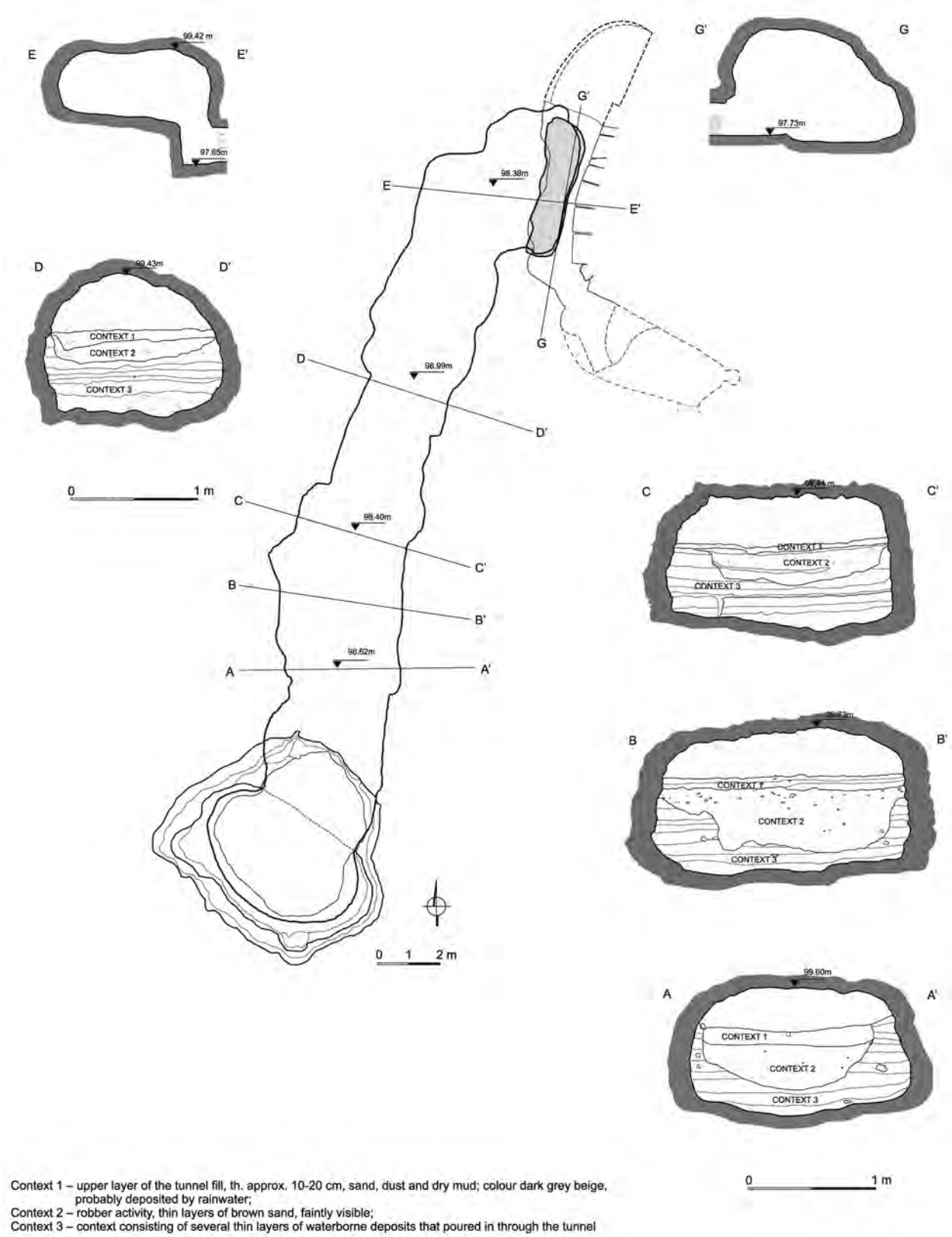


FIGURE 3.9 Tumulus 3, general plan and cross-section
DRAWN AND DIGITISED BY J. JUCHNIEWICZ



Context 1 – upper layer of the tunnel fill, th. approx. 10-20 cm, sand, dust and dry mud; colour dark grey beige, probably deposited by rainwater;
Context 2 – robber activity, thin layers of brown sand, faintly visible;
Context 3 – context consisting of several thin layers of waterborne deposits that poured in through the tunnel

FIGURE 3.10 Tumulus 3, sediment layers inside the tunnels
DRAWN AND DIGITISED BY J. JUCHNIEWICZ

FIGURE 3.11 Tumulus 3, view of the tunnel beneath the tumulus
PHOTO BY A. KAMROWSKI

was facilitated by two steps cut into two opposite corners (south-east and south-west), at a depth of about 0.65 m. In their search for the tunnel, the robbers appear to have missed the right place, as they broke through the top of the tunnel entrance causing some damage to its roof. The external shaft and the tunnel were both found filled with earth and sand, indicating that the passage to the burial chambers had been left open for a long period. The tunnel was 11.81 m long and 1.88 m wide with a height ranging from 0.93 m at the entrance to 1.06 m further in. Leading north-west and terminating above the west chamber, the tunnel appears to have been dug in the wrong direction. In both T.2 and T.5 the tunnel had been dug from south to north to reach the main chamber, hewn into the southern side of the principal grave shaft (Mahmoud El-Tayeb 2007, 73–80, Figs. 3b, 5; 2010b, Fig. 6).

However, detailed examination of the fill in the tunnel of T.3 led to a significant discovery. Near the hole leading down to chamber 2, some broken mud bricks were noted. Undoubtedly, these fragments in this specific location attest to the existence of a wall that blocked the way down to the burial chambers. Repeated plundering of the grave had a severe impact, not only on the mud-brick blocking wall, which was completely destroyed, but also on all of the burial chambers. The fill stratigraphy shows at least three phases of plundering activity [**Fig. 3.10**]. The importance of this stems from the fact that it is the first noted instance of such a situation in El-Zuma burials of type 1. Although the evidence is incomplete due to the large scale of destruction, this discovery again raises the question of what purpose the tunnel served. As previously mentioned, the tunnel opens directly into the underlying west chamber (Ch. 2) [**Fig. 3.11**], which measures about 4.50 m in length, 1.20 m in width, and about 0.67 m in height.

Most probably, this grave was of similar construction to others of the same type, consisting of a U-shaped vertical shaft and a number of lateral niches hewn into its side walls. This is attested by two holes of about 0.60 m × 0.40 m that connected chamber 2 with the chambers on its southern and northern sides [**Fig. 3.12 top**]. The southern chamber (Ch. 1) measured 3 m × 1 m and was 0.60 m high [**Fig. 3.12 bottom**]. All three chambers were found completely filled with sediment that had poured in through the tunnel. Due to the poor condition of the ceiling in the northern chamber (Ch. 3), no attempt was made to explore it. However, clearing the two other chambers (western and northern) of sand and debris revealed that both of them had been thoroughly plundered and badly damaged. Only some fragments of human and animal bones were found scattered in the tunnel and chamber 1 (for more about the animal bone remains see Chapter 8 in this volume; on the human remains see Chapter 6 in this volume). There are two small, unexplained niches in chamber 1. One is cut into the south wall and the other, reminiscent of a shelf, is cut into the east side of the chamber and appeared to contain some long fragments of bone (prob-

FIGURE 3.12 Tumulus 3, view of the unexcavated western chamber 2, facing north (top); view of the southern chamber 1 (bottom)
PHOTOS BY A. KAMROWSKI

ably a cattle scapula). Further excavation to determine the form of these two small niches was difficult due to the threat of ceiling collapse and the uncomfortable conditions inside the chamber, where there was very little space and fresh air. Comparing the uncovered part of the burial substructure with the ones beneath tumuli 2, 5, and 6, there is clearly a great difference in size and the quality of workmanship. No explanation for these observations can be offered without full excavation of the burials. For more detailed information see Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 119–120.

2.3 *Tumulus 5*

Tumulus 5 lies slightly east of the central part of the cemetery and is one of the eight largest mounds at this site. Its maximum diameter is about 26 m, with a preserved height of about 3.20 m, though it may originally have measured as much as 6 m in height [**Fig. 3.13**].

FIGURE 3.13 Tumulus 5, view of the mound, looking west
PHOTO BY K. KOTLEWSKI

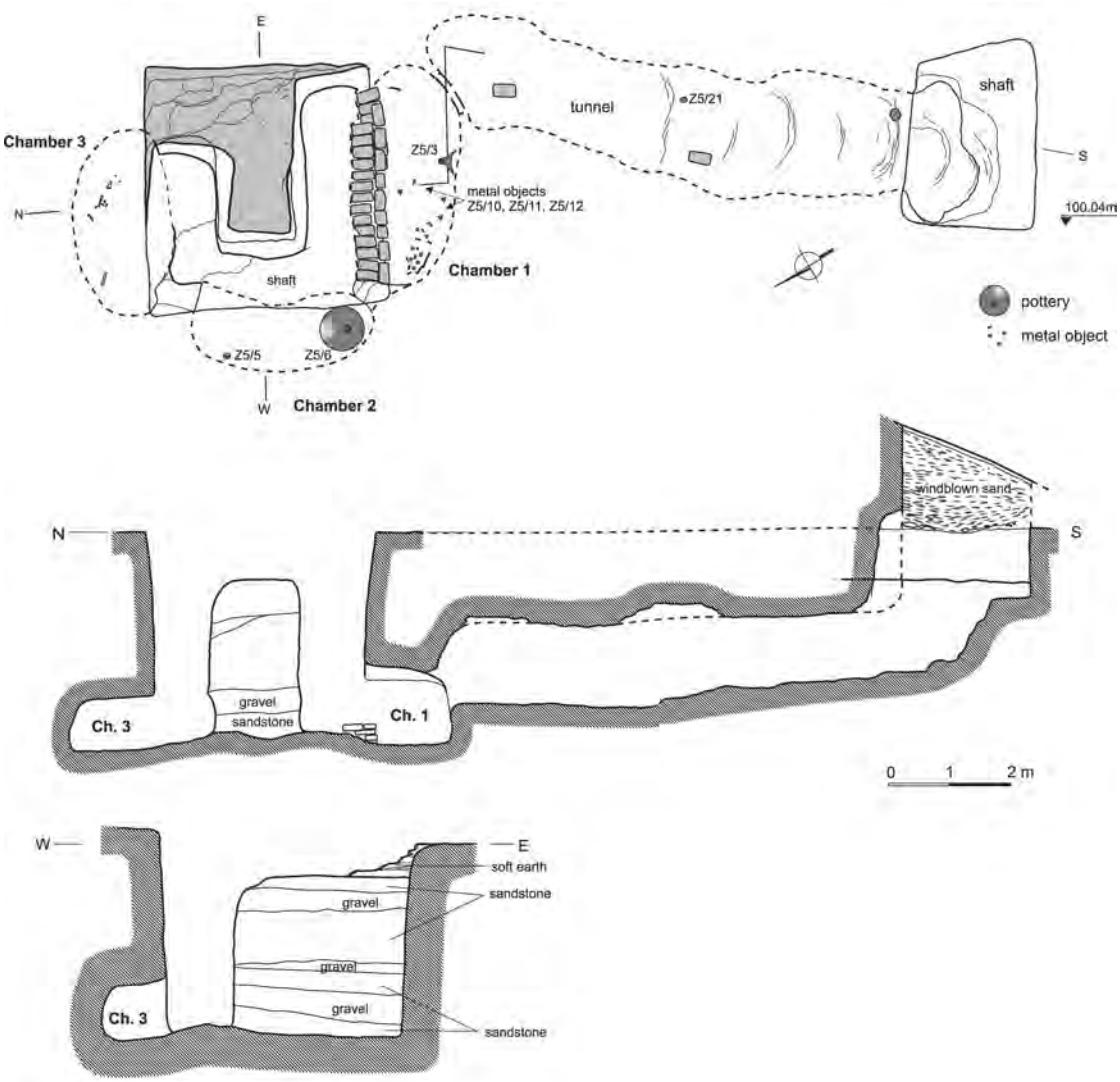


FIGURE 3.14 Tumulus 5, general plan and cross-sections
DRAWN BY A. BŁASZCZYK, K. OCHNIO, E. KLIMASZEWSKA-DRABOT, K. KOTLEWSKI, M. WYBIERALSKA, DIGITISED BY M. PUSZKARSKI

At the time of excavation, most of the summit of the tumulus had already been removed, leaving an almost flat top disturbed by some irregular pits. The easiest and most effective way to explore a mound in this state is to set out a rectangular or square test pit centrally at the top of the mound, provided that the excavator is aware of the whereabouts of the main shaft of the burial [**Fig. 3.14**].

In this case, a pit measuring 10 m × 10 m was dug to a depth of about 1 m, thereafter reduced to 10 m × 8 m and ultimately to 8 m × 6 m (the longer sides oriented east–west). The top of an almost square shaft appeared under a layer of crushed white sandstone that also comprised the upper part of the fill. The shaft measured 3.80–3.70 m × 3.65 m. Unlike other burials in the region, it was filled completely with rough stones of different size. Some 40 cm below the soft surface deposit, a sandstone layer representing the second geological stratum in this part of the site was worked into a kind of pier projecting from the east wall, a feature that turned the ground plan of the shaft into a U-shape with unequal sides measuring 2.14 m long on the north and 3.30 m on the south [**Fig. 3.15**]. The burial contained three lateral niches hewn into the south, west, and north walls of the shaft. All three chambers were blocked with the same kind of stones and stone slabs that filled the shaft. All of the sealing structures were found intact, promising undisturbed burials unless the chambers had been broken into from elsewhere. Unfortunately, the burial had indeed been plundered from the outside, through a tunnel penetrating the southern chamber from the south.

In keeping with the regional burial tradition, the southern chamber (Ch. 1) contained the body, while the other two chambers (Ch. 2 and Ch. 3) were set aside for grave offerings. Chamber 1 was entered by the robbers through a hole about 1 m in diameter, dug into the rear of the chamber on its east side [**Fig. 3.16**]. This chamber had been thoroughly ransacked, leaving only some disarticulated long bones of a human skeleton, a few potsherds, and some wooden remains suggestive of a bier used in the inhumation process. Chamber 2, which opens off the west side of the shaft, is separated from chamber 1 by a low partition wall hewn from the same sandstone as the whole tomb. A space of about 0.50–0.60 m was left between the roof and the top of this wall, which appears to be an innovation replacing the hole made in the partition walls of some of the burial chambers at this cemetery. Only one very large beer jar (75 cm high, 60 cm in diameter) and a small broken cup were left behind by the grave robbers. Chamber 3, the northern one, is separated from chamber 2 by another low partition wall that leaves a gap to the roof. Chamber 3 appeared undisturbed but proved to be completely devoid of grave goods apart from some remains of oxidised organic material, probably an item of basketry which left a distinct brown residue on the floor of the chamber. It is assumed that this chamber, which indeed had not been penetrated, held grave offerings, mainly food, set out in traditional baskets and on plates woven from plant fibres (Sudanese Arabic: *sabat*/*guffa* and *tabaq*). The food must have attracted white ants and rats (one naturally mummified rat was found among the stones in the shaft fill). Nothing but faint traces of these woven vessels could be discerned on the chamber floor. The tunnel in T.5 measured 7.30 m in length, 1.28 m in width, and 1.50 m in height. An external shaft of rectangular section had been cut at the south edge of the burial mound and sealed, originally with stones similar to those in the main shaft. The stones were, however, found in great disorder, indicating secondary penetration. It seems that the entrance had been left open to be filled with sand and earth from the top of the mound. Careful examination of this tunnel structure leaves little doubt that it was part of the original tomb layout. The robbers took advantage of it, but its original purpose remains obscure. For more detailed information see Mahmoud El-Tayeb 2010a, 205–209; 2010b, 468–471.

2.4 *Tumulus 8*

Tumulus 8 is located in the northern part of the cemetery. The mound was built from a mixture of earth, sand, and gravel, covered by small pieces of black ferruginous sandstone. It has a diameter of about 28.60 m and a maximum height of 4.91 m. Although no indications of earlier activity were observed on the surface around the lower part of the tumulus, a rectangular pit of about 8 m × 4 m was discovered on the southern side of the mound. The outline of a large robber pit measuring 5 m × 3.60 m appeared at a depth of 0.10–0.40 m. The uncovered external shaft is roughly rectangular in plan and aligned east–west, the north side measuring 2 m, the south 2.05 m, the east 1.25 m, and the west 1 m, reaching a depth of 1.95 m on the south side and 2.30 m on the north [**Fig. 3.17**].

Access to the bottom of the shaft was facilitated by a single step hewn out in its south-east corner at a depth of about 0.90 m from the ground surface, while there was another step rising about 0.40 m from the bottom of the shaft to the entrance of the tunnel [**Fig. 3.18**]. Here again, on their way down the robbers missed the centre of the external shaft, and as a result they partially destroyed the ceiling of the tunnel at its entrance. The relatively narrow entrance to the tunnel is sub-rectangular, measuring 1.26 m wide and 1.36 m high. So far the tunnel of T.8 is the narrowest and the most irregular in shape, as well as being the most poorly constructed of all eight tunnels excavated at the cemetery. Its maximum length reaches 6.40 m, while

FIGURE 3.15 Tumulus 5, view of the excavated shaft with stone blocking walls
PHOTO BY K. KOTLEWSKI

FIGURE 3.16 Tumulus 5, view of chamber 1. Note the entrance to the tunnel from the east side of the chamber
PHOTO BY K. KOTLEWSKI

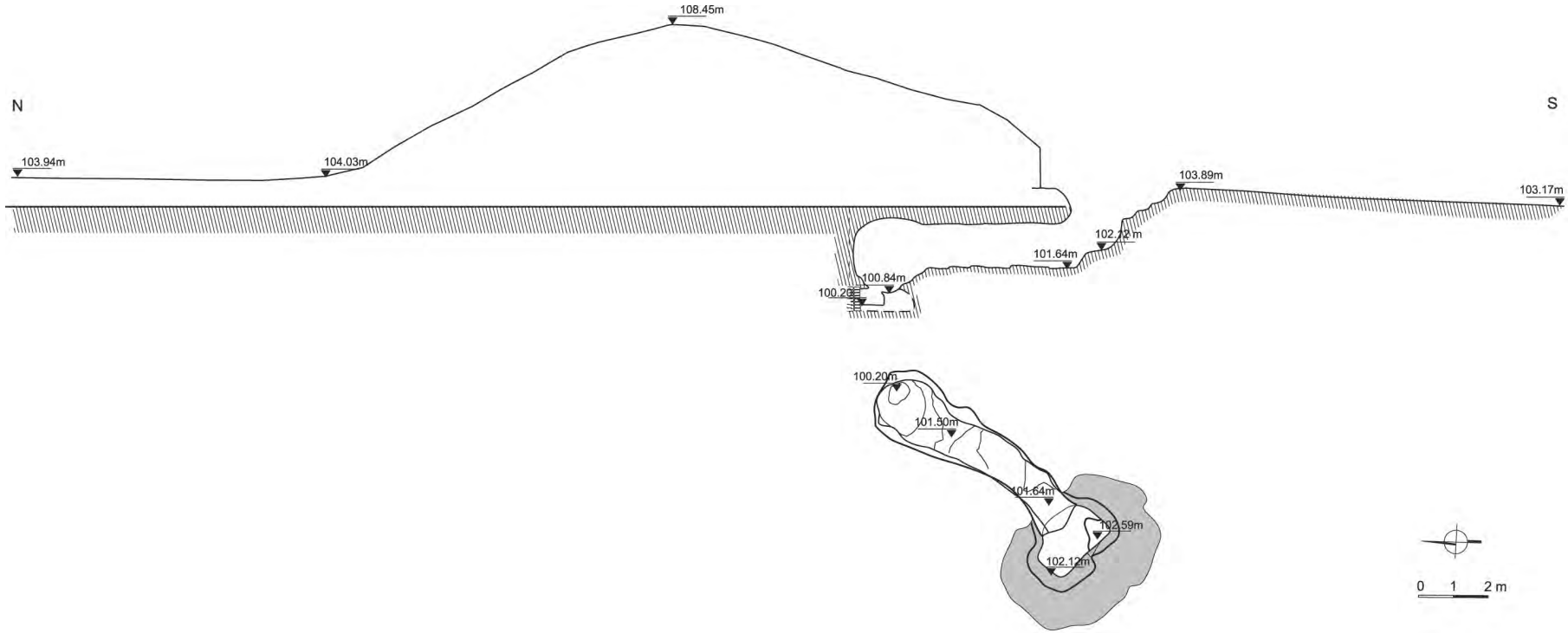


FIGURE 3.17 Tumulus 8, general plan and cross-sections
DRAWN BY E. SKOWROŃSKA, Z. KOWARSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.18 Tumulus 8, view of the external shaft and the entrance to the tunnel, facing north
PHOTO BY A. KAMROWSKI

its width ranges from 1.26 m at the entrance to 2.05 m at the end. The last 2 m of the tunnel has a gradual downward incline of about 0.50 m towards a hole leading into the west side of the main burial chamber (Ch. 1, on the south side). The hole, which perforated the ceiling of chamber 1, is of elongated, irregular shape, measuring 0.63 m × 0.46 m [**Fig. 3.19 top**]. The southern chamber (Ch. 1) measures 2.00 m × 1.20 m and is 0.65 m high, while chamber 2 is 3.40 m long but only 0.65 m wide, and measures about 0.65 m at its highest point [**Fig. 3.19 bottom**]. The ceilings of both chambers slope markedly towards the rear of the chamber, a construction practice which has so far been noted only in this burial and in T.3. Red bricks bearing traces of white plaster were reused in the seven courses making up the blocking walls of these burial chambers. As mentioned elsewhere, these bricks were most probably brought from the nearby ruins of an old Meroitic official building, the location of which remains unknown. The substructure of the tomb appears to have been penetrated and looted on multiple occasions. As a result, the two chambers, the tunnel, and the external shaft were all found filled with compact, brownish earth. The excavation of chamber 1 brought to light a pile of broken human and animal bones mixed together in the centre of the chamber, while only one small light brown bowl was noted near the red-brick blocking wall. Fragments of cattle bones were also found in the fill of the tunnel and the external shaft. For the same reasons as noted in T.3, no further work was conducted. Nonetheless, the results of this quite limited investigation have added further evidence relating to the origin and function of the tunnels beneath the El-Zuma tumuli. For more detailed information see Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 120–121.

2.5 *Tumulus 1*

Tumulus 1 is located on the far south-eastern fringes of the cemetery [see **Fig. 1.2**]. It measures about 34 m in diameter, with a preserved height of about 5.37 m. The search for the external shaft of this tumulus started on its southern side, where some remnants of whitish crushed sandstone were recorded at the foot of the mound. Grave robbers had earlier made at least three failed attempts to find this shaft. They partly succeeded on their fourth attempt, although they missed the centre of the external shaft, thus badly damaging the ceiling of the tunnel entrance. The external shaft is rectangular in plan and aligned east–west. It meas-

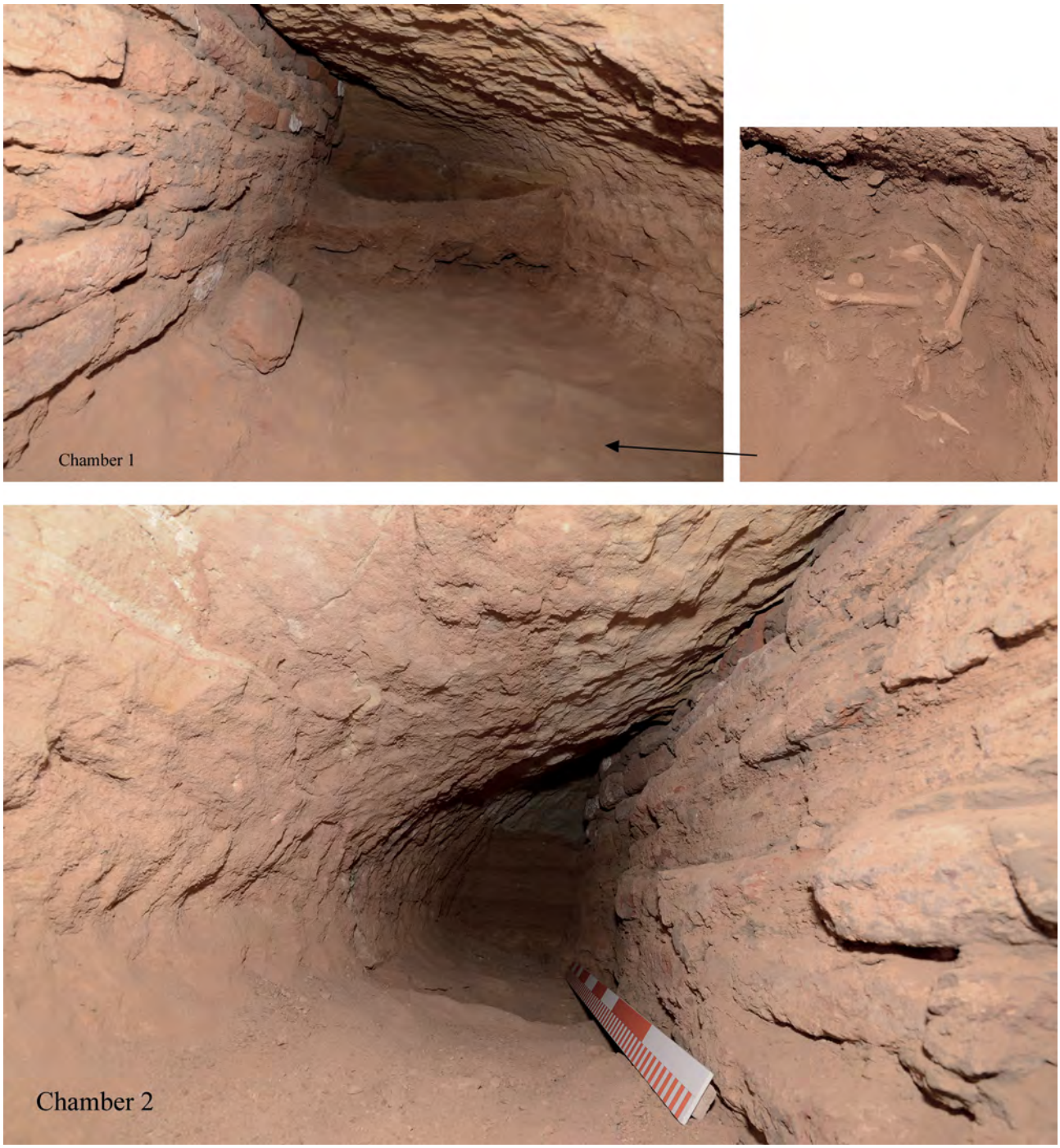


FIGURE 3.19 Tumulus 8, view of the southern chamber 1, facing east (top), view of the human bones excavated in the southern part of the chamber (top right); view of chamber 2 (bottom)
PHOTOS BY A. KAMROWSKI

ures 3.70 m in length and 1.70 m in width with a maximum depth of about 2.60 m. The shaft is provided with two steps cut into its south-east and south-west corners at respective depths of about 1.13 m and 1.33 m below ground level [**Fig. 3.20**].

Cleaning of the external shaft revealed the existence of a wide tunnel aligned north–south. The entrance to the tunnel is about 3.00 m wide and about 1.60 m high. The tunnel is supported by four pillars that divide it into two wings: east and west [**Fig. 3.21**]. The first pillar is located at a distance of 5.45 m from the south wall of the external shaft. Like the tunnel in T.4, the east wing of this tunnel, which measures 13.30 m in length, extends northwards, terminating in a rounded dead-end. The west wing

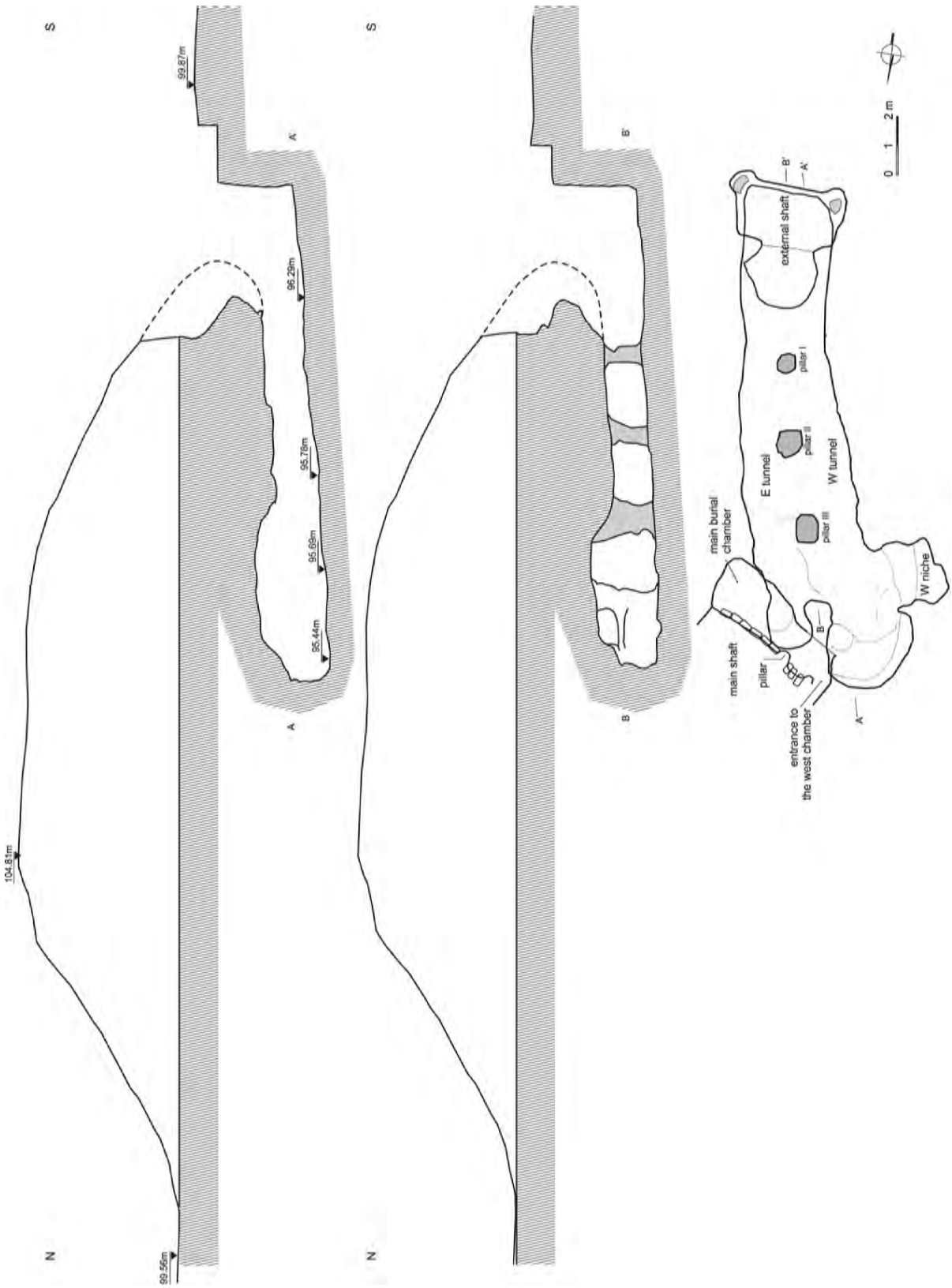


FIGURE 3.20 Tumulus 1, general plan and cross-sections
DRAWN BY Z. KOWARSKA, M. ANTOS, DIGITISED BY M. ANTOS, E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.21 Tumulus 1, view of the tunnel, looking north
PHOTO BY A. KAMROWSKI

is slightly longer, measuring 14.20 m, with a wider, rounded dead-end. At a distance of about 9 m into the west wing of the tunnel, there was an extremely unusual construction, unlike any ever noted in this type of burial at El-Zuma. It was discovered hewn into the west wall of the west wing and took the form of an open niche measuring about 2.00 m × 1.20 m. It is not clear, however, if the original plan had been to construct a side chamber here, which was never completed, or if this western lateral niche, provided with a bench-like feature, represented a new element in the burial tradition of the period. One large cattle bone (a scapula) was the only item found on top of the bench [**Fig. 3.22 top**].

Another modification in burial practice is the location and construction of the main burial chamber, which was found cut into the east wall of the west wing of the tunnel. The burial chamber was cut into the sandstone bedrock at about 1.50 m above the tunnel floor. It was covered by a mixture of sand, earth, and partly collapsed roof. Excavation revealed that the burial had been badly rifled in the past [**Fig. 3.22 bottom**]. Fragments of a disarticulated human skeleton, one medium-sized beer jar, pottery sherds, and broken pieces of various ornaments, as well as metal fragments, including a gold earring, were noted; they were scattered in the burial chamber and all along the tunnel (see Volume III, Chapter 5). The results of preliminary bone analysis conducted in the field were of great interest, for they pointed to the discovery of fragments from at least seven human skulls, in addition to 11 fragments of human right femurs (see Chapter 6, this volume). The burial chamber is approximately rectangular [see **Fig. 3.23 bottom**] and oriented north-west–south-east. It measures 4.56 m × 1.30 m on the north-western side and 1.86 m × 0.85 m on the south-eastern side, with a height of 0.95 m. Its entrance, from the side of the main burial shaft, is about 1.30 m wide, and it is divided by a small, fragile pillar, far smaller in size than the one discovered in the burial chamber of T.6 (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 122–123). The blocking wall (about 0.85 m high), separating the main shaft and the burial chamber, consists of nine courses of mud bricks lightly bonded with a thin layer of mud mortar [**Fig. 3.23**].

Two weeks after the mission left El-Zuma, the author heard from the foreman of the site workers that a large hole had appeared in the summit of the tumulus, similar to the one recorded in T.4 [see **Fig. 3.29**]. On site, it appeared that the situation was even worse and more frightening than that of T.4. In contrast to T.4, the pit at the top of T.1 reached the bottom of the main burial shaft directly in front of the burial blocking wall. The pressure of the sand falling in through the shaft had been great enough to destroy some of the mud-brick courses of the blocking wall. In consequence, sand had filled half of the burial chamber and poured down on to the tunnel floor. The only effective way to secure the pit from the top of the tumulus was to seal it with heavy concrete slabs since these mounds are a favourite playground of local children. The external shaft of the tumulus has been protected by building the same

FIGURE 3.22 Tumulus 1, view of the side niche, facing west (top); rear entrance of chamber 1 (bottom)
PHOTOS BY A. KAMROWSKI

FIGURE 3.23 Tumulus 1, view of the fragile pillar in chamber 1 (top); chamber 1 after excavation (bottom)
PHOTOS BY A. KAMROWSKI

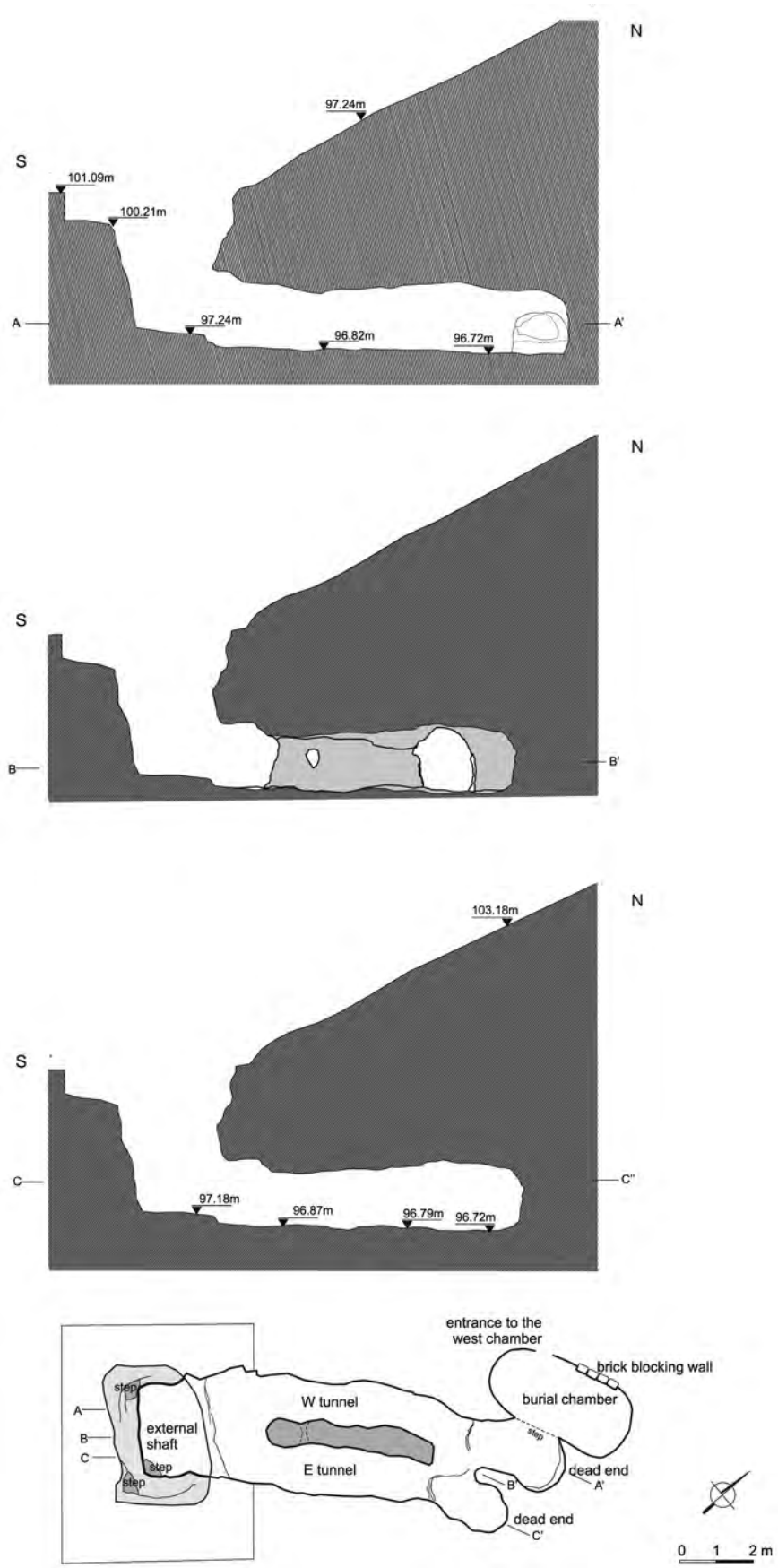


FIGURE 3.24 Tumulus 4, general plan and cross-sections
DRAWN BY M. ANTOS, DIGITISED BY M. ANTOS, E. CZYŻEWSKA-ZALEWSKA

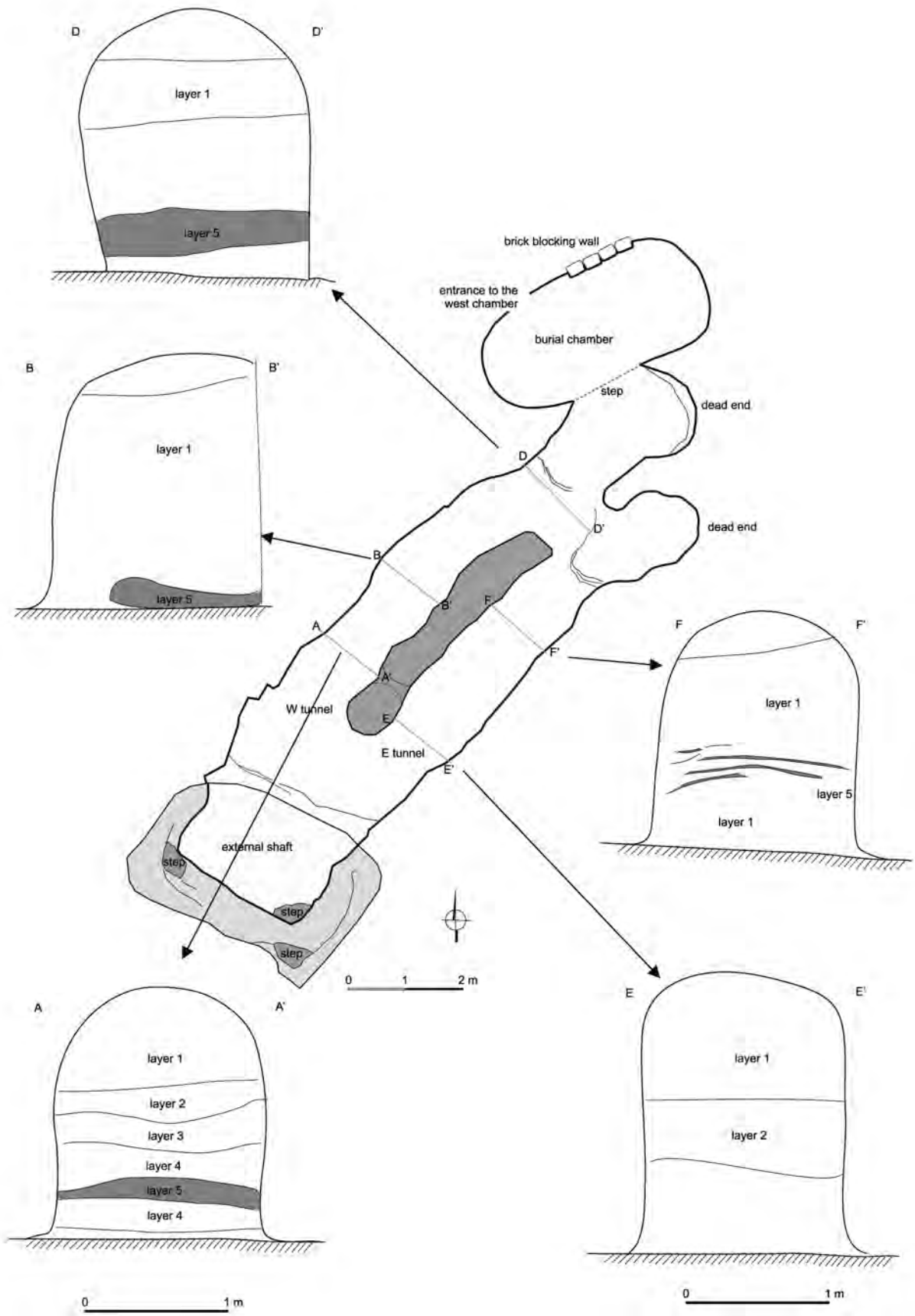


FIGURE 3.25 Tumulus 4, sediment layers inside the tunnels
DRAWN BY M. ANTOS, DIGITISED BY M. ANTOS, E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.26 Tumulus 4, underground tunnel divided by pillars into two wings (east wing filled with sediments)
PHOTO BY A. KAMROWSKI

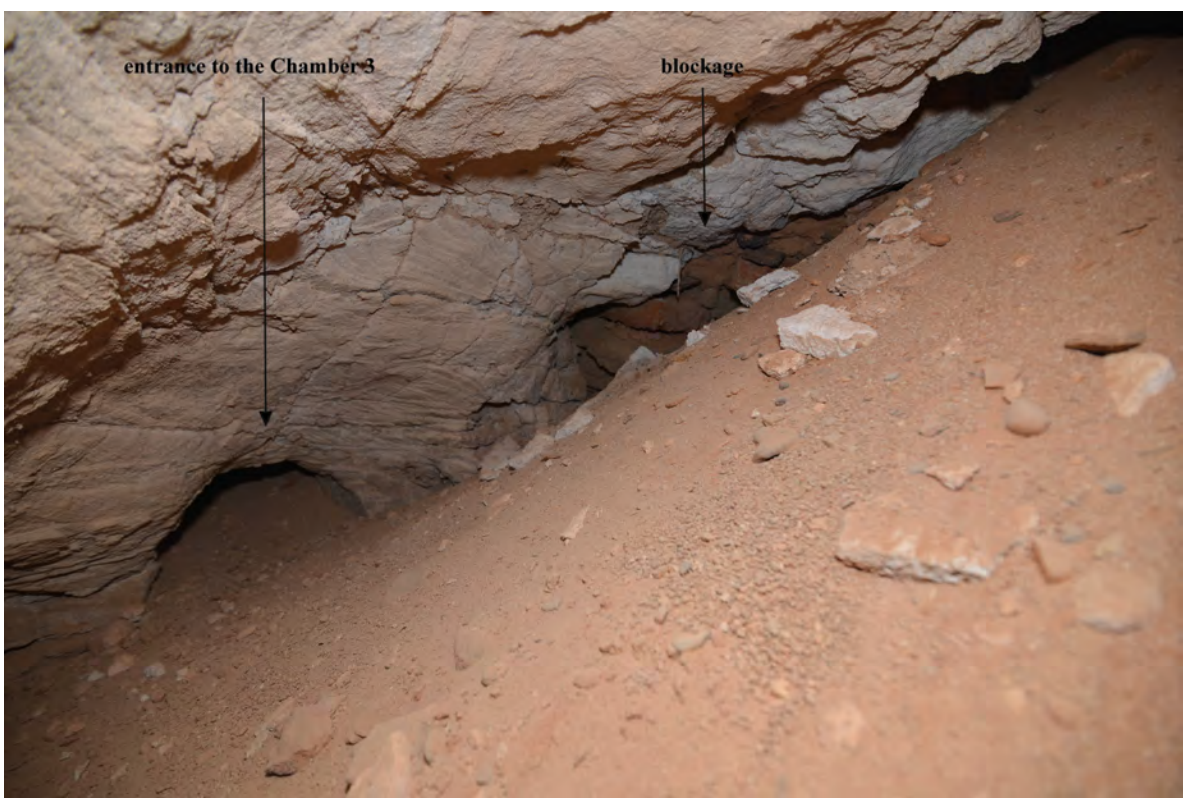


FIGURE 3.27 Tumulus 4, view of burial chamber 2. Note the red-brick blocking wall and the entrance to a secondary chamber (Ch. 3)
PHOTO BY A. KAMROWSKI

FIGURE 3.28 Tumulus 4, close-up, objects visible in the sand layers in front of the burial chamber (top); bronze ring (bottom left) and chain with crosses (bottom right) *in situ*
PHOTOS BY A. KAMROWSKI

type of construction as in T.4 (a vaulted roof), using metal beams and red bricks. A metal grid was also installed for safety purposes and to provide an easy means of descending to the bottom of the shaft. For more detailed information see Mahmoud El-Tayeb 2017, 346–350.

2.6 *Tumulus 4*

Tumulus 4 is located at the south-west side of the cemetery site [see **Fig. 1.2**]. Like the abovementioned tumuli, it has a conical shape and was built of earth and gravel, covered with small rough black stones. Its maximum diameter is about 34 m with a height of up to 6.20 m, making it one of the largest type 1 tumuli. A successful attempt to find the external shaft and the tunnel entrance was made at the end of the sixth excavation season, in 2013. Thereafter, during the cleaning of the entrance to the tunnel, the ceiling, which was very fragile, started to collapse. For lack of time and for safety reasons, the excavation of this feature was suspended until 2017. During the 2017 season, work was resumed with the aim of excavating the tunnel in order to reach the burial chamber and thus gain a better understanding of the burial practice and determine its date. To this end, the external shaft was fully unearthed, revealing some damage done by robbers to the top of the tunnel's entrance [**Fig. 3.24**]. The external shaft is rectangular in shape, oriented east–west, and measures 3.80 m (E–W) by 2.45 m (N–S) on the ground surface, narrowing towards the bottom, where it measures only 2.00 m × 2.60 m, with

FIGURE 3.29 Tumulus 4, view of the hole on top of the mound. Excavation of the tunnel in the background
PHOTO BY A. KAMROWSKI

a maximum depth of about 3.30 m. Access to the bottom of the shaft was made easier by two steps cut into the south-east and south-west corners of the shaft at a depth of about 1.50 m below ground level. The entrance to the tunnel is about 2.70 m wide. During the 2013 season only a stretch of 1.50 m from the edge of the shaft was cleared of fill [**Fig. 3.25**].

At a distance of about 2 m, it appeared that the tunnel was divided into east and west wings by a partition wall hewn from the sandstone bedrock [**Fig. 3.26**], rather than by pillars such as those in T.1, T.6, and T.7 (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016). The wall itself is about 5.50 m long and is provided with one small hole made at a distance of 1.50 m from its southern end. The tunnel height at the entrance point is about 1.62 m, becoming lower towards the central section, and measuring about 1.59 m at its northern end. The eastern wing of the tunnel is only about 8.25 m long, while the western wing is 9.90 m long. Although both wings terminate in a dead-end at their northern extremity, a small chamber is cut into the west wall of the western wing. A rear chamber entrance is cut about 0.60 m above the floor level of the tunnel. The chamber itself measures approximately 2.70 m in length from north to south and 1.20 m east to west, with a 1.50-m-wide entrance. It was found full of earth from the side of the tunnel, as well as loose sand that had poured into it through a hole in its roof, which was later discovered to be dug into the summit of the tumulus. Part of a wall built of reused red bricks was noted on the far north side of the chamber, almost entirely covered by the sand that had poured into it [**Fig. 3.27**].

The location of this relatively small chamber is quite unusual, and it was found to contain the remains of offerings that had escaped the robbers' attention and lay mixed with the sand in front of the chamber's rear entrance. These discoveries leave no room for doubt that this was the main burial chamber [**Fig. 3.28**].

Evidently, the grave robbers had forced their way into this chamber through the west wing of the tunnel. This is attested by several small finds, pottery vessels and broken human bones that were found scattered across the floor of the tunnel during excavation. However, the issue of the hole at the top of the mound remains unresolved. This hole measures about 0.65 m in width and is of irregular

shape. It reached down roughly to the north-eastern side of the burial chamber directly from the top. The question is whether this hole is evidence of a second attempt to rob the burial, or whether it resulted from structural movement of the sandstone bedrock that caused some damage, including the partial splitting of the chamber's ceiling. Unfortunately, in view of this situation and the serious risk of collapse, the burial chamber was not fully excavated. The chamber and the northern end of the tunnel's west wing were tightly sealed with sacks full of sand. Thereafter, the hole at the top of the tumulus was also filled with sand to avoid any further destruction, and above all as a safety precaution [**Fig. 3.29**].

At the end, further safety measures were taken by constructing a solid cover over the external shaft. Two-thirds of the shaft were covered using iron beams (Arabic: *kamar*) and red bricks, creating a type of vault known in Arabic as *aged*. The last portion was covered with a metal grid provided with a door that offers easy access to the tunnel whenever needed [**Fig. 3.30**]. For more detailed information see Mahmoud El-Tayeb 2017, 340–346.

2.7 *Tumulus 6*

Tumulus 6 lies on the west side of the cemetery [see **Fig. 1.2**]. The mound is built of materials similar to those used for other type 1 tumuli. It has a diameter of about 52 m and a height of up to 8.50 m, making it the largest and tallest of the tumuli at El-Zuma. Efforts to detect the existence of a subterranean tunnel were focused on the southern side of the tumulus. A narrow rectangular vertical shaft was uncovered, measuring 4 m long by 1.75 m wide and 4 m deep. At a depth of between 1.82 m and 1.90 m from the ground surface, the shaft is provided with two steps cut into its south-east and south-west corners [**Fig. 3.31**].

The tunnel has an entrance of a type unique in late antique Nubia: it is rectangular, with a central pillar hewn from the bedrock. Its east side measures about 1.70 m in width and 1.76 m in height, while the west side is about 1.60 m wide and 1.96 m high. Both sides were found filled with compact sediment and stone slabs, the latter were especially abundant at the top of the east side entrance. These stone slabs appear to have been arranged to form an additional blocking wall after the partial removal of the fill in the east wing of the tunnel [**Fig. 3.32**]. The removal of the stone slabs and the earth fill from the east entrance revealed that the tunnel itself is divided from south to north by three pillars hewn from the same bedrock. Thus two passageways were created inside the tunnel [**Fig. 3.33**]. The west passage, which is about 9.70 m long and 1.60 m wide, appeared to terminate in a dead-end. The east wing is about 1.70 m wide and 19.30 m long. At its north end it is divided into two east and west niches interconnected by a small hole of unknown function. For the second time at this cemetery, there was evidence of the burial chamber having been penetrated through its roof by means of an irregular hole dug in the floor of the west niche, which made it possible to descend about 1.40 m to the underlying main burial chamber. However, for safety reasons no attempt was made to excavate the chamber, which appeared to have been disturbed and ransacked several times. The devastation of the burial is attested by several broken pottery vessels and fragments of animal bones, which were found within the fill of the tunnel and the external shaft. Strong evidence of tomb penetration is seen in the straight cut through the fill that covered the east wing of the tunnel and in the lining of the entrance with stone slabs. A small oil lamp, probably of Early Christian date, was found placed on top of the fill near the second pillar [**Fig. 3.34**]. The presence of this lamp and the removal of the fill from the east passage of the tunnel remain unexplained.

The southern, main, burial chamber is a large niche finely cut into the soft sandstone bedrock, with a roof that gently slopes from the entrance due south to the rear of the chamber. It measures about 5.00 m × 1.20 m and 1.40 m in height. The chamber is blocked by a well-built wall consisting of 15 courses of reused red bricks bonded with lime mortar. On its west side this chamber is connected with the west chamber by a rectangular hole with rounded top, measuring *c.* 0.60 m long and 0.40 m wide [**Fig. 3.35**]. The plundered but archaeologically unexamined chamber (there was no way of securing the 16 m-long tunnel, hence excavation was deemed unsafe)—as seen from above—still contained a number of pottery vessels, comprising cups, beer jars, one dish, and one unidentified ceramic object. More enigmatic is the presence of what appear to be two bodies laid on biers supported by stones at the corners. The bodies are wrapped in what may be now decayed linen [see **Fig. 3.35**]. To the east of these suspected bodies there is a human skull and what seems to be another body on a bier. The pair of suspected bodies appear to lie in extended position. Such an inhumation practice has never been recorded among the common burials of the period in question in the Dongola Reach. The nearest parallel can be found in the royal cemeteries of Ballana and Qustul. The existence of more than one inhumation in a single grave could suggest either multiple burials or human sacrifice; here again, for a parallel practice we can look to the royal cemeteries of Ballana and Qustul (see Emery and Kirwan 1938; Williams 1991). This speculation about the El-Zuma burial remains to be verified with further excavation. So far nothing more can be

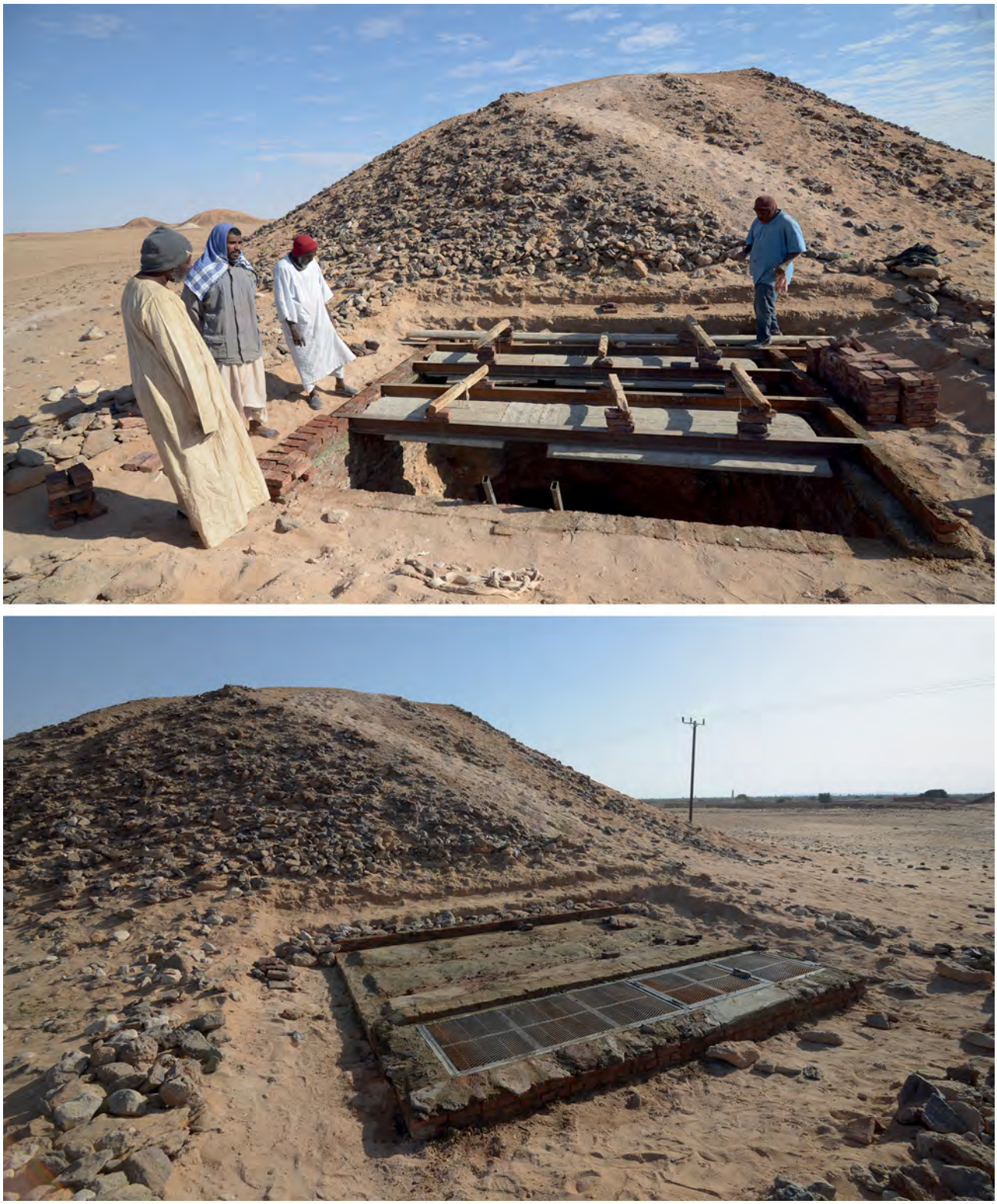


FIGURE 3.30 Tumulus 4, view of the mound from the south, work on construction of the roof shelter over the external shaft of the tumulus
PHOTOS BY A. KAMROWSKI [TOP], Z. KOWARSKA [BOTTOM]

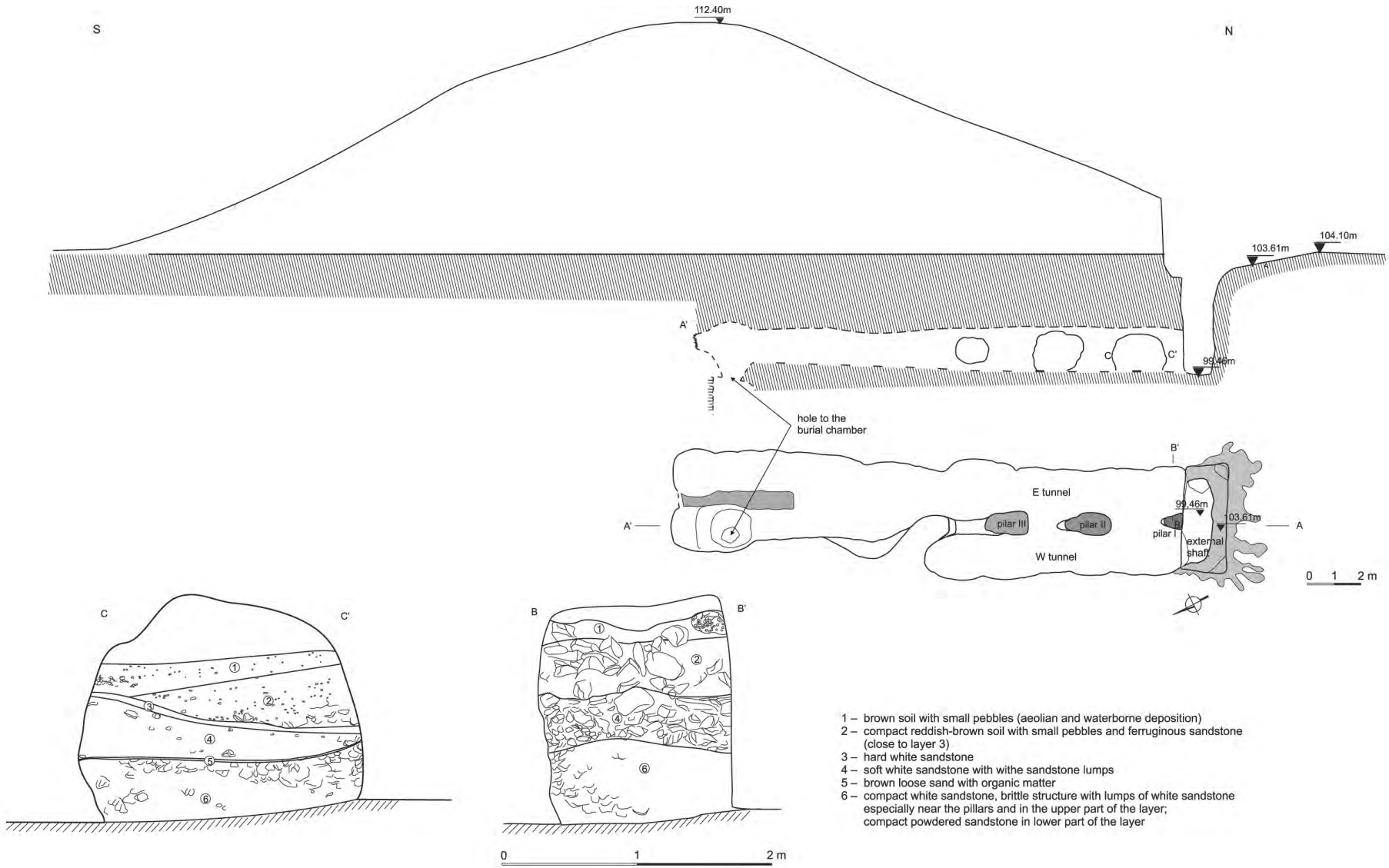


FIGURE 3.31 Tumulus 6, general plan and cross-section
DRAWN BY E. CZYŻEWSKA-ZALEWSKA, E. SKOWROŃSKA, Z. KOWARSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.32 Tumulus 6, view of the external shaft and the stone blocking wall of the tunnel entrance, looking north
PHOTO BY A. KAMROWSKI

FIGURE 3.33 Tumulus 6, underground tunnel facing north
PHOTO BY A. KAMROWSKI

FIGURE 3.34 Tumulus 6, view of the oil lamp on top of the tunnel fill, facing north
PHOTO BY A. KAMROWSKI

FIGURE 3.35 Tumulus 6, view of the main burial chamber. Note in the far west the open hole providing access to the west chamber, the scatter of objects in the middle and the vessel near the blocking wall
PHOTO BY A. KAMROWSKI

FIGURE 3.36 Tumulus 6, external shaft protected by concrete slabs
PHOTOS BY A. KAMROWSKI [TOP], Z. KOWARSKA [BOTTOM]

said about this tomb, for much depends on the identification of the wrapped objects in particular, as well as the other contents of the chamber.

In order to protect the external shaft, the mission decided to construct a temporary roof, which can be removed when a more practical and durable solution is devised as part of the project to create an archaeological park at this site [**Fig. 3.36**]. For more detailed information see Mahmoud Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 122–123.

2.8 *Tumulus 7*

Tumulus 7 lies at the far north-west edge of the cemetery. It is the second largest of the type 1 tumuli [see **Fig. 1.2**], standing up to 7.87 m above ground level, with a diameter of about 50 m. Like all type 1 tumuli, it is built from a mixture of earth, sand, and gravel, revetted with rough chunks of black ferruginous sandstone. As mentioned above, the external shaft had been partially examined in 2011. When work resumed, the whole shaft was excavated and proved to be about 3.60 m long by 1.30 m wide and 3.90 m deep, with one step cut into its south-west corner at a depth of 1.60 m [**Fig. 3.37**]. The destruction of the upper part of the tunnel entrance is an obvious indication of robber activity. The tunnel was found filled with compact sediment consisting of three different layers. At the very bottom was a layer of whitish-grey sandstone debris about 0.50 m thick, covered by another two layers of light brown sediment (0.50 m thick), and on top of that a *c.* 0.60-m-thick layer of dark brown sediment [**Fig. 3.38**]. There is no doubt that this fill accumulated as a result of the tunnel having been repeatedly broken into at different periods with long intervals between them [**Fig. 3.39**].

Clearing out the fill revealed that the tunnel, which is 17 m long, 3.60 m wide, and 1.75 m high, was divided into an east and a west passage by seven pillars cut in the sandstone bedrock, while the northern end was fashioned into two niches [see **Fig. 3.37**]. A hole in the east niche opens into the west side of the south chamber and connects the main burial chamber with the outside world through the tunnel [**Fig. 3.40**]. The main burial chamber, which is hewn into the south side of the main shaft, is a large lateral niche about 5 m long, 1.57 m wide, and 1.30 m high. The chamber has a unique, wide entrance divided in the middle by a pillar skilfully cut out of the sandstone bedrock, most probably to support the whole construction. On the west side another pillar separates the southern and western chambers. Generally, the east side of the south chamber is more finely hewn than the west side, with an almost flat roof and straight rear wall. The south chamber was found sealed by a wall of reused red bricks on both sides of the pillar. The blocking wall on the east side is well-built in regular courses, one header course laid as a foundation at the bottom, followed by 14 courses of stretchers bonded with lime mortar. The west wall is poorly constructed, as if it had been destroyed and then rebuilt in a hurry; however, the real reason behind its poor state of construction remains unknown [**Fig. 3.41**].

The main burial chamber had been severely ransacked. The remains of a broken bier and disarticulated human skeleton, scattered across the east side of the chamber, attest to an adherence to the well-established burial practice of the period: inhumation, usually in a contracted position, body laid on a bier at the east side of the chamber with head due east, facing north. The west side of the chamber contained some of the grave offerings that had been left behind by the robbers. These comprised complete and broken beer jars, small red bowls, and cups. Large fragments of animal bones, probably of cattle, were also amongst the offerings. The location of these offerings near the blocking wall of the entrance should not be taken as their original place of deposition due to the fact that the chamber had been visited by intruders. Using a camera attached to a long pole, it was possible to get an idea about the construction and contents of the western chamber. It appeared to be approximately of the same length as the southern chamber, but far narrower, with a sharply sloping roof. Its blocking wall was also roughly built of reused red bricks. The offerings, which consisted of about five large beer jars and several small vessels, mainly red bowls and cups, lined the rear wall and the blocking wall, indicating that the robbers totally ignored these types of grave goods, a phenomenon which has been repeatedly observed in burials of this period.

It is hoped that further excavation will provide more detailed information about these unexplored burials and help enrich our understanding of the origins of this culture. At this stage of research we can say that excavating the tunnels beneath T.3, T.6, T.7 and T.8 has shed much light on the origin and function of these enigmatic structures, though many issues remain unresolved.

As was the case with T.6, a temporary roof was installed above the external shaft in order to protect it [**Fig. 3.42**]. For more detailed information see Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 365–366; Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 123–125.

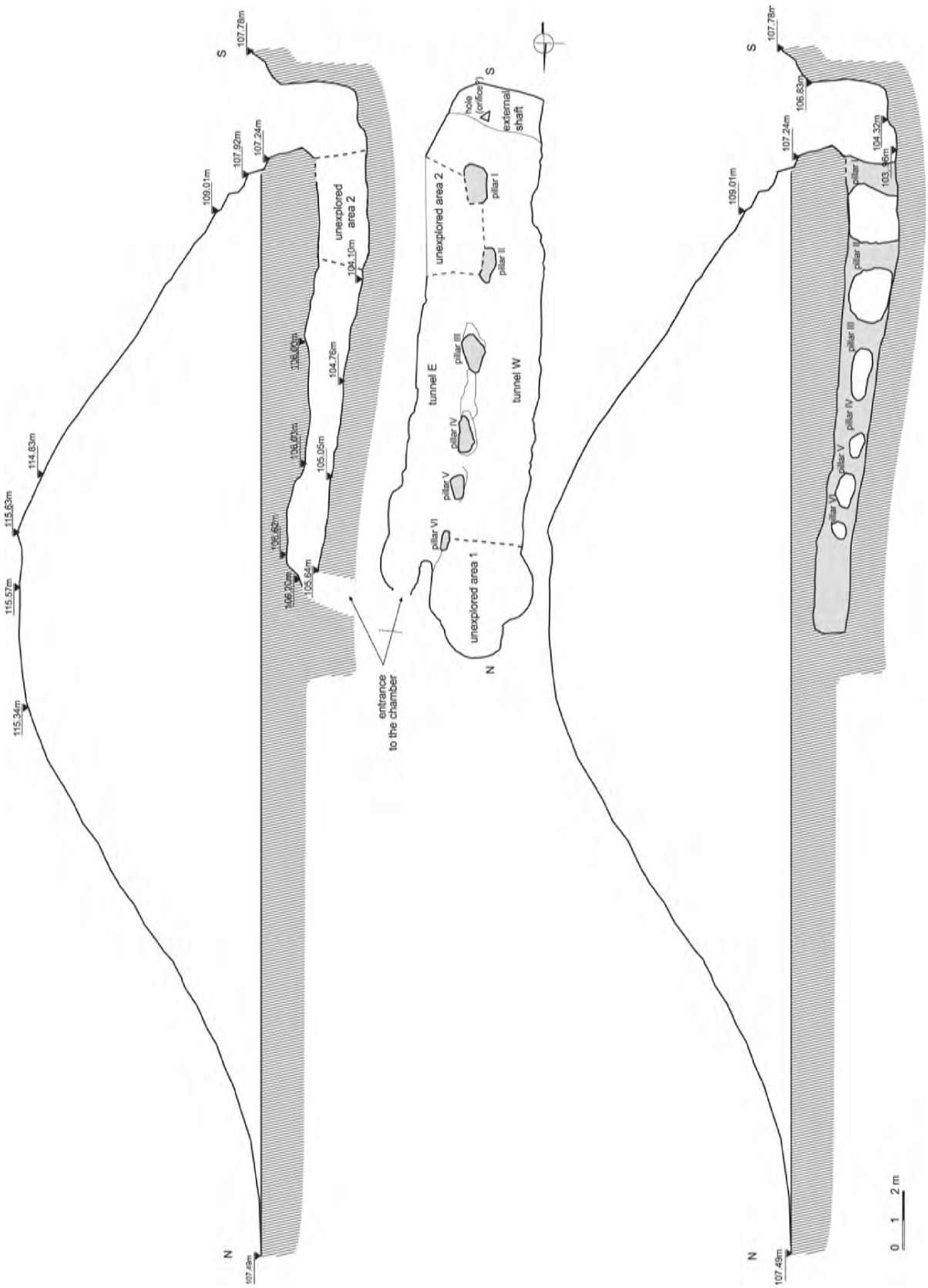


FIGURE 3.37 Tumulus 7, general plan and cross-sections
DRAWN AND DIGITISED BY J. JUCHNIEWICZ, Z. KOWARSKA

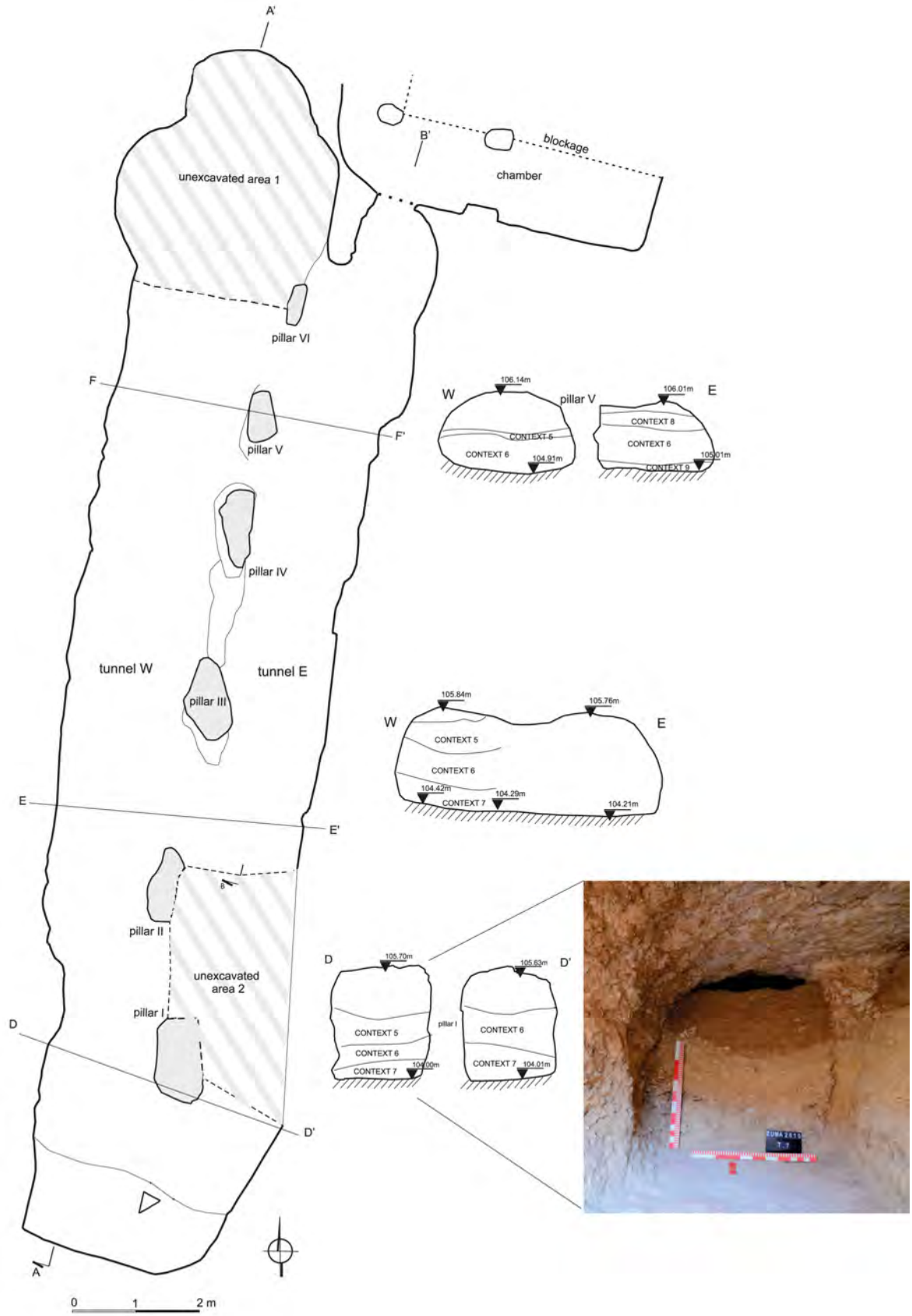


FIGURE 3.38 Tumulus 7, view of the sediment layers inside the tunnel
DRAWN AND DIGITISED BY J. JUCHNIEWICZ, E. CZYŻEWSKA-ZALEWSKA, PHOTO BY A. KAMROWSKI

FIGURE 3.39 Tumulus 7, underground tunnel with part of the fill still in place (top) and completely removed (bottom)
PHOTOS BY A. KAMROWSKI [TOP], K. JUCHNIEWICZ [BOTTOM]

FIGURE 3.40 Tumulus 7, view of the northern end of the tunnel showing the hole opening on to the main burial chamber, facing north
PHOTO BY A. KAMROWSKI

3 Type II Tumuli

3.1 *Tumulus 12*

Tumulus 12 is located on the north-west side of the cemetery. In contrast to all of the other tumuli at this site, the remains of its superstructure appeared to have been heavily disturbed by robbers, or possibly it was never built to the standard height of other type II tumuli (the preserved height of type II tumuli is generally 2–3 m) [**Fig. 3.43**].

The poorly discernible above-ground remains of T.12 consist of a very low earth ring with a slight depression in the centre, which is usually taken as an indication of burial plundering. The maximum diameter of the superstructure is about 21 m from north to south and 23 m east to west; the preserved height of the superstructure ranges from only 0.30 m to 0.60 m. The generally poor appearance of what is left of the superstructure suggested that it most probably represented a type III tomb (typically superstructures of type III tombs are a very low mound not exceeding 0.70 m in height). In order to verify this assumption, a square trench measuring 6 m × 6 m was excavated in the centre of the superstructure. Removing a layer of about 0.30 m of soil and aeolian sand revealed the outline of a large shaft measuring approximately 5.75 m on the north, 5.85 m on the east, 5.05 m on the south, and 5.75 m on the west side, with a maximum depth of 5.60 m. The shaft tapered slightly towards the bottom. At floor level its dimensions were as follows: 5.69 m (west wall), 4.77 m (north wall), 4.80 m (south wall), 1.60 m (east wall of the northern wing), and 1.84 m (east wall of the southern wing). The shaft had a very large pier projecting from the eastern wall, giving the shaft a U-shaped ground plan. This pier is so far the largest to have been discovered at El-Zuma. The top of it measures 3 m on the north side, 3.60 m on the south side and 2.40 m on the west side, while at the bottom it measures about 3.80 m on the north, 3.92 m on the south and 2.69 m on the west side [**Fig. 3.44**].

The upper north and west sides of the shaft walls bear clear signs of destruction by grave robbers. On the south-west side of the shaft, at a depth of 3.20 m from the original ground surface, about 30 vessels of various types (large beer jars, bottles, bowls, and cups) as well as fragments of animal bones were unearthed in a layer about 1.20 m thick. The vessels were found in different states of preservation, from complete to fragmentary. They appear to have been deposited in great disorder; no intentional arrangement was observed [**Fig. 3.45**]. Most probably they had been taken out of the southern burial chamber (Ch. 1), which was found to be heavily looted. Nonetheless, in view

FIGURE 3.41 Tumulus 7, view of the red-brick wall on the west side of the main burial chamber—note the poor workmanship (top); east side of the burial chamber (bottom)
PHOTOS BY A. KAMROWSKI

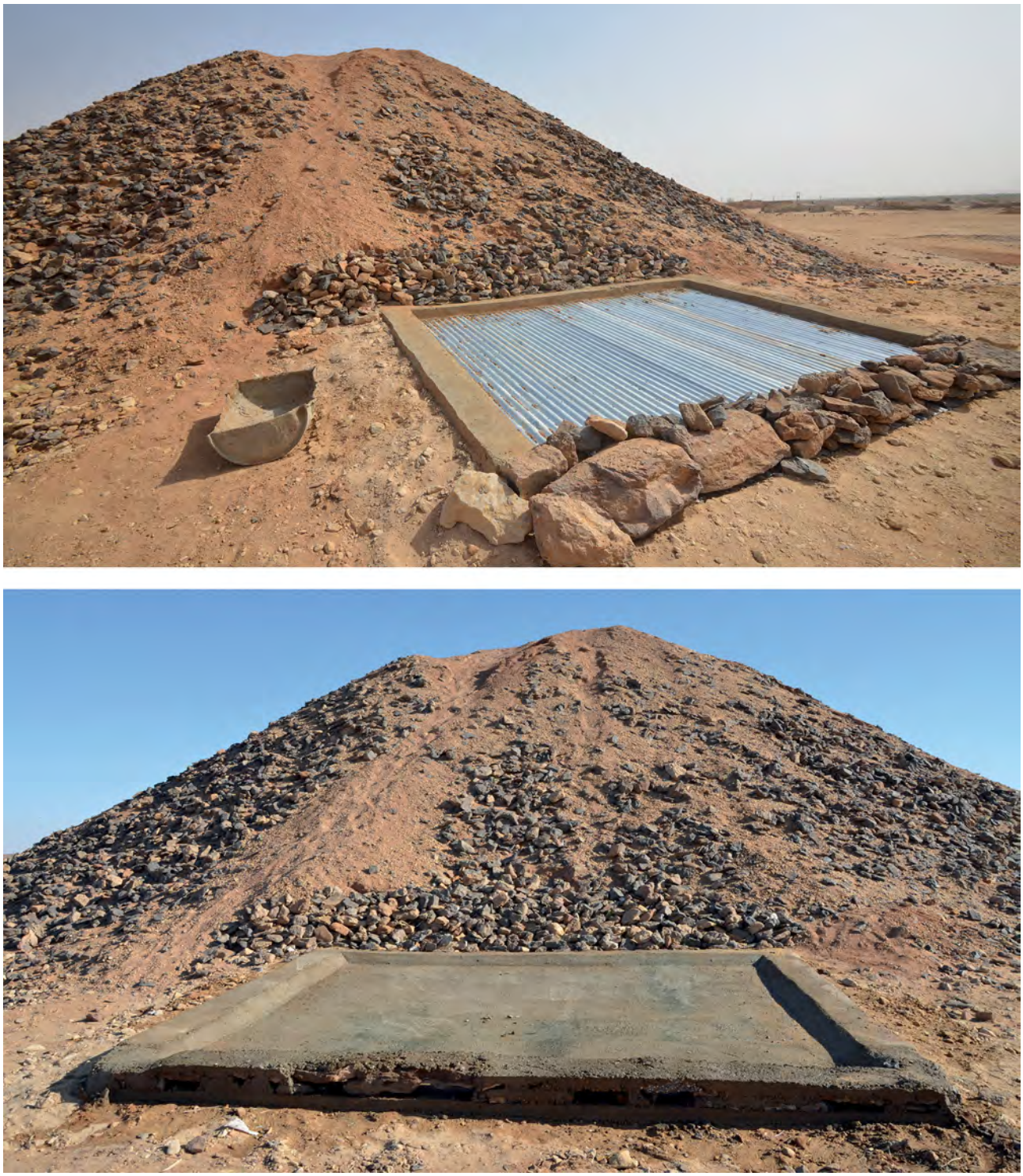


FIGURE 3.42 Tumulus 7, external shaft protected by a tin roof (top) reinforced with concrete mortar (bottom)
PHOTOS BY A. KAMROWSKI [TOP], Z. KOWARSKA [BOTTOM]

FIGURE 3.43 Tumulus 12, view of the tumulus superstructure, facing south
PHOTO BY A. KAMROWSKI

of the fact that these objects were found 1.20 m above the entrance of the chamber, it is tempting to put forward the hypothesis that they may attest to a funerary banquet. Yet, we should bear in mind that funerary banquets, as noted by Patrice Lenoble, usually took place at the end of or during the inhumation process (for more on funerary banquets see Lenoble 1994). The shaft of T.12 is the deepest of all shafts beneath tumuli of types I and II known to date, reaching about 5.60 m below the present-day ground level. Despite this, no steps affording easier access to its bottom were noted. However, in both the north and south wings of the shaft a number of small holes were observed in its walls. Holes of about 0.15–0.25 m in diameter and 0.10 m deep were recorded on the south side of the pier as well as in the south wall of the shaft. They were distributed in a zigzag pattern, and the distance between them ranged from 0.40 m to 1.00 m. In the opposite (northern) wing small holes were noted in both the north wall of the shaft and the pier, but in no particular arrangement. The considerable depth of the shaft and the lack of steps suggest that these holes were most probably made to support a wooden framework (scaffold) that would have enabled the body and grave furnishings to be lowered into the burial chamber. At the bottom of the shaft were three side chambers. Chamber 1, cut into the southern side of the shaft, was aligned east–west; chamber 2, cut into the west wall, was aligned north–south, and chamber 3 was cut into the north wall, in an east–west alignment [see **Fig. 3.44**].

Initially, the three chambers had been sealed by walls built of re-used red bricks laid in alternate courses of rowlocks (in which each brick is laid on its long, narrow side with the end showing in the face of the wall) and stretchers, in a regular sequence, bonded with mud mortar. The red-brick walls were sealed on top by small, flat, rough stone slabs. To the best of our knowledge, this type of blocking has never before been recorded in Early Makurian burials [**Fig. 3.46**].

The three chambers (south, west, and north) were interconnected by slightly irregular rectangular holes, measuring between 0.30 m and 0.40 m long, and 0.20–0.25 m wide. Usually such interconnecting holes were found cut at the floor level of the chamber. However, this was the first noted instance of the holes being cut about 0.50 m above the floor level [**Fig. 3.47**]. Chamber 1 is a large niche measuring 5.30 m × 2.36 m and 1.40 m high. Thorough excavation of the southern wing of the shaft revealed that chamber 1 had been penetrated by robbers from both the south-east and south-west. On the east side of the blocking wall the robbers dismantled the sealing slabs and destroyed six of the nine brick courses from top to bottom, creating a hole about 1.30 m wide and 1.40 m high. A similar situation, resulting in a hole of approximately the same dimensions, was recorded at the south-west end of the blocking wall. The destruction of this wall greatly weakened the soft sandstone into which the chamber is cut, leading to dangerous, deep cracks appearing in the south wall of the chamber, posing a real threat to the stability of the burial's structure.

Additionally, some parts of the west and central portions of the roof had partially delaminated and collapsed. Subsequently, loose earth and rough chunks of sandstone poured in through the dismantled south-west side of the blocking wall and filled half of the chamber [**Fig. 3.48 top**]. About 11 vessels were noted in the central section and east side of the chamber. The whole assemblage was aligned east–west along the rear wall of the burial chamber. It comprised eight beer jars, two storage jars, and one bowl, either complete or fragmentary [**Fig. 3.48 bottom**]. Moreover, about 22 small beads, one made of faience and 21 made of greenstone, were recovered from the east side of the burial chamber. Notably, not a single fragment of human bone was found either in or directly outside the southern chamber. Chamber 2 is hewn into the west wall of the shaft. It was similarly closed off by a red-brick wall measuring about 5 m long and 1 m high, sealed on top with stone slabs. Generally, the blocking wall was built using the same technique of rowlocks and stretchers, but laid in a different sequence. In this instance there were two courses of rowlocks at the very bottom, followed by one stretcher

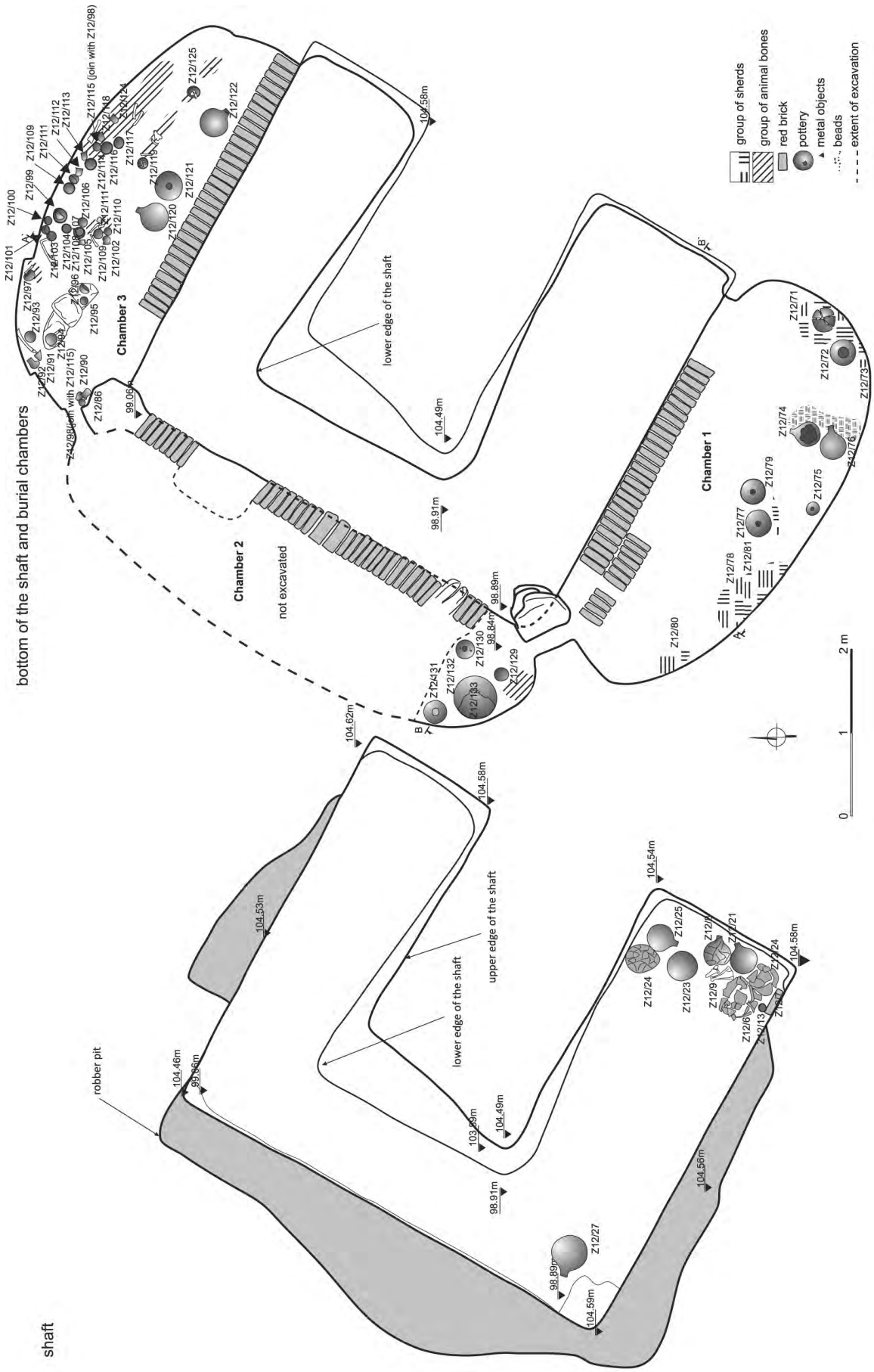


FIGURE 3.44A Tumulus 12, ground plan
DRAWN BY E. SKOWROŃSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

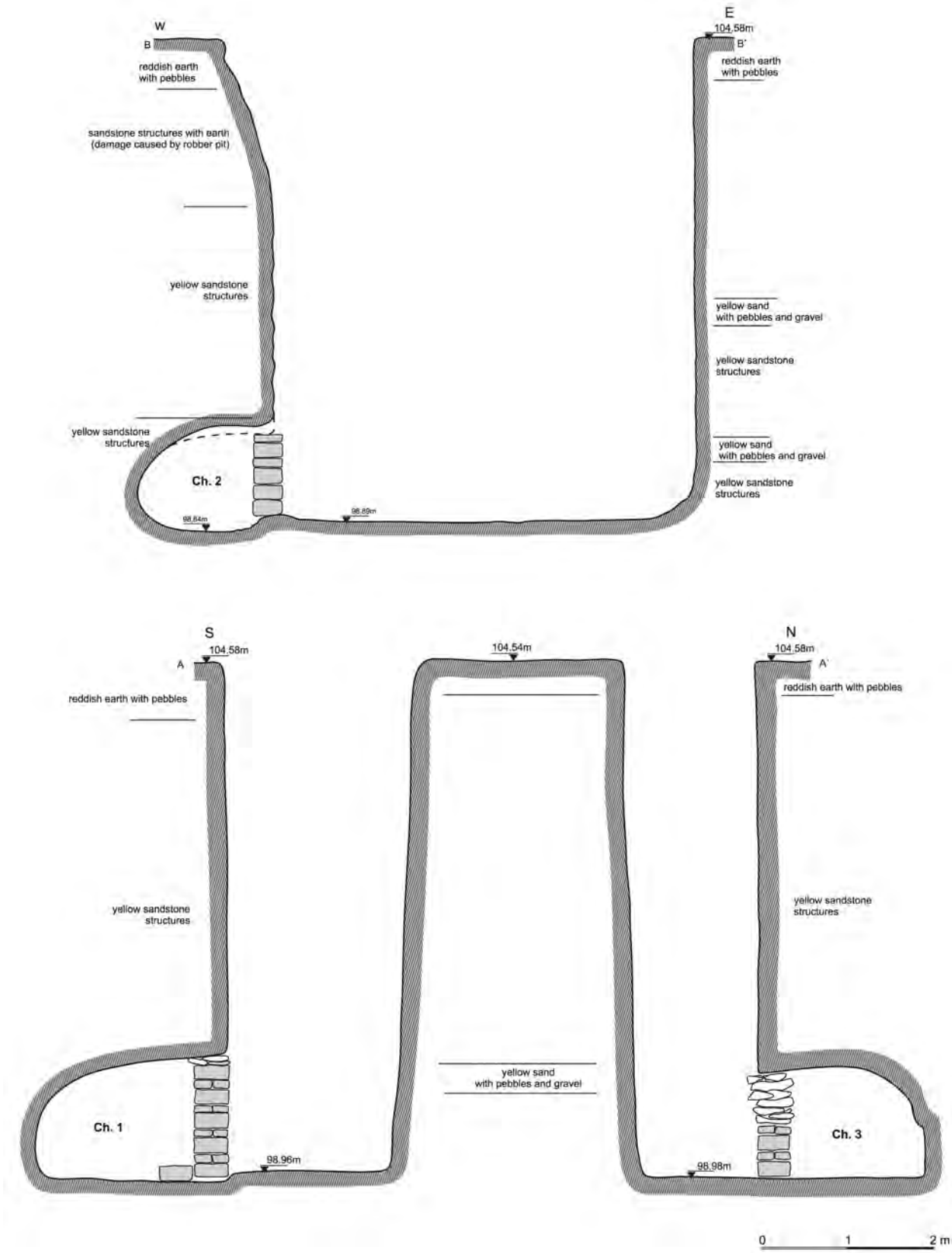


FIGURE 3.44B Tumulus 12, cross-sections of the tumulus
DRAWN BY E. SKOWROŃSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.45 Tumulus 12, view of objects scattered on the south side of the shaft just in front of the main (southern) chamber 1, facing east
PHOTO BY E. SKOWROŃSKA

FIGURE 3.46 Tumulus 12, red-brick blocking wall in chamber 1 (top left); red-brick blocking wall in chamber 3 (top right); view of the collapsed ceiling on the north-west side of chamber 2, facing west (bottom)
PHOTOS BY E. SKOWROŃSKA

FIGURE 3.47 Tumulus 12, view of interconnecting hole between chambers 3 and 2
PHOTO BY E. SKOWROŃSKA

course, followed again by another two rowlock courses sealed by stone slabs. However, this wall was not as well-built as the one in chamber 1 [**Fig. 3.46 top right**]. Here again it appears that the robbers had tried to break in from two ends of the burial (south and north). Unfortunately, due to this fact and the attempt to force their way from the top west side of the shaft, the robbers caused great damage to the west wall and the roof of the burial chamber. In view of this severe state of destruction, only a limited sondage was used to examine the disturbed sides. The southern side appeared to have been less affected by robber activity. The dense fill included some animal bones, a medium-size bowl, and one fragment of a large beer jar in addition to a complete small bottle. Under this fill two further medium-size complete beer jars were found deposited next to the entrance of the chamber. At the northern end of the chamber only one fragment of a large beer jar was found among the debris of the fallen roof [**Fig. 3.49 top**]. The devastation in this part made any further excavation impossible. Safety measures will be required before a thorough exploration of this chamber can be undertaken; therefore, work has been suspended until an adequate solution can be found which will enable the completion of this task [**Fig. 3.46 bottom**]. Chamber 3 is cut into the northern wall of the shaft. It is of similar dimensions to chamber 1, measuring 5.08 m × 1.85 m and 1.20 m high. The same construction technique was used for building the blocking wall, which consists of four alternate courses of red-brick rowlocks and stretchers, reaching 0.60 m high. Then a space of about 0.40 m is filled by a combination of large chunks of sandstone and black ferruginous stones, bonded with a mixture of mud and lime mortar [**Fig. 3.49 bottom**]. Tectonic movements appear to have affected the soft sandstone structure, as the northwest side of the chamber's roof had partially collapsed, destroying the stone seal and leaving a wide hole about 1 m high. Nonetheless, this chamber, which was intended exclusively for grave offerings, was certainly never penetrated or looted by robbers. Thirty-nine pottery vessels were found deposited all over the chamber. These comprise 24 bowls (only two of them broken) and 11 cups, of which five are complete, in addition to two beer jars, two storage jars, one piece of a ceramic scraper, and some large fragments of cattle bones. The majority of the small vessels and the animal bones were arranged along the rear wall of the chamber, while the storage and beer jars were located near the entrance, just behind the blocking wall. As noted above, chambers 3 and 2 are interconnected. For

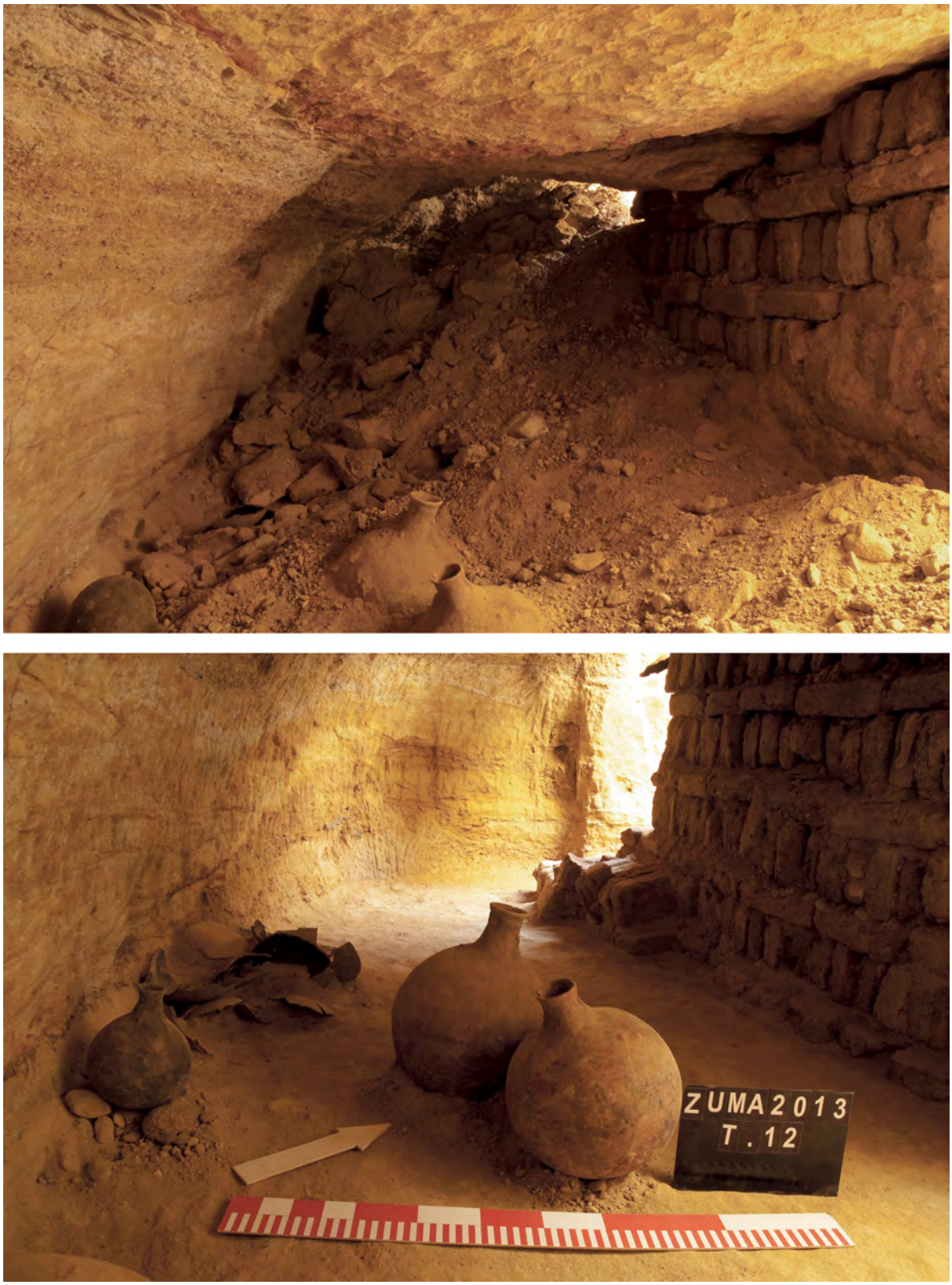


FIGURE 3.48 Tumulus 12, view of chamber 1 before excavation (note the earth fill flowing forth through a hole in the damaged blocking wall), looking west (top); the grave goods in chamber 1 (bottom)
PHOTOS BY E. SKOWROŃSKA

FIGURE 3.49 Tumulus 12, pottery in the collapsed chamber 2 (top); chamber 3, view of the grave goods (bottom)
PHOTOS BY A. KAMROWSKI [TOP], E. SKOWROŃSKA [BOTTOM]

FIGURE 3.50 Tumulus 13, superstructure, facing south. Note the higher east side of the mound
PHOTO BY O. BIAŁOSTOCKA

more information see Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 110–114.

3.2 *Tumulus 13*

Tumulus 13 lies a short distance north-east of T.11. It consists of a circular mound with a diameter of about 27.70 m [**Fig. 3.50**]. The mound is similar in shape to T.11; its preserved height ranges from 1.60 m on the southern side to 5 m on the north-east side. As with other tumuli at this cemetery, the same signs of robber activity were also clearly observed on the top central part of T.13. Unlike T.12, the shaft of T.13 was dug into a formation of hard white sandstone.

The removal of the upper layer of the fill made it possible to discern the top edge of a shaft which was U-shaped in plan. Further work revealed that only the southern, longer and larger side of the shaft had been disturbed, while the narrower and shorter northern side was found untouched. The general outline of the shaft represents a slightly deformed square, the sides of which measure 6 m (E), 5.80 m (W), 4.50 m (N) and 5.60 m (S), with a maximum depth on the northern side of 4 m, and 3.80 m on the southern side of the shaft [**Fig. 3.51**].

Access to the bottom was facilitated by four separate steps, cut in different parts of the shaft. Three of them are on the walls of the southern side; these are located in its north-east corner and south-west corner, with the third cut in the west wall. The fourth step is located in the north-east corner of the north side of the shaft. All of the steps were cut almost at the same level, about 1 m below the ground surface. For the first time at this cemetery five side chambers were discovered at the bottom of the grave. Chamber 1 is hewn into the south wall of the shaft's southern side. The robbers broke into it in the same manner as noted in chamber 1 of T.11, i.e. through a hole made in the east side of the blocking wall. The other four chambers were all found intact. Four of the five chambers, nos. 1, 3, 4, and 5, were sealed with red bricks in different arrangements. Only chamber 2, which is located in the south-west corner, was blocked using rough stone chunks [see **Fig. 3.51**]. Unfortunately, chamber 1, which is the main burial chamber, has not been excavated because of damage. As mentioned above, its solid red-brick wall had been destroyed on the east side leaving a hole about 0.70 m wide. Apparently, during their search for valuable offerings, the robbers devastated the burial, damaging the skeleton and throwing out some of the pottery vessels. Two handmade beer jars, one red wheel-made bowl, and a human femur were found in the shaft in front of the robber pit [**Fig. 3.52**]. Work on the first chamber altered the burial environment causing a sudden collapse of the already cracked layers of the sandstone ceiling. Another attempt to investigate the west side of the chamber was ended by a further collapse of the roof. Therefore, for the safety of the team, the excavation of this chamber, regretfully, had to be abandoned [**Fig. 3.53**].

Chamber 2 is located in the south-west corner of the shaft between chambers 1 and 3. It is the only chamber to be sealed with rough sandstone on a red-brick foundation. The weak sandstone into which the chamber was hewn and environmental factors caused the partial collapse of the crumbling roof, but resulted in no serious damage. A group of seven pottery vessels was recorded in the centre and at the north-west side of the chamber. These were three handmade beer jars, two small wheel-made red ware bowls, and two small wheel-made red ware cups. Some fragments of animal bone were also found near these vessels [**Fig. 3.54**].

Chamber 3 was hewn into the west wall, and was completely sealed by large red bricks. Yet again, misfortune

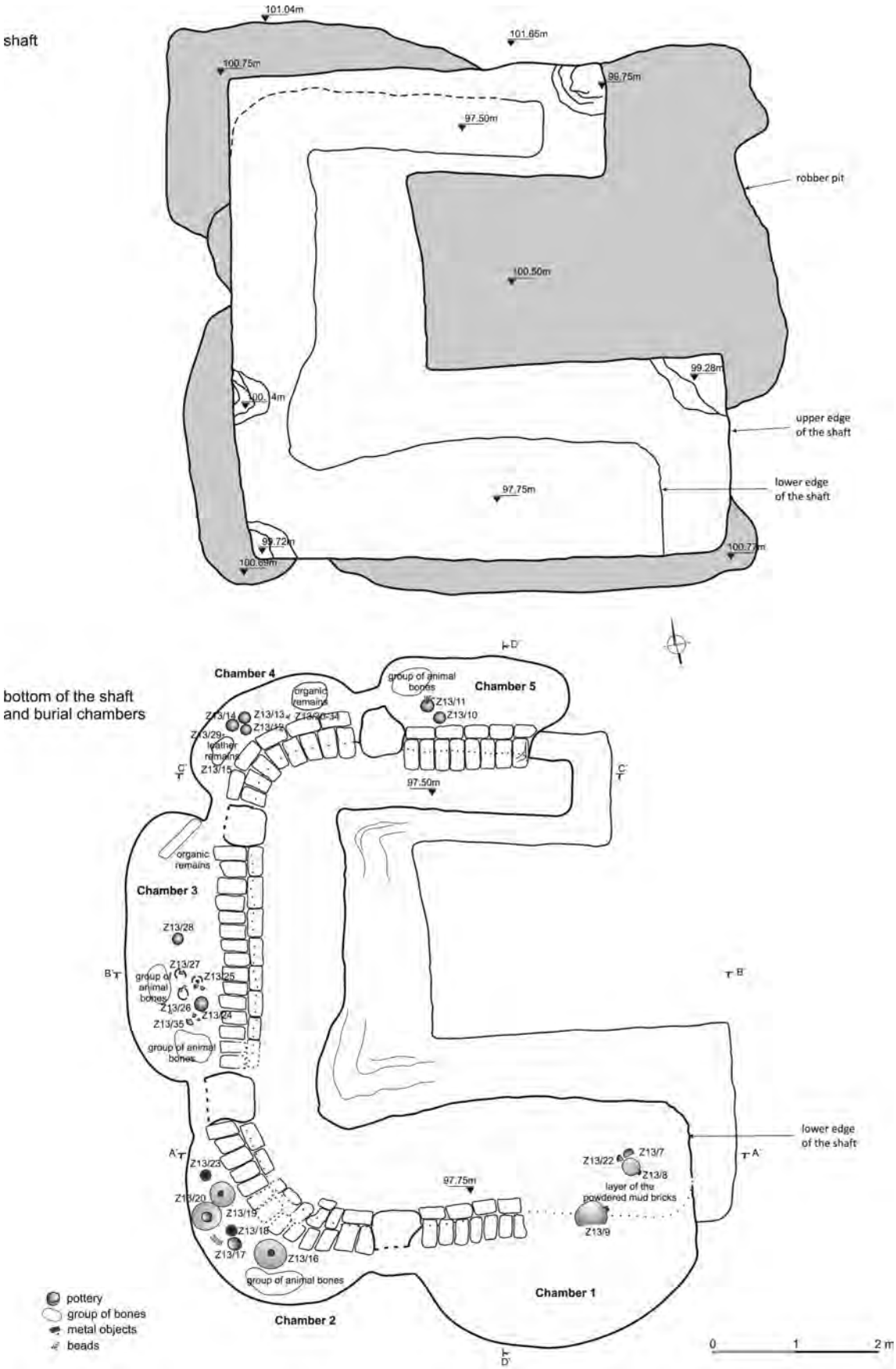


FIGURE 3.51A Tumulus 13, ground plan
DRAWN BY K. JUSZCZYK, O. BIAŁOSTOCKA, E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

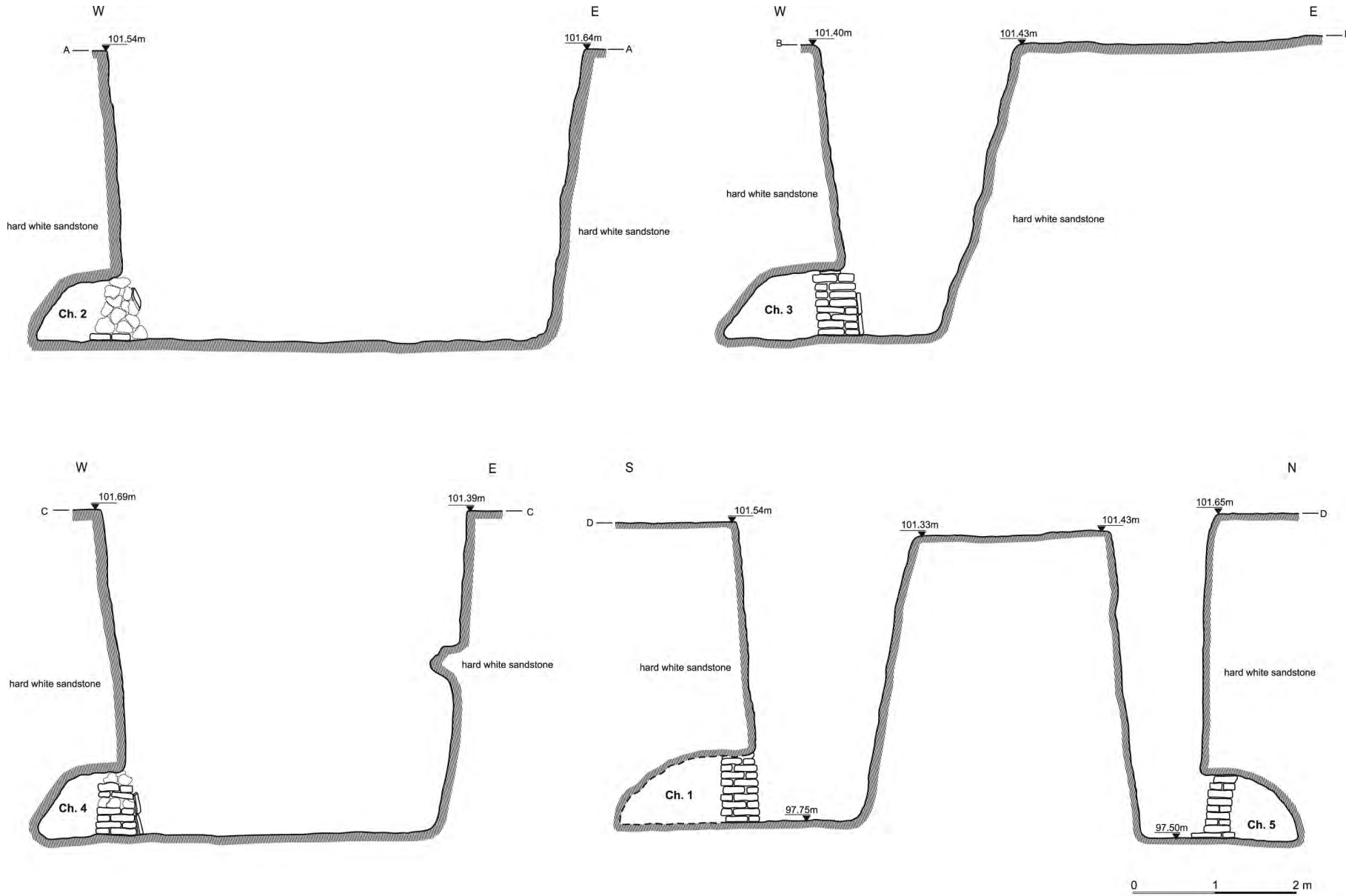


FIGURE 3.51B Tumulus 13, cross-sections of the tumulus
DRAWN BY K. JUSZCZYK, O. BIAŁOSTOCKA, E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.52
Tumulus 13, view of the funerary offerings in front of the robber pit, looking east
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.53
Tumulus 13, view of fallen stones from the ceiling of the southern burial chamber 1, looking south
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.54 Tumulus 13, view of chamber 2 before and after excavation, facing west
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.55 Tumulus 13, chamber 3, view of the fallen slabs from the ceiling, facing west
PHOTO BY O. BIAŁOSTOCKA

beset the excavation of this chamber when a large portion of the ceiling collapsed after the partial dismantling of the blocking wall. After taking steps to secure the ceiling from further collapse and remove the fallen debris, the chamber was carefully examined. Fragments of six pottery vessels, which had been crushed by the fallen roof, were recovered from the central part of the chamber. On its northern side, faint traces of a brown organic material were noted. These might be the remains of a very decayed wooden beam; however, the nature of the original object was hard to identify [**Fig. 3.55**].

Two of the five chambers were cut into the northern side of the shaft. Chamber 4 was hewn into the north-west corner and chamber 5 occupied the narrow northern side. Chamber 4 was furnished with three wheel-made red bowls deposited in the centre. To the south-west of them was a leather case (bag) in a very bad state of preservation; however, it may have originally been decorated with beads, some of which were found scattered around it. Remains of an unidentified organic object, which seems to be a kind of vessel, were found east of the three bowls [**Fig. 3.56 top**]. The last chamber (Ch. 5) contained even fewer objects. Only two wheel-made red bowls and some animal bones had been deposited as grave goods [**Fig. 3.56 bottom**]. It is noteworthy that all five chambers in this burial are interconnected by holes made in the dividing walls. This practice was also noted in T.2, T.5, T.23, and T.25 at this cemetery, as well as having been recorded at other burial grounds: at Hammur-Abbassiya (tumuli 1 and 4) and Tanqasi (T.87) (Mahmoud El-Tayeb 2003, 130–134, Figs. 8, 13; Godlewski 2008, 469–476, Fig. 8). So far the function of these holes has not been determined. Another question that remains open to debate is why the north and west sides of the shaft were missed by the robbers. Was it because they already knew that digging there was not worth the effort, or did they not recognize the construction plan of the shaft?

Both tumuli 17 and 27 are attributed to the smallest group of burials designated type III. T.17 has a very low mound with a preserved height of about 0.45 m and a maximum diameter of 10 m. It is located between T.18 and T.19, in the central part of the cemetery. In this area of the site, which in fact is not far from the above-described burials, the underlying geology is totally different. The surface is covered with aeolian sand beneath which there is a mixture of small stones, in addition to gravel and reddish soil

FIGURE 3.56 Tumulus 13, view of some offerings in chamber 4—note the hole interconnecting chambers 4 and 5 (top); view of the offerings in chamber 5, looking east through the interconnecting hole between chambers 4 and 5 (bottom)
PHOTOS BY O. BIAŁOSTOCKA

forming a stratum 2.31 m thick, which extends to the bottom of the shaft. The floor at the bottom consists of a compact layer of black gravel and whitish-greyish sand. The body of the mound was built from a mixture of sand and gravel surrounded by a stone ring about 3.60 m in diameter, which originally demarcated the perimeter of the mound. The robbers had dug a large hole, about 2 m wide, at the top of the mound, but it seems that they missed the centre of the shaft and the blocking wall. However, by cutting part of the west wall of the shaft they were able to access the chamber directly. The shaft is aligned north–south and has a trapezoid plan, its sides

FIGURE 3.57 Tumulus 14, view of the superstructure, looking north-west (top); aerial view of the tumulus (bottom)
PHOTOS BY T. WOJTCZAK [TOP], M. BOGACKI [BOTTOM]

measuring 1.34 m (W), 1.80 m (E), 0.98 m (N), and 0.86 m (S) on the ground surface, and 1.45 m (W), 1.24 m (E), 0.70 m (N), and 0.80 m (S) at the bottom of the shaft. A single burial chamber, 2.40 m long, 0.80 m wide and 0.52 m high, was cut into the west wall. As noted above, the robbers cut through part of the west wall and removed some of the stones of the blocking wall from the south-west corner. In this way they managed to break into the burial chamber and severely damage the human skeleton. Although the skeleton was greatly disturbed, fragments of leg and foot bones suggest that it may have lain on its right side, in a contracted position, with head due north-west, facing south. The grave goods consisted of two complete handmade beer jars: a large brown one located on the northern side of the chamber, and a smaller one of black ware deposited on the opposite, southern, side. Moreover, one iron ring and a group of nine badly corroded iron arrowheads were also found. Other finds included 88 beads of different materials such as quartz, agate, faience, and probably ivory or bone. Fragments of beer jars used by the robbers as scrapers were found in the shaft fill as well as in the burial chamber itself. For more information see Mahmoud El-Tayeb and Czyżewska 2011.

3.3 *Tumulus 14*

This is a rounded mound located on the north-east side of the cemetery. Like the majority of the tumuli at this site, it was built from a mixture of sandy earth and gravel with some black ferricrete stones, and was characterized by a visible depression at the top centre. The mound has a maximum diameter of 32.10 m measured east to west, with a maximum height of 2.79 m on its higher east side [**Fig. 3.57**].

The U-shaped shaft [**Fig. 3.58**] has sides that measure 3.20 m (E), 2.50 m (W), 5.60 m (N), and 5.20 m (S) on the original ground surface. The sides of the south pier

FIGURE 3.58 Tumulus 14, view of the U-shaped shaft, looking north
PHOTO BY T. WOJTCZAK

measure 1.70 m (W), 1.60 m (N), and 1.60 m (E), while the maximum depth of the shaft is 3.60 m. Access to the bottom of the shaft was made easier by a single step created in the south-west corner of the pier's eastern side, at a height of 1.30 m from the bottom of the shaft. At the bottom of the shaft three side chambers were cut into its western, northern, and eastern walls [**Fig. 3.59**].

The main chamber (Ch. 1) occupies about two-thirds of the western side of the shaft, measuring 2.30 m long by 1.80 m wide and 0.80 m high at the entrance to the chamber. The other two chambers were approximately L-shaped in plan.

Chamber 2 extends from the end of the north part of chamber 1 up to the third quarter of the north wall and measures 1.20 m from north to south and 5.10 m from east to west, with an entrance height of 0.95 m.

Chamber 3 is cut into the eastern wall of the shaft and extends into the north wall. The two parts of the chamber measure 4.90 m in length (N–S) by 1.20 m in width, and 1.60 m in length (E–W) by 1.30 m in width [see **Fig. 3.59**].

At the bottom of the shaft, both east and west wings were found covered by a quantity of broken mud- and fired bricks [**Fig. 3.60**]. The latter were reused red bricks bearing traces of painted plaster. They were most probably brought from the same source as the reused red bricks which were discovered in other tumuli at this cemetery (e.g. in T.11 and T.13). Notably, some of these bricks were found cut or with rounded corners, which could indicate their specific location in the original construction from which they were removed (Juszczyk 2011, 119–123).

The blocking wall of chamber 3 was found intact. It was mainly built of mud bricks, though some red ones measuring 40 cm × 20 cm × 10 cm were also used in its construction, which comprised eight courses of alternating headers and stretchers.

On the south-east side of the shaft, part of the blocking wall had been damaged by robbers. Nonetheless, the remains that were found in place helped in understanding the technique used to build this wall, which proved to be analogous to that used for the blocking wall of chamber 3. However, the wall that blocked chamber 2 was set on foundations composed of a rowlock course followed by alternate courses of headers and stretchers.

During excavation of the main chamber (Ch. 1) [**Fig. 3.61**], a disarticulated human skeleton was noted on the

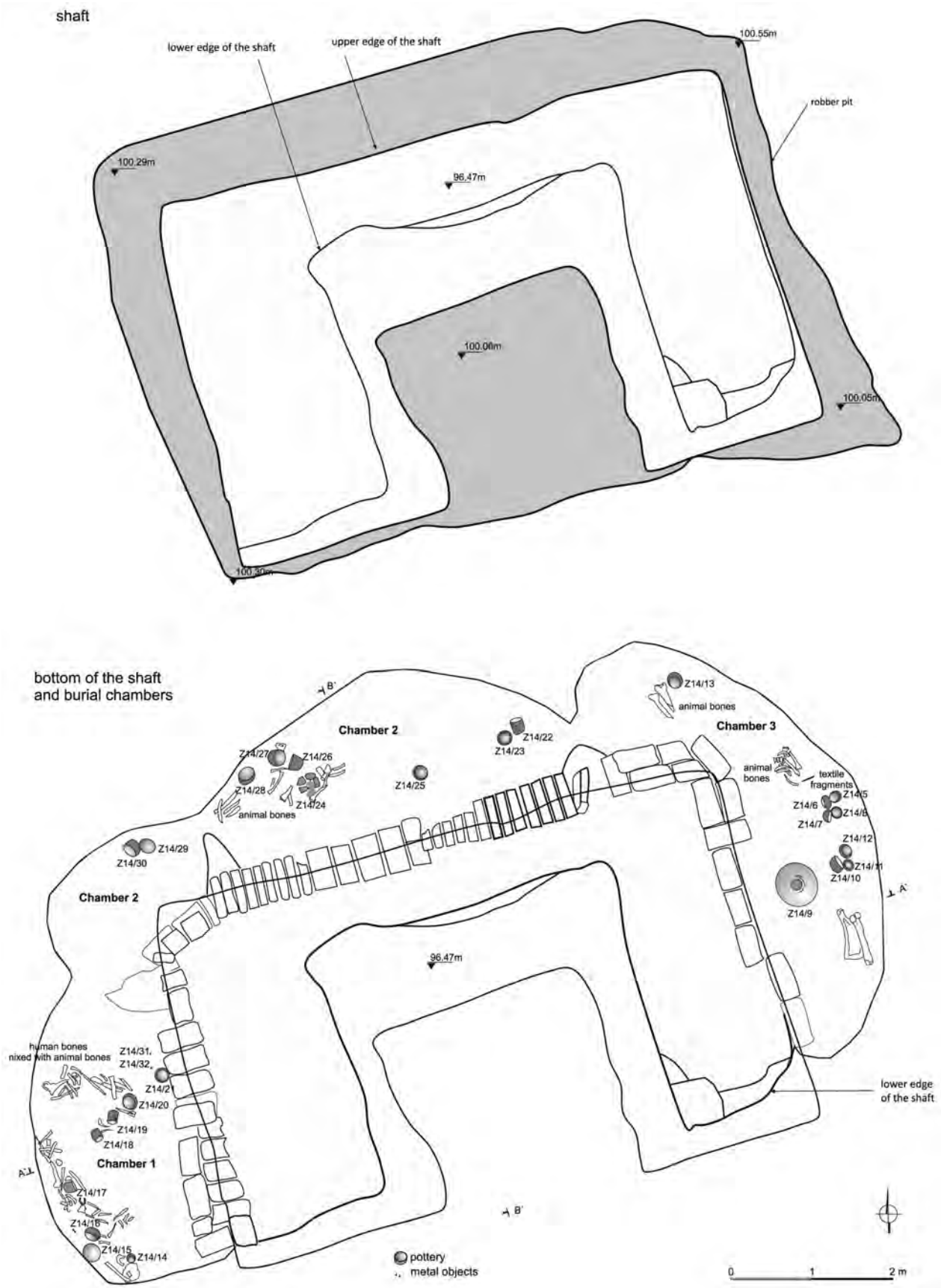


FIGURE 3.59A Tumulus 14, ground plan
DRAWN BY E. SKOWROŃSKA, J. BROCHOCKI, K. SOLARSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA, K. SOLARSKA, J. BROCHOCKI

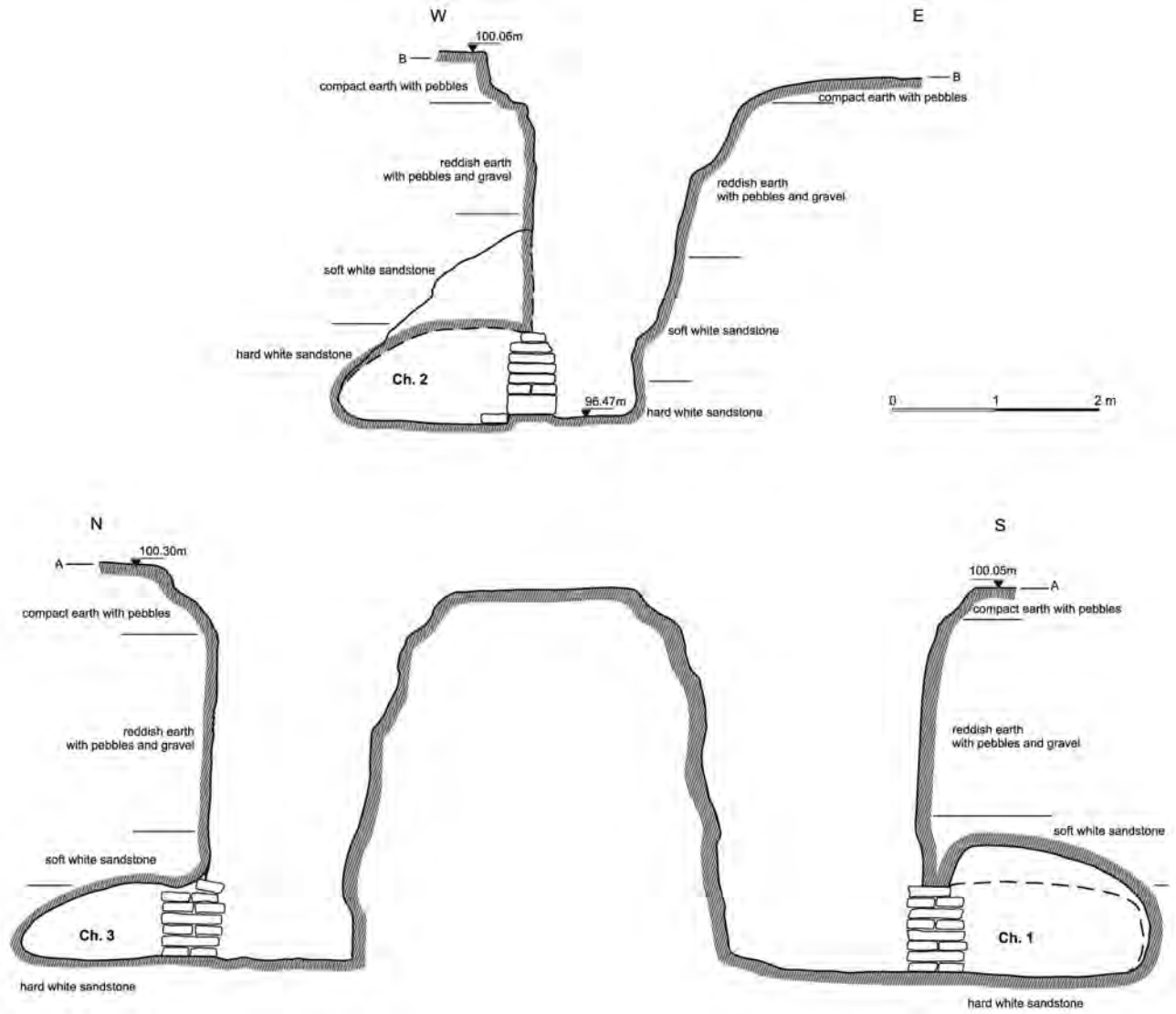


FIGURE 3.59B Tumulus 14, cross-sections of the tumulus
DRAWN BY E. SKOWROŃSKA, J. BROCHOCKI, K. SOLARSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA, K. SOLARSKA, J. BROCHOCKI

south-west side of the chamber, with the detached skull cast aside close to the west wall of the burial. Large cattle bones and some iron nails were observed scattered throughout the burial chamber. Other grave offerings that apparently had not been of any interest to the robbers comprised eight small wheel-made red vessels (four cups and four bowls), which were intermingled amongst the human and animal bones.

The location of the disturbed human skeleton clearly indicates that the body was deposited on the west side of the burial chamber in keeping with the rite of inhumation noted at this cemetery in type I and II tumuli, where the body was placed either on a wooden frame or directly on the ground, in contracted position with head due east, facing north.

Chamber 2 [**Fig. 3.62**] is hewn into part of the western wall, where it adjoins chamber 1, and extends into the northern wall, where it borders chamber 3 [**Fig. 3.63**]. It is interconnected with both chambers 1 and 3 through a small hole of about 0.30 m made at floor level. This chamber was found filled with debris as a result of its ceiling having split. Thorough cleaning of the chamber revealed the presence of burial offerings represented by nine wheel-made pottery vessels divided into four groups aligned east–west. These comprise three cups and six bowls. There was also a collection of cattle bones on the north-west side, near the rear wall of the chamber.

The last burial chamber (Ch. 3) is partly cut into the north wall of the shaft, while the larger part is cut into the east wall. It measures 1.60 m in length along its east–

FIGURE 3.60 Tumulus 14, blocking wall of chamber 3
PHOTO BY T. WOJTCZAK

FIGURE 3.61 Tumulus 14, view of the east side of the main burial chamber (Ch. 1), showing the robber pit on the east side
PHOTO BY T. WOJTCZAK

FIGURE 3.62 Tumulus 14, view of chamber 2 after excavation—note the fallen slab
PHOTO BY T. WOJTCZAK

FIGURE 3.63 Tumulus 14, view of the grave goods in chamber 3
PHOTO BY T. WOJTCZAK

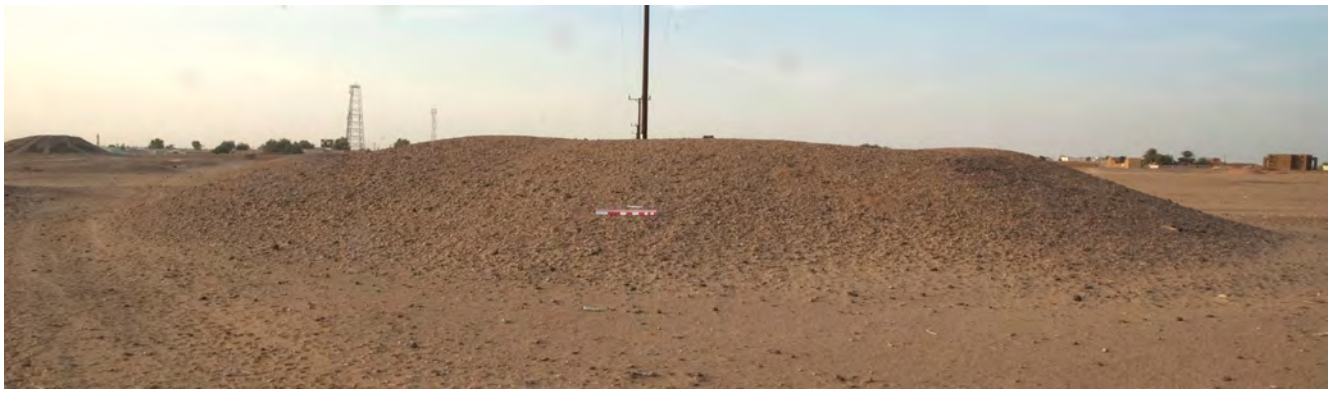


FIGURE 3.64 Tumulus 15, view of the superstructure, looking south
PHOTO BY R. MAHLER

west axis by 1.20 m in width, and 4.90 m in length along its north–south axis by 1.30 m in width. This undisturbed chamber was furnished with eight wheel-made vessels consisting of four small cups and three medium-size bowls, all of which were deposited near the rear wall of the chamber. On the opposite side, a handmade beer jar was found close to the blocking wall of the chamber. The last vessel is a wheel-made bowl found in the northern extension of the chamber. In addition to the pottery, the chamber also contained other offerings such as cattle meat; large bones were recorded at the south-east side of the chamber and in its central part as well as at the north end.

3.4 *Tumulus 15*

Tumulus 15 lies in the central part of the necropolis. It is a circular mound built from a mixture of earth and gravel with a diameter of about 30 m. The mound measures 1.87 m high on the north side, 1.70 m on the south, and 1.17 m on the west, reaching its maximum height of about 2.25 m on the east side. The superstructure of T.15 identifies it as a variant of type II burials because it does not have the flat top characteristic of this category [**Fig. 3.64**].

The substructure features a vertical shaft with a U-shaped ground plan and a pier projecting from the east wall. The top of the shaft measures 5.80 m on the west side, 5.70 m on the east, 3.70 m on the north, and 3.50 m on the south side. The upper part of the pier measures 1.75 m on the north side, 1.55 m on the west, and 1.55 m on the south side. At the bottom, the shaft is slightly narrower, measuring 3.14 m on its north side, 3.10 m on the south, and 5.05 m on the west side, while the pier dimensions reach 1.40 m on the north side, 2.20 m on the west, and 2.10 m on the south side. The depth of the shaft ranges from 3.10 m at the south-east end to 3.25 m at the south-west end. Access to the bottom of the shaft was provided by two steps. The first was made in the south-west corner of the northern wing of the shaft, about 2 m below the original ground surface, while the second was made on the south-west corner of the pier, at about 1.50 m below the original ground surface [**Fig. 3.65**].

Once more at this necropolis there was further confirmation that the existence of a depression on top of a mound attests to looting. Excavation of the fill in the south wing of the shaft revealed fragments of mud- and red bricks from the dismantled blocking walls of the burial chamber [**Fig. 3.66**]. Towards the bottom, amongst the earth, wind-blown sand, and debris, pottery vessels comprising one small table amphora, a locally made bottle, cups and fragmented footed bowls, as well as some large pieces of animal bone, were recorded. In the north wing, at a depth of about 0.70 m below the original ground surface, some fragments of mud- and red bricks appeared. Traces of blue paint on white plaster were discernible on some of the red bricks, while others had been specially shaped with rounded ends or angular cuts to fulfil certain structural needs (Juszczyk 2011, 120–123, Pls. 17–19). At the bottom of the shaft three side burial chambers were noted in the south, west, and north sides. Mainly mud bricks were used to build the chamber blocking walls, but some red bricks were also noted. Chamber 1, the main burial niche, was cut into the south wall of the shaft. It has a maximum length of 5.25 m and measures 1.95 m in width and 1 m in height at the entrance. The chamber was sealed by a mud-brick wall 0.95 m high, which appeared to have been built in successive phases in unbonded sections. Although it consisted of courses of rowlocks and stretchers similar to those noted in other graves, it exhibited a total lack of building skills [**Fig. 3.67 top**].

Robbers had destroyed the east side of the blocking wall. As a result, the chamber was badly damaged, its roof had partially collapsed, and it was found filled with debris. On the east side of the chamber a concentration of pot-

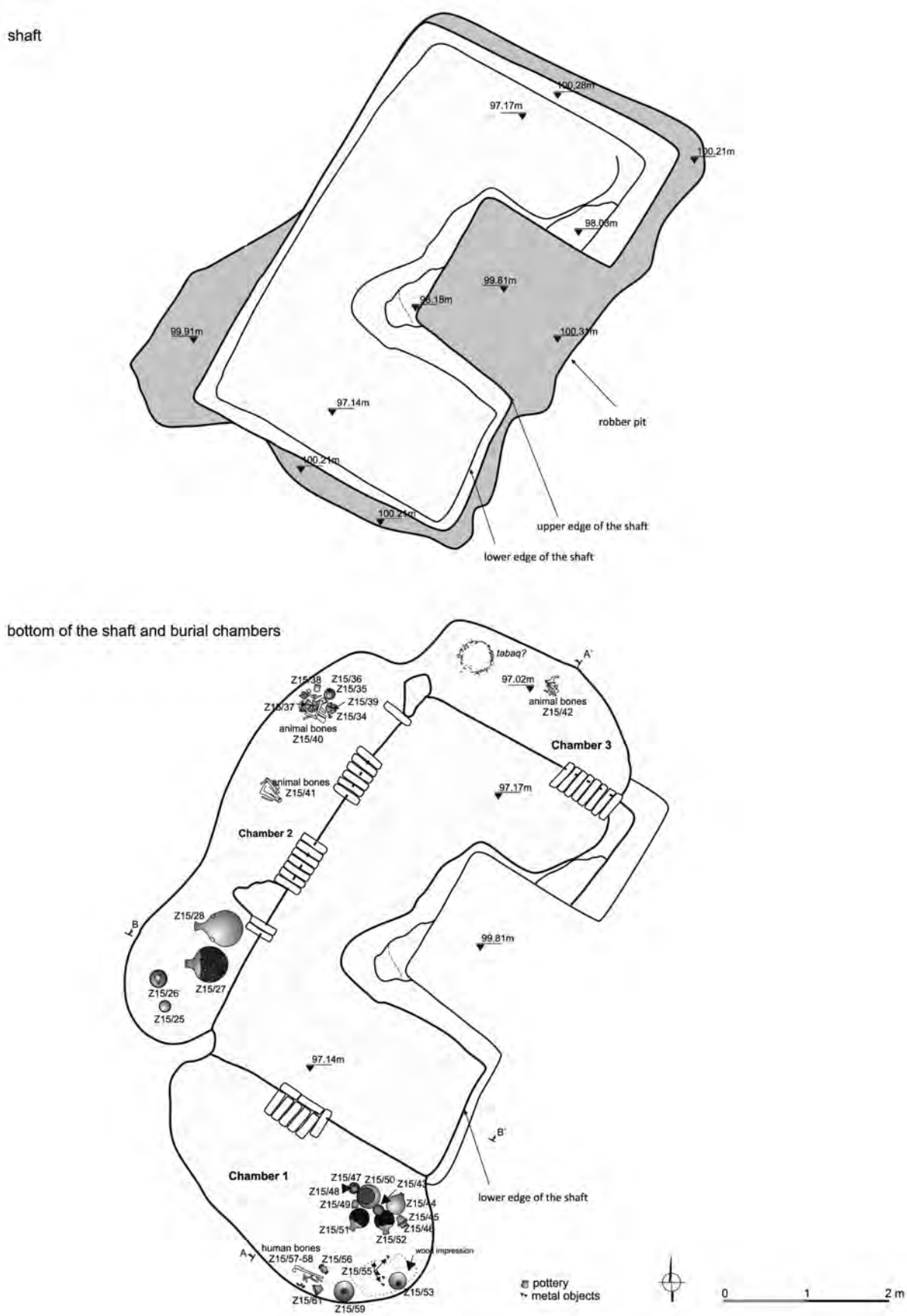


FIGURE 3.65A Tumulus 15, ground plan
DRAWN BY E. SKOWROŃSKA, A. GŁĄB, DIGITISED BY U. IWASZCZUK, E. CZYŻEWSKA-ZALEWSKA

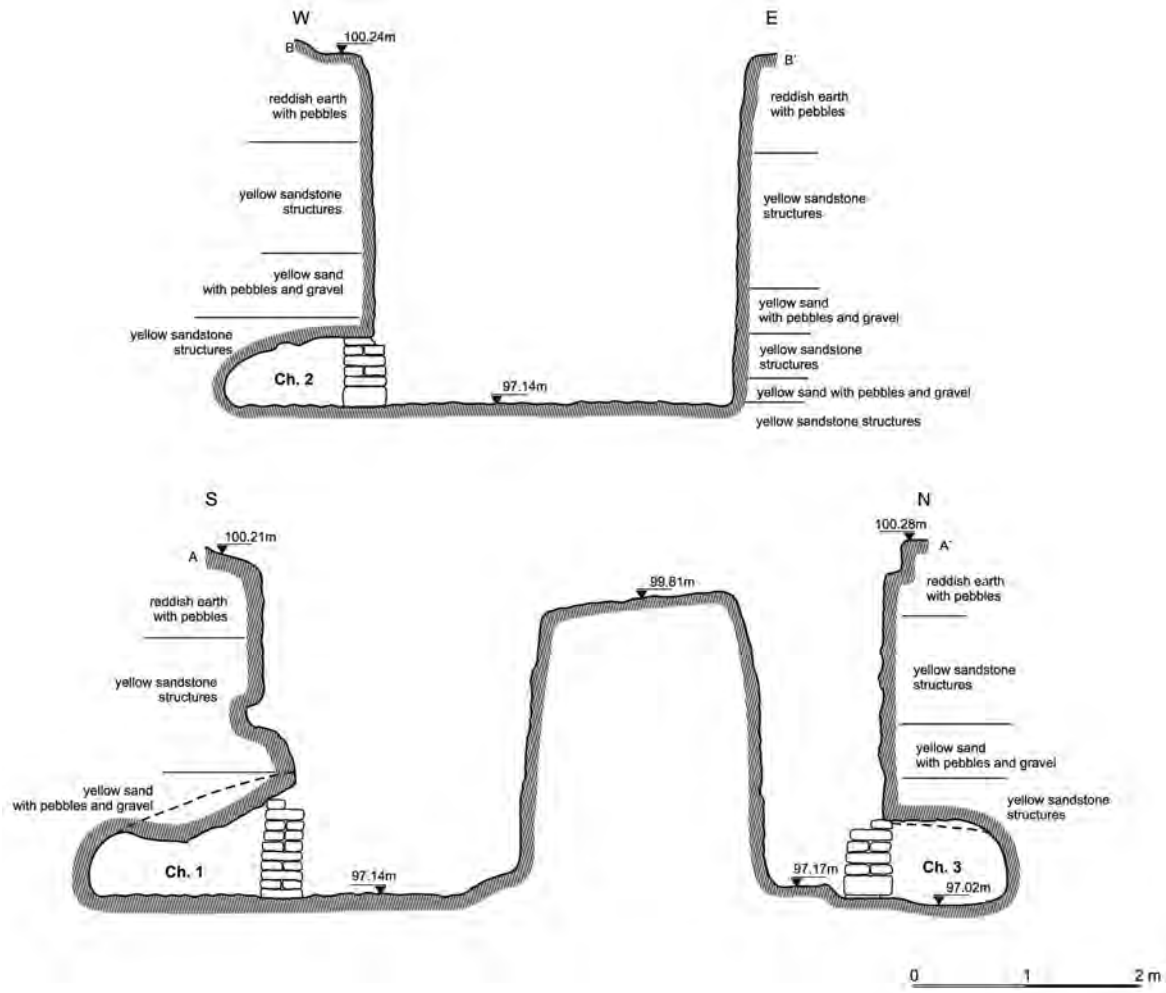


FIGURE 3.65B Tumulus 15, cross-sections of the tumulus
DRAWN BY E. SKOWROŃSKA, A. GŁĄB, DIGITISED BY U. IWASZCZUK, E. CZYŻEWSKA-ZALEWSKA

tery vessels was recorded, consisting of five beer jars, four hemispherical bowls, one finely made footed bowl, one neckless storage pot with a rounded body, three cups, and a small table amphora. Jumbled fragments of human and animal bones were also found in the same area [**Fig. 3.68**]. Other finds recorded in this eastern part of the chamber included fragments of iron nails and traces of decayed organic material (wood) forming a rectangle on the floor of the chamber—remnants of what may have been a wooden bier. The discovery of these three elements in one place indicates that the body had been placed on a bier located on the east side of the burial chamber, a practice which has been noted in several burials at El-Zuma. Chamber 2 adjoins chamber 1 from the west, but they are not interconnected. The blocking built along the west wall was about 0.60 m high and reinforced from the outside by an additional layer of bricks [**Fig. 3.67 middle**]. The removal of these bricks revealed that a 5.40-m-long chamber had been cut into the west wall. It had two entrances separated by a pillar hewn from the bedrock. The south side is about 1.10 m wide, while the north side is about 2.70 m wide. The narrowest part is in the middle of the chamber, between the pillar and the inner (west) edge of the niche, which does not exceed 0.70 m. One chamber with two entrances separated by a rock-hewn rather than a constructed pillar is a rare but nonetheless quite well-known practice of this period, noted not only in the Dongola Reach but also in other regions, such as the Atbara–Berber district. The nearest analogies for this type of chamber were excavated in Berber by Lenoble (1991, 167–169, Figs. 1, 2) and at Akad near Atbara by Mohamed Faroug (Faroug and Tsakos 2005, 62–71, Fig. 2; Faroug, Saeed, and Tsakos 2007, 98–106, Figs. 1, 2). At the El-Zuma cemetery this is the first recorded instance of such a feature in a type II burial. A similar example was noted in Tumulus 87 at Tanqasi, on the opposite bank of the Nile, excavated by Godlewski in

FIGURE 3.66 Tumulus 15, view of the U-shaped shaft, looking west
PHOTO BY R. MAHLER

2006. The only difference between the two burials is that the chamber in El-Zuma is a secondary one located on the west side, while at Tanqasi the double entrance led to the main burial chamber, cut into the south wall of the shaft (Godlewski 2008, 469–476). Although the chamber was found untouched, nature had contrived to destroy parts of the roof, from which some blocks had fallen onto the grave offerings [**Fig. 3.69**].

Beneath the fallen debris, two beer jars, one bowl, and one jug were uncovered *in situ* at the south side of the chamber. In the middle of the chamber, a pile of animal bones was noted. At the north side three bowls and two cups were recorded along with some animal bones. Chamber 3, which occupies the north side of the shaft, is interconnected with chamber 2 by a small hole about 0.40 m in height and 0.25 m in width, dug out at floor level through the wall that separates the two chambers. This was the first recorded instance of such a practice at the El-Zuma burial ground (the interconnection of all burial niches in a grave, in particular the main burial chamber and the one directly adjacent to it, is a common practice). The chamber was sealed by a mud-brick wall built in analogous fashion to the walls of the other two chambers [**Fig. 3.67 bottom**]. The 0.70-m-high blocking was found intact, as was the chamber. This is comparable, for example, to the situation in T.2, where both chambers 2 and 3 were untouched by the tomb robbers (Mahmoud El-Tayeb 2007, 71–85). The maximum length of the chamber reaches 2.70 m, while its width is only 1.05 m, with a height of about 0.75 m. The modest offerings inside the chamber comprised some fragments of animal bones deposited on the east side, while on the opposite side there were traces of what could have been a decayed organic object, probably a basket containing an unidentified material. For more information see Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 114–117.

3.5 *Tumulus 23*

Tumulus 23 lies about 100 m north of T.2. It was classified as a type II superstructure with a flat top constructed of earth and gravel, the sides revetted with rough stones [**Fig. 3.70**]. Its external diameter reached 20 m and the maximum preserved height did not exceed 0.80 m. The large depression in the middle of the mound was taken as evidence of plundering, and this assumption was corroborated when a robber pit was revealed in the northern

FIGURE 3.67 Tumulus 15, view of the blocking wall of chamber 1 (top), chamber 2 (middle) and chamber 3 (bottom)
PHOTOS BY E. SKOWROŃSKA

FIGURE 3.68
Tumulus 15, chamber 1, view of the grave offerings on its east side
PHOTO BY E. SKOWROŃSKA

FIGURE 3.69
Tumulus 15, view of the collapsed ceiling of the chamber
PHOTO BY E. SKOWROŃSKA

trench wall once excavation began. The unearthed shaft appeared to be of the same type as the one in T.2. While sharing a similar plan [**Fig. 3.71**], orientation and dimensions, this tumulus differed from T.15 in that it had only two side chambers cut at the bottom of the shaft [**Fig. 3.72**].

The main chamber (Ch. 1), measuring 2.00 m × 1.50 m × 0.60 m, was cut into the south wall of the shaft, and the other chamber was cut into the west wall. Chamber 1, presumably containing the main burial, had been plundered; the mud-brick blocking had been removed and the contents left upturned inside. Excavation was hindered by a hard and compact reddish soil that had filled the chamber at a later date. Only one human leg bone was discovered amongst some disturbed and partly smashed pottery vessels (18 in all), comprising cups, bowls, beer jars, a table amphora, and a pot stand [**Fig. 3.73 top**]. Characteristically, most of the beer jars were of medium size. The number and diversity of vessel forms indicates that this burial chamber had been richly furnished. Although we cannot be sure what the full set of grave furnishings originally consisted of, the absence of weapons, personal adornments, and metal objects should be noted. The western chamber measured 3.00 m in length, 1.50 m in width and not more than 0.50 m in height. The sandstone blocks sealing the chamber were intact except for a small hole at the southern end, through which the robbers apparently surveyed the chamber in search of the main burial, where more precious goods were to be expected. Some of the vessels were broken, others apparently moved from their original position. Upon excavation, chamber 2 [**Fig. 3.73 bottom**] proved to be a repository for grave goods alone. The offerings consisted of vessels of various shapes, mainly cups and bowls, and animal bones, the arrangement of these items following that already recorded in T.2. Eleven vessels were assembled in one group and four vessels in another group, both associated with animal bones. The third group consisted of three vessels. Another three vessels, making up a total of 21, were found broken and displaced. For more information see Mahmoud El-Tayeb 2005, 394–397; Klimaszewska-Drabot and Mahmoud El-Tayeb 2014.

3.6 *Tumulus 24*

Tumulus 24 lies on the north-east side of the cemetery, between T.15 to the north and T.19 and T.20 slightly to the west. The tomb has a rounded superstructure, built from a mixture of sandy earth and gravel. It has a diameter of about 23.00–24.65 m. The top centre features a distinct circular depression, which undoubtedly attests to earlier plundering activity. The south-east side of the mound is markedly higher than the rest. Thus, the preserved height on the south side of the mound is 1.10 m, while on the east it reaches 1.60 m [**Fig. 3.74**].

The fact that the mound is higher on one side seems to be an intentional feature rather than an inadvertent result of robber activity. Three other instances of superstructures which are evidently higher on one side have been noted at the El-Zuma cemetery, namely T.11, which lies on the north-west side of the cemetery, and T.14 and T.15, to the north-east of T.11. Based on these three tumuli, one would assume that the superstructures were built

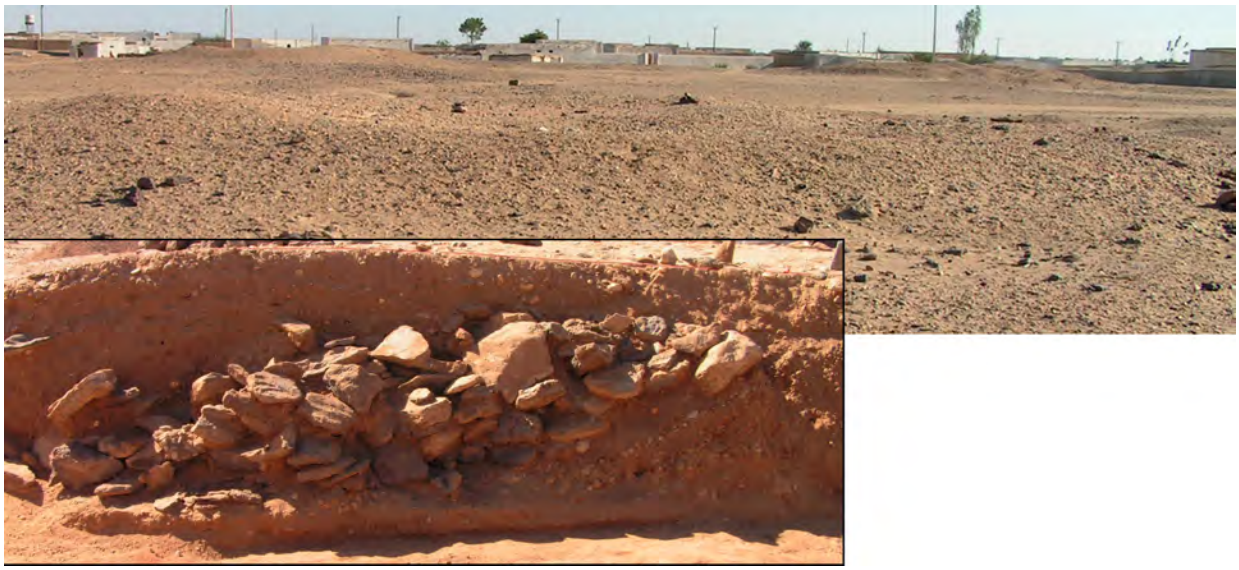


FIGURE 3.70 Tumulus 23, view from the superstructure of the tumulus and west section of the test trench, showing the stone slabs that covered the original mound, facing west
PHOTO BY A. OBŁUSKI

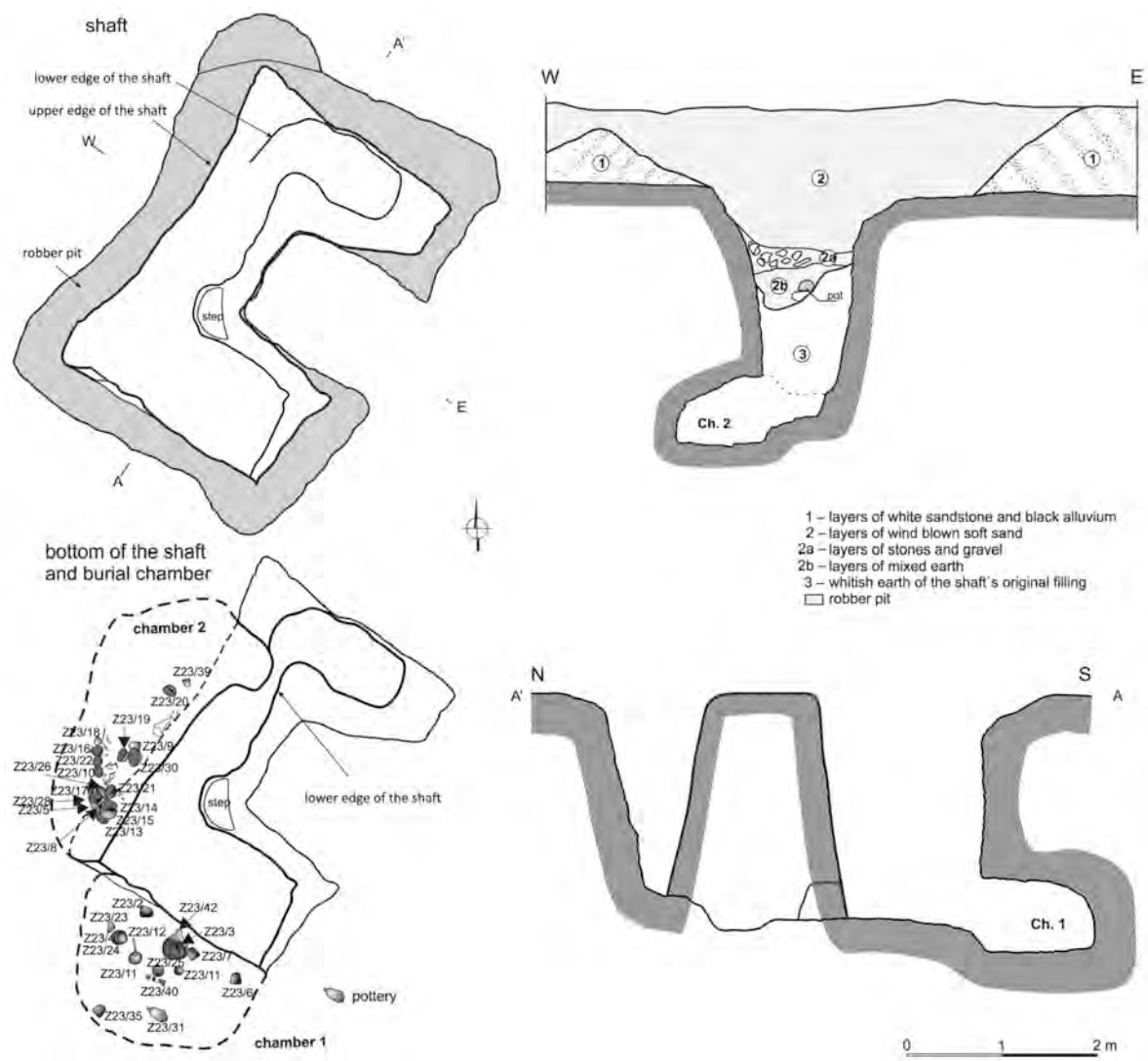


FIGURE 3.71 Tumulus 23, general plan and cross-sections
DRAWN BY A. OBŁUSKI, U. WICENCIAK, DIGITISED BY M. PUSZKARSKI

FIGURE 3.72 Tumulus 23, view of the stone slabs blocking chamber 2
PHOTO BY A. OBŁUSKI

FIGURE 3.73 Tumulus 23, view of the grave goods in chamber 1, facing west (top) and chamber 2, facing west (bottom)
PHOTOS BY H. KOŹMIŃSKA-SOWA

FIGURE 3.74 Tumulus 24, view of the tumulus superstructure, looking east
PHOTO BY T. WOJTCZAK

higher on one side deliberately rather than accidentally. The closest analogy for this type of burial comes from the Fourth Nile Cataract region, where examples were recorded at two cemetery sites discovered by the Gdańsk archaeological mission. The first lies near Elashameen village (site HP 595). The second cemetery site (HP 610) is located in the vicinity of Hager Zerga village (Kołosowska 2010, 94, Fig. 8).

On the ground surface the shaft presented a simple rectangular outline [**Fig. 3.75**] measuring 3.50 m on the north side, 3.40 m on the south, 5.30 m on the east, and 5.05 m on the west side. A pier with sides measuring about 1.50 m (N), 1.50 m (S), and 1.60 m (W) was revealed projecting from the east wall, affording the shaft a U-shaped plan. The shaft has a maximum depth of 3.60 m [**Fig. 3.76**].

At the bottom of the shaft, four burial chambers in an unusual layout were recorded cut into the western, southern, and eastern walls of the shaft, extending into part of the southern side of the pier [see **Fig. 3.75**]. Chamber 1, usually the main burial niche, was cut into the full length of the southern wall, as was the common practice [**Fig. 3.77 bottom**]. Yet, in the case of T.24, there is a unique feature in the construction of this niche. The chamber was partially cut into the eastern half of the southern side of the shaft, curving around towards the short east wall and terminating in the southern side of the pier. Thus, the final plan of the chamber resembled a reversed C shape, measuring about 3.20 m N–S, about 2.30 m E–W, and 1.40 m N–S. No similar construction of the main burial chamber had previously been noted in this type of tomb. Chamber 2, adjoining chamber 1 from the west side of the same southern wall of the shaft, measures 1.72 m in length, 1.15 m in width, and 0.95 m in height. The two chambers are interconnected through a small hole about 0.15 m in width, made at floor level. A similar hole of the same width also interconnects chambers 2 and 3.

There are two more side chambers: chamber 3, measuring 1.70 m in length, 0.70 m in width, and 0.90 m in height, and chamber 4, measuring 3.10 m in length by 1.10 m in maximum width. Both are hewn into the long west wall of the shaft, but because of concerns about the instability of the chambers' ceilings no attempts were made to verify if there is a connecting hole between the neighbouring chambers 3 and 4.

The burial chambers were sealed with mud bricks bonded with sandy lime mortar [**Fig. 3.78**]. The blocking wall of the secondary chamber 3 was the only one that had not been damaged by grave robbers. It is about 1.15 m long and 0.70 m high. The blocking wall was built on a foundation of mud bricks in which the headers were set on edge, upon which four courses of alternating headers and stretchers were laid. The blocking wall of chamber 1 had been disturbed on the north-east side of the southern section as well as its eastward extension and the southern side of the pier. Excavation of the four burial chambers revealed that apart from chamber 3, the other three niches had been heavily looted and disturbed. When clearing the shaft of debris and earth fill, a wall about 1.30 m high and 1.05 m wide, roughly built of mud bricks and sandstone chunks, was found blocking the northern wing of the shaft [**Fig. 3.79**]. A large heap of mudbrick debris and sand was accumulated behind the east side of the wall. Most probably this wall had been erected by the grave robbers to prevent the fallen material from pouring into the nearest chambers during the robbery.

Although three of the four chambers had been looted in the past, nonetheless, what was left behind can also throw some light on the funerary traditions at this burial ground. It is obvious that the construction of chamber 1 is far removed from the known practice of burial recorded in tumuli designated as types I and II at El-Zuma. Moreover,

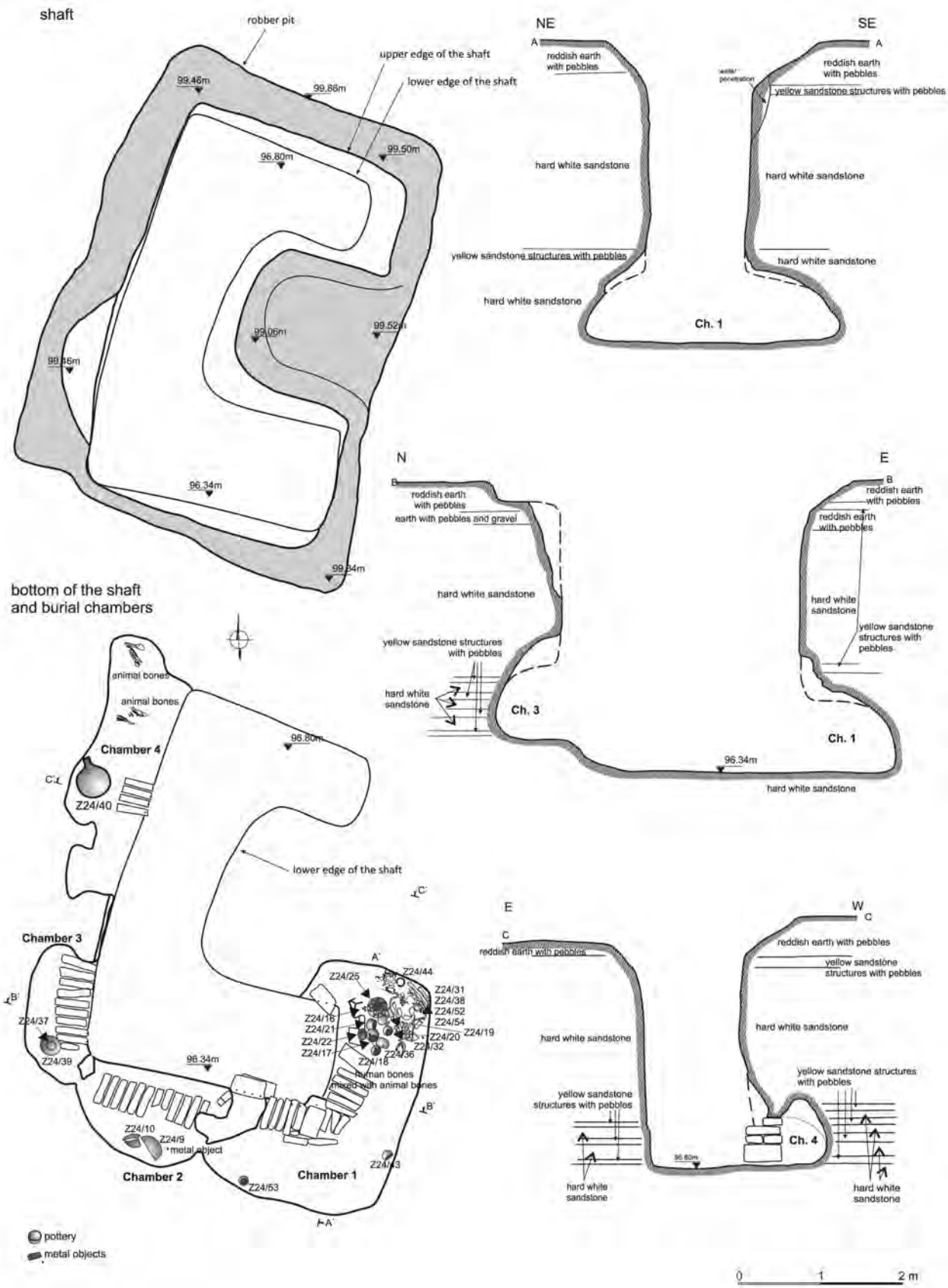


FIGURE 3.75 Tumulus 24, general plan and cross-sections
DRAWN BY E. SKOWROŃSKA, J. BROCHOCKI, DIGITISED BY J. BROCHOCKI, E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.76 Tumulus 24, aerial view of the shaft
PHOTO BY M. BOGACKI

excavation of T.24 revealed that even the last resting place of the grave's occupant was completely different from the well-established inhumation customs of the period. The north-east corner of chamber 1 was found to contain a mixed-up pile of disarticulated human and animal bones, in addition to iron nails, a knife, decayed wood fragments, unidentified metal objects, metal fittings, faience and quartz beads, plus a copper-alloy ferrule, which might have been part of a decorative object [see **Fig. 3.77 top left**]. The human long bones, skull, iron nails, and traces of decayed wood in this pile indicate that the body might have been placed on a wooden frame on the east side of the main chamber (Ch. 1). However, the limited space available in the central eastern part of the niche suggests that the body was laid in contracted position, with head due north, facing west. Alternatively, another possibility is that the inhumation was carried out according to the well-known practice noted in the southern main chamber of other type II tumuli, where the body was laid in contracted position, head to the east, facing north. Yet, careful examination of the pushed aside human bones and the other material shows that their arrangement was not the work of grave robbers, who usually left the plundered burial in a great state of disorder. One issue that remains unclear is whether or not this part of the chamber had been emptied intentionally to make way for another interment. The nearest parallel for this is burial 4 recorded at the cemetery in Hammur-Abbassiya (Mahmoud El-Tayeb 2003, 130–139, Figs. 8, 20, 21).

In the same north-east corner of chamber 1, in front of the abovementioned pile, eight complete vessels were noted. They consist of three handmade cooking pots, one big decorated spouted bowl, two small bowls, and two cups [see **Fig. 3.77 top right**]. Meanwhile, the southern part of chamber 1 yielded two small vessels (a wheel-made red slipped bowl and a red cup) in addition to some iron nails, metal fittings, beads, and scattered pieces of animal bone. Chamber 2 appeared to have been thoroughly plundered. It was found filled with red sand that concealed some beer jar sherds distributed across several layers. In contrast, chamber 3, which had not been ransacked, nonetheless appeared to contain only one beer

FIGURE 3.77 Tumulus 24, view of the piled-up bones and mixed material (top left) and pottery vessel at the north-east side of chamber 1 (top right); view of chamber 1 with the eastern annexe (bottom)
PHOTOS BY E. SKOWROŃSKA

jar with a wheel-made cup placed upside down over its rim [see **Fig. 3.80 top**]. This jar is decorated with a mat-impressed pattern and a red slipped stripe on its shoulder. The third target for the robbers was chamber 4, in which a heap of cattle bones was noted at the northern end of the chamber, and a large beer jar was located in the central part, near the demolished blocking wall [see **Fig. 3.80 bottom**]. Once again, the plundering of these chambers confirms the fact that the grave robbers were well organized, specialized gangs who knew exactly what they were looking for and where to find it, in particular the main chamber where the deceased was buried.

3.7 *Tumulus 25*

The medium-sized tumulus 25 lies at the north-eastern edge of the burial field. It is a relatively low, flat-topped mound about 21.50 m in diameter with a preserved height not exceeding 1 m [**Fig. 3.81**]. The mound consists of earth mixed with gravel. A recognizable depression at the top of the mound is proof of plundering. The burial shaft

FIGURE 3.78 Tumulus 24, view of the mud-brick blocking walls of chambers 2 and 3
PHOTO BY S. MAILLOT

resembles that of another tumulus (T.5), but the U-shaped plan with equal sides was cut into solid ground [**Fig. 3.82**]. At the top, the shaft measures 4.34 m × 3.08 m, and at the bottom, about 4.28 m × 3.08 m, with a maximum depth of about 2.38 m on the northern side and 2.50 m on the southern side [**Fig. 3.83**]. At the bottom of the shaft there are three niches hewn into the south and west walls. Chamber 1, cut into the south wall, measures 2.40 m × 1.20 m × 0.69 m. The other chambers, 2 and 3, were cut side by side with an arch-like opening in between. The former was 2.35 m × 0.74 m × 0.67 m, the latter 2.32 m × 1.04 m × 0.67 m. The three chambers were sealed with walls of large mud bricks (44 cm × 22 cm × 13 cm), each wall measuring 0.60–0.70 m in width. That of chambers 2 and 3 was found intact, but the wall blocking the entrance to chamber 1 appeared to have been disturbed directly above the east end and partly repaired at a later time. It is worth noting that rare instances of chamber blocking walls being repaired after plundering were observed in the Fourth Cataract region (in the Gdańsk Archaeological Museum Expedition's concession area on the right bank of the Nile).

Excavation of the burial chamber revealed only some disarticulated human bones and the skull of an adult. Finds included two medium-sized beer jars, a broken cup, an iron arrowhead, and a few beads [**Fig. 3.84 top**]. Chambers 2 and 3 held grave offerings. The first one (Ch. 2) contained some animal bones deposited in the centre and at the southern end of the chamber. Eleven pottery vessels were noted here: three handmade bowls, found broken,

FIGURE 3.79 Tumulus 24, wall blocking the northern wing of the shaft
PHOTO BY E. SKOWROŃSKA

and eight intact wheel-made bowls. In the centre of chamber 3 there was a pile of animal long bones and 16 pottery vessels [**Fig. 3.84 bottom**]. Eleven of these (six bowls and five cups) were wheel-made. The other five were hand-made globular beer jars. Traces of a fire containing small lumps of charcoal were observed on the top of the pier close to its south-eastern end. These remains were found buried beneath an undisturbed part of the original superstructure, so the fire could well have been part of a funeral ceremony, although there can be no certainty of this. Evidence of fires has been observed near the edges of burial shafts from the same (post-Meroitic) period at the El-Kadada cemetery in Central Sudan. For more information see Mahmoud El-Tayeb 2010b, 470–474.

3.8 *Tumulus 26*

This tumulus is located on the far north-east fringes of the cemetery. The superstructure is a rounded mound built of earth, gravel, and chunks of rough black stone and sandstone. It has a diameter of 30.80 m and its maximum preserved height does not exceed 1.40 m [**Fig. 3.85**]. This very low height is a result of the severe destruction inflicted on the mound in the past by grave robbers and in recent times by people who have used it as a source of building material, as clearly evidenced by the top of what remains of the burial superstructure.

On the original ground surface, the shaft presented a simple rectangular outline aligned north-east–south-west, its sides measuring 4.00 m (N), 6.80 m (E), 3.90 m (S) and 6.20 m (W). However, a pier projecting from the east wall gave the shaft a U-shaped plan [**Fig. 3.86**]. At the top of the pier its sides measure 2.40 m (N), 2.60 m (W) and 2.10 m (S), while its base is larger. At the bottom of the shaft four side chambers are hewn into three walls of the shaft [**Fig. 3.87**]. The main chamber (Ch. 1) occupies the southern wall. Chambers 2 and 4 are cut into the west wall, while chamber 3 is cut into the north wall and part of the west wall, forming a roughly L-shaped plan. All four chambers are interconnected by holes made at floor level in their adjoining walls.

The burial chambers were sealed by solid walls built mainly of mud bricks, in some cases capped by a single course of reused red brick.

The blocking wall of the main burial chamber 1 [**Fig. 3.88 top**] was damaged in the south-west corner of the shaft by robbers and rainwater. These two destructive factors in combination with the weak geological makeup of this part of the cemetery, comprising soft sandstone and

FIGURE 3.80 Tumulus 24, view of chamber 3 looking west (top); part of the grave goods in chamber 4 (bottom)
PHOTOS BY E. SKOWROŃSKA

FIGURE 3.81 Tumulus 25, view of the superstructure, looking east
PHOTO BY K. KOTLEWSKI

FIGURE 3.82 Tumulus 25, view of the shaft, looking south—note the effect of robber activity on the south wall
PHOTO BY K. KOTLEWSKI

fragile limestone, caused further problems, leading to the partial collapse of the chamber's ceiling. This in turn seriously damaged the blocking wall, especially its south-east side, where only four courses of the wall were left in place, revealing that the bricks had been laid in alternate rows of headers and stretchers, on a foundation consisting of two mud bricks, measuring about 42 cm × 20 cm × 10 cm, laid as stretchers, making the width of the blocking wall about 40 cm.

The full length of the wall till it reaches the blocking wall of chamber 2 is about 3.20 m with a height of 0.80 m. Both chambers 2 and 4 were closed off by one wall built along the west side of the shaft and measuring 4.70 m in length with a preserved height of no more than four courses (0.40 m), though it originally probably consisted of about 6–7 brick courses (0.60–0.70 m high).

The L-shaped northern chamber 3 was blocked by a wall of mud bricks made up of seven courses (0.70 m) laid in

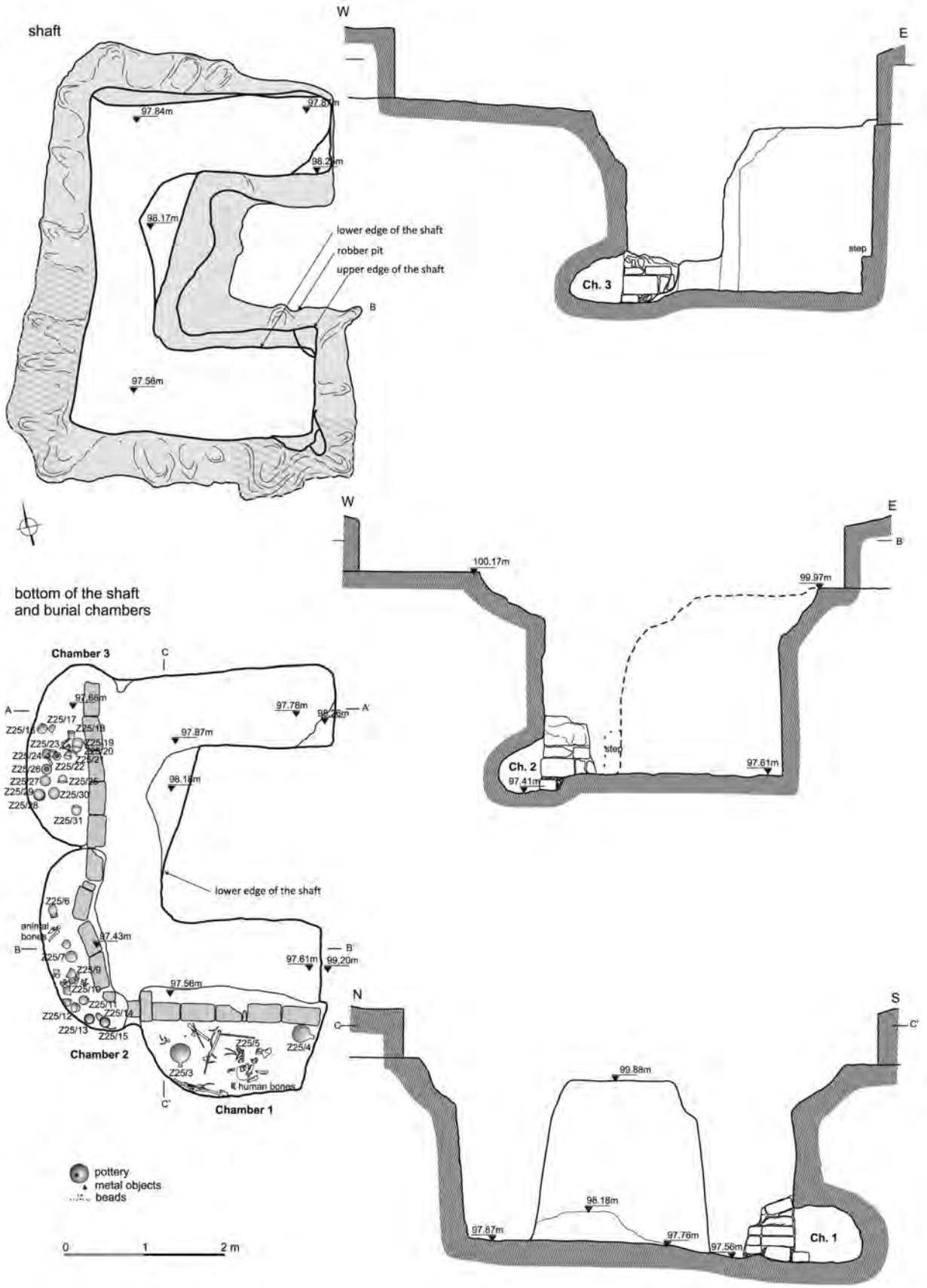


FIGURE 3.83 Tumulus 25, ground plan and cross-sections
DRAWN BY A. BŁASZCZYK, M. WYBIERALSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY M. PUSZKARSKI

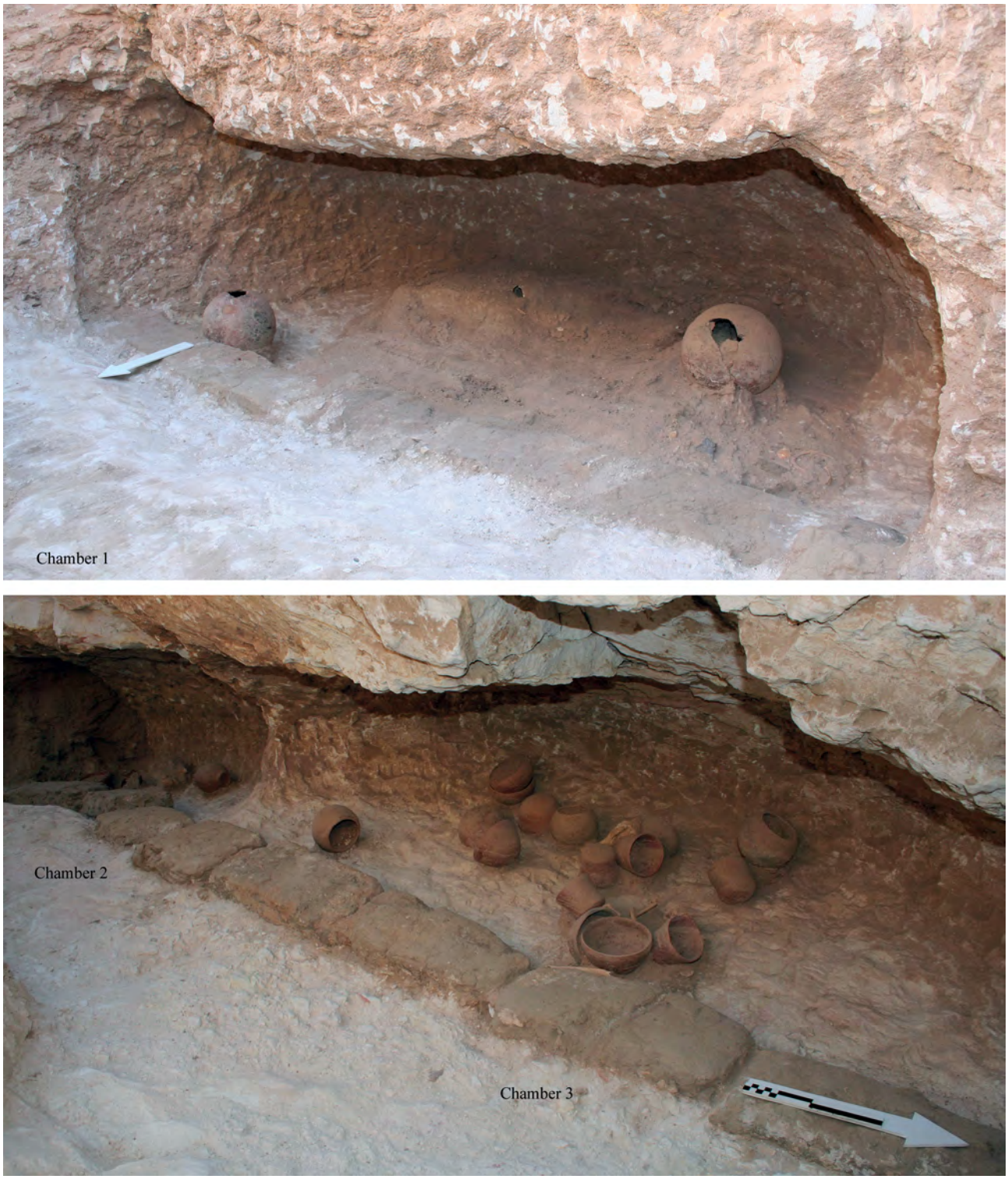


FIGURE 3.84 Tumulus 25, view of scattered grave goods in chamber 1 (top); view of the excavated chambers 2 and 3 (bottom)
PHOTOS BY K. KOTLEWSKI

FIGURE 3.85 Tumulus 26, view of the superstructure, looking east
PHOTO BY A. KAMROWSKI

a similar technique to the one used in the other walls of chambers 1, 2 and 4. However, in the last course both mud- and fired bricks had been used to complete the wall. The north-west side of the 3.20 m-long wall had been disturbed by grave robbers [**Fig. 3.88 bottom**].

The oval-shaped main southern chamber 1 measures 3.90 m in length (E–W), 1.40 m in width (N–S), and 0.80 m in height. The chamber was found filled with reddish soil, especially in the east and central parts, as a result of robber action that had damaged the blocking wall [**Fig. 3.89 top**]. Some disturbed human bones were observed scattered on the east side of the chamber. These comprised a pelvis, broken femurs, and a fragment of skull. Furthermore, on this same east side several faience beads were recorded, as well as wood fragments, metal fittings, and some nails. No doubt, these finds attest to the fact that the deceased was buried according to the funerary traditions that were followed at this cemetery in the second phase of the Early Makurian period (AD 450–550), one of the most notable features of which was the location of the body on the east side of the chamber, laid on a wooden frame, most probably in a contracted position, head due east, facing north. The central part of the chamber was not fully excavated due to the fragile state of the ceiling and its partial delamination. Nonetheless, a number of vessels, including cups, bowls, and a single amphora, were recorded alongside wood remains and a pile of cattle bones. The west side of the chamber yielded a few vessels represented by wheel-made cups and bowls, and handmade bowls.

Chamber 2 is a small oval shape, measuring 2.10 m × 1.05 m. As already mentioned, its mud-brick blocking wall was part of one long wall built to seal all of the four side niches. The northern side of the chamber was found destroyed; however, despite this destruction, a collection of large animal bones was noted together with 25 various types of vessels, mostly cups and bowls, with one bowl even being found in the hole connecting chamber 2 and chamber 4 [**Fig. 3.89 bottom**].

The L-shaped chamber 3, which occupies the northern and part of the western side of the shaft, measures 3.65 m (E–W) × 1.70 m (N–S) × 0.60 m in height. The blocking wall of this chamber had been dismantled on the north-west side, while its longer, northern, part remained untouched by the plunderers. The chamber was excavated slowly and conditions were complicated by the collapse of the weak limestone roof. Despite this, after careful cleaning of the chamber a single bowl and some scattered animal bones were found at the north-west end, which had been disturbed by the robbers. Two large beer jars were found some distance from each other in the central part of the northern side of the chamber. Between these two beer jars was a decayed basket with a cover (Arabic: *tabaq*—طبق), containing some small unidentified seeds. Such an unusual grave offering has rarely been noted in other burial chambers, if at all (no parallel has been recorded to date). Another unusual practice was noted in the form of a small bowl beside some animal bones laid on what appeared to be a mat made of organic material, which was found in a badly decayed state [**Fig. 3.90**].

3.9 *Tumulus 16*

Tumulus 16 is situated in the central part of the site, between T.9, T.15, and T.20 [see **Fig. 1.2**]. This round, flat-topped mound is slightly smaller than T.9, with a maximum height of about 1.10 m and a diameter of about 20 m [**Fig. 3.91**]. The stone ring encircling the mound was not examined [**Fig. 3.92**]. The superstructure covered a rectangular burial shaft measuring 2.85 m to 2.95 m (north and south walls respectively) by 4.35 m to 4.25 m (east and west walls respectively; the east wall being the one most damaged by looting), which narrows towards the bottom [**Fig. 3.93**]. A step was hewn in the bedrock at the bottom of the shaft by the east wall. The main chamber (Ch. 1) was

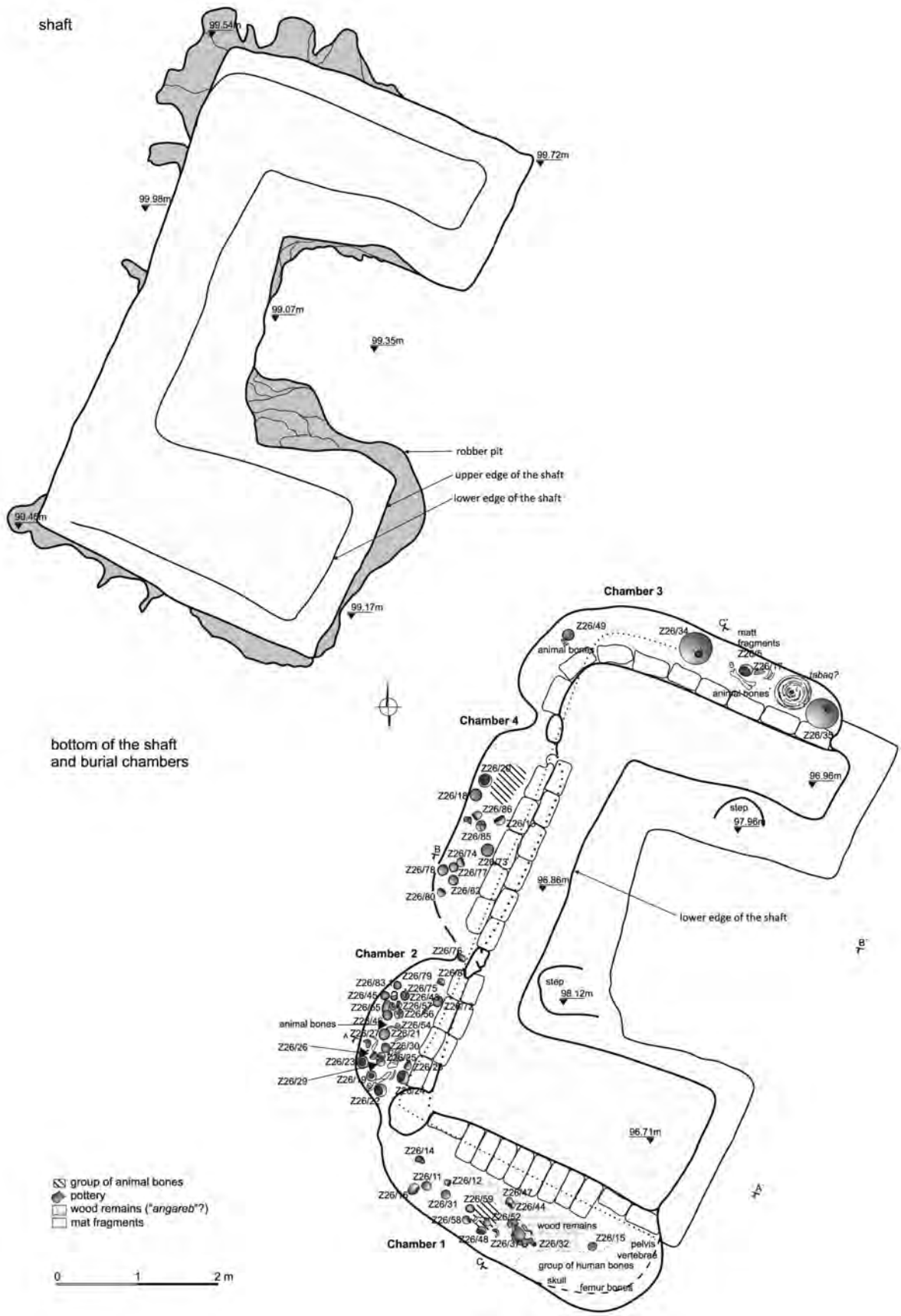


FIGURE 3.86A Tumulus 26, ground plan
DRAWN BY K. JUSZCZYK-FUTKOWSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

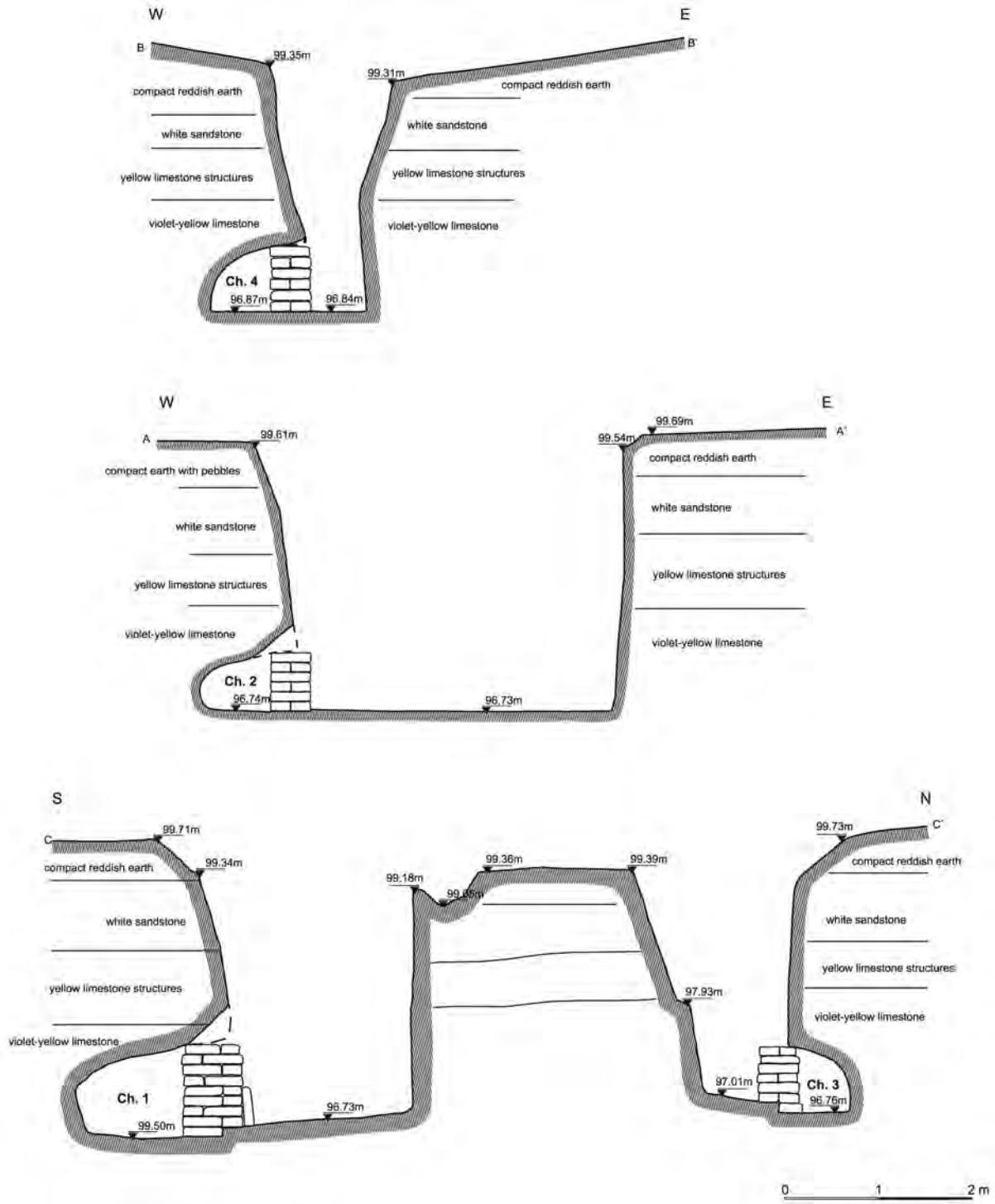


FIGURE 3.86B Tumulus 26, cross-sections of the tumulus
DRAWN BY K. JUSZCZYK-FUTKOWSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.87 Tumulus 26, aerial view of the U-shaped shaft
PHOTO BY T. WOJTCZAK

cut into the south-western side of the shaft; the front part was found collapsed, presumably because of the ancient break-in, which left dangerous cracks in the west wall of the chamber. This chamber measured 2.40 m × 1.40 m × 0.78 m, while chamber 2, a secondary niche cut into the north-western side of the shaft, measured 1.65 m × 1.20 m × 0.55 m. The two chambers were interconnected by a small opening, about 0.40 m wide, in a manner similar to other burials of types I and II at the El-Zuma cemetery [**Fig. 3.94**].

The entrances to both chambers had been blocked with mud bricks (average size 37 cm × 18 cm × 8 cm), which were found scattered at the bottom of the shaft. The blocking wall was 2.10 m long in the case of the main chamber and 1.40 m in that of the side chamber. The height could not be estimated easily. The lowest course of the blocking of the main chamber was a rowlock course. The fill of the main chamber [**Fig. 3.95 top**], which showed evidence of heavy plundering, contained two handmade beer jars, found at opposite ends of the chamber, as well as disarticulated and jumbled human bones, including vertebrae, ribs, long bones and a broken pelvis, in addition to a broken skull next to the beer jar at the southern end, indicating that this was the main burial chamber. Two small metal objects, an iron cross and a copper-alloy bell, were found near the skull (for a catalogue of metal artefacts and discussion, see Volume III, Chapter 5). Some large animal bones, probably of cattle, were found heaped near the second beer jar at the northern end of the chamber. The fill of the side chamber (Ch. 2) contained only some cattle bones [**Fig. 3.95 bottom**]. There is reason to believe that this chamber was intended solely for grave offerings. More small objects were found in front of the main chamber. These were mostly metal artefacts comprising a number of iron arrowheads and fragments of a broken spear blade, as well as different types of beads, all found scattered amongst the dismantled mud bricks of the chamber blocking. For more information see Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 363–365.

FIGURE 3.88 Tumulus 26, view of the disturbed chamber 1 (top); view of the blocking wall of chamber 3 (bottom)
PHOTOS BY A. KAMROWSKI

FIGURE 3.89 Tumulus 26, view of plundered and disturbed southern part of chamber 1 (top); grave goods in chamber 2 (bottom)
PHOTOS BY A. KAMROWSKI

FIGURE 3.90 Tumulus 26, view of grave goods in chamber 3 during excavation, facing north-east
PHOTOS BY A. KAMROWSKI

FIGURE 3.91 Tumulus 16, superstructure, looking south
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.92 Tumulus 16, view of the dismantled bricks of the chambers' blocking walls, thrown against the east wall of the shaft (left); view of two blocking walls of the burial chambers cut into the west wall of the grave shaft (right)
PHOTOS BY O. BIAŁOSTOCKA

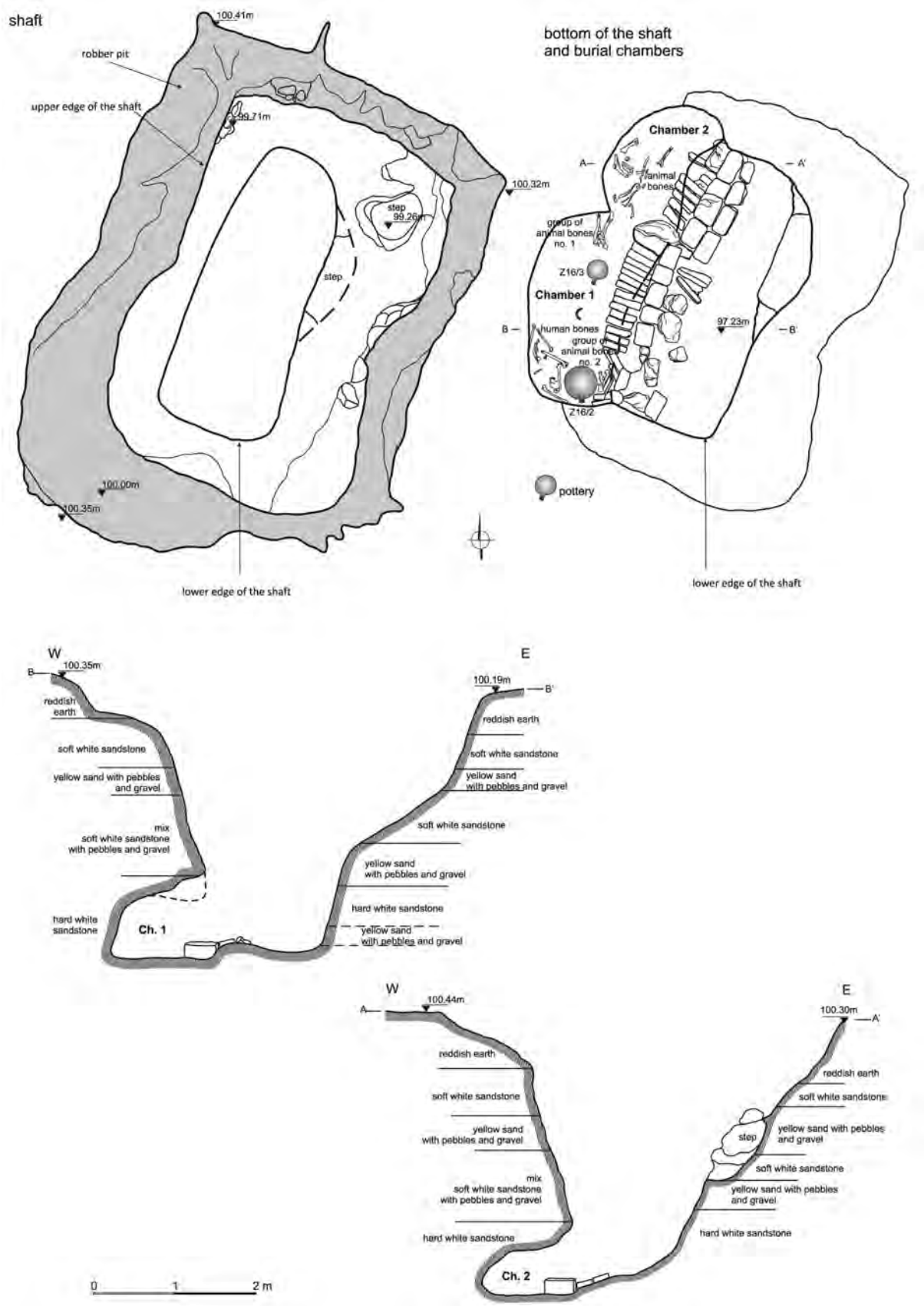


FIGURE 3.93 Tumulus 16, ground plan and cross-sections of the burial
DRAWN BY K. JUSZCZYK-FUTKOWSKA, E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.94 Tumulus 16, shaft, view of the rectangular shaft with two entrances to chambers 1 and 2
PHOTO BY O. BIAŁOSTOCKA

3.10 *Tumulus 9*

Situated in the central part of the site, between T.16 to the east and T.11 and T.10 to the west [see **Fig. 1.2**], this round, flat-topped mound has a maximum height of about 1.80 m, and an E–W diameter of 24.50 m [**Fig. 3.96**]. The L-shaped burial shaft (disturbed in the upper part by looting) is only the second of its kind to have been found at this cemetery; the first example was observed in T.11, which was excavated in 2009 (Mahmoud El-Tayeb and Czyżewska 2011). A parallel is known from the cemetery in Abkur, where tumulus T.1 had an L-shaped burial shaft, 3.30 m deep on the south and 3.60 m on the north side when measured from the ground surface around the tumulus (Kirwan 1939; Żurawski 2003, 220; Juszczyk 2011, 119–121). Two steps were hewn from the rock by the east wall of the burial shaft [**Fig. 3.97 left**] in a manner typical of El-Zuma tombs: one in the north-east corner of the shaft, and the other following the angle of the L shape at a depth of 2.20–2.50 m. The red bricks which were found in the fill were reused to block each of the three chambers of this tomb. The bricks measured 33 cm × 17 cm × 8 cm and 36 cm × 18 cm × 5 cm [**Fig. 3.98**].

The difference in their shape and size, as well as traces of coarse white plaster or mortar, suggest that they had been taken from various parts of an unidentified Meroitic structure. The blocking wall of the main chamber (Ch. 1) was 3.30 m long and about 0.60 m high. It consisted of six courses bonded with mud mortar. The bricks were laid in rows of alternating headers and stretchers, set on a lowermost rowlock course [**Fig. 3.99**] faced with shiners (bricks set on the long narrow side with the broad face exposed). The second chamber was blocked with a wall of the same height but shorter (2.10 m long), consisting of five courses. A rowlock course was laid at the bottom and top of this wall, with a course of headers between two courses of stretchers in the middle. Blocking the third chamber was a wall 1.40 m long and about 0.75 m high, consisting of seven single-thickness courses of alternating headers and stretchers; the bottom course was level with the same course in the blocking walls of the other two chambers. Chambers 2 and 3 shared a red-brick facade, approximately 3.80 m long. Three chambers were cut into the sides of the burial shaft: the main chamber into the south side, and chambers 2 and 3 into the west side. The dimensions of the chambers were as follows: chamber 1—L. 3.70 m, W. 1.50 m, H. 0.65 m; chamber 2—L. 2.40 m, W. 1.30 m, H. 0.60 m; chamber 3—L. 3.00–1.80 m, W. 1.40 m, H. 0.75 m. Passages were cut between the chambers, the one from the main chamber to the second chamber was 0.40 m wide, while the one from the second chamber to the third was just a narrowing of their shared space, which rendered both chambers kidney-shaped in plan [see **Fig. 3.98**]. The passages, as was mentioned earlier, could have been of symbolic significance, allowing the soul of the grave occupant to move freely between the chambers. Exploration was hindered by the poor geological structure of the bed-

FIGURE 3.95 Tumulus 16, view of chamber 1 with pottery offerings and disturbed human skeleton (top); animal bones in chamber 2 (bottom)
PHOTOS BY O. BIAŁOSTOCKA

FIGURE 3.96 Tumulus 9, view of the mound, looking west
PHOTO BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.97 Tumulus 9, view of the L-shaped shaft with steps cut in the wall (left); view of the lower part of the shaft showing the collapsed ceilings of chambers 2 and 3, facing west (right)
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

rock, which resulted in the intermittent crumbling of the walls of the shaft, especially the west wall, during excavation [**Fig. 3.100**]. A robber pit of irregular shape had been dug into the top centre of the mound, directly above the burial shaft and chambers, damaging especially the west wall of the shaft. The fill in the southern part of the shaft yielded concentrations of red bricks presumed to be from the destroyed blocking wall of chamber 1 and probably also chamber 2 (possibly only the outer facing [**Fig. 3.100 right**]). Two vessels and fragmentary human bones were found among the bricks by the main chamber, indicating that the burial had been plundered. The main chamber had been penetrated through a robber pit in the ceiling at its eastern end. Scattered human bones (pelvis, long bones and ribs) were found in the central part, as well as two cups and remains of nails. The original orientation of the burial was suggested by human teeth found lying in the south-east corner of the chamber. Two beer jars were found in the fill of the second chamber and one in the fill of the third. The third chamber may have been plundered at some point. For more information see Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 360–363.

3.11 *Tumulus 11*

Tumulus 11, built from a mixture of earth and gravel, measures about 27 m in diameter. At first glance it appeared to have a flat top, yet closer examination revealed that its preserved height from south to north ranges from 1.50 m to 2.00 m, a feature not observed among the earlier excavated tumuli of the same group [**Fig. 3.101**]. A large central depression at the top of the mound clearly indicated that the burial had been plundered. Therefore, a trench measuring 6 m × 6 m was opened in this area to allow excavation of the burial shaft. The task was not easy because of the problems caused by the coarse geological deposits in

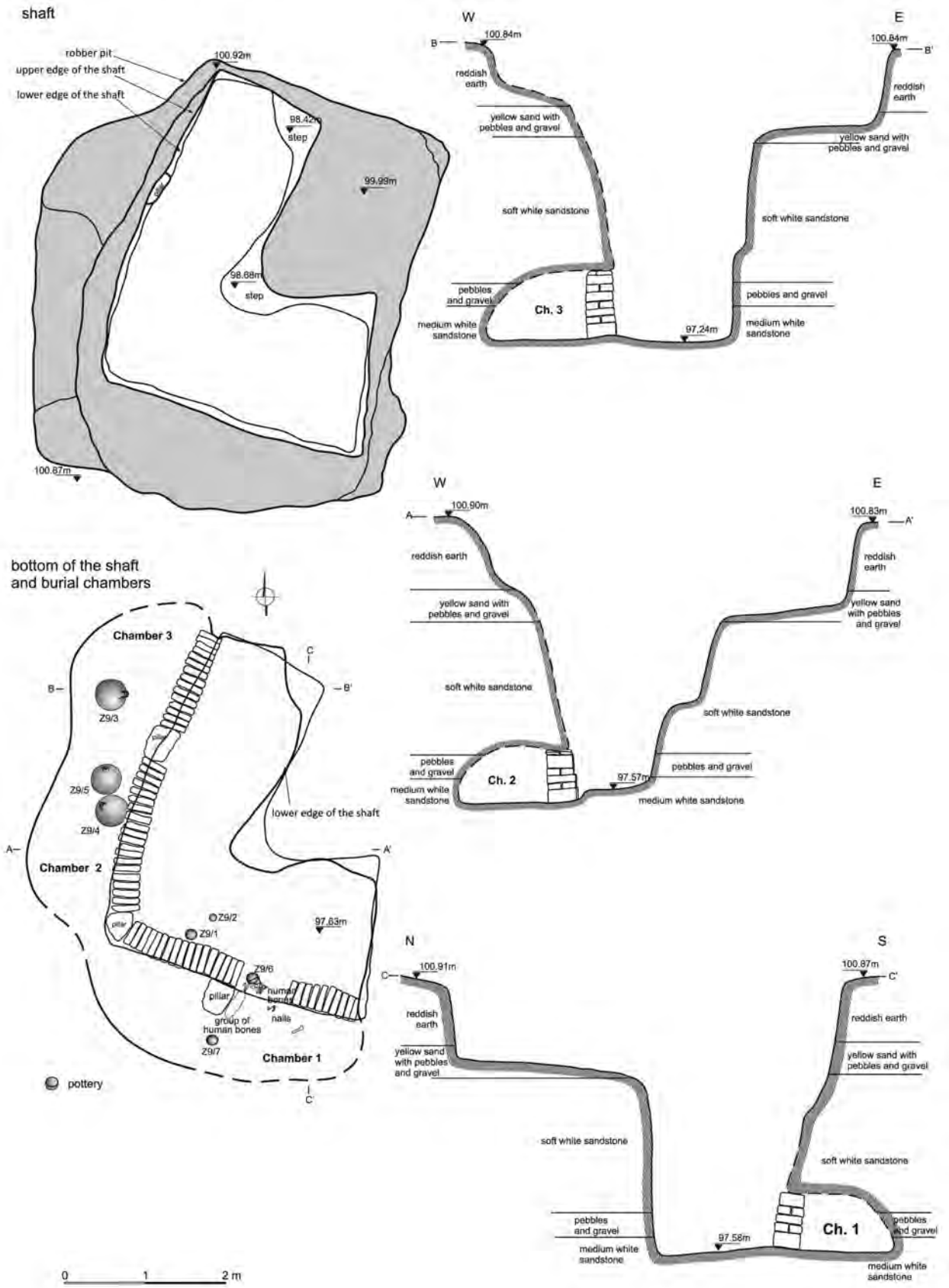


FIGURE 3.98 Tumulus 9, ground plan and cross-sections of the tumulus
DRAWN BY K. JUSZCZYK-FUTKOWSKA, E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.99 Tumulus 9, brick courses in the walls of the main chamber 1 (left), and chamber 3 (right)
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.100 Tumulus 9, view of the plundered chamber 1 (left); view of chamber 2, facing west (right)
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

this part of the cemetery. The first 0.30 m from the ground surface consisted of loose reddish earth with gravel, followed by 0.40 m of relatively compact yellow sandstone, a layer of yellow sand mixed with pebbles and gravel, a layer of whitish-grey soft sandstone, and finally the lowermost stratum, consisting of hard white sandstone. The upper part of the shaft had been much disturbed by robbers who created a pit of irregular shape.

Unexpectedly, the original shape of the shaft was revealed to be of a quite rare type [**Fig. 3.102**] so far only noted at two sites: Firka in northern Nubia and Abkur in the Dongola Reach (Kirwan 1939, 4, Pl. V; Żurawski 2003, 222–224). The longer side of the L-shaped shaft is aligned east–west and measures 2.95 m (S), 1.55 m (E–W) and 1.70 m (N); the shorter side is oriented north–south and measures 2.75 m (W), 1.40 m (N–S) and 1.10 m (E). The shaft has a maximum depth of about 4.95 m [**Fig. 3.103**]. Two side chambers were found at the bottom of the shaft. The main burial niche was hewn into the south wall of the longer side, while the offering chamber was cut into the west wall of the shaft's shorter side. The neighbouring chambers are interconnected by a small hole made in the dividing wall, at floor level. Both chambers were originally blocked with solid

FIGURE 3.101 Tumulus 11, superstructure, looking south
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.102 Tumulus 11, view of the L-shaped shaft, facing south
PHOTO BY O. BIAŁOSTOCKA

walls built of large mud bricks, in places mixed with some red bricks. Despite these precautions, both were plundered.

The robbers gained access to the main chamber (Ch. 1) through the dismantled eastern side of the blocking wall [**Fig. 3.104**]. A disarticulated human skeleton was found inside the chamber; however, due to its poor state of preservation, it was not easy to determine either the position or the orientation of the deceased. This chamber was probably richly furnished, as attested by 12 complete pottery vessels that were left behind by the grave robbers. These comprise four bowls and five cups, all of wheel-made red ware, and one large handmade bowl [**Fig. 3.105 top**]. Apart from the pottery vessels, a concentration of animal bones was found at the west side of the chamber, as well as some blue faience beads, and an eroded iron fragment, probably from the blade of a knife which was found beside the human bones. Chamber 2, on the west side of the shaft, was set aside exclusively for funerary offerings. It contained 17 complete ves-

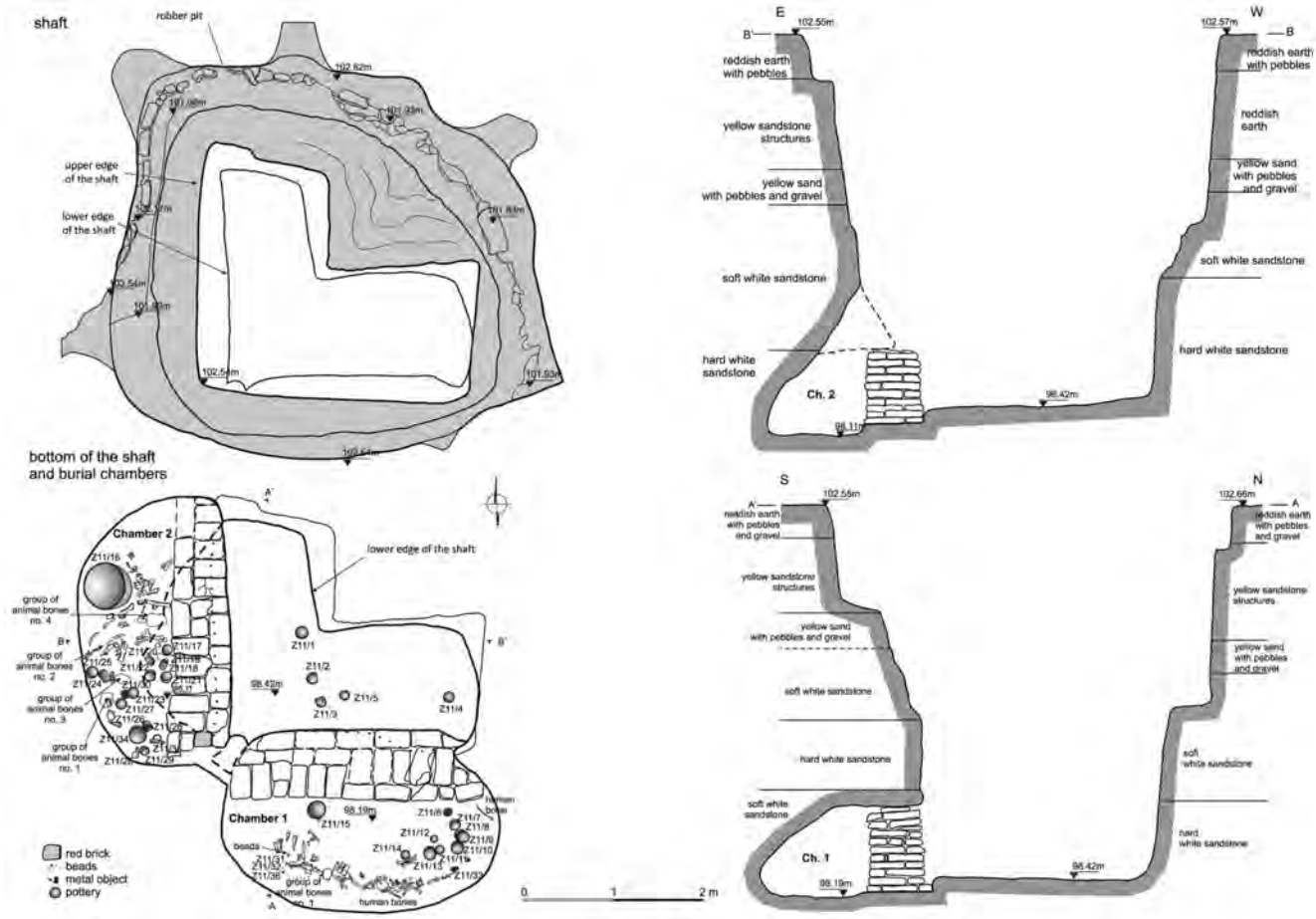


FIGURE 3.103 Tumulus 11, ground plan and cross-sections
DRAWN BY K. JUSZCZYK-FUTKOWSKA, E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.104 Tumulus 11, view of the blocking wall showing the robber hole in the east side
PHOTO BY O. BIAŁOSTOCKA

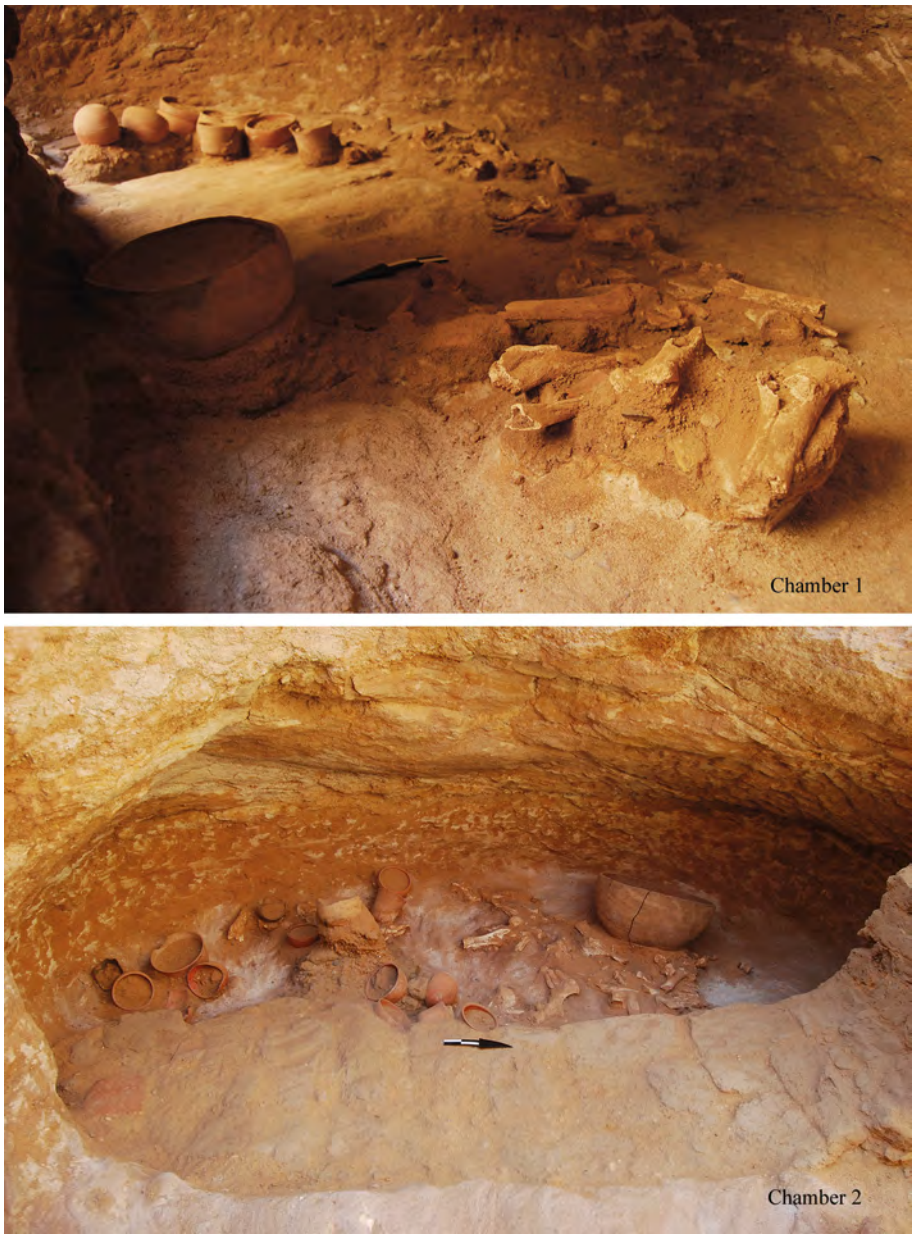


FIGURE 3.105 Tumulus 11, view of grave goods in chamber 1, facing east (top); view of the funerary offerings in the west chamber 2 (bottom)
PHOTOS BY O. BIAŁOSTOCKA

sels: 10 bowls and four cups of wheel-made red ware and three handmade vessels, consisting of one black beer jar, one cooking pot, and a very large basin containing animal bones. Animal bones, probably of cattle and sheep/goat, were also found arranged in four groups extending from south to north [**Fig. 3.105 bottom**]. For more information see Mahmoud El-Tayeb and Czyżewska 2011, 1–16.

4 Type III Tumuli

4.1 *Tumulus 10*

Tumulus 10 is made of similar material to that used in the construction of all the other mounds at the cemetery. It has a diameter of about 18.30 m and a preserved height of up to 1.20 m [**Fig. 3.106**]. The substructure is characterized by a slightly deformed rectangular shaft, its sides measuring 3.24 m (W), 3.14 m (E), 2.02 m (N) and 1.99 m (S) on the ground surface, with a depth of about 2.60 m. The shaft is provided with a single burial chamber measuring 3.32 m × 1.40 m × 0.90 m [**Fig. 3.107**]. The large stone slabs that

FIGURE 3.106 Tumulus 10, view of the superstructure, looking south
PHOTO BY K. KOTLEWSKI

were used to seal the chamber were found dismantled and scattered around the bottom of the shaft [**Fig. 3.108**]. Several broken fragments of pottery vessels recorded in the shaft fill attest to the fact that the burial chamber was heavily looted.

Fragments of human skull were noted in the centre of the burial chamber, mixed with some animal bones, while more of the latter were also recorded at the southern end of the chamber [**Fig. 3.109**].

Although the burial chamber had been badly rifled, 27 complete pottery vessels of different forms were, nonetheless, found inside it. These comprise wheel-made cups, bowls, and bottles, as well as handmade beer jars and cooking pots. Moreover, it contained many fragments of badly corroded metal objects, including a number of complete and fragmentary arrowheads, some barbless and others with a single barb, in addition to broken knives and spears.

Several adornments left behind by the robbers in the ransacked grave are represented by a fragment of silver chain, teardrop-shaped beads made of black stone, and rounded red agate beads as well as some made of faience. For more information see Mahmoud El-Tayeb 2010b, 474–476.

4.2 *Tumulus 17*

Tumulus 17 is a very low mound with a preserved height of about 0.45 m and a maximum diameter of 10 m [**Fig. 3.110**]. The mound is built from a mixture of sand and gravel and is surrounded by a stone ring about 3.60 m in diameter, which originally demarcated the limit of the mound. It is located between T.18 and T.19, in the central part of the cemetery [see **Fig. 1.2**]. The geological deposits in this part of the burial ground are quite different. The surface is covered with aeolian sand overlying a mixture of small stones in addition to gravel and reddish soil that forms a stratum of about 2.31 m thick down to the bottom of the shaft. The floor at the bottom consists of a compact layer of black gravel and whitish-greyish sand. The robbers had dug a large hole, about 2 m wide, at the top of the mound, but it seems that they missed the centre of the shaft as well as the blocking wall.

The shaft is aligned north–south and has a trapezoid plan [**Fig. 3.111**] that measures 1.34 m/1.80 m (E/W) by 0.98 m/0.86 m (N/S) at ground level, narrowing towards the bottom to 1.24 m/1.45 m (E/W) by 0.70 m/0.80 m (N/S). A single burial chamber is cut into the west wall of the shaft, measuring 2.40 m in length, 0.80 m in width and only 0.52 m in height [**Fig. 3.112**]. The robbers had dug into part of the west wall and removed some of the stones of the blocking wall from the south-west corner of the shaft. Thus, they reached the burial chamber and badly damaged the human skeleton inside it. Although the skeleton was greatly disturbed, fragments of leg and foot bones indicate that it may have originally been laid on its right side, in a contracted position, with head due north-west, facing south. The grave goods consisted of two complete handmade beer jars, a large brown one located at the northern end of the chamber and a smaller one of black ware deposited at the opposite (southern) end [**Fig. 3.113**]. An iron ring and a group of about nine badly corroded iron arrowheads were also found. Further finds included about 88 beads of different materials such as quartz, agate, faience, and probably ivory or bone. Fragments of beer jars used by the robbers as scrapers/digging

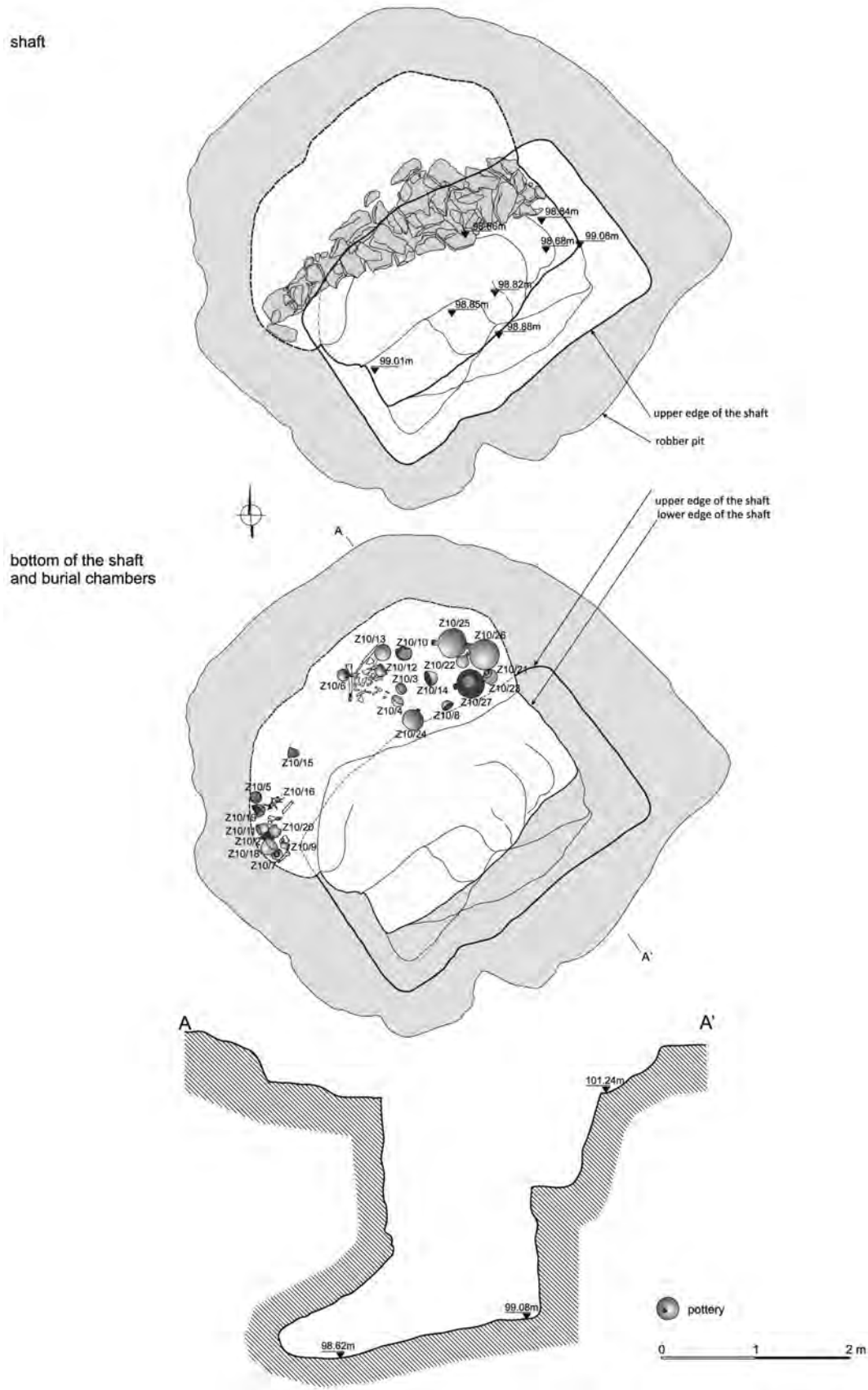


FIGURE 3.107 Tumulus 10, ground plan and cross-section of the burial shaft
DRAWN BY K. OCHNIO, A. BŁASZCZYK, E. KLIMASZEWSKA-DRABOT, M. WYBIERALSKA, DIGITISED BY M. PUSZKARSKI

FIGURE 3.108 Tumulus 10, view of the shaft, showing the disturbed blocking wall of stone slabs
PHOTO BY K. KOTLEWSKI

tools (see Volume II, chapter 4.3) were found in the shaft fill as well as in the burial chamber itself. For more information see Mahmoud El-Tayeb and Czyżewska 2011.

4.3 *Tumulus 18*

Tumulus 18 is a very low, flat-topped mound with a diameter of about 10 m and a preserved height of no more than 0.35 m [**Fig. 3.114**]. Like T.22, this mound is also built from a mixture of earth and fine gravel. Its substructure presented a trapezoidal outline at ground level, measuring 1.30 m/1.20 m (N/S) by 1.30 m/1.90 m (E/W) [**Fig. 3.115**]. This marked the top of a vertical shaft about 1.55 m in depth, provided with a side niche cut into the west wall of the shaft [**Fig. 3.116 left**]. The niche measures 1.80 m × 0.60 m × 0.52 m. Its entrance was originally sealed with large slabs of rough stones that were found dismantled and scattered in the direction of the opposite (east) wall of the shaft. Thus, the burial chamber had been penetrated and badly rifled [**Fig. 3.117**]. Nevertheless, inside the plundered burial chamber the robbers left behind a disarticulated human skeleton and some pottery, namely three bottles, one shallow bowl, two wheel-made cups, and two beer jars, one complete and the other fragmented. For more information see Mahmoud El-Tayeb 2010b, 474–476.

4.4 *Tumulus 19*

Tumulus 19 is a low mound [**Fig. 3.118**] built from earth and fine gravel, surrounded at the base by a stone ring [**Fig. 3.119**]. It has a diameter of about 13.40 m and a maximum preserved height of about 0.47 m. Like the substructure of T.18, the shaft of T.19 also has a trapezoid ground plan and a vertical shaft about 2.34 m deep, provided with one side chamber hewn into its west wall. This niche measures about 1.80 m × 0.83 m × 0.52 m [**Fig. 3.120**]. The entrance to the chamber was blocked with chunks of rough stone that were removed by robbers and piled up against the east wall of the shaft [**Fig. 3.121**].

As a result of looting, the burial chamber was left in a very bad state. The bones of a disarticulated human skeleton were found scattered across the centre of the chamber and its northern side. In addition to the broken pottery recovered from the shaft fill, four different vessels were found in fragmentary state inside the burial chamber. They comprised one handmade cup, one spouted bowl, one wheel-made bowl and one beer jar. The chamber also contained some arrowheads [**Fig. 3.122**]. For more information see Mahmoud El-Tayeb 2010b, 474–476.

FIGURE 3.109 Tumulus 10, view of the central and northern part of the burial chamber, showing disarticulated human skeleton in the middle (top); southern part of the burial chamber with offerings of pottery and animal bones (bottom)
PHOTOS BY K. KOTLEWSKI

FIGURE 3.110 Tumulus 17, view of the superstructure, looking east
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.111 Tumulus 17, the burial shaft and stone slabs of the burial chamber's blocking wall
PHOTO BY O. BIAŁOSTOCKA

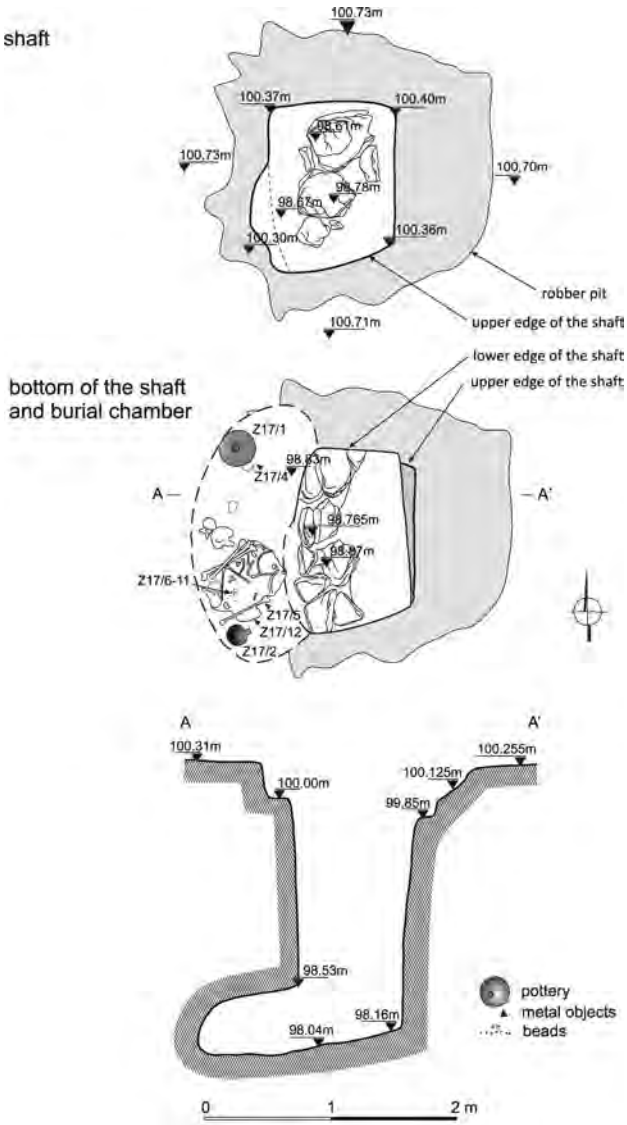


FIGURE 3.112
Tumulus 17, ground plan and cross-section
DRAWN BY E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

4.5 *Tumulus 20*

Tumulus 20 is situated in the central part of the site, in a group of three small tumuli (T.20–T.22) assigned to type III [see **Fig. 1.2**]. This is a round, flat-topped mound with a maximum height of 0.70 m and a diameter of 13.50 m [**Fig. 3.123**]. It is encircled by a stone ring 9 m in diameter [**Fig. 3.124**]. The burial shaft is trapezoidal in plan and its sides are of similar dimensions from top to bottom: 0.85 m (N), 1.20 m (E), 0.90 m (S), 1.50 m (W) [**Fig. 3.125**]. It is 2.58 m deep and was cut into soft, friable sandstone. The burial chamber, oriented north–south, was hewn into the white sandstone bedrock off the west side of the burial shaft. Humidity inside the chamber coupled with the friability of the stone resulted in the collapse of the roof [**Fig. 3.127**]. The chamber had originally been sealed with a wall made from blocks of white sandstone (found in the fill). The bottom course of this wall, which would have been 1.50 m long and approximately 0.80 m wide, consisted of two large sandstone boulders (each about 0.60 m long) [**Fig. 3.126**]. The tomb had evidently been plundered: traces of a robber shaft were observed at the top centre of the mound, encompassing the original shaft and part of the burial chamber. Human bones (including a skull), a substantial number of faience beads and a damaged vessel were found in the fill of the shaft, indicating that the body had been dragged from the chamber during the looting. Inside the chamber, the fill yielded three vessels, an abundance of faience beads and fragmented human bones. For more information see Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 357–360.

FIGURE 3.113 Tumulus 17, view of the burial chamber; inset: the damaged human skeleton
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.114 Tumulus 18, view of the superstructure, looking east
PHOTO BY K. KOTLEWSKI

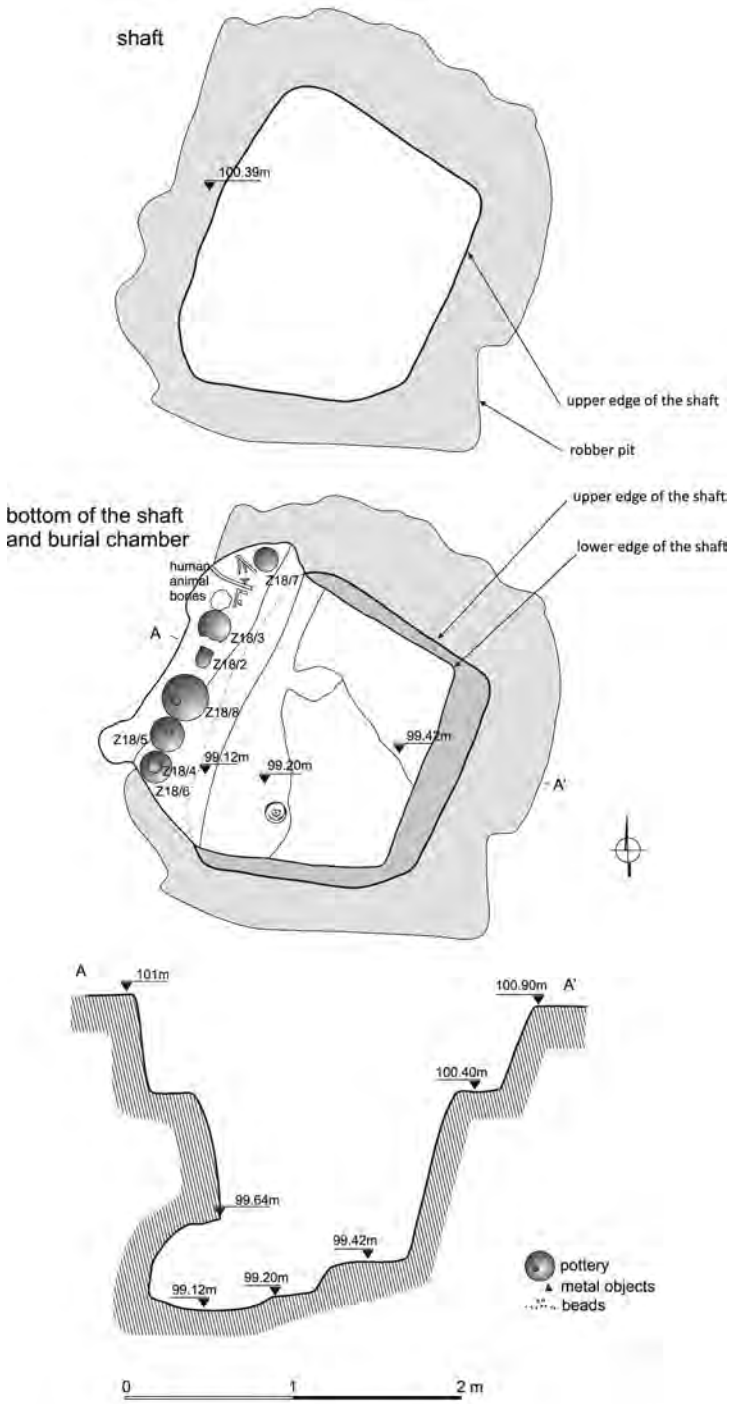


FIGURE 3.115
Tumulus 18, ground plan and cross-section
DRAWN BY E. KLIMASZEWSKA-DRABOT, M. WYBIERALSKA, K. KOTLEWSKI, DIGITISED BY M. PUSZKARSKI

FIGURE 3.116 Tumulus 18, view of the burial shaft, showing the dismantled stone blocking wall and part of the grave goods (left); view of the cleaned shaft (right)
PHOTOS BY K. KOTLEWSKI

FIGURE 3.117 Tumulus 18, view of the burial chamber with grave goods and damaged skeleton
PHOTO BY K. KOTLEWSKI

FIGURE 3.118 Tumulus 19, view of the partly disturbed superstructure, looking east
PHOTO BY K. KOTLEWSKI

FIGURE 3.119 Tumulus 19, view of the stone ring around the superstructure, looking west
PHOTO BY K. KOTLEWSKI

FIGURE 3.120 Tumulus 19, view of the dismantled stone blocking wall at the bottom of the trapezoidal burial shaft
PHOTO BY K. KOTLEWSKI

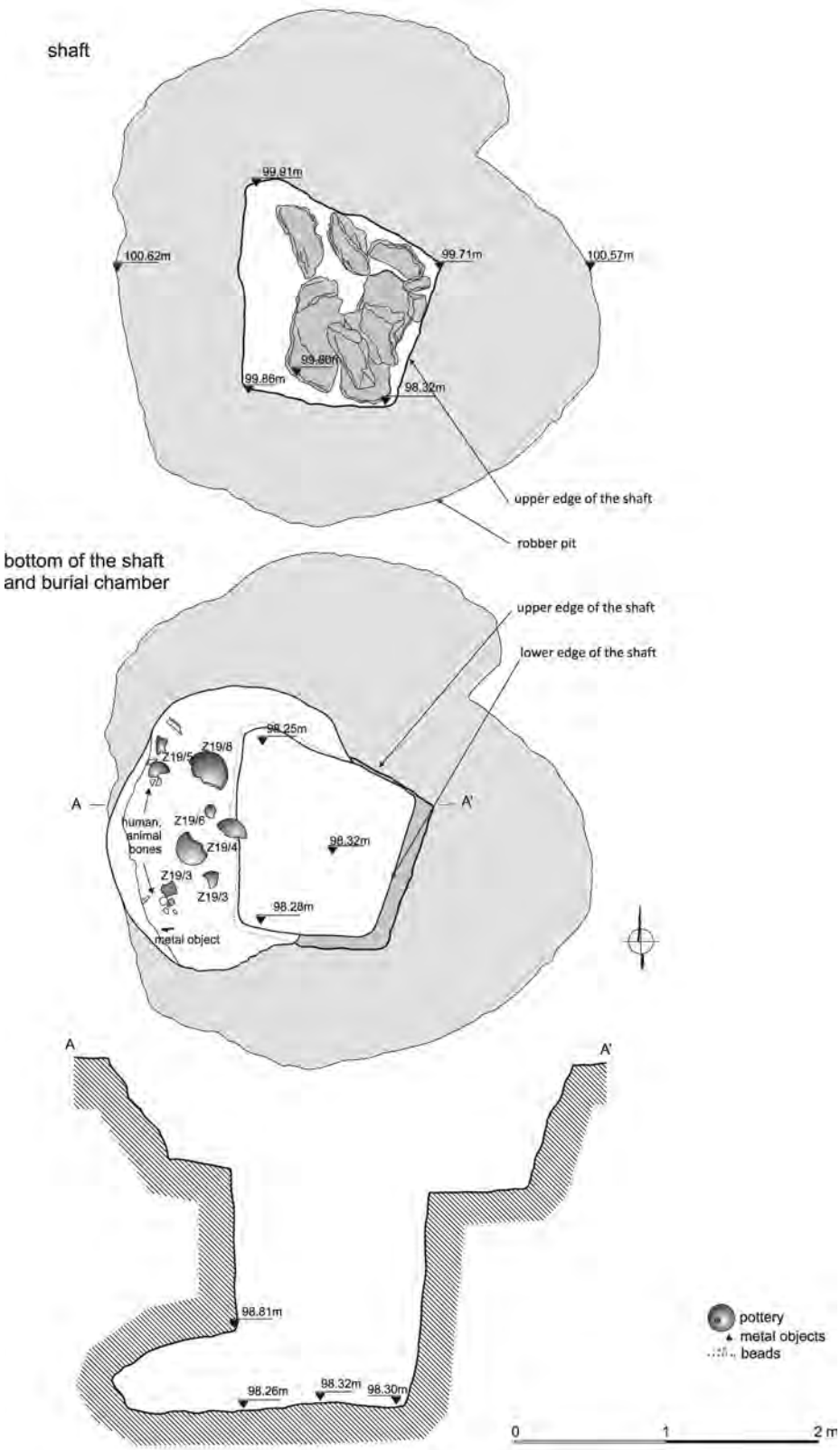


FIGURE 3.121 Tumulus 19, ground plan and cross-section
DRAWN BY A. BŁASZCZYK, K. OCHNIO, DIGITISED BY M. PUSZKARSKI, E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.122 Tumulus 19, view of the plundered burial chamber
PHOTO BY K. KOTLEWSKI

FIGURE 3.123 Tumulus 20, view of the superstructure, looking east
PHOTO BY E. CZYŻEWSKA-ZALEWSKA

4.6 *Tumulus 22*

Tumulus 22 lies roughly in the middle of the cemetery, about 20 m due west of T.23 [see **Fig. 1.2**]. It is a flat-topped mound, built from a mixture of sandy earth and gravel [**Fig. 3.128**]. The perimeter of the tumulus superstructure is demarcated at ground level by one course of rough sandstone chunks. The tumulus has a diameter of about 15 m and a preserved height not exceeding 0.50 m. Like other tumuli of types II and III, this one had also been penetrated from the top.

The substructure of the tumulus appeared to be of a type prevalent in the Dongola Reach between the Third and Fourth Nile Cataracts during Phase I of the Terminal Meroitic period (post-Meroitic Phase I, AD 350–450). It consists of a rectangular, vertical shaft provided with a single burial chamber hewn into the west wall of the shaft. The ground plan of the vertical shaft, which is aligned north-east to south-west, measures 2 m × 1 m, while its maximum depth is about 2.30 m. The burial chamber is cut into the north-west wall of the shaft and mea-

FIGURE 3.124 Tumulus 20, view of the stone ring
PHOTO BY E. CZYŻEWSKA-ZALEWSKA

sures 1.55 m in length by 0.50–0.40 m in width by 0.50 m in height [**Fig. 3.129**]. The large stone slabs that blocked the chamber had been removed and thrown against the south-east wall at the bottom of the shaft [**Fig. 3.130**]. It was evident that the chamber had been badly plundered [**Fig. 3.131**]. A human skeleton had been pulled out of the chamber and discarded against the east wall of the shaft while some of the soft tissues were still intact. This is attested by the fact that parts of the lower limbs were found articulated. Due to the state in which the human remains were found, it is quite hard to establish exactly where the body had originally been deposited. However, examination of the skeleton, the burial chamber, and its contents suggest that the deceased had been interred at the southern end of the chamber. In keeping with the funerary rites of the period, the body would have been laid in contracted position, on its right side with the head pointing south. Grave goods comprise six pottery vessels: two medium-size beer jars and two wheel-made red cups were recorded *in situ* at the northern end of the chamber, while another two red cups were found amongst the human bones at the bottom of the shaft.

It is worth highlighting that the rectangular vertical shaft with a side burial chamber is considered the standard type of burial construction in this region. It was often recorded in east–west alignment with a side niche cut into the south wall of the shaft. Nonetheless, differently aligned shafts and developments in burial niche construction of this same type have been noted at a number of cemetery sites in the Dongola Reach.

Examples were recorded at several sites in this region, including Tanqasi (Shinnie 1954, 66–86), El-Ghaddar (Phillips 1987, 35–41; Żurawski 1987: 41–46), Hammur-Abbassiya (Mahmoud El-Tayeb 1994, 65–79; 2003, 130–139), El-Kassinger Bahry (Paner 1998, 115–132), and Jebel Kulgeili (Ali Mohammed and Hussein 1999, 60–70).

4.7 *Tumulus 27*

Tumulus 27 lies at the far eastern edge of the cemetery. The mound is made from similar materials to those used in the construction of the earlier described tumuli [**Fig. 3.132**]. It has a diameter of about 10.50 m and a preserved height of only 0.67 m [**Fig. 3.133**]. The mound, in particular its western and northern parts, was severely damaged by grave robbers and their unsuccessful attempts to find the shaft. The substructure of the burial presented a trapezoidal outline at ground level marking the top of a vertical shaft with a lateral niche hewn into its west side. Both the shaft and niche were dug into the hard white sandstone which is predominant in this part of the cemetery. The ground plan of the shaft measures 1.20 m/0.95 m (E/W) by 0.85 m/0.90 m (N/S), narrowing slightly towards the

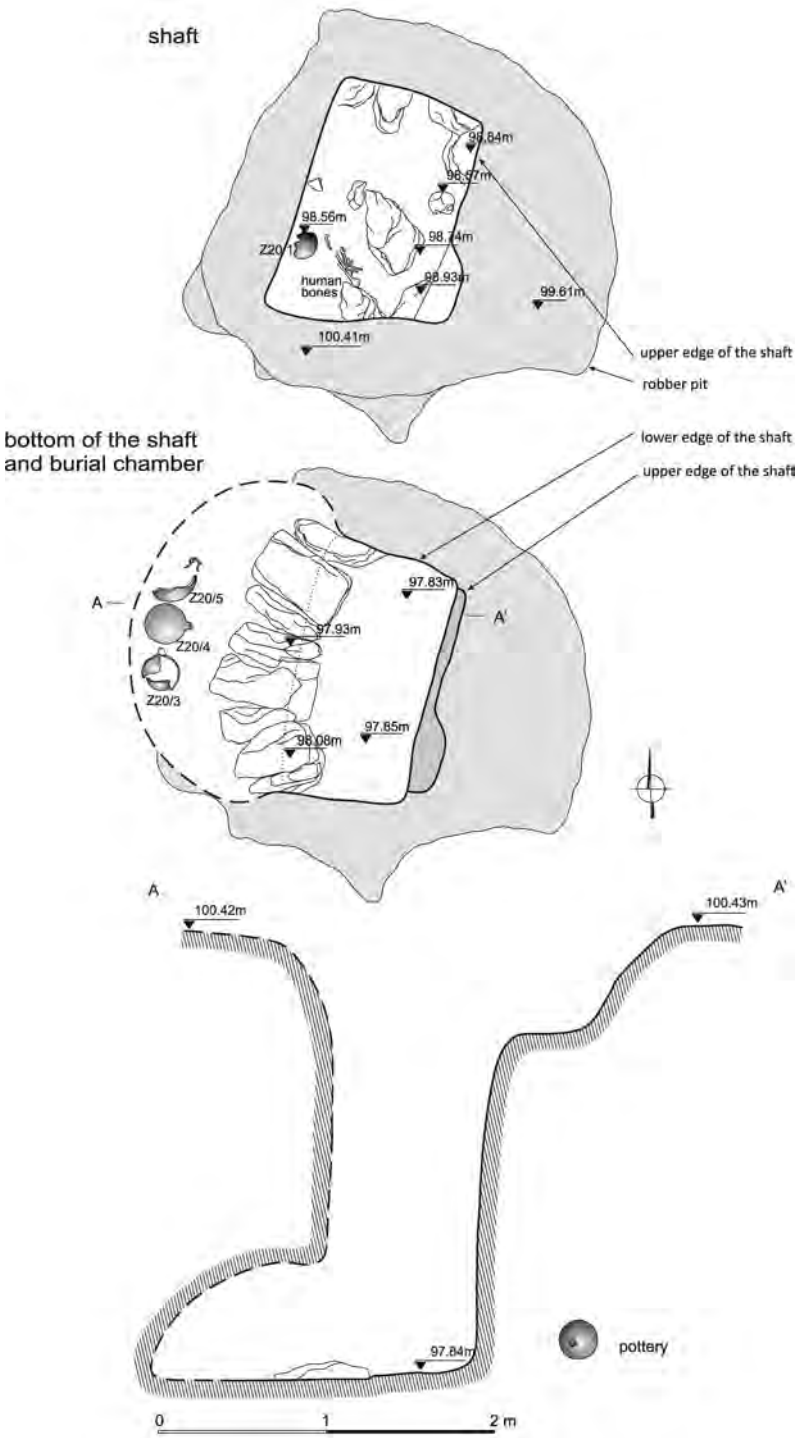


FIGURE 3.125 Tumulus 20, ground plan and cross-section
DRAWN BY K. JUSZCZYK-FUTKOWSKA, E. KLIMASZEWSKA-DRABOT, E. CZYŻEWSKA-ZALEWSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.126 Tumulus 20, view of the dismantled stone blocking wall and human bones pulled out of the burial chamber (top); view of the shaft with wall blocking the entrance to the burial chamber (bottom)
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

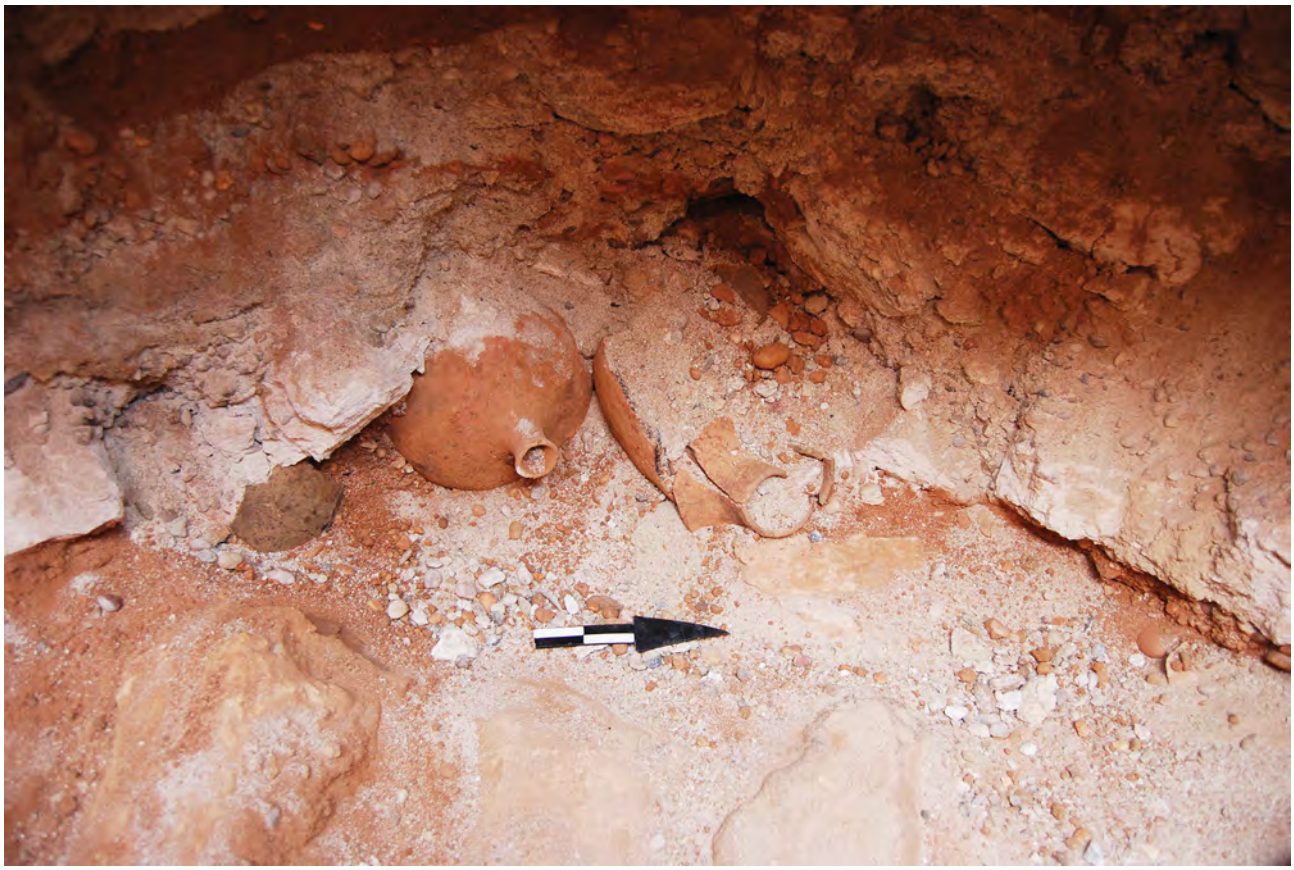


FIGURE 3.127 Tumulus 20, view of the burial chamber with collapsed roof
PHOTO BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.128 Tumulus 22, view of the partially excavated mound showing the stone-ring on the southern side of the superstructure
PHOTO BY MAHMOUD EL-TAYEB

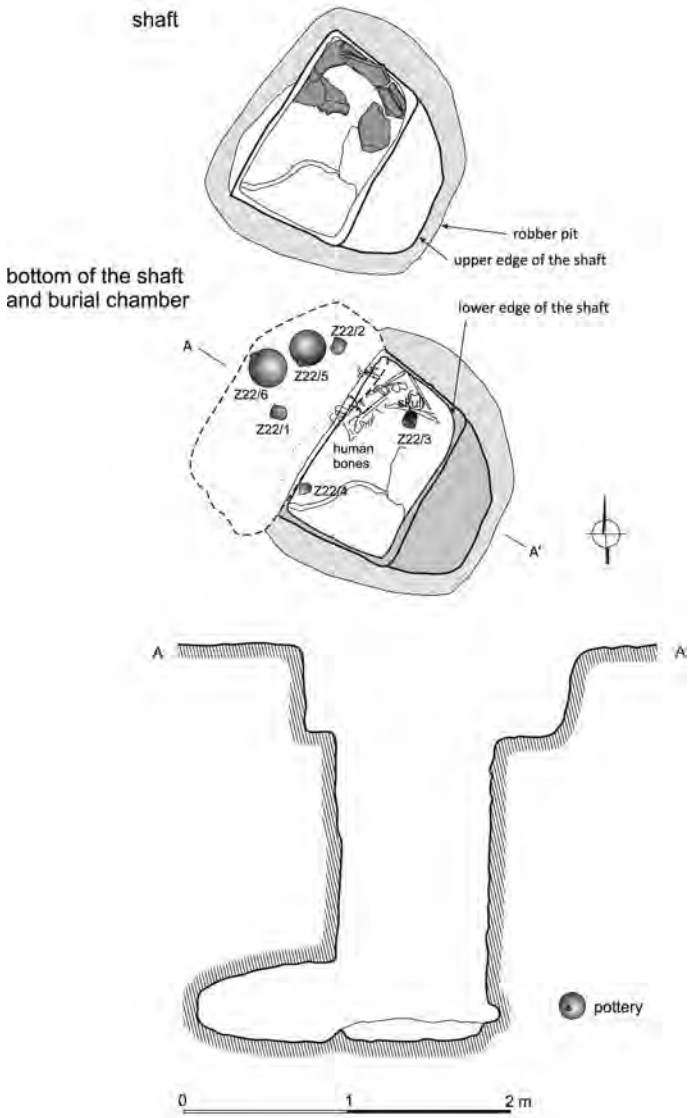


FIGURE 3.129
Tumulus 22, ground plan and cross-section of the tumulus
DRAWN BY A. OBŁUSKI, U. IWASZCZUK, H. KOŹMIŃSKA-SOWA, DIGITISED BY M. PUSZKARSKI, E. CZYŻEWSKA-ZALEWSKA

bottom to about 1.24 m/0.80 m (E/W) by 0.40 m/0.40 m (N/S). The shaft has a maximum depth of no more than 0.90 m, while the burial chamber measures 1.90 m × 0.75 m and is 0.44 m high. This small niche was blocked by large chunks of yellow sandstone, which appear to have been brought from another part of the cemetery. The robbers had only dismantled part of the south-west side of the blocking wall, discarding some of its stones in the shaft, an action that indicates that they had an idea about the burial tradition of the period and so were able to reach their target directly [**Fig. 3.134**].

A single, disarticulated human skeleton was strewn from north to south across the floor of the chamber. Due to the considerable disarray in which the skeleton was found, it is not easy to determine its original position or orientation with any degree of certainty. However, the small size of the chamber suggests that the body may have originally been laid in contracted position on its left side, aligned south–north with the head towards the south [**Fig. 3.135**].

The few objects found in the rifled burial chamber comprised pottery vessels, metal artefacts, and beads. Two vessels were deposited in the chamber: one large handmade beer jar located at the north end, and a small red wheel-made cup at the south end. A number of corroded iron arrowheads, some fragments of unidentified iron objects and a stone archer's ring were scattered amongst the pile of bones. In the same area, and particularly near the damaged skull, 101 beads made of different materials were found along with a faience scarab. The pottery sherds and scraper together with 14 arrowhead fragments recovered from the shaft had probably been dropped there by the grave looters.

FIGURE 3.130 Tumulus 22, the burial shaft with disarticulated human skeleton and some grave goods
PHOTO BY MAHMOUD EL-TAYEB

FIGURE 3.131 Tumulus 22, pottery vessels in the plundered burial chamber
PHOTO BY MAHMOUD EL-TAYEB

FIGURE 3.132 Tumulus 27, view of the superstructure, looking east
PHOTO BY O. BIAŁOSTOCKA

4.8 *Tumulus 21*

Tumulus 21 is located in the central part of the cemetery, within a group of the smallest variety of tumuli (type III). It is a circular, flat-topped mound built from a mixture of earth and gravel. The mound has a diameter of about 12.50 m and a preserved height not exceeding 0.60 m [**Fig. 3.136**]. The excavation revealed that the mound had originally been surrounded by a stone ring about 11.50 m in diameter and about 2.00 m wide at ground level [**Fig. 3.137**]. This form of construction has been noted in all excavated burials of type III. Existence of a depression at the top centre of the mound indicates that the burial was plundered sometime in the past. In making their way to the bottom of the grave, the robbers dug a large, roughly square hole measuring about 2.60 m × 2.55 m [**Fig. 3.138**]. Further cleaning revealed the original shape of the burial shaft [**Fig. 3.139**].

It has a rectangular ground plan with the long axis, unusually, aligned north-east to south-west. Its short sides measure 1.85 m (NE–NW) and 1.90 m (SW–SE), while the long sides measure 2.20 m (NW–SW) and 2.15 m (NE–SE). At a depth of 0.60 m, a single step (in the form of a long bench) about 0.70 m wide is cut along the full length of the NE–SE side of the shaft. The maximum depth of the shaft is 2.60 m. During the course of excavation, sandstone blocks of various sizes were noted at different levels inside the shaft. Amongst the debris one complete vessel was found, indicating that the burial had been rifled. In accordance with the construction tradition of type III tumuli, the vertical shaft was provided with a side niche at the bottom, albeit in an unusual location, as it is hewn into the north side of the NE–SW wall in a SW–NE alignment (usually the burial chamber in type III tumuli is located in the central part of the western wall of the shaft). The burial

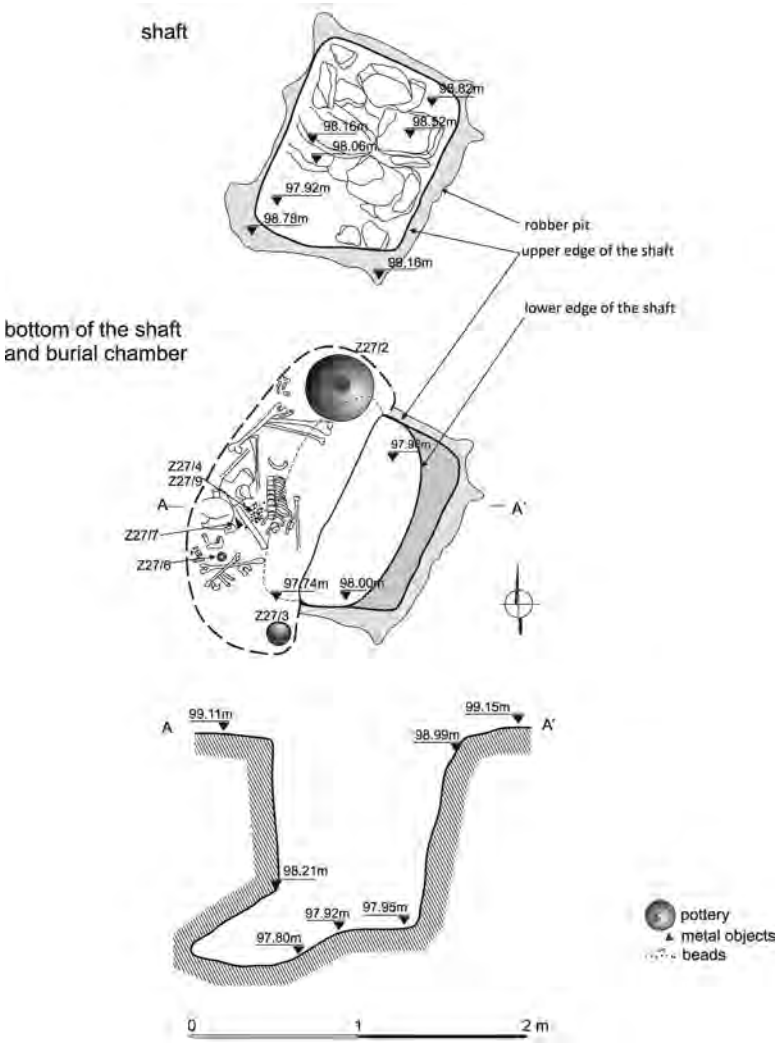


FIGURE 3.133
Tumulus 27, ground plan and cross-section
DRAWN BY K. JUSZCZYK-FUTKOWSKA, E. CZYŻEWSKA-ZALEWSKA, E. KLIMASZEWSKA-DRABOT, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.134 Tumulus 27, dismantled stone blocking wall in the burial shaft
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.135 Tumulus 27, view of the disturbed human skeleton in the central part of the burial chamber, with head to the south
PHOTO BY O. BIAŁOSTOCKA

FIGURE 3.136 Tumulus 21, view of the superstructure, looking east
PHOTO BY R. MAHLER

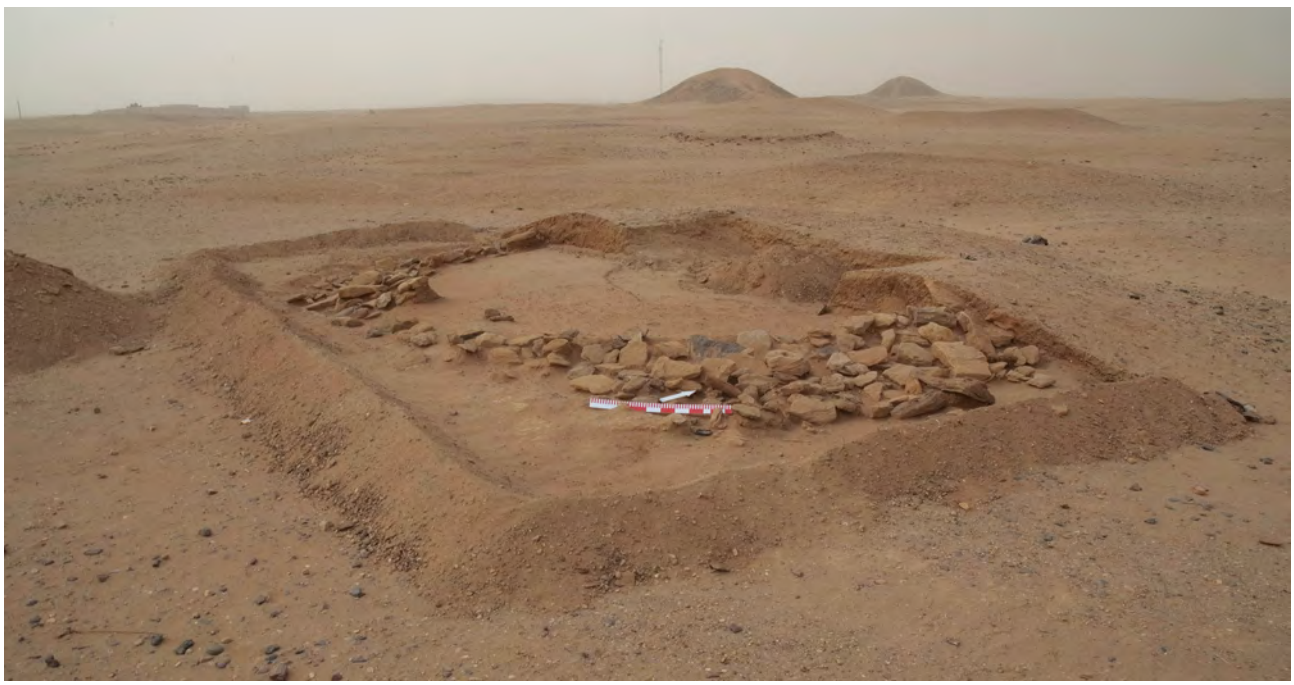


FIGURE 3.137 Tumulus 21, partially excavated superstructure, showing the southern side of the stone ring
PHOTO BY R. MAHLER

chamber measures a maximum of 2.20 m long, 1.15 m wide and about 0.65 m in height. Sandstone blocks of different sizes were used to seal the burial chamber. However, the grave robbers dismantled the south-west side of the blocking wall, subsequently rifling through and destroying the burial. The devastation caused by robber activity, coupled with rising humidity levels, resulted in the southern and central parts of the roof collapsing onto the remains of the burial. Removal of the debris from the disturbed southern side of the chamber led to the discovery of two complete wheel-made, red-slipped, undecorated bowls, located near the entrance to the chamber. This type of red bowl is quite common in the Dongola Reach and represents local production (more examples were found during earlier excavations at El-Ghaddar, Jebel Kulgeili and El-Kassinger Bahry: see Mahmoud El-Tayeb 1994; Ali Mohammed and Hussein 1999; Mahmoud el-Tayeb and Kołosowska 2007). One of the bowls contained some animal bone fragments. At the southern end of the chamber two medium-size beer jars (one a handmade dark ware and the other a wheel-made red-slipped ware, both undecorated) were discovered beneath the debris. All four vessels were found *in situ* [**Fig. 3.140 top and middle**]. Disarticulated and broken human bones mixed with earth

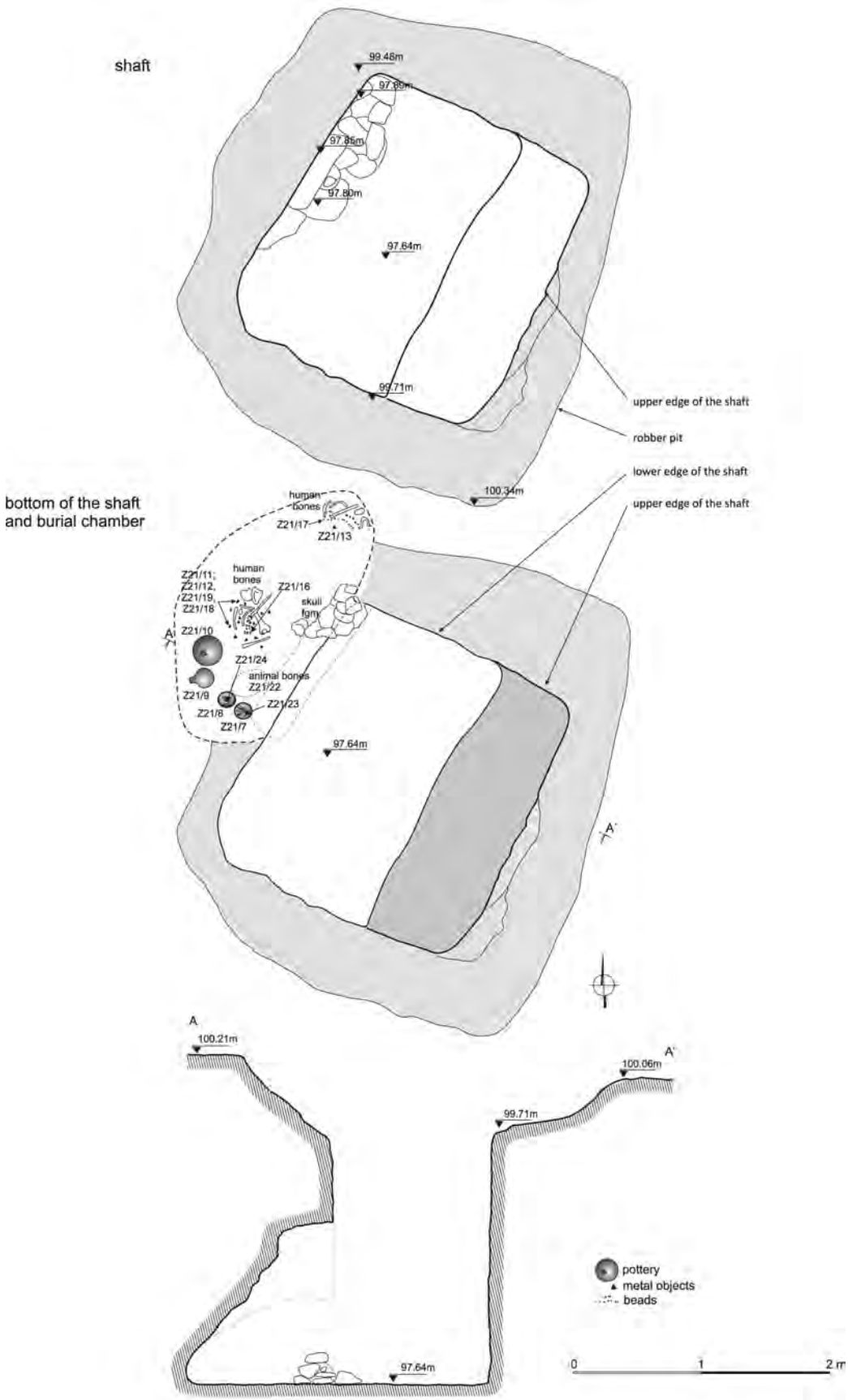


FIGURE 3.138 Tumulus 21, ground plan and cross-section
DRAWN BY A. GŁĄB, E. SKOWROŃSKA, DIGITISED BY U. IWASZCZUK, E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.139 Tumulus 21, view of the burial shaft with partially dismantled stone blocking wall (PHOTO BY R. MAHLER)

and debris were noted in two heaps located in the centre and at the northern end of the burial chamber. The bone fragments recovered from both parts of the chamber were intermingled with a number of small finds. These comprise objects made of iron: about ten arrowheads and fragments of two rings, all of them badly corroded. Two small rings made of copper alloy were also noted amongst the finds; one of them was found on a toe bone [**Fig. 3.140 bottom**]. Other finds included approximately 110 small beads made of different materials, such as faience, agate, and quartz. The poor condition of the human skeleton made it difficult to determine the original position of the body. Given the burial customs of the period, one would assume that the body would have been laid in a contracted position, on its left or right side, with the head to the south. In this case, however, the disarticulated head was found at the south-east side of the chamber. The aforementioned assumption stems from the fact that the smashed skull and some fragments of the upper limbs were noted in the centre, while bones of the lower limbs were found at the northern end of the chamber. The deposition of vessels containing offerings of food and drink at the south end of the chamber, usually above or around the head area, is a practice consistent with a well-known tradition of this period (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 117–119).

4.9 *Tumulus 28*

This very low and badly plundered tumulus is located on the eastern fringe of the burial ground. The remains of the disturbed mound show that it was built from a mixture of earth and gravel [**Fig. 3.141**]. The rounded tumulus has a diameter of 13.00–13.20 m and features a slight depression at its top centre. Its maximum height is only about 0.60 m.

In an effort to avoid wind erosion, the mound was excavated by dissecting it into north and south parts. Cleaning the southern part revealed traces of a robber pit in the centre of the tumulus, which had filled with windblown sand. It also came to light that the mound had originally been demarcated on the ground surface by large sandstone slabs. The construction of a stone ring around the perimeter of the mound is a practice repeatedly documented in the construction of type III burials at the El-Zuma cemetery.

The substructure comprises a rectangular, vertical shaft [**Fig. 3.142**] with two side chambers at the bottom. The

FIGURE 3.140 Tumulus 21, view of beer jars located at the southern end of the chamber (top and middle); view of the bronze ring on a human foot phalanx (bottom)
PHOTOS BY R. MAHLER

FIGURE 3.141 Tumulus 28, view of the superstructure, looking east
PHOTO BY R. HAJDUGA

FIGURE 3.142 Tumulus 28, trapezoidal shaft with stone blocking wall of the burial chamber on the western side
PHOTO BY R. HAJDUGA

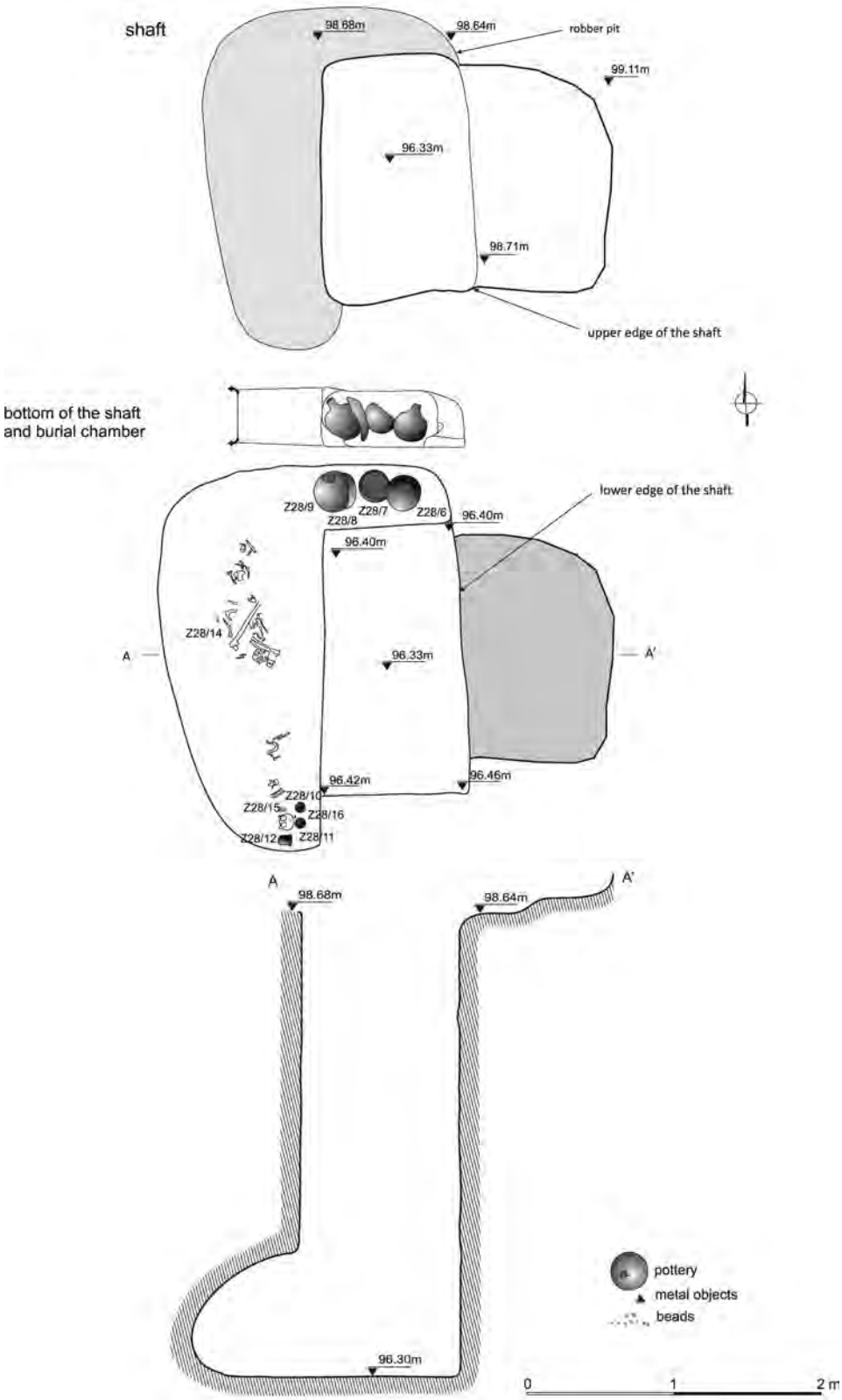


FIGURE 3.143 Tumulus 28, ground plan and cross-section
DRAWN BY R. HAJDUGA, DIGITISED BY J. BROCHOCKI, E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.144 Tumulus 28, view of the disturbed skeleton in the main, western, burial chamber (top); view of offerings in the additional, northern, niche (bottom)
PHOTOS BY R. HAJDUGA

main one is hewn into the long west wall of the shaft, while a small secondary niche is cut into the short northern wall [**Fig. 3.143**].

The sides of the rectangular shaft measure 1.92 m (W), 1.74 m (E), 0.96 m (N) and 1.40 m (S), and it has a maximum depth of 3.10 m from the original ground surface. At the bottom of the shaft the two aforementioned chambers were found sealed with large, rough stone slabs. However, careful cleaning of the stone blocking wall revealed that the main (western) burial chamber had been accessed through a hole made in its south-west side, while the part of the blocking wall on the short northern side was found completely untouched by the robbers.

During excavation some broken fragments of human bones were noted in the south-west corner of the shaft. Furthermore, a small bottle, a cup and three bowl sherds were found scattered within the shaft fill, in addition to about 30 faience beads and one made of glass. These finds obviously attest to the fact that the chamber had been rifled.

The main chamber measures about 1.92 m in length, 1.15 m in width, and 0.80 m in height. As mentioned above, the chamber had been broken into through a robber hole on its south-west side. In consequence the interior was found in great disorder, with a single disarticulated human skeleton strewn across the floor. The skull and part of the upper limbs were found at the southern end of the chamber [**Fig. 3.144 top**]. Near them three wheel-made red cups, as well as some ostrich eggshell and faience, stone and glass beads were recorded. A pile of ribs, a mandible, and vertebra fragments, plus one highly corroded metal item (probably part of a knife) were located in the centre. Part of the lower limbs, pelvis, and foot bones were found in the north-west corner of the chamber. These discoveries suggest that the inhumation had followed the well-established canon of burial rites of the Terminal Meroitic period (also referred to as the post-Meroitic period), where the body was buried in a contracted position, head due south, facing east. This tradition was commonly noted in burials designated as type III at the El-Zuma cemetery.

The secondary chamber [**Fig. 3.144 bottom**], which is hewn into the short northern side of the shaft, measures about 0.95 m in length, 0.47 m in width, and 0.40 m in height. This small niche, which was found intact, was reserved for grave offerings. It contained four complete vessels: two handmade medium-size beer jars (bottles), one handmade cooking pot and one large, slightly concave dish (Arabic: *gadah*).

5 List of Grave Goods

5.1 *List of Grave Goods Excavated in Type I Tumuli*

Grave goods excavated in tumulus 2

Tunnel:
- *pottery*—Z2/40

Chamber 2:
- *pottery*—Z2/6, Z2/9–16, Z2/18–30, Z2/32–35, Z2/37 (see Volume II, Chapter 7 and Fig. 7.135)

Chamber 3:
- *pottery*—Z2/1–5, Z2/7–8, Z2/17, Z2/31, Z2/36, Z2/38–39 (see Volume II, Chapter 7 and Fig. 7.135)

Grave goods excavated in tumulus 3

External shaft of tunnel:
- *pottery*—Z3/4, Z3/6–7 (see Volume II, Chapter 7 and Fig. 7.136)

Tunnel:
- *pottery*—Z3/1–3, Z3/5, Z3/18 (see Volume II, Chapter 7 and Fig. 7.136)
- *ornaments*—Z3/8–9 (see Volume III, Chapters 4–5)
- *wood fragments*—Z3/10, Z3/14–15 (see Volume III, Chapter 18)

Chamber 1:
- *other metal items*—Z3/17 (see Volume III, Chapter 18)
- *wood fragments*—Z3/12 (see Volume III, Chapter 18)

Chamber 2:
- *pottery*—Z3/19 (see Volume II, Chapter 7 and Fig. 7.136)
- *other metal items*—Z3/11 (see Volume III, Chapter 18)
- *stone*—Z3/13 (see Volume III, Chapter 18)

Grave goods excavated in tumulus 5

Superstructure:
- *pottery*—Z5/1–2, Z5/31–37, Z5/42 (see Volume II, Chapter 7 and Fig. 7.137)

Sondage (S side of tumulus):
- *pottery*—Z5/17, Z5/38 (see Volume II, Chapter 7 and Fig. 7.137)

Shaft:
- *ornaments*—Z5/13 (see Volume III, Chapters 4–5)

Tunnel:
- *pottery*—Z5/18–22, Z5/39–41, Z5/43 (see Volume II, Chapter 7 and Fig. 7.137)
- *burial equipment*—Z5/15–16, Z5/23–26 (see Volume III, Chapter 17)
- *ornaments*—Z5/29 (see Volume III, Chapters 4–5)
- *other metal items*—Z5/27–28 (see Volume III, Chapter 18)
- *miscellaneous*—Z5/9 (see Volume III, Chapter 18)

Chamber 1:
- *pottery*—Z5/3–4, Z5/14, Z5/30 (see Volume II, Chapter 7 and Fig. 7.137)

ornaments—Z5/7–8, Z5/10 (see Volume III, Chapters 4–5)
burial equipment—Z5/11–12 (see Volume III, Chapter 17)
Chamber 2:
pottery—Z5/5–6 (see Volume II, Chapter 7 and Fig. 7.137)

Grave goods excavated in tumulus 8
Tunnel:
pottery—Z8/1, Z8/3–4, Z8/6–7 (see Volume II, Chapter 7 and Fig. 7.138)
burial equipment—Z8/8–9 (see Volume III, Chapter 17)
Chamber 1:
pottery—Z8/2, Z8/5 (see Volume II, Chapter 7 and Fig. 7.138)
ornaments—Z8/10 (see Volume III, Chapters 4–5)

Grave goods excavated in tumulus 1
Superstructure:
pottery—Z1/12–13
Shaft:
pottery—Z1/1–11, Z1/16, Z1/21 (see Volume II, Chapter 7 and Fig. 7.139)
organic material—Z1/14 (see Volume III, Chapter 18)
red brick—Z1/15
Tunnel:
pottery—Z1/17–20, Z1/22–26 (see Volume II, Chapter 7 and Fig. 7.139)
ornaments—Z1/27 (see Volume III, Chapters 4–5)
Chamber 1:
pottery—Z1/28, Z1/31 (see Volume II, Chapter 7 and Fig. 7.139)
ornaments—Z1/30, Z1/32–33 (see Volume III, Chapters 4–5)
burial equipment—Z1/29, Z1/34–38 (see Volume III, Chapter 17)

Grave goods excavated in tumulus 4
External shaft:
pottery—Z4/1 (see Volume II, Chapter 7 and Fig. 7.140)
Tunnel:
pottery—Z4/2, Z4/4, Z4/10, Z4/14, Z4/29–35, Z4/58–66, Z4/77–80, Z4/132–135, Z4/181–182, Z4/196–202, Z4/219–220, Z4/223–256 (see Volume II, Chapter 7 and Fig. 7.140)
ornaments—Z4/3, Z4/11–13, Z4/23, Z4/45–54, Z4/82, Z4/84–85, Z4/89, Z4/95–98, Z4/105–106, Z4/108, Z4/113–131, Z4/136–141, Z4/144–179, Z4/206–207, Z4/209–213, Z4/257 (see Volume III, Chapters 4–5)
burial equipment—Z4/7, Z4/16–17, Z4/19, Z4/22, Z4/26, Z4/72, Z4/74–75, Z4/83, Z4/92, Z4/143, Z4/189 (see Volume III, Chapter 17)
weaponry—Z4/24, Z4/28, Z4/56, Z4/87–88, Z4/107, Z4/194, Z4/216 (see Volume III, Chapter 14)
belt elements—Z4/20, Z4/81 (see Volume III, Chapter 15)
other metal items—Z4/18, Z4/21, Z4/25, Z4/27, Z4/68, Z4/73, Z4/86, Z4/90–91, Z4/93–94, Z4/142, Z4/215 (see Volume III, Chapter 18)
organic material—Z4/69–70, Z4/100, Z4/184, Z4/192, Z4/208, Z4/214 (see Volume III, Chapter 18)

Grave goods excavated in tumulus 6
External shaft and tunnel:
pottery—Z6/7, Z6/11–15, Z6/17, Z6/19, Z6/24–26, Z6/38, Z6/40 (see Volume II, Chapter 7 and Fig. 7.141)
Tunnel:
pottery—Z6/1–3, Z6/6, Z6/16, Z6/18, Z6/20–23, Z6/27–37, Z6/39, Z6/41–58 (see Volume II, Chapter 7 and Fig. 7.141)
miscellaneous—Z6/4–5 (see Volume III, Chapter 18)

Grave goods excavated in tumulus 7
Superstructure:
pottery—Z7/13, Z7/20–21, Z7/23–24 (see Volume II, Chapter 7 and Fig. 7.142)
External shaft:
pottery—Z7/17, Z7/25–40, Z7/41–44, Z7/46–48, Z7/54, Z7/85–93 (see Volume II, Chapter 7 and Fig. 7.142)
ornaments—Z7/79 (see Volume III, Chapters 4–5)
Tunnel:
pottery—Z7/11–12, Z7/14, Z7/22, Z7/49–53, Z7/55–65, Z7/67–75 (see Volume II, Chapter 7 and Figs. 7.142–7.143)
wood fragments—Z7/45, Z7/66, Z7/76–78, Z7/81–83 (see Volume III, Chapter 18)
ornaments—Z7/5, Z7/7, Z7/8–10, Z7/15–16, Z7/66bis (see Volume III, Chapters 4–5)
burial equipment—Z7/1, Z7/19 (see Volume III, Chapter 17)
weaponry—Z7/2–4 (see Volume III, Chapter 14)
other metal items—Z7/5, Z7/6, Z7/18 (see Volume III, Chapter 18)

5.2 *List of Grave Goods Excavated in Type II Tumuli*

Grave goods excavated in tumulus 12
Superstructure:
pottery—Z12/1, Z12/3 (see Volume II, Chapter 7 and Fig. 7.144)
ornaments—Z12/2 (see Volume III, Chapter 4)
Shaft:
pottery—Z12/5–27, Z12/30–53, Z12/59–66, Z12/68–70, Z12/83–85, Z12/134–138 (see Volume II, Chapter 7 and Figs. 7.144–7.146)
weaponry—Z12/54–55 (see Volume III, Chapter 14)
Chamber 1:
pottery—Z12/71–81 (see Volume II, Chapter 7 and Fig. 7.147)
ornaments—Z12/82 (see Volume III, Chapter 4)
Chamber 2:
pottery—Z12/129–133 (see Volume II, Chapter 7 and Fig. 7.147)

Chamber 3:
pottery—Z12/86–127 (see Volume II, Chapter 7 and Fig. 7.148)

Grave goods excavated in tumulus 13
Superstructure:
pottery—Z13/39–40 (see Volume II, Chapter 7 and Fig. 7.149)
Shaft:
pottery—Z13/2–3, Z13/7–9, Z13/22, Z13/37–38, Z13/41 (see Volume II, Chapter 7 and Fig. 7.149)
ornaments—Z13/2–3 (see Volume III, Chapter 4)
burial equipment—Z13/1, Z13/4, Z13/6 (see Volume III, Chapter 17)
weaponry—Z13/5 (see Volume III, Chapter 14)
Chamber 2:
pottery—Z13/16–21, Z13/23 (see Volume II, Chapter 7 and Fig. 7.149)
Chamber 3:
pottery—Z13/24–28, Z13/35 (see Volume II, Chapter 7 and Fig. 7.149)
Chamber 4:
pottery—Z13/12–14 (see Volume II, Chapter 7 and Fig. 7.149)
ornaments—Z13/29–34, Z13/36 (see Volume III, Chapters 4–5)
organic material/textile—Z13/15 (see Volume III, Chapter 18)
Chamber 5:
pottery—Z13/10–11 (see Volume II, Chapter 7 and Fig. 7.149)

Grave goods excavated in tumulus 14
Superstructure:
pottery—Z14/1 (see Volume II, Chapter 7 and Fig. 7.150)
Shaft:
pottery—Z14/2–4, Z14/33–34 (see Volume II, Chapter 7 and Fig. 7.150)
red brick—Z14/35
Chamber 1:
pottery—Z14/14–21 (see Volume II, Chapter 7 and Fig. 7.150)
burial equipment—Z14/31–32 (see Volume III, Chapter 17)
Chamber 2:
pottery—Z14/22–30 (see Volume II, Chapter 7 and Fig. 7.150)
Chamber 3:
pottery—Z14/5–13 (see Volume II, Chapter 7 and Fig. 7.150)

Grave goods excavated in tumulus 15
Superstructure:
pottery—Z15/1 (see Volume II, Chapter 7 and Fig. 7.151)
Shaft:
pottery—Z15/2–8, Z15/16–24 (see Volume II, Chapter 7 and Fig. 7.151)
ornaments—Z15/9–10, Z15/13, Z15/33 (see Volume III, Chapters 4–5)
burial equipment—Z15/11–12, Z15/29 (see Volume III, Chapter 17)
Chamber 1:
pottery—Z15/43–53, Z15/56, Z15/59, Z15/61 (see Volume II, Chapter 7 and Fig. 7.151)
burial equipment—Z15/55 (see Volume III, Chapter 17)
Chamber 2:
pottery—Z15/25–28, Z15/34–38 (see Volume II, Chapter 7 and Fig. 7.152)

Grave goods excavated in tumulus 23
Shaft:
pottery—Z23/1, Z23/32–34, Z23/41–43 (see Volume II, Chapter 7 and Fig. 7.153)
Chamber 1:
pottery—Z23/2–4, Z23/6–7, Z23/11–12, Z23/23–25, Z23/31, Z23/35, Z23/37–38, Z23/40 (see Volume II, Chapter 7 and Fig. 7.153)
Chamber 2:
pottery—Z23/5, Z23/8–10, Z23/13–22, Z23/26–30, Z23/36, Z23/39 (see Volume II, Chapter 7 and Fig. 7.153)

Grave goods excavated in tumulus 24
Superstructure:
pottery—Z24/1, Z24/2, Z24/51 (see Volume II, Chapter 7 and Fig. 7.154)
stone—Z24/47
fossil—Z24/50
Shaft:
pottery—Z24/3, Z24/5, Z24/7–8, Z24/11–15, Z24/24, Z24/26–30, Z24/34, Z24/41, Z24/45 (see Volume II, Chapter 7 and Fig. 7.154)
ornaments—Z24/4, Z24/48–49 (see Volume III, Chapters 4–5)
weaponry—Z24/6 (see Volume III, Chapter 14)
Chamber 1:
pottery—Z24/17–23, Z24/25, Z24/33, Z24/35–36, Z24/42–43, Z24/53 (see Volume II, Chapter 7 and Fig. 7.154)
ornaments—Z24/46, Z24/55 (see Volume III, Chapters 4–5)
other metal items—Z24/16, Z24/32, Z24/38, Z24/44 (see Volume III, Chapter 18)
burial equipment—Z24/31, Z24/52, Z24/54 (see Volume III, Chapter 17)
Chamber 2:
pottery—Z24/10 (see Volume II, Chapter 7 and Fig. 7.154)
other metal items—Z24/9 (see Volume III, Chapter 18)
Chamber 3:
pottery—Z24/37, Z24/39 (see Volume II, Chapter 7 and Fig. 7.155)
Chamber 4:
pottery—Z24/40 (see Volume II, Chapter 7 and Fig. 7.155)

Grave goods excavated in tumulus 25

Shaft:
- *pottery*—Z25/1–2, Z25/37–42 (see Volume II, Chapter 7 and Fig. 7.156)

Chamber 1:
- *pottery*—Z25/3–5, Z25/33–36 (see Volume II, Chapter 7 and Fig. 7.156)

Chamber 2:
- *pottery*—Z25/6–15, Z25/32 (see Volume II, Chapter 7 and Fig. 7.156)

Chamber 3:
- *pottery*—Z25/16–31 (see Volume II, Chapter 7 and Fig. 7.156)

Grave goods excavated in tumulus 26

Shaft:
- *pottery*—Z26/36, Z26/39–41, Z26/53, Z26/60–71 (see Volume II, Chapter 7 and Fig. 7.157)
- *ornaments*—Z26/1 (see Volume III, Chapter 4)
- *burial equipment*—Z26/2 (see Volume III, Chapter 17)

Chamber 1:
- *pottery*—Z26/11–12, Z26/14–16, Z26/31–33, Z26/37–38, Z26/44, Z26/47–48, Z26/51–52, Z26/58–59, Z26/84 (see Volume II, Chapter 7 and Fig. 7.158)
- *ornaments*—Z26/6 (see Volume III, Chapter 4)
- *burial equipment*—Z26/3, Z26/7–8, Z26/10 (see Volume III, Chapter 17)
- *other metal items*—Z26/9, Z26/89, Z26/91 (see Volume III, Chapter 18)
- *wood fragments*—Z26/90, Z26/92, Z26/93 (see Volume III, Chapter 18)

Chamber 2:
- *pottery*—Z26/19, Z26/21–30, Z26/42–43, Z26/45–46, Z26/50, Z26/54–57, Z26/72, Z26/75–76, Z26/79, Z26/81, Z26/83, Z26/87–88 (see Volume II, Chapter 7 and Fig. 7.158)

Chamber 3:
- *pottery*—Z26/17, Z26/34–35, Z26/49 (see Volume II, Chapter 7 and Fig. 7.158)
- *organic material/textile*—Z26/4–5 (see Volume III, Chapter 18)

Chamber 4:
- *pottery*—Z26/13, Z26/18, Z26/20, Z26/73–74, Z26/77–78, Z26/80, Z26/82, Z26/85–86 (see Volume II, Chapter 7 and Fig. 7.158)

Grave goods excavated in tumulus 16

Superstructure:
- *stone artefacts/objects*—Z16/13 (see Volume III, Chapter 18)

Shaft:
- *pottery*—Z16/1, Z16/38–43 (see Volume II, Chapter 7 and Fig. 7.159)
- *ornaments*—Z16/5 (see Volume III, Chapter 4)
- *weaponry*—Z16/4, Z16/6–12, Z16/14–17 (see Volume III, Chapter 14)

Chamber 1:
- *pottery*—Z16/2, Z16/3 (see Volume II, Chapter 7 and Fig. 7.159)
- *ornaments*—Z16/19–25 (see Volume III, Chapter 4)
- *organic material*—Z16/18 unidentified small organic fragment
- *burial equipment*—Z16/28–30, Z16/32–35 (see Volume III, Chapter 17)
- *weaponry*—Z16/26–27, Z16/31, Z16/37 (see Volume III, Chapter 14)
- *belt elements*—Z16/36 (see Volume III, Chapter 15)

Grave goods excavated in tumulus 9

Superstructure:
- *pottery*—Z9/22–23, Z9/34 (see Volume II, Chapter 7 and Fig. 7.160)

Shaft:
- *pottery*—Z9/1, Z9/2, Z9/24–33, Z9/35 (see Volume II, Chapter 7 and Fig. 7.160)
- *ornaments*—Z9/8–10 (see Volume III, Chapter 4)
- *burial equipment*—Z9/11–12 (see Volume III, Chapter 17)

Chamber 1:
- *pottery*—Z9/6–7, Z9/21 (see Volume II, Chapter 7 and Fig. 7.160)
- *ornaments*—Z9/13–17 (see Volume III, Chapter 4)
- *burial equipment*—Z9/18–20 (see Volume III, Chapter 17)

Chamber 2:
- *pottery*—Z9/4–5 (see Volume II, Chapter 7 and Fig. 7.160)

Chamber 3:
- *pottery*—Z9/3 (see Volume II, Chapter 7 and Fig. 7.160)

Grave goods excavated in tumulus 11

Superstructure:
- *pottery*—Z11/37–48, Z11/53–54 (see Volume II, Chapter 7 and Fig. 7.161)

Shaft:
- *pottery*—Z11/1–5, Z11/50–51 (see Volume II, Chapter 7 and Fig. 7.161)
- *red brick*—Z11/49

Chamber 1:
- *pottery*—Z11/6–15, Z11/52 (see Volume II, Chapter 7 and Fig. 7.161)
- *ornaments*—Z11/31 (see Volume III, Chapter 4)
- *burial equipment*—Z11/33 (see Volume III, Chapter 17)
- *weaponry*—Z11/32 (see Volume III, Chapter 14)
- *other metal items*—Z11/36 (see Volume III, Chapter 18)

Chamber 2:
- *pottery*—Z11/16–30, Z11/34–35 (see Volume II, Chapter 7 and Fig. 7.161)

5.3 *List of Grave Goods Excavated in Type III Tumuli*

Grave goods excavated in tumulus 10

Shaft:
- *pottery*—Z10/54–57 (see Volume II, Chapter 7 and Fig. 7.162)

Burial chamber:
- *pottery*—Z10/1–29 (see Volume II, Chapter 7 and Fig. 7.162)
- *ornaments*—Z10/40, Z10/46, Z10/50–52 (see Volume III, Chapters 4–5)
- *weaponry*—Z10/30, Z10/32–39, Z10/41–44, Z10/47–49, Z10/53 (see Volume III, Chapter 14)
- *other metal items*—Z10/31 (see Volume III, Chapter 14)
- *scabbards and belt fittings*—Z10/45 (see Volume III, Chapter 15)

Grave goods excavated in tumulus 17

Superstructure:
- *pottery*—Z17/13 (see Volume II, Chapter 7 and Fig. 7.163)

Burial chamber:
- *pottery*—Z17/1–3 (see Volume II, Chapter 7 and Fig. 7.163)
- *ornaments*—Z17/4, Z17/6–11 (see Volume III, Chapter 4)
- *weaponry*—Z17/5, Z17/12 (see Volume III, Chapter 14)

Grave goods excavated in tumulus 18

Superstructure:
- *pottery*—Z18/13 (see Volume II, Chapter 7 and Fig. 7.164)

Shaft:
- *pottery*—Z18/1, Z18/14 (see Volume II, Chapter 7 and Fig. 7.164)
- *ornaments*—Z18/9, Z18/11–12 (see Volume III, Chapter 4)

Burial chamber:
- *pottery*—Z18/2–8 (see Volume II, Chapter 7 and Fig. 7.164)
- *ornaments*—Z18/10 (see Volume III, Chapter 4)

Grave goods excavated in tumulus 19

Superstructure:
- *pottery*—Z19/1, Z19/9–12 (see Volume II, Chapter 7 and Fig. 7.165)
- *stone*—Z19/15

Shaft:
- *pottery*—Z19/2–3, Z19/13–14 (see Volume II, Chapter 7 and Fig. 7.165)

Burial chamber:
- *pottery*—Z19/4–6, Z19/8 (see Volume II, Chapter 7 and Fig. 7.165)
- *weaponry*—Z19/7 (see Volume III, Chapter 14)

Grave goods excavated in tumulus 20

Superstructure:
- *ornaments*—Z20/12 (see Volume III, Chapter 4)

Shaft:
- *pottery*—Z20/1–2, Z20/13–15 (see Volume II, Chapter 7 and Fig. 7.166)
- *ornaments*—Z20/6–9 (see Volume III, Chapter 4)

Burial chamber:
- *pottery*—Z20/3–5 (see Volume II, Chapter 7 and Fig. 7.166)
- *ornaments*—Z20/10–11 (see Volume III, Chapter 4)

Grave goods excavated in tumulus 22

Superstructure:
- *stone*—Z22/8

Shaft:
- *pottery*—Z22/3–4 (see Volume II, Chapter 7 and Fig. 7.167)
- *ornaments*—Z22/9 (see Volume III, Chapter 4)
- *weaponry*—Z22/7 (see Volume III, Chapter 14)

Burial chamber:
- *pottery*—Z22/1–2, Z22/5–6 (see Volume II, Chapter 7 and Fig. 7.167)

Grave goods excavated in tumulus 27

Superstructure:
- *pottery*—Z27/12 (see Volume II, Chapter 7 and Fig. 7.168)

Shaft:
- *pottery*—Z27/11 (see Volume II, Chapter 7 and Fig. 7.168)
- *weaponry*—Z27/1 (see Volume III, Chapter 14)

Burial chamber:
- *pottery*—Z27/2–3 (see Volume II, Chapter 7 and Fig. 7.168)
- *ornaments*—Z27/4–5, Z27/9 (see Volume III, Chapter 4)
- *weaponry*—Z27/6–7, Z27/10 (see Volume III, Chapter 14)
- *organic materials*—Z27/8 unidentified organic fragments (see Volume III, Chapter 14)

Grave goods excavated in tumulus 21

Superstructure:
- *pottery*—Z21/1–2, Z21/26–28 (see Volume II, Chapter 7 and Fig. 7.169)

Shaft:
- *pottery*—Z21/3–6 (see Volume II, Chapter 7 and Fig. 7.169)
- *ornaments*—Z21/14–15 (see Volume III, Chapter 4)

Burial chamber:
- *pottery*—Z21/7–10 (see Volume II, Chapter 7 and Fig. 7.169)
- *ornaments*—Z21/16–19 (see Volume III, Chapter 4)
- *weaponry*—Z21/11–13 (see Volume III, Chapter 14)

Grave goods excavated in tumulus 28

Superstructure:
- *pottery*—Z28/1, Z28/18 (see Volume II, Chapter 7 and Fig. 7.170)

Shaft:
- *pottery*—Z28/2–3, Z28/5 (see Volume II, Chapter 7 and Fig. 7.170)

ornaments—Z28/4 (see Volume III, Chapter 4)
Burial chamber:
pottery—Z28/6–13 (see Volume II, Chapter 7 and Fig. 7.170)
ornaments—Z28/14–15, Z28/17 (see Volume III, Chapter 4)
other metal items—Z28/16 unidentified (see Volume III, Chapter 18)

CHAPTER 4

Burial Typology: Remarks and Discussion

Mahmoud El-Tayeb

Answers to some, if not all, of the questions concerning the date and cultural horizon of the cemetery were found during the first season of excavation. Even in the face of the limited evidence, it can safely be said that the local community was class-based and well-organized. There is also much that confirms the homogeneity of Early Makurian culture in the Dongola Reach. The rectangular, vertical shaft with side niche, which is a standard feature of burials in the region between the Third and Fourth Cataracts, is represented by tumulus 22. The general rule for shafts of this type is that they are aligned east–west with the burial niche hewn into the south wall. Nonetheless, differences in shaft orientation and niche location have also been noted at other cemeteries. Tumuli 2 and 23 belong to a rare type of burial that originated from a simple rectangular shaft. So far the only parallels for these tumuli are T1 and T4 recorded at the cemetery in Hammur-Abbassiya, about 150 km downstream from El-Zuma. The mysterious tunnels in the Hammur and El-Zuma burials are still a subject of considerable debate. Although in three cases the burials were entered through these tunnels, either to ransack or reuse the graves, the original function of the tunnels remains obscure. Tomb plundering through tunnels was a common practice in northern Nubia, as witnessed in Gemmai and Qustul, but the tunnels in Hammur and El-Zuma are far larger and more elaborate, which leaves no room for doubt that they were not dug by robbers [**Fig. 4.1**]. It has been assumed in recent studies that these tunnels were constructed intentionally for some ritual purpose connected with the main burial. Further excavations at El-Zuma and Hammur may throw more light on some of these unresolved questions.

Meanwhile, a study of grave typology, burial traditions, and the highly distinctive red wheel-made pottery (cups and bowls) found in the El-Zuma burials led to the three principal types of tumuli at this site being dated to between the end of the 5th century and the first half of the 6th century AD.

Subsequent excavations confirmed the results of the first season concerning the classification and dating of the cemetery, contributing to the known typology of type III tumuli, which are the smallest tombs at this cemetery in terms of both their super- and substructures. The standard configuration consists of a rectangular shaft cut vertically towards the bottom, provided with a lateral niche (seldom more than one) at the base. Most of the burial chambers discovered so far in the Dongola Reach were cut into the longer, southern side of shafts oriented east–west, although other locations for the niche have been observed at cemeteries elsewhere. To date nine burials of type III have been excavated at the El-Zuma cemetery. The excavations revealed that in all of these nine tombs, the shafts are oriented north–south with a single side niche hewn into the west wall of the shaft.

In contrast, it seems that certain innovations were introduced in the construction of the main burial chamber in tumuli of types I and II, where invariably the main burial chamber was found cut into the south wall of the shaft in all 19 burials, in a similar manner to two tombs at Hammur-Abbassiya and one at Tanqasi (Godlewski 2008, 469–476; Mahmoud El-Tayeb 2003).

Two of the four known shafts of type III burials were trapezoidal in plan, though whether by chance or design remains to be determined. Whatever the case, this feature undoubtedly renders these tumuli reminiscent of a type of burial with a shortened descending ramp rather than a rectangular shaft (as a matter of fact, tombs with descending ramps, both long and short, running east–west and dated to the Meroitic and post-Meroitic periods, are quite common in Central Sudan, but are rarely found in the Dongola Reach). Could it be that we are dealing here with two separate burial traditions, one a survival from Meroitic times—type III with a trapezoidal shaft and burial chamber cut into the west side—and the other an evolutionary development of some kind with super/substructures and burial chambers in the south wall, as represented by the tumuli of types I and II?

Some general comments on the pottery are essential at this point (for a detailed report, see Klimaszewska-Drabot 2008, 477–491). Despite extensive looting, especially of the main chambers of tumuli 5 and 25, the robbers left behind a substantial group of complete vessels of various types and large quantities of sherds. The repertoire is a rich one, ranging from large beer jars and cooking pots to small bowls and cups, most of them of wheel-made red ware. The beer jars include small rounded bottles, chiefly with a short narrow neck and smoothed external surface, comprising both red and black ware;

FIGURE 4.1 Eastern part of the tunnel of tumulus 7 showing evidence of 'secret' intruders—probably rats and bats
PHOTO BY A. KAMROWSKI

medium-sized bottles of a very specific type, almost ovoid in shape, featuring a long, narrow neck and low shoulders decorated with two small bosses (Klimaszewska-Drabot 2010b, 483, Fig. 3: Z25/4); and finally, large globular vessels (40–50 cm in diameter) with a medium-long or long neck and an external surface which is plain but smoothed. The beer jar from chamber 2 in tumulus 5 is indeed one of the largest complete handmade vessels of this kind ever found in the Dongola Reach. This well-manufactured vessel has a body diameter of 57.3 cm, a neck height of 21.4 cm, a mouth width of 10.8 cm, and a full height of about 75 cm. It bears a greater resemblance to vessels made in Central Sudan (between the Fifth and Sixth Cataracts) than to anything from the Dongola Reach (Lenoble 1992, 79–97). The bowls are, again, characteristic of the Dongola Reach between the Third and Fourth Nile Cataracts. These are wheel-made products decorated with parallel grooves or left undecorated (Mahmoud El-Tayeb 1994, 65–79; Phillips and Mahmoud El-Tayeb 2003, 458–462). Three examples with flat rims resemble bowls from El-Kadada in Central Sudan (Lenoble 1987). The fourth one appears to be of northern origin, resembling a goblet of X-Group type (Williams 1991). A red-ware footed table amphora found in chamber 2 of tumulus 25 merits special attention; it is most probably a locally produced imitation of a type imported from the north. Other examples of such vessels with ovoid body, heavy handles, red-slipped on the outside, were discovered in tumuli 2, 15 and 16 (see Volume II, pages 274–275).

The grave goods that survived in the looted tombs comprised beads, metal implements, and spear- and arrowheads. The richness of these offerings, despite instances of plundering, attest beyond all doubt to the high rank of the individuals buried at this cemetery.

1 Burial Typology (Note: Subtypes T.11, T.16, T.28)

The burial typology, which was formulated during the course of the first season's work at El-Zuma, requires closer scrutiny and verification after the completion of the excavations. Some of the tumuli that were classified as flat-topped mounds, for instance T.11, T.13, and T.19, need to be re-evaluated. As a result of their excavation, some doubts have arisen as to their original form. Uncertainty concerns the higher (east) side of the mound: was it accidentally formed by the grave robbers when they started to unearth the shaft, or was it a deliberate design? Tumuli intentionally constructed in this manner have been noted at other sites upstream in the Fourth Cataract region, among them the cemetery of El-Haraz near Jebel Kulgeili (Ali Mohammed and Hussein 1999, 60–70), excavated by the National Corporation for Antiquities and Museums together with the Department of Archaeology of Dongola University at Karima, and the one at Ab-Heregil excavated by the mission of Gdańsk Archaeological Museum (Mahmoud El-Tayeb and Kołosowska 2007, 21–22, Fig. 11). The second question concerns the substructure of T.11 and its L-shaped shaft. Of all the excavated burials, T.11 is the only one with an L-shaped shaft, differing from the well-known U-shaped shafts found in tumuli of types I and II. The nearest parallel to T.11's shaft comes from a burial in a cemetery near the village of Abkur, about 100 km downstream of El-Zuma. Another variant of this shaft type was found at Firka in northern Nubia (Żurawski 2003, 222, Fig. 4; Emery and Kirwan 1938). The distinctive construction of the super- and substructure, which has no parallel at the El-Zuma cemetery, can be classified as a sub-type of type II El-Zuma mounds. Confirmation of this suggestion has to await further investigation of other mounds with similar superstructures.

During the second season, excavation of one of the small tumuli (T.19, designated type III) revealed a shaft with a slightly unusual ground plan. Instead of the well-known rectangular shape, the shaft appeared to be of trapezoidal plan with a side niche cut into the west wall (Mahmoud El-Tayeb 2010, 474–475, Fig. 8). It is commonly accepted that the simplest type of Early Makurian burial has a rectangular, vertical shaft, as recorded in type III tumulus 22 and at a number of other burial sites in the region, such as Tanqasi (Shinnie 1954), El-Ghaddar South and Northern Cemeteries (Lenoble 1987, Pl. IV c, 20) and El-Kassinger Bahry (Kołosowska and Borcowski 2014). Initially, it was thought that the trapezoidal shaft was simply a misshapen rectangular one produced by haphazard digging. However, the discovery of three more burials with trapezoidal shafts makes it less likely that this was an accidental distortion of the intended ground plan. Based on the two burials excavated during the second season (2007), it was suggested in a previous article that such a shaft might have represented a shortened version of the well-known burials with an east–west *dromos* terminating in a burial chamber, usually hewn into the west end of the descending *dromos*. To date, about five shafts of this type have been found at El-Zuma. Graves with similar plans have also been discovered in the wider region, near Jebel El-Alim, during a rescue excavation conducted by a team from the National Corporation for Antiquities and Museums led by the Senior Antiquities Inspector El-Tahir El-Nur (El-Tahir, personal communication, 2010). At this stage of research it is too early to come to any definite conclusions on this subject, and whether tumuli with the aforementioned features should be classified as sub-types remains an unresolved issue.

Tumulus 28 is the only one of the nine type III burials at El-Zuma that features a structural modification in the form of a secondary chamber. This was, however, a known practice in the Dongola Reach between the Third and Fourth Nile Cataracts since the first phase of the Terminal Meroitic period (post-Meroitic Phase I, AD 350–450). The nearest parallels were discovered during the survey project carried out in the Fourth Nile Cataract region. The best examples for the modification of the simple rectangular shaft come from the cemeteries at El-Kassinger Bahry, some 20 km upstream of Karima. One of them is T.45/1, which has a rectangular, vertical shaft aligned east–west, with the main burial chamber cut into the southern long wall, in which the body was laid in a contracted position, on its right side, head due east, facing north. A number of offerings were found with the body, while on the short east side of the shaft a secondary chamber was furnished with more grave offerings (Paner 1998, 117, 118, Figs. 3, 4). A further example from cemetery 47 at El-Kassinger Bahry is burial T.47/1, in which the main burial is cut into the west wall of the shaft, but the secondary chamber is hewn into the short south wall (Paner 1998, 128, Fig. 20). Another unique modification was discovered in the Fourth Cataract region at Ab-Heregil cemetery. In this case, a rectangular shaft aligned roughly north–south led down to a semicircular chamber cut into the short southern side of the shaft and extending into the middle of the long western side. In a highly unusual burial practice, the deceased was buried in the short southern side of the chamber (Mahmoud El-Tayeb and Kołosowska 2005, 68–69, Figs. 26, 27).

Burial offerings at El-Zuma comprise various items characteristic of the period. As usual, pottery constitutes the bulk of the grave goods, which also include adornments, as well as iron arrowheads and one rare example

of leatherwork (for details of the pottery recovered from the El-Zuma burials see Volume II). However, a number of vessels discovered during the third season deserve some brief comments. There is no doubt that T.11 must have been well-furnished with grave offerings that testify to the social standing of the burial's occupant. The loss of chamber 1 (the main burial chamber) is a great pity, for one would always expect it to contain some type of personal item that could provide much more information about the buried individual, or the period in general, especially given that all the main burial chambers hitherto excavated were found robbed. However, chamber 2 contained a wide range of pottery and food. Although the pottery assemblage in general falls within the types produced in the Dongola Reach during the Early Makurian period, four types of vessels are especially noteworthy. One bowl form was observed in this type of burial for the first time. The bowls designated Z11/4, Z11/7, Z11/8, Z11/9, Z11/13, Z11/21 (see Volume II, page 196 and Fig. 7.92) are distinguished by a rounded base and flared sides with squared rims. In spite of the fact that they are classified in the same category as the well-known, small, undecorated red-ware bowls, they are finely made and slightly larger in size. Most probably these vessels were locally produced; however, they might have been made by a more skilled potter or potters. Two red-ware cups from chamber 1 (Z11/6 and Z11/10: see Volume II, page 177 and Fig. 7.90) represent a form which had not previously been noted among locally produced vessels, except for one example from Tanqasi T.87 (Klimaszewska-Drabot 2010a, 220, Fig. 3). They are characterized by a rounded profile, a simple applied rounded rim and slightly flattened base, and a slipped and burnished but undecorated external surface. Apparently, this form is an imitation of the short X-Group cups, usually decorated with two or three incised grooves on the lower part, just above the base, like the ones found at the ROM 32/1 site (see Phillips 1987, 35–41; Grzymski 1991, 18, 23, Figs. 5, 6; Williams 1991). A unique form of bowl was found amongst the pottery in chamber 2 of T.11. Cup Z11/30 (see Volume II, page 207 and Fig. 7.101) measures about 8.4 cm in height and 12 cm in rim diameter. It has a rounded base and strongly flared rim. The external surface is red-slipped and burnished, while the interior is covered with white paint. To the best of our knowledge, such a practice has never previously been noted, either in this region or elsewhere in Nubia. A particularly significant and interesting find was a distinctive type of large, deep, wheel-made bowl. Five vessels of this type were found in T.11, chamber 2: Z11/17, Z11/22, Z11/29, Z11/34, and Z11/35 (see Volume II, pages 181–182 and Fig. 7.92). On average these bowls measure about 7.7 cm in height and about 15 cm in rim diameter. They testify to cultural continuity, as this type of bowl originated in the Meroitic period and remained in production with continuous modifications until the Second Phase of the Early Makurian period (late post-Meroitic), varieties of it having been recorded throughout Lower and Upper Nubia. The simplest form, found at El-Kadada in a Meroitic burial, has a heavy hemispherical body of about 6.5 cm in height and 15 cm in rim diameter. Another variant is slightly larger, reaching up to 18 cm in rim diameter and about 7 cm in height, with sides out-flared, and a flattened base (Lenoble 1987, Pl. IV c, 20). A more developed version of the same type was found in the Meroitic part of the cemetery at Gabati, some 75 km north of El-Kadada, with standard dimensions of 12 cm in rim diameter and 9 cm in height (Edwards 1998, 158, Figs. 6.12 bottom, 6.13). A parallel, but larger variant of this vessel, measuring about 9.1 cm in height and 14.6 cm in rim diameter, was discovered in the West Cemetery at Meroe (Dunham 1963, V:189, Figs. 135; 342, F). In the Dongola Reach, bowls of this type were found in a late Meroitic burial at Hagar Sail, and at the Early Makurian (post-Meroitic) cemetery of El-Kassinger Bahry in the Fourth Cataract region, as well as in T.10 at El-Zuma and T.87 at Tanqasi (Klimaszewska-Drabot 2010a, 221, Fig. 3). The first two (Z11/17 and Z11/22) resemble an El-Kadada bowl (Lenoble 1987, Pl. IV c). Despite the larger size of the latter, and to some extent their varying quality of manufacture, the general shape is similar. The vessel walls are either rounded or out-turned to form small ledges or bevelled rims. The bases are often of irregular, rounded, flattened, conical shape, and in some versions they have a low ring base. Surface treatment tends to be wet-smoothed and burnished, or coated with red slip inside and out, executed with different degrees of care. A very large handmade vessel in a dark brown ware, so far only known from T.11 at El-Zuma, is a large bowl of 25 cm in height and 40 cm in rim diameter, which is characterized by a rounded profile, thick walls and flattened base. A number of small holes perforated on both sides of a long crack, extending from top to bottom, are signs of repair, leaving no doubt that the bowl was used for a considerable span of time before being deposited in the burial. The large bowl Z11/16 (see Volume II, page 212 and Fig. 7.103) was discovered in chamber 2, which contained only grave offerings. Some animal bones were found *in situ* inside it. This can be taken as a direct indication of the function of the vessel. It could, like the later large Funj black ware dishes or even the wooden *gadah* of the 19th century, have been used for serving food. Attention should also be drawn to the small red bowl Z13/28 (see Volume II, page 206 and Fig. 7.100) found in chamber 3 of T.13. Although in size and texture this bowl bears a resem-

blance to the distinctive red bowls of the Dongola Reach, its execution was unique: it has a slightly flattened base, turned-out profile, a tapered in, applied rim, and three wide grooves incised about 10 mm below the rim. To the best of our knowledge, this wonderful vessel has no parallel elsewhere in Nubia. Some fragments from two different vessels require a brief comment. Both varieties of sherds represent well-known forms, frequently found at Christian sites; the first is a handmade cooking pot distinguished by a recurved rim and rounded body covered with a mat-impressed pattern. The second is a wheel-made *qadus*. These sherds were found in the shaft fill of T.11. Their presence in the plundered shaft has raised doubts about their original location: were they thrown out from one of the two chambers by the robbers, or thrown down the shaft by someone else? Although the *qadus* was common in Nubia from the Meroitic period onwards, at this cemetery only the one under discussion has so far been found; however, its presence in the shaft is not that surprising, as it may have been part of the original grave goods. As for the cooking pot, different forms of cooking vessels were found in T.11, as well as in other burials at this cemetery. However, only one incomplete vessel very similar to the one discussed here, with a rounded body and recurved rim, was found in the tunnel of El-Zuma T.5, excavated in 2007. Its original location is also uncertain, as it was found in the sediment that partially filled the tunnel; therefore, it is hard to know whether it got there as part of the later fill, or whether it was among the original grave offerings. If this vessel had originally been deposited in the burial, it could mean that the first appearance of the characteristic recurved cooking pot is earlier than the Christian period to which it is usually attributed.

A rare find from burials of the period is the leather case discovered in T.11, chamber 4 (see Volume III, Chapters 8 and 18). This object lay near three small red bowls and was found in a fragile, fragmentary state. A number of beads were scattered between and around the leather fragments. Prior to this, only three leather cases of this type had been found in the region. The first came from T.1 at the Southern Cemetery of EL-Ghaddar, followed by another from T.1, chamber 2 at Hammur-Abbassiya, whilst the third was found in the main burial chamber at El-Kassinger Bahry cemetery 45/T.1 (Mahmoud El-Tayeb 1994, 66; Kołosowska and Mahmoud El-Tayeb 2007, 15–16, Fig. 13). In the case of El-Ghaddar, the object was thrown out of the plundered burial chamber. The second example was recovered from the ransacked main burial chamber, whereas at El-Kassinger Bahry, the leather case was found at the feet of the deceased in an unlooted chamber. In each of the four instances there was no evidence that these cases contained anything, which begs the question: what was the real function of such objects and why were they deposited in graves? Today such leather bags are still in use, especially by nomadic communities. Depending on their design, they can serve as a water-skin (Arabic: *girba*), a sack for carrying things (*jurab*), or a sack for shaking milk (*sea'in*). The exact function of the excavated leather objects remains obscure. However, a regular row of holes pierced along the edges of the hide fragments found at El-Zuma is an indication that the case was made either from one folded piece of leather or two pieces stitched together and additionally decorated with some beads. If this theory is correct, then the leather object must have been a *jurab*. This still leaves unanswered the question of why it was deposited so far away from where the body was buried.

Food was also present among the grave goods in almost all the excavated burials. Butchered fragments of bones were found scattered amongst the pottery vessels. In chamber 1 of T.11, a pile of large animal bones (probably cattle) was recorded near a large cooking pot at the west end of the east–west aligned burial chamber. Cattle bones were mainly found in burials designated as types I and II, while meat of small species (sheep or goat) were predominant in type III burials. Cattle meat appears to have been included as an offering with elite individuals, testifying to their high status.

Adornment is mainly confined to beads made of different materials, and, as is usual in this period, beads are a constant feature of the burial inventory. Approximately 101 various beads of blue faience, quartz, and agate, in addition to a small scarab of blue faience, were found in T.27 in the area around the disturbed skull; they were probably part of a necklace. One badly eroded iron ring and 88 small beads were found in T.17.

Weapons frequently accompanied the deceased. Two types of iron arrowheads were represented. The most common type is the single-barbed arrowhead; the second type, which is less common, is barbless. Other unidentified iron fragments were found in the burials, and one stone archer's ring was found in T.27 (see Volume III, Chapter 13).

To summarize, each season of excavations at the El-Zuma cemetery brought to light some new elements of burial traditions in tumuli of types II and III. In terms of tomb construction, the first recorded instance of a subtype of type II tumuli was represented by the superstructure and substructure of T.11, an aspect that needs further investigation. Another structural modification is the trapezoidal shaft noted in a number of burials of type III. To date, four burials with trapezoidal shafts have been discovered at this site, which, in conjunction with the pres-

ence of such shafts at other burial grounds in the same region, clearly shows elements of continuity between Meroitic and Early Makurian burial traditions.

The appearance of some vessel forms that had not been noted during the first seasons indicates the wide-ranging repertoire and expertise of the local pottery workshops. A more exciting discovery is that of large reused red bricks of Meroitic origin. Most probably, these were brought from a Meroitic temple or other official building located somewhere in the vicinity.

Initially, it was thought that the tumuli at El-Zuma could be classified using a very simple typology, but it has transpired that a rather more complicated one is needed, despite the fact that the burials are of the same chronological horizon. Undoubtedly, further detailed analysis of the cemetery and the excavated material is required for a better understanding of this important site representing a poorly studied period.

In conclusion, the discoveries made at El-Zuma clearly demonstrate the cultural continuity and evolution of Meroitic traditions, which is evident, for example, in the funerary customs, grave offerings, and pottery. Consequently, it would be more accurate to date the El-Zuma cemetery to the Terminal Meroitic period rather than the one-hundred-year-later post-Meroitic period.

CHAPTER 5

El-Zuma Cemetery: Contemporary Threats to the Site

Jolanta Juchniewicz

The ancient cemetery in El-Zuma is liable to degradation due to the combination of natural factors and human activities. The following is a preliminary analysis of threats to the site and its monuments.

1 Human Activity

The cemetery in El-Zuma is located on the edge of a dynamically growing village, which is encroaching on the tumulus field and threatening its complete absorption. There was no protective fence around the excavation area until 2014, which made it vulnerable to uncontrolled human activity, including quarrying of the tumuli for building materials (see Chapter 2.1), and car traffic, with heavy vehicles generating strong ground vibrations.

2 Natural Factors

Climate change represents a relatively new contemporary natural threat to both the substructure as well as the superstructure of the tumuli. This situation arose after the construction of the Merowe Dam (Ahmed 2003, 252) on the Fourth Cataract, completed in 2009. The reservoir is 176 km long (Zaid, Shigidi, and Koll 2013, 1) and covers an area of c. 500 km^2. Large reservoirs lead to an increase in humidity, resulting from surface evaporation and changes in the structure of precipitation within a belt around 100 km wide, extending outwards from the reservoir's shoreline (Degu et al. 2011). El-Zuma is only about 46 km away from the dam as the crow flies.

Laboratory tests have shown that the tombs are carved out in rocks characterized by a predominance of clay binder. The clay minerals contained in the binder, under the influence of water swell, can cause delamination, and as a consequence weaken the structure of the rocks. Rocks containing a larger amount of clay minerals are constantly damp because they do not dry out easily. Moistening of rocks can lead to spontaneous disaster (collapse of corridors, subsidence of shafts). The first major changes in soil moisture were noticed during the 2011 excavation season. It was then that the rock profiles of the tomb shaft in tumulus 9 subsided due to the high humidity of the freshly excavated structures [**Fig. 5.1**].

On the other hand, the tumuli, made from a mixture of earth, sand, and gravel, are exposed to erosion and when their surface layers become saturated with rainwater they flow downslope, typically as a continuous mass. In the summer, the mounds are worn away by the destructive force of abundant rainfall [**Fig. 5.2**].

Mining risks pose another serious danger. The tumuli in El-Zuma cover fairly extensive substructures. The vertical shafts and horizontal tunnels leading to them are carved out of rock. They can be compared to mine workings, although on a much smaller scale. The threat is of the same nature. The cross-sections of tunnels under type 1 mounds (see Chapter 3, in this volume) have the most unfavourable shape due to the mechanics of the rocks. The width of the tunnels is greater than their height, which causes very high tensile stress in the roof. This results in the detachment of parts of the roof layers, which can be observed under many tumuli in El-Zuma. Samples of rocks from which the tombs are hewn are characterized by extensive cracking, diversification of the petrographic composition, and, consequently, a high amplitude of overall strength, bulk density, porosity, and water absorption. This means inhomogeneous geological conditions, which makes it difficult to select appropriate protection measures to strengthen the excavated rock structures.

3 Geotechnical Laboratory Tests of Rock Samples

Prior to 2014, the El-Zuma excavation site had never been geologically examined. In that year seven rock samples (and one brick) were taken from the tombs and transported to Poland. The Foundation of Science and Mining Traditions at the AGH University of Science and Technology in Kraków was commissioned to perform geotechnical laboratory tests, including the determination of physical and mechanical parameters (bulk density, matrix density, porosity, water absorption, solubility, compressive strength). A lithological and mineralogical evaluation of rock samples was also carried out. The test results should be considered as indicative and preliminary.

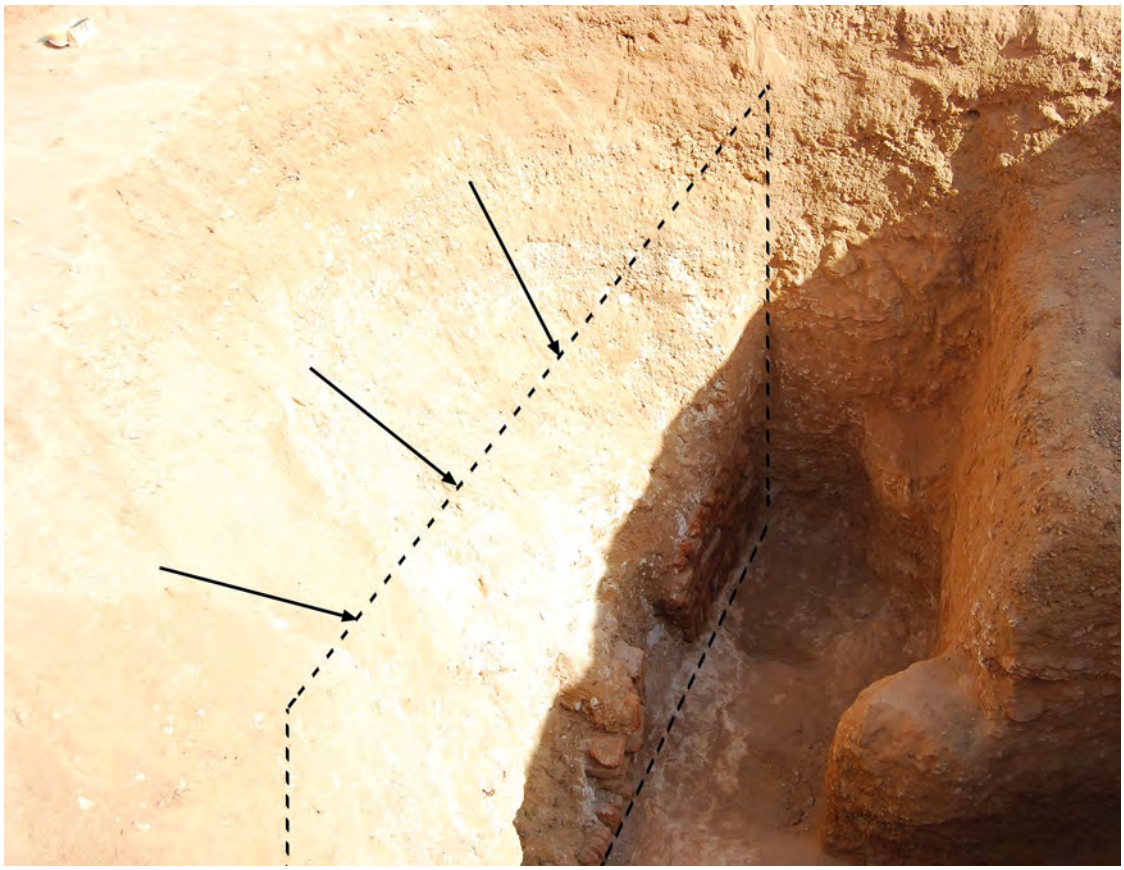


FIGURE 5.1 Tumulus 9, rock profile after landslide
PHOTO BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 5.2 Tumulus 7, blurring of the superstructure
PHOTO BY K. JUCHNIEWICZ

Rock samples were taken from two tumuli: from tunnel T.3 (D, F) and shaft T.26 (A, B, C, E, H). A brick from the blocking wall of T.26 is represented by sample G [**Fig. 5.3**].

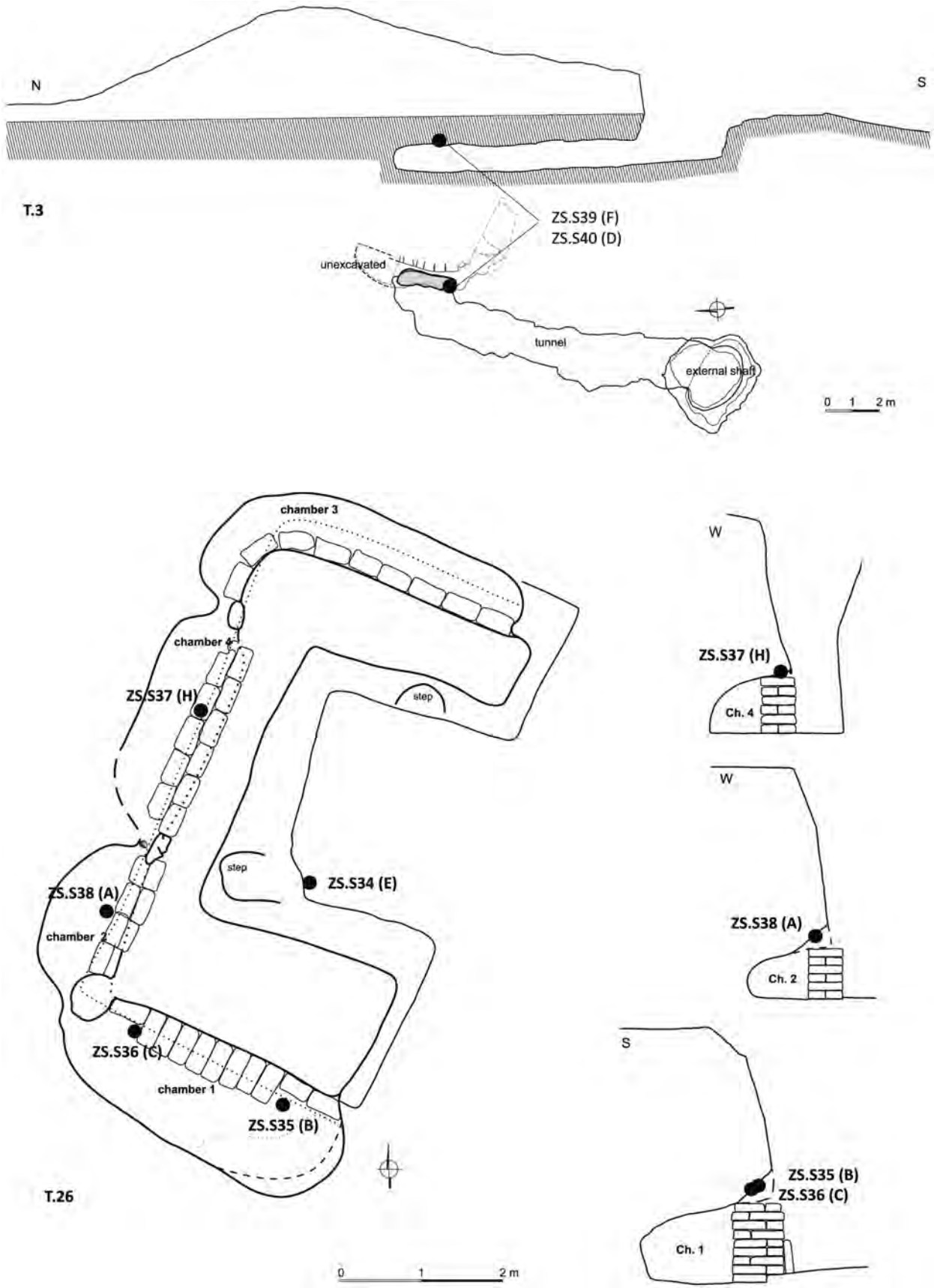


FIGURE 5.3 Locations from which samples were taken in tumuli 3 and 26
T.3 DRAWN AND DIGITISED BY J. JUCHNIEWICZ, T.26 DRAWN BY K. JUSZCZYK-FUTKOWSKA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.1 Test results: bulk density

Symbol	Number	Type	Bulk density [g/cm³]	Average bulk density [g/cm³]
A	1	R	2.00	2.03
	2	R	2.00	
	3	N	2.07	
	4	N	2.04	
B	1	N	2.72	2.82
	2	N	2.92	
	3	N	2.73	
	4	N	2.90	
C	1	R	2.01	1.98
	2	R	1.94	
	3	R	1.92	
	4	N	2.06	
	5	N	1.98	
D	1	R	1.53	1.63
	2	N	1.61	
	3	N	1.75	
E	1	R	1.63	1.61
	2	R	1.54	
	3	N	1.66	
F	1	N	1.73	1.71
	2	N	1.71	
	3	N	1.71	
G	1	R	1.44	1.47
	2	R	1.41	
	3	R	1.47	
	4	R	1.45	
	5	N	1.56	
	6	N	1.49	
H	1	R	2.01	2.04
	2	N	2.07	
	3	N	2.05	
	4	N	2.01	

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3.1 *Results of Geotechnical Laboratory Tests of Rock Samples*[1]

3.1.1 Mineralogical Description

A a rock clay, pelitic grain-size structured;
B this is probably the top layer, the so-called "caliche," which is desert polish/toppings founded on the sandstone quartz carbonate;
C quartz sandstone with clay-ferrite binder;
D arcose sandstone with clay binder;
E arcose sandstone with clay binder;
F arcose sandstone with clay binder;
G brick;
H a rock clay.

3.1.2 Physical and Mechanical Properties

Please see Tables 5.1–5.5.

1 Fundacja Nauka i Tradycje Górnicze 2014.

TABLE 5.2 Test results: matrix density

Symbol	Number	Matrix density [g/cm³]	Average matrix density [g/cm³]
A	1	2.66	2.66
	2	2.67	
B	1	2.84	2.85
	2	2.86	
C	1	2.63	2.62
	2	2.62	
D	1	2.56	2.55
	2	2.54	
E	1	2.61	2.60
	2	2.60	
F	1	2.63	2.63
	2	2.62	
G	1	2.67	2.69
	2	2.71	
H	1	2.66	2.65
	2	2.64	

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TABLE 5.3 Test results: porosity

Symbol	Porosity [%]
A	23.81
B	1.14
C	24.49
D	36.20
E	37.96
F	34.80
G	45.38
H	23.18

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TABLE 5.4 Test results: water absorption

Symbol	Water absorption [%]	Average water absorption [%]
B	1.60	2.40
	3.21	
C	11.09	10.65
	10.21	
G	23.87	24.21
	24.55	

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TABLE 5.5 Test results: compressive strength

Symbol	Number	Compressive strength [MPa]	Average compressive strength [MPa]
A	1	3.39	3.41
	2	3.43	
C	1	10.53	8.93
	2	9.23	
	3	7.03	
D	1	0.37	0.37
E	1	0.94	0.80
	2	0.65	
G	1	5.91	8.83
	2	9.86	
H	1	3.76	3.76

3.1.3 Compressive Strength

Compressive strength is defined as the ratio of the sample to the destructive force of the compression surface. The study was performed on the testing machine's walter + bai.

3.1.4 Solubility in Water after 24 Hours

A solubility study was performed on samples in the form of a shapeless mass of about 100 g. Samples were placed in a container and quenched with water. After 24 hours, the decomposition of the samples was examined in terms of quantity and quality.

- A and H—completely dissolved into silt.
- D, E, F—absorbed water and when they were being removed from the container, they disintegrated into smaller pieces.
- B, C, G—they did not disintegrate under the water, but were only saturated with water.

3.2 *Summary*

Laboratory tests show that the samples represent rocks of very loose compactness, of sedimentary origin, mainly sandstones, clay-bonded clay, of low compressive strength, with little resistance to weathering processes, especially under the influence of water. Samples are characterized by diversified petrographic composition, which results in a high amplitude of strength results, bulk density, total porosity, and absorbability. This means inhomogeneous geological factors.

PART 2

Bioarchaeological Research

∴

CHAPTER 6

El-Zuma Burials: Analysis of Human Skeletal Remains

Robert Mahler with appendix by Abagail Breidenstein

1 Introduction

The aim of the osteological analysis of human remains recovered from the tumuli at El-Zuma was to reconstruct the demographic and physical health profile of the buried individuals by collecting the best dataset possible on bone morphology. The relatively small number of tombs recorded (29 in total) and the overall poor state of preservation and incompleteness of the skeletal remains recovered required a detailed macroscopic examination to collect sufficient data to answer the main question posed in this research: whether the social status of the individuals buried at El-Zuma was reflected in their physical health. The observations that were made, essential to run statistical analyses (which were considered useful despite the small sample), contributed to a more in-depth interpretation of the social characteristics of the group that used El-Zuma as a burial ground for their dead.

The methodology applied in this study and the dataset are presented below. The catalogue presents demographic characteristics (sex and age at death), stature, and pathological changes determined in the course of the macroscopic examination. The subsequent analysis was aimed at determining characteristics associated with the three types of graves distinguished at the cemetery (Mahmoud El-Tayeb 2007; Obłuski 2005; for a discussion of tomb types, see Chapter 4, this volume).

2 Material

The human skeletal remains considered in the present chapter came from 21 tumuli excavated by the field team at El-Zuma between 2007 and 2016. Over the course of three study seasons, in 2013, 2014 and 2016, the author examined bones from burials in 12 tumuli: T.7, T.8, T.9, T.14, T.15, T.16, T.20, T.21, T.22, T.24, T.26, and T.28, excavated between 2011 and 2015. He also took into account the osteological assemblage recovered from nine tumuli (T.5, T.10, T.11, T.13, T.17, T.18, T.19, T.25, and T.27) in 2007 and 2009, and originally studied and published by Aleksandra Pudło (2010).

Of the remaining eight tombs (of a total of 29 tumuli identified at El-Zuma; see Fig. 2.9B, this volume), one (T.29) was not excavated and another (T.12)—the only one without a superstructure—did not yield any remains.[1] The burial chamber of T.6 is expected to yield human remains once its excavation becomes feasible (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 123). No human bones were recovered from T.2 (Mahmoud El-Tayeb 2005, 391–394), whereas T.23 yielded only a single human bone (Mahmoud El-Tayeb 2005, 394). The nine osseous assemblages previously examined by Aleksandra Pudło (2010) were re-examined by the author in an effort to reduce interobserver error and ensure methodological consistency.

Due to the poor preservation of the bones, the initial examination was conducted *in situ*, followed by a comprehensive analysis in a field laboratory. All of the excavated tombs had been previously looted, most probably in the distant past. Only some of the bones were found intact, with the bulk of the assemblage being heavily fragmented and badly eroded. The severe mechanical fragmentation resulting from repeated plundering of the graves accelerated the deterioration of the osseous material (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 110; Mahmoud El-Tayeb 2005, 394). In addition, the exposure of the bones to atmospheric factors and animal scavenging in the open robbers' pits further contributed to the bone degradation, therefore heavily impacting data acquisition. Some bones and bone fragments were found outside the burial chambers, in the tunnels or shafts, likely carried away by scavenging animals or removed with other looted material. Furthermore, the environment in the subterranean burial chambers was humid despite the location of the burial ground on the high northern bank of the Nile. Groundwater from the Nile is not an issue at this height, but rather the surface rain water and the now encroaching human settlement; evidence of the latter is unquestionable at the site today. Another destructive factor besides humidity and plundering is the friability of the highly heterogeneous rock into which the grave substructures were cut. Collapsing ceilings in the main grave chamber have repeatedly caused further serious damage to the skeletal remains.

1 There is a possibility, however slight, that some human remains may yet be found in the unexplored part of the western chamber, although the excavator believes this to be unlikely.

FIGURE 6.1
Reconstruction of the cranial vault of a female (T.14)
PHOTO BY R. MAHLER

From a bioarchaeological perspective, most of the graves from El-Zuma were single burials (a total of 23). The rest contained skeletal remains of multiple burials or the burial content could not be determined. It is not always evident that in the case of single burials the tomb did indeed contain no other inhumations; one cannot be sure that an assemblage of human bones, recovered from a tunnel for example, constituted the original inhumation (or one of several in a multiple burial). It is also likely that the bones could have come from later intrusive burials. The position of the bones was of little help in determining the completeness and number of individuals buried in each tomb. For the most part, the disturbed assemblages could not provide reliable information in this respect, with the exception of the inhumation in T.22, which was sufficiently preserved to establish that the body had been laid "on its right side in contracted position with the head to the south" (Mahmoud El-Tayeb 2005, 398).

3 Methods

The workflow of the osteological analysis of bone assemblages from El-Zuma comprised the following:

- Cleaning and reconstruction of the bones in the field laboratory
- Macroscopic analysis and data collection
- Data interpretation from a socio-bioarchaeological perspective.

Statistical methods were used to interpret the data and these require a brief discussion, including the measurement uncertainty involved, to justify the methodology applied and to describe the limitations of the interpretation, as well as the environmental background of the characteristics studied herein.

3.1 *Preparation of the Bones for Analysis*

The poor state of preservation of the skeletons and bone commingling within individual tombs necessitated certain extra measures to prepare the bones for analysis. Since water could not be used for cleaning purposes because of the high degree of bone decay, and because it was hoped to preserve the material for future sampling aimed at laboratory analyses, cleaning the bones involved more laborious, physical procedures.

Observation and measurement of diagnostic elements of the skeleton are essential to collect the data necessary to run certain statistical analyses. To counter the problem of the severe fragmentation of many diagnostic elements, bones were reconstructed wherever possible [**Fig. 6.1**], using a popular general-purpose, acetone-soluble, thermoplastic adhesive (UHU or a local substitute), with due care not to contaminate clean bone surfaces. This adhesive hardens on the adjoining surfaces without penetrating the bone, even if it is spongy. It is therefore easy to remove and should reduce potential contamination of samples.

The data collected from reconstructed bones are hindered by the same uncertainty that should be taken into account when analysing intact bones in the case of potential post-depositional deformation.

3.2 *Osteological Analysis*

The methodology applied attempted a compromise between applicability, labour intensity, and potential value of the collected data, the objective being to acquire the most comprehensive dataset that is possible, taking into account the condition of the osseous material and its provenance. Only macroscopic methods of analysis and data collection were selected. A recording form was designed to facilitate subsequent data input into a computer database. The state of preservation of individual skeletons was recorded graphically, allowing skeletal completeness to be visually assessed (Brickley and McKinley 2004, 7, 57–59). Such bone inventory diagrams (see Catalogue below) replace textual descriptions, facilitating immediate comprehension of the recorded material.

The skeletal remains were examined for the following basic characteristics:

1. Number of individuals, using the Minimum Number of Individuals (MNI) method for every single tumulus (White 2000, 291–292), taking into account morphological differences
2. Sex of individuals, using a set of morphological methods compiled by White (2000, 362–371), Piontek (1996, 127–141) and Buikstra with Ubelaker (1994, 16–21)
3. Age at death of individuals, applying a wide range of commonly accepted macroscopic methods:
   a) in the case of adults, the set of data taken simultaneously into account when dealing with age-at-death determination consisted of:
      – dental attrition, using tables by Lovejoy (1985, 49–50)
      – degeneration of the pubic symphysis: symphyseal face changes by Todd (1921; 1920), after Piontek (1996, 168–169), and Brooks with Suchey (1990), after Buikstra and Ubelaker (1994, 23–24)
      – degeneration of the auricular surface: ilium changes by Meindl, Lovejoy and others (Lovejoy et al. 1985; Meindl and Lovejoy 1989), after White (2000, 355–359), further refined by Buckberry and Chamberlain (2002)
      – degree of obliteration of cranial sutures, compiled by Buikstra and Ubelaker (1994, 32–35)
   b) for juveniles and young adults, the age-at-death determination was based mainly on the degree of epiphyseal fusion (Piontek 1996, 148) and, when possible, on tooth eruption stages according to tables prepared by Ubelaker (1978, 47), after Piontek (1996, 144–145), along with tables by Al Qahtani, Hector, and Liversidge (2010).

Data collection also included the following, if feasible:

1. Reconstruction of body morphology (Malinowski and Bożiłow 1997; Brothwell 1981; Strzałko 1971; Pearson 1899): height, shoulders-to-pelvic-width proportion, etc. based on long bone measurements (length, circumference, thickness of shafts, width of epiphyses, as well as diameter and circumference of heads). Measurement collection procedures followed generally accepted standards (Buikstra and Ubelaker 1994; Martin and Saller 1959)[2]
2. Evaluation of cranial morphology: measurements of chords (Malinowski and Bożiłow 1997; Buikstra and Ubelaker 1994) and main descriptive features (Piasecki 1992)
3. Evaluation of population homogeneity: so-called epigenetic traits (Alt 1997; Buikstra and Ubelaker 1994; Piontek 1996); most of them should be interpreted as possible reactions to long-lasting external factors, and may be connected, for example, with occupational stress or intentional deformation[3]
4. Evaluation of health and diet based on the following:
   a) degenerative changes of joints (Burt et al. 2013; Rogers and Waldron 1995; Buikstra and Ubelaker 1994)
   b) dental pathology: caries, enamel hypoplasia, calculus, and attrition (Alt, Rösing, and Teschler-Nicola 1998; Caselitz 1998, Table 3; Hillson 1996; Smith 1984)
   c) porotic hyperostosis and *cribra orbitalia* (Steckel et al. 2006, 13–14; Buikstra and Ubelaker 1994)
   d) other pathological changes, described in non-leading terms (Roberts and Manchester 2005) to ensure verifiable diagnoses (Aufderheide and Rodriguez-Martin 1998; Ortner 2003; Waldron 2009).

3.3 *Socio-bioarchaeological Interpretation*

To address the issue of whether the studied skeletons exhibited different biological characteristics depending on the type of grave in which they were buried, the following key characteristics of the individuals were taken into

2 For a brief list of measurements with references to the most popular handbooks, see Brickley and McKinley (2004, 30); however, note the erroneous labeling of tibia length measurements in this work.

3 See, for example, the formation of external auditory exostoses in divers (Smith-Guzmán and Cooke 2018) or the possible correlation between the intentional deformation of the skull and the formation of intersuturary ossicles (O'Loughlin 2004).

consideration in the analysis: sex, age at death, and nutritional status (as demonstrated by stature and the presence of *cribra orbitalia*).

3.3.1 Stature

The most useful methods of estimating the stature of archaeological populations from a burial context are those based on the length of the long bones (Mahler 2012, 54). The application of the so-called regression formulae can produce reasonably accurate results. However, selecting the most appropriate set of formulae can prove counter-intuitive (Mahler 2018, 198–222; Giannecchini and Moggi-Cecchi 2008; Kozak 1996). The method of choice would be one developed for a population with limb-bones-to-stature proportions as similar as possible to the population under study (Strzałko 1971). It would give the most consistent results in terms of the similarity of estimations when applied to different bone measurements of the same skeleton.

In practice, the El-Zuma material did not lend itself to making such a formal selection of the best regression-based method. The collected material was not sufficiently complete to apply the kind of statistical analyses known from other studies (e.g. from Europe: Giannecchini and Moggi-Cecchi 2008, 287; Kozak 1996, 84). Nor was the bone assemblage sufficient for an approach such as the one used in the study of early Islamic Alexandria (Mahler 2018, 204–205). The equations published by Trotter and Gleser (1977; 1952) based on Afro-American datasets were chosen for this study. This method performed best for women and only slightly worse for men in the case of early Islamic Alexandria (Mahler 2018, 215–216),[4] and it was second only to Pearson's (Pearson 1899) in the study from Italy (Giannecchini and Moggi-Cecchi 2008, 288). Regrettably, there are no comparisons of different regression-based stature-reconstruction methods used on skeletal series closer in time and place to the El-Zuma burials.

The one exception was a tibia from burial T.10, for which Pearson's formula was used instead of the Trotter and Gleser equation. Use of the Trotter-Gleser stature reconstruction formulae for the tibia should be avoided (White 2000, 372) because the length measurements of this bone by these authors has been shown to most probably be wrong (Jantz, Hunt and Meadows 1995; 1994).

3.3.2 Age at Death

Age at death is another key element of bioarchaeological analysis. No macroscopic analysis alone can determine the exact chronological age of an individual, but it is feasible to arrive at a biological equivalent in the form of a range. Once this is done as a first step, these ranges established for specific individuals need to be recalculated into uniform categories for counting and comparison. The specificity of osteological methods makes it more appropriate when studying skeletal populations to use uneven age categories, which are better at reflecting the ontogenetic rhythm of human life, rather than the arbitrary regular intervals (e.g. 5 years) used by demographers. For the El-Zuma material, six age-at-death categories were applied: 0–7, 7–14, 14–20, 20–35, 35–55, 55–x.[5] The overlapping borders emphasize the blurred nature of age determinations in osteology.

The age interval constituting the age-at-death determination of an individual frequently encompassed values from more than one age category. Therefore, the share of a single skeleton with a given age at death in the count of individuals of a particular age category was frequently expressed in real numbers. This share may be defined as the probability of the real age at death (biological not chronological) of an individual from a particular age category [Formula 1]. Therefore, the sum of probabilities of all age categories for each skeleton separately amounted to 1 exactly [Formula 2].[6]

$$P_i = \frac{\frac{xp_i}{ep_i - sp_i}}{\sum_{j=1}^{n} \frac{xp_j}{ep_j - sp_j}} \quad (1)$$

$$\sum_{i=1}^{n} P_i = 1 \quad (2)$$

where:

P_i probability of the real age of an individual being within a particular age range, assuming the age-at-death determination is valid;

$_{i,j}$ subsequent age category in a set of age ranges covering a whole human life;

4 For the population of Islamic Alexandria buried in the cemeteries on Kom el-Dikka, the author compared formulae by Christopher B. Ruff et al. (2012, 606), Michelle H. Raxter et al. (2008, 150), Mildred Trotter and Goldine C. Gleser (1977, 355; 1958, 120; 1952, 495), and Karl Pearson (1899, 196–197).

5 The division adopted here after Malinowski and Bożiłow (1997, 303) is very similar to the one proposed by Buikstra and Ubelaker (1994, 9).

6 Therefore, an individual with an age-at-death determination of 30–45 would be counted as 0.40 in the 20–35 age group and 0.60 in the 35–55 age group (in this case the sum in the denominator for the determination of P equals 0.83).

sp starting point of an age range (in years);
ep end point of an age range (in years);
xp count of years in an age range for a given individual.

3.3.3 Pathological Conditions

The bones from the El-Zuma burials bore evidence of numerous pathological conditions (see Catalogue), but owing to the overall poor state of preservation, only two kinds could be recorded systematically enough to be analysed. These are: degenerative joint disease and *cribra orbitalia*.

Degenerative changes of the joints, that is, osteoarthritis and intervertebral disc disease, were the most commonly observed. However, as the appearance of degenerative changes is age-related in general, the interpretation of their frequencies and severity in the light of the different age profiles observed for the three types of graves would not introduce anything new to the discussion.

The second systematically recorded type of pathological change and the most promising for the analysis at hand was *cribra orbitalia*, the porosity of the orbital roof, which, if coupled with data on stature, has the potential to add to the information pool on the status differences between the groups under study. This pathological lesion is one of the most frequently recorded in skeletal assemblages worldwide (Walker et al. 2009, 109) and is widely used as an unspecific indicator of physiological stress in the early stages of human life (Lorkiewicz 2012, 131), hence it is very useful in population studies. The lesion was scored on a four-degree scale, from 0 to 3 (Steckel et al. 2006, 13).

3.4 *Uncertainty of Measurements and Determinations*

The error inherent in the study of the El-Zuma material was potentially high and in excess of the uncertainty resulting from the methods employed due to the high degree of fragmentation of the skeletal material and its poor state of preservation. The careful reconstruction of bones mitigated this flaw but did not eliminate it entirely. In the case of long bones, a partial solution to the problem was to approximate measurements wherever feasible and to grade the scale of uncertainty of the results from 0 to 3. Critical values of uncertainty of the length measurements were arrived at through comparison with complete, undamaged bones. Two groups of maximum absolute uncertainty of estimations were established. The femoral, tibial, fibular, and humeral lengths were found to be burdened by an additional error of 0.0 cm, 0.2 cm, 0.5 cm, and 1.5 cm for the successive levels of uncertainty from 0 to 3, respectively. Similarly, estimations of the ulnar and radial lengths were found to be burdened by an additional error of 0.0 cm, 0.2 cm, 0.4 cm, and 1.0 cm for the respective levels of uncertainty from 0 to 3.

Since the credibility of other determinations, such as sex or degree of *cribra orbitalia*, was also affected by the generally poor state of preservation of the bones, a three-grade scale (from 0 to 2) was also implemented to evaluate the levels of uncertainty. However, the same scale carried different meanings for every such feature observed. As it was never transformed into numbers, it should be borne in mind that all it does is to give an indication of the level of uncertainty. Expressed in words, the scale should be read as follows: 0—no uncertainty (in excess of the error related to the method applied), 1—low to moderate uncertainty, and 2—high uncertainty, calling for the utmost reserve.

In the case of age at death, the uncertainty of its estimation was reflected in the age range instead.

3.5 *Statistics*

The χ^2 test was used to compare proportions wherever essential, following a procedure described, for example, by Drennan (2009, 181–185). Yates's correction for continuity was applied only in cases of at least one cell in a table having an expected count of less than 5 (Zar 2010, 469–470). The calculation was performed using the prop.test() function of the R language, particularly useful when comparing proportions with given expected values.

Moreover, the significance of the differences between pairs of means of stature was tested using the two-sided Welch's t-test for two unpaired variables for samples having unequal variances. It was calculated using the t.test() function of the R language.

4 Results and Discussion

The minimum number of individuals (MNI) buried in the graves taken into account in this study is 21.[7] The following table presents their division by tomb type, indicating the sex, age, and stature of the individuals [**Table 6.1**].

4.1 *Sex*

In the group under study, sex could be determined for 20 individuals. Eight (38.1%) females and 12 (57.1%) males were identified in the assemblage. In one case (4.8%), the

7 Tumulus 25 was suspected of containing two burials. However, Pudło (2010, Table 1), who studied the bones at the time of discovery, noted only one individual, hence the foot bones that were found by the present author, mixed in with the skeleton from this burial, must have been a later intrusion, possibly already in storage.

TABLE 6.1 Tumuli annotated by type, with sex, age, and stature of the buried individuals and *cribra orbitalia* taken into account

	Tumulus	Type (I–III)	Sex	Age†	Stature	*Cribra orbitalia*‡
1	T.5	I	M (?)	30–50	–	0
2	T.7	I	M (?)	25–45	–	0
3	T.8	I	F (?)	35–45	162	2
4	T.9	II	M (??)	25–30	172	1
5	T.11	II	?	16–18	–	0
6	T.13	II	M (?)	30–40	175	0
7	T.14	II	F (?)	20–30	168	2
8	T.15	II	F (?)	21–24	166	1
9	T.16	II	M (??)	16–24	167	1
10	T.24	II	F (?)	15–18	165	2
11	T.25	II	F	24–35	161	1
12	T.26	II	F	45–55+	164	2
13	T.10	III	M	30–40	166*	1
14	T.17	III	M	40–50	173	1
15	T.18	III	F (?)	50+	149	2
16	T.19	III	M (?)	35–45	167	1
17	T.20	III	M (??)	50+	171	2
18	T.21	III	M	35–40	167	2
19	T.22	III	M	35–45	165	0
20	T.27	III	M	35–45	165	1
21	T.28	III	F	40–55	160	1

† Age-at-death of individuals is given in the intervals that reflect the inherent resolution of applicable methods of age determination.

‡ Due to the overall poor state of preservation of the skeletal remains, the *cribra orbitalia* scores were burdened with uncertainty (for details see Catalogue).

Graves previously studied by Pudło (2010) are marked in grey. Asterisk (*) denotes stature estimation calculated using Pearson's formulae (1899)

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young age of the individual coupled with the poor state of preservation excluded sex determination. The apparent predominance of males in this assemblage, constituting 60% of the successful sex determinations, may not be entirely true as three of the male determinations are highly uncertain. Moreover, even if this uncertainty were to be overlooked, the χ^2 test of proportions shows this difference to be statistically insignificant ($\chi^2 = 0.8$; $p = 0.3711$) when compared to the ideal 1:1 sex ratio.[8]

The sex ratio in the context of a grave type does not give a clear picture either. Both male and female individuals were buried in structures of all three types. A certain preference is discernible for burying females in tombs of type II (F = 5; M = 3; $\chi^2 = 0.125$; $p = 0.7237$) and males in tombs of type III (F = 2; M = 7; $\chi^2 = 1.7778$; $p = 0.1824$), but statistical results do not support these observations; the test of the sex ratio between these grave types also proved the differences to be insignificant ($\chi^2 = 1.4175$; $p = 0.2338$). Moreover, the sex ratio for tombs of type I, with a count of 3 individuals (F = 1; M = 2), is purely random and should not be taken into account in any discussion until new data on type I burials become available.

4.2 *Age at Death*

Frequencies of age-at-death categories are summed up in tabular form [**Table 6.2**] and presented in a diagram [**Fig. 6.2**]. The age-at-death profile of the group buried in these particular tumuli at El-Zuma seems to be representative of a higher social stratum that considered the

8 According to Fisher's equal investment principle (Seger and Stubblefield 2002, 9) and as proved by empirical data (Bagnall and Frier 1994, 95), we should expect the ratio of sexes in human populations to be near equal.

TABLE 6.2 Count of individuals in age-at-death categories, for each grave type separately

		14–20	20–35	35–55	55–x	Σ
Type I	**n**	0	0.88	2.12	0	3
	(%)	(0)	(29.3)	(70.7)	0	(100)
Type II	**n**	2.71	4.86	0.76	0.67	9
	(%)	(30.16)	(53.97)	(8.47)	(7.41)	(100)
Type III	**n**	0	0.57	6.83	1.6	9
	(%)	(0)	(6.35)	(75.87)	(17.78)	(100)
Σ	**n**	2.71	6.31	9.71	2.27	21
	(%)	(12.93)	(30.04)	(46.24)	(10.79)	(100)

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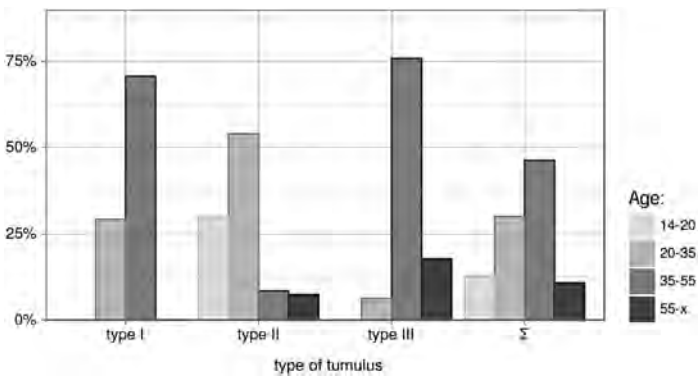

FIGURE 6.2
Frequencies of age-at-death categories of individuals buried in the cemetery taking into account three different tomb types
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cemetery as their special burial ground (see Chapter 11, this volume).

Looking at the burials without distinguishing them by tomb type, the most numerous group was that of mature individuals (35–55 years of age), followed closely by young adults (20–35). The least numerous were the groups of old adults (55+) and subadults (14–20). None of the individuals buried at this cemetery was younger than 14 years of age (in terms of development age ranges, not actual chronological age).

Tumuli of type III seem to have been constructed for mature individuals only. None of the individuals inhumed in this type of tomb was classified under 30 years of age and some may have even reached an advanced age of 50 and more. Skeletons recovered from type II tombs represented younger individuals. Most of them (n = 4; 4.86 in terms of frequency, amounting to 53.97% of all analysed burials of type II) were young adults (20–35 age category), and some of them (n = 3; with an age-group frequency of 2.71, that is 30.16%) may not have lived to early adulthood. In terms of age at death, the three individuals buried in type I tumuli seem to have been positioned somewhere in between these two extremes of young and old adults.

Moreover, the difference between age-at-death frequencies of type II and type III graves appears to be statistically significant (χ^2 =11.335; p = 0.01005), but we need to bear in mind the small number of individuals used in this comparison (n = 18). Importantly, type II and type III tombs also differ in the composition of sexes and these characteristics appear to be interdependent. One can thus observe a difference between these two types of tombs in terms of the age at death and sex of the individuals inhumed, but the exact nature of this difference cannot be ascertained.[9]

9 As El-Zuma was in all likelihood not a burial ground for a whole community, the observed differences may be cautiously interpreted as reflecting a social hierarchy, in which, for example, type II graves may be assumed to be the tombs of relatives of the most important figures (buried in type I structures), while the type III graves would have been intended for those who earned their higher position rather than being born into it.

TABLE 6.3 Mean stature of individuals buried at El-Zuma taking into account three grave types and sex

	Sex	n	x	s	x_{min}	x_{max}	$\overline{MUE}$	$\overline{SEE}$
Type I	♀	1	162	–	162	162	4.62	4.25
	♂	0	–	–	–	–	–	–
Type II	♀	5	164.8	2.59	161	168	0.68	4.12
	♂	3	171.3	4.04	167	175	1.77	4.26
Type III	♀	2	154.5	7.78	149	160	1.71	3.41
	♂	6	168	3.29	165	173	1.33	4.00

$\overline{MUE}$ mean maximum uncertainty of estimation of stature resulting from the uncertainty of the measurements of long bones used in stature estimation

$\overline{SEE}$ mean standard uncertainty of stature estimation resulting from specific regression formulae employed

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4.3 *Stature*

Stature as a characteristic that is relatively very eco-sensitive can be used as a good measure of the overall well-being of the group under study (Steckel and Rose 2002, 19–22). It works best when compared between groups of similar genetic background, so the potential differences observed can be attributed solely to the differences in extrinsic factors that influenced their growth. As far as the El-Zuma burial ground is concerned, it is very likely that as a group all the deceased were very much alike in terms of genetic characteristics, so the majority of the potential dissimilarities in mean stature may in general be attributed to the differences in the overall well-being of particular subgroups.

Interesting results come from the comparison of means calculated for the stature of individuals buried in the different types of graves identified at El-Zuma. Table 6.3 shows that both males and females buried in the tombs of type II were considerably taller than those from type III burials. Unfortunately, the differences observed were statistically insignificant, most probably due to the small number of available estimations of stature. The t-Student test gave $t = 1.2384$ with $p = 0.2943$ for males and $t = 1.8326$ with $p = 0.302$ for females. Even so, the overall well-being of individuals buried in type II structures was most probably higher than that of the type III ones.

For the most monumental tumuli of type I there was only one stature estimation available, that of a female (162 cm). While the observation is inconsequential because it is singular, it is worth noting that the individual was 2 cm taller than the maximum 160 cm obtained for the taller of the two females buried in type III tombs.

4.4 Cribra Orbitalia

The role of iron deficiencies, widely accepted as a general factor causing the formation of *cribra orbitalia* (Lewis 2007, 112–113; Roberts and Manchester 2005, 229–233; Goodman and Martin 2002, 27–29; Larsen 1997, 29–33), has been convincingly questioned in favour of a different diagnosis that indicates haemolytic, congenital, or megaloblastic anaemia, connected with nutritional deficiencies and disturbances in assimilation of vitamin B_{12} as causative factors behind these lesions (Walker et al. 2009). As the discussion continues (Rivera and Mirazón Lahr 2017; Smith-Guzmán 2015, 1; Klaus 2017, 98–101; McIlvaine 2015; Oxenham and Cavill 2010; Wapler, Crubezy, and Schultz 2004), the picture that emerges favours a heterogeneous, multi-factor, both congenital and environmental aetiology of this condition.

The scoring of *cribra orbitalia* was feasible in 16 cases only. Severe (score 3) lesions were not detected and light lesions (score 2) were present in seven cases. Of that number, three were found in burials inside type III structures ($n = 8$), three were present in type II ($n = 7$) and one in a type I structure.

There appears to be no observable pattern in the distribution of *cribra orbitalia* lesions in burials of different types in the El-Zuma tumuli. Therefore, early childhood physiological stress, which causes this condition to be manifested, may have influenced all three groups to the same extent. It is also possible that the limited number of observations, especially in the case of burials from type I tumuli, made it impossible to detect a pattern that in fact existed.

4.5 *Other Pathological Conditions*

Degenerative changes of the joints, which are the most frequently observed pathological condition affecting human bones, were noted mainly among individuals buried in type III and type I graves. All the individuals from these two groups presented degenerative changes either of the spine or other joints. Since the condition is in general correlated with age (Waldron 2009, 28), it is not surprising that only four out of nine of the generally younger individuals buried in type II graves showed such degenerative lesions.

Changes reflecting oral health are also to some extent age-dependent. Although carious lesions were not observed on teeth examined from the El-Zuma cemetery, some individuals showed periapical changes. Oral health observations were only possible for a total of 15 individuals: one case from a type I grave, six from type II graves, and eight from graves of type III. In the one case from a type I burial, no lesions were found. Among individuals from the type II burials there was one case of a possible abscess and five individuals with no periapical lesions observed. Two of the eight individuals buried in type III graves presented multiple abscesses, the third had only one, and the fourth had two lesions of this kind together with a periapical granuloma. Periapical inflammations may have been caused by excessive caries that resulted in root canal infection. It is also possible that some of the abscesses were caused by other factors, such as periodontal pocket formation (example from T.10 of a deep pocket running down to two-thirds of the root's length) or excessive tooth wear leading to root canal exposure.

There were three possible cases of traumatic lesions detected, but only among individuals buried in type III graves. The individual from T.10 presented a possible healed compression fracture of the body of two thoracic vertebrae. A bony outgrowth on a proximal phalanx of the right foot of the individual in T.22 may attest to a healed injury, while the flat lesion on the frontal bone of the skull in T.27 may have been the result of a blow or impact with a force running parallel to the bone surface (or attempted scraped trepanation interrupted at an early stage of the procedure).

Other lesions were also observed, including porosity of the outer table of the skull (T.8, T.14, T.24, T.21), arachnoid granulations on the inner table of the skull (T.11, T.20), Schmorl's nodes on the bodies of the lumbar (T.7, T.10) and lower thoracic vertebrae (T.8, T.10), and on the body of the sacrum (T.16), inflammation of the maxillary or frontal sinuses (T.14, T.20, T.22, T.27, T.28), and minor congenital defects, namely a groove (T.11) or a pit (T.26) on the lunate surface of the os coxae, congenital (?) fusion of the left hamate and capitate (T.15), and incisors most probably sharing the same socket (T.17). T.10 had a perforation in the frontal bone, approximately 10 mm in diameter, with a healed rim (the poor state of preservation prevents a diagnosis).

5 Conclusions

The results of the osteological study of burials from El-Zuma reveal a population with what appears to be a hierarchical social structure. However, the picture drawn here can be supported with statistically significant data only in the case of age-at-death differences.

The hierarchical social structure corresponds well with the three different types of tombs distinguished at the site (Mahmoud El-Tayeb 2007; Obłuski 2005). The building of the most monumental, type I, structures was likely very labour-intensive. Type II tombs were not as grand, but their construction must still have been very expensive. Type III tombs were simple and required far less labour than the other two types, but their location in the immediate vicinity of the type I and type II structures was most probably an attractive one.

The poorest, type III, tombs were constructed for mature individuals, mostly males, while young individuals, mainly females, were found in most of the type II tombs. Moreover, differences in the proportion of age-at-death frequencies between the structures of types II and III were found to be statistically significant. The generally lower social status of those buried in type III structures, assumed because of the least labour required for their construction compared to the other two, was supported with a comparison of mean statures. Nonetheless, the observed differences, although well marked, were statistically insignificant, calling for caution in accepting this conclusion.

The small number of individuals under study and even greater scarcity of data available on their sex, age, stature, and pathological conditions (as observed on bones), imposed research limitations. Certain patterns have been observed linking the biological characteristics of the deceased and the grave structures. Most of them are not reflected in the results of statistical analyses because of the small sample size. The results, however, once they are considered in combination with the outcome of another part of the study, namely isotope analysis conducted by Iwona Kozieradzka-Ogunmakin (Chapter 7, this volume) and the results of aDNA analysis (see appendix by Abagail Breidenstein at the end of this chapter) should help to shed more light on the people that used the El-Zuma cemetery as the burial ground for their dead.

6 Catalogue

Key:

Asterisk (*)	graves studied and published by Pudło (2010)	
MNI	Minimum Number of Individuals (White 2000, 291–292)	
Sex:	F	female
	M	male
	?	unknown

Diagrams presenting the bone inventory show the elements that were present in grey, those identified but with uncertain siding in blue, and those with uncertain identification and/or siding in black.[10]

Determination uncertainty levels (0–2) are denoted with question marks in brackets following a given value, i.e., no question mark—score 0; (?)—score 1; (??)—score 2.

Measurement uncertainty levels (0–3) are denoted with question marks in brackets following a given value (for the methodology, see above), i.e. no question mark—score 0; (?)—score 1; (??)—score 2; and (???)—score 3.

Permanent teeth were coded according to a generally accepted standard (Alt and Türp 1998, 42, 44–45). Two-digit numbers were used for the teeth: from 11 to 18 and from 21 to 28 for the maxilla, the right and left side respectively, starting from the first incisor, and from 41 to 48 for the right and from 31 to 38 for the left side of the mandible.

Degenerative Joint Disease (DJD):
- OA (Osteoarthritis)—diagnosis follows Waldron's (2009, 34) operational definition
- IDD (Intervertebral Disc Disease)—diagnosis follows Waldron's (2009, 34) operational definition.

Severity of degenerative lesions:
- no mention—no changes or no bone element present (refer to inventory diagram)
- small or light—osteophytes less than about 1 mm, degenerative or productive changes follow Schultz's (1988) score 2, left-hand column after Steckel et al. (2006, 31–33)
- medium or moderate—osteophytes less than about 3 mm, degenerative or productive changes follow Schultz's (1988) score 2, right-hand column after Steckel et al. (2006, 31–33)
- extensive, strong, or severe—osteophytes more than about 3 mm, degenerative or productive changes follow Schultz's (1988) score 3, after Steckel et al. (2006, 31–33).

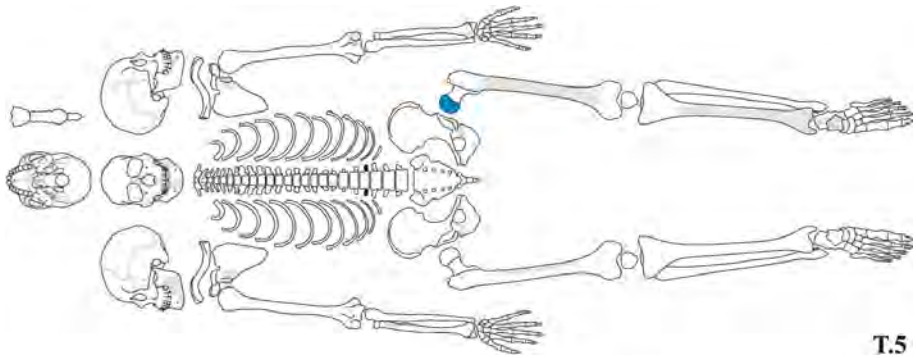
Cribra orbitalia—scored on a four-level scale (0–3) (Steckel et al. 2006, 13).

For other methodological decisions, see above, section 3.

10 All diagrams are by Marta Momot (Polish Centre of Mediterranean Archaeology, University of Warsaw) based on the author's notes.

Tumulus 5—type 1 *

MNI	1
Sex	M (?)
Age	30–50
Stature	–


T.5

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	–	–	–
left:	–	–	–	–	–	–

Dental pathology
None observed.

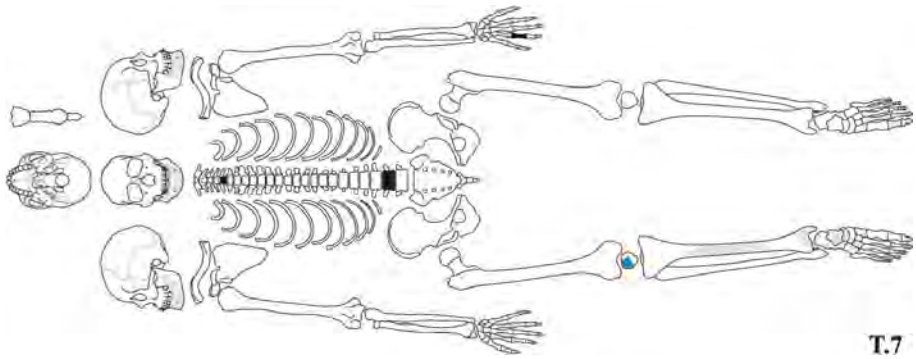
Skeletal pathology
DJD: 1) OA: small marginal lipping and small osteophytes on the surface of the distal epiphysis of the left radius
cribra orbitalia: 0
other: none observed

Trauma
None observed.

Other observations
None.

Tumulus 7—type I

MNI	1
Sex	M (?)
Age	25–45
Stature	–



Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	–	–	–
left:	–	–	–	–	–	–

Dental pathology
None observed.

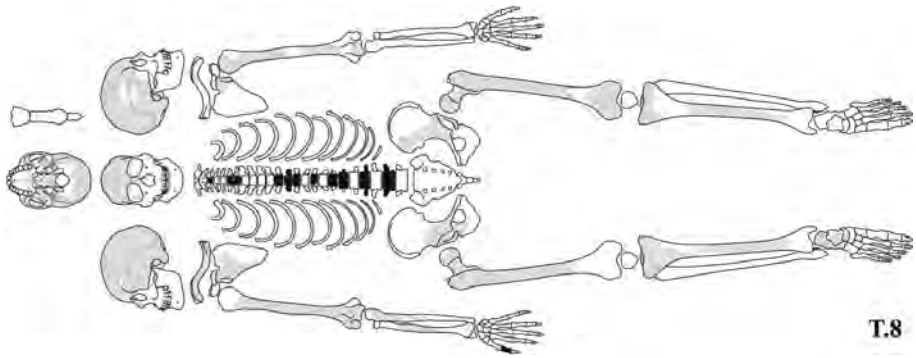
Skeletal pathology
DJD: 1) IDD: small marginal osteophytes and small pitting on the superior surface of the body of the lumbar vertebra
cribra orbitalia: 0
other: 1) Schmorl's node on the superior surface of the body of the lumbar vertebra

Trauma
None observed.

Other observations
None.

Tumulus 8—type 1

MNI	1
Sex	F (?)
Age	35–45
Stature	162



Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	315 (???)	–	–	–	–	–
left:	–	–	–	–	–	–

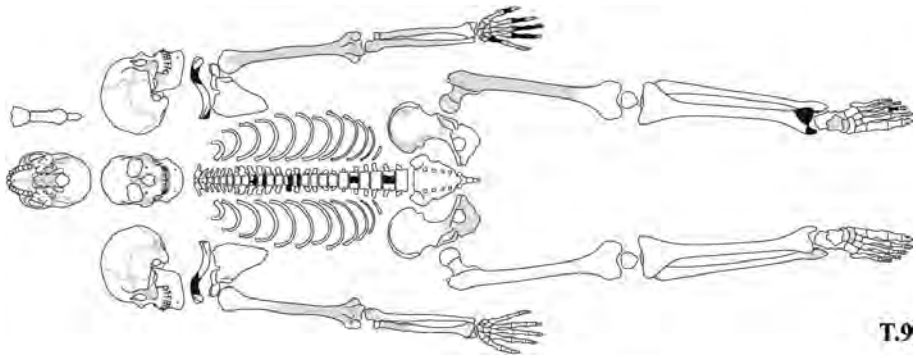
Dental pathology
None observed.

Skeletal pathology
DJD: 1) OA: small marginal lipping and small porosity of the lunate surface on the acetabulum of the right os coxae
2) OA: small marginal lipping and moderate pitting of the lunate surface on the acetabulum of the left os coxae
cribra orbitalia: 2 (?)
other: 1) light porosity on the ectocranial surface around the lambda
2) Schmorl's node on the superior body surface of a lower thoracic vertebra
3) small unhealed fracture on the superior surface of a thoracic vertebra

Trauma
None observed.

Other observations
None.

Tumulus 9—type 11



MNI	1
Sex	M (??)
Age	25–30
Stature	172

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	–	–	–
left:	338 (???)	–	–	–	–	–

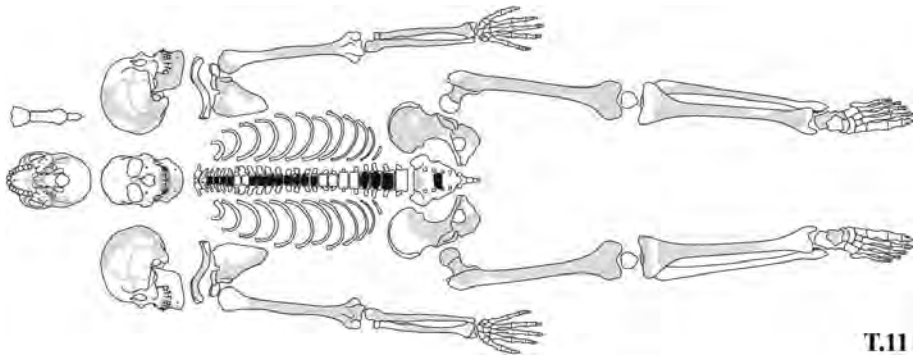
Dental pathology
None observed.

Skeletal pathology
DJD: none observed
cribra orbitalia: 1 (?)
other: none observed

Trauma
None observed.

Other observations
1) 2-mm-wide and 1-mm-deep groove on the lunate surface of the left acetabulum, running next to the rim, parallel to it, for about two-fifths of the length of the lunate surface (probably degenerative lesion)

Tumulus 11—type 11 *



MNI	1
Sex	?
Age	16–18
Stature	–

Preserved fragments of:
– 8 ribs

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	257 (???)	450 (??)	–	–
left:	–	–	–	455 (???)	–	–

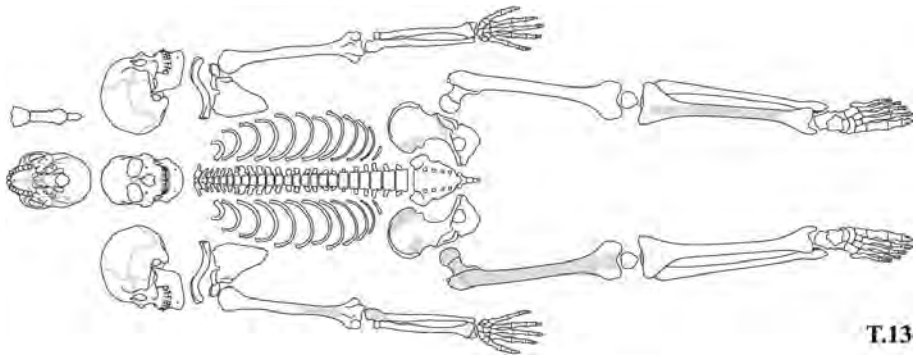
Dental pathology
1) a very fine-grained pitting (active) of the bone covering unerupted tooth 48

Skeletal pathology
DJD: none observed
cribra orbitalia: 0
other: none observed

Trauma
None observed.

Other observations
1) congenital dysplasia: groove 1 mm deep and up to 3.5 mm wide, bisecting radially the lunate surface of the acetabulum of the left os coxae
2) multiple shallow arachnoid granulations along the sagittal suture, the biggest 19 mm in diameter

Tumulus 13—type 11 *



MNI	1
Sex	M (?)
Age	30–40
Stature	175

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	497 (?)	–	–
left:	–	–	–	–	–	–

Dental pathology
None observed.

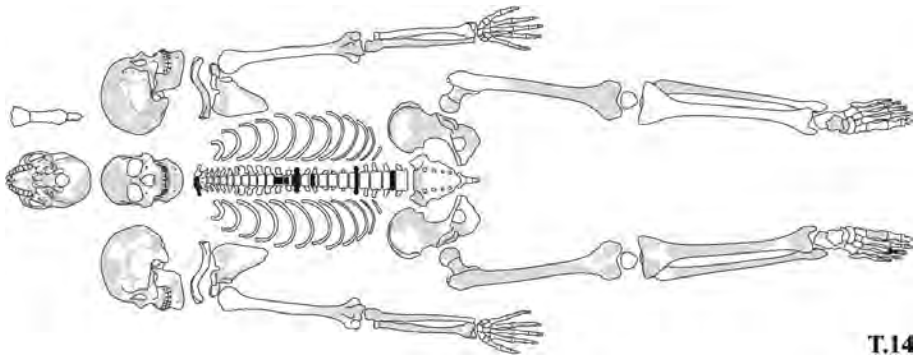
Skeletal pathology
DJD: none observed
cribra orbitalia: 0
other: none observed

Trauma
None observed.

Other observations
None.

Tumulus 14—type II

MNI	1
Sex	F (?)
Age	20–30
Stature	168



Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	262	–	476 (???)	–	394 (???)
left:	–	–	284 (???)	–	–	–

Dental pathology
None observed.

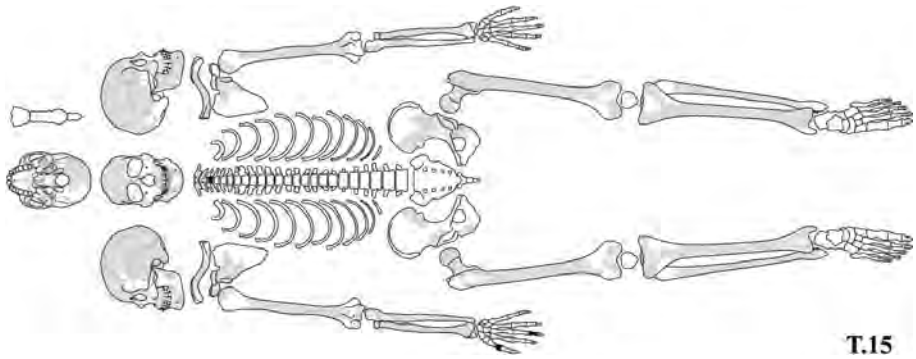
Skeletal pathology
DJD: 1) OA: small marginal lipping and small osteophytes in the glenoid cavity of the right scapula
cribra orbitalia: 2 (?)
other: 1) light porosity of the outer table of the skull
2) light inactive inflammation of the left frontal sinus
3) cluster (7 mm in diameter) of small osteophytes on the surface of the left glenoid cavity

Trauma
None observed.

Other observations
None.

Tumulus 15—type 11

MNI	1
Sex	F (?)
Age	21–24
Stature	166


T.15

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	277 (???)	463 (???)	–	–
left:	–	257	–	–	387 (???)	–

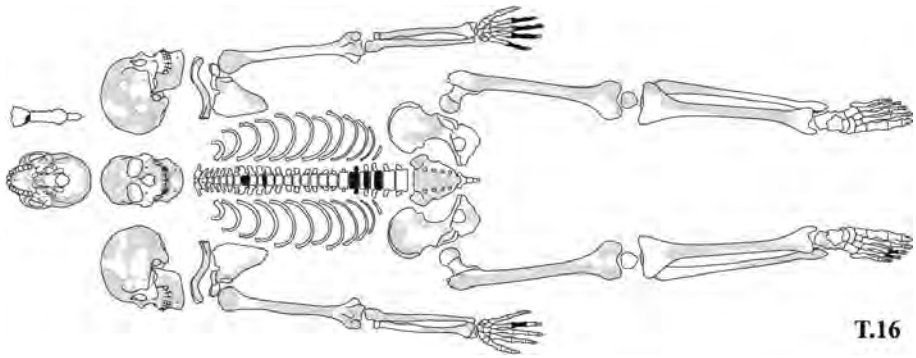
Dental pathology
None observed.

Skeletal pathology
DJD: 1) OA: light pitting and small osteophytes on the proximal joint surface of the left tibia and right ulna
2) OA: small marginal lipping and light pitting on the distal joint surface of the left radius
cribra orbitalia: 1 (?)
other: 1) congenital (?) fusion of the left hamate and capitate

Trauma
None observed.

Other observations
None.

Tumulus 16—type 11



MNI	1
Sex	M (??)
Age	16–24
Stature	167

Preserved fragments of:
– 2 foot phalanges

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	265 (???)	–	360 (???)	–
left:	–	241 (???)	269	–	360 (???)	–

Dental pathology
1) periapical changes (??) of the socket of tooth 21—alveolar abscess

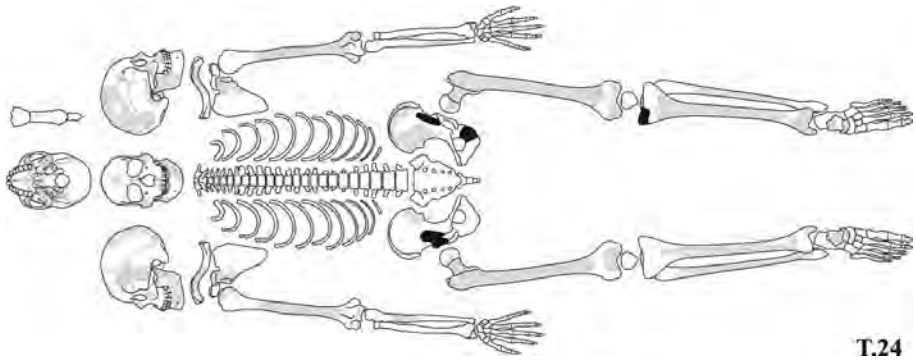
Skeletal pathology
DJD: none observed
cribra orbitalia: 1 (?)
other: 1) Schmorl's node on the body of the sacrum

Trauma
None observed.

Other observations
None.

Tumulus 24—type II

MNI	1
Sex	F (?)
Age	15–18
Stature	165



Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	461 (???)	–	–
left:	–	–	–	–	–	–

Dental pathology
None observed.

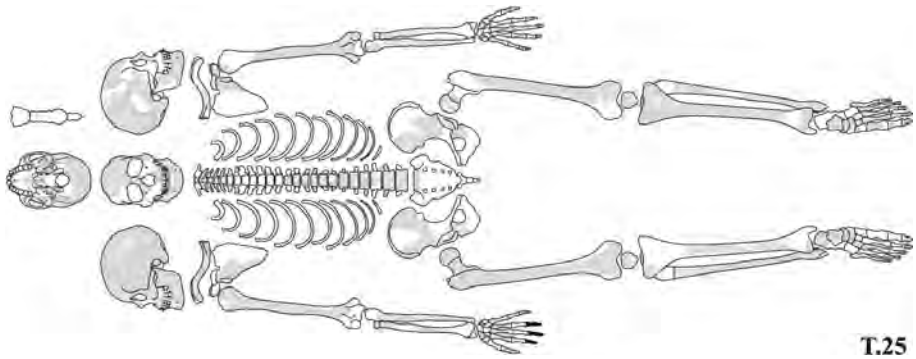
Skeletal pathology
DJD: none observed
cribra orbitalia: 2 (?)
other: 1) light porosity of the outer skull table around the lambda

Trauma
None observed.

Other observations
None.

Tumulus 25—type II *

MNI	1
Sex	F
Age	24–35
Stature	161



Preserved fragments of:
- 13 ribs
- 4 hand phalanges
- 6 foot phalanges

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	308 (??)	–	–	444	–	–
left:	–	–	–	452 (???)	–	–

Dental pathology
None observed.

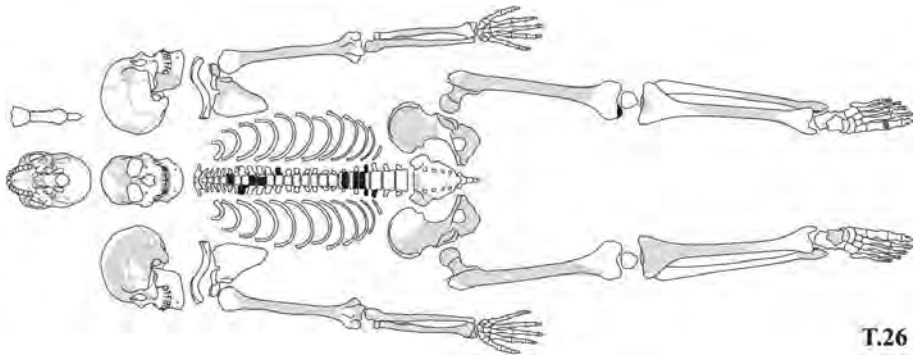
Skeletal pathology
DJD: 1) OA: small marginal lipping and small pitting on the surface of the left mandibular condyle
2) OA: small marginal lipping and small osteophytes on the surface of the left TMJ articular tubercle
3) OA: small marginal lipping and small porosity of the lunate surface on acetabulum of the left os coxae
4) IDD: small marginal lipping and small pitting of the superior surface of the bodies of the cervical vertebrae (C_4, C_5)
cribra orbitalia: 1 (??)
other: none observed

Trauma
None observed.

Other observations
1) bones of both feet of a second individual—possible case of post-excavation accidental commingling

Tumulus 26—type 11

MNI	1
Sex	F
Age	45
Stature	164



Preserved fragments of:
– 3 ribs

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	324 (??)	251	257 (???)	–	–	–
left:	–	–	–	–	–	–

Dental pathology
None observed.

Skeletal pathology
DJD: 1) OA: small marginal lipping, light pitting and small osteophytes on the surface of the right mandibular fossa
2) OA: small marginal lipping, moderate pitting and medium osteophytes on the surface of the right TMJ articular tubercle
3) OA: small marginal lipping and small porosity of the lunate surfaces on the acetabulum of both ossa coxae
4) OA: small marginal lipping and small osteophytes on the distal joint surface of the left fibula
5) OA: light pitting and small osteophytes on the proximal joint surface of the right tibia
6) OA: medium marginal lipping and small osteophytes on the proximal joint surface of the left ulna
7) OA: medium marginal lipping, light pitting and extensive osteophytes on the distal joint surface of a femur (not sided)
8) OA: small marginal lipping, moderate pitting and medium osteophytes on the distal joint surface of the 1st metatarsal (not sided)
9) IDD: small marginal lipping and extensive pitting of the superior body surface of a lower cervical vertebra
10) IDD: medium marginal osteophytes and light pitting on the superior surface of the sacral body
11) OA: small marginal lipping and medium pitting of the right superior articular process, and medium marginal lipping, light pitting and medium osteophytes of the right inferior articular processes of the upper thoracic vertebrae
12) OA: small marginal lipping and small osteophytes of the left inferior articular process of an upper lumbar vertebra

cribra orbitalia: 2 (?)
other: 1) medium osteophytes on the posterior part of the outer rim of the right acetabulum
2) numerous active inflammatory changes of the entheses (enthesitis)

Trauma
None observed.

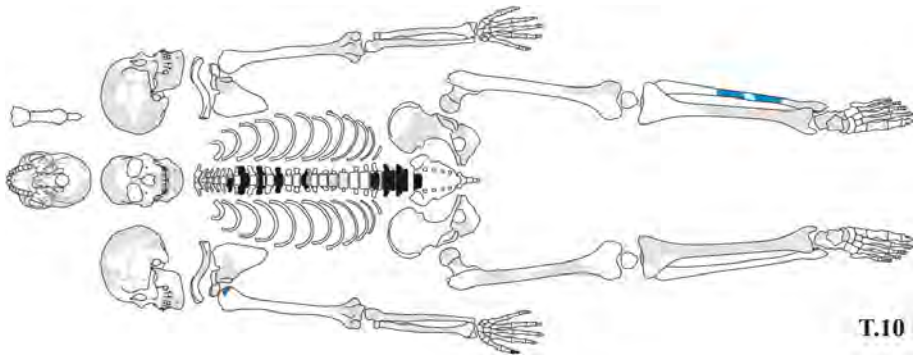
Other observations
1) congenital dysplasia: small pit in the middle of the lunate surface on the acetabulum of the right os coxae [**Fig. 6.3**]
2) small exostosis on the anterior surface of the distal epiphysis of the right fibula

3) 3.5–5-mm-wide right *emissarium parietale* with thinning of the os parietalis in the area—thinning more pronounced on the internal surface [**Fig. 6.4**]

FIGURE 6.3
Congenital dysplasia; small pit in the centre of the lunate surface on the acetabulum of the right os coxae (T.26)
PHOTO BY R. MAHLER

FIGURE 6.4
Emissarium parietale (3.5–5 mm wide) with thinning of the right os parietalis in the affected area (T.26)
PHOTO BY R. MAHLER

Tumulus 10—type III *



MNI	1
Sex	M
Age	30–40
Stature	166

Stature estimation calculated using Pearson's formulae (1899)

Preserved fragments of:
– 3 ribs
– 3 hand phalanges

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	–	367 (?)	–
left:	–	–	–	–	–	–

Dental pathology

1) periodontal pocket between tooth 47 and tooth 48, penetrating deep along the root of 48 for two-thirds of its length

Skeletal pathology

DJD: 1) OA: small marginal lipping and small pitting on the surface of the left mandibular fossa
2) OA: small marginal lipping and medium osteophytes on the distal joint surface of the left fibula
3) OA: small marginal lipping and small porosity of the lunate surface on the acetabulum of the left os coxae
4) OA: medium pitting and small osteophytes of the glenoid fossa of the right scapula
5) OA: small marginal lipping and small pitting of the glenoid fossa of the left scapula
6) IDD: medium-to-large marginal osteophytes and small-to-medium pitting of the superior and inferior surfaces of the body of the lumbar vertebrae

cribra orbitalia: 1 (??)

other: 1) Schmorl's nodes on the lumbar and lower thoracic vertebrae

Trauma

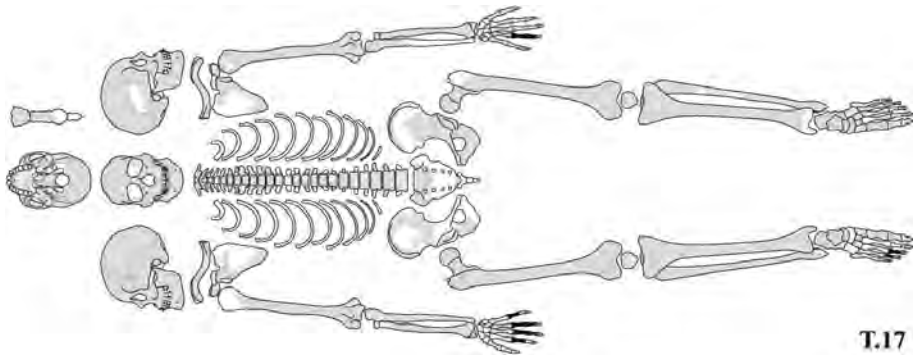
1) possible case of a compression fracture of the T11 (?) and T12 (?) vertebrae

Other observations

1) round hole (10 mm in diameter) with healed rim in the upper left part of the frontal skull bone [**Fig. 6.5**]
2) low bone density of the vertebrae

FIGURE 6.5
A round hole (10 mm in diameter) with healed rim (T.10)
PHOTO BY R. MAHLER

Tumulus 17—type III *



MNI	1
Sex	M
Age	40–50
Stature	173

Preserved fragments of:
– 15 ribs
– 1 foot phalanx

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	302	487	420 (?)	416 (?)
left:	349 (??)	282	305 (?)	490	418 (?)	–

Dental pathology

1) congenital: teeth 31 and 32 most probably shared the same socket (?) [**Fig. 6.6**]

FIGURE 6.6
Teeth 31 and 32 most probably sharing the same socket (T.17)
PHOTO BY R. MAHLER

Skeletal pathology

DJD: 1) OA: small marginal lipping and small osteophytes on the surface of the left TMJ articular tubercle
2) IDD: marginal lipping, small (C6) to moderate (C5), and pitting of the superior and inferior surface of the body of the cervical vertebrae, small (C6) to severe (C5)
3) IDD: small marginal lipping and small pitting of the superior and inferior surface of the body of the middle thoracic vertebrae

cribra orbitalia: 1 (?)

other: 1) partial synostosis of both sacroiliac joints (recorded by Pudło, but not observed in the current state of preservation)

Trauma

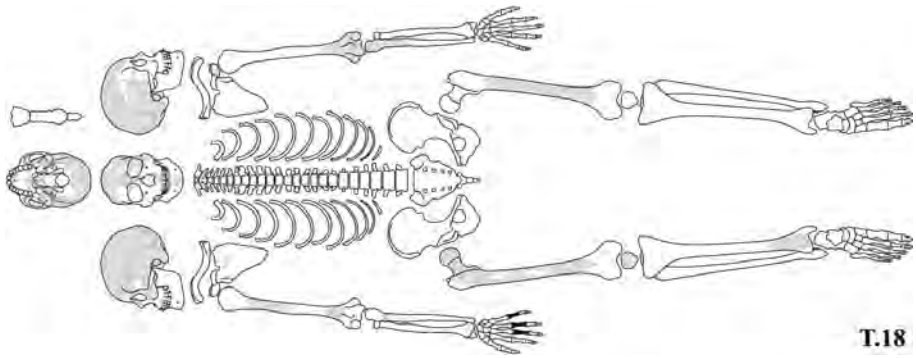
None observed.

Other observations

1) moderate-to-heavy attrition and compensatory eruption of teeth

Tumulus 18—type III *

MNI	1
Sex	F (?)
Age	50
Stature	149



Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	390 (???)	–	–
left:	–	–	–	–	–	–

Dental pathology

1) periapical changes of the socket of tooth 24—alveolar abscess

Skeletal pathology

DJD: 1) OA: small marginal lipping and small pitting on the surface of both mandibular fossae
2) OA: light pitting and medium osteophytes on the joint surface of the right patella
3) OA: light pitting and small osteophytes on the surface of the proximal joints of the hand phalanges
4) OA: light pitting and small osteophytes on the right superior and inferior articular facets of the atlas

cribra orbitalia: 2 (?)

other: none observed

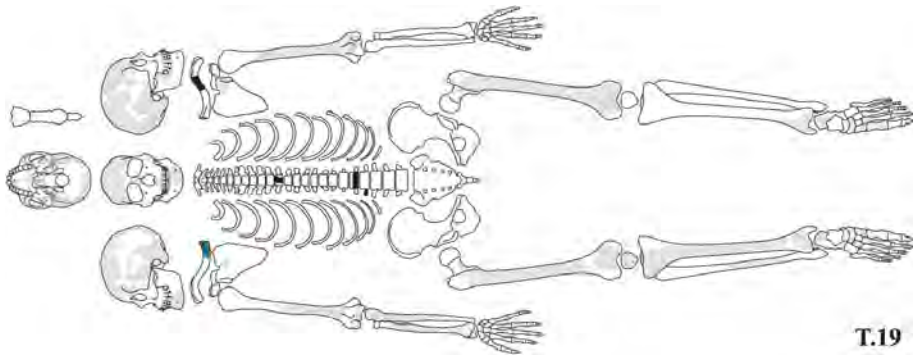
Trauma

None observed.

Other observations

1) bones very light and brittle

Tumulus 19—type III *



MNI	1
Sex	M (?)
Age	35–45
Stature	167

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	–	–	390 (???)	–
left:	–	–	–	456 (???)	–	–

Dental pathology

1) periapical changes of tooth sockets 13, 32 (?), 33, 34, 35—alveolar abscess

Skeletal pathology

DJD: 1) OA: small marginal lipping, moderate pitting and small osteophytes on the surface of the right TMJ articular tubercle
2) OA: small marginal lipping, light pitting and small osteophytes on the distal joint surface of the left femur
3) OA: light pitting and small osteophytes on the joint surfaces of the calcanei
4) IDD: medium marginal osteophytes and moderate pitting of the inferior (?) surface of the body of the lumbar vertebra

cribra orbitalia: 1 (?)

other: none observed

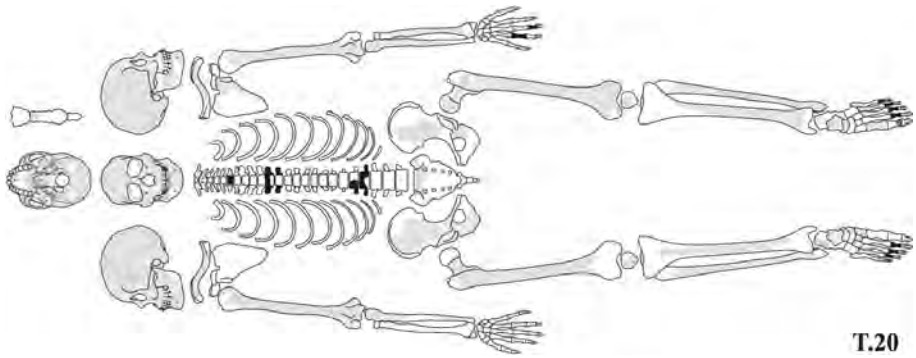
Trauma

None observed.

Other observations

None.

Tumulus 20—type III



MNI	1
Sex	M (??)
Age	50
Stature	171

Preserved fragments of:
– 3 foot phalanges

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	333 (??)	268 (???)	–	–	–	–
left:	331 (???)	–	–	471 (???)	398 (???)	400 (???)

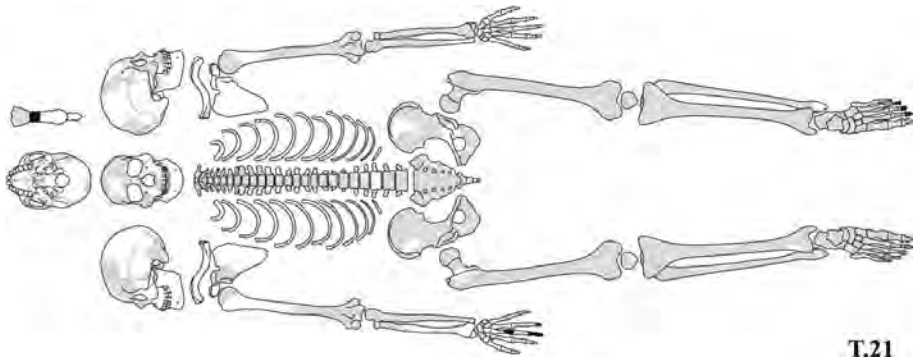
Dental pathology
None observed.

Skeletal pathology
DJD: 1) OA: small marginal lipping and light pitting on the distal joint surface of the left humerus and right radius
2) OA: medium marginal lipping and light pitting on the distal joint surface of the left femur
3) IDD: small marginal lipping and severe pitting of the superior body surface of the lower cervical vertebra and of the inferior body surface of an upper lumbar vertebra
4) OA: small-to-medium marginal lipping and light-to-moderate pitting of the articular processes of thoracic vertebrae (in one case small osteophytes observed as well)
5) OA: small marginal lipping and small osteophytes on a right articular process of an upper lumbar vertebra and on a left articular process of the sacrum
6) OA: medium marginal lipping and light productive changes of interphalangeal joints of both great toes
cribra orbitalia: 2 (?)
other: 1) light active inflammation and moderate inactive inflammatory changes of the left maxillary sinus
2) light inactive inflammation of the right maxillary and left and right frontal sinuses

Trauma
None observed.

Other observations
1) multiple arachnoid granulations on the inner table of the cranial vault along the sagittal suture, amalgamating into greater depressions in the lambda area, the biggest one 20 mm by 10 mm
2) moderate-to-heavy attrition and compensatory eruption of teeth

Tumulus 21—type III



MNI	1
Sex	M
Age	35–40
Stature	167

Preserved fragments of:
– 7 ribs

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	276 (???)	458	389 (??)	386
left:	–	262	–	455	394 (?)	–

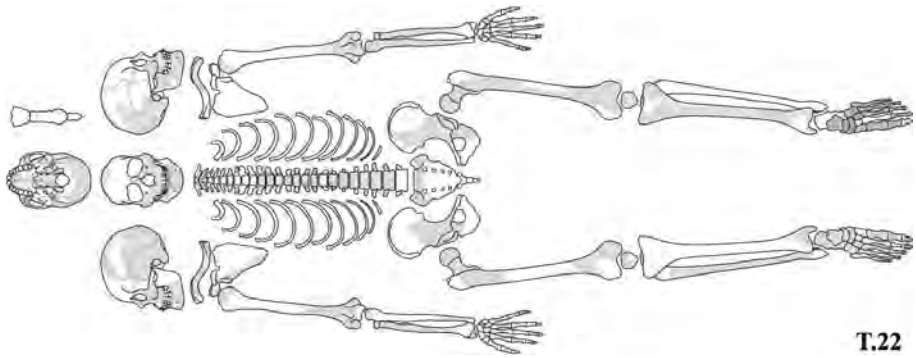
Dental pathology
None observed.

Skeletal pathology
DJD: 1) OA: strong marginal lipping and light pitting (?) of the head of the left 11th or 12th rib
2) OA: small marginal lipping, light pitting and small osteophytes on the surface of the head of the right femur
3) OA: small marginal lipping and light pitting on the distal joint surface of the left tibia, left radius and right femur
4) OA: medium (right) to small (left) marginal lipping and light pitting of the lunate surface of the acetabulae
5) OA: small marginal lipping and light pitting (10 mm in diameter) on the upper joint surface of the left talus head
cribra orbitalia: 2 (?)
other: 1) light porosity of the ectocranium along the sagittal suture

Trauma
None observed.

Other observations
None.

Tumulus 22—type III



MNI	1
Sex	M
Age	35–45
Stature	165

Preserved fragments of:
– 10 ribs

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	245 (???)	–	–	–	–
left:	–	–	–	450 (???)	–	–

Dental pathology
None observed.

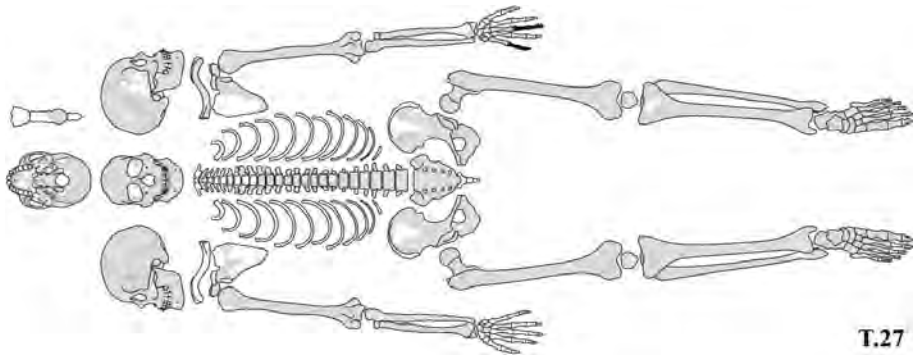
Skeletal pathology
DJD: 1) OA: small marginal osteophytes and light pitting on the surface of the distal joints of the foot phalanges
2) OA: small marginal osteophytes, medium pitting and small osteophytes on the surface of the inferior and superior articular processes of the upper thoracic vertebrae
3) OA: marginal osteophytes and pitting of the articular processes of the lumbar L3 vertebra (small on the superior and medium on the inferior processes)
cribra orbitalia: 0
other: 1) medium-size osteophytes on the anterior surface of the L3 vertebral body
2) light inactive inflammation of the right maxillary sinus

Trauma
1) bony outgrowth on the dorsal shaft surface of the 3rd (?) proximal phalanx of the right (?) foot—possible trauma [**Fig. 6.7**]

FIGURE 6.7
Proximal phalanx of the right (?) foot (T.22), possible trauma
PHOTO BY R. MAHLER

Other observations
1) moderate-to-heavy attrition and compensatory eruption of teeth (pronounced particularly in the maxilla)
2) symmetrical fovea (pits) on the proximal joint surfaces of both 2nd metacarpals

Tumulus 27—type III *



MNI	1
Sex	M
Age	35–45
Stature	165

Preserved fragments of:
– 12 ribs

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	324	252	274	447	378 (?)	370
left:	325	–	277	–	373 (??)	367 (?)

Dental pathology

1) apical granuloma at the position of tooth 23
2) possible abscesses at the position of teeth 37 and 38 (??)

Skeletal pathology

DJD: 1) OA: medium marginal lipping and light pitting of the lunate surface of the left acetabulum
2) OA: medium marginal lipping, light pitting and small osteophytes in the glenoid cavity of the left scapula
3) OA: small marginal lipping and light pitting on the proximal joint surface of the right tibia and on the distal joint surface of the left tibia
4) OA: light pitting and small osteophytes on the distal joint surface of the left ulna

cribra orbitalia: 1 (?)

other: 1) small button osteoma on the outer table of the left parietal bone, located next to the coronal suture in the middle of its length
2) possible case of a supernumerary left (?) cervical rib (??), most probably fused with the vertebra
3) small exostoses on the right lunate
4) localized lipping (joint surface expansion) on the lower margin of the right femoral head
5) light inactive inflammation of the left frontal sinus
6) irregular contour of the right acetabulum [**Fig. 6.8**] and light pitting of the lunate surface
7) considerable overgrowth of the lateral process of both calcanei [**Fig. 6.9**]

Trauma

1) possible case of healed trauma (?): round irregularity (3–4 cm in diameter) on the surface of the frontal bone in the centre of the forehead; the impact of the blow (?) appears to have been directed from the upper-right to the lower-left side of the forehead at an angle of about 25 degrees from the vertical (it may also be interpreted, for example, as attempted scraped trepanation interrupted at an early stage of the procedure)

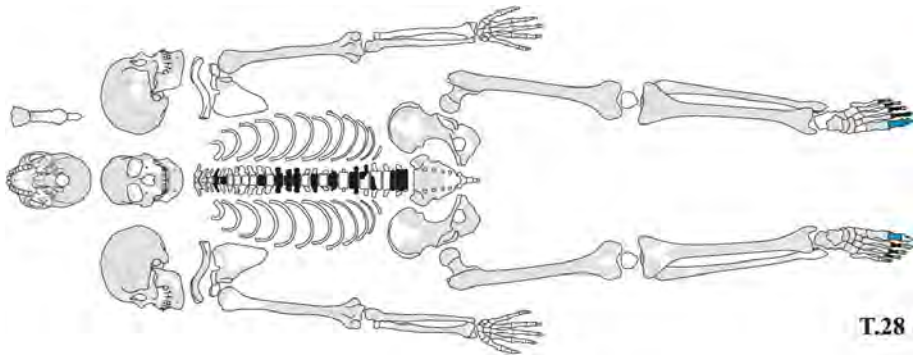
Other observations

1) very thin walls of the maxillary sinuses
2) moderate-to-heavy attrition and compensatory eruption of teeth

FIGURE 6.8
Irregular contour of the right acetabulum (T.27)
PHOTO BY R. MAHLER

FIGURE 6.9
Overgrowth of the lateral processes of both calcanei (T.27)
PHOTO BY R. MAHLER

Tumulus 28—type III



MNI	1
Sex	F
Age	40–55
Stature	160

Preserved fragments of:
– 15 ribs

Length measurements (M1):

bone:	humerus	radius	ulna	femur	tibia	fibula
right:	–	–	259 (???)	438 (???)	–	–
left:	315	–	–	439	375	369 (?)

Dental pathology
1) apical granuloma at the position of teeth 42 (?) and 43 (?)
2) abscesses at the position of teeth 47 (?), 46 (?), 45 (?), 44, 41, 31 and 34

Skeletal pathology
DJD:
1) OA: small marginal lipping and light pitting on the surface of the left mandibular fossa
2) OA: small marginal lipping and small osteophytes on the surface of the left TMJ articular tubercle
3) OA: small marginal lipping and light pitting on the proximal joint surface of the right fibula and left tibia
4) OA: small marginal lipping and light pitting on the lunate surfaces of both acetabulae
5) OA: light-to-medium marginal lipping and light-to-moderate pitting on the joint surfaces of articular processes of the cervical vertebrae (stronger on the left)
6) OA: small marginal lipping and small osteophytes of the right inferior articular process of an upper lumbar vertebra

cribra orbitalia: 1

other:
1) light inactive inflammation of the right frontal sinus (?) and the right maxillary sinus; moderate changes in the left frontal sinus (?)
2) multiple small button osteomas on the outer table of the left parietal bone, one on the right parietal bone and three on the frontal bone

Trauma
None observed.

Other observations
None.

Appendix: Pilot Study of Paleogenomic Analysis of El-Zuma Samples

1 Introduction

In February 2017, a pilot project was undertaken to determine DNA preservation in previously analysed skeletal remains excavated at El-Zuma. Bone and tooth samples were selected for screening of ancient DNA (aDNA) to determine the viability of paleogenomic research and then assemble mitochondrial genomes of successful individuals to map the genetic landscape of those interred at this site. These data would provide novel insights into the ancestry of El-Zuma individuals using mitochondrial (mt) DNA to be combined with other lines of evidence, including stable isotope analyses, anthropological evaluations, and the archaeological context of these tumuli, to contribute to a more comprehensive understanding of those living in the Dongola Reach.

2 Samples from the El-Zuma Tumuli

To begin this project, intact teeth and/or temporal bones were selected from the collection stored at the field house near the excavation site. Permission to sample for ancient DNA trials was granted by Assist. Prof. Mahmoud El-Tayeb, the director of the Early Makuria Research Project. Work was assisted by Robert Mahler, and in the field by Magdalena Srienc when retrieving samples. Having been previously evaluated for anthropometric traits and anthropological analyses, samples were selected by the above personnel for best results of retrieving sterile bone or tooth tissue; this included intact or uncompromised teeth and temporal bones, specifically the petrous portion. Listed in **Table 6.4**, the following samples were photographed (in the field) and recorded for exportation from Sudan.

As detailed above, 26 samples in total were exported, representing 16 unique individuals excavated from the El-Zuma burials; all samples were transported to the University of Zürich for processing as part of previous agreements with the project director. There, further photographs were taken of the remains before processing [**Figs. 6.10–6.15**]. Samples will be returned for permanent storage at the field site.

3 Sample Processing and Extraction Methods

Method optimization was a parallel objective to the evaluation of DNA viability for the samples from the El-Zuma archaeological site. Therefore, the samples were selected for and subjected to multiple state-of-the-art methods to retrieve ancient genetic material. A subset of samples was selected to trial multiple protocols to retrieve ancient DNA for next-generation sequencing (NGS), before applying a successful technique to the rest of the sample cohort. While being mostly or fully intact, the bone and tooth samples from El-Zuma had noticeable diagenic issues. In general, most bone tissue is slightly to moderately bleached or discoloured/stained from the soil, moderately to extensively weathered (with respect to the external cortical bone), and the tissue integrity is soft, suggesting the mineral component is compromised. For some skeletal remains, the presence of mould (i.e. extensive bioerosion) was noted and attests to the unfavourable conditions that may have damaged the tissue, as detailed further in this chapter (Kendall et al. 2018). For the teeth, the enamel is in good condition and any calculus is also intact. However, cementum is flaky or brittle and the dentine is bleached much like the bone tissue, but more severely, and can be soft, which again hints that demineralization may be a concern. Below are examples of the damage sustained by the skeletal remains from the tumuli at El-Zuma [**Fig. 6.16**].

For the samples from El-Zuma, the depositional environment—namely hot, humid, open-air, underground tumuli—likely caused the observed diagenic changes for both the teeth and bones mentioned above, in addition to looting (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016; Mahmoud El-Tayeb 2005). Environment has a large effect on the preservation of any endogenous DNA, and is especially the case for those from arid climates (Poinar 2003; Hansen et al. 2017; Pinhasi et al. 2015; Allentoft et al. 2012). Despite the preservation issues, this pilot project was undertaken since these paleogenomic data stand to add another line of evidence to understand differences observed in the archaeological context. Aggressive methods were selected to be used to retrieve genetic material from these seemingly compromised substrates (i.e. bones and teeth). In addition to environmental contamination, remains had been physically handled for many years by researchers during and after excavation (as all remains are), and it was assumed contamination (i.e. presence of modern DNA) would be an obstacle to be

TABLE 6.4 List of El-Zuma samples exported from Sudan and currently in storage at the University of Zürich

	Date collected	Tumulus no.	Sample type	Sample	Retrieval method / state of remains	Field notes and other observations
1	27/Feb/18	T.8	bone	R Temporal	broken	
2	27/Feb/18	T.10	bone	L Petrous portion	broken	
3	27/Feb/18	T.10	bone	R Temporal	broken	
4	27/Feb/18	T.11	bone	R Temporal	broken	
5	27/Feb/18	T.11	bone	L Petrous portion	broken	
6	27/Feb/18	T.14	bone	R Temporal	broken	glued/reconstruction
7	27/Feb/18	T.15	tooth	LPM2 (maxillary)	extracted	
8	27/Feb/18	T.15	tooth	LC1 (mandibular)	extracted	
9	27/Feb/18	T.15	bone	L Petrous portion	broken	very weathered, a bit mouldy
10	27/Feb/18	T.16	bone	R Petrous portion	broken	some glue/reconstruction
11	27/Feb/18	T.17	bone	L Temporal	broken	some lesions on ventral slope of petrous
12	27/Feb/18	T.18	bone	L Temporal	broken	very weathered
13	27/Feb/18	T.18	bone	R Temporal	excised	very weathered
14	27/Feb/18	T.19	bone	R Petrous portion	broken	
15	27/Feb/18	T.20	bone	L Petrous portion	excised	some glue/reconstruction, mouldy
16	27/Feb/18	T.20	bone	R Petrous portion	excised	some glue/reconstruction, mouldy
17	27/Feb/18	T.22	bone	L Temporal	excised	some glue/reconstruction
18	27/Feb/18	T.24	bone	R Petrous portion	broken	
19	27/Feb/18	T.25	bone	R Petrous portion	broken	
20	27/Feb/18	T.25	bone	L Petrous portion	broken	
21	27/Feb/18	T.25	tooth	RPM1 (maxillary)	broken	
22	27/Feb/18	T.25	tooth	RPM2 (maxillary)	broken	
23	27/Feb/18	T.26	bone	L Petrous portion	broken	some glue/reconstruction
24	27/Feb/18	T.27	tooth	LPM2 (maxillary)	extracted	
25	27/Feb/18	T.27	tooth	RPM2 (maxillary)	extracted	
26	27/Feb/18	T.28	bone	R Petrous portion	broken	

Abbreviations used: T = Tumulus, R = right side, L = left side, C = canine, PM = premolar
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FIGURE 6.10 El-Zuma Tumulus 10 sample—left petrous pyramid of temporal bone. Left: dorsal view. Middle: inferior view. Right: ventral view
PHOTOS BY A. BREIDENSTEIN

FIGURE 6.11 El-Zuma Tumulus 11 sample—left petrous pyramid of temporal bone. Left: dorsal view. Middle: inferior view. Right: ventral view
PHOTOS BY A. BREIDENSTEIN

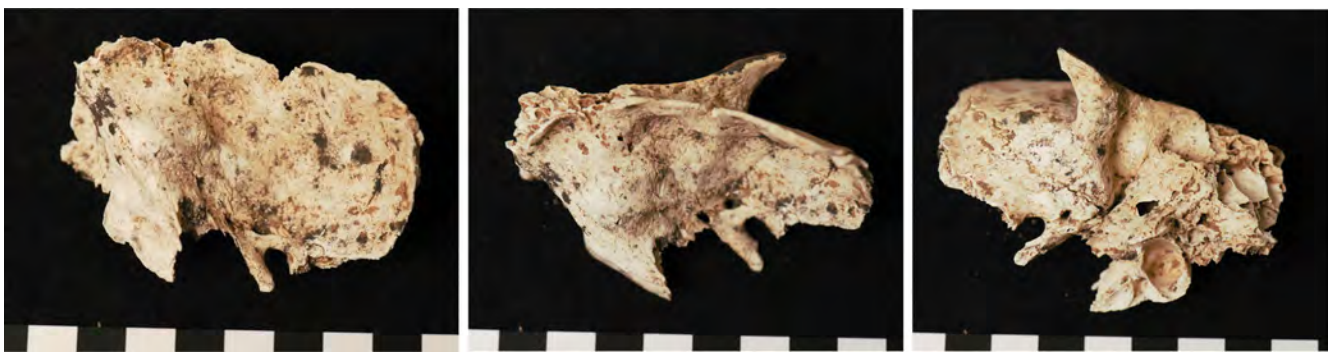

FIGURE 6.12 El-Zuma Tumulus 15 sample—left temporal bone. Left: medial view. Middle: superior view. Right: inferior view
PHOTOS BY A. BREIDENSTEIN

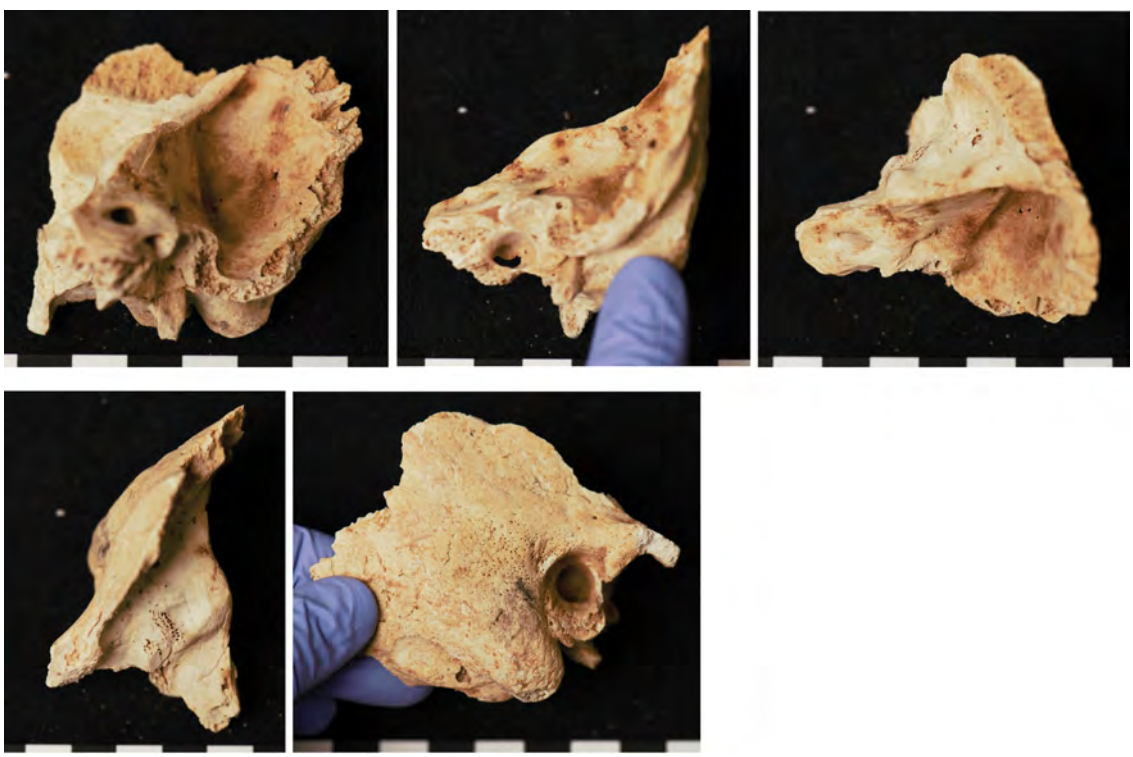

FIGURE 6.13 El-Zuma Tumulus 17 sample—left temporal bone. Left upper: medial view. Middle upper: ventral view. Right upper: superior view. Left lower: ventral view. Right lower: lateral view
PHOTOS BY A. BREIDENSTEIN

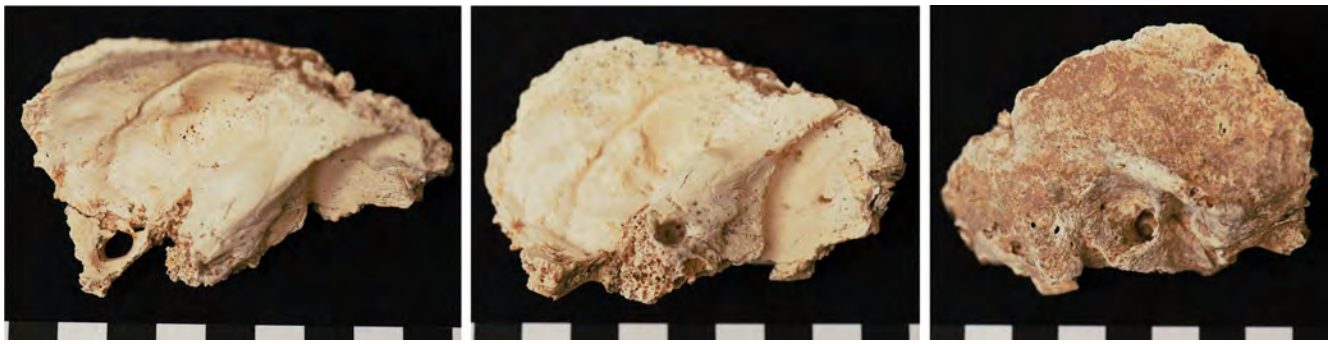

FIGURE 6.14 El-Zuma Tumulus 18 sample—right temporal bone. Left: superior view. Middle: medial view. Right: lateral view
PHOTOS BY A. BREIDENSTEIN

FIGURE 6.15 El-Zuma Tumulus 28 sample—right petrous pyramid of temporal bone. Left upper: dorsal view. Middle upper: superior view. Right upper: ventral view. Left lower: lateral view
PHOTOS BY A. BREIDENSTEIN

addressed through processing methodologies. To mitigate the above issues, three methodologies were trialled to compare the yield of ancient DNA across the selected protocols using a subset of six bone samples [**Table 6.5**] to test these methods. Additionally, several samples were processed for DNA extraction but have yet to be extracted due to time constraints (i.e. tooth samples, not listed).

To begin, samples were processed according to the most current protocols optimized for materials from Africa to obtain sterile tissue from the remains (Gamba et al. 2014; Pinhasi et al. 2015; Gallego Llorente et al. 2015; Damgaard et al. 2015; Hansen et al. 2017), in addition to more experimental methods to mitigate high contamination or compromised tissues, as outlined in Gondek, Boessenkool, and Star (2018). The first subset of samples was chosen for multiple methodologies to evaluate DNA yield and optimize extraction methods to be applied to the El-Zuma samples following these trials [**Table 6.5**].

Temporal bone samples were first decontaminated in a UV-crosslinker (at least 15 min each side) before mechanically removing a layer of the outer cortical bone (i.e. most

FIGURE 6.16 Examples of taphonomic damage to skeletal remains and teeth found at El-Zuma. Left: right petrous from Tumulus 16 showing mould growth on external cortical bone. Middle: right temporal from Tumulus 18 showing extensive weathering on external surface. Right: right 2nd premolar from Tumulus 27 showing flaky or brittle cementum found on some teeth
PHOTOS BY A. BREIDENSTEIN

TABLE 6.5 El-Zuma samples prepped for DNA extraction and notes about the state of the remains before processing; two aliquots were obtained for double digestion protocols. Additional aliquots for ZUM18 were taken for a bleach pre-treatment before double digestion, designated as "B"

Sample name	Sample	Tissue type	Processing method	Sample amount (+remaining)	Sampling / lab notes
ZUM10	L Petrous	Bone	crush	2×100 mg + 213 mg	very soft, weathered, chalky bone, flaky when crushed
ZUM11	L Petrous	Bone	crush	2×100 mg + 913 mg	very soft, weathered, some external and internal mould, darker stains
ZUM15	L Petrous	Bone	crush	2×200 mg + 470 mg	weathered, chalky, mouldy, powdered better than expected
ZUM17	L Petrous	Bone	crush	2×200 mg + 1410 mg	(none)
ZUM18	R Petrous	Bone	crush	2×200 mg + 370 mg	mouldy, chalky, soft, but produced a fine powder, superficial surface removed
ZUM18_B	R Petrous	Bone	crush	2×200 mg	(see above, additional powder for bleach treatment method)
ZUM28	R Petrous	Bone	crush	2×100 mg + 201 mg	soft bone, very bleached in colour, maybe osteoporotic; some glue

Abbreviations: R = right, L = left, mg = milligrams
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likely to be contaminated), following another round of UV decontamination. Bone samples were then powdered into multiple aliquots using a stainless steel mortar and pestle (Gondek, Boessenkool, and Star 2018), then subjected to various pre-treatments before DNA extraction, for a total of ten trials: three were subjected to a standard digestion ("SD") method (detailed in Schuenemann et al. 2017, with modification from Dabney et al. 2013), six to a pre-digestion step before the standard extraction, known as a double digest ("DD") (modelled from Damgaard et al. 2015 and Schroeder, de Barros Damgaard, and Allentoft 2019), and one with an experimental bleach pre-treatment before a double digestion of the powder ("B") (Boessenkool et al. 2017; Kemp and Smith 2005). Samples were processed in two labs while trialling new methodologies: the Institute of Evolutionary Medicine, University of Zürich, Switzerland (UZH) and the Centre for Ecological and Evolutionary Synthesis, University of Oslo, Norway (UiO). DNA extracts were built into double-stranded libraries as outlined in Meyer and Kircher (2010), then

TABLE 6.6 Shotgun sequencing results for the subset of El-Zuma samples using three protocols with two different pre-treatments, while standard methodology is single digestion "SD". Samples were treated with a pre-digestion ("DD") and/or bleach ("B") to mitigate modern or external contamination. Cluster factor is a measurement of sequence uniqueness within the libraries

Sample name	Extraction method	Mapped human reads	Endogenous DNA (%)	Cluster factor	Mapped MT reads	Avg. MT coverage (X)	MT/NUC ratio	Avg. fragment length (bp)
ZUM10_DD	DD	134	0.011	1.067	0	NaN	0	54.31
ZUM10_SD	SD	201	0.011	1.025	0	NaN	0	38.29
ZUM11_DD	DD	121	0.008	1.058	0	NaN	0	55.88
ZUM11_SD	SD	259	0.014	1.058	0	NaN	0	42.12
ZUM15_oslo	DD	222	0.015	1.032	0	NaN	0	51.29
ZUM17_oslo	DD	276	0.014	1.033	0	NaN	0	57.34
ZUM18_oslo	DD	106	0.011	1.075	0	NaN	0	48.36
ZUM18B_oslo	B+DD	8188	0.215	1.345	11	0.042126	244.91	65.12
ZUM28_DD	DD	650	0.134	1.318	1	0.002655	168.5	75.13
ZUM28_SD	SD	3554	0.063	1.301	5	0.022451	290.21	67.49

"oslo" = samples processed, and libraries constructed at UiO. "X" = measure of coverage of the genome where the number designates the average number of unique reads covering any location along the genome. "MT" = mitochondrial DNA, "NUC" = nuclear DNA, bp = base pairs. "NaN" = no sequence reads available
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dual-indexed according to Kircher, Sawyer, and Meyer (2012). Libraries were 75 paired-end sequenced on an Illumina HiSeq4000 platform at the UiO and/or the Functional Genomics Center Zürich (at the UZH). Raw data reads were pre-processed bioinformatically, then mapped against a human reference genome using the EAGER program, a pipeline optimized for degraded sequence data (Peltzer et al. 2016). For those DNA extracts with obtained human mitochondrial DNA from shotgun sequencing and evidence of the material being ancient, magnetic bead hybridization was applied to enrich and concentrate for mtDNA, as detailed in Maricic, Whitten, and Pääbo (2010), then sequenced for mitogenome assembly and analysis.

4 DNA Extraction and Sequencing Results with Discussion

Despite employing mechanical and/or chemical means of mitigating contamination and the use of NGS strategies to obtain ancient genetic material, only one of the trials was successful in retrieving human DNA characterized as ancient. Shotgun sequencing yields ranged from around 100 to over 8,000 reads (or molecules) mapping to the human reference genome and endogenous contents (i.e. amount of authentic human DNA) were between 0.01 and 0.2%, which were both disappointing outcomes. Results are listed in **Table 6.6**. Moreover, mitochondrial reads were only obtained in three trials, one of which was with the bleach treatment, but at an unappreciable level (i.e. between 1 and 11 reads).

For most El-Zuma samples listed above, two libraries were built from separate extracts subjected to different extraction methods (e.g. single digest, double digest). These sequenced libraries are theoretically the same individual and could thus be merged post-sequencing to evaluate authenticity criteria (i.e. mapped human reads, damage patterns, fragment length). After merging, the resulting metrics are listed in **Table 6.7**.

As expected, merging these data increased mapped reads—between a few hundred to more than 9,000, while the endogenous contents were averaged. These merged read files are also more useful to evaluate damage patterns. Ancient or degraded DNA can be characterized by an accumulation of misincorporation lesions at the terminal ends of sequences, and these frequencies can be plotted along the length of the sequence reads to create a "damage profile" (Briggs et al. 2007; Dabney, Meyer, and Pääbo 2013; Krause et al. 2010). These patterns function as an authentication criterion when working with aDNA and frequencies typically reach percentages of at least 10 and up to 40 (Dabney, Meyer, and Pääbo 2013; Krause et al. 2010). For the El-Zuma extracts, damage frequencies were

TABLE 6.7 Merged shotgun sequence data per individual

Sample name	Mapped human reads	Endogenous DNA (%)	Cluster factor	Mean NUC coverage (X)	Mapped MT reads	Avg. MT coverage (X)	MT/NUC ratio	DMG 1st base 5′ (%)	DMG 1st base 3′ (%)	Avg. fragment length (bp)
ZUM10	333	0.011	1.048	0	0	NaN	0	0.0196	0.0465	44.61
ZUM11	378	0.011	1.063	0	0	NaN	0	0.0333	0.0244	46.34
ZUM15	1772	0.017	1.158	0	0	NaN	0	0.0533	0.057	49.74
ZUM17	2783	0.016	1.349	0	0	NaN	0	0.0142	0.0169	48.82
ZUM18	9477	0.07	1.32	0.0002	11	0.0421	222.95	0.0127	0.0153	61.79
ZUM28	4201	0.068	1.305	0.0001	6	0.0251	269.83	0.0085	0.0069	68.67

"NUC" = nuclear DNA, "MT" = mitochondrial DNA, "DMG" = damage, "bp" = base pairs, "NaN" = no sequences available

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TABLE 6.8 Mapped mitochondrial reads for samples subjected to enrichment

Sample name	Mapped MT human reads	Endogenous DNA (%)	Cluster factor	Mapped MT reads	Avg. MT coverage (X)	Damage at 1st base 5′	Damage at 1st base 3′	Avg. fragment length (bp)
ZUM18B_oslo	493	1.808	265.022	493	2.0538	0	0.0079	69.02
ZUM28_DD	7	0.347	396	7	0.0179	0	0	42.29
ZUM28_SD	80	0.222	174.488	80	0.4021	0	0	83.28

"MT" = mitochondrial, "bp" = base pairs, "oslo" = prepped at UiO, "DD" = double digest, "SD" = single digest

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at most 5%, and most plots did not demonstrate a pattern that would indicate the genetic material to be ancient. One sample, ZUM15, showed some hints of a characteristic pattern, and with short fragment sizes (30–50 bp, on average), but remains unconvincing and no mitochondrial reads were obtained [**Fig. 6.17**]. Other damage plots for merged shotgun reads for the six individuals are found at the end of this appendix [**Figs 6.19–6.23**].

For all extracts in general, the mapped human reads were very low as typical read numbers should be in the range of millions, not hundreds or thousands. Additionally, the reads did not show typical characteristics to firmly indicate the obtained material was ancient, namely a lack of chemical damage patterns at the terminal ends and, in some cases (ZUM18, ZUM28), fragments are too long (Briggs et al. 2007; Poinar et al. 2006). For those samples with optimal fragment lengths (i.e. less than 50bp; ZUM10, ZUM11, ZUM15, ZUM17), the damage patterns are not ideal and, most notably, no mitochondrial reads were obtained. While not a complete metric of the sequences captured, shotgun sequencing is a snapshot of what is available in an extract; thus, zero mitochondrial reads suggests that these samples are not good candidates for the hybridization step to enrich for this genomic marker specifically.

Despite lacking any criteria for the sequences being authentically ancient, there were a few mitochondrial DNA reads obtained from three of the library trials: ZUM18B_oslo, ZUM28_DD, ZUM28_SD. These samples also had the highest number of mapped reads for the samples from the El-Zuma tumuli. Thus, these extracts were subjected to mitochondrial enrichment via hybridization with baits constructed from human mtDNA, as per Maricic, Whitten, and Pääbo (2010). These enriched extracts were amplified, pooled, and sequenced on an Illumina MiSeq platform at the Functional Genomic Center Zürich (at UZH). Sequencing results are listed in **Table 6.8**.

These results show that even with enrichment, the mitochondrial sequences did not increase to an appreciable level for analysis or mitogenome reconstruction. Furthermore, there are no indicators these sequences are ancient, as reads lack damage at terminal ends of the

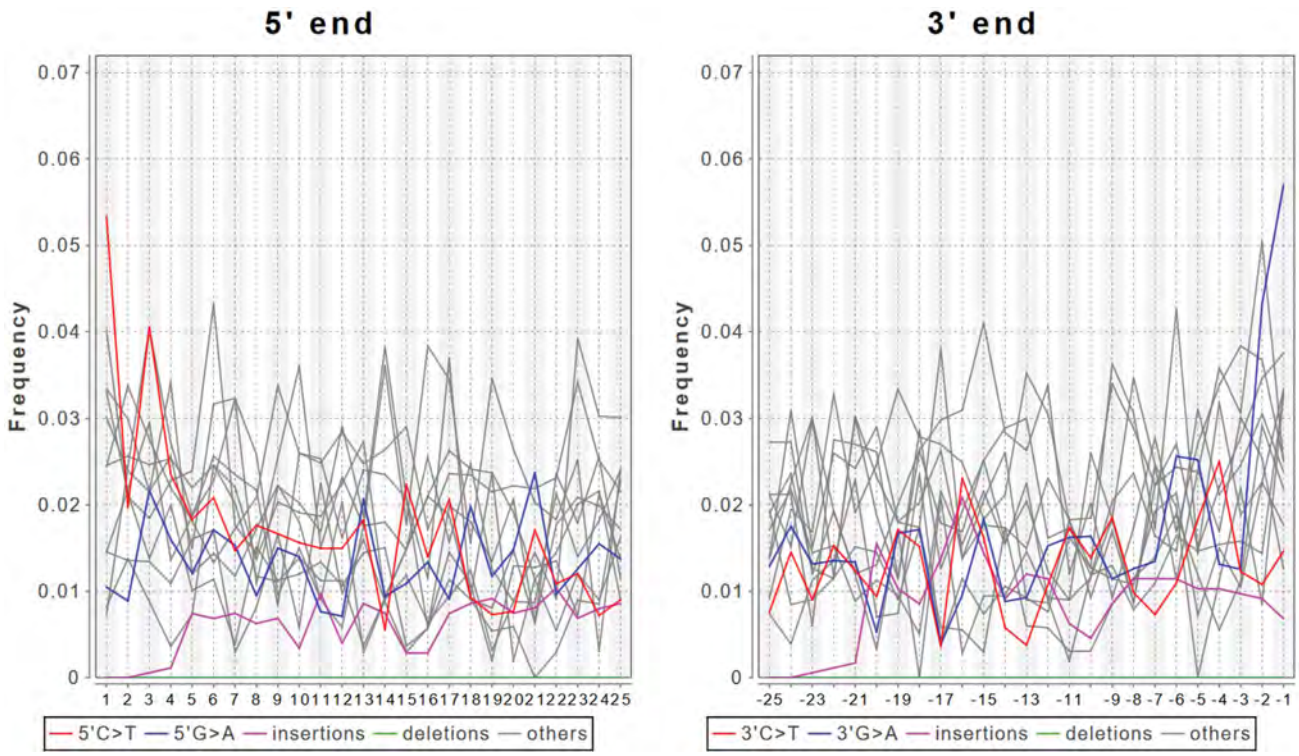

FIGURE 6.17 Merged shotgun reads for sample ZUM15 (total of 1772 reads used) showing over 5% damage accumulation at the 5′ and 3′ ends, and a characteristic "smile" profile, where C to T substitutions are higher at the 5′ end and G to A substitutions are higher at the 3′ end
PLOT PRODUCED BY MAPDAMAGE [GINOLHAC ET AL. 2011]

sequences and fragments are too long [**Fig. 6.18**]. While there were relatively very few reads to construct a damage plot, the characteristic misincorporations were not present or less than 1% [**Fig. 6.18**].

5 Conclusions

Despite cutting-edge protocols and robust measures to mitigate contamination, no ancient DNA was obtained for further analysis from ten trials using samples from the El-Zuma tumuli. Taken together, these results show that DNA is likely not preserved well enough in the El-Zuma samples for paleogenomic analyses with the performed methodologies, likely due to the depositional environment of the skeletal remains in tumulus burials at this site. While these results are discouraging for further invasive analyses, tooth samples still need to be trialled and more sensitive methods, for example, single-stranded library preparation techniques (Gansauge and Meyer 2019), may be considered to obtain DNA from these samples.

These data were collected and analysed as part of a larger project, "Paleogenomic Investigation of Ancient Nubian Populations in the Past 3,000 Years," funded by the National Geographic Society EC-224R-18, GR-000039064.

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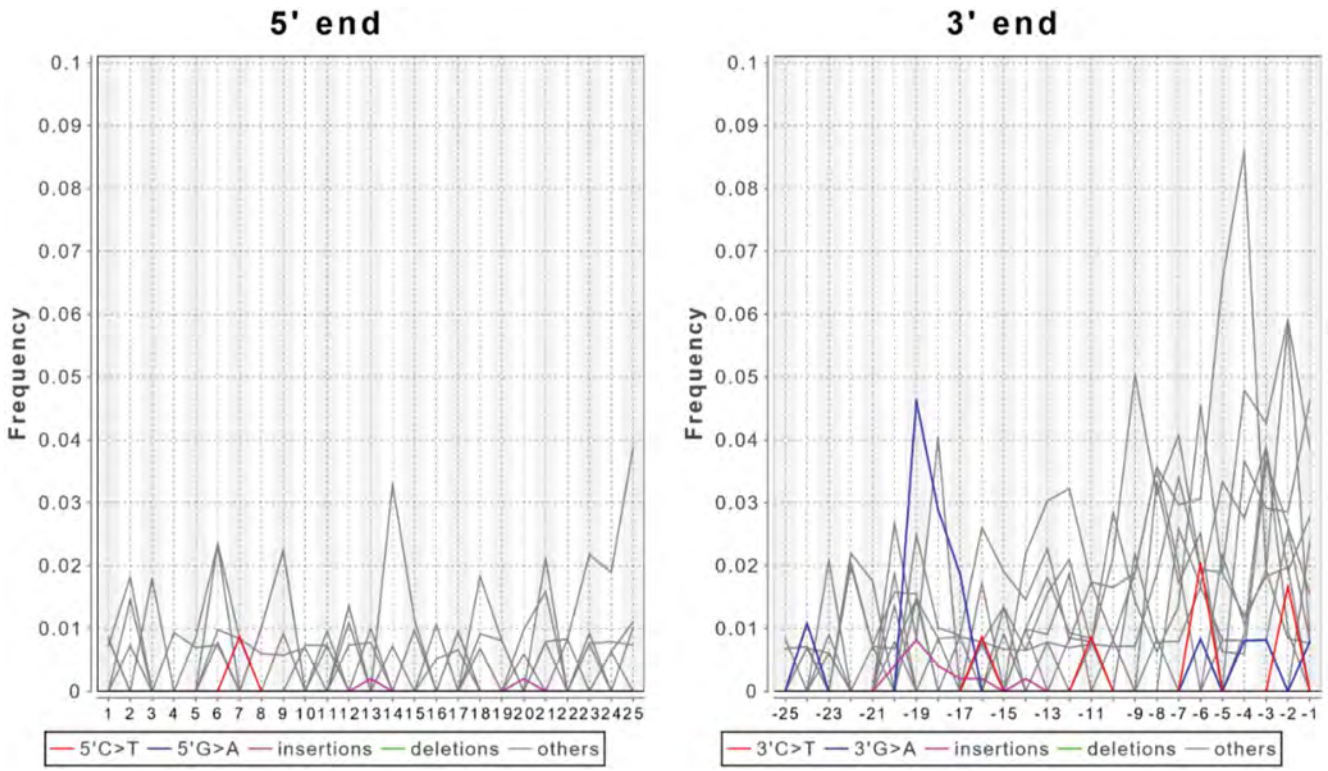

FIGURE 6.18 Damage pattern of 493 sequenced mitochondrial reads post-enrichment obtained from T.18 (ZUM18B_oslo) sample with bleach pre-treatment and double digest method. Left: frequencies (in %) of C to T misincorporations found at 5′ end of sequences. Right: frequencies of G to A misincorporations found at 3′ end of sequences
PLOT PRODUCED BY MAPDAMAGE [GINOLHAC ET AL. 2011]

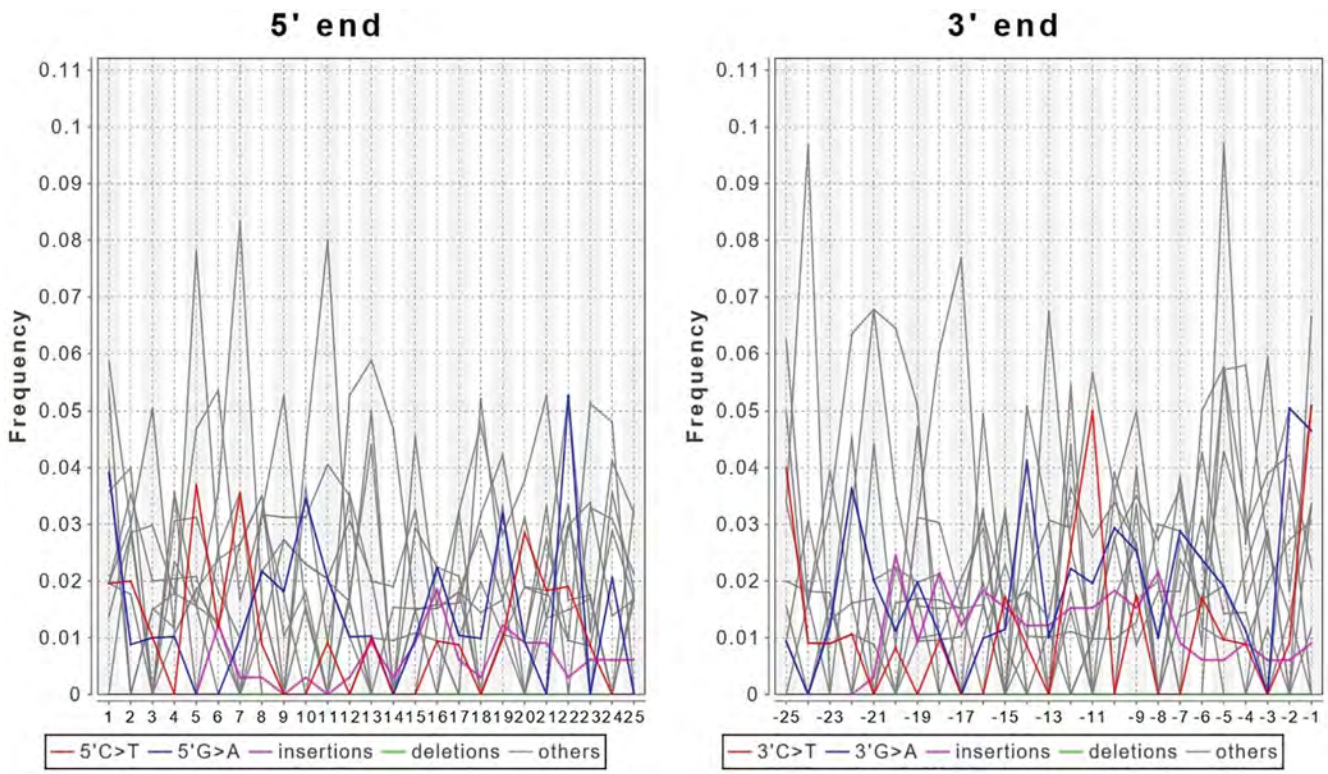

FIGURE 6.19 Damage plot for El-Zuma T.10 Individual, 333 shotgun reads used
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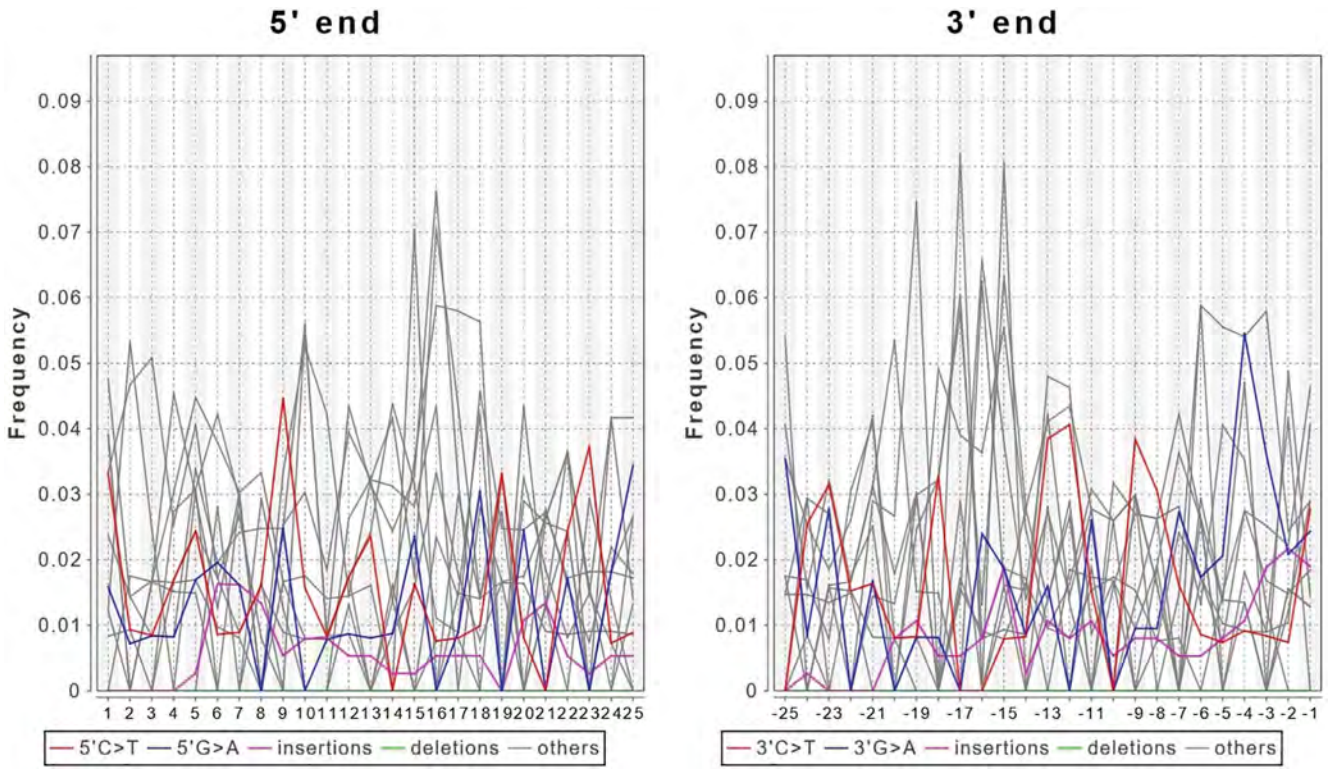

FIGURE 6.20 Damage plot for El-Zuma T.11 Individual, 378 shotgun reads used
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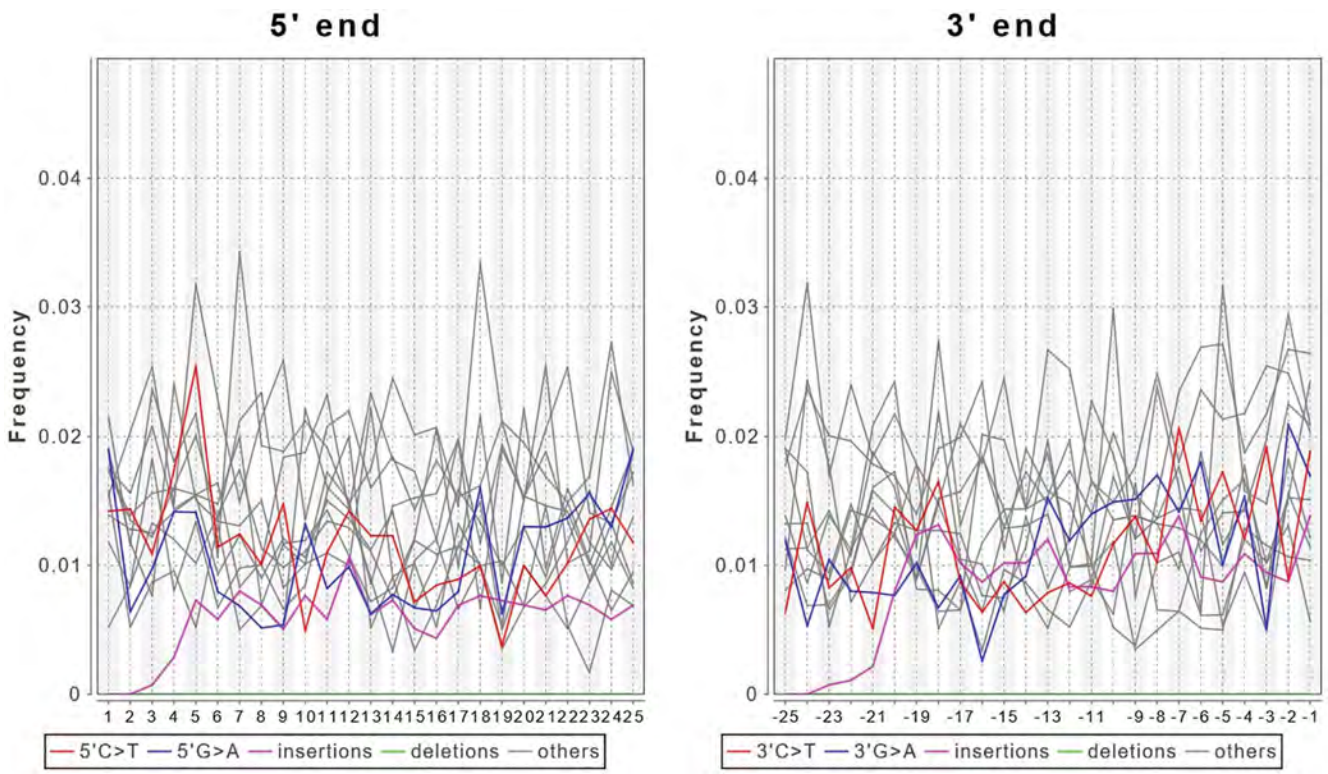

FIGURE 6.21 Damage plot for El-Zuma T.17 Individual, 2783 shotgun reads used
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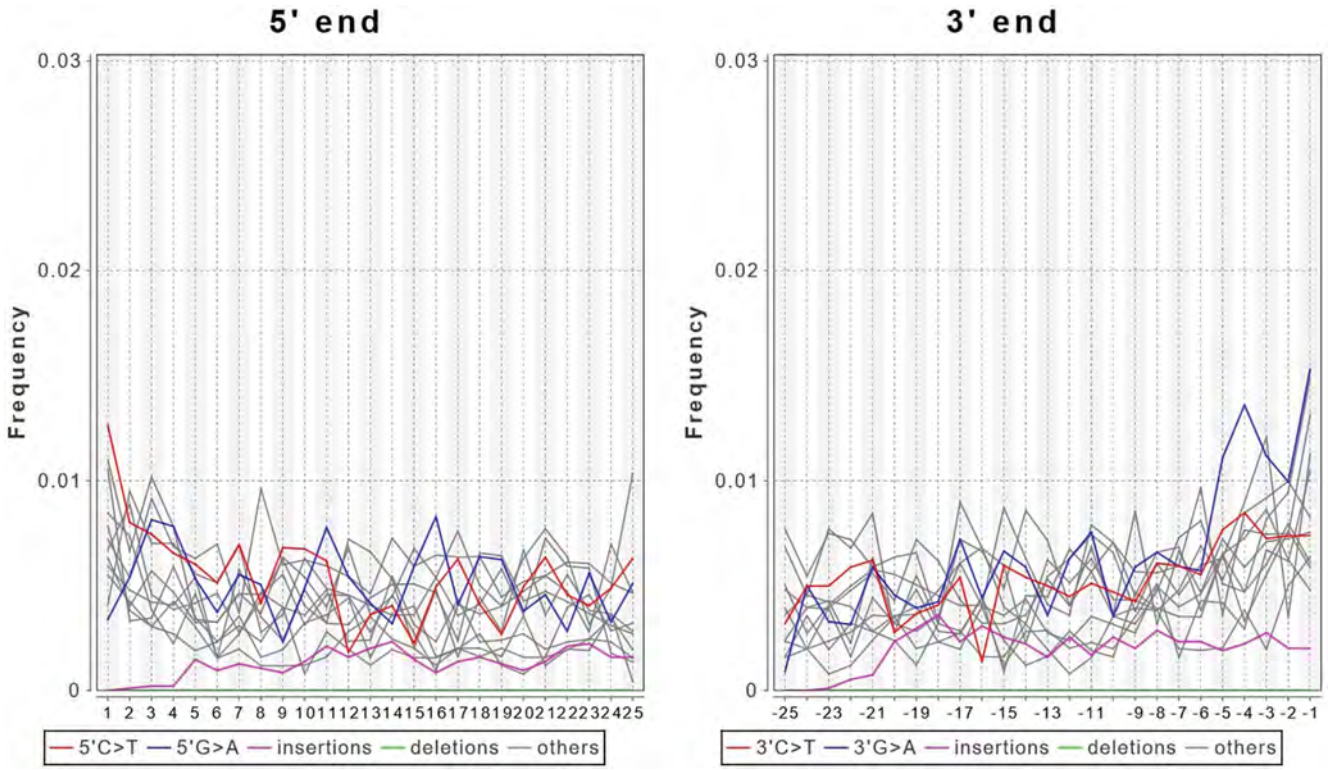

FIGURE 6.22 Damage plot for El-Zuma T.18 Individual, 9477 shotgun reads used
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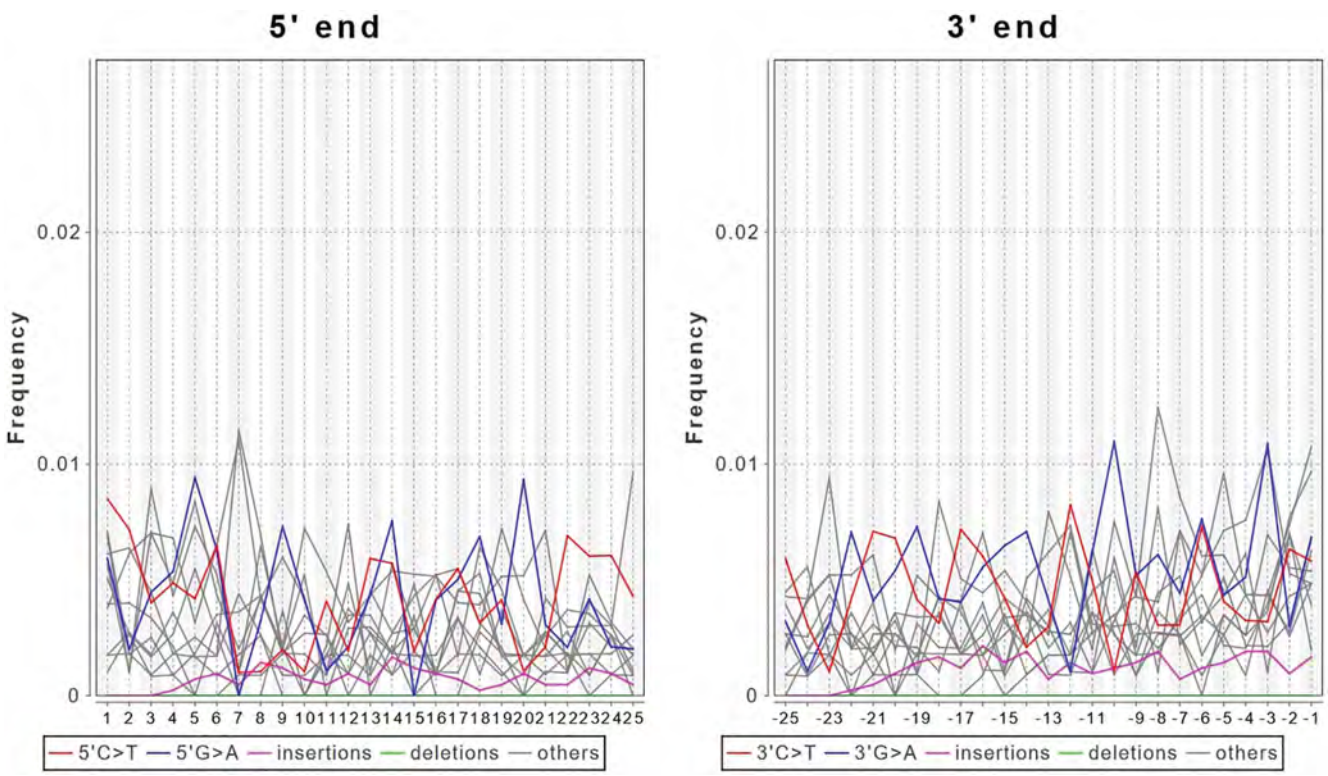

FIGURE 6.23 Damage plot for El-Zuma T.28 Individual, 4201 shotgun reads used
PLOT PRODUCED BY MAPDAMAGE [GINOLHAC ET AL. 2011]

CHAPTER 7

Isotope Analysis and Radiocarbon Dating of Human Remains from El-Zuma

Iwona Kozieradzka-Ogunmakin

1 Introduction

Isotope analysis of human remains has become a widely applied technique in the reconstruction of ancient diets (e.g. Kellner and Schoeninger 2007; Tykot 2004), human mobility and environmental changes (e.g. Loftus, Roberts, and Lee-Thorp 2016; Roberts et al. 2013; Slovak and Paytan 2011), with a growing body of research in the Nile Valley (e.g. Buzon and Bowen 2010; Buzon and Simonetti 2013; Buzon, Schrader, and Bowen 2019; Dupras and Schwarcz 2001; Iacumin et al. 1998, 2016; Schrader et al. 2019; Thompson, Chaix, and Richards 2008).

The author presents here the results of carbon ($\delta^{13}C$), oxygen ($\delta^{18}O$) and strontium ($^{87}Sr/^{86}Sr$) isotope analysis of human tooth enamel, which has been used to identify potential migrants and shed light on the diet of the ancient population of El-Zuma during the post-Meroitic/Early Makuria period (*c.* AD 350–600). Tooth enamel forms during infancy and childhood, after which its chemical composition does not change (Hillson 2005). Since tooth enamel does not remodel like bone tissue, the composition of the former will reflect the diet and locality—given the local resources are consumed—of an individual during the time of enamel formation. Human remains from selected El-Zuma burials have also been used to obtain radiocarbon dates to verify the chronology of the site. For comparative reasons, stable isotope data from two nearby sites at El-Detti and El-Kurru [**Fig. 7.1**] have also been included. The cemetery site at El-Detti lies approximately 7.5 km upstream from El-Zuma. Both sites are contemporaneous and have been excavated by the PCMA team as part of the Early Makuria Research Project. The Kushite cemetery at El-Kurru is located approximately 6 km upstream from El-Zuma and contains royal pyramids and tumuli. The former burials were extensively excavated by George A. Reisner in 1918–1919. Artefacts and human remains recovered during his excavations at El-Kurru were brought to Boston, USA; the collection is now held at the Peabody Museum of Archaeology and Ethnology and the Museum of Fine Arts (MFA) in Boston. The samples of human dental enamel from El-Kurru were collected at the MFA.

Palaeodietary reconstruction is based on the principle that the isotopic composition of consumed food is transformed by the body and preserved in human tissue, such as skin, hair, dental enamel and bone collagen (Lamb 2016; Sealy 2001). Carbon ($\delta^{13}C$) isotope analysis has been successfully applied to reconstruct dietary regimens of ancient Egyptian and Nubian populations. For example, the studies by Basha et al. (2016), Iacumin et al. (1998), Thompson et al. (2005), Thompson, Chaix, and Richards (2008), Turner et al. (2007), White (1993), and White and Schwarcz (1994) have identified seasonal fluctuations in the C_3/C_4 plant balance, suggesting some form of crop rotation, as well as periods of significant C_4 adapted plant consumption, corresponding to low levels of the Nile and periods of social unrest. A recent study by Iacumin et al. (2016) has demonstrated changes in subsistence strategies dictated by environmental changes occurring from the pre-Mesolithic to the Meroitic period.

Carbon isotope ratios of human tooth enamel carbonate reflect the isotopic composition of dietary carbon sources. Carbon is assimilated by plants through one of three pathways (C_3, CAM, C_4), resulting in distinct $\delta^{13}C$ values for each group of plants (Bender 1971; Smith and Epstein 1971). C_3 plants, which include wheat, barley, most fruits and vegetables, show values centred around -28‰ to -26‰. C_4 plants, such as sorghum and millet, demonstrate higher values centred around -14‰ to -12‰. The Nubian diet was predominantly based on C_3 plants; however, the consumption of C_4 plants increased significantly during the post-Meroitic period (AD 350–550) (White and Schwarcz 1994). Sorghum, a C_4 plant, was likely included in the diet already during the Meroitic period (*c.* 300 BC–AD 350) (Rowley-Conwy 1989), and its presence in archaeological deposits dates back to the 3rd millennium BC, based on recent evidence from Jebel Moya in southern Sudan (Brass et al. 2019).

Stable isotope of oxygen ($\delta^{18}O$) and radiogenic strontium ($^{87}Sr/^{86}Sr$) have been used successfully to investigate migration patterns in ancient Egypt and Nubia (Buzon, Simonetti, and Creaser 2007; Buzon and Simonetti 2013; Buzon and Bowen 2010; Dupras and Schwarcz 2001). A detailed review of the applicability of oxygen isotope ($\delta^{18}O/^{16}O$) analysis in bioarchaeology has been delivered by Pederzani and Britton (2019). Oxygen isotope has potential to reflect the individual's water intake and thus can be a proxy for location and migration. The oxy-

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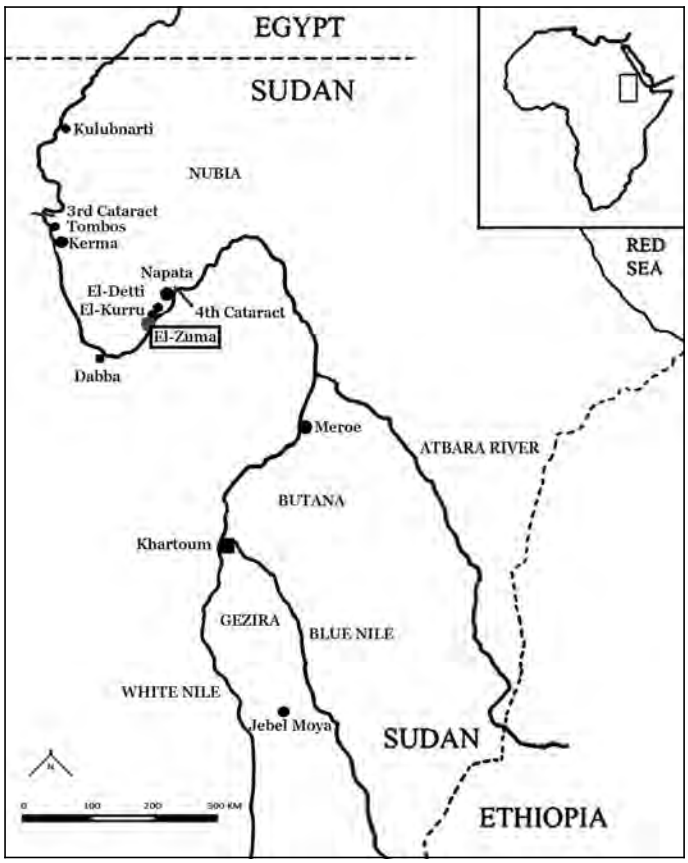

FIGURE 7.1 Location of El-Zuma and associated sites
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gen isotope ($\delta^{18}O/^{16}O$) ratio in enamel carbonate primarily reflects the composition of available water sources at the location where the individual lived during childhood. Dupras and Schwarcz (2001) established that there were significant differences between the oxygen isotope ratios of the teeth of individuals living in oasis communities and those of populations living in settlements in the Nile Valley. Touzeau et al. (2013) used oxygen isotope ratios in human teeth to show that there were progressive increases in the Nile water $\delta^{18}O$ composition from the pre-Dynastic to the Late period, correlating with a regional climatic trend towards increasing aridity.

An overview of the applicability of radiogenic strontium isotope ($^{87}Sr/^{86}Sr$) analysis in archaeology has been presented by Slovak and Paytan (2011). Analysis of strontium isotope ratios ($^{87}Sr/^{86}Sr$) is considered a successful technique for identifying residential mobility, since strontium from the local environment is incorporated into body tissues (hydroxyapatite crystal in human tooth enamel and bone) from the consumed water and food. The $^{87}Sr/^{86}Sr$ ratios in human tissue should, therefore, reflect the $^{87}Sr/^{86}Sr$ composition of water, animals and plants consumed, in turn reflecting the $^{87}Sr/^{86}Sr$ signature of geology in a given region (Ericson 1985). Buzon et al. (Buzon, Simonetti, and Creaser 2007; Buzon and Simonetti 2013) tested the applicability of this analysis to the Nile Valley to track the movements of the ancient peoples of Egypt and Nubia, who interacted via trade, warfare, and political occupations over millennia.

2 Materials and Methods

2.1 *Carbon and Oxygen Isotope Analysis*

Tooth enamel samples were collected from a total of 15 individuals with preserved dentition. Where possible, canines and molars were used, except for a single case (El-Zuma T.18) where an incisor was substituted. Enamel samples for the carbon and oxygen isotope analysis were cut and prepared at the Stable Isotope Laboratory, Centre for Arctic Gas Hydrate, Environment and Climate (CAGE), the Arctic University of Norway, Tromsø. The samples

(n = 22) were placed in vials and flushed with helium (He), and five drops of water-free orthophosphoric acid (H_3PO_4) were added manually with a syringe. Following reaction with orthophosphoric acid and chromatographic isolation of carbon dioxide (CO_2) on a Gasbench II automated preparation device, the carbon and oxygen composition of hydroxyapatite carbonate was analysed using a ThermoFisher MAT253 Isotope Ratio Mass Spectrometer (standard deviation ≤0.1‰).

Tooth enamel carbonate $\delta^{18}O$ values reported relative to the VPDB standard were re-referenced to the VSMOW standard following Sharp (2007) to enable comparison with the published data:

$$\delta^{18}O_{ca,\ VSMOW} = (1.03092 \times \delta^{18}O_{ca,\ VPDB}) + 30.92‰$$

2.2 *Strontium Isotope Analysis*

Archaeological human remains are susceptible to diagenetic contamination, which can alter the strontium isotope ratio of human tissue due to uptake of strontium from the burial environment. In comparison to bone tissue, tooth enamel is less susceptible to such contamination and was therefore the preferred sampling material. In order to establish the most accurate representations of biologically available $^{87}Sr/^{86}Sr$ levels, archaeological (human and faunal) and modern (botanical) samples were analysed (Price, Burton, and Bentley 2002).

All samples were prepared and analysed at the AMU Isotope Laboratory in Poznań, using published and modified methodologies (Dufour et al. 2007; Pin et al. 1994; Dopieralska 2003). Strontium ($^{87}Sr/^{86}Sr$) isotope ratios were measured using a Finnegan MAT-261 Thermal Ionization Mass Spectrometer. Radiogenic strontium isotope ratios were calibrated against the NBS SRM 987 standard (0.710240) and normalised to $^{86}Sr/^{88}Sr$ = 0.1194.

In addition to the El-Zuma samples (n = 14), and for comparative reasons, human enamel samples from the nearby cemetery sites at El-Detti and El-Kurru [see **Fig. 7.1**] were also analysed. To establish the local strontium isotope range, samples of archaeological faunal remains from funerary contexts at El-Zuma (n = 3) and El-Detti (n = 3), as well as modern botanical samples (n = 5) were analysed. The former included the following taxa: sheep/goat (*Ovis/Capra*) (El-Zuma, n = 1; El-Detti, n = 1), cattle (*Bos*) (El-Zuma, n = 2; El-Detti, n = 1), and dog (*Canis*) (El-Detti, n = 1). Botanical samples of the local shrubs were collected in the vicinity of the cemetery at El-Zuma, away from agricultural fields and water sources. For comparative purposes, a single botanical sample was also collected from a location a few kilometres north of the cemetery at El-Kurru, known as the Stone Forest.

3 Results and Discussion

3.1 *Carbon and Oxygen Isotopic Results*

Table 7.1 and **Fig. 7.2** provide the results of the carbon and oxygen stable isotope analysis of human tooth enamel from El-Zuma. The mean $\delta^{13}C$ value is -5.06‰ with values ranging from -8.15‰ to -2.83‰. These are very high values in comparison to the New Kingdom/Third Intermediate Period site at Tombos (mean = -11.8‰ [-13.4‰ to -7.2‰]; Buzon and Bowen 2010) but similar to those from the Meroitic site at Al-Khiday[1] (mean = -7.0‰ [-9.0‰ to -4.2‰]), where the mean contribution of C_4 plants was approximately 30% (Iacumin et al. 2016). The C_4 plant contribution in the diet could be due to the direct consumption of C_4 plants, such as cereals and tubers, or to the consumption of meat from domesticated herbivores feeding on C_4 plants and thus providing ^{13}C-enriched meat to humans (Iacumin et al. 2016). The results would, therefore, be consistent with the previous isotopic research on the diet of the Nubian population, which has indicated a C_3-plant dominated diet (%C_4 = 10–25), with an increase in consumption of C_4 plants during the post-Meroitic period (White and Schwarcz 1994).

The large range of values may indicate the presence of non-local individuals. When only values obtained from the molar (post-weaning) teeth are considered, the lowest $\delta^{13}C$ value was obtained for the individual from T.27, further in the text identified as an outlier and likely non-local individual based on the oxygen value and $^{87}Sr/^{86}Sr$ ratio. However, despite the second lowest $\delta^{13}C$ value in the tooth enamel from T.16, this individual has been considered local based on the $^{87}Sr/^{86}Sr$ ratio. A similar carbon value was recorded for T.9; however, there is no strontium value for this individual to determine whether they were likely of local or non-local origin. When $\delta^{13}C$ values from pre- and post-weaning teeth are compared (canines versus molars; see **Table 7.1**), the latter are enriched by ~2‰ in three of the cases (T.9, T.15, T.17); however, in two further cases (T.16 and T.27) the $\delta^{13}C$ values for molars are slightly depleted. ^{13}C-enrichment in pre-weaning teeth has been noted in a Roman-era population at Dakhleh Oasis in Egypt and linked to the weaning process and early introduction of ^{13}C-enriched supplementary foods (Dupras, Schwarcz, and Fairgrieve 2001). As observed elsewhere and in three cases at El-Zuma, breastfeeding infants would usually be depleted in ^{13}C due to the consumption of lipids from breast milk (Wright and

1 Al-Khiday is an area located south of Omdurman with nine archaeological sites identified so far.

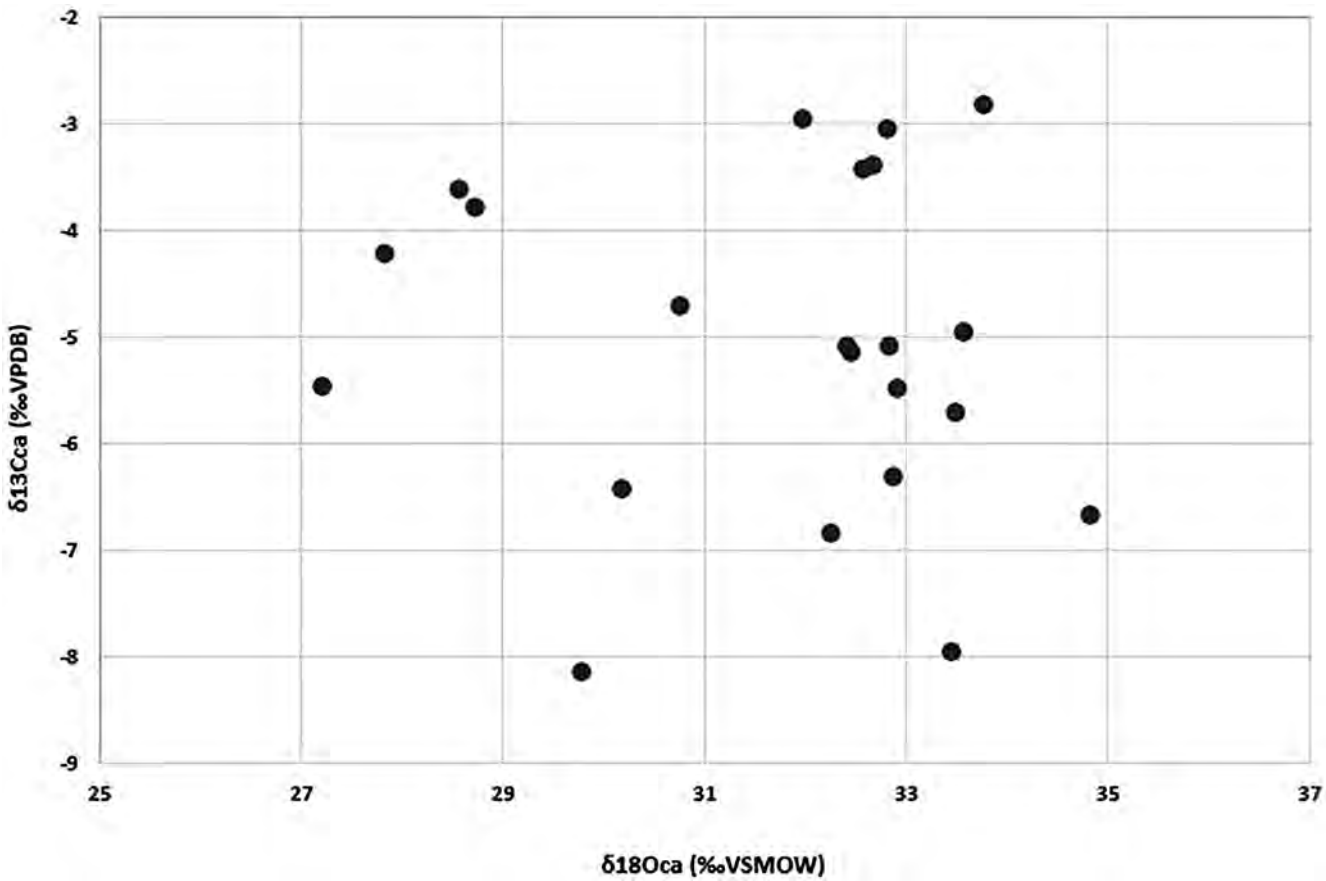

FIGURE 7.2 Distribution of $\delta^{13}C_{ca}$ and $\delta^{18}O_{ca}$ values for El-Zuma individuals
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Schwarcz 1998, 1999). The observed differences within the El-Zuma population could suggest differences in weaning practices and likely non-local origin of the individuals (e.g. T.27).

The mean $\delta^{18}O_{ca}$ value for human tooth enamel samples from El-Zuma is 31.7‰, with values ranging from 27.21‰ to 34.83‰. The range of values measured for tooth enamel carbonate in the El-Zuma individuals is large (~7.6‰) but close to those observed at other Nubian sites [**Table 7.2**], such as Wadi Halfa (~6‰; White, Longstaffe, and Law 2004), Tombos (~6.1‰; Buzon and Bowen 2010) and Al-Khiday (~6‰; Iacumin et al. 2016). Like these sites, the large range of values is likely indicative of the presence of non-local individuals. It should be pointed out, however, that a variety of water sources (the Nile and ground water) and treatment of water (for example, boiling, irrigation and storage) could also account for a large range of values.

3.2 *Strontium Isotopic Results*

The $^{87}Sr/^{86}Sr$ ratios for the individuals (n = 14) buried at El-Zuma range from 0.706899 to 0.708725, as presented in **Table 7.1**. However, the majority (n = 12) of the values fall within a smaller range, from 0.707004 to 0.707392, which also covers the values for the individuals from the nearby El-Kurru and some from El-Detti [**Table 7.3** and **Fig. 7.3**]. Using the $^{87}Sr/^{86}Sr$ ratios of the archaeological faunal remains and modern botanical samples from El-Zuma and El-Detti [see **Table 7.3**], the local strontium range of 0.706984–0.707522 was determined by the mean of ratios (0.707253) ± standard deviation (SD = 0.000269).

The strontium ratios of two El-Zuma individuals fall outside the local range (T.14: 0.706899 and T.27: 0.708725). In particular, the individual from T.27 has a much higher value in comparison to all archaeological and modern botanical samples from the local area. As teeth do not remodel, their isotopic ratios remain constant from the time of their formation during childhood. Since the two values are different from the local range where the burial took place, this signals the individuals' non-locality. It is

TABLE 7.1 Carbon, oxygen and strontium isotope values for individuals from El-Zuma

Sample ID	Sex	Tooth	$\delta^{13}C_{ca}$ ‰VPDB	$\delta^{18}O_{ca}$ ‰VPDB	$\delta^{18}O_{ca}$ ‰VSMOW	$^{87}Sr/^{86}Sr$
El-Zuma T.9	M??	C	-8.15	-1.09	29.79	–
El-Zuma T.9	M??	M3	-6.31	1.89	32.87	–
El-Zuma T.10	M	M1	-3.80	-2.12	28.74	0.707392
El-Zuma T.11	?	M1	–	–	–	0.707129
El-Zuma T.11	?	M2	-3.41	1.70	32.68	–
El-Zuma T.13	M?	M1	-5.47	-3.60	27.21	0.707257
El-Zuma T.14	F?	M1	-5.15	1.49	32.45	0.706899
El-Zuma T.14	F?	M3	-5.11	1.46	32.42	–
El-Zuma T.15	F??	C	-4.23	-2.98	27.85	–
El-Zuma T.15	F?	M1	–	–	–	0.707182
El-Zuma T.15	F?	M3	-2.96	1.02	31.97	–
El-Zuma T.16	M??	C	-6.44	-0.70	30.20	–
El-Zuma T.16	M??	M1	–	–	–	0.707004
El-Zuma T.16	M??	M3	-6.85	1.29	32.25	–
El-Zuma T.17	M	C	-4.96	2.58	33.58	–
El-Zuma T.17	M	M1	–	–	–	0.707271
El-Zuma T.17	M	M2	-2.83	2.76	33.77	–
El-Zuma T.18	F?	I1	-3.62	-2.28	28.57	0.707226
El-Zuma T.20	M??	C	-5.48	1.92	32.90	–
El-Zuma T.20	M??	M1	–	–	–	0.707392
El-Zuma T.21	M	M1	–	–	–	0.707187
El-Zuma T.21	M	M2	-3.05	1.83	32.81	–
El-Zuma T.22	M	M2	-5.71	2.50	33.50	0.707268
El-Zuma T.24	F?	M1	-5.08	1.85	32.83	0.707010
El-Zuma T.25	F	M1	-4.73	-0.14	30.77	0.707096
El-Zuma T.25	F	M3	-3.43	1.61	32.58	–
El-Zuma T.27	M	C	-6.68	3.79	34.83	–
El-Zuma T.27	M	M1	–	–	–	0.708725
El-Zuma T.27	M	M3	-7.96	2.47	33.47	–

*Sex estimates were recorded as "M" for male, "F" for female, and "?" for undetermined sex; question marks next to sex estimates (e.g. "M?" or "M??"—probable male) reflect degree of uncertainty (see Chapter 6 of this volume). Sampled teeth included: central incisor (I1), canine (C), molars (M1–3)

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impossible to indicate where the two individuals could have likely originated from due to the currently limited research on biological and geological $^{87}Sr/^{86}Sr$ ratio variability in the Nile Valley.[2] Interestingly, the two individuals (T.14 and T.27) also demonstrate the highest $\delta^{18}O_{ca}$ values in the local range, which could be indicative of their non-local origin and support the strontium data interpretation. High $\delta^{18}O_{ca}$ values, however, have also been recorded for the individuals who appear to be local based on their strontium ratios and local range. It is, therefore, apparent that the individuals identified as non-local using the oxygen and strontium isotope analyses do not necessarily correspond. Similar observations have been made at Kulubnarti and Tombos (Buzon and Bowen 2010). This discrepancy in identifying non-local individuals using these two methods could be due to different principles,

2 The geology of the area stretching between the Third and Fourth Cataracts (the Great Bend of the Nile) is represented by the Cretaceous Nubian sandstones formation made of continental clastic sediments which include sandstones, siltstones, mudstones and conglomerates (non-outcrop to the right of the Nile and predominantly outcrop in the area to the left of the Nile in downstream direction). Recent alluvial deposits run along the Nile ("Geological Map of the Sudan" 1981; Panagos et al. 2011).

TABLE 7.2 Comparison of $\delta^{18}O_{ca}$ from the Nile Valley sites

Site	Time period	Mean $\delta^{18}O_{ca}$ ‰VSMOW (range)	Sample	Reference
Mendes	Graeco-Roman (332 BC–AD 395)	31.1 (29.8–31.5)	Enamel carbonate	Prowse et al. 2007
Asyut	First Intermediate Period (2150–2025 BC)	31.6 (30.2–32.1)	Bone carbonate	Iacumin et al. 1996
Gebelein	Predynastic (3500–2600 BC)	31.6 (31.0–32.3)	Bone carbonate	Iacumin et al. 1996
Gebelein	First Intermediate Period (2150–2025 BC)	31.4 (30.6–31.9)	Bone carbonate	Iacumin et al. 1996
*Kellis, Dakhleh Oasis	Roman-Byzantine (AD 50–350)	28.2 (24.3–31.6)	Bone carbonate	Dupras and Schwarcz 2001
Wadi Halfa	X-Group (AD 350–550) and Christian (AD 500–1400)	33.0 (29.8–35.7)	Bone and enamel carbonate	White, Longstaffe, and Law 2004
Kulubnarti	Christian (AD 500–800)	33.7 (32.1–36.00)	Bone carbonate	Turner et al. 2007
Tombos	New Kingdom and Third Intermediate Period (1400–1050 BC)	31.4 (29.2–35.3)	Enamel carbonate	Buzon and Bowen 2010
El-Zuma	Late to post-Meroitic/Early Makuria (AD 90–600)	31.7 (27.2–34.8)	Enamel carbonate	
Al-Khiday	Meroitic (300 BC–AD 350)	33.6 (29.7–35.7)	Bone carbonate	Iacumin et al. 2016

* Oasis site outside the Nile Valley

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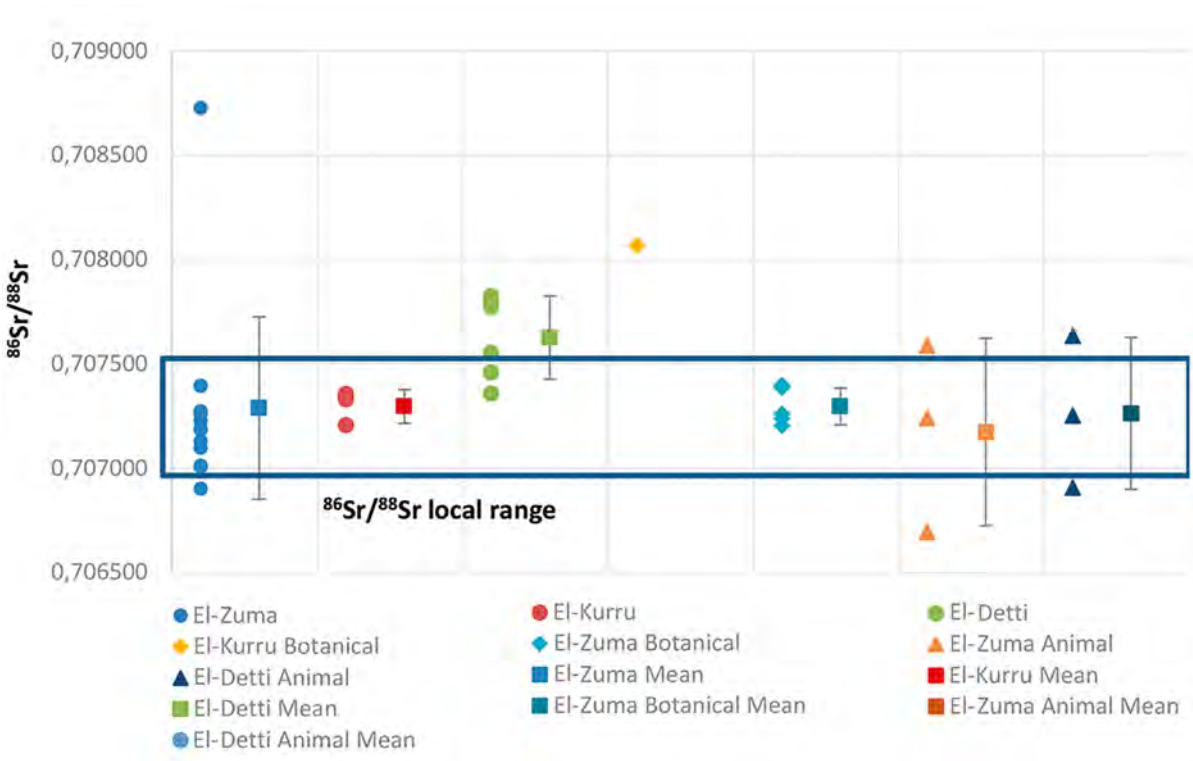

FIGURE 7.3 Distribution of $^{87}Sr/^{86}Sr$ values for human, faunal and botanical samples

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TABLE 7.3 Strontium values for human remains from El-Detti and El-Kurru and faunal and botanical remains from El-Zuma, El-Detti and El-Kurru

Sample ID	Lab ID no.	Sample	$^{87}Sr/^{86}Sr$	Internal precision
		Human (archaeological tooth enamel)		
El-Detti T.2	SM-047	M1	0.707205	± 0.000010
El-Detti T.5	SM-048	M1	0.707354	± 0.000010
El-Detti T.7	SM-049	M1	0.707550	± 0.000010
El-Detti T.3	SM-076	M3	0.707329	± 0.000009
El-Detti T.6	SM-078	P	0.707356	± 0.000009
El-Detti T.7, Lower M1	SM-079	M1	0.707456	± 0.000009
El-Kurru, Eg. Inv. 4606	SM-038	M1	0.707803	± 0.000009
El-Kurru, 22-1-534r	SM-039	I1	0.707822	± 0.000014
El-Kurru, 4608, M2	SM-068	M2	0.707772	± 0.000009
		Animal (archaeological bone)		
El-Zuma T.4: Z4/187	SM-081	cattle (*Bos*)	0.707239	± 0.000010
El-Zuma T.14: Z14/6	SM-082	sheep/goat (*Ovis/Capra*)	0.707586	± 0.000010
El-Zuma T.24: ZS-21,Z/B/24/3	SM-083	cattle (*Bos*)	0.706694	± 0.000010
El-Detti T.1: DS-1	SM-084	cattle (*Bos*)	0.707633	± 0.000010
El-Detti T.4	SM-085	sheep (*Ovis*)	0.707250	± 0.000010
El-Detti T.4	SM-086	dog (*Canis*)	0.706906	± 0.000010
		Botanical (modern)		
El-Kurru (Stone Forest)	SM-060	shrubs	0.708067	± 0.000009
El-Zuma P1	SM-062	shrubs	0.707384	± 0.000010
El-Zuma P2	SM-063	shrubs	0.707396	± 0.000010
El-Zuma P3	SM-064	shrubs	0.707203	± 0.000010
El-Zuma P4	SM-065	shrubs	0.707238	± 0.000010
El-Zuma P5	SM-066	shrubs	0.707258	± 0.000010

* Sampled human teeth from El-Detti included: central incisor (I1), premolar (P), molars (M1–3).
Shrub species (small size) were not identified.
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and their applicability in the Nile Valley warrants further investigation.

4 Radiocarbon Dating

Based on the funerary evidence and associated artefacts, the cemetery site at El-Zuma was in use during the post-Meroitic/Early Makuria period (*c.* AD 350–600). To verify the archaeological dating of the site, samples of human bone and teeth from selected funerary contexts (El-Zuma T.14, T.18, T.21 and T.24) were submitted for radiocarbon dating. Of these, one sample (El-Zuma T.14) was disqualified due to insufficient amount of collagen. The analysis was conducted at the Poznań Radiocarbon Laboratory and Gliwice Radiocarbon Laboratory (GADAM Centre), Institute of Physics, Silesian University of Technology. Radiocarbon dates were calibrated using the OxCal 4.3 program (Bronk Ramsey 2009, 2017; Bronk Ramsey and Lee 2013) and IntCal13 atmospheric calibration curve (Reimer et al. 2013).

The ^{14}C dates [**Table 7.4**] obtained for the selected samples confirm that the cemetery was in use during the post-Meroitic period (El-Zuma T.21 and T.24) and as early as the Late Meroitic period (*c.* AD 90–350) based on the AMS date obtained for the human remains recovered from T.18. This finding puts the cemetery in a new light; additional radiocarbon dates from the remaining funerary contexts should assist with establishing the time span of the cemetery's use and investigating the funerary practices of the local population during that period.

TABLE 7.4 Radiocarbon dates for selected funerary contexts at El-Zuma

Sample ID	Lab No.	^{14}C yr bp	Calibrated BC (94.5%)	Material	Comments
El-Zuma T.14	Poz-0	–	–	tooth	failed
El-Zuma T.18	Poz-101750	1830 ± 30	AD 86–311	bone	
El-Zuma T.21	Poz-101746	1615 ± 30	AD 387–538	bone	
El-Zuma T.24	GdA-5761	1645 ± 35	AD 264–535	tooth	enamel used

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5 Conclusions

The application of isotope analysis to the study of human remains recovered from the funerary contexts at El-Zuma presented both a challenge and an opportunity. The state of preservation of the skeletal remains, generally characterized by extensive incompleteness, fragmentation and bone degradation, presented numerous limitations for osteological assessment and the subsequent reconstruction of the individuals' biological profiles (see Chapter 6 of this volume). With highly degraded bone tissue, the study focused on isotope analysis of dental enamel—the hardest and highly mineralised tissue in human body—to address the questions pertaining to diet and locality of the individuals buried in the tumuli at El-Zuma.

The analysis of the ratio of carbon ($\delta^{13}C$), oxygen ($\delta^{18}O$) and strontium ($^{87}Sr/^{86}Sr$) isotopes in dental enamel allowed to identify potential migrants and shed light on the diet of the ancient population of El-Zuma during the post-Meroitic/Early Makuria period (*c.* AD 350–600). The results suggest that the local population had a C_3-plant dominated diet with the contribution of C_4 plants equating to approximately 30%. This finding is consistent with the previous isotopic research on the diet of the Nubian population, which has indicated a C_3-plant dominated diet ($\%C_4$ = 10–25), with an increase in consumption of C_4 plants during the post-Meroitic period (White and Schwarcz 1994).

The large range of isotopic values and the presence of outliers may be indicative of their non-local origin (e.g. T.14 and T.27). However, the study showed that the individuals identified as non-local using the oxygen and strontium isotope analyses do not necessarily correspond; an observation also made at other Nubian sites (Buzon and Bowen 2010). This discrepancy in identifying non-local individuals using these two methods could be due to different principles, and their applicability in the Nile Valley warrants further investigation. In particular, more research is needed on regional isotopic variability to enable meaningful data interpretation and conclusions.

This study presents a small but important contribution to the growing body of isotopic research on the subsistence and pattern of human habitation and migration in the Nile Valley, particularly in relation to environmental and major socio-political changes, such as the collapse of the Meroitic kingdom and the formation of independent Christian kingdoms. As this and many other similar studies have demonstrated, isotope analysis of human, but also animal remains offers unparalleled data that can greatly benefit archaeological research in Nubia and beyond.

CHAPTER 8

Animals in Funerary Rituals at the El-Zuma Cemetery

Urszula Iwaszczuk

1 Introduction

Animal remains have been coming to light in the tombs at El-Zuma since regular excavations were first conducted at this site in 2005. The bone remains from the first two seasons (2005 and 2007) were analysed and published by Marta Osypińska (2005; 2010) and they are not included in this volume. Some comments concerning the results of this earlier work are, however, made in this chapter. The rest of the animal bones, discovered between 2009 and 2012, and partially in the 2007 season, remained in storage awaiting analysis till 2013. The bone fragments from 2013–2018 were identified during the excavation seasons immediately after their discovery. Some of the material analysed during this study has already been published (Iwaszczuk 2015; Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21), but some supplementary remarks are made further on herein.

The state of preservation of the tumulus structures is described earlier in this volume (see Chapters 3 and 5). It is, however, important to mention that the graves were looted sometime after the funerary rituals had taken place, which is reflected in the plans and profiles of the various grave structures. In the case of most of the type II and III tumuli the burial chamber (chamber 1) was looted but the additional chambers were left untouched with the material remaining *in situ*. There were, of course, some exceptions to that pattern (e.g. the ceiling of chamber 2 in T.11 and T.12 was damaged during the looting). Chamber 3 in T.9 and chamber 4 in T.26 could also have been looted, as the ceilings of those graves had collapsed, but the damage to the ceiling could also be attributable to natural processes, such as the humidity of the rock weakening the structure of the ceiling. In other cases the collapse of the ceilings was probably caused by natural factors.

2 Material and Methods

The number of excavated fragments was high: 15,191 bone and tooth fragments from 20 tumuli (nos. 1, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 24, 26, and 28) and two almost-complete skeletons of small rodents (with skin) excavated from T.6 were analysed. Additionally, in T.13 five fragments of one bivalve shell were found. A few animal bones were discovered in chamber 2 of T.23, according to the field documentation; however, they were subsequently lost when the finds were moved to a new storage location. A similar situation concerned animal remains from an original deposit found in T.22. Only 31 fragments belonging to 13 bones from the re-exploration of this part of the tomb were submitted for analysis. These remains have not been included in this analysis, as they might have come from the recent sand layers accumulated in the vicinity of the tumuli.

Animal bones were identified to a zoological taxon and anatomical element. Ovicaprine remains were identified according to standard methods (Schramm 1967; Zeder and Lapham 2010; Zeder and Pilaar 2010). Estimation of the age of individuals was carried out based on the fusion of long bone epiphyses with shafts, the fusion of pelvic bones and the degree of development of the glenoid articulation of the scapula (Kolda 1936). Tooth development was also taken into consideration (Lutnicki 1972); however, teeth were very seldom found among the animal remains in the excavated graves. The morphotypes of sheep and cattle were analysed on the basis of measurements according to Driesch's (1976) method and coefficients estimated for sheep by Teichert (von den Driesch and Boessneck 1974) and for cattle by Matolcsi (von den Driesch and Boessneck 1974) and Fock (1966). The minimum number of individuals (MNI) was calculated for all species recovered from the tumuli using the most frequent bone elements in the assemblages, also taking into consideration the size of the bones and, in some cases, the age and sex of the individuals. In the case of animals other than cattle and sheep (e.g. donkey, camel, horse, and goat) measurements were taken but, as such remains were very scarce, further analysis on the morphotypes of these animals was impossible. Nevertheless, all of the measurements are listed in **Table 8.1**.

TABLE 8.1 Measurements of mammal bones from El-Zuma

Tumulus 1

CATTLE				
Scapula			**Radius**	
SLC			Bp	
			71	
45			77.2	
41.5			84.2	
Metacarpal				**Tibia**
Bp	Bd	SD	DD	Bd
64.8		36.3	26.4	57
	59.8			
DONKEY				
Humerus				
Bd				
58				
Metacarpal				
GL	GLl	Bp	Bd	SD	DD
181.5	176.8	37.8	34.1	23.7	20.1
HORSE			**CAMEL**	
Pelvis			**Talus**	
LA			GLm	
69.4			74	

Tumulus 3

CATTLE		
Scapula		
GLP	BG	SLC
58.4	51	57
Humerus		
Bd		
70.5		
Radius		
Bp	Bd	SD
84.5	77.7	44.8
Tibia		
Bp	Bd	SD
	54.6	
95	58.2	41.3
SHEEP		
Humerus	**Pelvis**	
Bd	LA	
32.5	22.8	

TABLE 8.1 Measurements of mammal bones from El-Zuma (*cont.*)
Tumulus 4

CATTLE				
Scapula	**Humerus**	**Radius**	**Meta-carpal**	**Pelvis**
SLC	Bd	Bd	Bd	LA
	82	65.7	48.3	56.3
56.8	80.2		59.4	
47.2	63		47	

Femur		**Tibia**	
Bp	Bd	GL	Bd
120.3			55.9
	/85/	349	59.3
			57.3

Talus		
GLl	GLm	Bd
64.9	61.9	41.4
68.7	60	43
64	59.5	41.5
64.5	59.6	40.8
67.4	62.9	44.8

Metatarsal				
GL	Bp	Bd	SD	DD
	46.3	54	25.4	27.8
233	40.4	45.3	23	23.8

Tumulus 4 (*cont.*)

Ph 1			
GL	Bp	Bd	SD
72	30.8	28	27
69.7	28	27.6	25.5

SHEEP		
Scapula		
GLP	BG	SLC
33.8	21.4	20.1
40.1	26	22

Talus		
GLl	GLm	Bd
30	28.3	28.8
29.6	27.3	19.9

DONKEY				
Pelvis	**Ph 1**			
LA	GL	Bp	Bd	SD
46.8	67	33.2	31.2	23

Radius				**Femur**
GL	Bp	Bd	SD	Bp
267	59	50.5	27	83.2

CAMEL		
Scapula		
GLP	BG	SLC
105	57	72

TABLE 8.1 Measurements of mammal bones from El-Zuma (*cont.*)
Tumulus 4 (*cont.*)

Humerus	Metacarpal
Bd	Bp
87.8	59

Tumulus 6

DONKEY		
Ph III		
GL	GB	Ld
40.2	45	39.3

Tumulus 7

CATTLE			
Metacarpal	Talus		
Bp	GLl	GLm	Bd
47.2	69.8	63.1	45.2
	57.2	54.5	

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3 State of Preservation

High temperatures during summer, long periods of drought, and sudden and violent floods were the main factors responsible for the poor state of preservation of the bones. These specific conditions of the Sudanese desert made the bones very dry and fragile, almost devoid of organic components. Some of the bones were also weathered, which is a natural consequence of exposure to water followed by high temperatures [**Fig. 8.1**]. During the excavations, after contact with fresh air, some of the bones crumbled into small pieces, sometimes leaving only bone powder. The long period of storage (from 2007 till 2013) was also detrimental to the bones [**Fig. 8.2**]. All these factors had an impact on the significant difference between the number of identified bone fragments (NISP) and the minimum number of bone elements (MNE): in some cases fragments that came from one bone were extremely numerous (over 100 fragments per bone). Analysis of the assemblages was, therefore, rather time-consuming, and measurement of the excavated bones was very rarely possible. That is why only 79 cattle and 34 sheep bone elements, such as scapula, pelvis, long bones, and talus were measured. In the case of other animals (donkey, camel, goat, and horse) measurements were taken from 14 bones and fragments of bones. It should also be mentioned that only a few bones were preserved as whole bone elements that enabled all measurements to be taken according to Driesch's (1976) method, and thus made it possible to calculate the withers height of the animals. The author is aware that the coefficients used in this research were originally formulated for European populations of domestic animals and, therefore, the results may be treated only as a suggestion.

It is worth noting that some of the bones bore post-consumption marks as well as marks made by animals. Marks left by animals had a particularly significant impact on the degree of bone fragmentation after carcass parts and meat had been deposited in the graves. Two types of such marks were recorded on the bones from El-Zuma.

The first type, gnawing by rodents, has also been attested at many other sites and is easy to identify. Bones with this type of modification were, however, relatively few. All of these marks were made by rodents of mouse rather than rat size [**Fig. 8.3**]. Bones of small rodents were present in the tunnels of the biggest tumuli (type I), as were bones bearing marks made by these animals. Only one bone with gnawing marks was found in a type II tumulus (T.26). Such marks were visible on the bones of different animals: cattle, sheep/goat, horse, donkey, camel, and gazelle. They were also recorded on bones from different parts of carcasses. All this suggests that there were no preferences in choosing bones for gnawing. It is possible then that they were used by rodents as a rasp to wear down the incisors that grow throughout the lifetime of these animals, especially given that such marks were also discovered on some pieces of pottery (see Volume II, Chapter 6, p. 160).

The other type of marks of animal origin recorded on the bones from El-Zuma were much more interesting [**Fig. 8.4**]. Bones with these marks were found in only some of the type I and II tumuli and in one tumulus of type III. Thirteen of the total number of 20 graves analysed between 2013 and 2018 were found to contain bones bearing such marks (T.1, T.4, T.7 and T.8 of type I, T.11, T.12, T.13, T.14, T.15, T.16, T.24, and T.26 of type II, and T.17 of type III). The marks themselves were unusual and had

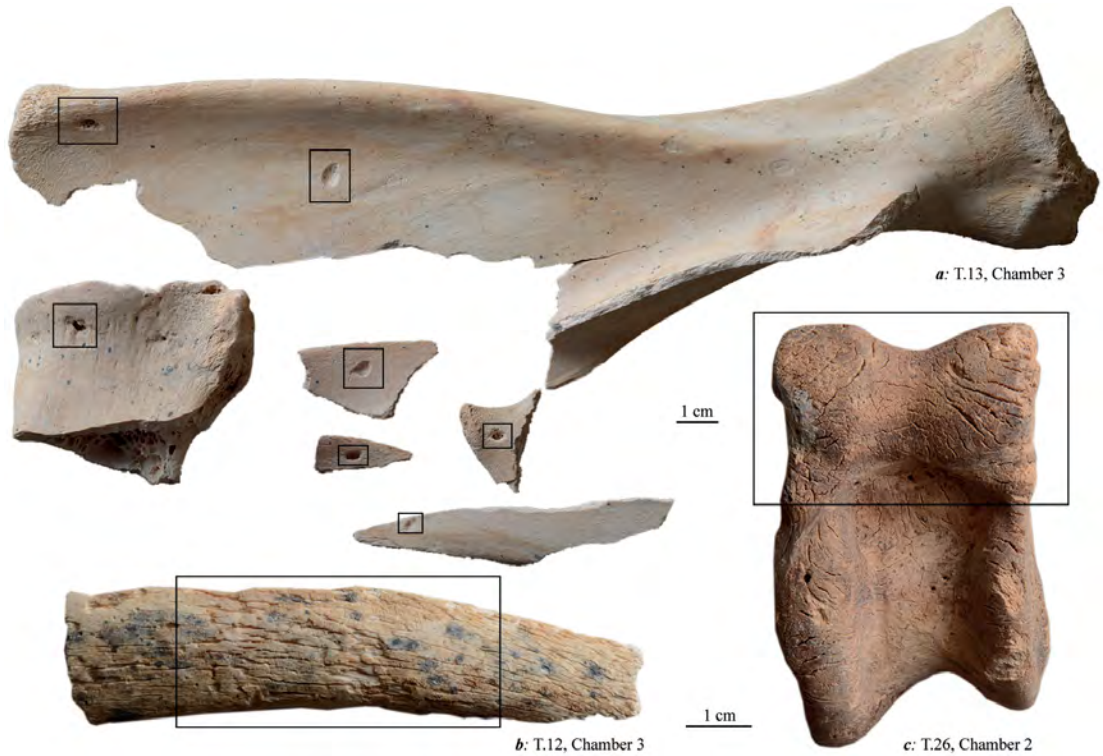

FIGURE 8.1 State of preservation of animal remains from El-Zuma: a—bone fragmentation, left and right sheep scapulas (right scapula in several pieces bears marks probably left by larvae); b and c—weathered bones
PHOTOS BY A. KAMROWSKI

FIGURE 8.2 State of preservation of the animal remains from the southern part of chamber 2 in T.26 at El-Zuma: a—*in situ*; b—during analysis
PHOTOS BY A. KAMROWSKI

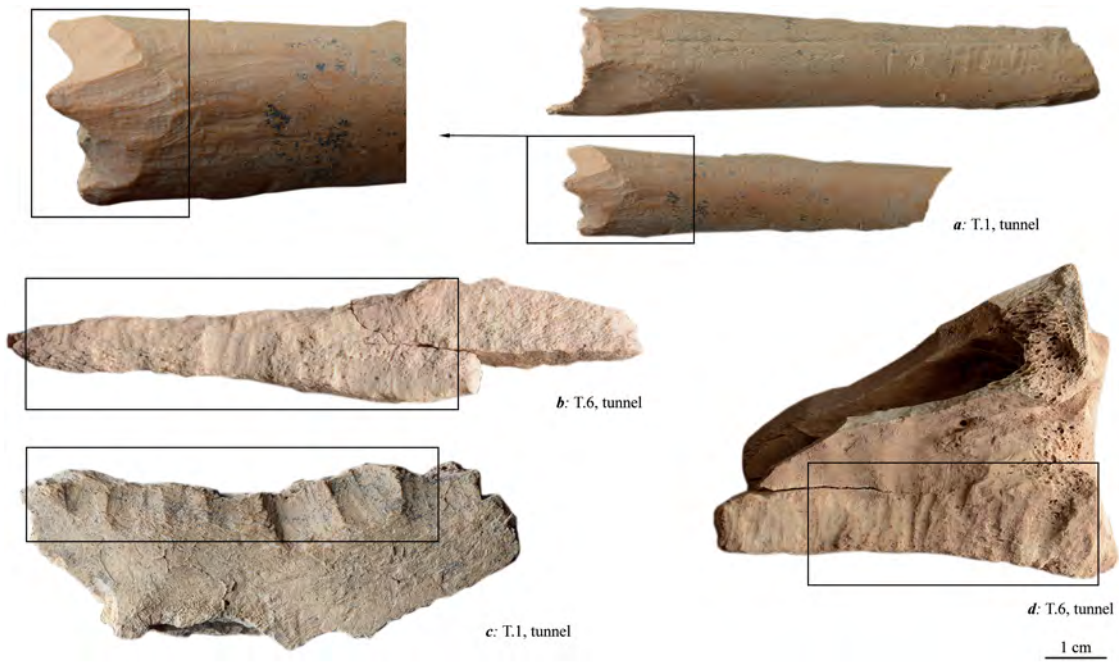

FIGURE 8.3 Rodent gnawing marks on mammal bones found in the tunnels of type I tumuli at El-Zuma
PHOTOS BY A. KAMROWSKI

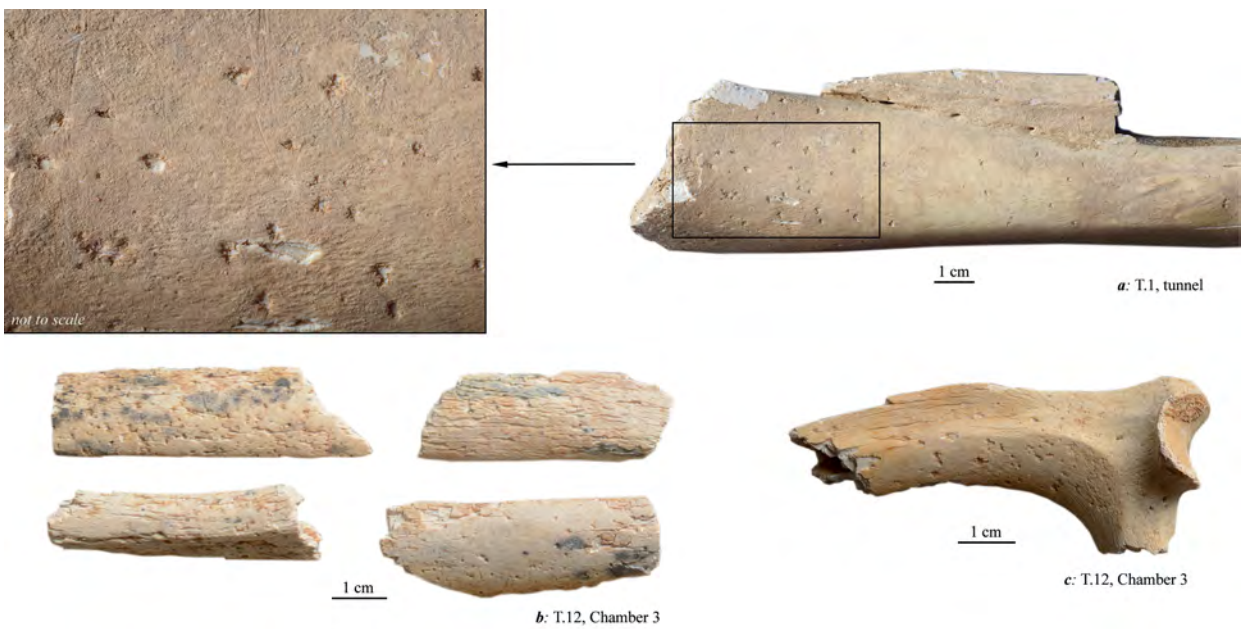

FIGURE 8.4 Termite gnawing marks visible on bones from tumuli of types I and II at El-Zuma
PHOTOS BY A. KAMROWSKI

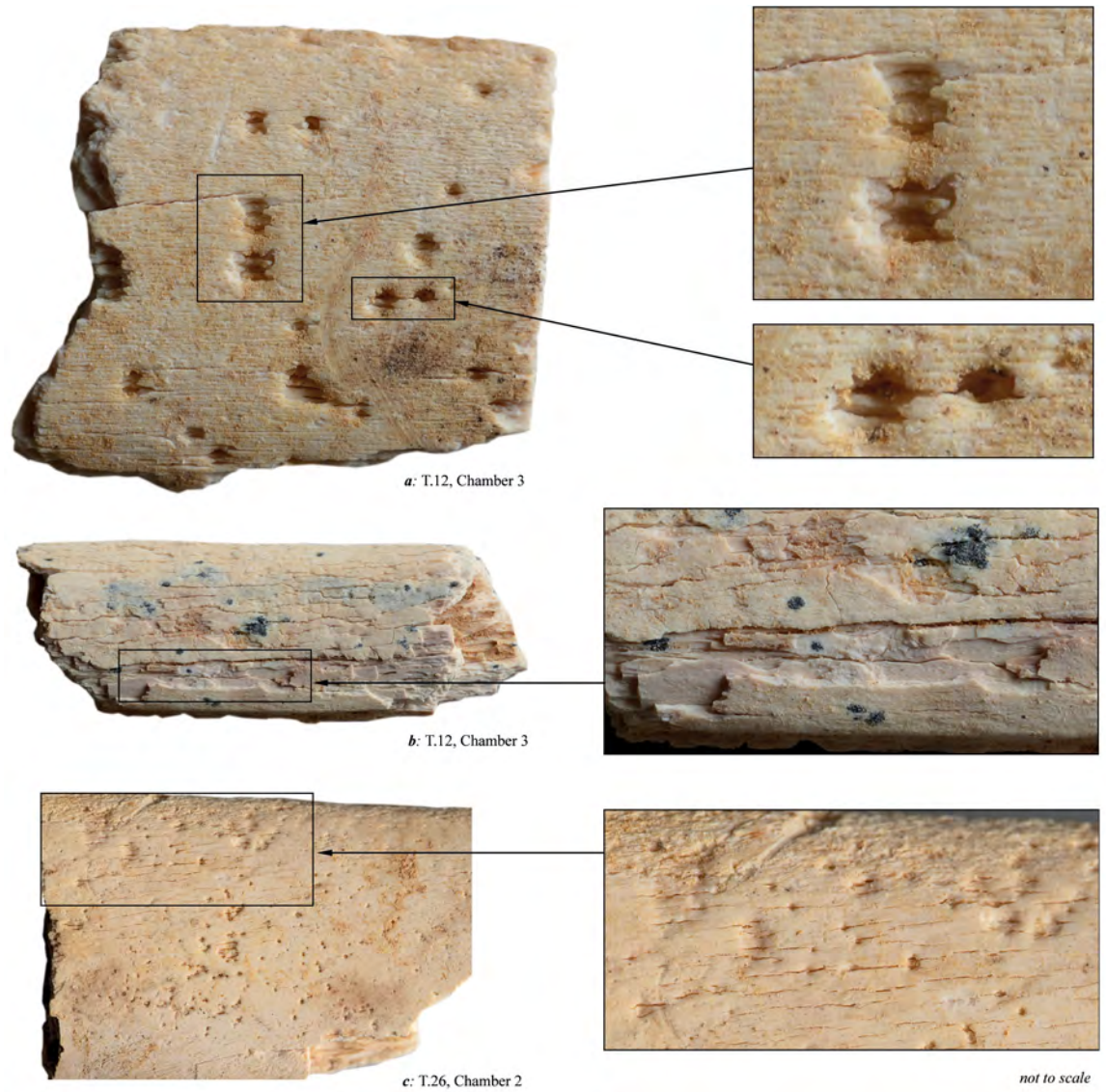

FIGURE 8.5 Different types of gnawing marks left by termites on bones from tumuli of types I and II at El-Zuma
PHOTOS BY A. KAMROWSKI

never previously been recorded in this area. In some cases they were separated from each other, while some of them merged into larger patches. The bones, however, were also modified in another way (i.e. they were weathered), which made this pattern not so evident and clear and therefore more difficult to detect. The marks in question were similar at first glance to marks made by certain larvae (Lyman 1994, 394; Huchet et al. 2013), but without the characteristic grooves left by them. They also differed in other details: for instance, they looked as if they were made by gnawing the bone surface starting from the central points and creating a star-shaped pattern [**Fig. 8.5**]. The small holes visible on the surface of the bones were also unlike the holes left by wasps or wild bees (Pittoni 2009). The closest analogy to these marks seems to be the alteration of bone surfaces recorded by Backwell et al. (2012, see also references therein) as marks left by the subterranean termite *Trinervitermes trinervoides*. The example shown by Huchet (2014, 340, Fig. 7e) seems to confirm the suggestion connecting these marks with termites. At least four types of patterns correspond to the features described by these authors [see **Fig. 8.5**]: an etched appearance, surface residue, star-shaped marks and surface pits. Star-shaped marks, which were also observed in the El-Zuma material, are especially characteristic of these insects.

4 Results

4.1 *Type 1 Tumuli*

Type 1 tumuli were the largest and most complicated structures from an archaeological as well as an archaeozoological point of view, and yielded the richest faunal assemblages from the greatest variety of contexts. The animal bones were located in chambers, grave shafts, tunnels, shafts leading to the tunnels and in robber pits. The remains from two tumuli of this type (T.2 and T.5) were analysed by Osypińska (2005; 2010), and they are not included in this analysis. The contexts in which the animal bones were discovered have already been described in detail in the case of three type 1 graves: T.3, T.4 and T.7 (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21), and so will only be mentioned in passing herein. The animal bones from other graves (T.1, T.6 and T.8) are presented in detail.

4.1.1 Tumulus 1

There were 680 animal bone fragments found in this grave. More than one-third of that number remain unidentified (273 fragments). Most of the remains were discovered in the tunnel, scattered along its entire length. Only 33 fragments from 1 cattle mandible and 17 fragments from 3 cattle teeth that belonged to a very young individual aged about 5–6 months, were found in the robber pit [**Table 8.2**].

The bone fragments from the tunnel belonged to 3 cattle individuals: one was about 2–2.5 years old, another was about 3.5–5 years old, and the third one was much older—it was more than 5 years old at death. Bones represented only some parts of the carcass: the head, thorax, forelimb, and hind limb without extremities. The bones bore no post-consumption marks but some of them were gnawed by rodents (fragments of mandible and radius) and carnivores (humerus and radius). One of the tooth roots also showed traces of a mild inflammatory process.

Sheep bones were much less numerous: there were only 23 fragments representing 6 bones. All but one belonged to a female aged over 21–24 months. A fragment of mandible belonged to a younger, but not very young, animal of more than 9 months. Only one of the bones bore marks indicative of gnawing by rodents.

Goat was represented solely by 2 horncores from the left and right side of the same skull of an adult female individual. The left one had been chopped about 1 cm above its base. Other ovicaprine remains representing only 4 bones probably belonged to the older sheep mentioned above. They came from the part of the limbs with good-quality meat. The radius featured carnivore gnawing marks. There were also 7 fragments of 2 teeth that were found at the top of the fill in the western part of the tunnel.

The discovery of bones of transportation animals, such as donkey, horse, and camel, was a great surprise in the light of previous finds that had delivered only cattle and sheep remains. They were few and represented different parts of the carcass. In the case of camel there were only 19 fragments of 5 bones from the head and hind limb of 1 adult female. The calcaneus had been gnawed by rodents. Additionally, one talus was found in the robber pit. This bone could also have come from the individual mentioned above; however, it could be a skeletal element that had got into this assemblage accidentally. The bones of donkey were also few: only 15 fragments from 7 bones of 1 adult animal were found in the tunnel. The bones came from the head and proximal part of a forelimb. The humerus had been gnawed by carnivores. Only 1 fragment of horse pelvis was recorded in the material; it came from 1 adult individual and bore marks of gnawing by rodents.

There was also a group of 20 fragments from 7 equid bones (cranial elements, a fragment of pelvis, and metapodial bones) that could not be identified to species. A small but thickset metacarpal among these bones could probably belong to a mule or a very small horse. This bone was burnt at the distal end. Additionally, a fragment of pelvis had been gnawed by carnivores. The bones from this group probably came from 2 adult animals, but it is not certain if they belonged to the individuals of horse and donkey described above or to another two animals.

Nine fragments of 4 bones of a game animal were noted in the material. All of them belonged to gazelle. This genus was represented by a fragment of mandible, shafts of both tibias, and a metatarsal of an adult animal. The mandible had been gnawed by rodents.

The last group of bones consisted of 3 long bones of a bird.

4.1.2 Tumulus 3

The bone material from this grave has already been described (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21). Animal remains were found in the tunnel and in two partially explored chambers (nos. 1 and 2), though it is possible that some of the material from these chambers had been discarded in the tunnel during looting together with other artefacts of no greater value to the robbers. From the total number of 381 bone fragments, 45 remain unidentified. The zoological and anatomical distribution of the animal remains given in **Table 8.3** shows the variety of species found in this grave: bones of animals traditionally used as offerings were found in different contexts, as were porcupine [**Fig. 8.6**], dog, micro-mammal,

TABLE 8.2 Animal remains discovered in T.1

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel, central part	Thoracic vertebrae	10	1				3 individuals: 1 about 2–2.5 years old; 1 about 3.5–5 years old; 1 more than 5 years old
		Radius	1	1				
		Ulna	1			1		
		Femur	5	1				
		Tibia	3	2			present on 1 fragment	
	Tunnel, eastern part	Thoracic vertebrae	2			2		
		Rib	5	2	1			
		Scapula	5		2			
		Humerus	1	1				
		Radius	1	1				
		Ossa carpi	1			1		
		Metacarpal	3	1				
		Tibia	4			1		
	Tunnel, north-western part, top of fill	Scapula	1	1				
	Tunnel, western part, top of fill	Skull	17		1	1		
		Mandible	16	2				
		Tooth (Skull)	2		1	1		
		Tooth	5	1		≥ 2		
		Scapula	1	1				
		Radius	2	1				
		Ulna	6	1				
		Tibia	8			1		
	Tunnel, western part	Skull	32	1				
		Mandible	8		2			
		Tooth (Skull)	36	3				
		Atlas	1			1		
		Lumbar vertebrae	26			7		
		Humerus	6	1				
		Radius	7	2	1			
		Ulna	1		1			
		Metacarpal	13	1				
		Metacarpal or Metatarsal	1			1		
		Femur	7		1			
		Tibia	8	1		1		
		Metatarsal	8			1		
	Robber pit	Mandible	33		1			1 individual: about 5–6 months old
		Tooth	17		2	1		

TABLE 8.2 Animal remains discovered in T.1 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Tunnel, eastern part	Mandible	2	1				2 individuals: 1 more than 9 months (only part of mandible); 1 female, more than 21–24 months
	Tunnel, western part	Skull	1	1				
		Horn core	1	1				
		Metatarsal	1			1		
	Tunnel, western part, top of fill	Mandible	4	1				
		Skull	14			1		
Goat	Tunnel, eastern part	Horn core	1		1			1 individual: female, adult
	Tunnel, western part	Horn core	1	1				
Ovicaprine	Tunnel, eastern part	Pelvis	2	1	1			probably from the older sheep above
		Tibia	1			1		
	Tunnel, western part	Radius	1	1				
	Tunnel, western part, top of fill	Tooth	7			≥ 2		
Horse	Tunnel, western part	Pelvis	1		1			adult
Horse/ Donkey	Tunnel, central part	Mandible	8	1				probably from 2 adult individuals
		Tooth	5			≥ 2		
		Metacarpal	1		1			
		Metacarpal or Metatarsal	2		1			
	Tunnel, eastern part	Pelvis	3	1				
	Tunnel, western part	Pelvis	1	1				
Donkey	Tunnel, western part	Skull	1			1		1 adult individual
		Tooth (Skull)	1		1			
		Tooth (Mandible)	1	1				
		Scapula	2	1				
		Metacarpal	1		1			
	Tunnel, western part, top of fill	Tooth (Skull)	1	1				
	Tunnel, western part	Humerus	8	1				
Camel	Tunnel, western part	Mandible	6	1	1			1 individual: female, adult
		Tooth	11			1		
		Calcaneus	1		1			
	Robber pit	Talus	1	1				probably from the above individual
Gazelle	Tunnel, central part	Metarsal	3			1		1 adult individual
	Tunnel, eastern part	Tibia	4	1				
	Tunnel, western part	Mandible	1		1			
		Tibia	1		1			

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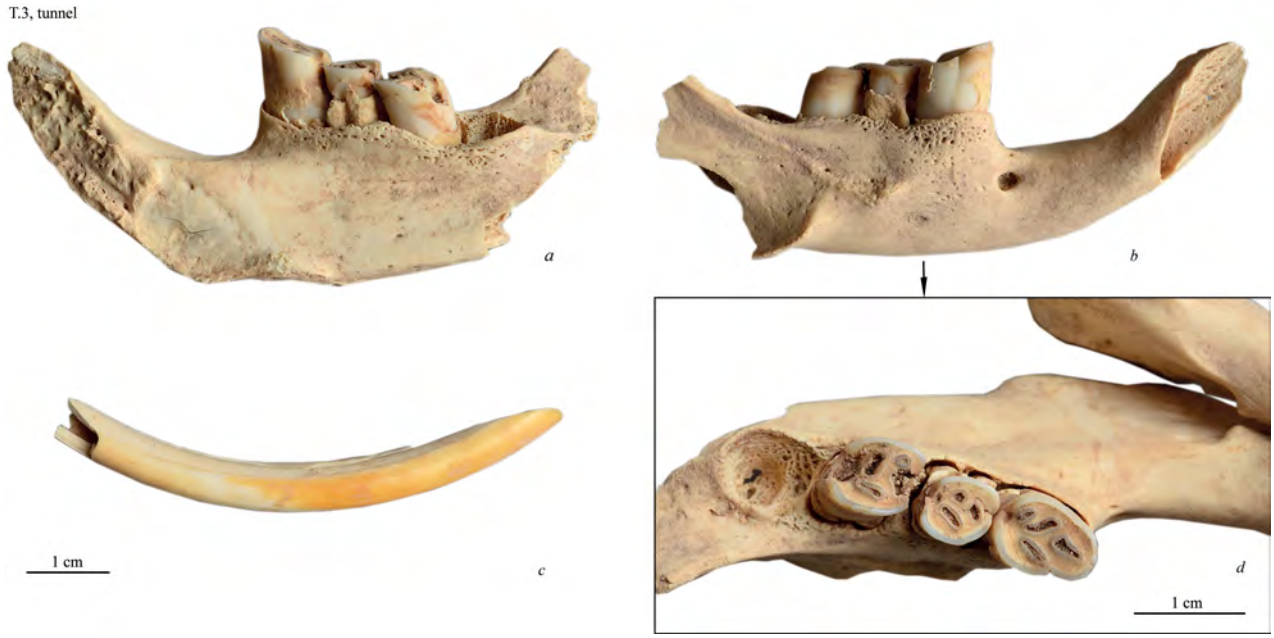

FIGURE 8.6 Porcupine mandible found in T.3 at El-Zuma
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TABLE 8.3 Animal remains discovered in T.3

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	16			1		1 individual: under 3.5 years old
	Chamber 2	Tooth	18			1		
		Rib	4			3		
		Humerus	6		1			
		Femur	2			1		
		Patella	1			1		
	Niche	Ribs	2			1		2 individuals: 1 under 3.5–4 years old; 1 adult individual
		Humerus	1			1		
	Tunnel	Mandible	16	1				
		Sternum	7			3		
		Rib	31			3		
		Scapula	6			1		
		Humerus	3		1			
		Radius	1		1			
		Ulna	1		1			
		Ossa carpi	1			1		
		Metacarpal	21		1			
		Pelvis	19	1	1			
		Femur	12	1	1			
		Patella	1			1		

TABLE 8.3 Animal remains discovered in T.3 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel	Tibia	1		1			
		Centroquartale	2			1		
		Metatarsal	2	1				
	Robber pit	Rib	2			1		
		Scapula	22		1			adult individual or individuals
		Tibia	2		1			
		Ph III	1		1			
Sheep	Chamber 1	Sternum	29			7		1 individual: about 3.5 years old
		Rib	43			4		
		Scapula	9	1				
		Humerus	11	1				
	Tunnel	Pelvis	2		1			adult individual or individuals
		Femur	5		1			
Ovicaprine	Tunnel	Scapula	2			1		adult individual or individuals
		Humerus	3			1		
	Robber pit	Rib	3			1		
Dog	Robber pit	Humerus	9		1			adult individual or individuals
		Ulna	1		1			
		Femur	1		1			
		Calcaneus	1		1			
		Metatarsal	1		1			
Porcupine	Tunnel	Mandible	7	1				old individual
Micro-mammal	Chamber 1	Femur	1	1				adult individuals
		Tibia	1	1				
	Tunnel	Tibia	2	2				
Bird	Tunnel	Vertebrae	2			2		adult individual: pigeon size
		Coracoid	2			1		

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and bird remains. T.3 was the only type 1 tumulus analysed during this study that was found to contain animal bone elements in its burial chambers, though these were only partially excavated. Another two tumuli (T.2 and T.5) were analysed by Osypińska (2005; 2010); however, in these the distribution of animal bones differed significantly from that noted in the other tumuli at El-Zuma. The bones from the chambers in T.3 came from cattle and sheep exclusively, while in two papers published by Osypińska, she described camel bones found in the chambers of T.2 and T.5. This identification should be discussed here in the light of the photographs illustrating these two papers. Osypińska (2005, 407, Fig. 13) presented a cattle pelvis from T.2 bearing marks probably made during dismembering, but she identified it as a camel bone. A similar mistake concerns the material from T.5 (Osypińska 2010, 490, Fig. 3), where a cattle talus with skinning marks on it was described as a camel bone. It is probable that these two errors are simply the editor's mistakes, but as the presence of camel bones amongst food offerings has not been reported from Early Makurian graves, either in El-Zuma, El-Kassinger Bahry (Makowiecki 2007), Tanqasi (Osypiń-

FIGURE 8.7 Fragment of skull with horncore of a dorcas gazelle found in T.4 at El-Zuma
PHOTOS BY A. KAMROWSKI

ska 2008) or El-Detti (Iwaszczuk 2016), it is, therefore, also highly improbable in this context. These findings indicate that different sacrificial animals were used during rituals in T.2 and T.5, and therefore that a different group was conducting the sacrifices. Camel has never been mentioned as a sacrificial animal slaughtered for food offerings in Egyptian and Nubian history. The tradition of eating camel meat in Sudan is known nowadays only among nomadic groups in eastern Sudan (Mahmoud El-Tayeb, personal communication). Food offerings consisting of beef, on the other hand, were widespread in ancient Egypt (e.g. Ikram 1995) and have also been attested in Nubia (e.g. Chaix and Grant 1992). All other grave types in El-Zuma analysed during this study contained only sheep or sheep and cattle remains as food offerings deposited in the burial chambers. Misidentification is therefore possible in the case of T.2 and T.5, or at least the presence of camel bones is uncertain in light of the doubts mentioned above.

4.1.3 Tumulus 4

The context of the discovery of 3,551 animal bone fragments inside the tunnel of this tumulus has previously been discussed (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21). It is, however, worth mentioning that the content of the tunnel fill, especially the artefacts and other finds extracted from the dark bottom layer (see Chapter 3.2, Fig. 3.28, this volume) (Mahmoud El-Tayeb 2017, 340–346), were exceptional in the context of the entire cemetery as well as other Early Makurian cemeteries (see Chapter 3, in this volume, and Volume III). The variety of mammal species found in this grave is also impressive [**Table 8.4**]. Except for the bones of cattle and sheep (which were the most popular sacrificial animals), elements of the skeletons of transport animals were also found, as well as the remains of a game animal (gazelle) [**Fig. 8.7**], which shows that the content was very similar to that of T.1. The very characteristic feature exclusive to this tumulus was the presence of almost-complete bat skeletons in the tunnel fill [**Fig. 8.8**], which will be discussed later.

FIGURE 8.8 Bat head bone elements found in T.4 at El-Zuma: a—dorsal view of a skull, b—ventral view of a skull, c—lateral view of a skull, d—buccal and lingual views of a mandible
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TABLE 8.4 Animal remains discovered in T.4

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Entrance to room W	Thoracic vertebrae	4			1		3 individuals: 1 female, about 3.5–4 years old; 1 male, more than 3–3.5 years old; 1 young individual, between 15 and 20 months old
		Femur	10	1				
		Talus	1		1			
	Tunnel, eastern part	Skull	9			1		
		Mandible	105	1	3			
		Tooth	171		1	≥ 4		
		Cervical vertebrae	1			1		
		Lumbar vertebrae	5			3		
		Rib	45	2				
		Scapula	24	2	1			
		Humerus	16	2	2			
		Radius	18	2	1	1		
		Ulna	3	1	1			
		Metacarpal	11	1	1	1		
		Metacarpal or Metatarsal	1			1		
		Pelvis	4	1	1			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel, eastern part	Femur	13	1		2		
		Patella	1	1				
		Tibia	28	2	3			
		Calcaneus	3	1	2			
		Talus	3	1	2			
		Centroquartale	2			1		
		Ossa tarsi	1			1		
		Metatarsal	9	1		1		
	Tunnel, western part	Skull	89			1		
		Mandible	7	1	1			
		Tooth	63		≥ 4			
		Lumbar vertebrae	1			1		
		Sternum	6			3		
		Rib	56	2	≥ 4			
		Scapula	1			1		
		Humerus	3	1				
		Radius	5	1	1			
		Metacarpal	1	1				
		Metacarpal or Metatarsal	1			1		
		Pelvis	27	1	1			
		Femur	27	3	1			
		Tibia	29	3	2			
		Calcaneus	1		1			
		Talus	2	1	1			
		Ossa tarsi	1			1		
		Metatarsal	36	1	1	2		
		Ph I	3	1	1			
	Tunnel, western part—dark bottom layer	Skull	1			1		
		Mandible	2			1		
		Tooth	5			1		
		Rib	27			2		
		Humerus	4	1				
		Radius	8			1		
		Pelvis	11	1				
		Femur	2		1			
		Tibia	17	1				
		Calcaneus	1	1				
		Talus	4	1	1			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Tunnel, eastern part	Skull	6			1		2 individuals: 1 under 5 months old; 1 between 5 months and 3–3.5 years old
		Mandible	20		1			
		Scapula	1		1			
		Radius	9	1				
		Femur	1		1			
		Talus	1		1			
	Tunnel, western part	Femur	1		1			
		Talus	2	2				
	Tunnel, western part—dark bottom layer	Scapula	9		1			
Goat	Tunnel, western part	Skull	2			1		1 individual: between 2 and 3 years old
		Atlas	1			1		
		Humerus	1	1				
		Calcaneus	1	1				
		Metacarpal or Metatarsal	1			1		
Ovicaprine	Tunnel, eastern part	Skull	22			1		probably from the above sheep and goat
		Tooth (Skull)	4		1			
		Tooth (Mandible)	1		1			
		Tooth	19			≥ 7		
		Sacrum	1			1		
		Rib	9			2		
		Scapula	4	1	1			
		Humerus	3		1			
		Radius	6		1			
		Ossa carpi	4			4		
		Femur	2		1			
		Tibia	7			2	present	
		Calcaneus	1			1		
		Ossa tarsi	1			1		
		Metatarsal	8	1		1	present on 4 fragments	
		Ph 1	1	1				
	Entrance to room W	Cervical vertebrae	1			1		
	Tunnel, western part	Skull	5			1		
		Mandible	6		1	1		
		Tooth (Skull)	3			1		
		Tooth (Mandible)	10		1	2		
		Tooth	9			5		

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Tunnel, western part	Cervical vertebrae	1			1		
		Sternum	2			2		
		Rib	55	5	3	2		
		Scapula	6			1		
		Humerus	2	1		1		
		Radius	1		1			
		Metacarpal	1		1			
		Pelvis	2			1		
		Femur	1			1		
		Patella	1		1			
		Tibia	13	1		1		
		Calcaneus	1		1			
		Metatarsal	2			1		
	Tunnel, western part—dark bottom layer	Mandible	4			1		
		Lumbar vertebrae	2			1		
		Metacarpal	1			1		
Donkey	Tunnel, eastern part	Humerus	2	1	1			1 individual: adult
		Metacarpal	2			1		
		Femur	5	1	1			
		Tibia	3		1			
		Ph 1	1		1			
	Entrance to room W	Rib	5	1				
		Pelvis	17	1				
	Tunnel, western part	Radius	2		1			
		Ulna	1	1				
		Ossa carpi	1		1			
Camel	Tunnel, eastern part	Skull	8			1		2 individuals: 1 almost adult; 1 adult
		Mandible	3	2	1			
		Thoracic vertebrae	1			1		
		Lumbar vertebrae	1			1		
		Rib	20	3				
		Scapula	2	1	1			
		Humerus	3		1			
		Femur	1	1				
		Metatarsal	4		1			
	Tunnel, western part	Mandible	4			1		
		Scapula	16		1			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Camel	Tunnel, western part	Centroquartale	2	1				
		Calcaneus	1	1				
		Metatarsal	5	1				
Gazelle	Tunnel, eastern part	Humerus	8		1			adult
Dorcas gazelle	Tunnel, western part	Skull	1					female
Carnivore	Tunnel, eastern part	Lumbar vertebrae	1			1		adult
Carnivore	Tunnel, western part	Rib	2			2		1 individual
Dog	Tunnel, eastern part	Lumbar vertebrae	2			1		young
Bat	Tunnel, eastern part, top of fill	Skull	14			5		5 individuals: adult
		Mandible	15	4	3			
		Atlas	2			2		
		Cervical vertebrae	10			10		
		Thoracic vertebrae	2			2		
		Lumbar vertebrae	4			4		
		Rib	28			28		
		Clavicle	1		1			
		Scapula	3	1	2			
		Humerus	6	3	3			
		Radius	3	1	1			
		Ulna	8	3	2	1		
		Metacarpal	1			1		
		Pelvis	3			3		
		Femur	2	1				
		Tibia	3	2	1			
		Metatarsal	2			2		
		Fragments of long bones	15			15		
	Tunnel, eastern part	Skull	2			2		3 individuals: adult
		Mandible	4	2	2			
		Atlas	2			2		
		Axis	2			2		
		Cervical vertebrae	8			8		
		Thoracic vertebrae	4			4		
		Lumbar vertebrae	4			4		
		Sternum	2			2		
		Clavicle	1			1		
		Rib	26			26		
		Scapula	4	2	2			
		Humerus	4	2	2			

TABLE 8.4 Animal remains discovered in T.4 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
	Tunnel, eastern part	Radius	2			1		
		Ulna	6	2	3			
		Metacarpal	10			8		
		Pelvis	2	1	1			
		Femur	5	2	2			
		Metatarsal	1			1		
		Ph I	1			1		
		Fragments of long bones	10			10		
Bat	Tunnel, western part, top of fill	Skull	4			1		1 individual: adult
		Mandible	4	1	1			
		Cervical vertebrae	4			4		
		Thoracic vertebrae	3			3		
		Sacrum	1			1		
		Sternum	1			1		
		Rib	12			12		
		Scapula	4	1	1			
		Humerus	2	1	1			
		Ulna	3	1	1			
		Metacarpal	2			2		
		Pelvis	2			1		
		Tibia	2	1	1			
		Ph I	1			1		
		Fragments of long bones	27			27		
	Tunnel, western part	Skull	2			1		2 individuals: adult
		Mandible	1		1			
		Humerus	3	1	2			
		Ulna	3	1	1			

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4.1.4 Tumulus 6

A total of 176 remains were discovered in this tumulus. Only 16 fragments remain unidentified. The bones were found within two structures: the shaft and the tunnel, but the remains from the tunnel were much more numerous than those from the shaft [**Table 8.5**]. There were only 4 ovicaprine remains (from the thorax and the proximal parts of the limbs) in the shaft. The bone material from the tunnel was similar in species variety to that noted in T.3. Remains of cattle, ovicaprine, donkey, small rodents, and a bird of pigeon size were discovered in the tunnel. The cattle, ovicaprine, and donkey bones came from adult individuals. Cattle remains were represented almost exclusively by cranial elements (only 2 other bones were recorded there: a carpal and tibia). Donkey and ovicaprine remains were very scarce. The first of these species was represented solely by a third phalanx, and the second by a solitary fragment of femur. The tunnel must have been open for some time (after the funeral? after the robbery?) because in both corridors of the tunnel, and at the front of that structure, there were incomplete skeletons of small rodents. The bones of one of them could be identified

TABLE 8.5 Animal remains discovered in T.6

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Tunnel, central part	Mandible	18	1				probably 1 individual: adult
	Tunnel, north-eastern part	Mandible	3			1		
	Tunnel, north-western part	Ossa carpi	1			1		
	Tunnel, southern part	Tooth	2		1			
		Mandible	10		1			
	Tunnel, western part	Tibia	1			1		
Ovicaprine	Shaft	Rib	1					1 individual between 5 months and 3.5 years old
		Scapula	3	1		1		
		Tibia	1					
	Tunnel, north-western part	Femur	1					
Donkey	Tunnel, central part	Ph III	1	1				probably adult
Arvicanthis niloticus	Tunnel, western part	Skull	1			1		1 adult individual
		Mandible	2	1	1			
		Vertebrae	3			3		
		Long bones	10			9		
Small rodent	Tunnel, south-eastern part	skeletons of 2 young individuals, almost complete—one individual of bigger size						
Micro-mammal	Tunnel, eastern part	Mandible	1					2 individuals: 1 young, 1 adult
		Pelvis	1					
		Femur	2	1	1			
		Tibia	2	1	1			
Bird	Tunnel, eastern part	Vertebrae	16					young individual: pigeon size
		Sternum	2					
		Long bones	38					

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to species as *Arvicanthis niloticus*; the two others (almost complete) were not determined.

4.1.5 Tumulus 7

The content of T.7 was very typical of type 1 tumuli. All of the remains, 329 fragments, were found in the tunnel. The faunal material has already been analysed (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 7–21), and it seems that the zoological and anatomical distribution of the remains [**Table 8.6**] is very similar to the distribution of the remains recovered from T.1, T.3, T.6, and T.8. Some of the cattle bones bore evidence of filleting (ribs) [**Fig. 8.9**].

4.1.6 Tumulus 8

There were 388 fragments of animal bones found in T.8; unfortunately, 88 of that number could not be identified. The remains were discovered in chamber 1, in the tunnel and in the robber pit. Chamber 1 yielded the bones of two cattle individuals (one aged about 2–2.5 years and the other an adult), as well as two sheep individuals (one aged 2–2.5 years and the other an adult). The withers height of the cattle was estimated at 111 cm and the sheep withers height at 53.5 cm. The remains of both species came from the thorax and proximal parts of limbs. Also some cattle and sheep bones from the same parts of the carcasses were found in the tunnel. They probably came from the same animals as the bones deposited in chamber 1. Additionally, the head bones and a large part of the thorax of an ovicaprine found in the tunnel belonged to an indi-

TABLE 8.6 Animal remains discovered in T.7

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	1			1		2 individuals: 1 between 7–10 and 15–20 months old; 1 between 7–10 months and 3.5–4 years old
	Chamber 1, group 1	Rib	4			4		
		Scapula	30		1			
		Humerus	4			1		
		Radius	2		1			
		Ulna	2		1			
		Ossa carpi	1			1		
		Femur	9		1			
	Chamber 1, eastern part	Sternum	3			3		
		Scapula	3	1			present	
		Patella	1			1		
	Chamber 2, group 1	Femur	20	1				
		Patella	1	1				
	Chamber 2, group 2, in vessel Z11/19 and around	Pelvis	6		1			
	Chamber 2, group 3	Humerus	9		1			
	Chamber 2, group 4	Thoracic vertebrae	6			4		
		Lumbar vertebrae	15			6		
		Sternum	4			4		
		Rib	116			≥ 7	present on 2 fragments	
		Scapula	24	1	1			
		Humerus	9	2				
		Radius	16	2				
		Ulna	4	1	1			
		Ossa carpi	6	1	5			
		Pelvis	7	1	1			
		Femur	3			1?		
		Tibia	25	1	2			
		Talus	2	1	1			
	Chamber 2	Thoracic vertebrae	2			2		
		Lumbar vertebrae	4			≥ 2		
		Sternum	1			1		
		Rib	51			≥ 2		
		Scapula	3			1		
		Ulna	1			1		
		Femur	3	1				
	Shaft, bottom, eastern part	Mandible	1		1			adult individual or individuals
	Shaft, bottom	Rib	1			1		

TABLE 8.6 Animal remains discovered in T.7 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Chamber 1	Radius	1		1			2 individuals: 1 under 3–4 months old; 1 adult
		Calcaneus	1		1			
	Chamber 1, eastern part	Scapula	4	1				
		Radius	1	1				
		Femur	8	1				
	Chamber 1, group 1	Humerus	2		1			
	Chamber 2, group 3	Calcaneus	1	1				
	Chamber 2, group 4	Humerus	2	2				
		Radius	2	1	1			
		Pelvis	1	1				
	Chamber 2, in vessel 14	Pelvis	5	1				
	Chamber 2	Talus	1	1				
		Tibia	1	1				
Ovicaprine	Chamber 1	Femur	1			1		2 individuals: 1 between 5 months and 3.5 years old; 1 under 15–20 months, probably remains from the young sheep above
	Chamber 1, eastern part	Cervical vertebrae	2			1		
		Lumbar vertebrae	2			1		
		Sternum	1			1		
		Humerus	1			1		
		Ulna	1			1		
		Metacarpal	2			2?		
		Ossa carpi	1			1		
		Femur	5			1?		
		Tibia	1		1			
		Calcaneus	1			1		
	Chamber 1, group 1	Sternum	1			1		
		Radius	1		1			
		Femur	8		1			
		Tibia	2		1			
	Chamber 2, group 3	Rib	2			1		
		Pelvis	1			1		
	Chamber 2, group 4	Cervical vertebrae	1			1		
		Thoracic vertebrae	3			3		
		Lumbar vertebrae	4			1		
		Rib	26			1?		
		Radius	1			1		
		Ulna	2	1				
		Ossa carpi	2	2				
		Pelvis	3	1	1			

TABLE 8.6 Animal remains discovered in T.7 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 2, group 4	Tibia	6			1?		
		Ossa tarsi	1	1				
	Chamber 2	Rib	25			1		
		Humerus	4			1		
		Radius	1			1		
		Femur	3			1?		
		Tibia	5	1				
		Ossa tarsi	1			1		
	Shaft, bottom	Rib	14			≥ 3		adult individual or individuals
		Humerus	3			1		

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vidual or individuals under 3–3.5 years old. Two fragments of goat ulna were deposited in the tunnel. Goat bones have rarely been discovered in the El-Zuma graves and might be regarded as an intrusive deposit. Some bones of adult sheep, ovicaprines, and birds of pigeon size were also recovered from the robber pit [**Table 8.7**]. It seems that they were not connected with the funerary rituals as they were found in the mixed earth and gravel of the robber pit.

4.2 *Type II Tumuli*

The discovery context of the animal bones in type II tumuli has already been discussed in the case of some tumuli (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 21–23; Iwaszczuk 2015, 427–428). Two other tumuli of this type, T.10 and T.25, were analysed by Osypińska (2010), as mentioned earlier.

4.2.1 Tumulus 9

The majority of animal remains were discovered in the central and southern part of chamber 1, though some remains were also excavated in the robber pit [**Table 8.8**]. Bones found in the chamber had been moved from their original positions and mixed with human remains. All of these bones (36 fragments in total) could be identified. The material consisted of ovicaprine remains exclusively. Only 15 fragments from 5 bones were found in the chamber. They represented parts of the carcass with good-quality meat: the thorax and proximal parts of the limbs of a relatively young animal. None of the bones bore post-consumption or other marks. Additionally, 21 fragments of two ovicaprine bones (a mandible and tooth) were discovered in the robber pit, which suggests that they were probably not connected with the funerary ritual and undoubtedly got there after the superstructure had been built above the grave.

4.2.2 Tumulus 11

Animal bones were concentrated in one group in chamber 1 and in four clusters in chamber 2, but some bones were also found in other parts of these chambers. A small number of the remains, only 19 fragments, were also found at the bottom of the shaft [**Table 8.9**]. Altogether, 1,362 bone and tooth fragments were analysed; unfortunately, a large number of them (794 fragments) could not be identified to species because they lacked diagnostic features.

The remains discovered in the chambers came from 2 individuals: one was aged between 7–10 and 15–20 months, the other one was a little older (it was only possible to estimate the age to within a broad range of between 7–10 months and 3.5–4 years). Sheep bones also came from 2 individuals: the first one was very young, less than 3–4 months old, and the other was an adult. Other remains of ovicaprines belonged to 2 individuals: one of them was under 15–20 months (it is probable that these remains came from the young sheep mentioned above); the other one was older—between 5 months and 3.5 years old. All remains found in the shaft belonged to adult animals.

Cattle and ovicaprine remains were located in a cluster in the western part of chamber 1. Cattle bones were more numerous: there were 52 fragments from 10 bones of the thorax and proximal parts of the limbs. In this group there were also ovicaprine remains representing the same body parts as the cattle remains. One of these bones

TABLE 8.7 Animal remains discovered in T.8

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Ribs	15			3		2 individuals: 1 about 2–2.5 years old, 1 adult
		Scapula	9		1			
		Femur	4		1	1		
		Patella	1		1			
		Tibia	12		1			
	Tunnel	Cervical vertebrae	3			3		
		Ribs	6			3		
		Scapula	111	1				
		Humerus	8	1	1			
		Radius	12		1			
		Ossa carpi	4			4		
		Femur	1	1				
		Tibia	1			1		
		Talus	1		1			
		Ph 1	1			1		
Sheep	Chamber 1	Thoracic vertebrae	3			1		2 individuals: 1 individual between 15–20 months and 3.5 years old, 1 adult individual
		Ribs	1			1		
		Humerus	9	1				
		Radius	2	1				
		Femur	11	1				
		Tibia	3		1			
	Tunnel	Scapula		2				1 individual under 3–3.5 years old
		Humerus	4	1				
		Radius	3	2				
		Ulna	1	1				
	Robber pit	Calcaneus	1	1				adult individual
Goat	Tunnel	Ulna	2	1				adult individual
Ovicaprine	Tunnel	Skull	1			1		2 individual: 1 under 3–3.5 years old, 1 adult (only 2 lumbar vertebrae)
		Mandible	3			1		
		Cervical vertebrae	3			3		
		Thoracic vertebrae	2			1		
		Lumbar vertebrae	8			2		
		Ribs	5			2		
		Scapula	5	1				
		Radius	2			1		
		Metacarpals or Metatarsals	2			1		
		Pelvis	2		1			
		Femur	10	1				
		Tibia	9	1				

TABLE 8.7 Animal remains discovered in T.8 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Robber pit	Lumbar vertebrae	1			1		adult individual
		Scapula	2			1 (part)		
		Radius	5		1			
		Metacarpals or Metatarsals	6			1 (part)		
		Pelvis	1		1			
		Femur	2		1			
Bird	Tunnel	Long bones	1			1		adult individual or individuals, pigeon size
	Robber pit	Long bones	1					

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TABLE 8.8 Animal remains discovered in T.9

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 1, southern and central part (among human bones)	Rib	7	1	1			1 individual, relatively young
		Humerus	1			1		
		Pelvis	2	1				
		Femur	5		1			
	Robber pit, south-eastern part	Mandible	13			1		1 individual
		Tooth	8			1		

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(a humerus) could be determined to species (sheep). The other bones of cattle (8 fragments from 6 bones) and ovicaprine (33 fragments from 16 bones) were found dispersed, mostly at the eastern side of the chamber, and they represented the same carcass parts as the bones mentioned above. The only ovicaprine remains determined to species belonged to sheep.

In chamber 2 animal remains were distributed in four clusters (see Chapter 3.3, Fig. 3.103, this volume). The first two groups comprised only cattle bones. Group 1, located in the southern part of the chamber near bottle Z11/26, consisted of an articulated femur and patella. Group 2, found in and around a cup that was slipped and burnished on both sides (Z11/19), also in the southern part of the chamber, was made up of fragments of pelvis broken into pieces. Two other groups, located in the central (group 3) and northern (group 4) parts of the chamber, were more numerous (especially group 4) and contained not only cattle bones but also ovicaprine remains. There were 4 bones in group 3, including a cattle humerus and 3 ovicaprine bones, among them a sheep calcaneus. Two incomplete skeletons of cattle and sheep made up group 4; however, the bones were partially mixed. Both of them lacked cranial elements and extremities. Bones of cattle and ovicaprine were also scattered in the space between the clusters; some of them could have belonged to the abovementioned skeletons, and the rest came from other individuals.

Additionally, a fragment of cattle mandible and rib, as well as fragments of 4 ovicaprine bones from the thorax and proximal part of a forelimb, were found in the eastern part of the shaft.

Some of the bones bore post-consumption marks, such as chopping and filleting. Filleting marks were observed on cattle bones (lumbar and thoracic vertebrae, ribs, scapula, pelvis) as well as ovicaprine bones (thoracic vertebra). Chopping marks were also recorded on both cattle (scapula, ulna, pelvis) and ovicaprine bones (thoracic vertebra and pelvis). A few bones also bore marks indicating dismembering. In T.11 there were 3 such bones belonging to

TABLE 8.9 Animal remains discovered in T.11

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	1			1		2 individuals: 1 between 7–10 and 15–20 months old; 1 between 7–10 months and 3.5–4 years old
	Chamber 1, group 1	Rib	4			4		
		Scapula	30		1			
		Humerus	4			1		
		Radius	2		1			
		Ulna	2		1			
		Ossa carpi	1			1		
		Femur	9		1			
	Chamber 1, eastern part	Sternum	3			3		
		Scapula	3	1			present	
		Patella	1			1		
	Chamber 2, group 1	Femur	20	1				
		Patella	1	1				
	Chamber 2, group 2, in vessel 17 and around	Pelvis	6		1			
	Chamber 2, group 3	Humerus	9		1			
	Chamber 2, group 4	Thoracic vertebrae	6			4		
		Lumbar vertebrae	15			6		
		Sternum	4			4		
		Rib	116			≥ 7	present on 2 fragments	
		Scapula	24	1	1			
		Humerus	9	2				
		Radius	16	2				
		Ulna	4	1	1			
		Ossa carpi	6	1	5			
		Pelvis	7	1	1			
		Femur	3			1?		
		Tibia	25	1	2			
		Talus	2	1	1			
	Chamber 2	Thoracic vertebrae	2			2		
		Lumbar vertebrae	4			≥ 2		
		Sternum	1			1		
		Rib	51			≥ 2		
		Scapula	3			1		
		Ulna	1			1		
		Femur	3	1				
	Shaft, bottom, eastern part	Mandible	1		1			adult individual or individuals
	Shaft, bottom	Rib	1			1		

TABLE 8.9 Animal remains discovered in T.11 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Chamber 1	Radius	1		1			2 individuals: 1 under 3–4 months old; 1 adult
		Calcaneus	1		1			
	Chamber 1, eastern part	Scapula	4	1				
		Radius	1	1				
		Femur	8	1				
	Chamber 1, group 1	Humerus	2		1			
	Chamber 2, group 3	Calcaneus	1	1				
	Chamber 2, group 4	Humerus	2	2				
		Radius	2	1	1			
		Pelvis	1	1				
	Chamber 2, in vessel 14	Pelvis	5	1				
	Chamber 2	Talus	1	1				
		Tibia	1	1				
Ovicaprine	Chamber 1	Femur	1			1		2 individuals: 1 between 5 months and 3.5 years old; 1 under 15–20 months, probably remains from the young sheep above
	Chamber 1, eastern part	Cervical vertebrae	2			1		
		Lumbar vertebrae	2			1		
		Sternum	1			1		
		Humerus	1			1		
		Ulna	1			1		
		Metacarpal	2			2?		
		Ossa carpi	1			1		
		Femur	5			1?		
		Tibia	1		1			
		Calcaneus	1			1		
	Chamber 1, group 1	Sternum	1			1		
		Radius	1		1			
		Femur	8		1			
		Tibia	2		1			
	Chamber 2, group 3	Rib	2			1		
		Pelvis	1			1		
	Chamber 2, group 4	Cervical vertebrae	1			1		
		Thoracic vertebrae	3			3		
		Lumbar vertebrae	4			1		
		Rib	26			1?		
		Radius	1			1		
		Ulna	2	1				
		Ossa carpi	2	2				
		Pelvis	3	1	1			

TABLE 8.9 Animal remains discovered in T.11 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 2, group 4	Tibia	6			1?		
		Ossa tarsi	1	1				
	Chamber 2	Rib	25			1		
		Humerus	4			1		
		Radius	1			1		
		Femur	3			1?		
		Tibia	5	1				
		Ossa tarsi	1			1		
	Shaft, bottom	Rib	14			≥ 3		adult individual or individuals
		Humerus	3			1		

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cattle: a pelvis with cut marks visible on the acetabulum, a mandible with cut marks between the processes, and a talus with a cut mark recorded on the distal end. There were also 2 ovicaprine bones with such marks: a humerus with a cut mark visible near the trochlea, and a sheep radius with a cut mark on the proximal end. Additionally, a cattle talus bore marks of skinning on the medial surface.

4.2.3 Tumulus 12

2,451 animal bones and bone fragments were found in two chambers and in the shaft; 925 of them remain unidentified. It seems that most of the remains from the shaft were originally deposited in chamber 1. Some of them might have got there together with the shaft fill during the funeral or as a result of robber activity. The bones came from two cattle individuals and at least two sheep [**Table 8.10**]. The cattle remains belonged to two animals between 12–15 months and 3.5–4 years old, while the sheep bones came from one individual aged about 3.5 years and one individual between 5 and 15–20 months old. The bones found in the shaft belonged to young animals, probably from the carcasses deposited in the chambers. It was possible to establish sheep withers height on the basis of three bones from one animal. The results were between 65.8 cm and 73.3 cm with an average of 68.8 cm. In chamber 2 one cattle rib and a few sheep bones (ribs and sternum, a fragment of the proximal part of the right and left forelimbs and two bones from the proximal part of a hind limb) were found. Many more bones were discovered in chamber 3. There were at least five cuts of beef there: part of the thorax, the right and left forelimbs without extremities, and the right and left parts of the hind limbs, also without extremities. The sheep remains were represented by ribs, bones from the proximal part of the left forelimb, and a big part of the left hind limb without extremities. Additionally, four beef cuts were deposited in a large and shallow bowl, slipped on the inside (Z12/125): ribs, bones from the proximal part of the left forelimb and the distal part of the right forelimb, and probably the proximal part of a hind limb. Bones were also located in four clusters in the northern, southern, south-eastern, and western parts of the shaft (see Chapter 3.3, Fig. 3.44a, in this volume). They consisted of ribs and the proximal parts of the limbs of cattle, and of fragments from the thorax and limbs (mostly the proximal parts) of two young sheep individuals.

Some of the cattle and ovicaprine bones bore evidence of chopping, cutting (ribs, humerus, and radius) and filleting (vertebrae, ribs, and radius) [**Fig. 8.9**].

4.2.4 Tumulus 13

Animal remains were found in almost all of the structures of this grave. As the ceiling of chamber 1 collapsed and excavation was, therefore, impossible (see Chapter 3.3, Fig. 3.53, this volume), only those bones found among the bricks of the blocking wall that fell into the shaft were analysed. These bones were mixed with human remains and other artefacts, such as faience beads, arrowheads, and pottery, and they had probably been thrown out of the chamber during looting. The total number of animal remains was 558 fragments, only 96 of which could not be identified. Bone fragments came from three young individuals of cattle: two of them were about 7–10 months

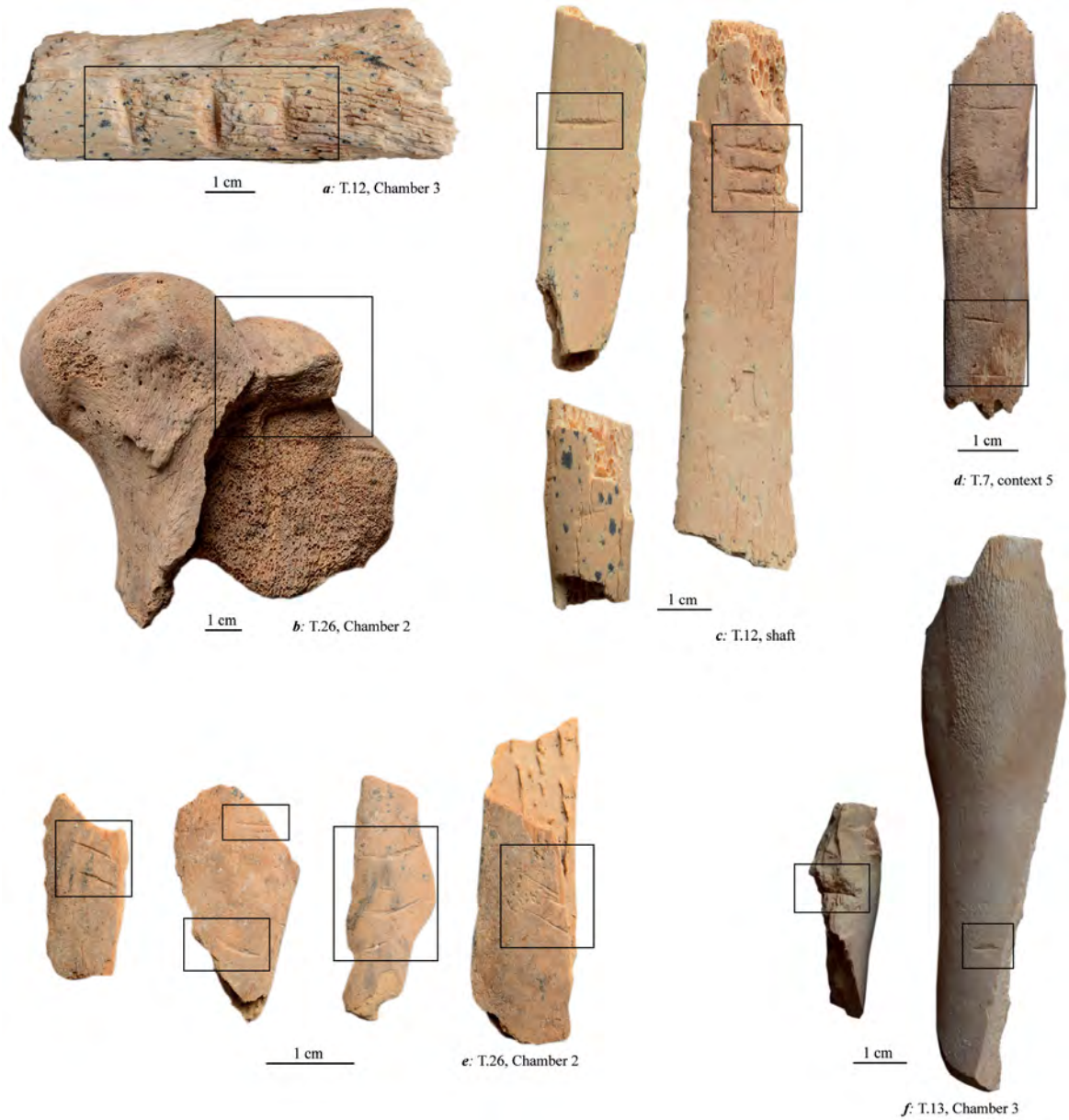

FIGURE 8.9 Cutting and chopping marks visible on cattle bones from El-Zuma: a—chopping marks on a humerus (this bone is also weathered); b—chopping marks on a femur; c—filleting marks on a rib; d–e—filleting marks on ribs; f—chopping and cut marks on a humerus
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old (only 2 bone fragments of the second animal were found in the grave) and one was about 15–20 months old. Ovicaprine remains were less numerous and the majority of them belonged to 1 sheep aged about 5 months. A further 2 fragments of ribs found in chamber 3 in a bowl with grooved decoration, slipped and polished on both surfaces (Z13/27), came from an adult animal. In the extension of the robber pit, on its northern side, there was also a fragment of goat skull and 1 bivalve shell broken into pieces. It is highly improbable that they were connected with funerary rituals [**Table 8.11**].

The remains from the shaft, which consisted exclusively of cattle and ovicaprine bones, were characteristic of almost all other chambers in tumuli of type II. Cattle was represented by 90 fragments from 11 bones of the thorax and proximal parts of the limbs. Ovicaprine remains were represented by 71 fragments from 9 bones, among them 7 fragments from 3 sheep bones, all of which came from the same body parts as the cattle remains. The content of additional chambers was very similar: only cattle and ovicaprine bones from the same parts of the carcass were recorded in chambers 2, 3 and 5. Additionally,

TABLE 8.10 Animal remains discovered in T.12

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 2	Ribs	25			1	present on 2 fragments	2 individuals between 12–15 months and 3.5–4 years old
	Chamber 3	Sternum	3			1		
		Ribs	157	1		5	present on 39 fragments	
		Scapula	44	1	1		present on 4 fragments	
		Humerus	8		1			
		Radius	12	1	1		present	
		Ulna	5			2	present on 1 fragment	
		Ossa carpi	2			2		
		Femur	32	2	2		present on 3 fragments	
		Tibia	15	1	1			
		Talus	2	1	1			
		Ossa tarsi	1			1		
	Chamber 3, in vessel Z12/125	Ribs	35			2	present on 6 fragments	
		Scapula	23	1			present on 8 fragments	
		Humerus	5		2			
		Radius	10		2		present on 1 fragment	
		Ulna	1		1			
		Ossa carpi	6		6			
		Pelvis	2			1		
		Femur	17	1				
		Patella	1	1				
	Shaft	Scapula	5	1				
		Tibia	28			1		
	Shaft, northern part	Ribs	61			1		
		Femur	27		1			
	Shaft, southern part	Ribs	102			4	present on 9 fragments	
		Scapula	67	2				
		Humerus	25		1		present	
		Radius	20	1			present on 2 fragments	
		Ulna	4			1		
		Ossa carpi	5			5		
		Pelvis	15	1				
		Femur	27	1		1		
		Tibia	6			1	present on 2 fragments	
	Shaft, south-eastern part	Ribs	48			2	present	
		Scapula	54	1	1		present on 8 fragments	
		Humerus	14	1			present	
		Radius	5	1			present	

TABLE 8.10 Animal remains discovered in T.12 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Shaft, south-eastern part	Ulna	2			1		
		Ossa carpi	4			4		
		Pelvis	8		1			
		Femur	16	1	1		present on 1 fragment	
	Shaft, western part	Ribs	40			1		
Sheep	Chamber 2	Sternum	5			5		2 individuals: 1 about 3.5 years old, 1 between 5 and 15–20 months old
		Ribs	58			2	present on 6 fragments	
		Scapula	10		1			
		Humerus	11		1		present	
		Radius	2	1			present	
		Ulna	2	1				
		Ossa carpi	3			3		
		Pelvis	5		1			
		Femur	5	1			present	
	Chamber 3	Ribs	39	1		2	present on 2 fragments	
		Scapula	10		1			
		Humerus	3		1			
		Pelvis	7		1			
		Femur	2	1				
		Patella	1			1		
		Tibia	7	1	1			
		Calcaneus	2	1	1			
		Talus	1	1				
	Shaft, southern part	Atlas	2			1		young individual
		Axis	1			1		
		Cervical vertebrae	24			5		
		Thoracic vertebrae	39			8		
		Lumbar vertebrae	42			6		
		Sacrum	4			1		
		Ribs	32			3		
		Scapula	48	1				
		Humerus	7	1				
		Radius	3		1			
		Ulna	6		1			
		Ossa carpi	3			3		
	Shaft, south-eastern part	Atlas	1			1		young individual
		Axis	1			1		
		Cervical vertebrae	15			5		

TABLE 8.10 Animal remains discovered in T.12 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Shaft, south-eastern part	Thoracic vertebrae	22			6		
		Lumbar vertebrae	29			6		
		Sacrum	3			1		
		Ribs	21			2		
		Scapula	7		1			
		Humerus	3		1			
		Radius	3		1		present	
		Ulna	5		1			
		Ossa carpi	3			3		
Ovicaprine	Shaft, western part	Lumbar vertebrae	17			4		young individual or individuals
		Ribs	2			1		
		Femur	11			1		

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FIGURE 8.10 Dismemberment marks visible on cattle bones from El-Zuma: a—femur; b—humerus; c—talus
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one ovicaprine rib was found in bowl Z13/27. There were also fragments of 2 ovicaprine ribs in a bowl slipped and burnished on both sides (Z13/11), located in the western part of chamber 5.

Some of the cattle and ovicaprine bones bore post-consumption marks as well as marks made during dismembering. The bones showed traces of cutting (a rib, scapula, pelvis, and 2 femurs) and filleting (3 ribs, a scapula, pelvis, and femur). Evidence of dismembering was visible on 2 bones: a pelvis with a cut mark on the sacral tuber, and a humerus with 2 parallel cut marks on the trochlea and a cut mark on the shaft near the distal end [**Figs. 8.9, 8.10, 8.11**].

TABLE 8.11 Animal remains discovered in T.13

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Shaft, among human bones	Lumbar vertebrae	1			1		3 individuals: 1 about 7–10 months old, 1 about 15–20 months old, 1 about 7–10 months (only 2 bones)
		Rib	41			≥ 2	present on 4 fragments	
		Scapula	1		1			
		Humerus	3		1		present	
		Ossa carpi	1		1			
		Pelvis	12	1				
		Femur	19	1			present	
		Patella	1	1				
		Tibia	10	1				
		Talus	1	1				
	Chamber 2	Rib	15			1	present on 4 fragments	
		Pelvis	17	2				
		Femur	6	1				
	Chamber 3	Thoracic vertebrae	3			1		
		Rib	30		≥ 4			
		Scapula	116	2	1			
		Humerus	24		1			
	Chamber 5, group 1	Rib	5			2		
		Pelvis	3		1			
Sheep	Shaft, among human bones	Tibia	5	1				1 individual about 5 months old
		Calcaneus	1	1				
		Talus	1	1				
	Chamber 3	Pelvis	2		1			
		Femur	13		1			
		Patella	1		1			
		Tibia	3		1			
		Calcaneus	1		1			
		Talus	1		1			
		Sesamoid	1			1		
Goat	Extension of the robber pit on the northern side	Skull	1			1		1 individual
Ovicaprine	Shaft, among human bones	Rib	44			1?	present	most of the bones from the above sheep; additionally, 2 fragments of rib from an adult individual
		Humerus	1			1		
		Femur	16	1			present	
		Patella	1	1				
		Metatarsal	1			1		
		Sesamoid	1			1		
	Chamber 2	Rib	13			1	present	

TABLE 8.11 Animal remains discovered in T.13 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 3	Rib	30	7	5			See above
	Chamber 5, group 2, in vessel Z13/11	Rib	10		1	1		
	Chamber 3, in vessel Z13/27	Rib	1			1		

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4.2.5 Tumulus 14

The 538 animal bone fragments from this tumulus and the context of their discovery have already been described (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 22–23). They were found exclusively in the burial chambers and two additional chambers [**Table 8.12**]. The content of this grave was very typical of type II tumuli and similar to that of all other graves of this type but one (T.9) at the El-Zuma cemetery.

4.2.6 Tumulus 15

The animal remains from this tumulus have been partially discussed before (Iwaszczuk 2015); however, after publishing the material some new remains from this grave were analysed, which is why it was important to revise the earlier results. T.15 was the best equipped type II tumulus, though the state of preservation of the faunal material was very poor and resulted in a great number of unidentified small bone fragments: 925 elements out of 1,921 remain undetermined.

Chamber 1 contained pottery and a few fragments of nails and bed frame fittings together with human and animal remains. Pottery (in two clusters) (see Chapter 3.3, Fig. 3.65a, this volume) and animal bones (in one cluster in the central part of the chamber) were also discovered in chamber 2, though mostly animal remains and some botanical remains were excavated in this part of the grave.

Cattle remains (779 fragments from 35 bones) were deposited in the burial chamber (Ch. 1) and in one of the additional chambers (Ch. 2) [**Table 8.13**]. Some of the cattle bones were also found in the shaft, in the vicinity of chamber 1, and might have originally come from the burial chamber. It is interesting that 5 cattle ribs together with 3 ovicaprine ribs were found in a bowl in the northern part of chamber 2. The remains located in the chambers and shaft came from the thorax (cervical vertebrae and ribs) and proximal parts of forelimbs (scapula and humerus) and hind limbs (pelvis, femur, patella, and tibia) with the addition of one left and two right taluses. Cattle bones from this grave belonged to three individuals: one about 2–2.5 years old, one aged between 2–2.5 and 3.5–4 years and the last one over 3.5–4 years.

Ovicaprine bones were less frequent than cattle remains [see **Table 8.13**]. Only 26 fragments from 5 bones belonged to sheep, while another 191 fragments from 19 bones could not be identified to species. Sheep bones (a pelvis and femur) were deposited *in situ* in chambers 1 and 3. Three other bones (3 humeri and 1 femur) were probably thrown out of chamber 1 and were found in the shaft near this chamber. The remains belonged to 2 individuals: one under 3.5 years old and one about 3–3.5 years old. Ovicaprine bones were also deposited in chambers 2 and 3. In chamber 2 there were only three ribs inside a bowl slipped and burnished on both sides (Z15/35), while in chamber 3 the bones were found on the floor. The other bones were recovered from the shaft in the vicinity of chamber 1. Altogether, 165 fragments from 16 bones were found in these contexts. They came from the thorax (ribs, lumbar vertebra, and sacrum) and proximal parts of the forelimb (humerus) and hind limb (femur and tibia) and probably belonged to the 2 sheep mentioned above. There were also 26 fragments from 3 bones (mandible, rib, and femur) discovered in the fill of the shaft that came from a different individual or individuals.

It seems that the animal offerings deposited in T.14 and T.15 were typical of this type of grave. Similar animal remains that came only from cattle and ovicaprines (most probably sheep only, as the goat remains were not found in sepulchral contexts) are known from other type II tumuli in El-Zuma, such as T.11, T.12, T.13, T.16, T.24, and T.26. Only T.9 had a different bone assemblage, yielding only a few ovicaprine bones during excavation; however, this grave had been damaged by the collapse of the chambers' ceilings, and the fill of the chambers was very wet, which might have caused the destruction of the botanical and zoological remains.

TABLE 8.12 Animal remains discovered in T.14

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Cervical vertebrae	1			1		2 individuals: 1 between 2–2.5 and 3.5–4 years old, 1 between 3.5–4 and 5 years old
		Thoracic vertebrae	1			1		
		Sternum	1			1		
		Rib	43	1	1	1	present on 1 fragment	
		Scapula	1	1				
		Femur	16		1			
		Patella	1			1		
	Chamber 2	Rib	20			≥ 4	present on 3 fragments	
		Humerus	6	1				
	Chamber 3	Sternum	6			3		
		Rib	94	1		≥ 6	present on 2 fragments	
		Scapula	78		1			
		Humerus	6	1				
		Tibia	2	1				
		Talus	1	1				
		Ossa tarsi	1			1		
Sheep	Chamber 2	Humerus	5		1			2 individuals: 1 under 3.5 years old, 1 about 3.5 years old
		Radius	1		1			
		Ulna	3		1			
		Tibia	17	1	1			
		Calcaneus	3		2			
		Talus	2	1	1			
Ovicaprine	Chamber 1	Humerus	1			1	present	probably from 2 of the above sheep
		Tibia	2			1		
	Chamber 2	Rib	13			≥ 2		
		Scapula	3			1		
		Ossa carpi	1			1		
		Pelvis	6	1				
		Ossa tarsi	1			1		
		Centroquartale	1	1				
	Chamber 3	Rib	110	1	1	≥ 6		
		Sternum	11			≥ 2		
		Pelvis	5	1				
		Femur	6	1	1			
		Patella	1			1		

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TABLE 8.13 Animal remains discovered in T.15

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	37		1	2		3 individuals: 1 about 2–2.5 years old, 1 between 2–2.5 and 3.5–4 years old, 1 more than 3.5–4 years old
		Tibia	8	1		1		
		Talus	1			1		
	Chamber 2	Scapula	181		1			
		Humerus	53	1			present	
	Chamber 2, in vessel Z15/39	Rib	138	2		3	present on 23 fragments	
	Shaft (in the vicinity of chamber 1)	Rib	218			6	present on 15 fragments	
		Cervical vertebrae	1			1		
		Pelvis	25		1	1		
		Femur	70	3	2			
		Patella	1	1				
		Tibia	43	2	2			
		Talus	3	2	1			
Sheep	Chamber 1	Femur	13	1				2 individuals: 1 under 3.5 years old, 1 about 3–3.5 years old
	Chamber 3	Pelvis	9	1				
	Shaft (in the vicinity of chamber 1)	Humerus	3	1		1		
		Femur	1			1		
Sheep/goat	Chamber 2, in vessel Z15/39	Rib	14	2		1		probably from 2 of the above sheep
	Chamber 3	Lumbar vertebrae	9			≥ 2		
		Sacrum	1			1		
		Rib	23			≥ 3		
	Shaft (in the vicinity of chamber 1)	Rib	75			2		
		Humerus	3			1		
		Femur	24	1	1			
		Tibia	16		1	1		
	Shaft	Mandible	15			1		probably not from the 2 sheep above
		Rib	5			1		
		Femur	6			1		

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4.2.7 Tumulus 16

Animal remains were discovered in 2 clusters: in the northern part of chamber 1 (group 1) and in the southern part of this chamber, in the vicinity of the blocking wall (group 2) (see Chapter 3.3, Fig. 3.93, in this volume). Additionally, 2 bones were mixed with the human remains in the southern part of the chamber, and other bones were discovered in the central and southern part of chamber 2, as well as in the shaft and robber pit. One cattle and 2 ovicaprine bones were also found during the excavation of the superstructure, but it seems that they were not connected with funerary rituals and got there accidentally. There were 605 bone and tooth fragments in total, among them 174 fragments that could not be identified to species. There were only cattle and ovicaprine remains present in these assemblages. The cattle bones came from 2 individuals: the first one was about 3.5–4 years old and the other was an adult (but only the tibia of this animal was found in chamber 2) [**Table 8.14**].

TABLE 8.14 Animal remains discovered in T.16

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1 (among human bones)	Rib	1			1		2 individuals: 1 about 3.5–4 years old, 1 adult (tibia only)
	Chamber 1, northern part, group no. 1, near beer jar	Sternum	1			1		
		Rib	22			1	present	
		Pelvis	14		1			
		Femur	16		1			
	Chamber 1, southern part, group no. 2, near beer jar	Rib	10	1				
		Humerus	15		1			
	Chamber 2, central and southern part	Lumbar vertebrae	5			1		
		Sacrum	4			1		
		Sternum	7			7		
		Rib	173	2	6	1	present on 6 fragments	
		Scapula	60	1				
		Humerus	1	1				
		Pelvis	13	1				
		Patella	1	1				
		Tibia	46	1	2			
		Talus	2	1	1			
		Ossa tarsi	3	2	1			
	Shaft, from damaged blocking wall, southern part	Rib	12			1		
	Shaft, central part, near damaged blocking wall	Femur	9	1				
	Shaft, central part	Skull	1			1		adult individual or individuals
	Shaft, south-eastern part	Tooth	1			1		
	From natural ground level, south-western part	Tibia	1		1			
	Robber pit, north-eastern part	Mandible	1			1		
Ovicaprine	Chamber 1 (among human bones)	Sternum	2			1		young individual
	Robber pit, central part	Scapula	2			1		adult individual or individuals
		Humerus	4			1		
	Robber pit, northern part	Tibia	2			1		
	From natural ground level, south-western part	Humerus	1			1		
	Superstructure, eastern part	Tibia	1			1		

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Group 1 in chamber 1 consisted exclusively of cattle remains (53 fragments from 4 bones) from the thorax and proximal part of a hind limb. Group 2 also consisted exclusively of cattle remains (25 fragments from 2 bones), which came from the thorax and proximal part of the forelimb. In the southern part, together with human remains, 1 cattle rib and 2 fragments of ovicaprine sternum were found.

Only cattle remains were also discovered in chamber 2. This was the most numerous assemblage from this grave (315 fragments from 30 bones) and it consisted of bones representing the thorax and proximal parts of the limbs.

Another 4 cattle bones were found in the central and south-eastern part of the shaft (a rib, femur, skull and tooth). The remains obtained from the robber pit and superstructure were very similar: in both cases there was 1 cattle bone and 2 or 3 ovicaprine bone fragments.

The only marks observed featured on cattle remains; no marks were observed on ovicaprine bones. A few bones had been chopped (sternum, rib, and tibia), filleted (rib) and in 2 cases it was possible to detect marks suggesting dismembering (a scapula bore a cut mark on the caudal angle, and another cut mark was also visible on the proximal end of a tibia). Additionally, a mild inflammatory process was noted on a cattle tibia near the line of fusion of the proximal end and of the shaft.

4.2.8 Tumulus 23

Only a few animal bones were discovered in chamber 2. They were not, however, submitted for analysis.

4.2.9 Tumulus 24

Animal bones were discovered in two chambers: 1 and 4. In chamber 1 they were found in the eastern part, mixed with human remains, and in the south-eastern part (see Chapter 3.3, Fig. 3.75). In chamber 4 they occupied the north-west corner of the chamber. Altogether, 1,171 bone fragments were recovered from this grave, 445 of which could not be identified. The majority of the bones came from cattle and ovicaprines; there were also 2 bird bones [**Table 8.15**]. Cattle remains came from 3 individuals: one was about 2–2.5 years old, the second was between 15–20 months and 3.5–4 years old, and the third one was an adult (it was represented by only 1 fragment of rib). Sheep remains belonged to 2 individuals: one younger, between 3–4 months and 3–3.5 years old, and one adult. Two adult goat bones were also found in this tumulus, which was unexpected in the context of the other graves. There were no goat bones in the studied material recovered from the chambers. Additionally, 2 bones (calcaneus and rib) belonged to an adult ovicaprine of undetermined species.

Some of the bones in chamber 1 were mixed with human remains; there were cattle and ovicaprine bones among them. It was possible to identify 9 ovicaprine bones (35 fragments) as belonging to sheep. Cattle, as well as ovicaprine remains, came from the thorax and proximal parts of limbs.

The majority of bone fragments were located in the south-eastern part of chamber 1. In the case of cattle, bone fragments were numerous, though the number of bones represented in this assemblage was rather low: 271 fragments from 15 bones. There were not only bones from the thorax and proximal parts of limbs but also a skull fragment. Head elements have very rarely been found in the burial and side chambers of the El-Zuma tumuli. The only examples recorded to date were those in chamber 1 of T.3 and chamber 1 of T.24. In both cases (a tooth from chamber 1 in T.3 and a fragment of skull from chamber 1 in T.24) only small fragments were found in the mixed bone material. It cannot be ruled out that they were put there intentionally; however, it is also probable that they got there accidentally. In both cases the chambers were looted and the materials mixed; therefore, the original content is not certain. In T.24 the ceiling of chamber 1 had collapsed, and the eastern part was covered with the fill of the superstructure (sand and gravel). Ovicaprine bones were also found in greater numbers in the south-eastern part of chamber 1, where 100 fragments from 19 bones were found. Two species were recognized in this material: sheep (only a pelvis could be identified) and goat (2 bones were determined: tibia and talus). The rest of the bones could not be identified to species. All ovicaprine bones came from the thorax and proximal parts of limbs. In this assemblage there were also 2 fragments of long bones that belonged to a bird. It was one of two examples of bird bones found in a burial chamber at El-Zuma. The second example of a bird bone was discovered in the burial chamber of T.21 (a type III tumulus). But these were not the only bird bones found inside the graves. They were also present among the bone material from the tunnels of type I tumuli (T.1, T.3, T.6, and T.8) with the mixed material, partially accidental. As the burial chambers of both T.21 and T.24 were looted and their ceilings collapsed, it seems probable that these bones were not part of the original content of the chambers.

An assemblage located originally in the north-western part of chamber 4 consisted of cattle and ovicaprine bones. There were 232 fragments from 14 cattle bones, among them bones from the thorax and proximal part of a hind limb. Only fragments of 1 rib belonged to an ovicaprine. The remains probably came from the same individuals as the remains in chamber 1.

TABLE 8.15 Animal remains discovered in T.24

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1, south-eastern part	Skull	1			1		3 individuals: 1 about 2–2.5 years old, 1 between 15–20 months and 3.5–4 years old, 1 adult (1 fragment of rib only)
		Lumbar vertebrae	3			2		
		Sternum	4			2		
		Rib	205	≥ 2	≥ 2	1	present on 30 fragments	
		Scapula	24	1				
		Humerus	16	1				
		Pelvis	10	1	1			
		Femur	8	1				
	Chamber 1, north-eastern part	Lumbar vertebrae	2			1	present	
		Rib	23			2?	present on 9 fragments	
		Scapula	17			1		
		Pelvis	5	1			present	
		Femur	3	1				
	Chamber 4, north-western part	Rib	192	4	4	2	present on 8 fragments	
		Tibia	38	1	1			
		Talus	2	1	1			
Sheep	Chamber 1 (among human bones)	Rib	15			1		2 individuals: 1 between 3–4 months and 3–3.5 years old, 1 adult (scapula, humerus and pelvis only)
		Scapula	1		1			
		Humerus	1		1			
		Radius	3		1			
		Ulna	2		1			
		Pelvis	5		1			
		Calcaneus	1		1			
	Chamber 1, south-eastern part	Pelvis	8	1 (part)	1			
	Chamber 1, north-eastern part	Scapula	6	1			present	
		Humerus	1	1				
Goat	Chamber 1, south-eastern part	Tibia	5	1				1 adult animal
		Talus	1	1				
Ovicaprine	Chamber 1 (among human bones)	Rib	4			1		from 2 of the above sheep (most of the bones come from the young individual, only calcaneus and rib come from the adult individual)
	Chamber 1, south-eastern part	Sternum	1			1		
		Rib	92	4	5	5	present on 14 fragments	
		Humerus	1	1				
		Pelvis	4		1			
		Tibia	1			1	present	
		Calcaneus	1		1			
	Chamber 1, north-eastern part	Rib	7			2		
		Pelvis	1	1 (part)				
		Femur	1			1		

TABLE 8.15 Animal remains discovered in T.24 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Ovicaprine	Chamber 4, north-western part	Rib	9			1		
Bird	Chamber 1, south-eastern part	long bones	2			2		1 individual

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Some of the bones bore post-consumption marks. Filleting marks were observed on both cattle (most of the ribs, a lumbar vertebra, sternum, and femur) and ovicaprine bones (ribs and a few sheep bones: scapula, humerus, radius, and pelvis). Cattle bones were additionally chopped (2 ribs, a pelvis, and femur).

4.2.10 Tumulus 26

Animal remains, as a part of offering deposits, were mostly placed in the chambers of the tomb, but two bones were also found among the bricks of a blocking wall. 553 animal bones and bone fragments were discovered in the tumulus, but because of their poor state of preservation (the specimens were dry and fragile) 98 fragments remain unidentified. The material came from one cattle and two sheep [**Table 8.16**]. The cattle remains belonged to an animal about 3.5–4 years old. The sheep bones came from two individuals: one about 15–20 months old and an older one aged about 3.5 years. Chamber 1 contained four beef cuts: ribs, two left humeri, and one right pelvis. In chamber 2 there were remains of two species: cattle and sheep. The cattle bones were found on the floor in the southern part of the chamber and inside two bowls slipped and burnished on both sides (Z26/24 and Z26/75). Three parts of the cattle carcass lay on the floor: a fragment of thorax, a big part of the left forelimb, and bones from the proximal part of the right hind limb. Cattle ribs and lumbar vertebrae had been put into bowl Z26/24 together with a sheep rib, two cuts from the proximal part of the forelimb, and 2 fragments of the proximal part of the hind limbs. In bowl Z26/75 there were only cattle ribs. Chamber 3 contained, among other things, cattle ribs and thoracic vertebrae, and part of a forelimb as well as part of a sheep thorax and right pelvis. In chamber 4 there were fewer animal remains: only cattle ribs and a sternum, mixed with two sheep femurs, were deposited on the floor. Some cattle and sheep bones bore marks of skinning, dismembering [**Figs. 8.10, 8.11**], chopping, and filleting [see **Fig. 8.9**].

4.3 *Type III Tumuli*

The discovery context of the animal bones from some of the type III tumuli has already been outlined elsewhere (Iwaszczuk 2015, 428–429; Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 23–26).

4.3.1 Tumulus 17

Animal remains from this tumulus have already been discussed (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 23–26). It is interesting that this tomb was one of the two type III tumuli that contained not only ovicaprine but also cattle bones [**Table 8.17**]. In both cases only one cattle bone was found inside the chamber. Such a discovery is interesting in the light of other finds from these graves (see Chapter 3, in this volume). They were poorly equipped in comparison with graves such as T.21 and T.27, so the presence of cattle bone cannot be connected directly with the special status of the deceased. But the question about why these two bones were present in type III tumuli remains unresolved, unless we assume that the bones got into the chamber accidentally, which was possible but highly improbable given that cattle bones are big enough to not be accidentally moved along with sand.

4.3.2 Tumulus 18

No animal bones were recorded in this grave.

4.3.3 Tumulus 19

Only a few animal bones were found together with human remains in the burial chamber [**Table 8.18**]. A cattle rib came from an animal under 5 years old. There was also a sheep pelvis, as well as lumbar vertebrae, and the tibia of an ovicaprine. These bones probably belonged to a young individual under 15–20 months old. There were no marks on the bones.

4.3.4 Tumulus 20

The remains from this tumulus have been analysed before (Iwaszczuk, Niderla-Bielińska, and Ścieżyńska 2019, 23–25). They were very typical of the type III tumuli, and contained only ovicaprine remains found in the shaft (mixed with human remains), and the burial chamber (only 1 fragment of pelvis). The bones came from the proximal parts of limbs, but there was also 1 fragment of mandible found among human remains [**Table 8.19**].

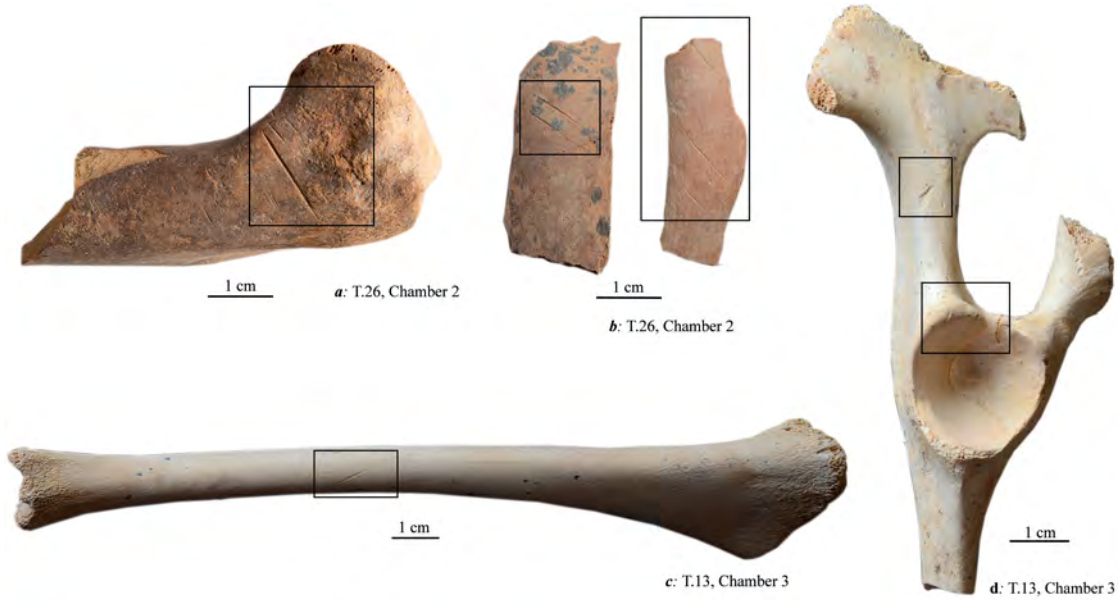

FIGURE 8.11 Dismemberment and filleting marks visible on ovicaprine bones from El-Zuma: a—dismemberment marks on a sheep humerus; b—filleting marks on ovicaprine ribs; c—filleting marks on an ovicaprine tibia; d—dismemberment mark and probable skinning mark on a sheep pelvis
PHOTOS BY A. KAMROWSKI

TABLE 8.16 Animal remains discovered in T.26

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 1	Rib	6		1	2		1 individual: about 3.5–4 years old
		Humerus	4		1			
		Pelvis	6	1				
	Chamber 2	Lumbar vertebrae	5			2		
		Sternum	23			5		
		Rib	41	1	1	3		
		Pelvis	12		1			
		Femur	30	1	1			
		Patella	2	1	1			
		Tibia	15	1	1			
		Talus	1		1			
	Chamber 2, in vessel Z26/24	Lumbar vertebrae	5			1		
		Rib	12			2		
	Chamber 2, in vessel Z26/75	Rib	2			2	present on 1 fragment	
	Chamber 3	Thoracic vertebrae	14			4		
		Rib	32		1	3		
		Radius	3		1			
		Ossa carpi	5			5		

TABLE 8.16 Animal remains discovered in T.26 (*cont.*)

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber 4	Sternum	7			2		
		Rib	25			3		
	Shaft, blocking wall	Rib	1			1		adult individual or individuals
		Humerus	1			1		
Sheep	Chamber 1	Tibia	4		1			2 individuals: 1 about 15–20 months old, 1 about 3.5 years old
	Chamber 2	Scapula	8	1	1			
		Humerus	9	1	1			
		Radius	4	1	1			
		Ulna	2		1			
		Femur	12	1	1		present on 5 fragments	
		Tibia	2		1			
	Chamber 2, in vessel Z26/24	Calcaneus	1	1				
		Talus	1	1				
	Chamber 3	Pelvis	4	1				
	Chamber 4	Femur	11	1	1			
Ovicaprine	Chamber 2	Rib	70	2	1	3		probably from 2 of the above sheep
		Lumbar vertebrae	2			2		
		Humerus	3		1			
		Ulna	1			1		
		Pelvis	5	1	1			
		Femur	10	1	1			
		Patella	1		1			
		Tibia	10	1	1			
		Calcaneus	1		1			
	Chamber 2, in vessel Z26/24	Rib	10			1		
		Scapula	6			1		
		Ulna	1	1		1		
		Femur	5		1			
		Patella	1		1			
		Centroquartale	1			1		
	Chamber 3	Lumbar vertebrae	7			2		
		Caudal vertebrae	1			1		
		Sacrum	4			1		
		Rib	7			1	present	

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TABLE 8.17 Animal remains discovered in T.17

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber	Ulna	3			1		1 individual
Sheep	Chamber	Sternum	2			2		1 individual: between 3 and 3.5 years old
		Femur	4	1				
		Tibia	1	1			present	
		Talus	1	1				
		Calcaneus	1	1				
		Centroquartale	1			1		
		Sesamoid	1	1				
Ovicaprine	Chamber	Rib	1			1		probably from the above sheep

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TABLE 8.18 Animal remains discovered in T.19

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Cattle	Chamber	Rib	2			1		young individual under 5 years old
Sheep	Chamber	Pelvis	3			1		probably 1 young individual under 15–20 months old
Ovicaprine	Chamber	Lumbar vertebrae	1			1		
		Tibia	2		1			

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TABLE 8.19 Animal remains discovered in T.20

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Shaft (among human bones)	Humerus	1			1		1 individual: under 3–3.5 years old
		Talus	1			1		
Ovicaprine	Chamber	Pelvis	2		1			probably from the above sheep
	Shaft (among human bones)	Mandible	4			1		
		Scapula	2			1		
		Ulna	1			1		
		Pelvis	2	1				

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TABLE 8.20 Animal remains discovered in T.21

Species	Context	Bone	Number of fragments	Number of bones			Marks left by termites	Description
				Right	Left	Right/left		
Sheep	Chamber	Scapula	4		1			1 individual: about 3–4 months old
		Humerus	4		1			
		Radius	5		1			
		Tibia	3			1		
		Calcaneus	1			1		
		Talus	1			1		
		Metatarsus	2			1		
Ovicaprine	Chamber	Sternum	7			1		probably from the above individual
		Rib	30			7		
		Humerus	3	1				
		Ulna	2		1			
		Ossa carpi	1			1		
		Pelvis	4			1		
		Tibia	4			1		
Carnivore	Shaft	Ph 1	2					adult
Bird	Chamber	Long bone	1			1		

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4.3.5 Tumulus 21

The animal remains have been described before (Iwaszczuk 2015). Sheep and a bird were the only species represented in this tumulus [**Table 8.20**]. The sheep bones came from the more valued parts of the carcass of an animal aged about 4 months.

4.3.6 Tumulus 22

Only bones from the re-excavation of the grave were submitted for analysis. The material, however, was mixed and the remains had no specified context, so they were not ultimately included in the analysis.

4.3.7 Tumulus 27

No animal bones were recorded in this tumulus.

4.3.8 Tumulus 28

Only 1 fragment of ovicaprine pelvis was found during the excavation of this tumulus. The fragment was, however, discovered in the superstructure of the grave, so it is probable that it was unconnected with any funerary rituals.

5 Discussion: Funerary Rituals on the Basis of Animal Remains

It seems that most of the animal remains found in El-Zuma were deposited in the graves during the funerary ritual or rituals. The rituals, however, were different in the case of the different types of tumuli. The most complicated rituals were performed for those buried in type I tumuli, the simplest ones for those interred in type III tumuli, which might have been connected with the social status of the people buried in the different types of tumuli. The most popular animal offerings, found in all types of tumuli, were food offerings, but there were also other types of rituals that left a material footprint in the form of animal remains. These will be analysed separately.

5.1 *Food Offerings*

The animal remains found in the grave chambers of all tumulus types represented bigger parts of cattle and sheep carcasses. These parts of the animal carcasses, probably prepared as meat cuts, were deposited in the tumuli as grave goods to serve the dead in the afterlife. Originally they were placed in the burial chamber as well as in the side chambers (not necessarily in all of them), but tomb robberies caused, among other things, their partial dis-

placement into the grave shafts, and in the case of type I tumuli probably also into the tunnels. Not all graves were, however, equipped with food offerings. Three tumuli of type III (T.18, T.27 and T.28) did not contain any animal remains either in their chambers or shafts.

There were notable differences between the contents of tumuli of different types. It seems characteristic of the biggest and most richly equipped tumuli (types I and II) that remains came from both cattle and sheep, sometimes even two individuals of each species were placed inside the grave (T.11, T.12, T.14, T.16). In T.13, T.15, and T.24 as many as 3 cattle carcasses were represented. The smallest tumuli (type III) contained only sheep bones, and in all cases only the remains of 1 animal were recorded. Only 2 exceptions from this rule are known: in each of two tumuli (T.17 and T.19), a single cattle bone was found together with ovicaprine remains.

It seems obvious on the basis of the recorded bones that only certain parts of the carcasses were used as offerings. In most cases, even if the bone material was mixed, the pattern of depositing whole parts of cattle and sheep carcasses (joints) was confirmed. In the excavated chambers of tumuli of types I and II both species, cattle and sheep, were represented by articulated and disarticulated thorax elements as well as forelimbs and hind limbs without extremities. Meat cuts came from top quality parts of the carcasses, with large amounts of meat. Cattle slaughtered for such offerings were usually young (under 3.5–4 years old) or relatively young (about 3.5–4 years old). Sheep were young (under 3.5 years old) or adult. No bones belonging to old individuals were found in ritual contexts, which confirms the careful choice of meat intended as food offerings. Such a pattern has also been noted at other cemeteries from the region, such as El-Sadda 1 (Osypińska 2007), Tanqasi (Osypińska 2008), El-Kassinger Bahry (Makowiecki 2007) and El-Detti (Iwaszczuk 2016). The young age of offertory animals was reported from all these sites. In the case of tumulus HP45/1 at El-Kassinger Bahry Makowiecki estimated the age of the slaughtered sheep at 12–15 months and 12–18 months old. Osypińska also confirmed the presence of relatively young ovicaprine bones, from individuals aged about 3.5 years, in graves 67 and 83 at El-Sadda. In tumulus 87 at Tanqasi the analysed ovicaprines were between 5 months and 3 years old; however, the cattle remains came from an animal over 4 years old. Almost exclusively young sheep and barely adult cattle remains were also discovered in El-Detti. No old animals were reported from any of these sites.

The presence of post-consumption marks, as well as marks suggesting skinning and dividing the carcasses into small pieces, also indicates that the deposited bones were intended as food offerings. Such marks were also present on the bones from El-Kassinger Bahry (Makowiecki 2007) and El-Detti (Iwaszczuk 2016), but it is interesting that they were not reported from the Tanqasi and El-Sadda 1 cemeteries. It seems obvious that the animals were carefully chosen for these offerings. There were no preferences as to the side of the body from which the meat cuts were offered for the deceased. Carcasses were divided into smaller pieces, but in some cases bigger parts of carcasses, such as forelimb or hind limb without extremities, were placed among the other grave goods. In some cases a beef or mutton dish was also served: the presence of ribs and sometimes also other bones inside bowls, noted in type II tumuli, should be considered in such a context. There were 2 cases when bigger meat cuts were placed inside vessels: in chamber 3 of T.12 a number of cattle bones were registered in vessel Z12/125, and in chamber 2 of T.26 some sheep remains were found inside the small bowl Z26/24. In some instances (vessels Z13/11 from chamber 5 and Z13/27 from chamber 3 of T.13, vessel Z15/35 from chamber 2 of T.15, and vessels Z26/24 and Z26/75 from chamber 2 of T.26), the bones found inside the bowls may suggest that a liquid could have originally accompanied the bones—all these bowls were slipped and burnished on both sides, which helps to keep liquid inside the vessel. In other cases, bigger meat cuts were placed on the bowls and not inside them (e.g. fragments of cattle pelvis were found inside cup Z11/19 from chamber 2 in T.11 and around it)—perhaps they were also prepared in some way. In the case of the bowl (Z12/125) containing cattle bone fragments, the vessel was large and shallow, slipped only inside—a meat-dish could have been prepared and served in it for the dead.

The animals were probably slaughtered outside the cemetery and certainly outside the graves. No place which could have been used for butchering the animals and dividing the carcasses was found at the El-Zuma site either during the survey or during the excavations. This suggests two scenarios: the existence of such a place elsewhere, or the slaughtering of animals in the village inhabited by the society that buried its dead in the tumuli at El-Zuma. Both scenarios are equally probable in the light of available evidence.

5.2 *Other Forms of Ritual*

It seems probable that other forms of rituals besides food offerings also accompanied the funerals at El-Zuma in the Early Makurian period. The animal remains found in contexts other than chambers (and partially shafts) differ from the assemblages connected with food offerings. It is possible to discuss three types of such rituals on the basis

of animal remains: animal offerings accompanying funerary rituals, feasting during funerary rituals, and probable banquets after funerary rituals.

5.2.1 Animal Offerings Accompanying Funerary Rituals

Unusual animal bone fragments were found in the tunnels of type I tumuli. The zoological variety of the remains observed in the tunnels of T.1 and T.4 suggests the existence of different types of funerary rituals. At least one of these graves (T.4) was exceedingly well equipped (see Chapter 3.2, this volume). The presence in these structures of large fragments of skeletons of transport animals, such as camel and donkey, as well as gazelle bones, is reminiscent of the situation known from the tumuli at the cemetery in Qustul (Emery and Kirwan 1938, 27–74, Pls. 9, 11–14). Whole animal skeletons (cattle and ovicaprine as well as transport animals and dogs) were discovered there lying on the ramps and in the corridors of the very richly equipped graves (including Qustul tombs 17, 25 and 31). A similar situation was observed in Firka: for example, in tomb 11 at least one camel was buried lying on its side with its head directed down to the main chamber. The skull of this animal bore chopping marks (Kirwan 1935, 192, 193, Fig. 5). Altogether, skeletons of cattle, sheep, horse, and camel were discovered in three tumuli (nos. 11, 12, and 14), the biggest ones at the Firka cemetery. Transport animals, sometimes with decorative elements, such as bronze bells or necklaces of faience beads and cowrie shells, were found on the ramp, while cattle and sheep remains were usually located in the pit by the main chamber (Kirwan 1935, 192–194). Though the remains found in T.1 and T.4 in El-Zuma were broken into pieces, scattered along the tunnels and mixed with human bones and other finds, they represented different parts of the skeleton, not only the thorax and proximal parts of limbs as it was in the case of the remains found in the chambers of tumuli from this cemetery. Both tumuli were looted and robbers got to the graves through the shaft leading into the tunnel, so the graves were open for some time, which was attested by bat remains found in different levels of the fill of T.4, as well as by bird bones found in the tunnel of T.1, and some accidental finds, such as a single carnivore rib and two vertebrae in T.4. The other type I tumuli were also looted in this way and some remains, like the bird and micro-mammal bones from T.3, T.6, and T.8 or the single porcupine mandible found in T.3, suggest that the graves could have been accessed in this way at least some time after the looting. It seems, however, improbable that almost-whole skeletons of big mammals could get into the tunnels accidentally along with sand sliding down into the open tunnels. It is therefore possible that similar rituals to those observed in Qustul and Firka may have been performed in the case of two tumuli at El-Zuma.

5.2.2 Feasting during Funerary Rituals

The question is, what happened to the carcass parts that remained after the offerings had been left inside the graves, as large fragments of them were not found among the food offerings. Probably they served as food during a feast that accompanied the funerary rituals, though no evidence to support this theory is provided by the animal remains from El-Zuma. It is possible that feasting also took place in the graves, or that people tried the dishes intended for the dead, because filleting marks were observed on the bones (usually on ribs, but not exclusively). Filleting marks are made when taking meat off the bone, which usually takes place when the meat is eaten (especially filleting marks observed on the ribs), and therefore they are commonly connected with the consumption and not with the preparation of meat.

5.2.3 Probable Banquet after Funerary Rituals

The remains of two sheep were found in the southern and south-eastern part of the shaft of T.12, on a level above the floor of the grave, in a separate cluster, together with a number of artefacts (mostly pottery) neatly placed (see Chapter 3.3, Fig. 3.45, this volume). Perhaps this kind of find was connected with a banquet that took place sometime after the funeral (as a layer of sand had already been formed by then) but before sealing the grave with the superstructure. Maybe also some other animal bone fragments discovered in the shafts of type II tumuli were the visible remains of such practices. There is also the possibility that this material was a component of the grave goods added there as a part of a separate ritual performed before the construction of the superstructure of the grave but, nevertheless, some time after the funeral and unconnected with a banquet.

5.3 *Time of Death and Chronology of Funerary Rituals*

As has been discussed before, it is probable that marks left by termites were recorded on the bones recovered from some graves at El-Zuma. If so, the implications for studies into ritual practices at El-Zuma are really interesting. The activity pattern of the colonies of some of the species of these small insects is especially noteworthy. According to Geerts, van der Linden, and van der Linden (2016) the maximum foraging activity of *Baucaliotermes hainesi*, the species of termite analysed by them, occurs only above 20°C. Backwell et al. (2012, 84) observed that *Trinervitermes trinervoides* do not forage during the June–August

period and during the hottest months. These authors are convinced, therefore, that the destruction of bones is seasonal and connected with the lifecycle of the termites. Furthermore, the research carried out by Backwell and her team (2012, 79, 84) showed clearly that termites consume bones not only for their protein and marrow lipid content but also because of various trace elements (calcium, phosphorous, and nitrogen), preferring fresh bones and bones with meat on them to fossilized ones. This was also confirmed by Thorne and Kimsey (1983) in their research. These two factors (seasonality and consumption of meat and fresh bones) are of great importance in the case of El-Zuma. On the one hand, the seasonality of termite activity indicates that burials took place during different seasons. The tumuli in which the bones gnawed by termites were recorded were probably visited by them in search of forage in those seasons with moderate temperatures, while the burials in the tumuli without such bones would have taken place during the coldest or the hottest seasons. It confirms that the cemetery was used by people during normal life-death cycles and was not connected with sudden deaths caused by diseases or war. On the other hand, the search for meat and bone protein and lipids, as well as minerals, must have attracted termites to remains that were relatively fresh. It seems that though termites can build long tunnels underground, they must be tempted to do so, therefore forage must have been available at least close to the surface. It is possible then that the graves were sealed with blocking deposits (tumuli of type I and II), as the animal offerings in the side chambers were mostly intact, but not necessarily covered with sand and gravel structures, at least for some time after the burial. There is also a possibility that the burial chambers were not equipped at the same time as the body was placed in the main chamber but sometime later, in one or more separate rituals, and the graves were covered with superstructures after these rituals had been completed. Type III tumuli contained virtually no bones gnawed by termites; the only fragment bearing such marks was discovered in T.17. It seems then that these graves were covered with superstructures almost immediately after the burial had taken place. It is interesting that the graves containing bones with termite gnawing marks were located in the central part of the cemetery, forming a strip of land indicating the existence of a path used by termites. But in this zone there were also graves without signs of termite activity, which confirms the theory of seasonality.

Rodent and bat remains were found in the tunnels of type I tumuli. It is possible, as discussed earlier, that gnawing marks were made by rodents (most probably not rats) while wearing down their incisors. If so, the bones must have already been meat-free, and the rodent activity would have taken place sometime after the burial, maybe after the graves had been looted, when the tunnels were left open. The theory that the tunnels remained open for a longer time is supported by the presence of bat skeletons, exclusively of 1 species, in the tunnel of T.4. This suggests the existence of a colony of these animals in the shelter provided by the tunnel, which would have been accessible from the outside at that time. Additionally, bat excrement covered the floor along the walls of chamber 1 of T.6 (see Chapter 3.2, Fig. 3.35, this volume) and chamber 1 of T.7 (see Chapter 3.2, Fig. 3.41, this volume) suggesting its prolonged usage.

6 Summary

The animal remains discovered in the various tumulus structures at El-Zuma were connected with different types of rituals. Bones found in chambers, and partially in shafts (especially fragments mixed with human remains and other finds), were most probably deposited in the graves as food offerings. The number of animals slaughtered for this purpose differed depending on the tumulus type. The smallest tumuli (type III) were equipped with meat of only one young sheep or contained no meat offerings. Probably 1–3 young cattle and sheep were killed for meat that was used during the funerary rituals performed in type II tumuli. Additional rituals took place in the case of some type I tumuli. A large number of animals was slaughtered not only as food offerings but probably also as whole animal offerings (among them game and transport animals), which were deposited in the tunnels that most probably led to the burial chambers, maybe as animals to accompany the dead in the afterlife. The variety of rituals performed at El-Zuma sets this cemetery apart from other cemeteries in the region. It shows the wealth of some people buried there, as well as the social stratification of the society living in that neighbourhood during the Early Makurian period.

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PART 3

The Proposed Archaeological Park in El-Zuma

∵

CHAPTER 9

The Conception of the Archaeological Park in El-Zuma

Jolanta Juchniewicz

1 Burial Mounds of El-Zuma on the UNESCO World Heritage List

On the strength of decision 27 COM 8C.31, taken by the UNESCO World Heritage Committee in 2003, "Gebel Barkal and the Sites of the Napatan Region" became the first cultural heritage property in Sudan to be inscribed on the World Heritage List (C i, ii, iii, iv, vi / 2003; World Heritage Committee 2003, 115). The five archaeological sites which make up this property (Jebel Barkal, El-Kurru, Nuri, Sanam and El-Zuma) represent the Napatan and Meroitic cultures of the second Kingdom of Kush. The cemetery at El-Zuma has been recognized as representing unique burial traditions and a masterpiece of human creative genius. The Early Meroitic period saw the start of a series of cultural changes in inhumation practices in Nubia (Mahmoud El-Tayeb 2012).

The five sites together cover a stretch of land over 60 km long. Gebel Barkal and the Sites of the Napatan Region, Sudan, were inscribed on the World Heritage List on the basis of cultural criteria (i), (ii), (iii), (iv) and (vi):

Criteria (i), (ii), (iii), (iv): The nominated pyramids and tombs, being also part of the special desert border landscape on the banks of the Nile, are unique in their typology and technique. The remains are the testimony to an ancient important culture that existed and flourished in this region only;

Criterion i: The rock-cut burials and temples, together with the pyramids and funerary chapels represent a masterpiece of human creative genius.

Criterion ii: The Amun temple at Gabel Barkal is a main center of once an almost universal religion and together with the other sites represents the revival of Egyptian religious values.

Criterion iii: Gebel Barkal and the other sites bear an exceptional testimony of the Napatan, Meroitic and Kushite civilizations that existed along the Nile between 900 BC and 600 AD.

Criterion iv: The tombs, pyramids and temples are special and outstanding examples of architectural ensembles (ICOMOS 2003, 101).

1.1 *Authenticity and Integrity: Challenges Regarding the Property's Protection and Conservation*

> Authenticity
>
> Properties nominated under criteria (i) to (vi) must meet the conditions of authenticity.
>
> World Heritage Committee 2017, para. 79
>
> Integrity
>
> All properties nominated for inscription on the World Heritage List shall satisfy the conditions of integrity.
>
> World Heritage Committee 2017, para. 87

The fundamental premise of protecting monuments, in particular those inscribed on the UNESCO list of World Heritage sites, is that their historic substance should be fully respected. The high degree of intactness of these sites' attributes means that they require adequate preservation measures executed to modern scientific standards. Protection and conservation are major challenges because they have a significant impact on the authenticity and integrity of a property. It is necessary to preserve and permanently protect monuments without violating their original structure. All reinforcements, according to the current standards, should be hidden in order not to disturb the impression of authenticity (Małachowicz 2007, 235).

The Venice Charter of 1964 is the International Charter for the Conservation and Restoration of Monuments and Sites, which sets out international standards of protection practice for architecture and sites. It defines the principles of protection based on the concept of authenticity and provides an international framework for the conservation and restoration of historic buildings.

Excerpts from the Venice Charter (ICOMOS 1964):

> **Restoration**
>
> **Article 9.** The process of restoration is a highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and

authentic documents. It must stop at the point where conjecture begins, and in this case moreover any extra work which is indispensable must be distinct from the architectural composition and must bear a contemporary stamp. The restoration in any case must be preceded and followed by an archaeological and historical study of the monument.

Article 10. Where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modern technique for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience.

Article 12. Replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence.

Article 13. Additions cannot be allowed except in so far as they do not detract from the interesting parts of the building, its traditional setting, the balance of its composition and its relation with its surroundings.

When working on monuments, certain rules should be followed in accordance with modern conservation principles:

1. the PRIMUM NON NOCERE principle,
2. the principle of maximum respect for the original fabric of a monument and all of its values (material and intangible),
3. the principle of minimum necessary interference (refraining from unnecessary works),
4. the principle of removing only those elements that destructively influence the original,
5. the principle of discernibility and distinguishability of complements and current interferences and their aesthetic subordination to the original (the principle of non-competition),
6. the principle of reversibility of methods and materials,
7. the principle of performing all works in accordance with best knowledge and safeguarding top quality, including full documentation of research results and the course of subsequent works (Narodowy Instytut Dziedzictwa, n.d.).

1.2 *The Concept of Cemetery Protection in El-Zuma*

The UNESCO Management Plan for the sites of the Napatan Region, drawn up in 2003, includes some guidelines on how to protect monuments. Among other things, there should be protection against degradation caused by natural factors and human activity (Ahmed 2003, 251–252).

The ancient cemetery in El-Zuma is liable to degradation due to the combination of natural hazards and human activity. The monuments at this site have never been professionally conserved and need long-term protection. The following is a preliminary analysis of how to stop or reduce the impact of these factors by finding optimal methods of care and conservation.

In order to adequately protect the archaeological heritage in El-Zuma in accordance with UNESCO's principles of local community participation, the idea of an archaeological park has been put forward. Opening the site to tourists will strengthen the local economy and, hopefully, foster better stewardship of the monuments among the local population.

The concept of comprehensive protection of the graves at the cemetery in El-Zuma encompasses several elements: reinforcement and protection of aboveground features (tumulus superstructures), strengthening of underground features (shafts, burial chambers, and tunnels), as well as protection against damage. The underground parts must be adapted for tourist purposes in such a way that they guarantee the safety of visitors while below ground.

The most urgent conservation action at the archaeological site in El-Zuma is the protection of those tombs that are open and have only temporary protection (T.2, T.5, T.12, and T.25). From year to year there is noticeable progressive erosion of the rock substrate into which the (currently open) burial shafts were hewn. Rainwater has direct access to the inside of the tombs, which leads to erosion of the shaft walls. Existing protective measures only safeguard the tumuli from destructive human activity and prevent any accidental falls into deep excavations [**Fig. 9.1**].

Protection against the destruction of shafts and tunnels should start with structural consolidation of their surfaces. The most suitable method for treating porous rock such as that encountered in El-Zuma is impregnation of the surface with a deep-penetrating agent that will not form sealing layers, so that moisture can evaporate freely.

A set of guidelines for the implementation of all rescue operations for underground and above-ground historic assets, devised by Zalewski and Strzelecki, focuses on geomechanical aspects such as:

– carrying out monitoring surveys of the site substrate;
– using laboratory tests to accurately identify the physical and mechanical properties of the ground (rock mass) in and around the historic monument;
– the role of non-destructive testing in determining the current stability of excavations;

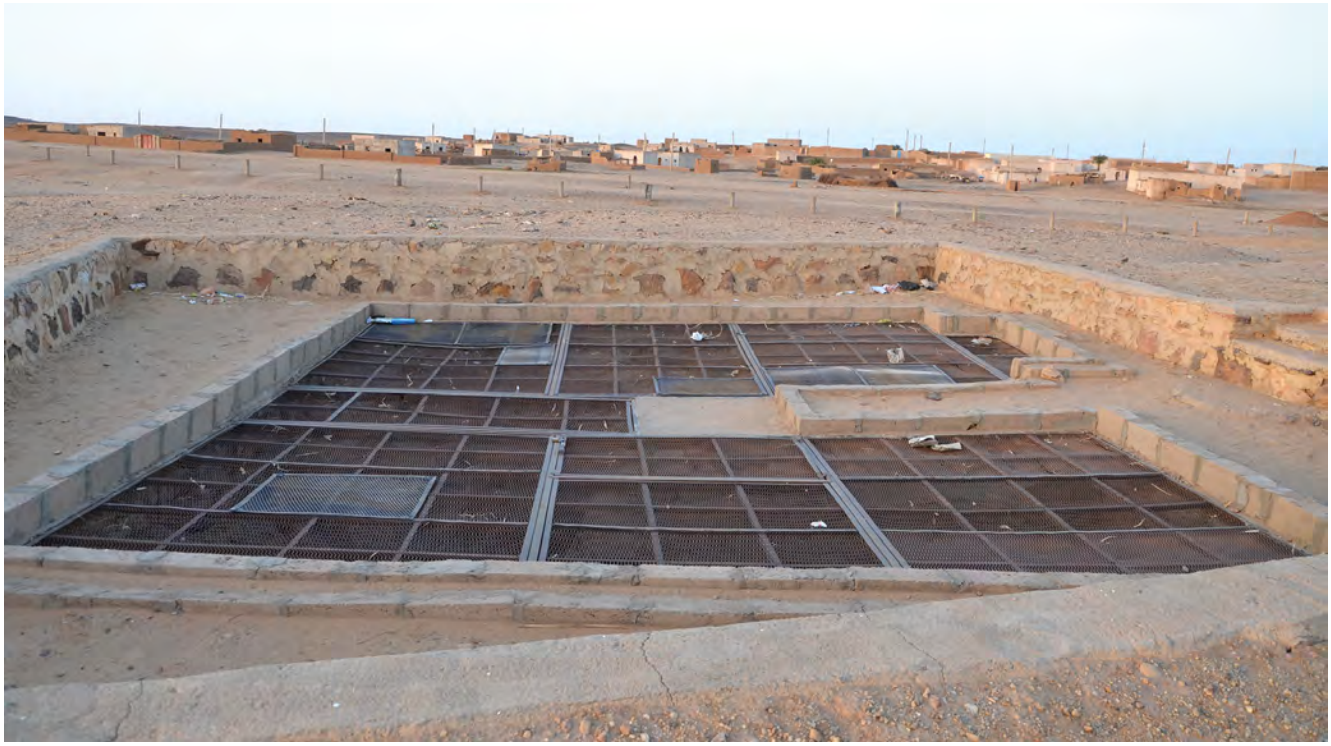


FIGURE 9.1 Tumulus 12: temporary protection
PHOTO BY Z. KOWARSKA

– static strength analysis of individual technical solutions for ground stabilization and consolidation of underground heritage assets (Tajduś, Mikoś, and Chmura 2006, 306).

The method formulated by Zalewski and Strzelecki requires a specific, multidirectional plan of action, the implementation of which guarantees the elimination of the causes and effects of the addressed threat.

1.2.1 Consolidation of Burial Shafts

The substructures of the burial mounds are carved into weak, sedimentary bedrock. It consists mainly of sandstone with an adhesive clay that is very susceptible to weathering and is characterized by low compressive strength. Diverse geological factors make it very difficult to choose a method for protecting and consolidating the rock mass. To safeguard the excavated tombs, there is no doubt that some kind of shelter is necessary, providing a cover for the shafts to protect them from destructive atmospheric conditions. Such a construction should, moreover, provide very good ventilation to help remove the excess moisture generated by the rise in groundwater levels caused by the Merowe Dam.

Typical mining methods for safeguarding underground monuments cannot be used here. Any reinforcement in the form of visible elements of casings, struts, or sprayed concrete would disturb the impression of authenticity. Shaft walls, which reach a height of almost 6 m in the deepest tomb, should be protected in the least visible way and without compromising the tomb's historic fabric. In addition, the face of the rock is so weathered that cleaning of any contaminants cannot take place without a severe loss of material. The surface of the shaft should be impregnated, sealed, and consolidated with chemical agents. The next stage should focus on strengthening the shaft walls with special mining methods.

The surface of the rock in the tombs is porous, therefore the most suitable consolidation agent will be one with good penetration depth that does not form layers that seal the surface. One agent that meets the above requirements is the one-component KSE 510 from Remmers, containing organic solvents based on ethyl esters of silicic acid (KS).[1]

The walls of the burial shafts should be protected against damage by special mining methods. In the case of eroded, weak, cracked, and damp walls, and given the requirement to avoid using visible reinforcements, it would be beneficial to use spiral ground anchors. Anchors of this type increase the internal strength of the rock mass while being almost invisible from the outside. However,

1 http://www.remmers.pl/3823.0.html, accessed 16 February 2015.

anchoring weak or cracked rock involves the risk of the rock loosening between the anchor points. To ensure the effectiveness of this method, a steel mesh must also be used to stabilize the surface with the anchor. The advantage of using spiral ground anchors is that they can be easily dismantled if necessary. This anchoring system works regardless of atmospheric conditions, allows installation in places with limited access, is trenchless, and does not require holes to be drilled for the anchors. An additional advantage is immediate checking of the assumed strength parameters and load of the anchors. The choice of the size of anchors and their arrangement depends on the ground conditions and the loads involved. The mesh used to stabilize the shaft walls should be made of stainless steel to prevent the risk of corrosion. Its colour should be as close as possible to the colour of the rock to minimize its visibility.

1.2.2 Strengthening of Tunnels

The tunnels leading to the burial chambers beneath the tumuli are carved into the same weak rock as the shafts [**Fig. 9.2**]. The largest tunnels are up to 20 m long (T.6) with a problematic cross-section of approximately 4 m wide by approximately 1.5 m high in the case of tunnels with pillars in the middle. This poses a major challenge to ensuring the safety of the tunnels, necessitating the use of unusual structural solutions and preventive measures. In addition, long-term excavation has resulted in the development of multiple cracks in their surroundings. As it is not possible to use fully reliable reinforcement solutions in the form of mining enclosures, there are no plans to allow visitors into any of the tunnels. Maintenance works are designed to secure the existing structures for as long as possible without any visually intrusive interference. Just as in the case of the burial shafts, the preferred solution is the use of surface impregnation with organosilicon consolidants and strengthening of the rock mass with spiral ground anchors together with a steel mesh.

1.2.3 Consolidation of Tumulus Superstructures

The superstructures of the burials are conical-shaped mounds with a slope of up to 30° (58%). Depending on the type of tumulus, it is made up of a mixture of soil and gravel or pure sand with gravel. Some of the type I tumuli are high mounds of up to 8.5 m. Their durability is threatened by erosion and downslope flows triggered by heavy rain.

The shape and structure of the tumuli make them susceptible to slope failure. Loss of existing slope stability creates new forces or leads to a reduction of friction forces (Stryczek, Gonet, and Wiśniowski 2008, 78).

The phenomena that destabilize the tumulus slopes include:

– an increase in soil humidity caused by long-lasting or very intense precipitation, which causes swelling and thus reduction of frictional forces and soil cohesion;
– vibrations caused by, for example, road traffic.

These factors cause the uncompacted material that makes up the tumuli to gradually slide down their slopes.

To protect the mounds and stop these destructive processes, tumuli should be consolidated and their surfaces stabilized. Vibrations produced by road traffic should also be eliminated. Methods for stabilizing slopes include the use of geotextiles, steel mesh, or anti-erosion mats. The chosen method should have a minimal impact on the appearance of the reinforced surface and provide drainage of the slopes.

The use of flexible slope surface stabilization systems in the form of steel wire mesh combined with nailing would give the possibility of merging and masking new reinforcements in the structure of the mounds.

1.2.4 Tumulus Reconstruction

The tombs at El-Zuma need to be strengthened and protected through conservation and restoration. This has prompted the idea of reconstructing several tumulus superstructures, both to protect the tombs and make them accessible to visitors.

According to UNESCO's Operational Guidelines in relation to authenticity, the reconstruction of archaeological remains is justifiable only in exceptional circumstances and acceptable only on the basis of documentation, without conjecture [**Fig. 9.3**].

The following concept of tumulus reconstruction meets several objectives: it faithfully reconstructs the shape of the original earth superstructure, ensures access to the inside of the tomb, and creates a protective cover for the historic fabric. These objectives will be achieved by building a dome over the excavated tumulus grave and then covering it with earth to reconstruct the burial mound. By placing a skylight at the top of the dome, interior lighting will be provided. The use of photovoltaic cells at the top of the mound (hidden in the new structure) or alongside information panels will enable the provision of electricity for the lighting of burial chambers and tunnels [**Fig. 9.4**].

The dome will consist of a lightweight durable frame, which will be fitted with a rigid membrane to ensure adequate ventilation. Covering the dome with earth will make this new feature blend into the landscape and reconstruct the tomb's earthen superstructure [**Fig. 9.5**]. The dome will be placed around the perimeter of the excavated tomb on a foundation of helical screw piles, which will

FIGURE 9.2 A view of the tunnel in tumulus 5 (top), and a view of the tunnel in tumulus 7 with pillars in the middle
PHOTOS BY K. JUCHNIEWICZ

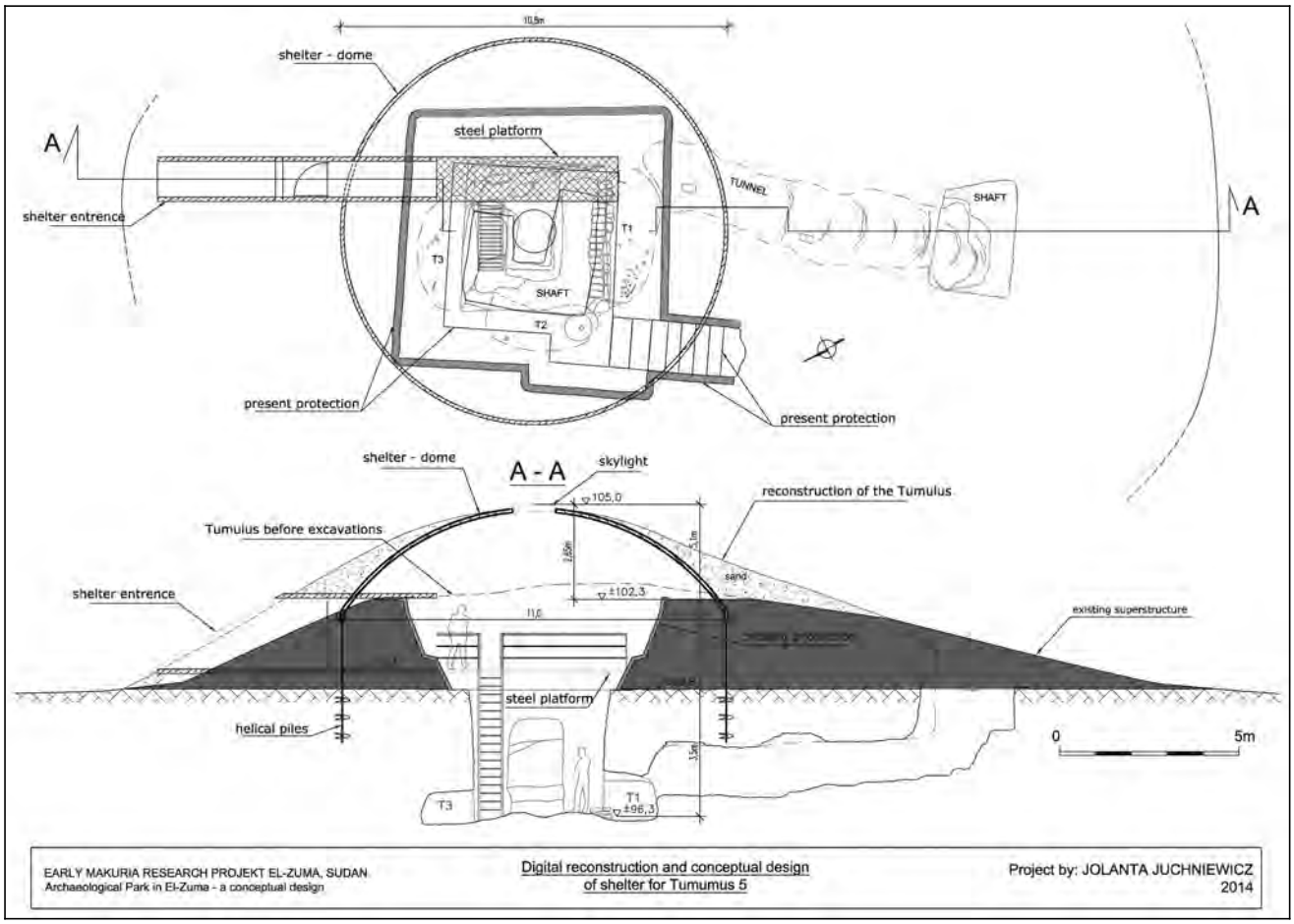


FIGURE 9.3 Proposed design for the reconstruction of the T.5 mound along with its protective structure
PRODUCED BY J. JUCHNIEWICZ

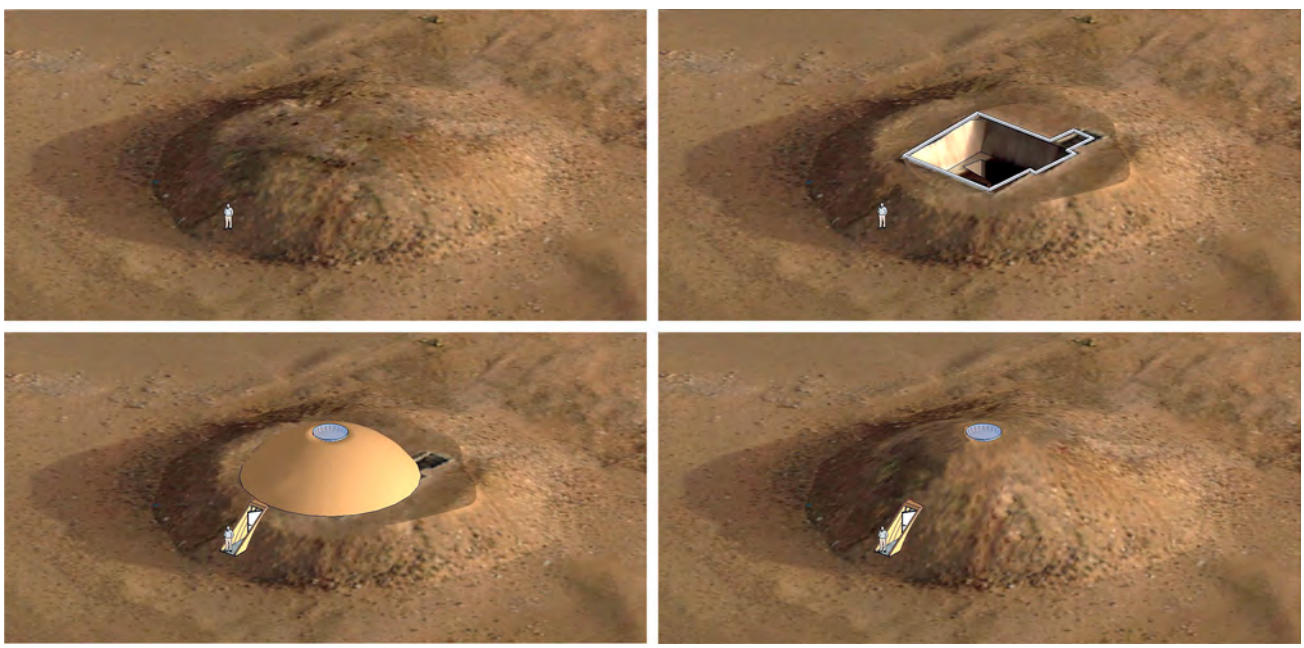


FIGURE 9.4 Computer reconstruction of tumulus 5: upper left—original state; upper right—state after excavation and installation of temporary safety measures; lower left—building the dome; lower right—the final reconstruction of the tumulus
PRODUCED BY J. JUCHNIEWICZ

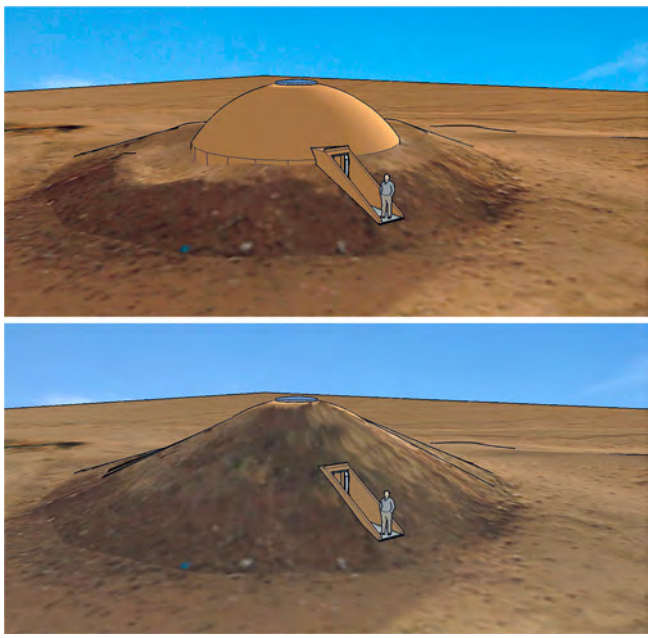


FIGURE 9.5
Tumulus 5: top—construction of the dome; bottom—final reconstruction of the tumulus
PRODUCED BY J. JUCHNIEWICZ

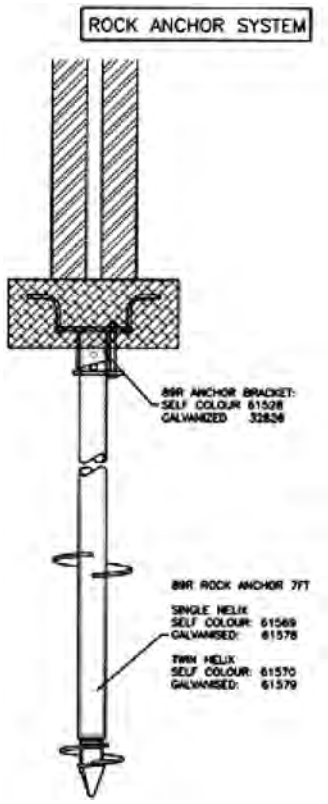


FIGURE 9.6
Drawing of a helical screw pile, ABC Anchors & Autoguide Equipment product information
WWW.ABCANCHORS.CO.UK

minimize interference with the existing burial mound. By using piles, there is no need to excavate and remove earth.

Installation of helical piles avoids spoilage and prevents vibrations, ensuring the safety of existing historic structures. Screwing the piles in makes it possible to reach the prescribed depth, at which there is a suitable primer capable of transferring the predicted loads. An important aspect of this type of foundation is the possibility of later disassembly.

Helical anchor benefits [**Fig. 9.6**]:[2]
– lightweight;
– can be installed by hand;
– one single component;
– cost effective;
– durable;
– re-usable;
– removable;
– instant loading capacity;
– zero plant required;
– can be easily load/proof tested if required;
– limited soil damage;
– suitable for any displaceable ground;
– bespoke designs available.

Modern composite profiles are suitable as structural components. They can be used as a substitute for steel, aluminium, and wood, wherever high-resistance parameters for corrosion, longevity, and durability, as well as low weight, are required. They are characterized by good physico-mechanical parameters, such as a high tensile strength of approximately 230 MPa, a very high compressive strength of approximately 950 MPa, and excellent flexibility (a bending strength of approximately 950 MPa), and hardness (approximately 400 N/mm^2).

Composite profiles are made of various types of resins. Reinforcement (approx. 70%) is achieved by using glass, basalt, carbon fibres, or aramid fibres (Kevlar). Thanks to their unique structure, composite profiles have shape memory, which means that they can temporarily deform under the influence of an acting force, and then return to their original form without losing their parameters. The products can be given any colour at the production stage.

2 https://www.anchorsystems.co.uk/products/helical-anchors/, accessed 7 July 2019.

When using glass or basalt fibre as the main raw material, constituting 70–80% of the composite, the products based on them are considered to be pro-ecological products, subject to easy and full recycling, without adverse impact on the natural environment and humans.

The advantages of composite profiles include:

- low weight (about 2.0 g/cm^3)—four times lighter than steel;
- high mechanical strength;
- any shape on request;
- resistance to low and high temperatures;
- resistance to changing weather and UV radiation;
- resistance to corrosion and chemical agents (no additional maintenance or protection required);
- long working time with minimum maintenance;
- low coefficient of thermal expansion;
- high impact resistance;
- flexibility and elasticity;
- can be dyed in bulk in any colour.

2 Plans for the Archaeological Park in El-Zuma

2.1 *The Main Concept of the Archaeological Park*

The creation of an archaeological park at the El-Zuma site is aimed at protecting the tombs and making them accessible to the public. All works should comply with the recommendations of UNESCO, be minimally invasive, and fully respect the site's historic substance and landscape.

The planned visitor route should be both interesting and informative, helping visitors to understand the site and its monuments while also ensuring a minimum of comfort for sightseeing. Tracks across the site will be designed with both guided tours as well as individual visitors in mind.

A suitable means is required for exhibiting the tomb interiors with their burial chambers and equipment. The protective structure covering each tomb should ensure visitor safety, provide good ventilation, and shield the archaeological remains from weather conditions such as rain and windblown sand. Protection of this sort should be given in the first instance to tombs with small earth mounds (T.2, T.5, T.12, T.25), which are currently open and secured only by a brick perimeter and a temporary mesh that does not protect the interior of the tombs from progressive erosion. These new constructions, which would provide the opportunity for tourists to go down into the burial shafts, would be equipped with convenient descents, barriers, and natural and artificial lighting. The shape of the new structures should be sympathetic to the landscape. A very important aspect is to minimize interference with the tombs' historic fabric. Also, it should be possible to dismantle the modern shelters without causing any damage to the original substance in case the shelters need to be replaced or should better methods of conservation and protection be developed in the future.

Two of the tombs selected for exhibition (T.2 and T.5) would need to have their earthen superstructures rebuilt. Currently, they each have only the flattened remains of a tumulus. Based on archaeological documentation, it would be possible to restore the original shape of the mounds. Research indicates that these tombs, both of which represent type I and have underground tunnels leading to the main burial chamber, were originally covered with a characteristic earthen superstructure.

An important goal of the archaeological park is to raise cultural awareness among the local community and to educate them about their cultural heritage, especially that recognized as having Outstanding Universal Value. The creation of the archaeological park would also generate jobs related to tourism: the production of souvenirs, traditional crafts, the organization of trips within the area of the archaeological park (on camels and in off-road vehicles), etc. Building a cultural centre with a local museum at the archaeological site will serve local inhabitants as well as tourists. The archaeological park will require basic infrastructure, including car-parking areas near the site.

An important element of the archaeological park's protection is its perimeter fence. The real problem is unauthorized urbanization without any consideration for the archaeological site and its environs. Moreover, vehicles travelling between the tumuli cause vibrations that may contribute to the destruction of the site's underground structures.

2.1.1 Site Extent and Features

The proposed archaeological park covers an area of approximately 207,000 m^2 (21 hectares), and its perimeter is almost 2 km long. In keeping with UNESCO recommendations, in 2014 a complete map of the property was drawn up to clearly identify its boundaries. For the purposes of effective protection, a buffer zone was delineated around the site (World Heritage Committee 2017, para. 104). This zone stretches approximately 15 m from the border of the site along almost its entire perimeter. Within this zone any building activity is strictly prohibited. The boundaries of both the site and its buffer zone were topographically specified with the permission (and in the presence) of the local authorities.

The site boundaries are delineated by a semi-open fence system of 1-m-high reinforced concrete posts, spaced

FIGURE 9.7
Construction of the concrete posts
PHOTO BY A. KAMROWSKI

every 1.5 m, which prevent vehicles entering the protected area. Such a system leaves the site open to visitors and accessible to local inhabitants. From a practical point of view, it is more durable and does not need maintenance in contrast to metal fences (plastic bags and other lightweight refuse do not become entangled in it) [**Fig. 9.7**].

In 2014 an old house located close to the eastern border of the site was reconstructed and designated as a headquarters for the tourist police, who safeguard monuments and provide security for tourists. One of the buildings is also a storeroom for artefacts recovered from excavation [**Fig. 9.8**].

2.1.2 Access Road, Entrances and Car Parks

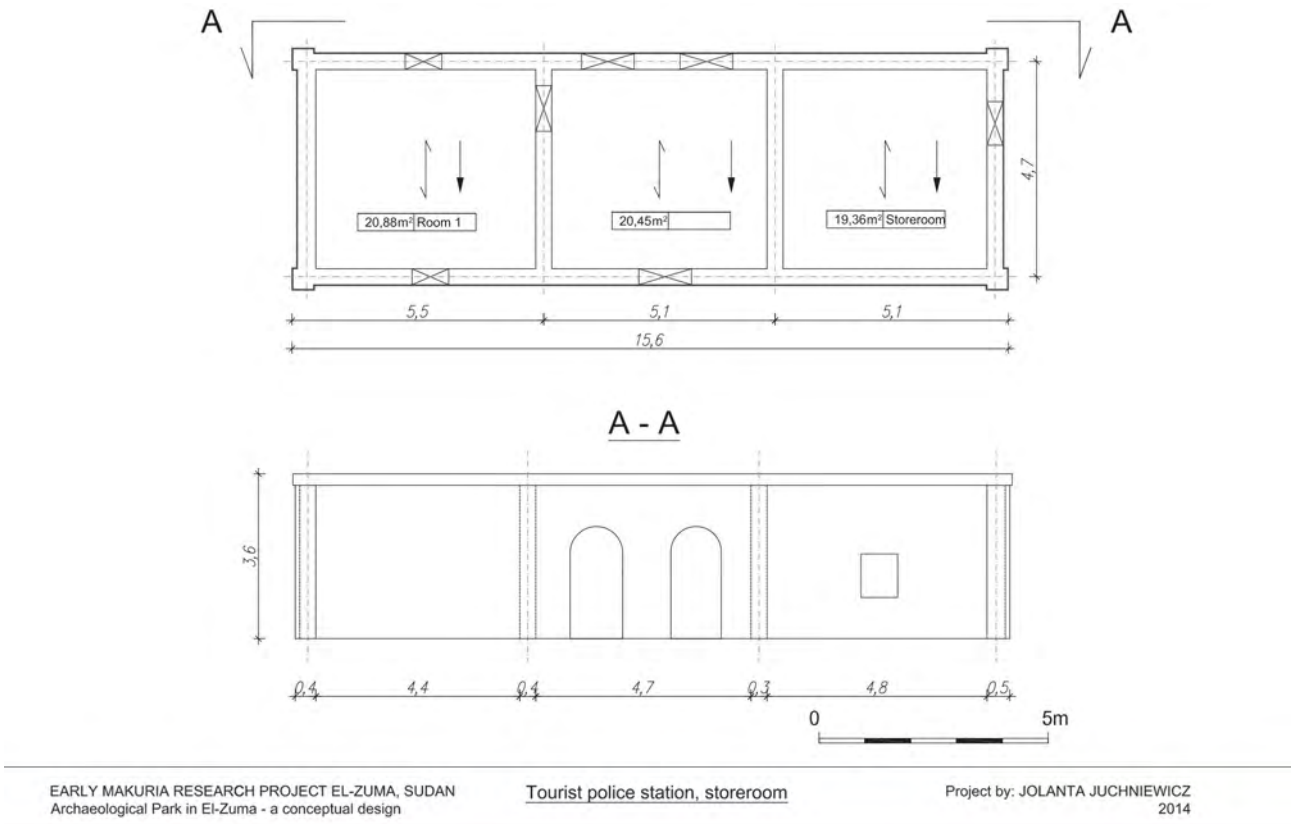
The archaeological site is located 400 m from the main road to Khartoum, and the first burial mounds are clearly visible from it. The site is marked by a billboard [**Fig. 9.9**]. One of the two main entrances to the archaeological park, together with a large car park, is to be located as close as possible to the main road. Tourist-car traffic should arrive directly from the main road without entering the village.

The access road to the large car and coach park of the archaeological park would branch off from one of the two main dirt roads leading to the village of El-Zuma, marked by a dotted line on the map shown in **Fig. 9.10**.

This large car and coach park (number 1) is planned outside the area of the archaeological park. Due to the hard ground surface, the car park will not be paved. Its area will be demarcated by small concrete pillars.

Main entrance number 1, from the north-west side, will be equipped with a guard building and an information centre with a ticket office. There will also be a large information panel about the archaeological site and the history of El-Zuma's burial mounds. The archaeological park itself will be open to tourists; however, visiting the tomb interiors will only be possible with a guide.

Entrance number 2 is planned at the south-eastern end of the site, next to a museum and administration complex. Due to the very close proximity of other buildings and the lack of manoeuvring space, no coach entry is planned there. A small car park (number 2) will be located within the bounds of the archaeological park.



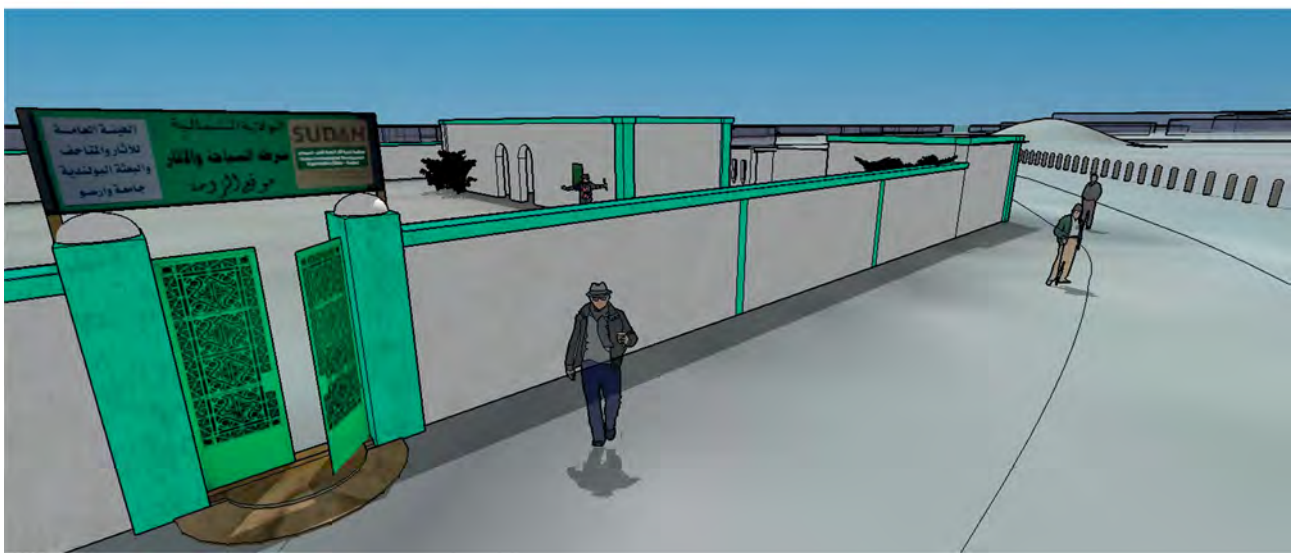


FIGURE 9.8 Plan of tourist police station (storeroom) and visualization of the tourist police station at the archaeological park
PRODUCED BY J. JUCHNIEWICZ

FIGURE 9.9
Billboard near the main road
PHOTO BY K. JUCHNIEWICZ

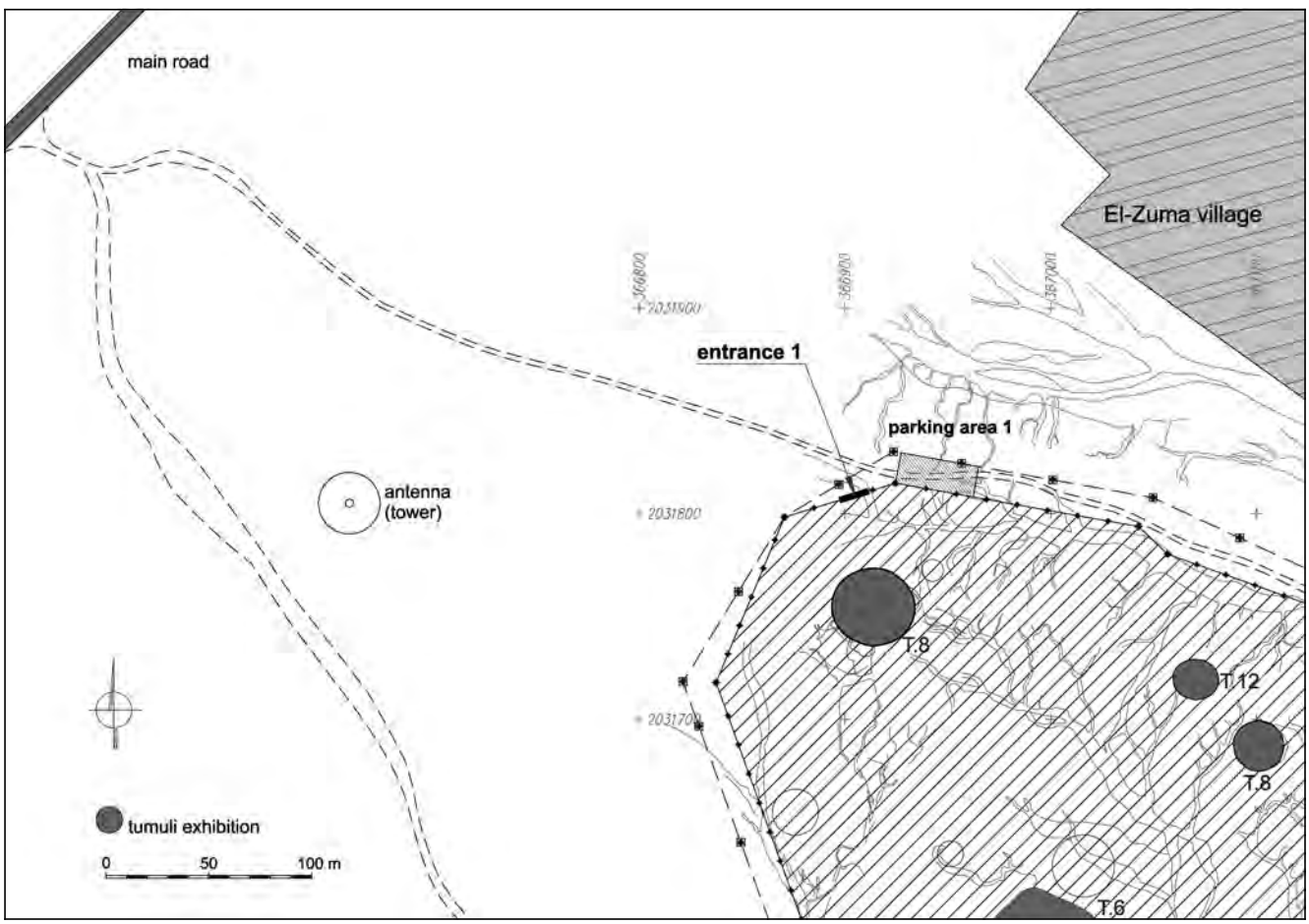


FIGURE 9.10 Map of the archaeological park, northern part
PRODUCED BY J. JUCHNIEWICZ

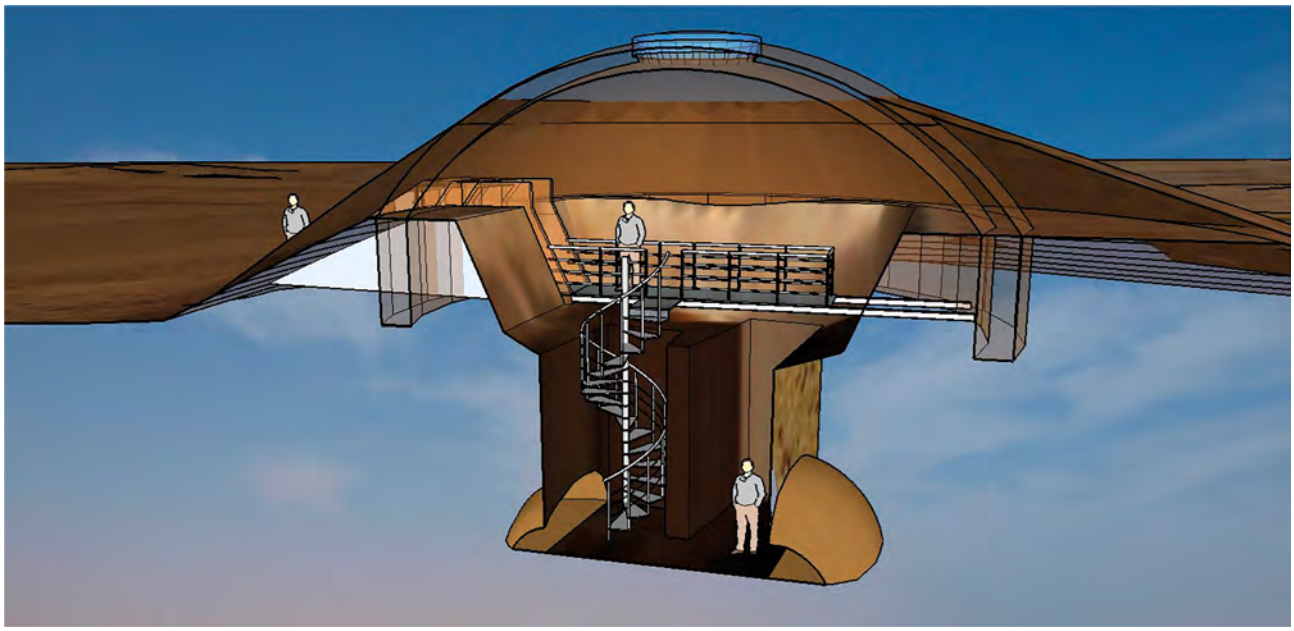


FIGURE 9.11 Cross-section through the structure of the dome and tumulus 5
PRODUCED BY J. JUCHNIEWICZ

2.1.3 Direction of Visitor Movement

The principal influx of visitors is planned from the north-east, where the main entrance will be located. Only pedestrian traffic will be allowed within the archaeological park. The burial mounds open to visitors are located across the whole area of the archaeological site.

2.1.4 Information Panels and 3D Visualizations

Information panels are to be located at the entrances to the archaeological park and alongside each of the tumuli open to visitors. Panels at the entrance will provide information about the history of El-Zuma's burial mounds and the research that has been carried out into them, as well as about the archaeological park's media patrons and investors. Information about the site's inscription on the UNESCO World Heritage List will also be posted.

All of the tombs accessible to visitors, and several other selected tumuli, will have panels with descriptions, drawings, cross-sections, and plans of the burial shafts and their visualizations.

All information on the panels will be provided in two languages: English and Arabic.

2.1.5 Visiting the Burial Chambers

The burial chambers in some of the tumuli at the archaeological park will be made accessible to visitors. Because these graves are below ground level, appropriate stair constructions leading to the bottom of the shafts will be needed, as well as some form of closed cover to protect the tombs from weather conditions and damage.

In order to provide visitors with appropriate information based on archaeological research, the burial chambers are to be reconstructed with their human skeletons and furnishings, as found by archaeologists. The grave equipment accompanying the deceased will be put on display, and will include items such as the funeral bed, pottery, baskets, weapons, and everyday objects deposited as votive offerings. These burial goods would be faithful copies of the original artefacts, which will be held in the on-site museum.

In order to create the appropriate visual effect, the burial chamber and the shaft leading to it should be properly lit. Due to the nature of their construction, illumination is of great importance for the presentation of tunnels in type I tombs (large burial mounds). For safety reasons, visitors will only be able to view the tunnels from shaft level [**Fig. 9.11**].

2.1.6 Museum Exhibition and Conference and Administration Complex

It is planned to build a conference and administration compound as well as a museum in the south-eastern part of the archaeological park. The museum will host a traditional exhibition with multimedia elements.

2.2 *Al Takamul Al Handasi Engineering Consultants Project*

The concept described above is based on the general guidelines delivered by UNESCO and ICOMOS. As an alternative, the project of Dr. Abdalla M. Sabbar from Al Takamul Al Handasi Engineering Consultants is presented below [**Figs. 9.12–9.14**].

FIGURE 9.12 Computer visualization of the Al Takamul Al Handasi Engineering Consultants' design for the archaeological park
ABDALLA M. SABBAR FROM AL TAKAMUL AL HANDASI ENGINEERING CONSULTANTS

FIGURE 9.13 Plans of the Al Takamul Al Handasi Engineering Consultants' design for the archaeological park
ABDALLA M. SABBAR FROM AL TAKAMUL AL HANDASI ENGINEERING CONSULTANTS

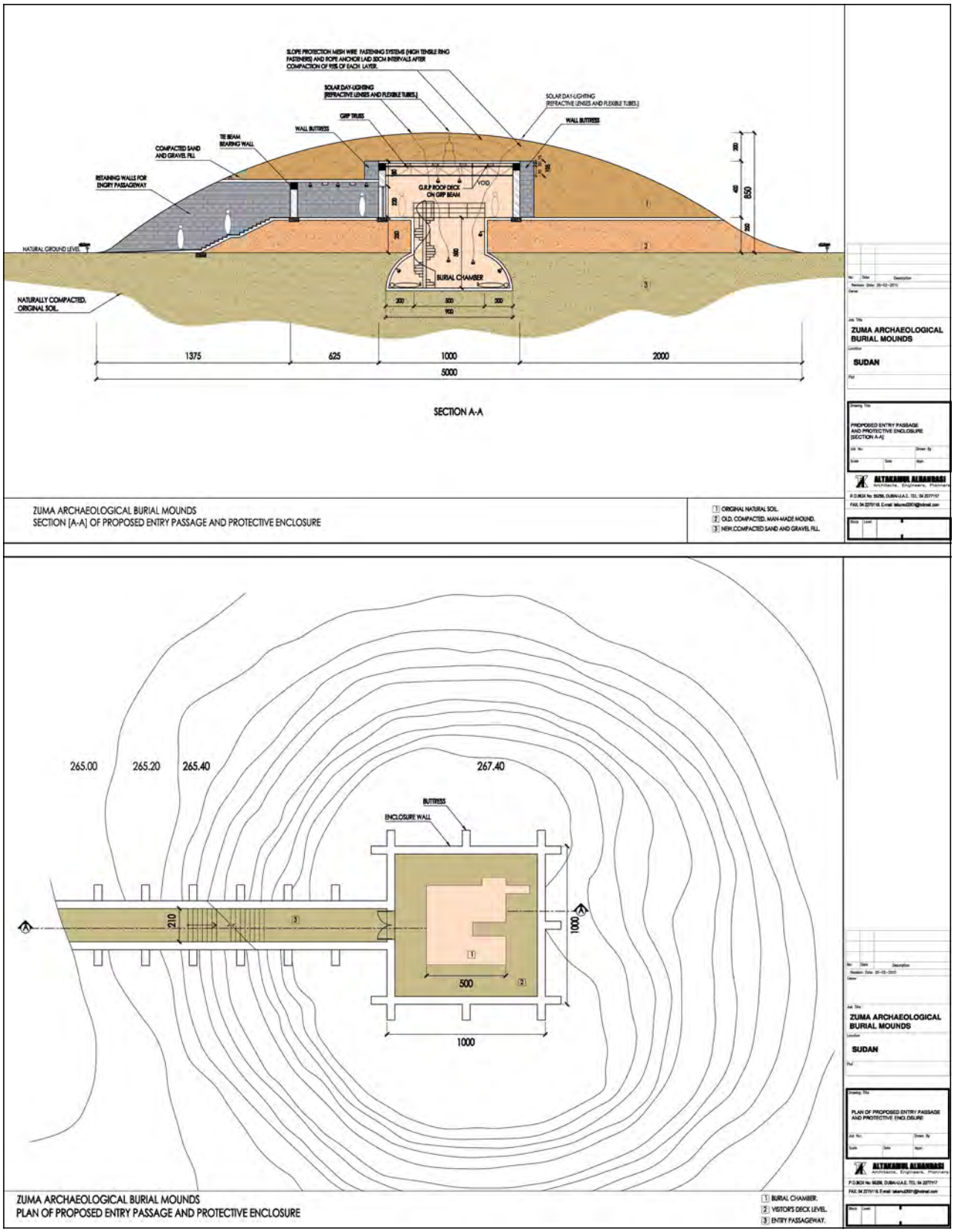


FIGURE 9.14 Hypothetical reconstruction of the tumulus
ABDALLA M. SABBAR FROM AL TAKAMUL AL HANDASI ENGINEERING CONSULTANTS

CHAPTER 10

Archaeological Park and Cultural Centre at the El-Zuma Cemetery: A Future Concept

Mahmoud El-Tayeb

At the beginning of the first season of excavation, in December 2004, some leading figures of the local community expressed their gratitude for our work and their happiness that, at last, the cemetery area will be free of obstacles. Obviously, this meant that they needed the land for housing projects. Nonetheless, the results of the excavation of the first tumulus, T.2, with its rare type of U-shaped ground plan and an underground tunnel, seemed to encourage the same gentlemen to ask if this burial could be left open for visitors. Since the cemetery field is situated in the middle of the village and it is the favourite place for local children to come and play, the natural answer was a definite 'no.' However, an alternative solution was reached, which resulted in the substructure of the burial being covered with a metal grid fitted with a door allowing easy access to the bottom of the grave. As a matter of fact, the idea of the Archaeological Park was born in consequence of the active engagement of the whole local community in El-Zuma.

Generally speaking, the idea is quite simple. The unique types of burials at this site should be reconstructed and exhibited as an open-air museum or an archaeological park. The disturbed superstructures of T.2 and T.5 should be restored to their original shape. Both of these type I tombs have tunnels and were fully excavated during the first two seasons. They were subsequently covered with metal grilles, installed in cooperation with the local community, as a temporary protection measure. Two tombs of type II, with flattened tops, T.25 and T.12, were also protected in the same manner as the type I burials. The proposed tomb reconstructions must not disrupt the panorama of the whole cemetery field, thus fulfilling the conditions set out by the National Corporation for Antiquities and Museums as well as the UNESCO guidelines.

In all the aforementioned graves, copies of the finds that were excavated from them would be displayed inside the burial chambers, in their original locations, to give the visitor an idea of the burial customs of the period. The next plans concern the tunnels in T.2, T.5, T.6, and T.7. The last tumuli, T.6 and T.7, are the largest and the highest in the field; yet only their external shafts and tunnels were excavated. In both cases, the tunnels are of unique, monumental construction, and hence deserve to be open to visitors, tourists, scholars, and students of archaeology alike. The tunnels still require conservation and consolidation work, and for safety reasons access would be allowed only to their external shafts.

The last aim of the project is to create a Cultural Centre consisting of a small gallery with audio-visual displays, a meeting hall, an open theatre, offices, and guest rooms, in addition to a tourist police station, and a public family park (garden) with refreshment facilities. The centre would also have a visitor car park.

The ultimate goal is not just to share the results of the El-Zuma excavations and raise awareness among the Sudanese about an important chapter of their history. It is hoped that the Cultural Centre will also help to revive the local rural community, both socially, by providing a platform for integration between the different ethnic groups that live in the area (mainly the Shayggyia, Hawawir, and Hassanyia), and economically, by creating jobs in various service and commercial sectors. This would be especially beneficial for young people, as it would help them to improve their standard of living, and consequently encourage them to stay in their hometown instead of migrating towards the big cities to work as cheap labour (even if they are university graduates). The revival of traditional local crafts could also be of significance for the older generation. Other activities that could be organized at El-Zuma include short trips on camels and donkeys (which the mission has already successfully trialled), camel-racing festivals run by groups from the Hawawir and Hassanyia, and artistic performances given by the Shayggyia singers.

This proposal was included in PCMA's first application to the Qatar-Sudan Archaeological Project in 2009, but there was no chance to implement it without preparing an engineering design and a separate budget for it. Bashmuhandis Abdallah Sabbar subsequently created designs for the reconstruction of the aforementioned tombs and for the construction of the Cultural Centre. A second method for reconstructing the tombs was designed by Engineer Jolanta Juchniewicz (see Chapter 5, this volume).

Finally, it is fair to say that the realization of such a comprehensive project would play an important role in promoting tourism in this central zone of the Dongola Reach, with its rich monumental complexes at Jebel Barkal, Nuri, and El-Kurru, as well as downstream at other unique sites, such as Selib, Banganarti, Old Dongola, and Kerma.

PART 4

The El-Zuma Necropolis—Final Remarks

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CHAPTER 11

The Necropolis of an Early Makurian Elite

Mahmoud El-Tayeb and Ewa Czyżewska-Zalewska

To contextualise the necropolis at El-Zuma in the history of Ancient Nubia and demonstrate its elite status within local social structures, we need to look at it from various perspectives: from the purely architectural aspect of the grave constructions, as well as from cultural and religious angles. We also need to take into account the specific period to which this cemetery is attributed, between the fall of the Royal Authority of the Meroitic kingdom and the rise of Makuria as an independent political entity, when changes in political systems were often not synonymous with the usually slower and more gradual changes that took place in everyday culture and religious practices. No doubt, regionalism and ethnic societal composition are amongst the significant factors that had an effect (positive or negative) on the changes that took place during the later phase of the Meroitic kingdom. These aspects of change and evolution, scrupulously observed and analysed during the excavations, enabled us to situate El-Zuma cemetery in Nubian history, and to determine the status of the burial occupants in the local society. Hence, as mentioned in the introduction, these three volumes aim to showcase the results obtained from studying the archaeological evidence. First of all, what we have learned about burial construction and its development; then, mortuary practice and grave furnishings. This is followed by studies of pottery vessels, personal adornment, and armaments as essential cultural items of each historical period.

Evolution and gradual changes are evident in the construction of the tombs at El-Zuma: from the simple structures of type III tombs, which are deeply rooted in classic Meroitic traditions, followed by the emergence of a new type of grave with a rectangular shaft and lateral niche, ending with a U-shaped shaft with double, or multi, side chambers.

Prior to the Fourth Nile Cataract salvage campaign, which was conducted in the years 1996–2010, archaeologists had paid little attention to the study of Meroitic funerary customs and their development in the Dongola Reach. The results of excavations in various districts within the Reach revealed that the earliest known type of Meroitic burials had followed the Pharaonic tradition, which had been adopted by the Kushites of the Twenty-fifth Dynasty during the Napatan period (850–590 BC). Francis Griffith noted that the simple common burial consisted of a pit aligned north–south, in which the body was laid in a supine position, hands on the pelvis area, with the head due north (Griffith 1923). Later developments show some signs of a revival of indigenous mortuary traditions in different forms. The best known of these forms are burials with a long or short descendary, terminating in a niche cut into its west side. This type of sloping ramp was known in the Dongola Reach as early as the Napatan period, where it was first constructed beneath the Royal pyramids at El-Kurru (Dunham 1950). Thereafter, a more modest version was adopted in the graves of commoners during the Napatan and Classic Meroitic periods (Lenoble 1987; Welsby 2018). Burials featuring lateral niches appeared during the Classic Meroitic period (1st century BC–2nd century AD) and continued to be constructed until the last phase of Meroitic culture (AD 450–600). The beehive type of burial that originated in the Gezira region south of Khartoum is also noted in the Dongola Reach. The rectangular shaft, oriented east–west, provided at the bottom with a side chamber hewn into the southern wall of the shaft, was dominant in the Reach during the first phase of the Terminal Meroitic period (AD 350–450). A revival of indigenous traditions can be seen not only in tomb construction but also in the way that bodies were buried. The deceased was usually laid in a contracted position, often in east–west or north–south alignment. A later development in this type of grave, that to date has only been noted in the Dongola Reach, is the U-shaped shaft characterised by a pier projecting from the east wall of the shaft. In some cases these graves were provided with an underground tunnel aligned south–north, terminating at the main burial chamber. In this last phase (AD 450–600), the main burial chamber was always cut into the southern wall of the shaft, while the body was placed at the east end of the main burial chamber, in a contracted position, head to the east, facing north (for more information, see Edwards 1991; Mahmoud El-Tayeb 2002; 2012, 9, 41–84; Kołosowska and Mahmoud El-Tayeb 2007, 11–25).

Among the 29 burials excavated at El-Zuma, only eight have underground tunnels, attesting to the dead individual's high standing in local society. Furthermore, the variety in tunnel construction, from simple tunnels (T.2, T.3, T.5, T.8) to more sophisticated ones that are wider and supported by solid pillars hewn from the same bed-

 | DOI:10.1163/9789004433755_012

rock (T.1, T.4, T.6, T.7), is not only a sign of the elevated rank of those buried in these graves, but evidently of their elite status too, though we cannot say that they were "royalty" without further evidence to confirm this supposition (Mahmoud El-Tayeb 2012, 9, 41–84).

Looking at the grave goods buried with the deceased, it is difficult to ignore the aspect of religion and a certain symbolism. The deposition of food offerings, bearing traces of consumption, was a well-known tradition among ancient Nubian societies from the Mesolithic period until the conversion to Christianity. It is a tradition that attests to the awareness of the Nubians and their deep and long-lasting belief in eternity and the afterlife. The presence of cooking pots and large bowls normally used in food preparation may also have served as a sort of symbolic affirmation of everyday earthly life (see Chapter 8, this volume and Volume II, Chapter 4).

In the case of mortuary rites, one question that remains unresolved is whether or not the pottery found outside burial chambers (e.g., in shafts) was associated with funerary rites, interpreted by Lenoble as a "funerary banquet." This practice was noted in earlier periods (Lenoble 1994). Examples of processing marks noted by Urszula Iwaszczuk on animal bones found in El-Zuma grave shafts alongside pottery, may point to this (see Chapter 8, this volume); however, the fact that these graves were looted means that this theory cannot be confirmed conclusively, as the pottery may also have been displaced during the ransacking of the burial chambers.

Social stratification is also apparent at the El-Zuma necropolis. The differentiation of the graves into three types, which probably reflect the grave occupant's status in the local social hierarchy, is manifest not only in the structure of the tombs but also in the grave goods and furnishings. Although all three types of graves had suffered various degrees of looting, nevertheless, a range of personal adornments, including jewellery that is attributed to the elite class, such as that noted at Ballana and Qustul, was found primarily in type I graves, whereas examples of jewellery recovered from graves of types II and III were far less opulent (see Volume III, Chapters 2–5). This distinction is also noticeable in the food offerings. Better and more varied types of meat were found in type I graves, while the other two grave types contained fewer varieties and smaller quantities of meat (see Volume II, Chapter 8). This cannot be taken as definite evidence of social differentiation due to the heavily plundered state of the burials; however, pottery, which was usually the main component of the grave goods, offers some further clues. More significant numbers and greater varieties of vessels were found in type I tumuli, which also featured imported pottery. Although type II tumuli sometimes contained significant quantities of ceramics, the types of vessels were far less diverse, and imports were noted only sporadically. The sets of pottery found in type III tumuli were very modest, comprising several vessels of two or three types. The geographical location of the Dongola Reach, as a middle zone between Lower Nubia and the Shendi Reach [see **Fig. 11.1**], explains the presence of handmade vessels, such as the large beer jars imported from the south, while more sophisticated, small, wheel-made vessels were mainly local products or northern imports from Lower Nubia (see also Volume II, Chapter 6, Figs. 6.2, 6.4, 6.10). Based on the grave architecture and burial goods, we can conclude that the largest tombs were the most elite, whilst the smallest ones were the graves of individuals ranked lower in the social hierarchy.

It is worth drawing attention to the weaponry found in some of these graves. Łukasz Zieliński's analysis shows that arrowheads predominate in this assemblage, but it also includes javelins, knives, and archer's thumb rings, which were found mostly in graves of types II and III, accompanying males aged 30–45 years. We can assume that they were probably meant to denote the social status of these individuals, who may have been warriors or hunters, or even dignitaries who ran elite workshops producing pottery, iron weapons, adornments, bronze work, and a variety of tools. Most of the weapons show traces of use, whilst most of the thumb rings were clearly not used (see Volume III, Chapter 14). Based on grave architecture, we can conclude that hunters/warriors and other dignitaries occupied a lower position in the social hierarchy, as most of them were buried in tumuli of types II and III.

The most important question to address is the chronology of this site. Where does El-Zuma fit within the history of Ancient Nubia, and where is its position on the timescale of other important sites of this period such as Ballana, Qustul, El Hobagi, and Tanqasi?

Analysis of personal adornments by Joanna Then-Obłuska and weaponry by Łukasz Zieliński places El-Zuma at the end of the Meroitic period, as both sets of finds show that Meroitic culture endured at this site till the conversion to Christianity in the mid-6th century AD. Ewa Czyżewska-Zalewska's analysis of the pottery also shows that Meroitic traditions continued and gradually evolved over time, with new vessel forms (e.g., Dongolan amphorae) associated with the Christian Kingdom of Makuria and its capital at Dongola later appearing in some graves. The repertoire of vessel forms deposited in the graves at El-Zuma is fairly consistent (see Volume II, Chapter 6). Based on the pottery evidence, we can attribute El-Zuma to the Transitional Early Ma-

kuria period. Signs of this transition (from the Terminal Meroitic [AD 550] to the Christian period [AD 600]) were first noted in tumulus T. 4 at Hammur-Abbassyia and T.5 at El-Kassinger Bahry (site HP45), and as far north as Sessebi in the Third Nile Cataract region (Mahmoud El-Tayeb 2003; Kołosowska and Mahmoud El-Tayeb 2007, 20–22; Edwards 1994).

Iwona Kozieradzka-Ogunmakin successfully obtained dates from human teeth recovered from three type III tumuli: T.18—AD 83–311; T.21—AD 387–538; and T.24—AD 264–535 (see Chapter 7, this volume). For various reasons, the mission was not able to carry out C14 dating on the available material from the cemetery.

Tumulus 26 (type II) was probably one of the later graves, given that a Dongolan amphora and a bowl with horizontal handles dated to the 7th century were discovered in the burial chamber. This tumulus was probably built when amphora production was already up and running at Dongola (see Volume II, Chapter 6).

Yet, from the dates cited above, only T. 21 (AD 387–538) and T.26 appear to fit precisely with the dating established from the study of funerary practice and material culture.

Further dating of the cemetery puts El-Zuma in line with other tumulus fields excavated in this middle zone of the Nile Valley, between the Third Nile Cataract and the junction of the two Niles at Khartoum. The nearest parallel to El-Zuma in terms of date is cemetery site HP 45 at El-Kassinger Bahry (see Introduction to this volume).

Given the years of study that have been devoted to various sites in Upper Nubia, remarkably little is known about the political transformation that occurred in the Meroitic centre of power, leading to the disintegration and demise of the kingdom and the subsequent rise of new political entities. Historically, we know that by the mid-4th century AD royal pyramids were no longer used as tombs. Thereafter, several necropolises appeared, characterised by large tumuli, often constructed of earth and gravel or just stones. The spread of these mound burials between Lower Nubia and the Central Nile Valley clearly points to the fact that they were symbols of sovereignty of new local centres of power [**Fig. 11.1**]. To date, only a few sites of this type have been fully excavated and analysed. The best known are the royal cemeteries at Ballana and Qustul in Lower Nubia, while sites in Upper Nubia, including El-Ghaddar cemeteries South and North, Hammur-Abbassiya and Tanqasi, still await comprehensive excavation and study. Further upstream are the recently excavated tumuli at Hagar El-Beida in the Abu-Hamed Reach (Chłodnicki and Stępnik 2013). So far El-Hobagi is the best-known site in the Shendi Reach. A close look at the results obtained from the work carried out at these sites clearly highlights some crucial facts. First, they appear to represent a similar chronological horizon, between the 4th and 6th centuries AD. They also clearly exhibit signs of an uninterrupted, continuous evolution of Meroitic culture. This continuity in turn provides strong evidence against the erroneous conventional theories on the fall of Meroe having been brought about by foreign invaders. Therefore, as demonstrated by the material remains outlined above, there can be no doubt that the tumuli at El-Zuma are symbols of sovereignty containing burials of local chiefs of the region. However, the exact status of these chiefs cannot be determined until we can devise an appropriate method for excavating the most promising, main burial chambers of T.6 and T.7. As mentioned before, the exploration of these two tumuli was postponed for safety reasons.

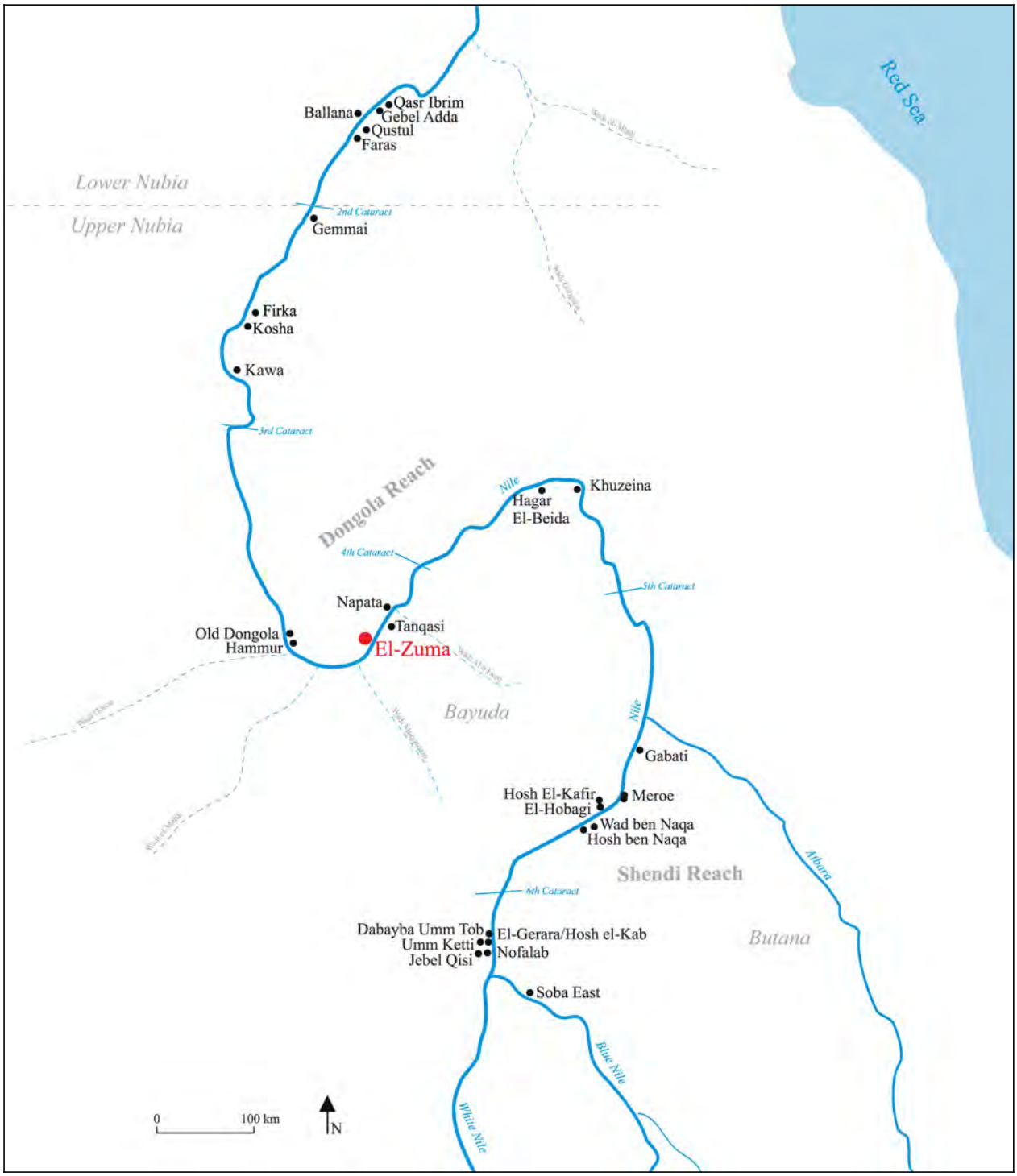

FIGURE 11.1 Map showing sites with post-Meroitic period tumuli
DRAWN BY E. CZYŻEWSKA-ZALEWSKA

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Early Makuria Research Project
El-Zuma Cemetery

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Cover illustration: Pottery assemblage in chamber 2 of tumulus 26, photo A. Kamrowski

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Foreword

The elite tumuli cemetery at the village of El-Zuma in the Dongola Reach, the cradle of ancient Nubian civilization, is at the centre of this three-volume study. The site, which is inscribed on UNESCO's World Heritage List, has been excavated since 2004 by the Polish Centre of Mediterranean Archaeology University of Warsaw in collaboration with the National Corporation of Antiquities and Museums of Sudan.

The investigation of the burials representing different classes of the Nubian elite has brought into the limelight a long understudied period in ancient Nubian history, that is, the centuries preceding the rise of the Christian kingdom of Makuria. Hence the moniker "Early Makuria", which refers to a broader programme of research, as well as to the political and social entity that the elites buried in El-Zuma were part of.

The three-volume monograph ***Early Makuria Research Project. El-Zuma Cemetery*** is a comprehensive presentation of the results of the excavation project. Volume I discusses the excavation of the tombs (Mahmoud El-Tayeb, Ewa Czyżewska-Zalewska and Ewa Skowrońska with a methodological section by Szymon Lenarczyk, Zofia Kowarska and Magdalena Antos) and the bioarchaeological research that was carried out on the skeletal remains, both human and faunal, giving insight into funerary traditions set in a broader historical and economical background of the site and region (Robert Mahler, Iwona Kozieradzka-Ogunmakin, Abagail Breidenstein, Urszula Iwaszczuk). It also draws plans for an archaeological park to be established at the site (Jolanta Juchniewicz, Mahmoud El-Tayeb).

Volumes II and III have been dedicated to studies of the artifacts found in burial contexts. In Volume II, Ewa Czyżewska-Zalewska discusses details of the pottery typology, classification, manufacturing techniques, fabric and ware descriptions with a separate section on oil lamps (contributed by Aneta Cedro). Small finds are the theme of Volume III, opening with a study by Joanna Then-Obłuska of personal adornments and ornaments, such as beads, jewellery and toilet containers. The second part of the volume is a presentation, by Łukasz Zieliński and Ewa Czyżewska-Zalewska, of the metal artifacts as a category, focused on weaponry and personal accessories, as well as miscellaneous burial equipment.

Mahmoud El-Tayeb
Ewa Czyżewska-Zalewska

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List of Drawings of Pottery Presented in Chapter 7

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T.1, general plan and cross-sections	draw. Z. Kowarska, M. Antos, digit. M. Antos, E. Czyżewska-Zalewska
Z1/1	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z1/3	draw. & digit. J. Górecka
Z1/10+Z1/11	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z1/17	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z1/18	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z1/19	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z1/20	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z1/21+Z1/22	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z1/23	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Tumulus 2	
T.2, general plan and cross-sections	draw. U. Wicenciak, A. Obłuski, digit. M. Puszkarski
Z2/1	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/2	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/3	draw. & digit. U. Wicenciak
Z2/4	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/5	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/6	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/7	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/8	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/9	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/10	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/11	draw. & digit. U. Wicenciak
Z2/12	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/13	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/14	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/15	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/16	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/17	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/18	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/19	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/20	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/21	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/22	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/23	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/24	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/25	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/26	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/27	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/28	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/29	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/30	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/31	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska

(*cont.*)

Inventory number	
Z2/32	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/33	draw. & digit. U. Wicenciak
Z2/34	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/35	draw. & digit. U. Wicenciak
Z2/36	draw. & digit. U. Wicenciak
Z2/37	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/38	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/39	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z2/40	draw. & digit. U. Wicenciak
Tumulus 3	
T.3, general plan and cross-sections	draw. & digit. J. Juchniewicz
Z3/5.1	draw. & digit. U. Wicenciak
Z3/6.1+Z3/7.1	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z3/6.2	draw. & digit. U. Wicenciak
Z3/6.3	draw. & digit. U. Wicenciak
Z3/7.2	draw. & digit. J. Górecka
Tumulus 4	
T.4, general plan and cross-sections	draw. M. Antos, digit. M. Antos, E. Czyżewska-Zalewska
Z4/1.2	draw. & digit. U. Wicenciak
Z4/1.3+Z4/4	draw. & digit. U. Wicenciak
Z4/1.4	draw. & digit. E. Czyżewska-Zalewska
Z4/1.5	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/2+Z4/10.11	draw. J. Górecka, A. Głąb, digit E. Czyżewska-Zalewska, J. Górecka
Z4/10.1	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/10.10	draw. & digit. U. Wicenciak
Z4/10.2	draw. & digit. U. Wicenciak
Z4/10.3	draw. & digit. J. Górecka
Z4/10.4	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/10.5+Z4/14.2	draw. & digit. U. Wicenciak
Z4/10.7	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/10.8	draw. & digit. U. Wicenciak
Z4/10.9	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/14.1+Z4/10.6	draw. & digit. U. Wicenciak
Z4/14.1+Z4/63	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/14.3a	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/14.3b	draw. & digit. J. Górecka
Z4/14.3d	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/14.4	draw. & digit. J. Górecka
Z4/14.5	draw. & digit. U. Wicenciak
Z4/14.6	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/31	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/35	draw. & digit. J. Górecka
Z4/58	draw. & digit. J. Górecka
Z4/59	draw. & digit. J. Górecka
Z4/60	draw. & digit. J. Górecka

(*cont.*)

Inventory number	
Z4/61	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/65	draw. & digit. J. Górecka
Z4/66	draw. & digit. J. Górecka
Z4/77	draw. & digit. J. Górecka
Z4/78	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/79	draw. & digit. J. Górecka
Z4/80	draw. & digit. J. Górecka
Z4/132	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/133	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/134+Z4/34 fgm	draw. & digit. J. Górecka
Z4/135	draw. & digit. J. Górecka
Z4/196	draw. & digit. J. Górecka
Z4/197	draw. & digit. J. Górecka
Z4/198	draw. & digit. J. Górecka
Z4/199	draw. & digit. J. Górecka
Z4/200	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/201	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/202	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/219	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/220	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/224	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/225	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/226	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/227	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/235	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/238	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/239	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/240	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/241	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/244	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/246	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/249	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/253	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z4/254	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Tumulus 5	
T.5, general plan and cross-sections	draw. A. Błaszczyk, K. Ochnio, E. Klimaszewska-Drabot, K. Kotlewski, M. Wybieralska, digit. M. Puszkarski
Z5/1	draw. & digit. E. Klimaszewska-Drabot
Z5/2	draw. & digit. E. Klimaszewska-Drabot
Z5/3	draw. & digit. E. Klimaszewska-Drabot
Z5/4	draw. & digit. E. Klimaszewska-Drabot
Z5/5	draw. & digit. E. Klimaszewska-Drabot
Z5/6	draw. & digit. E. Klimaszewska-Drabot
Z5/14	draw. & digit. E. Klimaszewska-Drabot
Z5/17	draw. & digit. E. Czyżewska-Zalewska
Z5/18	draw. & digit. E. Klimaszewska-Drabot

(*cont.*)

Inventory number	
Z5/19	draw. & digit. E. Klimaszewska-Drabot
Z5/20	draw. & digit. A. Błaszczyk
Z5/21	draw. & digit. J. Górecka
Z5/22	draw. & digit. E. Czyżewska-Zalewska
Z5/35	draw. & digit. J. Górecka
Z5/36	draw. & digit. J. Górecka
Z5/38.1	draw. & digit. J. Górecka
Tumulus 6	
T.6, general plan and cross-sections	draw. E. Czyżewska-Zalewska, E. Skowrońska, Z. Kowarska, digit. E. Czyżewska-Zalewska
Z6/2.1+Z6/3.5+Z6/55	draw. & digit. J. Górecka
Z6/3.3+28.1+35.4+39+56+58.2	draw. & digit. U. Wicenciak
Z6/3.4	draw. & digit. J. Górecka
Z6/7	draw. & digit. U. Wicenciak
Z6/11.3+Z6/18.2	draw. & digit. U. Wicenciak
Z6/11+Z6/11.1	draw. & digit. J. Górecka
Z6/11+Z6/11.2+Z6/38.3	draw. & digit. J. Górecka
Z6/12.1	draw. & digit. U. Wicenciak
Z6/12.2	draw. & digit. U. Wicenciak
Z6/13	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z6/15+Z6/18	draw. & digit. U. Wicenciak
Z6/16+Z6/20.1	draw. & digit. U. Wicenciak
Z6/16+Z6/20.2	draw. & digit. J. Górecka
Z6/18.3+Z6/20+Z6/24+Z6/25	draw. & digit. J. Górecka
Z6/19.1+Z6/19.2+Z6/38.1	draw. & digit. U. Wicenciak
Z6/19+19.4+24+25+25.1	draw. & digit. J. Górecka
Z6/19+Z6/19.3+Z6/24.1	draw. & digit. J. Górecka
Z6/21	draw. & digit. U. Wicenciak
Z6/22.1	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z6/25.2	draw. & digit. U. Wicenciak
Z6/25.3	draw. & digit. U. Wicenciak
Z6/26.1	draw. & digit. U. Wicenciak
Z6/26.2	draw. & digit. J. Górecka
Z6/27.1	draw. & digit. U. Wicenciak
Z6/27.2	draw. & digit. U. Wicenciak
Z6/30.1	draw. & digit. J. Górecka
Z6/32	draw. & digit. U. Wicenciak
Z6/33.3+35+35.3+36.1+41+48	draw. & digit. J. Górecka
Z6/35.2+Z6/58.1	draw. & digit. J. Górecka
Z6/52.1	draw. & digit. U. Wicenciak
Z6/53.2	draw. & digit. J. Górecka
Z6/55	draw. & digit. U. Wicenciak
Z6/58.2	draw. & digit. J. Górecka
Tumulus 7	
T.7, general plan and cross-sections	draw & digit. J. Juchniewicz, Z. Kowarska
Z7/11	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk

(*cont.*)

Inventory number	
Z7/12	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/14	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/17	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/20	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/21	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/22+Z7/54+ maybe Z7/41	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/23	draw. & digit. E. Czyżewska-Zalewska
Z7/25	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/27	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/28	draw. & digit. E. Czyżewska-Zalewska
Z7/29	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/33	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/38	draw. & digit. E. Czyżewska-Zalewska
Z7/39	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/41	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/42	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/43	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/46	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/47	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/48	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/49	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/50+Z7/69	draw. & digit. E. Czyżewska-Zalewska
Z7/59	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/60	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/63.1	draw. E. Czyżewska-Zalewska, digit. U. Iwaszczuk
Z7/64	draw. & digit. E. Czyżewska-Zalewska
Z7/68	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/68.1	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/69.1	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/71	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/72	draw. & digit. E. Czyżewska-Zalewska
Z7/73	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z7/74	draw. & digit. E. Czyżewska-Zalewska
Z7/93+ maybe z7/54	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Tumulus 8	
T.8, general plan and cross-sections	draw. E. Skowrońska, Z. Kowarska, digit. E. Czyżewska-Zalewska
Z8/1	draw. & digit. U. Wicenciak
Z8/2	draw. & digit. U. Wicenciak
Z8/3.1+Z8/7.1	draw. & digit. U. Wicenciak
Z8/7.2	draw. & digit. J. Górecka
Tumulus 9	
T.9, general plan and cross-sections	draw. K. Juszczyk-Futkowska, E. Czyżewska-Zalewska, E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z9/1	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z9/2	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk

(*cont.*)

Inventory number	
Z9/3	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z9/4	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z9/5	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z9/6	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z9/7	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z9/21	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Tumulus 10	
T.10, general plan and cross-sections	draw. K. Ochnio, A. Błaszczyk, E. Klimaszewska-Drabot, M. Wybieralska, digit. M. Puszkarski
Z10/1	draw. & digit. E. Klimaszewska-Drabot
Z10/2	draw. & digit. E. Klimaszewska-Drabot
Z10/3	draw. & digit. E. Klimaszewska-Drabot
Z10/4	draw. & digit. E. Klimaszewska-Drabot
Z10/5	draw. & digit. E. Klimaszewska-Drabot
Z10/6	draw. & digit. E. Klimaszewska-Drabot
Z10/7	draw. E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z10/8	draw. & digit. E. Klimaszewska-Drabot
Z10/9	draw. & digit. E. Klimaszewska-Drabot
Z10/10	draw. & digit. E. Klimaszewska-Drabot
Z10/11	draw. & digit. E. Klimaszewska-Drabot
Z10/12	draw. & digit. E. Klimaszewska-Drabot
Z10/13	draw. & digit. E. Klimaszewska-Drabot
Z10/14	draw. & digit. E. Klimaszewska-Drabot
Z10/15	draw. & digit. E. Klimaszewska-Drabot
Z10/16	draw. & digit. E. Klimaszewska-Drabot
Z10/17	draw. & digit. E. Klimaszewska-Drabot
Z10/18	draw. & digit. E. Klimaszewska-Drabot
Z10/19	draw. & digit. E. Klimaszewska-Drabot
Z10/20	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z10/21	draw. & digit. E. Klimaszewska-Drabot
Z10/22	draw. & digit. E. Klimaszewska-Drabot
Z10/23	draw. & digit. E. Klimaszewska-Drabot
Z10/24	draw. & digit. E. Klimaszewska-Drabot
Z10/25	draw. & digit. E. Klimaszewska-Drabot
Z10/26	draw. & digit. E. Klimaszewska-Drabot
Z10/27	draw. & digit. E. Klimaszewska-Drabot
Z10/28	draw. & digit. E. Klimaszewska-Drabot
Z10/29	draw. & digit. E. Klimaszewska-Drabot
Tumulus 11	
T.11, general plan and cross-sections	draw. K. Juszczyk-Futkowska, E. Czyżewska-Zalewska, E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z11/1	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/2	draw. & digit. E. Klimaszewska-Drabot
Z11/3	draw. & digit. E. Klimaszewska-Drabot
Z11/4	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk

(*cont.*)

Inventory number	
Z11/5	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/6	draw. & digit. J. Górecka
Z11/7	draw. & digit. E. Klimaszewska-Drabot
Z11/8	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/9	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/10	draw. & digit. E. Klimaszewska-Drabot
Z11/11	draw. & digit. E. Klimaszewska-Drabot
Z11/12	draw. & digit. E. Klimaszewska-Drabot
Z11/13	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/14	draw. & digit. E. Klimaszewska-Drabot
Z11/15	draw. & digit. E. Klimaszewska-Drabot
Z11/16	draw. & digit. E. Klimaszewska-Drabot
Z11/17	draw. & digit. E. Klimaszewska-Drabot
Z11/18	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/19	draw. & digit. E. Klimaszewska-Drabot
Z11/20	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/21	draw. & digit. E. Klimaszewska-Drabot
Z11/22	draw. & digit. E. Klimaszewska-Drabot
Z11/23	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/24	draw. & digit. E. Klimaszewska-Drabot
Z11/25	draw. & digit. E. Klimaszewska-Drabot
Z11/26	draw. & digit. E. Klimaszewska-Drabot
Z11/27	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/28	draw. & digit. E. Klimaszewska-Drabot
Z11/29	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z11/30	draw. & digit. E. Klimaszewska-Drabot
Z11/34	draw. & digit. E. Klimaszewska-Drabot
Z11/35	draw. & digit. E. Klimaszewska-Drabot
Z11/37	draw. & digit. E. Klimaszewska-Drabot
Z11/38	draw. & digit. E. Klimaszewska-Drabot
Z11/39	draw. & digit. E. Klimaszewska-Drabot
Z11/40	draw. & digit. E. Klimaszewska-Drabot
Z11/41	draw. & digit. E. Klimaszewska-Drabot
Z11/42	draw. & digit. E. Klimaszewska-Drabot
Z11/43+Z11/47	draw. E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z11/44	draw. E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z11/45	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z11/46	draw. J. Górecka, digit. E. Czyżewska-Zalewska
Z11/48	draw. & digit. J. Górecka
Tumulus 12	
T.12, general plan and cross-sections	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/1	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/1.2	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/6	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/7	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/8	draw. A. Głąb, digit. E. Czyżewska-Zalewska

(*cont.*)

Inventory number	
Z12/9.1	draw. & digit. U. Wicenciak
Z12/10	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/11	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/12	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/13	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/14	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/15	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/16	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/17	draw. & digit. U. Wicenciak
Z12/18	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/19	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/20	draw. & digit. E. Czyżewska-Zalewska
Z12/21	draw. & digit. U. Wicenciak
Z12/22	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/23	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/24.1	draw. & digit. U. Wicenciak
Z12/24.2	draw. & digit. U. Wicenciak
Z12/25	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/26	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/27	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/30	draw. & digit. E. Czyżewska-Zalewska
Z12/32	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/33.1	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/34	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/35	draw. & digit. E. Czyżewska-Zalewska
Z12/36	draw. & digit. E. Czyżewska-Zalewska
Z12/37	draw. & digit. E. Czyżewska-Zalewska
Z12/38	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/39	draw. & digit. E. Czyżewska-Zalewska
Z12/40	draw. & digit. E. Czyżewska-Zalewska
Z12/41	draw. & digit. E. Czyżewska-Zalewska
Z12/42	draw. & digit. E. Czyżewska-Zalewska
Z12/43	draw. & digit. E. Czyżewska-Zalewska
Z12/44	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/45	draw. & digit. E. Czyżewska-Zalewska
Z12/46	draw. & digit. E. Czyżewska-Zalewska
Z12/47	draw. & digit. E. Czyżewska-Zalewska
Z12/48	draw. & digit. U. Wicenciak
Z12/49	draw. & digit. U. Wicenciak
Z12/50	draw. & digit. U. Wicenciak
Z12/51	draw. & digit. E. Czyżewska-Zalewska
Z12/52	draw. & digit. E. Czyżewska-Zalewska
Z12/53	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/59	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/60	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/62	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/63	draw. & digit. U. Wicenciak

(*cont.*)

Inventory number	
Z12/65	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/68	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/70	draw. & digit. U. Wicenciak
Z12/72	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z12/73	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/74	draw. & digit. U. Wicenciak
Z12/75	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/76	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/77	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/78+Z12/71	draw. & digit. U. Wicenciak
Z12/80	draw. & digit. U. Wicenciak
Z12/81	draw. & digit. U. Wicenciak
Z12/83	draw. & digit. U. Wicenciak
Z12/84	draw. & digit. U. Wicenciak
Z12/85	draw. & digit. U. Wicenciak
Z12/86	draw. & digit. U. Wicenciak
Z12/87	draw. & digit. U. Wicenciak
Z12/89	draw. & digit. U. Wicenciak
Z12/90	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z12/91	draw. & digit. U. Wicenciak
Z12/92	draw. & digit. U. Wicenciak
Z12/93	draw. & digit. U. Wicenciak
Z12/94	draw. & digit. U. Wicenciak
Z12/95	draw. & digit. U. Wicenciak
Z12/96	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/97	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/99	draw. & digit. U. Wicenciak
Z12/100	draw. & digit. U. Wicenciak
Z12/101	draw. & digit. U. Wicenciak
Z12/102	draw. & digit. U. Wicenciak
Z12/103	draw. & digit. U. Wicenciak
Z12/104	draw. & digit. U. Wicenciak
Z12/105	draw. & digit. U. Wicenciak
Z12/106	draw. & digit. U. Wicenciak
Z12/107	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/108	draw. & digit. U. Wicenciak
Z12/109	draw. & digit. U. Wicenciak
Z12/110	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/111	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/112	draw. & digit. U. Wicenciak
Z12/113	draw. & digit. U. Wicenciak
Z12/114	draw. & digit. U. Wicenciak
Z12/115+z12/98	draw. & digit. U. Wicenciak
Z12/116	draw. & digit. U. Wicenciak
Z12/117	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/118	draw. & digit. U. Wicenciak
Z12/119	draw. & digit. U. Wicenciak

(*cont.*)

Inventory number	
Z12/120	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/121	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z12/122	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/123	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/124	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/125	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z12/126	draw. & digit. U. Wicenciak
Z12/127	draw. & digit. U. Wicenciak
Z12/129	draw. & digit. U. Wicenciak
Z12/130	draw. & digit. U. Wicenciak
Z12/131	draw. & digit. U. Wicenciak
Z12/133.1	draw. & digit. U. Wicenciak
Z12/133.2	draw. & digit. U. Wicenciak
Z12/134	draw. & digit. U. Wicenciak
Z12/135	draw. & digit. U. Wicenciak
Tumulus 13	
T.13, general plan and cross-sections	draw. K. Juszczyk, O. Białostocka, E. Czyżewska-Zalewska, E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z13/7	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/8	draw. & digit. E. Klimaszewska-Drabot
Z13/9	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/10	draw. & digit. E. Klimaszewska-Drabot
Z13/11	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/12	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/13	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/14	draw. & digit. E. Klimaszewska-Drabot
Z13/16	draw. & digit. E. Klimaszewska-Drabot
Z13/17	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/18	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/19	draw. & digit. E. Klimaszewska-Drabot
Z13/20	draw. & digit. E. Klimaszewska-Drabot
Z13/21	draw. & digit. E. Klimaszewska-Drabot
Z13/22	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/23	draw. & digit. E. Klimaszewska-Drabot
Z13/24	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/25	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/26	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z13/27	draw. & digit. E. Klimaszewska-Drabot
Z13/28	draw. & digit. E. Klimaszewska-Drabot
Z13/35	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Tumulus 14	
T.14, general plan and cross-sections	draw. E. Skowrońska, J. Brochocki, K. Solarska, digit. E. Czyżewska-Zalewska, K. Solarska, J. Brochocki
Z14/1.2	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z14/1.3	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska

(*cont.*)

Inventory number	
Z14/2.1	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z14/4.1	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z14/4.2	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z14/4.3	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z14/5	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/6	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/7	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/8	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/9	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/10	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/11	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/12	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/13	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/14	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/15	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/16	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/17	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/18	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/19	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/20	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/21	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/22	draw. & digit. J. Górecka
Z14/23	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/24	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/25	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/26	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
z14/27	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/28	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/29	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z14/30	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z14/33	draw. J. Górecka, digit. M. Piorun
Z14/34.1	draw. & digit. J. Górecka
Z14/34.2	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Tumulus 15	
T.15, general plan and cross-sections	draw. E. Skowrońska, A. Głąb, digit. U. Iwaszczuk, E. Czyżewska-Zalewska
Z15/3	draw. & digit. E. Czyżewska-Zalewska
Z15/4	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/5	draw. & digit. E. Czyżewska-Zalewska
Z15/6	draw. & digit. E. Czyżewska-Zalewska
Z15/7	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/8	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/16	draw. & digit. E. Czyżewska-Zalewska
Z15/17	draw. & digit. E. Czyżewska-Zalewska
Z15/19	draw. & digit. E. Czyżewska-Zalewska
Z15/20	draw. & digit. E. Czyżewska-Zalewska
Z15/21	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska

(*cont.*)

Inventory number	
Z15/22	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/23	draw. & digit. E. Czyżewska-Zalewska
Z15/25	draw. & digit. E. Czyżewska-Zalewska
Z15/26	draw. & digit. E. Czyżewska-Zalewska
Z15/27	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/28	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z15/34	draw. & digit. E. Czyżewska-Zalewska
Z15/35	draw. & digit. E. Czyżewska-Zalewska
Z15/36	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/37	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/38	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/43	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/45	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/46	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/47	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/48	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/49	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z15/50	draw. A. Głąb, digit. E. Czyżewska-Zalewska
Z15/51	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/52	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/53	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/56	draw. & digit. E. Czyżewska-Zalewska
Z15/59	draw. E. Skowrońska, digit. E. Czyżewska-Zalewska
Z15/61	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Tumulus 16	
T.16, general plan and cross-sections	draw. K. Juszczyk-Futkowska, E. Czyżewska-Zalewska, E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z16/1	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z16/2	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z16/3	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Tumulus 17	
T.17, general plan and cross-sections	draw. E. Czyżewska-Zalewska, E. Klimaszewska-Drabot, digit. E. Czyżewska-Zalewska
Z17/1	draw. & digit. E. Klimaszewska-Drabot
Z17/2	draw. & digit. E. Klimaszewska-Drabot
Tumulus 18	
T.18, general plan and cross-sections	draw. E. Klimaszewska-Drabot, M. Wybieralska, K. Kotlewski, digit. M. Puszkarski
Z18/1	draw. & digit. M. Wybieralska
Z18/2	draw. & digit. A. Błaszczyk
Z18/3	draw. & digit. A. Błaszczyk
Z18/4	draw. & digit. E. Klimaszewska-Drabot
Z18/5	draw. & digit. E. Klimaszewska-Drabot
Z18/6	draw. A. Błaszczyk, digit. E. Klimaszewska-Drabot
Z18/7	draw. & digit. E. Klimaszewska-Drabot
Z18/8	draw. A. Błaszczyk, digit. E. Klimaszewska-Drabot

(*cont.*)

Inventory number	
Tumulus 19	
T.19, general plan and cross-sections	draw. A. Błaszczyk, K. Ochnio, digit. M. Puszkarski, E. Czyżewska-Zalewska
Z19/1	draw. & digit. A. Błaszczyk
Z19/2	draw. & digit. A. Błaszczyk
Z19/3	draw. & digit. A. Błaszczyk
Z19/4	draw. & digit. A. Błaszczyk
Z19/5	draw. & digit. A. Błaszczyk
Z19/6	draw. & digit. A. Błaszczyk
Z19/8	draw. & digit. A. Błaszczyk
Z19/9	draw. & digit. A. Błaszczyk
Tumulus 20	
T.20, general plan and cross-sections	draw. K. Juszczyk-Futkowska, E. Klimaszewska-Drabot, E. Czyżewska-Zalewska, digit. E. Czyżewska-Zalewska
Z20/1	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z20/2	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z20/3	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z20/4	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Z20/5	draw. E. Klimaszewska-Drabot, digit. U. Iwaszczuk
Tumulus 21	
T.21, general plan and cross-sections	draw. A. Głąb, E. Skowrońska, digit. U. Iwaszczuk, E. Czyżewska-Zalewska
Z21/4	draw. E. Czyżewska-Zalewska, digit. Z. Kowarska
Z21/6	draw. & digit. E. Czyżewska-Zalewska
Z21/7	draw. & digit. E. Czyżewska-Zalewska
Z21/8	draw. & digit. E. Czyżewska-Zalewska
Z21/9	draw. & digit. E. Czyżewska-Zalewska
Z21/10	draw. & digit. E. Czyżewska-Zalewska
Z21/28	draw. & digit. E. Czyżewska-Zalewska
Tumulus 22	
T.22, general plan and cross-sections	draw. A. Obłuski, U. Iwaszczuk, H. Koźmieńska-Sowa, digit. M. Puszkarski, E. Czyżewska-Zalewska
Z22/1	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z22/2	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z22/3	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z22/4	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z22/5	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z22/6	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Tumulus 23	
T.23, general plan and cross-sections	draw. A. Obłuski, U. Wicenciak, digit. M. Puszkarski
Z23/1	draw. & digit. U. Wicenciak
Z23/2	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/3	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/4	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/5	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska

(*cont.*)

Inventory number	
Z23/6	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/7	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/8	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/9	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/10	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/11	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/12	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/13	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/14	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/15	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/16	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/17	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/18	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/19	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/20	draw. & digit. U. Wicenciak
Z23/21	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/22	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/23	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/24	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/25	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/26	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/27	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
Z23/28	draw. U. Wicenciak, digit. E. Czyżewska-Zalewska
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Z23/40	draw. H. Sowa, digit. U. Wicenciak
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Z24/28	draw. & digit. U. Wicenciak

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Z26/24	draw. U. Wicenciak, digit. U. Iwaszczuk
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Z26/41+Z26/60.1+Z26/61+Z26/62+ Z26/68+Z26/71	draw. & digit. J. Górecka
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Z26/51	draw. U. Wicenciak, digit. U. Iwaszczuk
Z26/52	draw. U. Wicenciak, digit. U. Iwaszczuk
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Z26/55	draw. U. Wicenciak, digit. U. Iwaszczuk

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Z26/65.2	draw. U. Wicenciak, digit. U. Iwaszczuk
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Z26/69.2	draw. & digit. J. Górecka
Z26/69.3	draw. U. Wicenciak, digit. U. Iwaszczuk
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Tumulus 27	
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Z27/3	draw. & digit. E. Klimaszewska-Drabot
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Z27/12	draw. & digit. J. Górecka
Tumulus 28	
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Z28/8	draw. R. Hajduga, digit. E. Czyżewska-Zalewska
Z28/9	draw. R. Hajduga, digit. E. Czyżewska-Zalewska

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Inventory number	
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Z28/11	draw. K. Solarska, digit. E. Czyżewska-Zalewska
Z28/12	draw. K. Solarska, digit. E. Czyżewska-Zalewska

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CHAPTER 1

Introduction

The second volume in the **Early Makuria Research Project. El-Zuma Cemetery** publication showcases the results of the examination of the pottery assemblage excavated in the course of the Early Makuria Research Project at the El-Zuma tumulus cemetery site. The ceramic wares discussed herein came from 28 tumuli (see General map of the El-Zuma archaeological site at the end of this volume) dated to the Early Makurian period (see Volume I, Chapter 4). These tumuli have been classified into three main types:

- type I, large tumuli with a U-shaped shaft and several burial chambers and tunnels;
- type II, medium-sized tumuli with an L-shaped or U-shaped shaft and two to five burial chambers;
- type III, small tumuli with a rectangular shaft and one side burial chamber (Mahmoud El-Tayeb 2012, 61–75; see Volume I, pp. 125–154).

The pottery presented in this volume was recovered from:

- two fully excavated type I tumuli (T.2, T.5);
- six partly excavated type I tumuli (T.1, T.3, T.4, T.6, T.7, T.8)—only the external shafts and tunnels were examined (pottery was found mainly in the external shafts and inside the tunnels);
- ten fully excavated type II tumuli (T.9, T.11, T.13, T.14, T.15, T.16, T.23, T.24, T.25, T.26);
- one partly excavated type II tumulus (T.12);
- nine fully excavated type III tumuli (T.10, T.17, T.18, T.19, T.20, T.21, T.22, T.27, T.28).

Reports on the pottery uncovered in the course of ten years of excavations have been published successively (Mahmoud El-Tayeb 2005, 2007, 2010a, 2010b, 2012, 85–105; Klimaszewska-Drabot 2010b; Mahmoud El-Tayeb and Czyżewska 2011; Klimaszewska-Drabot and Czyżewska 2012; Klimaszewska-Drabot and Mahmoud El-Tayeb 2014; Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014; Czyżewska-Zalewska 2016, 2017).

The research has raised several questions concerning the function of specific types of vessels in grave contexts, the continuity of Meroitic traditions and the changes in pottery that can be observed in comparison to the Meroitic period. Nonetheless, the most important question was about the function and meaning of the vessels deposited in the El-Zuma tumuli.

The analysis of the pottery from the El-Zuma burial contexts has been rooted in an outline of the state of research into archaeological pottery from post-Meroitic period sites excavated in Ancient Nubia. It includes a discussion of production technology and a description of vessel types, a catalogue of which can be found at the end of this volume. An important part of the presentation is a mapping of the distribution of pottery and lamps inside the tumuli.

CHAPTER 2

Pottery in the Funerary Context, Chronology and State of Archaeological Research—An Overview

1 Pottery in the Funerary Context

The Nubians believed in the afterlife, and that death was a journey to a new life in another world, and that it was necessary to equip the deceased for this journey (Mahmoud El-Tayeb 2012, 80). Mortuary practices had two main aspects: a social dimension, relating to earthly/human activities (reflected in grave structures and burial goods) and a spiritual one (concerning faith, customs, and religion) [**Fig. 2.1**].

In the social dimension, the tomb is the last 'house' for the physical body of the deceased, and a symbol of the end of earthly life. Grave goods, drinks, and food were provided for the deceased to use on their last journey to eternity. They also served as manifestations of the social status of the deceased during their earthly life. In the religious dimension, the grave could be understood as a symbol of home in the new life, but in the new life the deceased still needed food. When analysing the burial contexts, we should also remember about funeral ceremonies and religion. Analysing the pottery as containers for grave goods, we should take into account the symbolic function of vessels used in rituals and burial ceremonies as well their function in domestic life, which is difficult to establish because of the lack of settlement sites in the study area (see Chapter 2.2). If we look at the grave goods deposits from El-Zuma, we notice that pottery was the major component of these assemblages, but we should also remember that it was only one of many elements in the whole burial context.

Analysis is sometimes hindered by robber activity. In most cases, personal adornment rather than pottery was the main object of the looter's interest (Mahmoud El-Tayeb 2012, 81), but damage caused during the robberies (such as the destruction of the shaft, the ceiling of the burial chamber, or the body itself) disturbed the entire burial context (see also Volume 1, Chapters 3 and 5). We should bear in mind that looting at archaeological sites creates a secondary context which influences our analysis and interpretation of what we find.

An important aspect is the religious meaning of pottery, such as liturgical vessels, which probably served ritual functions during some kind of purification ceremony (Mahmoud El-Tayeb 2012, 101–102; Bonnet and Mahmoud El-Tayeb 1991, 32). Pottery is one of the materials that defines a culture, and it is especially significant in the earlier periods of habitation in the Nile Valley (David and Salvatori 2019, 1). Many years of archaeological work in the territories of Lower and Upper Nubia have revealed cultural diversity in different regions of Ancient Nubia.

The deposition of grave goods was a custom noted among Nubian communities from the Mesolithic period onwards [**Fig. 2.2**, **Fig. 1** at the end of this volume]. The first Mesolithic site in Upper Nubia, in the Sixth Cataract region, was recognized by Arkell, working within the grounds of Khartoum Hospital (Arkell 1949). Later, radiocarbon analysis in other regions around Khartoum established that pottery users (hunters, gatherers, fishermen) had been present in the Nile Valley in the seventh millennium BC (Edwards 2004, 24–25). The earliest phases of the Mesolithic (*c.* 9000 BC) have been recognized at Nabta in Lower Nubia, in the Kerma area in the Northern Dongola Reach, at Al-Khiday, in the Atbara area, north of Khartoum, and at Sarourab in Central Sudan (see map, Fig. 1 at the end of this volume) (Usai 2016, 12). In the Dongola Reach, Mesolithic sites such as Kadruka, El-Barga, and Wadi El-Arab, have been recorded in the Kerma region (Honegger 2014, 19). In Lower Nubia, archaeological work in Nabta Playa played an important role in our understanding of Mesolithic burials (David and Salvatori 2019, 1, Fig. 3). Grave goods were not abundant in tombs of the Mesolithic period. Most of the burials at El-Barga did not contain any funerary offerings, apart from two graves in which shells were found (Honegger 2014, 23–24). Graves in Upper Nubia, for example in the Atbara region (below the Fifth Cataract, see Fig. 1, map at the end of this volume), sometimes contain shells that were deposited as offerings (or were maybe items of personal adornment), but this practice was not frequent at the time (Haaland and Magid 1995, 137–145). Mesolithic handmade pottery (jars and bowls) is characterized by decoration executed using rocker stamp, comb, and cord-wrapped techniques to produce motifs made up of dots, leaves, and dotted wavy lines. These vessels were made using the coiling technique (David and Salvatori 2019, 4–6).

Neolithic sites were discovered in Upper Nubia in the Khartoum region (e.g. Kadero, El Geili) and the Dongola

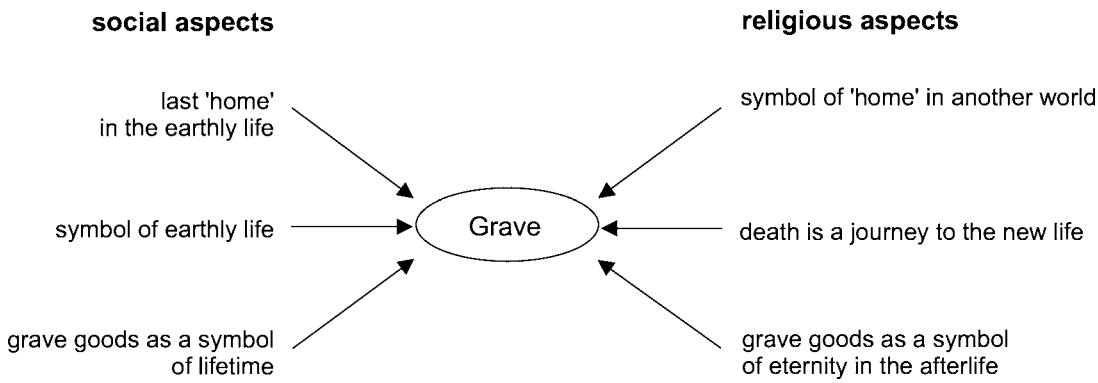

FIGURE 2.1 Social and religious aspects of burial customs
DRAWING BY E. CZYŻEWSKA-ZALEWSKA

Reach (e.g. Kerma Basin, Kadruka, El-Barga, Wadi El-Arab, Wadi al-Khowi, Wadi Howar) [**Fig. 2.2, Fig. 1** at the end of this volume] (David and Salvatori 2019, 8–9, Fig. 4, 5; Edwards 2004, 44–47, 50; Honegger 2014, 24–28).

In the Neolithic [see **Fig. 2.2**], we have evidence of the introduction of domestic animals. The earliest traces of domestic animals in Sudan come from Neolithic graves at El-Barga, where domestic cattle skulls (bucrania) were recorded among other burial offerings (Honegger 2014, 24). Many graves in the cemeteries at Kadruka contained cattle skulls located close to the body (Reinold 2006). The Neolithic graves of El-Barga in the Northern Dongola Reach contained numerous tools, weapons, and ornaments, including ivory and semiprecious stone jewellery (Honegger 2014, 24). A limited amount of pottery appeared in graves of this period (Usai 2016, 13). The Neolithic ceramic repertoire featured an increased variety of vessel forms: bowls, globular and ovoid jars, caliciform beakers, smaller vessels and closed vessels probably for serving liquids (David and Salvatori 2019, 8–9, Figs. 4, 5; Edwards 2004, 44–47, 50). The rocker stamp dotted pattern was still used, and herringbone patterns, zigzags, bands, dotted zigzag lines, and incised bands with dotted lines appeared. Pots were made using the coiling technique, and possibly also the paddle and anvil technique, and the surface of vessels was sometimes polished or burnished (David and Salvatori 2019, 8–9, Figs. 4, 5; Edwards 2004, 44–47, 50).

In Late Neolithic Upper Nubia pre-Kerma culture (3100–2600 BC, see **Fig. 2.2**) appeared in the Kerma region within the Dongola Reach (Edwards 2004, 44–47, 66–67). Pre-Kerma culture (contemporary with the A-Group in Lower Nubia), is known only from a few sites located between Kerma and the Second Cataract, among them Sai and Kerma (Chaix and Honegger 2015, 206–207). The most important pre-Kerma settlement was Kerma (dated to 3000 BC) [**Fig. 2.2**, **Fig. 1** at the end of this volume], and it was based on an agro-pastoral economy but, unfortunately, this period is poorly known (Honegger 2014, 28). In the funerary tradition, bucrania played a more significant role and were placed in or near the graves. The most spectacular example is the deposit of 5,600 skulls close to a Middle Kerma grave dated to *c.* 1900 BC (Chaix and Honegger 2015, 206–207).

The A-Group (3400–2700 BC) [**Fig. 2.2**, **Fig. 1** at the end of this volume] appeared in Lower Nubia in about 3400 BC around the First Cataract area in Egypt, and settlements have been discovered between the First and Second Cataracts, in Dakka, Gerf Hussein, Qustul, Faras, Serra, and Gemmai (David and Salvatori 2019, 10; Edwards 2004, 44–47, 68–70). A-Group evidence was not always found in an A-Group context; in the First Cataract area A-Group material culture was present within Naqadian sites above the First Cataract (Gatto 2006, 62). Mortuary practices depended on regional, chronological, and sociocultural differences. Graves did not usually have superstructures, and the shaft was sealed by large stone slabs (Gatto 2006, 69). The bodies from the Second Cataract cemeteries were commonly wrapped in animal leather and laid on animal skins, while those from the First Cataract were wrapped in mats or linen and laid on a mat or a wooden box (Gatto 2006, 68–69). Remains of wooden beds dated to this period were recorded only at Qustul (Williams 1986). Objects placed in the grave as offerings included local and Egyptian imported pottery, stone vessels, grindstones, palettes, Nile pebbles, mace heads, copper and bone tools, ornamental objects made of different materials, ornaments for clothing, hand axes, incised ostrich eggshells, incense burners, lithic tools, clay figurines, lapis lazuli, seals, and seal impressions (Gatto 2006, 69). Animals also were buried in human graves or independently within the human cemeteries (Gatto 2006, 70). The A-Group specialized in black-topped and rippled pottery decorated with incised geometrical patterns, thin egg-

shell wares with painted decoration, and red polished wares (David and Salvatori 2019, 10; Edwards 2004, 44–47, 68–70).

In the second half of the third millennium BC, the area of Lower Nubia was occupied by the C-Group (2700–1500 BC, see **Fig. 2.2**), while in the Northern Dongola Reach the main centre of habitation was focused around the Kerma region and Kingdom of Kush (2700–1500 BC, see **Fig. 2.2**) (Edwards 2004, 44–47, 76–77). The C-Group was probably related to the A-Group, which is reflected in their pottery. C-Group people led a pastoral life, and cattle seem to have been an important economic and cultural issue. A large amount of cattle leather was recorded in C-Group graves (probably having been used as material for clothing) (Hafsaas-Tsakos 2010, 389–390). The pottery assemblage features black-topped wares, vessels with incised and impressed patterns, as well as evidence of Egyptian influences and pottery imported from Egypt (David and Salvatori 2019, 13). The incised decoration which appeared in this period includes half-moon and quadrate patterns on black bowls, wavy lines on rims, zigzag, herringbone, figurative motifs, and chessboard patterns (David and Salvatori 2019, 13). Egyptian commodities imported into Lower Nubia were recorded as burial goods in C-Group graves. The C-Group cemetery at Aniba appears to have been used from around 2500 to 1500 BC; Egyptian imports make their earliest appearance at this cemetery in graves dating from the beginning of the Sixth Dynasty, around 2345 BC (Hafsaas-Tsakos 2010, 390). The distribution in time of Egyptian pottery in the C-Group cemetery at Aniba shows that there was a dramatic increase in trade. Different kinds of jewellery were the most numerous Egyptian imports among the burial goods in C-Group graves; others included bronze objects such as mirrors, daggers, and various tools (Hafsaas-Tsakos 2010, 391). Mortuary evidence shows that after Lower Nubia was again incorporated into Egypt, the C-Group population acculturated and Egyptianized (Hafsaas-Tsakos 2010, 395).

The Kingdom of Kerma (Old Kush, see **Fig. 2.2**) in Upper Nubia retained a pastoral way of life, in which cattle played an important economic role and also served a social function. Representations of cattle were discovered at Kerma in the form of small figurines and images painted in murals decorating the large funerary chapels of the Eastern Cemetery (Chaix et al. 2012, 189). Bucrania, which were recorded in pre-Kerma funerary contexts (see above), took on a more significant role during the Kerma period, when thousands of bucrania were placed in front of graves (Chaix et al. 2012, 189, 192). In the Ancient Kerma period (2500–2050 BC, see **Fig. 2.2**) meals probably took place during funeral ceremonies, during which large numbers of bowls were turned upside down on the ground close to the grave (traces of liquid were visible on the hardened mud). Human sacrifices sometimes also featured in this period, whilst grave goods were restricted to a few personal adornments (Bonnet 1992, 621–622). In the Middle Kerma period (2050–1750 BC, see **Fig. 2.2**) graves became larger and contained more food supplies; human sacrifices increased, and libation rituals were still present (broken pottery was recorded in front of grave entrances) (Bonnet 1992, 622). During the Classic Kerma period (1750–1500 BC, see **Fig. 2.2**) human sacrifices increased further still, and grave goods became more lavish, with pottery, jewellery, toilet objects, chests, beds of wood inlaid with ivory, as well as Egyptian imported pottery, statues, and stelae appearing in burials (Bonnet 1992, 622–623). Kerma period pottery represents a wide range of fine and coarse wares, incised black wares, and fine polished black-topped red wares (David and Salvatori 2019, 13–14). Some wares copied Egyptian pottery. Black-topped bowls decorated with incised triangles below the rim, and black-topped tulip beakers appeared in this period (Edwards 2004, 85, 96; David and Salvatori 2019, 13–14). The thickness of vessel walls did not exceed 3 mm, and the pot surface was highly polished to a metallic sheen. These vessels were inspired by metal prototypes (Edwards 2004, 85, 96; David and Salvatori 2019, 13–14).

During the Egyptian occupation (1500–1100 BC, see **Fig. 2.2**), Egypt extended south of the Third Cataract, and an Egyptian presence was established at Jebel Barkal in the Dongola Reach (Edwards 2004, 103). Many cultural changes in religion and burial customs took place in Egypt at that time. During the Amarna period (1353–1336 BC), Amenhotep IV decided to build a new city, Akhenaten, devoted to the cult of Aten (the sun god) and his children. Amenhotep IV changed his name to Akhenaten and became the manifestation of Aten's will (Van Dijk 2000, 269). Tombs of this period were decorated with representations of Aten temples and of the king and his wife. It was believed that the dead lived on earth among the living, and their tombs served as nightly resting places. Mummification was practised, and funerary offerings and tomb equipment were commonplace (Van Dijk 2000, 277). After the Amarna episode in Egyptian history, religious beliefs returned to the tradition and cult of Amon Ra and Osiris, but with some changes. Rock tombs and free-standing tombs were built, and the tomb became a private mortuary temple for the owner, with wall paintings focused on the owner adoring the gods (Van Dijk 2000, 280). The Egyptians' attitudes to life and death were influenced by their belief that eternal life could be ensured by a wide range of strategies, including piety to the gods, the preservation

of the body through mummification, and the provision of funerary equipment. Temples complete with priests and a steady flow of offerings would also help grave owners to express their adoration of the gods (Shaw 2004, 120–121).

The Egyptian occupation of the Dongola Reach gradually put an end to many local traditions, and subsequent changes in religious beliefs were followed by major changes in burial traditions (Mahmoud El-Tayeb 2012, 47). Burials began to be furnished with greater numbers of utensils and practical items (Mahmoud El-Tayeb 2012, 80). The first evidence of changes in burial customs dating from the period of the New Kingdom occupation was noted in the Fourth Cataract region in the form of tombs referred to as dome graves and semi-dome graves, in which there was no burial pit (Paner and Borcowski 2005, 209–212). The ceramic traditions of the C-Group and Kerma period survived and met with Egyptian influences and the introduction of the potter's wheel. Wheel-made dishes, carinated bowls, and *zirs* appeared in this period (David and Salvatori 2019, 15).

During the 10–9th century BC, political changes in the Dongola Reach led to the establishment in the 8th century BC of the new Kushite Kingdom, centred on the Napata Region in the Upper Dongola Reach (Edwards 2004, 112–113, 122–123, 128). The rulers of this kingdom conquered Egypt in the 7th century BC (founding the Twenty-fifth Dynasty), and Kushite sites have also been discovered in Lower Nubia, among them Mirgissa, Faras, Buhen, Qustul and Qasr Ibrim. The history of the Kushite Kingdom is divided into two main periods: Napatan (1100–300 BC, see **Fig. 2.2**) and Meroitic (300 BC–AD 350, see **Fig. 2.2**) (Edwards 2004, 112–113, 122–123, 128).

Kushite occupation in the Napatan period continued up to 300 BC, and was concentrated in the Napata region, with important centres and royal cemeteries at El-Kurru, Nuri, and Jebel Barkal (Edwards 2004, 112–113, 122–123, 128). After the Egyptian withdrawal, Kushite culture was Egyptianized (Török 2004, 132). The innovation in burial customs which occurred in northern Nubia as a result of Egyptian influence was confined to the shift from a flexed position to the traditional Egyptian supine attitude. Burials in foot-shaped graves probably appeared in Napatan times, several graves of this type having been discovered at Kerma (Mahmoud El-Tayeb 2012, 47–48, Bonnet 1999, 1–7, fig. 3, t 123). In the Napatan period, Nubian pottery, such as handmade black-topped red bowls, black-topped goblets, red burnished bowls, and globular jars, co-existed with Egyptian wares, represented by large numbers of wheel-made bowls with red-painted rims and amphorae. Besides the large quantity of imports from Egypt, local pottery started to imitate Egyptian models (Edwards 2004, 137; David and Salvatori 2019, 15–16).

In the Meroitic period (300 BC–AD 350, see **Fig. 2.2**) the main centre of power was moved to the Shendi Reach, between the Sixth and Fifth Cataracts, and remained there till the 4th century AD. The northern frontier of the kingdom probably extended to the Second Cataract (Edwards 2004, 141–143).

The mortuary custom of burying bodies in extended position was adhered to during the Early Meroitic period. Foot-shaped graves have been recorded at cemeteries in Lower Nubia at Abu Simbel, and in the northern part of Upper Nubia at Sai Island and Soleb. Burials of this type have even been noted upstream of the Fourth Nile Cataract (Mahmoud El-Tayeb 2012, 47–48). Mahmoud El-Tayeb believes this practice was known only in northern Nubia during the Napatan and Early Meroitic periods (Mahmoud El-Tayeb 2012, 47–48). Classic Meroitic burials in northern Nubia consisted of a rectangular pit, which seems to have been covered by a brick vault and marked on the surface by a *mastaba* or sometimes even by a small pyramid (Woolley and Randall-MacIver 1910, 32–45; Bonnet and Mahmoud El-Tayeb 1991, 29–34). In Upper Nubia, graves took the form of a perpendicular chamber that would have been entered via a sloping ramp, and the burial was usually covered by a circular mound (Mahmoud El-Tayeb 2012, 48–49). In the Late Meroitic period, graves began to have more distinctive superstructures, consisting of a low, rounded, flat-topped mound surrounded by a skirt of small, rough, black stones (Mahmoud El-Tayeb 2012, 49, 51). These changes may have originated from the waning of Egyptian influence on Meroitic society. Stronger contacts with the Meroitic heartland allowed for the revival of certain older traditions and the influx of ideas stemming from southern burial practices (Mahmoud El-Tayeb 2012, 49, 51). In the 3rd century AD, changes in grave construction were followed by changes in inhumation attitude, the Egyptian extended position (which had remained unaltered as the sole practice since the New Kingdom period) was replaced by the old tradition of contracted burials (Mahmoud El-Tayeb 2012, 76).

There is no evidence of human sacrifice during the Napatan and Meroitic periods. The inhumation practice of reopening a grave to accommodate a secondary burial probably appeared during the Early Meroitic period and was maintained throughout the Classic and Christian periods (Mahmoud El-Tayeb 2012, 77). In the Classic and Late Meroitic, burials were furnished with various grave goods, sometimes including *ba* statues and offertory tables, depending on the social and material status of the deceased (Bonnet and Mahmoud El-

Tayeb 1991, Mahmoud El-Tayeb 2012, 77). The pottery does not show continuity of Napatan traditions but modifications to the local handmade repertoire. The potter's wheel was still in use (David and Salvatori 2019, 17). Ceramic wares in the earliest phases of the Meroitic period include black handmade pottery that was, however, different to that seen in the Napatan period. Black vessels with impressed decoration are more reminiscent of the Kerma and C-Group traditions mentioned above (David and Salvatori 2019, 16). Painted designs such as wavy lines and floral motifs known from Egypt were copied on Meroitic pottery (David and Salvatori 2019, 16). During the first centuries AD, when Egypt was under Roman rule (Bowman 2008), fine wares made with kaolinitic clay were introduced to the Meroitic repertoire. Roman influences also led to the appearance of new vessel shapes, stamped decoration, and light-coloured ceramic surfaces (David and Salvatori 2019, 16–18; McNally and Schrunk 2000).

At the end of the Meroitic period, around the 3rd century AD, burial goods became quite modest; in some graves they were limited to a single pottery vessel and no food offerings were left for the buried individual. The body was usually wrapped in a perishable material and placed directly on the ground, where no remains of a bed, bier, bench, or even an animal hide have ever been noted (Mahmoud El-Tayeb 2012, 78).

In the early 4th century, the hegemony of Meroe seems to have begun to disappear. The time between the 3rd and 7th centuries AD was a period of political and cultural transitions during which a number of regional traditions appeared and three Kingdoms arose: Nobadia in the north, Makuria in the middle and Alwa in the south of Ancient Nubia (Edwards 2004, 182–185). El-Zuma is situated in the Dongola Reach, between the Third and Fourth Cataracts, within the bounds of the Makurian Kingdom [see **Fig. 1**, end of this volume] (Mahmoud El-Tayeb 2012, 15). The period between the 4th and the 6th century is known as the post-Meroitic, and this term was widely applied to the period succeeding the end of central authority in Meroe. The post-Meroitic period was first recognized in the cemeteries of Lower Nubia, where burials of this date were identified by Reisner, who attributed them to a culture he referred to as the 'X-Group,' which filled the gap between the Meroitic and medieval Christian periods (Reisner 1910). Royal burials of new tradition were discovered at the cemeteries of Ballana and Qustul (Edwards 2004, 185–187).

In Upper Nubia, the research conducted by Shinnie at Tanqasi (Shinnie 1954) in the Dongola Reach led to the emergence of the term 'Tanqasi Culture,' coined by Trigger, which became a southern equivalent of the northern 'X-Group' of Lower Nubia (Trigger 1965). The excavation of cemeteries at Firka (Kirwan 1939), Gemai (Bates and Dunham 1927), El-Hobagi (Lenoble 2004), El-Zuma (Mahmoud El-Tayeb 2012), and Hagar El-Beida (Longa 2007; Lemiesz 2007) increased the number of similar tumulus sites, but the term 'Tanqasi Culture' has now become largely obsolete (Edwards 2004, 192–195). Cemetery evidence of this period is scarce in the northern Dongola Reach. Further upstream, sites of this date (almost entirely tumulus cemeteries) appear to be much more common. A significant post-Meroitic presence can be identified in the Letti Basin and in the Fourth Cataract region, especially in the area of Old Dongola, where Meroitic cemeteries were recorded around El-Ghaddar (Mahmoud El-Tayeb 1994), Hammur (Mahmoud El-Tayeb 2003), and El-Zuma. The abundance and scale of the post-Meroitic cemeteries upstream of Old Dongola, rather than in the Letti Basin, suggests that settlement during this period may have been focused on the basins of the southern Dongola Reach (Edwards 2004, 188, 192–195).

The processes of political change and cultural transformation in Meroitic Lower Nubia probably began with the reorganization of the Egyptian frontier of the Roman Empire in the 3rd-century AD, and these changes transformed a province of the Meroitic kingdom into the independent kingdom of Nobadia (Edwards 2004, 195). Significant centres of this period probably focused around the Second Cataract, as far south as Murshid, Gemai and Meinarti, and extending north as far as Abu Simbel (Edwards 2004, 200). The post-Meroitic settlements (see below, Chapter 2.2) seem to have been small, and the majority of cemeteries continued to be used into the medieval period, tumulus burials gradually being abandoned (Edwards 2004, 200). The survey in the Third Cataract region suggests that the appearance of post-Meroitic settlement seems to be a relatively late phenomenon, and the Third Cataract may have marked a significant political frontier of Nobadian culture (Edwards 2004, 201).

It was during this period that the El-Zuma necropolis came into being (see. Fig. 2.2, box marked in grey). Mahmoud El-Tayeb suggests that this period should be divided (based on burial architecture and traditions—see Volume I, Chapters 3 and 4) into two main phases: Early Makuria phase I (AD 350–450), and phase II (AD 450–550) (see **Fig. 2.2**). Phase I was dominated by graves with two variants of superstructure: a conical mound of earth, or a flat-topped mound clad with stones. Beneath the mound was a substructure consisting of a rectangular vertical shaft provided with a side niche. At the turn of the 4th century, this type of construction appeared to

be widespread throughout the Dongola Reach, at least from the Letti Basin upstream to the Fourth Nile Cataract region (Mahmoud El-Tayeb 2012, 57). In Early Makuria phase II, grave construction changed through the addition of one or more secondary chambers for the deposition of burial goods inside the tomb (Mahmoud El-Tayeb 2012, 68, 70). The tradition of digging a separate pit to accommodate offerings most probably started during the transition between the Late Meroitic and Early Makurian periods, or even a little earlier, yet this practice was maintained in the late phase of the Early Makurian period (Mahmoud El-Tayeb 2012, 61). The large mound burials at El-Zuma (see Volume I, Chapter 3), Tanqasi (Shinnie 1954), and Hammur-Abbassiya (Mahmoud El-Tayeb 2003) were regarded as elite tombs because of their size and construction (Mahmoud El-Tayeb 2003, 130–134, Figs 8, 13). An interesting feature recorded in burials with double or multiple chambers is the existence of a connecting system between the burial chambers, created by making holes in the partition walls. The function of these holes and passages remains obscure, though based on Lower Nubian traditions it appears that they may have been intended to provide the soul of the deceased with easy access to the offerings deposited in the other chambers (see Volume I, Chapters 3 and 4; Mahmoud El-Tayeb 2012, 68, 70).

During the Early Makurian period, inhumation adhered to the same tradition that had reappeared in the Late Meroitic period, with the body being buried in contracted position (Mahmoud El-Tayeb 2012, 76). In most cases, the body appeared to be wrapped in a linen cloth, or in other instances simply dressed in a leather kilt or woven animal hair shroud (Mahmoud El-Tayeb 2012, 79). The best-preserved example of burial garments was found in grave HP45/1 at El-Kassinger, where the body was wrapped in three woollen shrouds (Fischer 2007, 125–128).

Burials with grave furnishings deposited in multiple chambers, and bodies interred on a bed, a bier, an animal hide, an earthen bench, or even on a layer of pure sand, became quite popular and followed a specific pattern. The main burial chamber contained the body accompanied by adornments, personal effects, and some valuable grave goods (Mahmoud El-Tayeb 2012, 79). Pottery, which provided containers for grave goods and was the major component of burial assemblages, included tableware (such as cups, bowls, and goblets) and utility wares (such as beer/storage jars and cooking pots) (Mahmoud El-Tayeb 2012, 81). Food, consisting mainly of meat such as lamb or goat, was placed inside the burial chamber (Mahmoud El-Tayeb 2012, 82). Offerings of cattle meat were not common in Nubia, though examples have been recorded at El-Hobagi (Lenoble et al. 1994) and more recently at El-Kassinger Bahry (Paner 1998, 129). Animal sacrifice was also practised in this region, though on a very limited scale (see Volume I, Chapter 8; Mahmoud El-Tayeb 2012, 82). It appears that the animal was first slaughtered, then intentionally placed near the edge of the shaft, and finally buried beneath the earthen mound (Mahmoud El-Tayeb 2012, 82). A sacrificed animal or animals were either placed directly in the grave in the Kerma period (see above), or buried in the grave shaft, outside the burial chambers, as was recorded in the X-Group tumuli at Ballana and Qustul (Emery and Kirwan 1938). Another interesting issue is the presence of hearths associated with burials. Attention was first drawn to this by Lenoble during the excavation of the tumulus field at El-Kadada, where hearths were observed on the ground surface at the edge of the descending ramp, just in front of the entrance to the burial chamber (Lenoble 1987, 92). Traces of fire have been recorded at some burial grounds in the Dongola Reach, for example at the cemeteries in El-Ghaddar (Mahmoud El-Tayeb 1994) and El-Zuma (see Volume I, Chapters 3 and 4), and in the Fourth Cataract region at El-Kassinger. Lenoble assumes that meat had been cooked and consumed during the inhumation process, and before the burial was finally sealed, as part of an organized ceremony which he referred to as a "Funerary Banquet" (Lenoble 1994, 95–96). At El-Zuma, pieces of charcoal were found on the top surface of the pier in T.25, and at the bottom of the external shaft of the tunnel in T.5 (Mahmoud El-Tayeb 2010, 209).

After the post-Meroitic transition (*c.* AD 600), as mentioned above, three Kingdoms—Nobadia in the north, Makuria in the middle and Alwa (Alodia) in the south—took shape in Ancient Nubia, heralding the arrival of the Christian period, which lasted till around AD 1400 (Edwards 2004, 195). In the pottery of this period, painted decoration and religious themes appeared, and new types of pottery began to be produced (Edwards 2004, 234). Several pottery-producing centres have been discovered in Lower Nubia and the Makurian area. The revival of wheel-made pottery manufacture signals further innovation. Faras wares were also produced at Old Dongola and perhaps Ghazali in the Dongola Reach (Edwards 2004, 234, 235–236). In the 11th century, a range of new wares appeared. Some vessels may have been made at Old Dongola, which may have become the main producer of later decorated wares (Edwards 2004, 236).

In the southern part of Upper Nubia, Alodian pottery seems to have developed out of post-Meroitic traditions, and handmade manufacture still existed. Black burnished pottery was common in this region. The new and most distinctive pottery is known as Soba Ware (named after the capital of the Alodian kingdom), and consists of bowls and

basins, with decoration painted over a black or brown slip (Edwards 2004, 224).

After the dissolution of the Medieval Nubian kingdoms, the 16th century saw the establishment of the Funj Sultanate of Sinnar and the Sultanate of Darfur, and the introduction of Islam (Edwards 2004, 256; Adams 1987; Crawford 1951). Pottery of this period tends to be identified simply as 'Islamic' or 'Funj.' The Funj pottery types consist mainly of large flat-bottomed handmade dishes elaborately decorated with incised geometric designs, braziers, incense burners, and tobacco pipes (Edwards 2004, 270).

The short historical overview presented above outlines the changes and/or continuation of burial customs and traditions throughout the long history of Ancient Nubia. The El-Zuma cemetery bears witness to the beginnings of the Kingdom of Makuria, which flourished in the territory of Ancient Nubia between the Third and Fifth Cataracts during the 4th–6th centuries AD (Mahmoud El-Tayeb 2006; 2012). The excavations have uncovered burial architecture and artefacts of material culture attributable to early Makurian times. Pottery makes up the largest group of finds recovered from this site. Many vessels were found *in situ*, inside the burial chambers, or broken and scattered in the shafts. Little is known about the settlements of this period [see **Table 2.1**], and there is no evidence of any pottery workshops, which begs the question: Where was this pottery produced?

Ethnographical observations of pottery making in the El-Zuma and Karima regions (Czyżewska-Zalewska and Kowarska 2020) revealed similarities between modern and ancient pottery, suggesting that this is a tradition that has not changed, or changed only a little over the centuries. This could perhaps be indicative of the fact that cultural changes in general did not occur rapidly, and we should bear this in mind when examining materials from El-Zuma.

2 State of Archaeological Research into the Post-Meroitic Period

As mentioned above, the post-Meroitic period is the most relevant to the analysis of the El-Zuma burials, and it is essential to summarize the state of archaeological research into this period. Archaeological sites connected with the post-Meroitic period are presented below in the form of a table [**Table 2.1**]. Sites are itemized in geographical order from north (Lower Nubia) to south (Upper Nubia). The table lists different types of sites, such as settlements, cemeteries, and fortresses, and includes data from surveys as well as excavations.

As we can see in the table, the post-Meroitic period is well represented, mainly by cemeteries which were discovered in Lower and Upper Nubia. Tumulus cemeteries include burials of the elite, rulers and other important members of Nubian society (Drzewiecki 2016, 14–15). Tumulus fields dated to the post-Meroitic period were very widespread across much of Central Sudan (Edwards 2004, 188–189).

Fortifications are not widely represented in the post-Meroitic period. Fortresses were located south of the Fifth Cataract, but during the post-Meroitic to medieval period no significant political centre formed in this region (Drzewiecki and Stępnik 2014).

Settlements are less well-represented in the archaeological record of this period. Some burials of post-Meroitic date were recorded close to the Meroitic settlement sites of Musawwarat es-Sufra and Naqa. These two sites seem to have been largely abandoned, although a small Christian community may have been established at the latter during the early medieval period (Edwards 2004, 187). Post-Meroitic activity was observed in the earlier layers at Sonyiat (Orzechowska 2003, 443, 446–447, 452–453) and Selib (Cedro 2017). Soba, capital of medieval Alodia, was probably established during this period, and distinctive post-Meroitic pottery has been found in early levels there (Edwards 2004, 187).

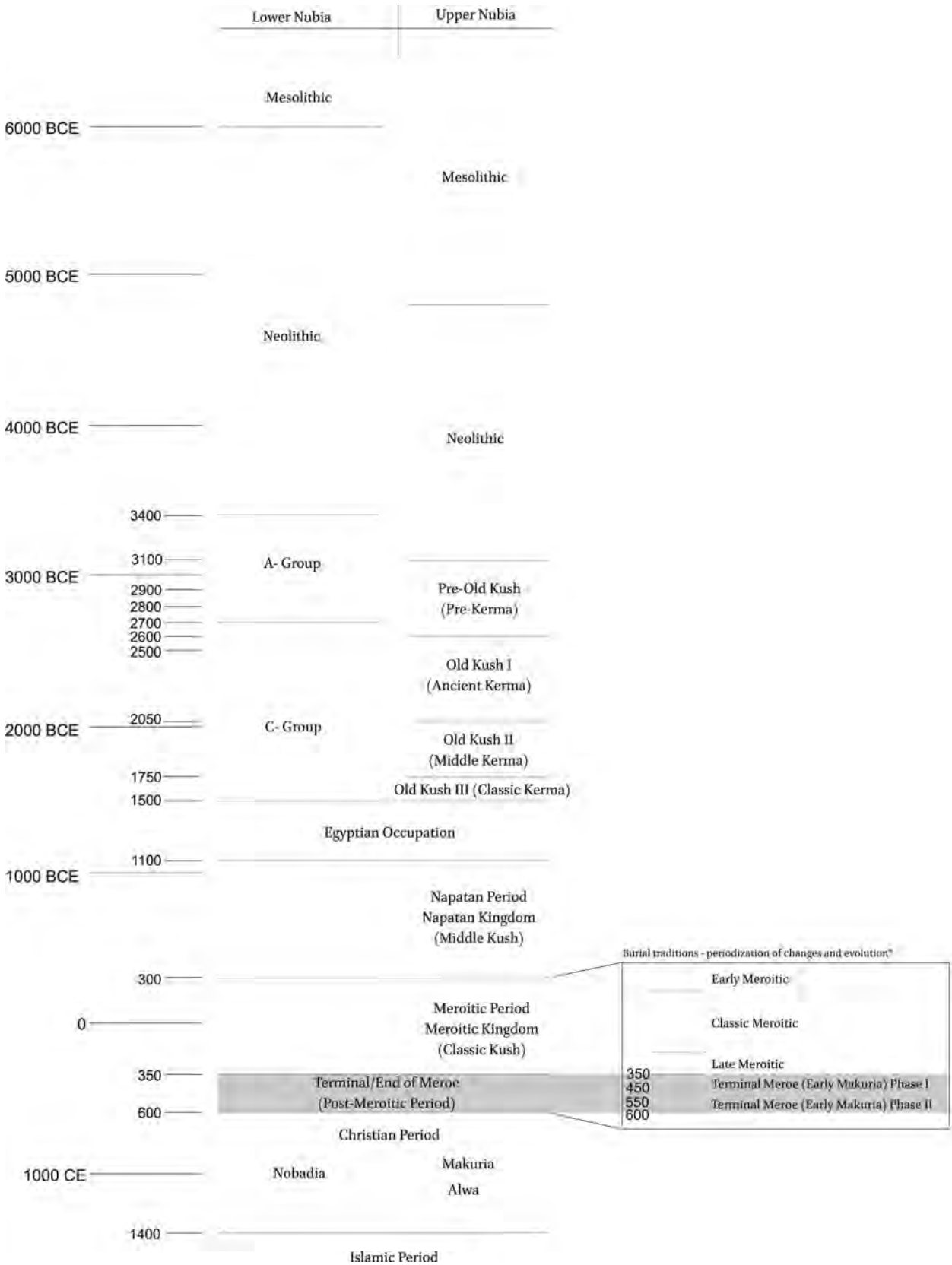

FIGURE 2.2 General chronological table based on chronology of Mesolithic and Neolithic Sudan (David and Salvatori 2019, Fig. 2), and timeline of Kush, Nubia, and Christian Nubia (Emberling and Davies eds. 2019, x–xi; Obłuski 2014, 9); * periodization according to burial traditions after Mahmoud El-Tayeb 2012

TABLE 2.1 State of archaeological research into the post-Meroitic–Early Makuria period

Archaeological site	Discovery context	Additional information	Date	References
		Lower Nubia		
El Hesa	graves	cemetery 2	5th–6th century AD	Reisner 1910, 9–15
El-Biga	graves	cemetery 59	5th–6th century AD	Reisner 1910, 9–16
Bab Kalabsha	graves	cemetery 59	X-Group	Firth 1912
Dandur	graves	cemetery 63	X-Group	Firth 1912
Gerf Husein	graves	cemeteries 27 and 74	X-Group	Firth 1912
Aman Daud	graves	cemetery 92	X-Group	Firth 1912
Shalub Batha	graves	cemetery 75	X-Group	Firth 1912
Qasr Ibrim	graves	cemetery 192	post-Meroitic	Alexander 1999; Mills 1982
Gebel Adda	graves	cemeteries 3 and 4	X-Group	Millet 1963; Huber and Edwards 2012
Ballana	graves		X-Group, 4th–6th century AD	Emery and Kirwan 1938
Qustul	graves		X-Group, 4th–6th century AD	Emery and Kirwan 1938
Faras area	habitation	south of Faras	X-Group and Christian times	Nordström 1962; Verwers 1962; Williams 1993
Serra East and West	graves		Meroitic, X-Group	Nordström 1962; Verwers 1962; Williams 1993
Argin	graves, habitation		X-Group and Christian times	Nordström 1962; Verwers 1962; Williams 1993
Gezira Dabarosa	graves, habitation		X-Group and Christian times	Nordström 1962; Verwers 1962; Williams 1993
Gudhi	graves		X-Group	Reisner 1910
		Upper Nubia		
Gemmai	graves	cemetery	post-Meroitic	Sakamoto 2016a
Kulubnarti	graves	cemetery, Site 21-S-46	Ballana Culture (X-Group)	Adams et al. 1999, 7
Sesebi	graves, habitation		AD 350–550	Edwards 1994; Osman and Edwards 2012, 128–133
El-Ga'ab	graves	cemetery	post-Meroitic	Tahir 2012
El-Ghaddar	graves		4th–6th century AD	Godlewski and Kociankowska-Bożek 2010; Mahmoud El-Tayeb 1994
Hambukol	graves		4th–5th century AD	Grzymski 1991
Old Dongola	graves, fortifications		Late Meroitic—post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Hammur-Abbasiya	graves	cemetery	post-Meroitic	Mahmoud El-Tayeb 2003; Phillips and Mahmoud El-Tayeb 2003
Dam Debba-Nuri	graves, survey	cemeteries	post-Meroitic	Bashir 2014
Argi	graves, survey	Argi 48, 65	post-Meroitic/Early Dongola	Żurawski 2003, 176–206
Abkur	graves	Abkur 39, 55, 69	post-Meroitic	Żurawski 2003, 89–90, 207–223
Soniyat	habitation, survey		post-Meroitic	Orzechowska 2003
Selib	habitation	Selib 3, refuse dump	6th–7th century AD	Cedro 2017
Tergis	survey	Tergis 47, 54	post-Meroitic	Żurawski 2003, 234–261
Affad	survey	Affad 18, 19, 28, 37, 60, 64	post-Meroitic	Żurawski 2003, 262–290
Ed-Diffar	survey	Ed-Diffar 18	post-Meroitic	Żurawski 2003, 291–304
Mansourkuti	graves	cemetery	Late Meroitic—post-Meroitic	Bashir 2014
Wadi Muqaddam	graves	cemetery	post-Meroitic	Mallinson et al. 2018
Usli	graves	cemetery	Meroitic and post-Meroitic	Żurawski 2001
El-Zuma	**graves**	**cemetery**	**Early Makuria AD 450–550**	
El-Detti	graves	cemetery	Early Makuria AD 450–550	Mahmoud El-Tayeb et al. 2016
Tanqasi	graves	cemetery	post-Meroitic	Godlewski 2008; Shinnie 1954; Wyżgoł and Mahmoud El-Tayeb 2018
Merowe Sheriq	graves, fortifications		post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015; Klimaszewska-Drabot 2010a

TABLE 2.1 State of archaeological research into the post-Meroitic–Early Makuria period (*cont.*)

Archaeological site	Discovery context	Additional information	Date	References
Wadi Abu Dom	graves		post-Meroitic	Gabriel and Lohwasser 2010; Lohwasser and Karberg 2012; Gabriel 2014; Lohwasser, Eger, and Karberg, 2015
Nuri	graves		post-Meroitic	Sidebotham, Thomas, and Harrell 2010
Umm Ruweim 1	graves, fortifications		Late Meroitic—post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik, 2014; Rees, Lahitte, and Näser 2015; Klimaszewska-Drabot 2010a; El-Nur and Bandi 1994
Khor Al-Greyn	graves		post-Meroitic	El-Nur and Bandi 1994
Umm Kuweib	fortifications		Late Meroitic—post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Umm Muri	habitation	settlement	Late Meroitic–Early Christian	Thomas 2008
El-Kassinger Bahry	graves	HP 47, HP 47 tumuli	post-Meroitic	Mahmoud El-Tayeb 1998; Mahmoud El-Tayeb and Kołosowska 2007a, 2007b
Saffi Island	graves		post-Meroitic	Phillips and Mahmoud El-Tayeb 2005; Żurawski 2005, 2007b
Jebel Kulgeili	graves		post-Meroitic	Ali Mohammed and Hussein 1999
El-Kassinger Bahry area	graves	HP112, 129, 135, 142, 537	Meroitic and post-Meroitic	Paner and Borcowski 2005, 213–216
Fourth Cataract	graves		post-Meroitic	Ahmed 2003
Fourth Cataract	graves	cemetery 3-Q20	post-Meroitic	Wolf 2004
Fourth Cataract	graves	cemeteries 3-Q-33, 3-Q-102	post-Meroitic	Wolf and Nowotnick 2005
Fourth Cataract	habitation	setttlement 3-Q-14	post-Meroitic	Wolf and Nowotnick 2005
Fourth Cataract	graves	cemetery 3-R-69	post-Meroitic	Wolf and Nowotnick 2006
Fourth Cataract	graves	setttlement 3-R-103	post-Meroitic	Wolf and Nowotnick 2006
Fourth Cataract	graves	cemetery 3-N-160	post-Meroitic	Wolf and Nowotnick 2007
Ed-Doma	graves		post-Meroitic	Welsby 2005
Fourth Cataract	graves, habitation	71 cemeteries, 17 settlements	post-Meroitic	Paner and Pudło 2010a
Suegi	fortifications	fortifications	Late Meroitic or post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
El Tereif	grave	cow grave	post-Meroitic	Welsby and Welsby Sjöström 2011
El-Haraz	graves		post-Meroitic	Ali Mohammed and Hussein 1999
Amri and Kirbekan area	graves		post-Meroitic	Welsby 2003, 2010
Bayuda Desert	graves	cemetery BP86	post-Meroitic	Paner and Pudło 2010b
Umm Melykta	graves		post-Meroitic	Edwards and Fuller 2005
Dar al-Manasir	graves		post-Meroitic	Budka 2005
Us, Sur, Sherari	graves		post-Meroitic	Näser 2007, 125–126
between **El-Gerif** and **Abu Hamed**		HP543, HP544, HP545, HP546, HP547, HP548, HP550, HP551, HP554, HP557, HP558	post-Meroitic	Paner and Borcowski 2005, 221–226
El-Sada	graves		post-Meroitic	Osypiński 2007; Chłodnicki and Żurawski 2005
Hagar El-Beida	graves	Hagar El-Beida 1, 2	Late Meroitic—post-Meroitic	Longa 2007; Chłodnicki and Stępnik 2013; Lemiesz 2007; Chłodnicki and Żurawski 2005
El-Ar	fortifications		Late Meroitic or post-Meroitic, 6th century AD	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
	graves	cemetery	post-Meroitic	Chłodnicki, Longa, and Osypiński 2010; Żurawski 2010b
Umm Saffaya	graves	cemetery	post-Meroitic	Chłodnicki and Żurawski 2005; Chłodnicki, Longa, and Osypiński 2010
Keheili	graves		post-Meroitic	Chłodnicki, Longa, and Osypiński 2010

TABLE 2.1 State of archaeological research into the post-Meroitic–Early Makuria period (*cont.*)

Archaeological site	Discovery context	Additional information	Date	References
Gamamiya	graves		post-Meroitic	Chłodnicki and Żurawski 2005; Chłodnicki, Longa, and Osypiński 2010
Shemkhiya	graves		post-Meroitic	Chłodnicki and Żurawski 2005; Żurawski 2007a
Mikeisir	fortifications		Late Meroitic or post-Meroitic, 6th century AD	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Morgat Island	fortifications		Late Meroitic or post-Meroitic, 6th century AD	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Kurgus	graves		post-Meroitic	Welsby Sjöström 2001
Gandeisi	fortifications		Late Meroitic or post-Meroitic, 6th century AD	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Dangeil	graves		post-Meroitic	Anderson, Bashir, and elRasheed 2015
El-Gol	graves		post-Meroitic, 4th–6th century AD	Jesse, Fiedler, and Gabriel 2013
Jebel Nakhara	fortifications		Late Meroitic or post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Akad	graves		post-Meroitic	Ali 2002; Faroug, Saeed, and Tsakos 2007; Faroug and Tsakos 2005
Gabati	graves		post-Meroitic	Edwards 1998
El-Hobagi	graves	cemetery Hobagi III, IV	4th century AD	Lenoble 2004, 2018
El-Kadada	graves		4th–5th century AD	Geus 1983; Caneva 1994
El-Hatra	graves		post-Meroitic	Geus 1984
Hosh el-Kafir	fortifications		Late Meroitic or post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Abu Rtela (Abu Erteila)	graves		4th–7th century AD	Fantusati et al. 2010
Musawwarat es-Sufra	graves		post-Meroitic	Daszkiewicz et al. 2016; Daszkiewicz and Schneider 2001; Joachim 2014
Sabaloka	graves		post-Meroitic	Varadzinová Suková et al. 2015
Wadi Mukhtar	fortifications		Late Meroitic or post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Hosh el-Kab	fortifications		Late Meroitic or post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Umm Marrahi	fortifications		Late Meroitic or post-Meroitic	Drzewiecki 2013; Drzewiecki and Stępnik 2014; Rees, Lahitte, and Näser 2015
Kabbashi	graves		post-Meroitic	Caneva 1994
Al-Khiday	graves		post-Meroitic	Salvatori et al. 2014
El-Gereif	graves		post-Meroitic	Geus 1984, 12–13
El-Sabeil	graves		4th–5th century AD	Mahmoud El-Tayeb 1999
Gheresli	graves		post-Meroitic	Abd el-Rahman 2016
Amara el-Nasri	graves		post-Meroitic	Mohamed 2003
Jebel Ofreik	graves		4th–5th century AD	Manzo 2004

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CHAPTER 3

Pottery

1 General Information about Vessel Typology

Chapter three focuses on a discussion of pottery production technology and the description of vessel types presented in the catalogue section of this book.

The author presents methods of pottery classification, as well as descriptions of macroscopic fabric groups, pottery-shaping techniques, firing conditions, surface treatments and the varieties of decoration represented in the El-Zuma ceramic assemblage. As examples to illustrate hand-shaping methods, the author uses information obtained during ethnoarchaeological studies of modern traditions of hand-shaping vessels, carried out as part of the Pots Project (Czyżewska-Zalewska and Kowarska 2020), which is a sub-project of the Early Makuria Research Project. This is followed by descriptions of the wares encountered at the El-Zuma site.

The last part of this chapter focuses on the description of pottery types, which are presented in the catalogue section (see Chapter 7, this volume). Typological descriptions are based on the morphological features of the vessels. The pottery is divided into functional groups, such as cups, bowls, jars, etc, which are subdivided into individual types and variants. The typology used in this volume is a continuation, with slight modifications, of a general typology established by Edyta Klimaszewska-Drabot during the 2007–2009 excavation seasons (Klimaszewska-Drabot 2010b, 480–485), which was subsequently expanded to include new groups and types distinguished during later excavations. Klimaszewska-Drabot divided the assemblage into seven main groups with several types and subtypes: group I—cups; group II—bowls; group III—spouted bowls; groups IV–VI—handmade pots and bowls; group VII—handmade bottles/jars (Klimaszewska-Drabot 2010b, 480–484). New groups and types (partially published: Czyżewska-Zalewska 2016, 727–733) were identified after analysing material from later excavations. Also, some modification of the typology, especially among the cooking pots and bowls (see Chapters 3.6.4–3.6.6, this volume), was necessary in light of all analysed pottery from the site.

The typology presented by the current author in an earlier published article (Czyżewska-Zalewska 2016, 727–733) also needs to be modified. The main modification concerns jars (group VII), for which the original typology proposed by the author is not quite correct in the light of all examined vessels from this assemblage (see Chapter 3.6.7, this volume).

Group I comprises five types of wheel-made cups. Types I.1–I.4 are red-slipped and mostly burnished cups. Type I.5 represents cups with red slip but no burnish. Single examples of cups of different shapes are collected together under the heading 'Varia'.

Group II consists of nine types of bowls. Bowls of types II.1–II.7 were wheel-made; bowls of types II.8 and II.9 were handmade. Bowls of types II.1 and II.2 were red-slipped and in most cases burnished, like cups of types I.1–I.4. Bowls of type II.3 are a little bit different in shape to those of types II.1 and II.2, and their surfaces are red-slipped but not burnished. Type II.4 bowls feature grooved decoration on the external surface. The bowl surfaces were red-slipped and polished. Type II.5 are footed bowls with red-slipped and polished surfaces. Type II.6 consists of a group of bowls with abundant grooved decoration on the external surface (they differ in shape from bowls of type II.4). These bowls were slipped and polished. Larger bowls of type II.7 were slipped on both surfaces, but the external surface was coated with red slip while the internal one was white-slipped. Types II.8 and II.9 are large handmade bowls which are either shallow (II.8) or deep (II.9). Single examples of bowls of different shapes are collected together under the heading 'Varia'.

Group III represents examples of spouted bowls.

Groups IV–VI are made up of handmade vessels. Group IV bowls and group V pots both feature characteristic clay added to the bottom of the vessel. Group VI comprises closed forms of pots of different shapes and variants.

Group VII consists of handmade bottles or jars. This group is divided into four main types: jars with a broad mouth and shoulders; jars with a narrow mouth; bottles with a short neck; and bottles with a long neck. These are in turn subdivided into variants based on decoration and surface treatment. Single examples of jars of different shapes and production technology are collected together under the heading 'Varia'.

Group VIII represents wheel-made stands.

Group IX consists of wheel-made goblets of three different types.

Group X represents several examples of wheel-made lamps. The oil lamps presented in this volume were analysed by Aneta Cedro.

Group XI consists of wheel-made pots. Vessels known as *qawadis* are homogenous in this group and it does not feature any sub-types.

Group XII represents transport and table amphorae, most of which were imported vessels.

Group XIII represents bottles, and group XIV consists of jugs. These vessels were imported mainly from Egypt.

A separate category (not included in the typology) of ceramic finds in terms of function rather than morphological features are scrapers or digging tools. This is a group of sherds from different types of vessels, mainly jars, large bowls or *qawadis*, which were re-used as scrapers.

2 Pottery Classification

After the excavation of 28 tumuli, 750 complete vessels and diagnostic pottery fragments, including rims, handles, and bases/RHB, were recorded using descriptions, photographs and drawings; a further 280 undiagnostic body sherds (including scrapers) or groups of sherds were also recorded, but only in photographs.

The pottery has been classified in terms of morphology and vessel shape. Other details, such as production technology, surface treatment and decoration, have been used to distinguish variants of individual types. Typological and technological analysis is included for complete vessels and diagnostic sherds.

The following main morphological classes have been distinguished: cups, goblets (footed vessels), bowls, jars, pots, amphorae (two-handled containers), jugs (vessels with one handle and a narrow neck, used for storing liquids), bottles (containers with a narrow neck without handles), *qawadis* (jars used for water) and oil lamps (for detailed information, see Chapter 3.6, this volume).

The descriptions of pottery types based on the morphological features, shape, size or breadth of the vessels. The author has used calculations of *aperture index* and *vessel index* to describe the proportions and sizes of the vessels (Aston 1996, 11).

A glossary of the essential terminology used herein can be found at the end of this volume.

2.1 Aperture Index, Vessel Index *and Vessel Proportions*

The *Aperture Index* and *Vessel Index* are useful formulae that help to classify vessels, especially open forms, but also to determine the proportions of vessels, i.e. whether they are small, tall, slender, or broad or narrow, etc. When assessing vessel forms there is sometimes a fine line between different types, for example between cups and bowls, and in some cases it is difficult to conclude whether we have a cup or maybe a bowl, or to differentiate between shallow and deep cooking bowls. To describe and classify open and closed forms the author has adopted the formulae for calculating *Aperture Index* (*AI*) and *Vessel Index* (*VI*) introduced by David A. Aston in Egyptian pottery classification (Aston 1996, 11).

$$AI = \left(\frac{\text{MBD}}{\text{AP}} \right) \times 100$$

MBD maximum body diameter
AP vessel aperture (= rim diameter?)

The classification presented by the author is as follows:

If the *AI* index is greater than 140, the vessel is described as a closed form. If the *AI* is less than 140, the vessel is described as an open form.

To determine the shapes of vessels (e.g. bowls, cups, etc.) the author uses the *Vessel Index* (*VI*) (Aston 1996, 11–12):

$$VI = \left(\frac{\text{MBD}}{\text{H}} \right) \times 100$$

H vessel height

For the El-Zuma assemblage, the author has used the following definitions of open forms:
– cups when the *VI* is less than 130;
– bowls when the *VI* is between 130 and 275.
Closed forms are more problematic because their shapes are more complicated and it is not possible to use a simple mathematical equation, so in classifying the closed forms of this assemblage, the author uses the *VI* to define different parameters, such as the depth or width of vessels, or to characterize them as shallow, tall, slender or deep.
Globular jars referred to as beer jars and bottles with a *VI* between 75 and 92 are:
– broad when the *VI* is greater than 80;
– medium-broad when the *VI* is between 70 and 80;
– slender when the *VI* is less than 70.
Amphorae have a *VI* of less than 75.
Pots have a *VI* between 110 and 130.
Cups are:
– tall/slender when the *VI* is less than 105;
– medium-tall when the *VI* is between 105 and 130.
Bowls are:
– low/shallow when the *VI* is greater than 180;
– medium-deep when the *VI* is between 140 and 180;
– deep when the *VI* is between 130 and 140.

2.2 *Vessel Size*

In terms of size, large, medium and small vessels can be distinguished.

Cups are:
- small when the height of the vessel is less than 7 cm and the rim diameter is less than 13 cm;
- medium-sized when the height of the vessel is 7–13 cm and the rim diameter is greater than 13 cm;
- large/big when the height of the vessel is more than 13 cm.

Bowls are:
- small when the height of the vessel is less than 7 cm and the rim diameter is less than 13 cm;
- medium-sized when the height of the vessel is 7–13 cm and the rim diameter is greater than 13 cm, or height is less than 7 cm but rim diameter is greater than 13 cm;
- large/big when the height of the vessel is more than 13 cm.

The distinction between jars and bottles can cause certain problems, and it is sometimes hard to determine whether we have a bottle or a jar. This issue has been broadly discussed by Mahmoud El-Tayeb and by the author in previous articles (Mahmoud El-Tayeb 2012, 89, 91; Czyżewska-Zalewska 2017, 730–732).

Jars are:
- small when the height of the vessel is 20–35 cm (in some cases less than 20 cm) and the maximum vessel diameter is 20–25 cm;
- medium-sized when the height of the vessel is 30–39 cm and the maximum vessel diameter is 25–39 cm;
- large when the height of the vessel is 40–75 cm and the maximum vessel diameter is 40–60 cm.

Bottles are:
- small when the height of the vessel is 14–19 cm and the maximum vessel diameter is 12–14 cm;
- medium-sized when the height of the vessel is 20–35 cm and the maximum vessel diameter is 15–30 cm;
- large when the height of the vessel is greater than 36 cm and the maximum vessel diameter is greater than 31 cm.

2.3 *Rim and Base Shape*

The author determines different rim types in this assemblage based on the shape and inclination of the rims. A distinction is made between simple (unmodelled) and modelled rims, which can be straight, flaring or narrowing. In addition, rim lips can be rounded, pointed or flat [**Fig. 3.1**].

Base types are determined by their shape and any additional elements, such as a base-ring, foot or toe (in the case of amphorae). Bases can be rounded, pointed or flat; some are modelled with a base ring or have an added foot [**Fig. 3.2**].

3 Macroscopic Fabric Group Descriptions

Macroscopic fabric group descriptions are based on general visual analysis and on estimations of the size and quantity of specific organic and mineral inclusions using a hand lens (x 10 magnification) in conjunction with a percentage inclusion estimation chart and an inclusion sorting chart [**Fig. 3.3**]. Colours are described with reference to *The Munsell Soil Color Book 2013*. Photographs were taken through an Optika SZO-2[1] microscope. Each macroscopic fabric group has been given the prefix ZF (Zuma Fabric) followed by a sequential number (1, 2, 3, etc.). This volume does not include details of laboratory examination and chemical composition of the pottery fabrics, as these will be published in a separate article (Daszkiewicz, Czyżewska-Zalewska, Mahmoud El-Tayeb, forthcoming) and as part of the results of the ethnoarchaeological Pots Project. The Pots Project documents modern pottery workshops in Sudan; El-Zuma was one of the areas included in this study. The documentation of modern traditional workshops involved collecting samples of clays and vessels. Modern samples will be analysed and compared with ancient pottery to identify the compositional diversity of clay used in the production of pottery. The authors will be able to point out and discuss the similarities and differences between ancient and modern vessels (Czyżewska-Zalewska and Kowarska 2020).

3.1 *ZF1* [*Fig. 3.4*]

Abundant in fine quartz with sporadic medium quartz; small quantity of silver mica and fine organic inclusions; small quantity of soft red particles, and small quantity of fine to medium white particles.

Dense and moderately sorted.

Medium-hard to hard.

Cross-section colour (mainly no core visible; faint core observed in some cases)—red (2.5YR 4/6–5/6 red), reddish brown (2.5YR 5/4 reddish brown, 5YR 4/4 reddish brown), brown (7.5YR 4/3–5/4 brown).

Wares and types of vessels (see Chapter 3.4, this volume)
- CW.A1.RSW.1; small bowls, types II.2, II.3
- CW.A2.RSW; cups, types I.1, I.2, I.3; small bowls, types II.1, II.2
- CW.A3.RSW; small bowls, types II.3, II.4, II.5

1 All photographs in this chapter were taken using an Optika SZO-2 (Camera DFK 23UP031) microscope with Nikon NIS-Elements software at the Polish Centre of Mediterranean Archaeology, University of Warsaw.

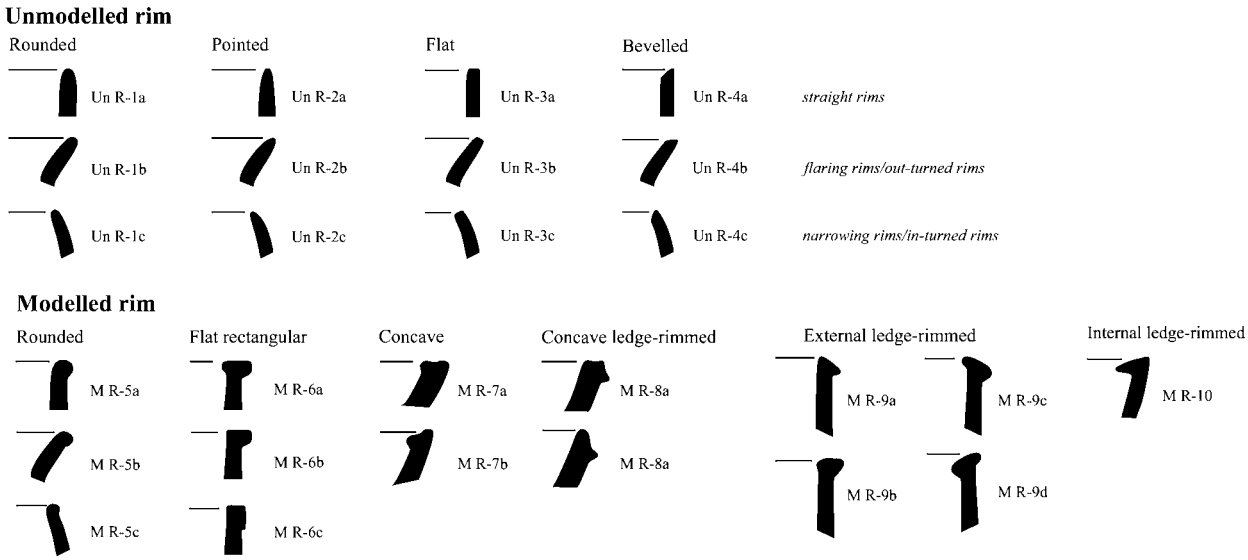


FIGURE 3.1 Different types of rims
DRAWING BY E. CZYŻEWSKA-ZALEWSKA

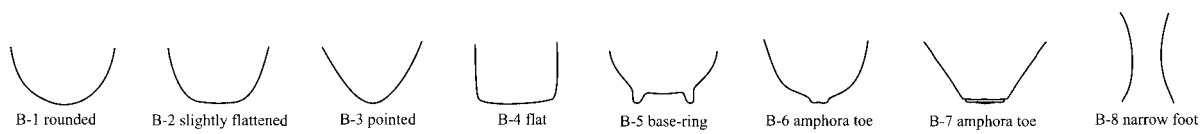


FIGURE 3.2 Different types of bases
DRAWING BY E. CZYŻEWSKA-ZALEWSKA

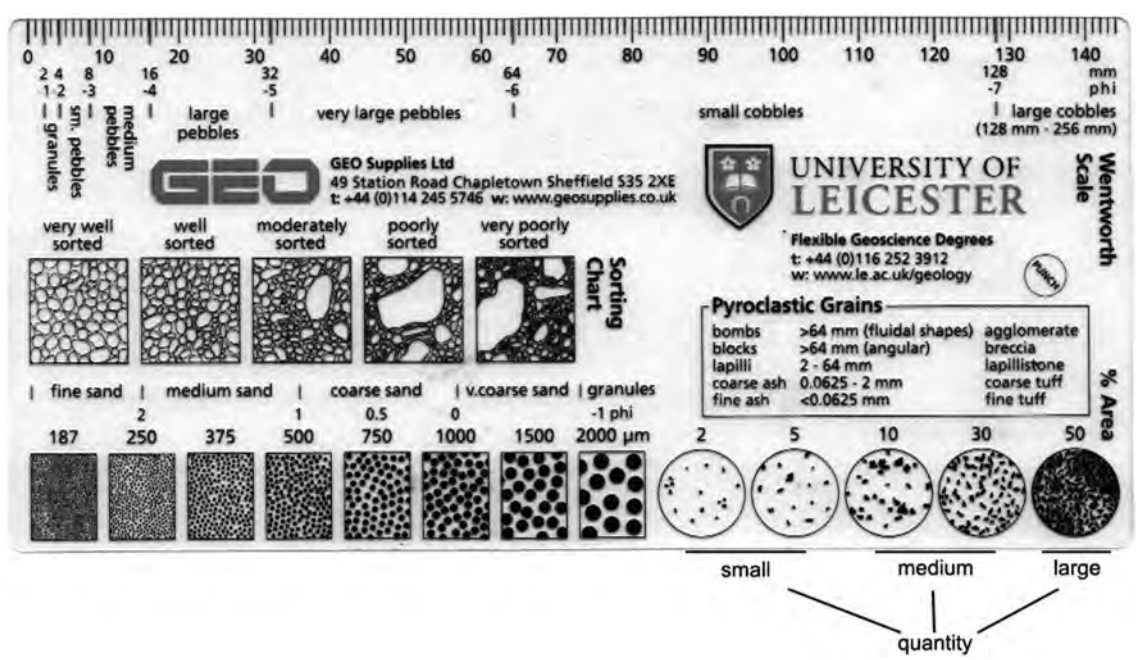


FIGURE 3.3 Comparison charts
PREPARED BY GEO SUPPLIES LTD AND UNIVERSITY OF LEICESTER

3.2 *ZF2* [*Fig. 3.4*]
Moderate amount of fine quartz, sporadic medium and large quartz, and large amount of fine to medium organic inclusions; silver mica occurs sporadically; small quantity of fine to medium white particles.

Medium-dense and poorly sorted.

Soft to medium-hard.

Cross-section colour (mainly diffuse core is present)—red (2.5YR 4/6–5/6 red), reddish brown (2.5YR 5/4 reddish brown, 5YR 4/4 reddish brown), brown (7.5YR 4/3–5/4 brown), grey (7.5YR 3/1 very dark grey, 2.5Y 4/1 dark grey).

In comparison with ZF1 there are more organic inclusions and voids.

Wares and types of vessels (see Chapter 3.4, this volume)
– CW.A2.RSW; cups, types I.1, I.2, I.3; small bowls, types II.1, II.2
– CW.B1.UW; cups, type I.1; small bowls, type II.3

3.3 *ZF3* [*Fig. 3.4*]
Moderate quantity of fine quartz; small quantity of medium quartz; moderate quantity of fine to medium organic inclusions; small quantity of soft red particles; silver mica and fine white particles occur sporadically.

Dense and moderately sorted.

Medium-hard to hard.

Cross-section colour (mainly diffuse core is present)—red (2.5YR 4/6–5/6 red), reddish brown (2.5YR 5/4 reddish brown, 5YR 4/4 reddish brown), brown (7.5YR 4/3–5/4 brown).

In comparison with ZF2 there are fewer organic inclusions, and in comparison with ZF1 a large number of medium and large quartz grains and organic inclusions are visible.

Wares and types of vessels (see Chapter 3.4, this volume)
– CW.A1.RSW.1; small bowls, types II.1, II.2, II.3
– CW.A2.RSW; cups, types I.2, I.3, I.4; small bowls, types II.1, II.2
– CW.A3.RSW; small bowls, type II.4
– CW.A4.R/WSW; small bowls, type II.7

3.4 *ZF4* (*Probably Lower Nubia Area*) [*Fig. 3.5*]
Abundant in fine to medium quartz with sporadic silver mica; small quantity of soft red particles; small quantity of fine white particles.

Dense and well sorted.

Medium-hard to hard.

Cross-section colour (mainly no core visible; faint core observed in some cases)—mostly red (2.5YR 4/6–5/6 red), rarely reddish brown (2.5YR 5/4 reddish brown, 5YR 4/4 reddish brown) and brown (7.5YR 4/3–5/4 brown).

Wares and types of vessels (see Chapter 3.4, this volume)
– CW.A1.RSW.2; cups, type I.5; small bowls, types II.3, II.4, II.6; oil lamps, type X
– CW.A2.RSW; cups, type I.2
– CW.A3.RSW; small bowls, types II.3, II.4; goblets, types IX.1, IX.3

3.5 *ZF5* [*Fig. 3.5*]
Large quantity of fine quartz, moderate quantity of medium quartz and small quantity of large quartz; small amount of fine organic inclusions; small quantity of silver mica and fine white particles.

Medium-dense and poorly sorted.

Medium-hard to hard.

Cross-section colour (faint diffuse core is observed)—red (2.5YR 4/6–5/6 red), reddish brown (2.5YR 5/4 reddish brown, 5YR 4/4 reddish brown), brown (7.5YR 4/3–5/4 brown), grey (7.5YR 3/1 very dark grey, 2.5Y 4/1 dark grey).

Wares and types of vessels (see Chapter 3.4, this volume)
– CW.A1.RSW.2; amphorae, type XII.6
– CW.A2.RSW; cups, type I.1; small bowls, type II.2
– CW.A3.RSW; small bowls, type II.4

3.6 *ZF6* [*Fig. 3.5*]
Moderate quantity of fine quartz; medium quartz occurs sporadically; small quantity of fine to medium-fine organic inclusions; small quantity of fine to medium white particles.

Quite dense and moderately sorted.

Cross-section colour (core with sharp margins clearly visible)—black (2Y 2.5/1 black, GLEY1 3/N black), grey (7.5YR 4/1 dark grey, 10YR 3/1 very dark grey).

Hard.

Wares and types of vessels (see Chapter 3.4, this volume)
– CW.B2.UW; spouted bowls, type III.2; *qawadis*, type XI

3.7 *ZF7* [*Fig. 3.6*]
Moderate amount of fine quartz; moderate amount of seeds; small quantity of other fine organic inclusions; moderate quantity of fine white particles, and small quantity of medium and large white particles.

Highly porous and poorly sorted.

Medium-hard.

Cross-section colour (broad core clearly visible)—black (2Y 2.5/1 black, GLEY1 3/N black), grey (7.5YR 4/1 dark grey, 10YR 3/1 very dark grey).

Wares and types of vessels (see Chapter 3.4, this volume)
– CRW.A2.SW.3; jars/bottles, type VII.5
– CRW.B1.UW.2; large bowls, type II.8; spouted bowls, type III.1; pots, type V.1 jars/bottles, type VII.1
– CRW.B2.UW.2; jars/bottles, type VII.2

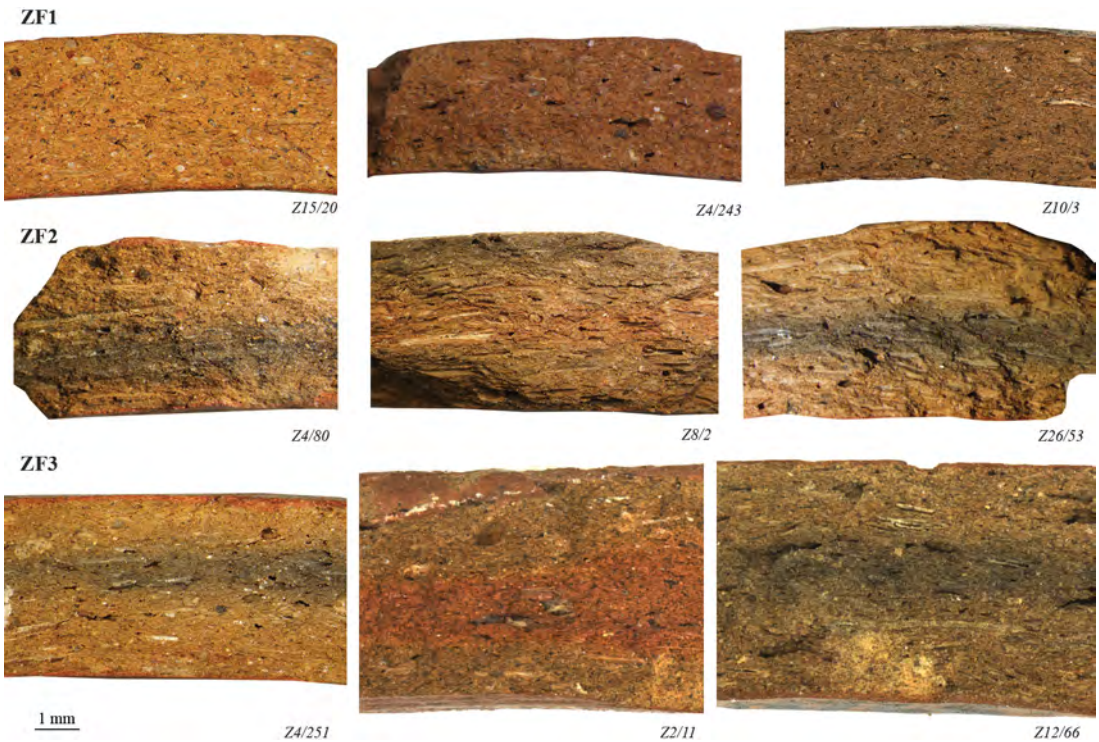


FIGURE 3.4 Microscopic photos of fabrics ZF1, ZF2, and ZF3
PHOTOS BY M. PIORUN

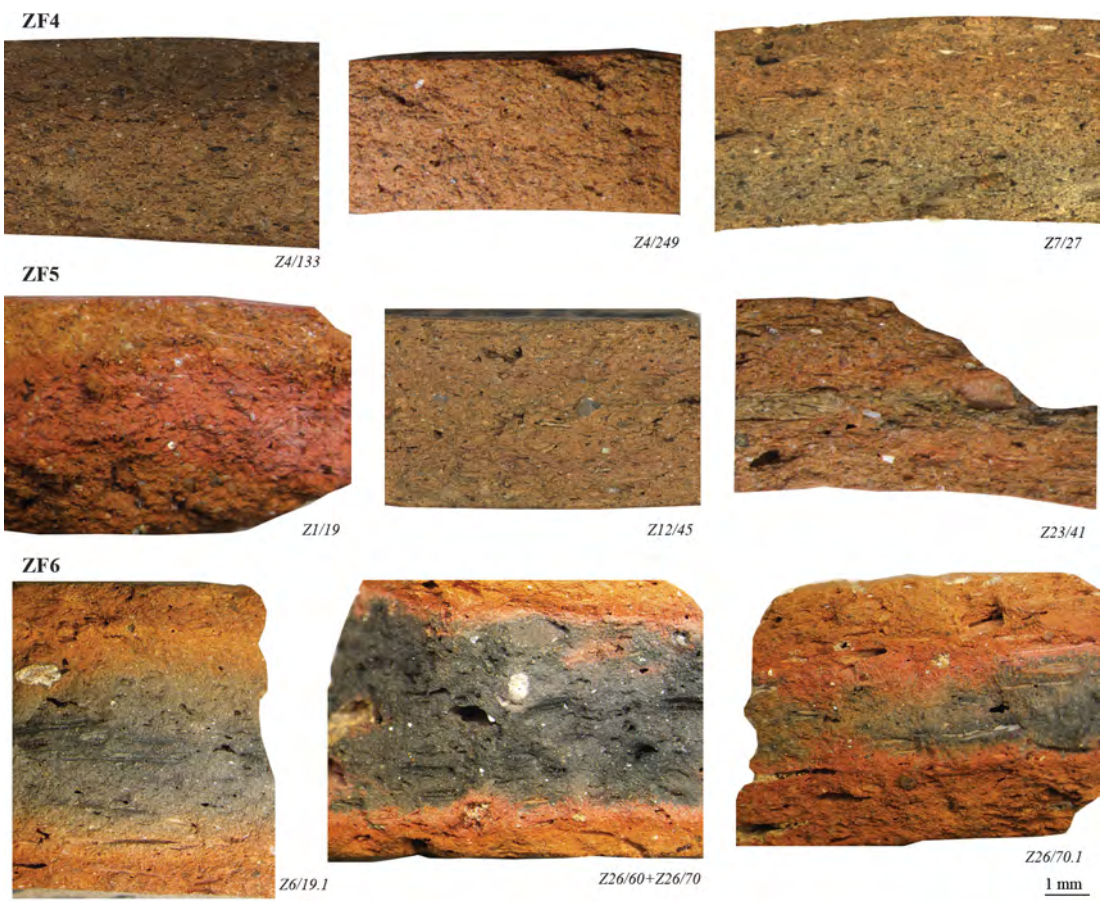


FIGURE 3.5 Microscopic photos of fabrics ZF4, ZF5, and ZF6
PHOTOS BY M. PIORUN

3.8 ***ZF8*** [***Fig. 3.6***]
Moderate amount of fine quartz, moderate amount of medium quartz and small amount of large quartz; large amount of seeds; small quantity of other fine organic inclusions; moderate quantity of fine white particles, small quantity of medium and large white particles.

Highly porous and poorly sorted.

Soft to medium-hard.

Cross-section colour (core with sharp margins clearly visible)—black (2.5Y 2.5/1 black, 5YR 2.5/1 black, GLEY12.5/N black), brown (10YR 3/3 dark brown).

Wares and types of vessels (see Chapter 3.4, this volume)
- CRW.A2.SW.3; jars/bottles, type VII.5
- CRW.A3.SW.2; bowls, type IV.1; pots, type V.1
- CRW.B1.UW.2; bowls, type IV.1; pots, type V.1

3.9 ***ZF9*** [***Fig. 3.7***]
Moderate quantity of fine quartz, small quantity of medium-fine and large quartz; large quantity of fine to medium organic inclusions; moderate to large quantity of fine silver mica, moderate quantity of fine to medium white particles; single small stones.

Highly porous and poorly sorted.

Soft to medium-hard.

Cross-section colour (broad, mainly diffuse core is present)—black (deep black, GLEY12.5/N black, 2.5Y 2.5/1 black, GLEY2 2.5/5PB bluish black), brown (10YR 4/3 dark brown), grey (5Y 5/1 grey).

Wares and types of vessels (see Chapter 3.4, this volume)
- CRW.A1.SW; large bowls, type II.9; jars, type VI.2; jars/bottles, types VII.1, VII.2, VII.5, VII.6
- CRW.A2.SW.1; pots, type VI.1; jars/bottles, type VII.4
- CRW.A3.SW.1; large bowls, types II.8, II.9
- CRW.B1.UW.1; large bowls, type II.8; jars/bottles, types VII.1, VII.2
- CRW.B2.UW.1; bowls, types IV.2, IV.4; jars/bottles, type VII.1
- CRW.B3.UW; bowls, type IV.4; jars/bottles, type VII.1

3.10 ***ZF10*** [***Fig. 3.7***]
Moderate quantity of fine quartz; large quantity of fine to medium organic inclusions and small quantity of large organic inclusions; small to moderate quantity of fine silver mica, moderate quantity of fine to medium white particles; single small stones.

Highly porous and poorly sorted.

Soft to medium-hard.

Cross-section colour (diffuse core is present)—black (GLEY1 2.5/N black, 5Y 2.5/1 black, deep black), brown (10YR 4/2 dark greyish brown, 7.5YR 3/2 dark brown), grey (2.5Y 4/1 dark grey, 2.5Y 3/1 very dark grey).

Wares and types of vessels (see Chapter 3.4, this volume)
- CRW.A1.SW; jars, type VI.2; jars/bottles, types VII.1, VII.2, VII.4, VII.6
- CRW.A2.SW.1; jars, type VI.3; jars/bottles, types VII.1, VII.4, VII.5, VII.6
- CRW.A2.SW.2; pots, type V.3
- CRW.A3.SW.1; large bowls, types II.8, II.9; spouted bowls, type III.1; bowls, type IV.2
- CRW.B1.UW.1; bowls, types IV.1, IV.3; pots, types V.2, V.3, V.4; jars/bottles, type VII.1; stands, type VIII
- CRW.B2.UW.1; large bowls, type II.8; bowls, type IV.3; pots, types V.3, V.4; jars/bottles, type VII.1
- CRW.B3.UW; bowls, type IV.1

3.11 ***ZF11*** [***Fig. 3.7***]
Moderate quantity of fine quartz; small quantity of fine to medium-fine organic inclusions; moderate quantity of fine to large white particles.

Highly porous and poorly sorted.

Medium-hard.

Cross-section colour (broad core with sharp margins clearly visible)—black (5Y 2.5/1 black, GLEY1 2.5/N black).

Wares and types of vessels (see Chapter 3.4, this volume)
- CRW.B1.UW.1; pots, type VI.5
- CRW.B2.UW.1; jars/bottles, type VII.1

Imported Wares [***Fig. 3.8***]

3.12 ***Dongolan Fabrics***
Two fabrics are represented in the El-Zuma repertoire which correspond to the fabric of Dongolan LRA (Pluskota type A) [**Fig. 3.8** top left]:
- fabric similar to Dongolan ALF1, red-orange, brown inclusions (0.7–0.15 mm), brown and grey particles (0.2–0.05 mm), white particles (0.1–0.05 mm); dense, hard, rarely medium-dense fabric; pink break sometimes with grey core;
- fabric similar to Dongolan ALF2, red-orange, inclusions (0.8–0.2 mm), white and grey mineral particles (0.2–0.1 mm); dense, hard, rarely medium-dense and hard fabric; beige break sometimes with light core (Danys 2015, 118–119 and personal communication).

3.13 ***Lower Nubia?***
Single examples probably from the Lower Nubia area, abundant in fine quartz; fine white particles sometimes visible; hard, dense and well sorted; light brown break with no core [**Fig. 3.8** centre left].

3.14 ***Eastern Desert Ware?***
Moderate quantity of fine quartz; small quantity of fine to medium white particles, with small quantity of large white particles; small amount of seeds; medium hard, medium

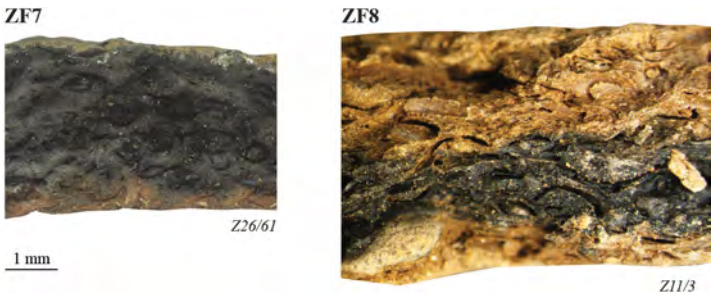


FIGURE 3.6 Microscopic photos of fabrics ZF7 and ZF8
PHOTOS BY M. PIORUN

FIGURE 3.7 Microscopic photos of fabrics ZF9, ZF10, and ZF11
PHOTOS BY M. PIORUN

dense, poorly sorted fabric; black break with clearly visible core [**Fig. 3.8** bottom left] (Barnard 2005–06 and Katarzyna Danys, personal communication).

3.15 *Egyptian Fabrics*

Fabric with small quantity of fine quartz, moderate quantity of soft red particles (fine to medium), small quantity of small white particles, well sorted medium hard fabric with pink break (no core) [**Fig. 3.8** bottom right, Z6/7]; or large quantity of fine to medium quartz, moderate quantity of large quartz, small quantity of fine white particles, dense, poorly sorted, medium-hard fabric [**Fig. 3.8** bottom right, Z7/92].

3.16 *Gazan Fabric*

LRA4 (Zemer 51, Almagro 54; http://potsherd.net/atlas/Ware/GAZA)

White and grey particles, fine quartz and crushed shells. Hard, rough fabric, with abundant sand and limestone temper; varying somewhat in colour, but often with a dark brown (5YR 5/6) surface [**Fig. 3.8** centre right].

3.17 *Asia Minor Fabric*

Late Roman Amphora 3 fabric (https://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/petrology.cfm?id=240)

Deep reddish brown in colour; abundant in silver and golden mica, medium quantity of fine white particles; dense, hard, well sorted fabric; chocolate-colour break with faint diffuse dark brown core [**Fig. 3.8** top right].

4 Ware Descriptions

The term *ware* is used by the author to refer to a class of pottery that shares similar technology, fabric and surface treatment. The examined pottery assemblage has been divided into two main ware categories: common ware and coarse ware (based on general visual analysis using a hand lens x 10 magnification). Common ware is characterized by mineral particles with the presence of organic inclusions ranging from fine to medium-fine, and a medium-dense fabric [see **Fig. 3.3**]. The vessel walls are usually medium-thick (0.4–1cm). This ware is represented by small and medium-sized wheel-made bowls and *qawadis* (see Chapter 3.2, this volume). Coarse ware is characterized by large quantities of organic inclusions and small to moderate quantities of non-organic white particles (probably limestone), and by high porosity. It is represented by handmade jars and large bowls.

Ware descriptions are based on the local pottery assemblage.

4.1 *Common Ware* (*CW*)

The common ware is divided into two categories: slipped wares and uncoated/plain wares.

4.1.1 CW.A—Slipped Wares

Vessels made on the wheel (wheel-made [1] or [2]), mostly red-slipped on both surfaces, sometimes slipped only outside or inside, burnished or polished. Four types of wares have been distinguished in this group.

4.1.1.1 *CW.A1—Red-Slipped Wares* (*CW.A1.RSW*)

Vessels made on the wheel, in most cases slipped on both surfaces, though sometimes only one surface is slipped. Red, reddish brown or brown in colour with a red, light brown or light grey core, this is a medium-dense and medium-hard ware, abundant in quartz.

CW.A1.RSW.1—Red-Slipped Wares, wheel-made (1)

ZF1 – small bowls, types II.2, II.3

ZF3 – small bowls, types II.2, II.3

CW.A1.RSW.2—Red-Slipped Wares, wheel-made (2)

ZF4 – cups, type I.5; small bowls, types II.3, II.6; oil lamps, type X

ZF5 – amphorae, type XII.6

(see Chapter 7.18, Figs 7.92, 7.97, 7.98, 7.102, 7.129, this volume)

4.1.1.2 *CW.A2—Red-Slipped and Burnished Wares* (*CW.A2.RSW*)

Wheel-made (1) vessels, in most cases slipped on both surfaces, though sometimes only one surface is slipped, and burnished mostly on both surfaces. Red, reddish brown or brown in colour with a red, brown or light grey core, this is a medium-dense and medium-hard ware, abundant in quartz, with small to moderate quantities of fine organic inclusions.

ZF1 – cups, types I.1, I.2, I.3; small bowls, types II.1, II.2

ZF2 – cups, types I.1, I.2, I.3; small bowls, types II.1, II.2

ZF3 – cups, types I.2, I.3, I.4; small bowls, types II.1, II.2

ZF4 – cups, type I.2

ZF5 – cups, type I.1; small bowls, type II.2

(see Chapter 7.18, Figs 7.89–7.92, 7.94–7.98, this volume)

4.1.1.3 *CW.A3—Red-Slipped and Polished Wares* (*CW.A3.RSW*)

Wheel-made (2) vessels slipped on both the surfaces, in most cases, and polished mostly on both surfaces. Red, reddish brown or brown in colour with a red, light brown or light grey core, this is a medium-dense and medium-

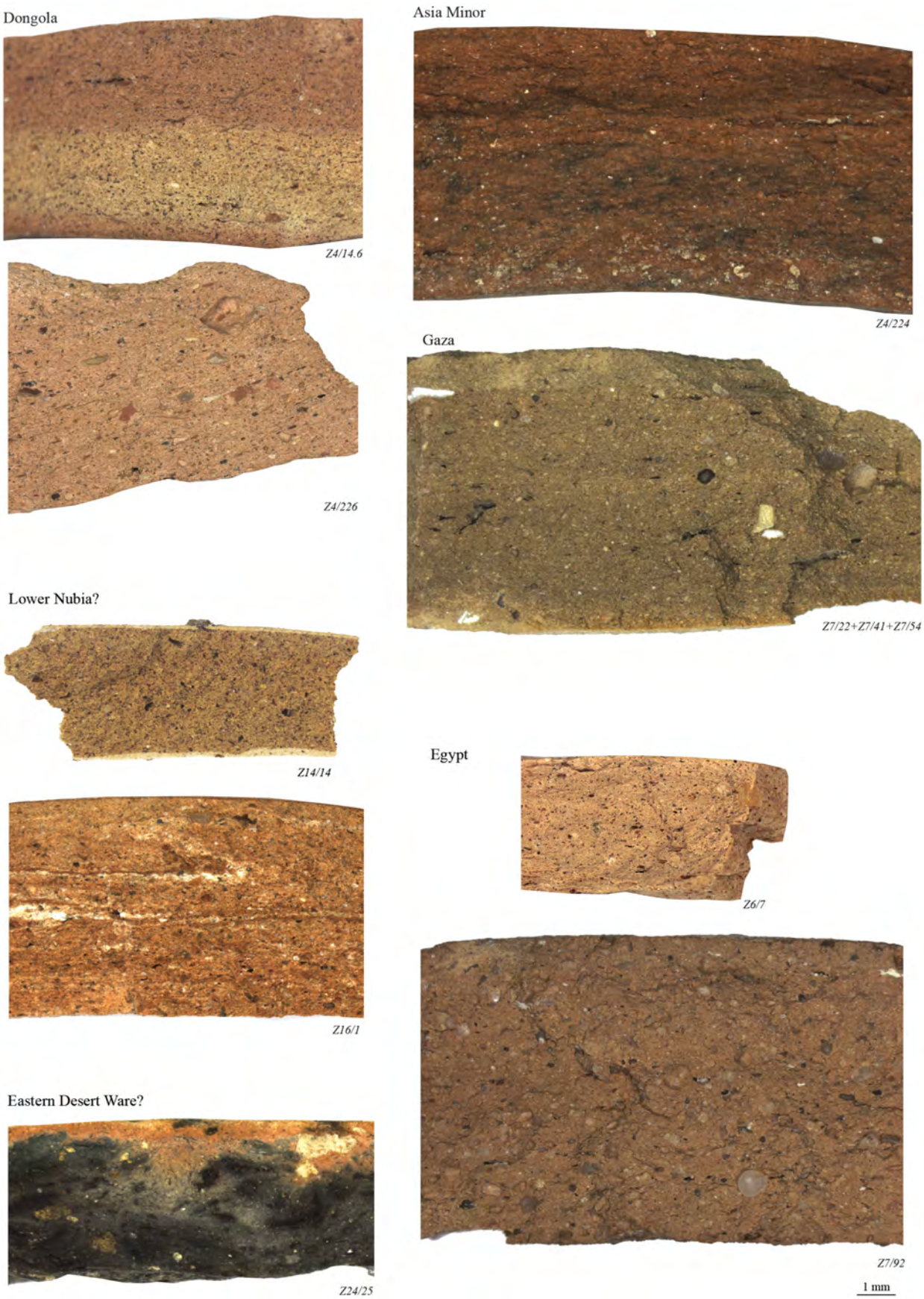


FIGURE 3.8 Microscopic photos of imported fabrics from Lower Nubia, Egypt, Palestine, and Asia Minor
PHOTOS BY M. PIORUN

hard ware, abundant in quartz, with small to moderate quantities of fine organic inclusions.
ZF1 – small bowls, types II.3, II.4, II.5
ZF3 – small bowls, type II.4
ZF4 – cup, type I.2a; small bowls, types II.3, II.4; goblets, types IX.1, IX.3
ZF5 – small bowls, type II.4
ZF6 – small bowls, type II.4
(see Chapter 7.18, Figs 7.99–7.101, 7.128, this volume)

4.1.1.4 *CW.A4—Red/White Slipped Wares* (*CW.A4.R/WSW*)
Wheel-made (1) vessels, slipped outside in red, inside in white. Red, reddish brown or brown in colour with a red, brown or grey core, this is a medium-dense and medium-hard ware, with moderate quantities of quartz, and moderate quantities of fine organic inclusions.
ZF3 – small bowls, type II.7
(see Chapter 7.18, Fig. 7.103, this volume)

4.1.2 CW.B—Uncoated/Plain Wares
4.1.2.1 *CW.B1—Uncoated Wares* (*CW.B1.UW*)
Wheel-made (1) vessels. Red or brown in colour with a red or light brown core, this is a medium-dense and medium-hard ware, with moderate amounts of quartz and a large amount of fine to medium organic inclusions.
ZF2 – cups, type I.1; small bowls, type II.3

4.1.2.2 *CW.B2—Uncoated Wares* (*CW.B2.UW*)
Wheel-made (2) vessels. Red in colour with a grey core, this is a medium-dense and hard ware with a moderate amount of quartz, small quantities of fine to medium-fine organic inclusions and a small quantity of fine to medium white particles.
ZF6 – spouted bowls, type III.2; *qawadis*, type XI
Small bowls Z26/52, Z14/8, Z14/11 (fabric not possible to determine)
(see Chapter 7.18, Figs 7.108, 7.130, this volume)

4.2 *Coarse Ware* (*CRW*)
4.2.1 CRW.A—Slipped Wares
Handmade vessels, red-slipped on external surfaces, sometimes together with burnish and mat-impressions; some examples slipped inside. Red, brown or black in colour with a dark grey or black core. Three types of wares have been distinguished in this group.

4.2.1.1 *CRW.A1—Slipped and Burnished Wares* (*CRW.A1.SW*)
Handmade vessels (paddle-and-ground and beating method, coiling), red-slipped on both or only external surfaces; in most cases the surface was burnished. Red, brown or black in colour with a dark grey or black core, this is a highly porous and soft to medium-hard ware with a large number of organic inclusions and a moderate quantity of fine to medium white particles.
ZF9 – large bowls, types II.8, II.9; jars, type VI.2; jars/bottles, types VII.1, VII.2, VII.5, VII.6
ZF10 –large bowls, types II.8, II.9; spouted bowls, type III.1; jars, type VI.2; jars/bottles, types VII.1, VII.2, VII.4, VII.6
(see Chapter 7.18, Figs 7.105, 7.108, 7.114, 7.115, 7.118, 7.122, 7.125, this volume)

4.2.1.2 *CRW.A2—Slipped, Burnished and Mat-Impressed Wares* (*CRW.A2.SW*)
Handmade vessels (paddle-and-ground and beating method, coiling), red-slipped on external or internal surfaces, sometimes burnished, with mat-impressions on the external surface. Red or brown in colour with a dark grey or black core, this is a highly porous and soft to medium-hard ware with a large quantity of organic inclusions, and moderate quantities of fine to medium white particles.
CRW.A2.SW.1
External surface partially slipped and burnished with a mat-impressed pattern.
ZF9 – jars, type VI.1; jars/bottles, type VII.4
ZF10 –jars, type VI.3; jars/bottles, types VII.1, VII.4, VII.5, VII.6
CRW.A2.SW.2
External surface with a mat-impressed pattern, internal surface slipped and sometimes burnished.
ZF10 –pots, type V.3
CRW.A2.SW.3
External surface partially slipped and burnished with a mat-impressed pattern.
Seeds were added to the clay paste as a temper. This is a soft ware.
ZF7 – jars/bottles, type VII.5
ZF8 – jars/bottles, type VII.4
(see Chapter 7.18, Figs 7.112, 7.114, 7.116, 7.124, this volume)

4.2.2 CRW.B—Uncoated Wares
4.2.2.1 *CRW.B1—Uncoated Wares* (*CRW.B1.UW*)
Handmade, uncoated ware (paddle-and-ground and beating method, coiling); sometimes the surface was burnished.
Red or brown in colour with a dark grey or black core, this is a highly porous and soft to medium-hard ware with a large quantity of organic inclusions and a moderate quantity of fine to medium white particles.
CRW.B1.UW.1
ZF9 – large bowls, type II.8; jars/bottles, types VII.1, VII.2

ZF10 – bowls, types IV.1, IV.3; pots, types V.2, V.3, V.4; jars/bottles, type VII.1; stands, type VIII
ZF11 – jars, type VI.5
CRW.B1.UW.2
Seeds were added to the clay paste as a temper. This is a soft ware.
ZF7 – large bowls, type II.8; spouted bowls, type III.1; pots, type V.1; jars/bottles, type VII.1
ZF8 – bowls, type IV.1; pots, type V.1
(see Chapter 7.18, Figs 7.104, 7.105, 7.111–7.113, this volume)

4.2.2.2 *CRW.B2—Uncoated Mat-Impressed Wares* (*CRW.B2.UW*)
Handmade, uncoated ware; sometimes the surface was burnished; mat-impressions feature on the external surfaces.

Red or brown in colour with a dark grey or black core, this is a highly porous and soft to medium-hard ware with a large quantity of organic inclusions and a moderate quantity of fine to medium white particles.
CRW.B2.UW.1
ZF9 – bowls, types IV.2, IV.4; jars/bottles, types VII.1, VII.4
ZF10 – large bowls, type II.8; bowls, type IV.3; pots, types V.3, V.4; jars/bottles, type VII.1
ZF11 – jars/bottles, type VII.1
CRW.B2.UW.2
Seeds were added to the clay paste as a temper. This is a soft ware.
ZF7 – jars/bottles, type VII.2
(see Chapter 7.18, Figs 7.104, 7.105, 7.112, 7.120, this volume)

4.2.2.3 *CRW.B3—Uncoated Wares* (*CRW.B3.UW*)
Cast, uncoated ware (moulding).

Red or brown in colour with a dark grey or black core, this is a highly porous and soft to medium-hard ware with a large quantity of organic inclusions and a moderate quantity of fine to medium white particles.
ZF9 – bowls, type IV.4
ZF10 – bowls, type IV.1
(see Chapter 7.18, Figs 7.109, 7.110, this volume)

5 Manufacturing Technology

Ancient pottery is the only source of information on past production techniques. Identifying manufacturing techniques based on the traces left on vessel surfaces is not always straightforward. In some cases, evidence of forming techniques is clearly visible on the surface, but in others, it was removed by surface finishing processes such as smoothing, slipping, polishing or burnishing (see Glossary). Sometimes detecting evidence of manufacturing techniques is possible with broken vessels when breaks can be examined, but it is difficult with complete closed forms, when only the external surface treatment can be observed.

Ethnoarchaeological studies can give a better picture to help understand the shaping process (Martineau 2003, 209), especially in handmade vessels. To better understand the production technology of the El-Zuma pottery assemblage, the author used information gained during ethnographical studies of pottery making in local modern workshops. The ethnoarchaeological project, as mentioned above, documents and studies modern traditional handmade pottery workshops in and around El-Zuma and Karima, which is the core area investigated by the Early Makuria Research Project of the Polish Centre of Mediterranean Archaeology, University of Warsaw. The evidence recorded during this project, including tell-tale traces of pebble-beating and impressed textile patterns on vessel surfaces, has already provided insights into ancient pottery production techniques. By comparing the results of this research with those gleaned from analysis of the abundant ceramic assemblage recovered from the tumulus tombs of El-Zuma, the authors of the Pots Project will be able to point out and discuss the similarities and differences between ancient and modern vessels (Czyżewska-Zalewska 2016, 735–737; Czyżewska-Zalewska and Kowarska 2020).

In general, we can distinguish three main stages of vessel forming (Rye 1981, 62):
– a primary forming process where a lump of clay is converted into an almost finished vessel form using techniques like throwing, coiling, slab building, pinching and moulding;
– a secondary forming process where the shape of the vessel is finished and the proportions of various parts of the vessel are established using techniques such as turning, scraping, beating, trimming and throwing;
– a third forming process where surface modifications such as smoothing, slipping, burnishing, polishing and impressing are executed.

Observation of marks left by the manufacturing process in the El-Zuma assemblage showed that vessels were handmade and formed on the simple and fast wheel during the primary forming process.

5.1 *Forming Techniques*
5.1.1 Handmade Shaping Techniques
5.1.1.1 *Paddle-and-Ground and Beating Method*
This method of vessel shaping was noted among the C-Group, Pan Grave and Kerma cultures (about 2400–

1550 BC). The potter used a depression in the ground to shape a clay paste into a vessel. Sometimes the depression was covered with a mat. The potter used a stone beater (paddle) to apply sharp blows to the clay while shaping the vessel. This shaping method was described by Bruce Williams in a discussion about C-Group, Pan Grave and Kerma remains at the Adindan Cemeteries (Williams 1983, 29–35). It is a method which is used to this day (Czyżewska-Zalewska 2016, 735–737; Czyżewska-Zalewska and Kowarska 2020; David and Evina 2016, 88–91; Tobert 1984, 143–144). In the El-Zuma assemblage this technique was used for shaping large bowls, pots, and jars/bottles. In most cases, the external surface was more or less smoothed, while the internal surface could be finished in a number of different ways. Some vessels were not smoothed, as can be seen in **Fig. 3.9**: Z25/2 and Z10/54, where traces of beating are clearly visible on the internal wall. The Z25/2 jar is a closed form, so neat execution of the internal surface was not necessary, but the external surface is quite smooth. Pots (groups V–VI) exhibit the same shaping technique, with mat-impressed decoration on the external surface [**Fig. 3.9:** Z25/20]. In addition to mat-impressed patterns we can observe surface unevenness attributable to the paddle-and-ground technique. A different situation is represented by large bowls, which may have been shaped using the same method [**Fig. 3.10**]. In example Z1/10 we can see traces of smoothing by hand below the rim on the external surface, while on Z6/39 the smoothing was carefully executed and smoothing marks are virtually invisible. The internal surface of beer bottles and jars was variously executed. Some examples show clear evidence of beating, as in Z10/54 in **Fig. 3.9**, while others have surfaces that were smoothed by hand [**Fig. 3.11:** Z6/54] or scratched with some kind of tool [**Fig. 3.11:** Z6/46].

The paddle-and-ground and beating method (hand-made [1]) is a primary forming technique and can be used on its own to produce an overall shape, or can be used in conjunction with other primary techniques such as coiling (see below).

5.1.1.2 *Coiling*

This technique is less well represented in the El-Zuma assemblage and was used mostly in shaping large bowls. The term coiling may refer to ring building, segmental coiling or spiral coiling. Vessels are made by stacking successive coils around the circumference of a base, thus gradually increasing the height of the pot. The surface is smoothed as the walls are built up (Rice 2006, 127; Rye 1981, 67). If the surface of the vessel was carefully smoothed the traces of coil building might not be visible; however, traces are clearly visible in the fresh break of a sherd [**Fig. 3.12**]. Vessels are weak along the seam where the coils were joined and often fracture at this point.

Coiling (hand-made [2]) is a primary forming technique and can be used on its own to produce an overall shape or can be used with other primary techniques, such as the paddle-and-ground and beating method. The latter technique could be used for the lower part of the vessel, while the upper part and rim could be made by coiling.

5.1.1.3 *Moulding*

Evidence of this method is rare in the El-Zuma assemblage, having only been recorded on a few examples of bowls (hand-made [3]). In the presented materials convex moulds were used to shape vessels. The internal surface adjoined the mould surface, and techniques such as smoothing were used on the external surface. In these cases the vessel interior is smooth and plain, and the exterior exhibits traces of the shaping and smoothing process [**Fig. 3.13**]. This method of shaping is employed to this day and can be used with other techniques such as coiling (Garcea 2004, 97–99; David and Evina 2016, 88–91; Czyżewska-Zalewska and Kowarska 2020).

5.1.2 Wheel Throwing

The clay body prepared for throwing techniques is softer and wetter than that used for handmade shaping techniques, and the clay is finer textured to avoid excessive abrasion of the potter's hands (Rice 2006, 128–129). Examples of pottery made using a simple and compound wheel have been identified by the author in the presented assemblage.

5.1.2.1 *Simple Wheel*

A simple wheel, sometimes inaccurately called a slow wheel, is one which does not rotate with the sustained momentum and centrifugal force of a compound wheel, although the simple wheel can be rotated quickly for short periods (Rice 2006, 134). Vessels shaped on a simple wheel (wheel-made [1]) are often irregular. Their walls are thick and often of uneven thickness. Both deep and shallow irregular wheel marks are visible on the walls [**Fig. 3.14**].

5.1.2.2 *Compound Wheel*

Using a compound wheel, also known as a kick-wheel, the potter could control the speed of rotation, and the wheel could rotate rapidly and without interruption for a long time (Rice 2006, 135). Vessels shaped on this type of wheel (wheel-made [2]) are much more proportional with far more even and thinner walls than seen in vessels made on

FIGURE 3.9 Traces of beating noted on vessels
PHOTOS Z25/2, Z25/20 BY K. KOTLEWSKI, Z10/54 BY A. KAMROWSKI

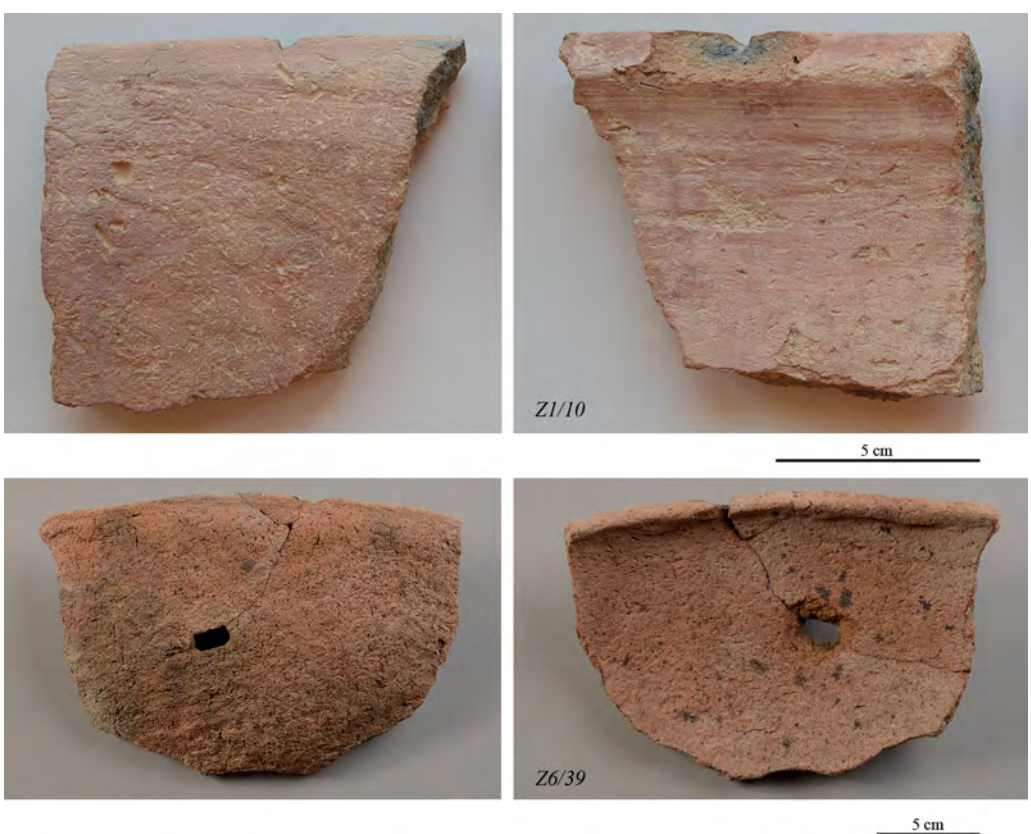


FIGURE 3.10 Hand-smoothing marks
PHOTOS BY A. KAMROWSKI

FIGURE 3.11 Traces of surface smoothing by hand and scratching with a tool
PHOTOS BY A. KAMROWSKI

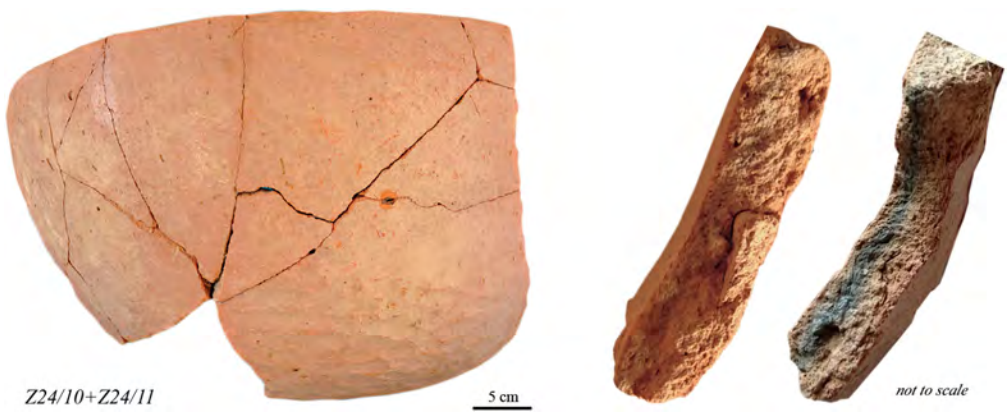


FIGURE 3.12 Traces of coil building
PHOTOS BY T. WOJTCZAK (LEFT), E. CZYŻEWSKA-ZALEWSKA (RIGHT)

FIGURE 3.13 Evidence of moulding
PHOTOS BY A. KAMROWSKI

FIGURE 3.14 Evidence of shaping on a simple wheel
PHOTOS Z13/11, Z11/12 BY O. BIAŁOSTOCKA, Z19/5 BY K. KOTLEWSKI

FIGURE 3.15 Traces of shaping on a compound wheel
PHOTOS Z10/6 BY K. KOTLEWSKI, Z4/202 BY A. KAMROWSKI, Z4/27 BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.16
Example of an untreated vessel surface (Z26/52)
PHOTO BY A. KAMROWSKI

FIGURE 3.17
Examples of slipped surfaces
PHOTOS Z11/6 BY O. BIAŁOSTOCKA, Z24/39 BY T. WOJTCZAK

a simple wheel [**Fig. 3.15**]. Wheel marks visible on the walls can be shallow or deep, but in most cases they are faint and regular, though sometimes they can be much more pronounced but still regular.

5.2 *Surface Treatment*

Surface treatment is the third forming process in vessel shaping. In the pottery assemblage from El-Zuma, the author distinguishes the following kinds of surface treatment:

5.2.1 Plain Surface

The surface of the vessel was not coated with any additional layer such as a slip, a wash or a glaze [**Fig. 3.16**]. Plain surfaces were recorded on bowls and pots of groups IV and V, on some group VII jars, large bowls of types II.8 and II.9, *qawadis* of type XI and on the surfaces of group XII amphorae.

5.2.2 Slipped Surface

Vessel surfaces were coated with a thin layer of slip (see Glossary) [**Fig. 3.17**]. In the case of open forms such as cups and bowls of types II.1–II.7, slip was present on both external and internal surfaces and constituted a fairly thin layer [**Fig. 3.17**: Z11/6]. In closed forms like jars and cooking pots, slip was applied to the external surface and was thicker [**Fig. 3.17**: Z24/39]. A slip could be applied on the whole surface of the vessel or only partially. In the case of some jars and bottles of group VII, partially applied slip can be read as decoration (see Chapter 3.6.7, this volume). In most analysed examples the slip is red or brownish red (10R 4/6 red, 2.5YR 5/4 reddish brown) [**Fig. 3.18**: Z12/130], though in the case of some bottles it turned black when fired [**Fig. 3.18**: Z12/75]. There are also a few rare examples of white slip (10YR 8/1 white), which could be made from a fluid suspension of iron-free clay with water or clay mixed with powdered hematite (Adams 1986, 29) [**Fig. 3.18**: Z11/30]. A slip could be matt or shiny if the slipped surface was burnished or polished. It could be applied by wiping, as in the case of cups or bowls, or by rubbing, as in the case of jars. Details of slip application methods have been presented by the author in a previously published article (Czyżewska-Zalewska 2016, 733–734).

5.2.3 Washed Surface

A wash, a post firing coating (see Glossary) was recorded on only two vessels: a table amphora (Z15/23) and a jar (Z12/51). In both cases, the coating was applied on the external surface and survives in residual form [**Fig. 3.19**].

5.2.4 Burnished Surface

Burnishing is a method of producing a lustre on an unfired vessel surface by rubbing it with a hard, smooth object. Burnish could be executed on plain or slipped surfaces. In the pottery assemblage from El-Zuma, burnish features on slipped cups of types I.1–I.4 and bowls of types II.1 and II.2 [**Fig. 3.20**]. In some examples of vessels of groups IV and V, burnish was noted on plain [**Fig. 3.21**: Z26/20] and slipped surfaces [**Fig. 3.21**: Z10/10]. Jars of group VII were burnished over the whole surface if the vessels were slipped [see **Fig. 3.18:** Z12/130], or burnished on the slipped neck and shoulders in those instances where a slip was applied only partially on the vessel as decoration [see **Fig. 3.17**: Z24/39].

Three variants of burnishing were distinguished by the author, and presented in detail in an earlier article (Czyżewska-Zalewska 2016, 734–735) [see **Fig. 3.20**]:

dense burnish—executed in overlapping strokes;
medium-dense burnish—no overlap of strokes of the burnishing tool, and gaps between burnishing marks are narrower than the executed strokes;
thin burnish—narrow burnishing marks, gaps between marks are wider than in the medium-dense burnish.

Burnish could be executed carefully [see **Fig. 3.20:** Z26/44] or carelessly with the strokes going in every direction [see **Fig. 3.20:** Z12/89].

5.2.5 Polished Surface

Polishing is a method of producing a glossy lustre on the surface by rubbing it with a yielding tool. In the El-Zuma pottery assemblage polishing was executed with varying degrees of care on slipped surfaces. The polished surface could be slightly shiny [**Fig. 3.22**: Z4/79, Z15/20] or very lustrous [**Fig. 3.22**: Z4/14.3b]. The long time that the vessels remained buried and their exposure to different weather conditions may have adversely affected the preservation of any surface treatment. Thus, in poorly preserved vessels polished surfaces may now be matt. Bowls of types II.4, II.5 and II.6 had polished surfaces.

5.2.6 Mat-Impressed Surface

The subject of mat-impressed surfaces has been discussed by Jacke Phillips (2010). In many cases, a mat-impressed body occurs together with smoothing or burnishing, and sometimes with painted or incised decoration on the shoulders, neck and rim area. The items used to make impressed patterns may have been mats, basketry, bags and clothes (Phillips 2010, 227). Patterns noted in the El-Zuma assemblage were partially presented by the

FIGURE 3.18 Different colours of slipped surfaces
PHOTOS Z12/130 BY A. KAMROWSKI, Z12/75 BY E. SKOWROŃSKA, Z11/30 BY O. BIAŁOSTOCKA

FIGURE 3.19
Vessel with wash on the surface (Z12/51) (Z12/51)
PHOTO BY Z. KOWARSKA

FIGURE 3.20 Different variants of burnished surfaces
PHOTOS BY A. KAMROWSKI

FIGURE 3.21 Burnishing on uncoated and slipped surfaces
PHOTOS Z10/10 BY K. KOTLEWSKI, Z26/20 BY A. KAMROWSKI

FIGURE 3.22 Examples of polished surfaces
PHOTOS BY A. KAMROWSKI

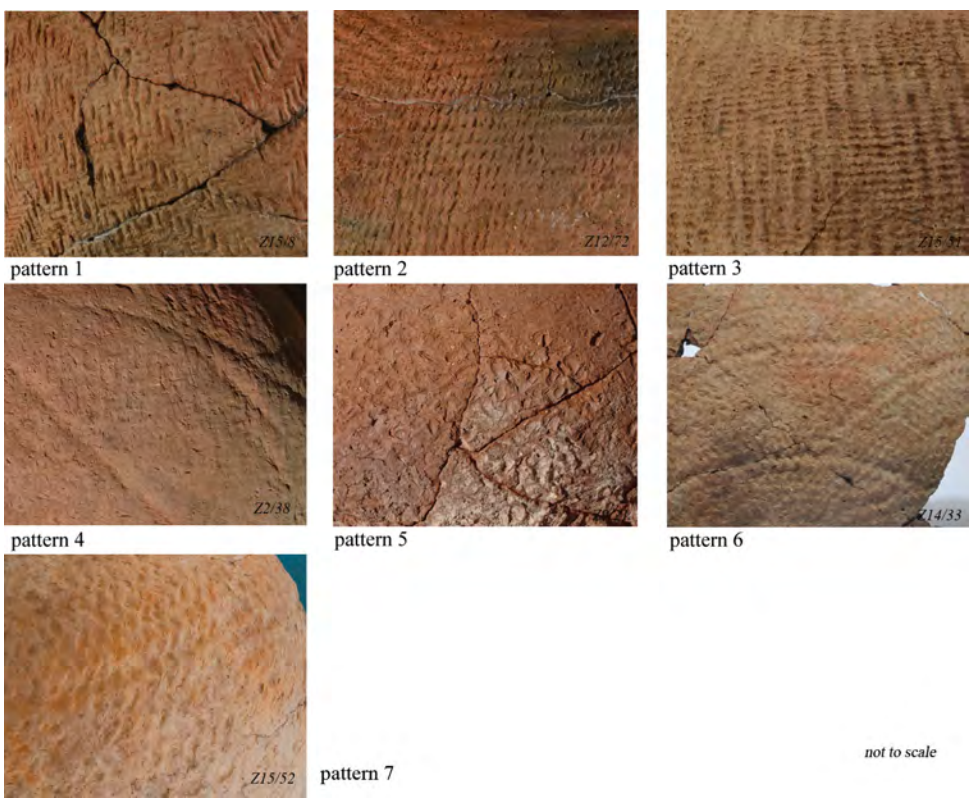


FIGURE 3.23 Mat-impressed patterns on El-Zuma pottery
PHOTOS OF PATTERNS 1–3, 6–7 BY A. KAMROWSKI; PATTERNS 4–5 BY E. CZYŻEWSKA-ZALEWSKA

author in an earlier article in the context of group VII jars (Czyżewska-Zalewska 2016, 735–737). Mat-impressed patterns on the external surface of vessels such as group VII jars or bowls and pots of groups IV, V and VI were probably produced by using the paddle-and-ground shaping technique (see Chapter 3.5.1, this volume). The pattern on the surface was made during the technological process (Czyżewska-Zalewska 2016, 735–737), and in the case of pots and bowls of groups IV–VI was functional, creating a textured surface that made these vessels easier to grip. In the case of jars and bottles of group VII, we should consider two variants of mat-impressions: as technological traces on the surface and as decoration (see Chapter 3.5.1, this volume). As with pots, we cannot rule out a functional meaning, as the additional friction provided by a textured surface would have made the vessel easier to grip, but some examples of mat-impressed jars and bottles are burnished and smoothed, and the pattern is poorly visible (see Cat. 246: Z12/71+Z12/78, Chapter 7, this volume) (Czyżewska-Zalewska 2016, 735–737).

In the analysed assemblage seven different mat-impressed patterns were noted, four of which were identified in the materials analysed by Phillips [**Fig. 3.23**]:

Pattern 1 similar to a diagonal twill weave pattern (Phillips 2010, 232, Fig. 6);

Pattern 2 similar to a warp-faced plain or tabby weave pattern (Phillips 2010, 230–232, Figs 4A and 4B);

Pattern 3 similar to a twined mat pattern (Phillips 2010, 233–234, Fig. 7);

Pattern 4 similar to plaiting consisting of plaited strips of palm leaf (Phillips 2010, 229–230, Fig. 1);

Pattern 5 looks like small seeds impressed on the surface;

Pattern 6 reminiscent of some kind of mat or basket with a thicker main strip;

Pattern 7 probably produced using some kind of mat or cloth.

5.3 *Types of Decoration*

In the presented materials from El-Zuma the author selects eight types of decoration. Seven of them were executed during the shaping of the vessel. The eighth one, scratched decoration, was executed later and is connected with the usage of the vessels (see below).

5.3.1 Painted Decoration

Painted pottery is not common in the El-Zuma assemblage, but has been recorded on some bowls and cups of different types (see Cups Varia and Bowls Varia), on stands, on goblets and on some amphorae. Three main decorative colours can be distinguished in unglazed pottery: black, red and white. The red and white pigments were the same as those employed in slipping, the black was probably manganese or maybe carbon blacks known from Ancient Egypt (Adams 1986, 30; Abdel-Ghani 2009, 45–48).

The most common are geometrical patterns, bands, wavy and intersecting lines with dots or spiral patterns [**Fig. 3.24**]. Painted decoration sometimes occurs together with grooves which served as a border for painted designs composed of spots and straight lines [see **Fig. 3.24:** c–f], horizontal, diagonal, or crisscross lines [see **Fig. 3.24:** b, g, h], and wavy lines [see **Fig. 3.24:** a].

5.3.2 Punctuated and Incised Decoration

Punctuated decoration was executed in wet clay, before the vessels were fired, using some kind of tool such as a piece of straw or maybe wood [**Fig. 3.25**]. This kind of decoration was recorded on bottles and jars of group VII [see **Fig. 3.25:** a, b] and jugs of group XIII [see **Fig. 3.25:** c], as well as on other open vessels [see **Fig. 3.25:** d]. Incised decoration was also executed with a tool in wet clay, before the vessels were fired. It was recorded on the surfaces of group III spouted bowls, on the rim of bowls and pots of groups IV, V and VI, on the neck and shoulders of group VII jars and on oil lamps [**Fig. 3.26**].

5.3.3 Grooved Decoration

Grooved decoration was executed in the wet clay before vessels were fired, probably whilst they were turned on a potter's wheel [**Fig. 3.27**]. Circumferential grooves could be executed as a continuous spiral, as noted on type II.4 bowls [see **Fig. 3.27**: a, b, d], or alternatively each groove could make an individual ring [see **Fig. 3.27:** c].

5.3.4 Slip as Decoration

In some vessels, such as certain group VII jars and a group III spouted bowl, slip can be read as decoration and occurs together with other types of decoration [**Fig. 3.28**]. In the case of spouted bowl Z24/25 [see **Fig. 3.28:** a], triangles made of slip are connected with incised decoration to form a pattern of triangles. On the surface of jars and bottles such as Z24/39 and Z27/11 [see **Fig. 3.28:** b, c] slip was applied in a band or a series of intersecting lines in conjunction with a mat-impressed pattern on the body (see also Cat. 249: Z12/72, Cat. 278: Z15/53, Chapter 7, this volume).

5.3.5 Mat-Impressed Decoration

Mat-impressed patterns were made during the technological process (see Chapter 3.5.1, this volume) on the

FIGURE 3.24 Examples of painted decoration
PHOTOS A, B, H, I BY K. KOTLEWSKI; C BY T. WOJTCZAK; D BY R. MAHLER; E–G BY A. KAMROWSKI

FIGURE 3.25 Examples of punctuated decoration
PHOTOS A BY K. KOTLEWSKI; B, C BY A. KAMROWSKI; D BY T. WOJTCZAK

FIGURE 3.26 Examples of incised decoration
PHOTOS A BY T. WOJTCZAK; B, C BY E. SKOWROŃSKA; D, E BY K. KOTLEWSKI

FIGURE 3.27 Examples of grooved decoration
PHOTOS A, C BY K. KOTLEWSKI; B BY A. KAMROWSKI; D BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.28 Examples of slipped decoration
PHOTOS A, B BY T. WOJTCZAK; C BY A. KAMROWSKI

external surface of vessels such as group VII jars or bowls and pots of groups IV, V and VI. In the case of some group VII jars presented above [see **Fig. 3.28**], the aspect of a mat-impressed pattern as decoration should be mentioned. The subject of mat-impressed patterns as decoration was discussed by the author in a previous article (Czyżewska-Zalewska 2016, 732–733, 735–737).

A mat-impressed pattern on a jar with a slipped neck and shoulders (see **Fig. 3.28** and also Cat. 249: Z12/72, Cat. 278: Z15/53), or a mat-impressed pattern and incised or punctuated decoration below the rim and on the neck of a jar (see Cat. 257: Z15/52, Cat. 258: Z2/34 or Cat. 260: Z2/39, Chapter 7, this volume), could be regarded as a decorative composition.

5.3.6 Applied Decoration

Applied decoration was recorded on group VII bottles and jars in the shape of small bosses or lugs placed on the shoulders of the vessel [**Fig. 3.29**]. Only one vessel (Z28/6) recorded in the El-Zuma pottery assemblage has four small bosses on the shoulders [see **Fig. 3.29:** b]; all other vessels with bosses (Z12/134) or lugs (Z12/21) have only one pair of them [see **Fig. 3.29:** a, c].

5.3.7 Scratched Decoration

Preliminary remarks on vessels with scratched decoration have previously been presented by the author (Czyżewska-Zalewska 2016, 738). Scratched decoration was executed post-firing on bottles and jars in a sloppy and random manner somewhere on the neck, shoulder or body, and sometimes resembles children's drawings. There is a wide range of motifs, from geometrical to floral and cross patterns. Floral decorative motifs were common in the Meroitic and post-Meroitic periods (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367–368). All motifs recorded on vessels from El-Zuma are presented in **Fig. 3.30**.

5.4 *Firing Conditions and Colour*

The original firing temperature of ancient pottery can only be determined in the laboratory, where this task can be accomplished using two methods. One method is used to analyse sherds in order to assess their physical properties or phase composition, and the results obtained serve to draw conclusions about the temperature at which the vessels were originally fired. The second method involves refiring ceramic sherds and assessing at which temperatures any changes occur. When refiring is carried out at a lower temperature than the original firing temperature, no significant changes should be observable in the analysed sherd; however, when refiring is conducted at a higher temperature than the original firing, changes occur both in the physical properties and in the phase composition of the sherd (Daszkiewicz 2014, 187; Hunt 2017, 327–362, 478–479).

Without laboratory methods, vessel firing conditions can be estimated in the field based on the colour of the surface and the fresh break of the vessel wall. Two firing environments were identified in this assemblage: oxidized and reduced.

Firing in a reduced atmosphere (see Glossary, this volume) takes place at low temperature and is evidenced when a dark black or grey core is visible in the section of the vessel wall [**Fig. 3.31:** Z12/23]. A grey core is usually a result of the incomplete oxidation of organic temper or inclusions in the clay, when the firing time was insufficient to burn off the carbon. In the presented assemblage this kind of firing can be observed, for example, in handmade, mostly thick-walled, pottery, such as beer jars and bottles, cooking pots, jars and bowls. Examples among the wheel-made pottery include *qawadis* and some of the cups and bowls of groups I and II. Some vessels, especially large ones with walls of varying thickness, show evidence of firing in variable conditions [see **Fig. 3.31:** Z24/11]. Samples of pottery were tested in the laboratory by Małgorzata Daszkiewicz to determine their original firing temperature and chemical composition, and the results of this analysis will be published in a separate article (Daszkiewicz, Czyżewska-Zalewska, and Mahmoud El-Tayeb, forthcoming).

Firing in an oxidizing atmosphere (see Glossary, this volume) meant that the clay was fired evenly and resulted in a monochromatic section [**Fig. 3.32:** Z4/252] if the vessel was completely oxidized. If it was incompletely oxidized, we can observe a narrow core of a different colour in the section of the vessel wall [see **Fig. 3.32:** Z2/11, Z4/251].

In some examples the overfiring process can be observed, when excessive heat treatment of a vessel during firing causes deformation, bloating and other defects [**Fig. 3.33**]. In some examples we can observe damage to the vessel surface in the form of lime blowing, which can happen when a clay paste contains calcium carbonate, such as limestone or calcite. Lime or calcium may occur naturally in clays (calcareous or marly clays) or may be added to the clay as a temper. Calcium carbonate decomposes at temperatures between 650°C and 900°C (Rice 2006, 97–98) [**Fig. 3.34**]. Ethnoarchaeological studies carried out by Daszkiewicz in the Shendi workshops and information received during excavation indicate that the pottery could have been fired in a bonfire, and her experimental firings demonstrated that it is possible to fire pottery at high temperatures (above 1000°C) in such bon-

FIGURE 3.29 Examples of applied decoration
PHOTOS A, C BY A. KAMROWSKI; B BY T. WOJTCZAK

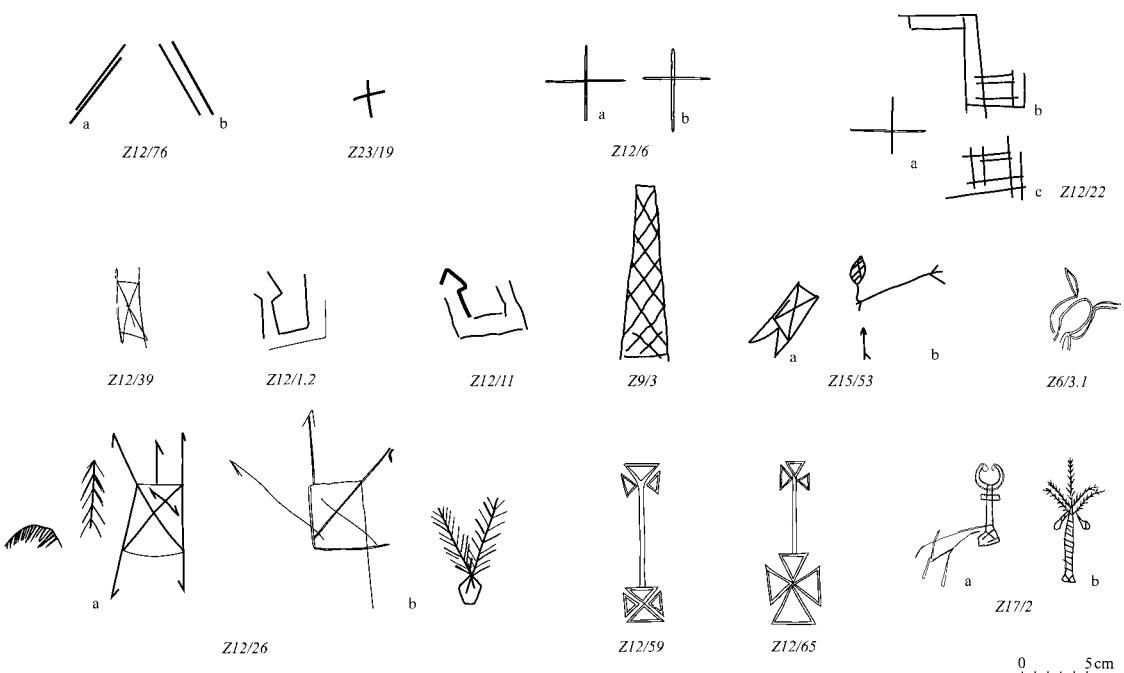


FIGURE 3.30 Examples of scratched decoration (see List of drawings to the catalogue)

FIGURE 3.31 Examples of pottery fired in a reduced atmosphere
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.32 Examples of pottery fired in an oxidizing atmosphere
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 3.33
Example of overfired pottery Z18/7
PHOTO BY E. CZYŻEWSKA-ZALEWSKA

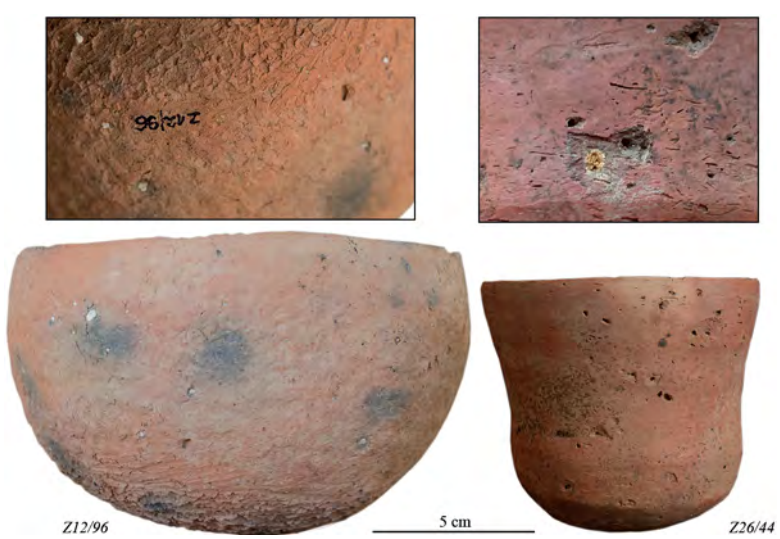


FIGURE 3.34
Examples of lime blowing
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

fires (Daszkiewicz and Wetendorf 2017). But this does not exclude the use of pottery kilns, which were known and used in the Meroitic and post-Meroitic periods (Adams 1962).

6 Vessel Forms and Types

The typology presented below includes descriptions of the morphological features of the vessels. The pottery is divided into functional groups, such as cups, bowls, jars, etc., which are further subdivided into individual types and variants, all of which are described. Each form is illustrated with a miniature drawing, and references are also given to illustrations in the catalogue in Chapter 7.2–7.17 and colour plates in Chapter 7.18. Definitions of the terms used to describe vessel size as well as rim shape and base shape are given in Chapter 3.2 (Figs 3.1 and 3.2). Attributions to macroscopic fabric groups are presented here for all vessel types. In some cases, especially where completely preserved vessels were concerned, it was not possible to determine which macroscopic fabric group they represent (see Chapter 7).

Generally, the parallels cited below concern the whole type but, where possible, parallels for specific variants are also indicated.

6.1 *Group 1—Cups*

This group consists of five types of cups. Single examples of various cups appear under the heading 'Varia' at the end of this section.

Cups of types 1.1–1.4 have been broadly discussed in earlier published articles and need only a brief review (Klimaszewska-Drabot 2010b; Czyżewska-Zalewska 2016). These types of cups were made on the wheel, covered with a thin layer of slip and mostly burnished on both surfaces. Burnish was executed with different degrees of care (see Chapter 3.5.2, this volume). In some cases, a slip covers only one surface, but such examples occur sporadically.

6.1.1 Type 1.1 [Cat. 1–22, Figs 7.86–7.87]

Cups with slightly flattened bases (Fig. 3.2: B-1, B-2), slightly flared walls in the upper part, and unmodelled straight or incurved rims, usually rounded or pointed (Fig. 3.1: Un R-1a–c, Un R-2a–c). Medium-tall and medium-sized, these cups are predominantly 7–10 cm high with a rim diameter of 8–10 cm. Cups of this type were made on the wheel (1). They occur in macroscopic fabrics ZF1–ZF3.

Both surfaces are covered with slip and burnished.

Variant 1.1a

Calyx-shaped cup. This variant is defined by markedly flared walls. The profile is curved, resembling the letter S. Maximum body diameter is roughly equal to the rim diameter or bigger. Rims are unmodelled, rounded and always flared (Fig. 3.1: Un R-1b). Bases are rounded or pointed (Fig. 3.2: B-1, B-3). These cups are tall and medium-sized with a height of 8–10 cm and rim diameter of 7–8 cm. Cups of this variant were made on the wheel (1). Both surfaces are covered with slip and burnished. Only two cups of this variant were discovered at El-Zuma: Z21/6 and Z20/2.

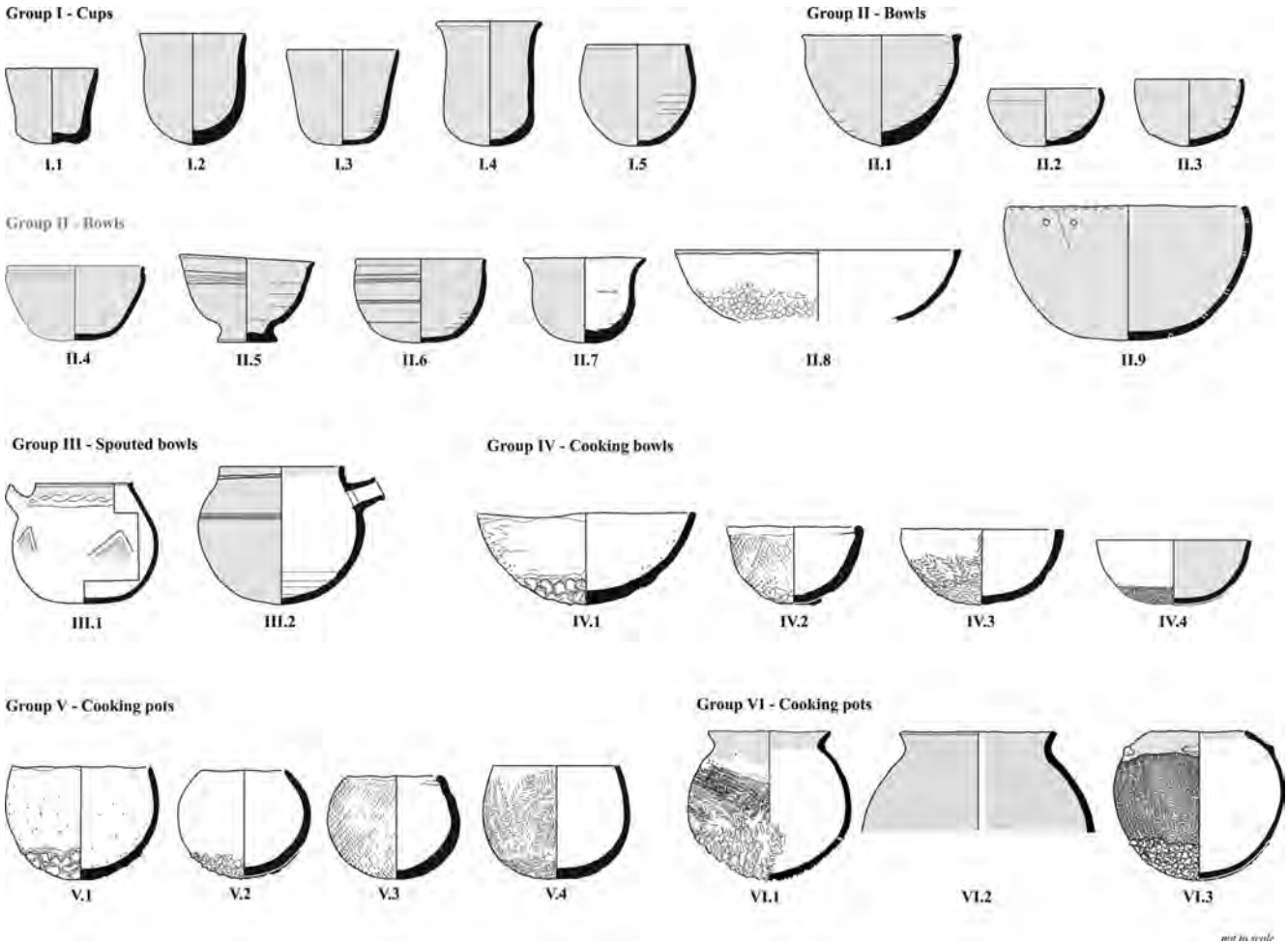
These cups look like a miniature version of caliciform vessels, widely known in the Late Neolithic from El-Kadada with a production range reaching as far as Upper Egypt (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 369–370; Reinold 2001).

Variant 1.1b

Calyx-shaped cup. Similar to variant 1.1a but with less curvature, and the maximum body diameter is roughly equal to the rim diameter but not bigger. Rims are unmodelled, rounded and always flared (Fig. 3.1: Un R-1a–b). Bases are flattened (Fig. 3.2: B-2). Only two examples were discovered at the El-Zuma cemetery. Medium-tall and medium-sized, these cups are 8–9 cm high with a rim diameter of 8–9 cm. Cups of this variant were made on the wheel (1), but their surfaces were only slipped without burnishing.

Parallels and Dating for Type 1.1

Cups of this type were found at: El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); Tanqasi, tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4); El-Kassinger Bahry, site HP47, dated to



AD 130–340, and site HP45, dated to AD 350–540 (Daszkiewicz and Goedicke 2007; Mahmoud El-Tayeb and Kołosowska 2007b, 39–40, 44–45); and Saffi Island, post-Meroitic graves, Saffi 56 (Żurawski 2007b, 195–196, Fig. 13).

Parallels and Dating for Variant 1.1b

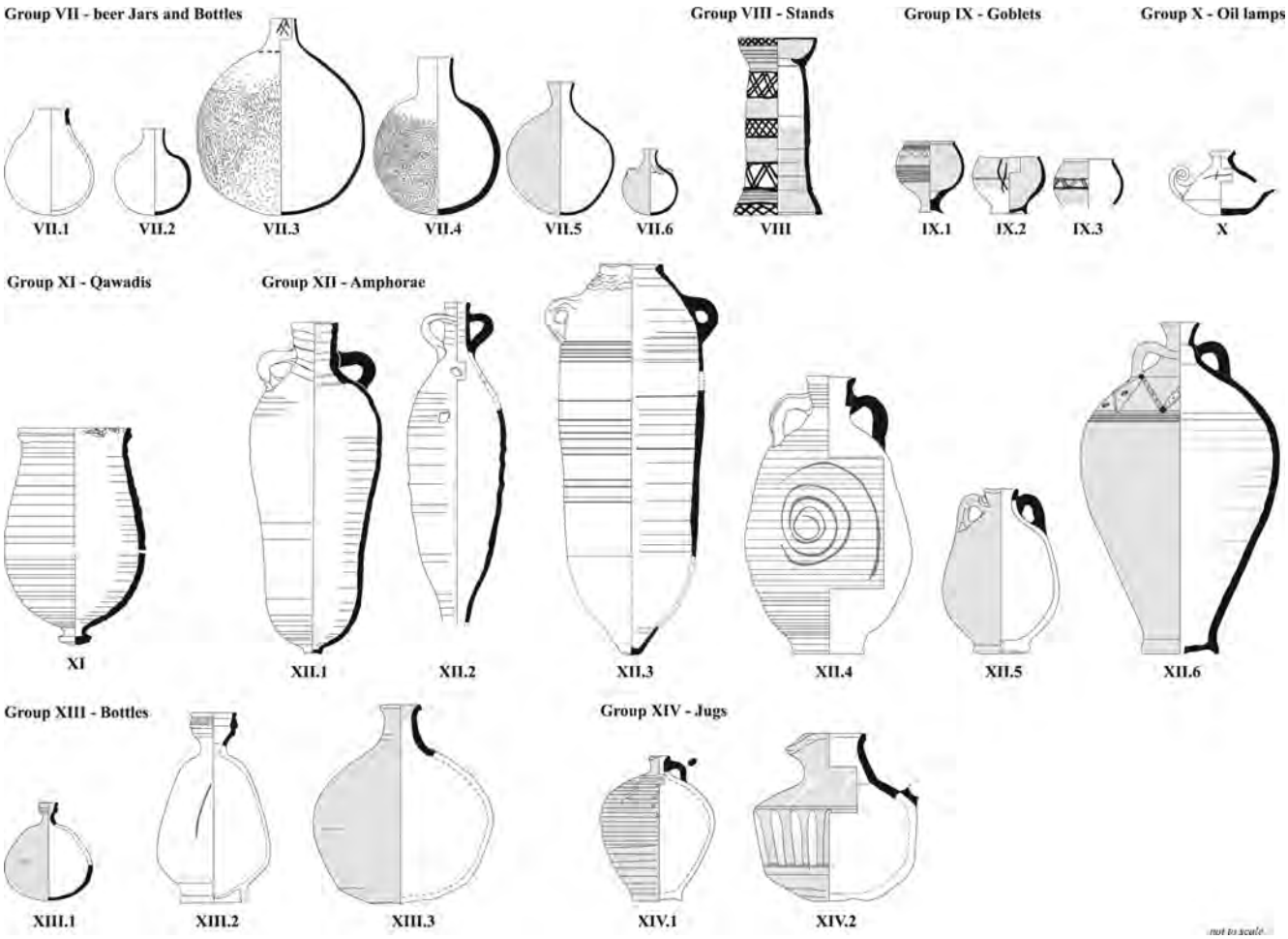
Slipped and polished cups were discovered at Hammur 2 in tumulus 1 and dated to AD 500–650 (Phillips and Mahmoud El-Tayeb 2003, 459–460, Fig. 21g).

6.1.2 Type 1.2 [Cat. 23–40, Figs 7.87–7.89]

Tulip-shaped cups with slightly rounded bases and almost vertical walls, flaring close to the rim (the profile of the walls is straight, with no S-shaped curve). Rims are unmodelled and flared, usually rounded (Fig. 3.1: Un R-1a–c, Un R-2a–b); bases are usually rounded or pointed (Fig. 3.2: B-1, B-3). Tall or medium-tall, these medium-sized cups are predominantly 8–13 cm high with a rim diameter of 8–12 cm. Cups of this type were made on the wheel (1). They occur in macroscopic fabrics ZF1–ZF3. Both surfaces are covered with slip and burnished.

Variant 1.2a

Only one example was discovered at the El-Zuma cemetery. It is a tulip-shaped cup with an unmodelled and flared rim (Fig. 3.1: Un R-2b) and a pointed base (Fig. 3.2: B-3), but made on the wheel (2) (wheel marks are more deli-



cate), and both surfaces are slipped and polished. This is a tall, medium-sized cup, 8.6 cm high with a rim diameter of 8.4 cm, in macroscopic fabric ZF4.

Parallels and Dating for Type 1.2

Cups of this type were found at: El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation); Tanqasi, tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4); and Saffi Island, post-Meroitic graves, Saffi 56 (Żurawski 2007b, 195–196, Fig. 13).

6.1.3 Type 1.3 [Cat. 41–51, Figs 7.89–7.90]

Cups similar to type 1.2 but with straight, flared walls (with no S-shaped curve). Rims are unmodelled and straight, usually rounded (Fig. 3.1: Un R-1b, Un R-2a–b, Un R-3b). Bases are rounded or slightly flattened (Fig. 3.2: B-1, B-2). Tall or medium-tall, these medium-sized cups are predominantly 9–11 cm high with a rim diameter of 9–12 cm. They occur in macroscopic fabrics ZF1–ZF3.

Cups of this type were made on the wheel (1). Both surfaces are covered with slip and burnished.

Parallels and Dating for Type 1.3

Cups of this type were found at: El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation); Tanqasi, tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4); Jebel Kulgeili, dated to the post-Meroitic period (Ali Mohammed and Hussein 1999, 65–68); and El-Sadda, graves dated to the post-Meroitic period (Osypiński 2007, 358–359).

6.1.4 Type 1.4 [Cat. 52–54, Fig. 7.90]

Cups with vertical (straight or slightly concave) walls and unmodelled flared rims (Fig. 3.1: Un R-1b), with either a rounded or flattened base (Fig. 3.2: B-1, B-2). These are tall, medium-sized vessels, predominantly 11–12 cm high, with a rim diameter of 9–10 cm. They occur in macroscopic fabrics ZF1 and ZF3. Cups of this type were made on the wheel (1). Both surfaces are covered with slip and burnished.

Parallels and Dating for Type 1.4

Examples are known from El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation); cups of similar shape were discovered on Saffi Island and dated to the post-Meroitic period (Żurawski 2005, 216–218).

6.1.5 Type 1.5 [Cat. 55–56, Fig. 7.90]

Globular cups with incurved walls, unmodelled rim (Fig. 3.1: Un R-1b), and flattened base (Fig. 3.2: B-2). These medium-tall, medium-sized vessels are 10 cm high with a rim diameter of 10 cm. Cups of this type were made on the wheel (2). Both surfaces are covered with slip and smoothed. Only two such cups were discovered at the El-Zuma cemetery, and they are almost identical in size. Both are complete, which precluded thorough examination of the fabric, but observation of chips in the surfaces of these vessels suggests that they were made in macroscopic fabric ZF4.

Parallels and Dating for Type 1.5

These two red-ware cups are of a form not previously noted among locally produced wares, except for one example from Tanqasi T.87 (Klimaszewska-Drabot 2010a, 220, Fig. 3); on Saffi Island vessels of this type were found in post-Meroitic graves at the Saffi 56 site (Żurawski 2007b, 195–196, Fig. 13).

6.1.6 Cups—Varia [Cat. 57–64, Figs 7.90–7.91]

Cup Z14/14 has straight walls, a modelled rim (Fig. 3.1: M R-9b) and a flat base (Fig. 3.2: B-4). This tall, medium-sized vessel is 10 cm high with a rim diameter of 9 cm. It was made on the wheel (2). Both surfaces are slipped with pinkish-white slip, and the external surface is covered with decoration. The macroscopic fabric of this cup suggests that it probably came from Lower Nubia (see Fig. 3.8: Z14/14).

Parallels and Dating

Similar decoration is noted on a cup from the Romano-Nubian cemetery at Karanog (dated to the 1st–5th century AD). Measuring 9 cm high and 8.7 cm in diameter, this cup is adorned with a red band set against a pinkish-brown ground at the top of the vessel, and brown lines on the body (Woolley and Randall-MacIver 1910, III:272, Pl. 86:8655). A white cup with brown painted decoration, similar in shape and size, was discovered at Qasr Ibrim cemetery 193 and dated to the X-Group—Christian period (Mills 1982, 62, Pl. LXVII:138a). A cup of similar shape but with different painted decoration was found in Hamdab and dated to the Late Meroitic period (Dittrich 2003, 87).

Cups Z26/52, Z14/8, Z14/11 and Z14/5 each have a rounded belly but differ in shape, although they all represent the same uncoated ware (CW.B2.UW). They were made on the wheel (2) and their surfaces are plain. These vessels are complete, meaning that the fabric could not be examined in detail; however, observation of chips in the surface suggests that they represent the same fabric.

Parallels and Dating

A cup similar in shape to Z14/8 was found at Qasr Ibrim cemetery 192 and dated to the X-Group period (Mills 1982, 24, Pl. XXVIII:41.1). A cup of similar shape to Z14/11 was found at Qus-

tul in X-Group burials (Williams 1991, 9:55, Fig. 9:0). No parallels from other sites have been found for the other two cups.

These three cups with flared walls are similar in shape and size.

Cup **Z7/20** was made on the wheel (2); both surfaces were slipped and polished. The rim is modelled (Fig. 3.1: M R-5a) and the base is rounded (Fig. 3.2: B-1). The rim diameter is 9 cm. Evidence of trimming with some kind of tool is visible on the external surface of the base. It occurs in macroscopic fabric ZF4.

Parallels and Dating
Examples from El-Detti are dated to the Early Makurian period (Czyżewska-Zalewska, in preparation).

Cup **Z12/68** is similar in shape to type 1.3. It is medium-deep and medium-sized, with a rim diameter of 9.3 cm and a height of 7.5 cm. The rim is unmodelled (Fig. 3.1: Un R-2b) and the base is rounded (Fig. 3.2: B-1). This cup was made on the wheel (1); the surfaces were slipped but not burnished.

Parallels and Dating
No parallels have been found at any other archaeological sites.

Ribbed cup **Z9/2** was made on the wheel (1); both surfaces were slipped and polished. This medium-tall and medium-sized cup has a rim diameter of 9.5 cm and a height of 7.2 cm. It occurs in macroscopic fabric ZF4.

Parallels and Dating
This cup probably developed from classic Meroitic forms and was widely produced in Lower Nubia during the X-Group period, but there is no parallel for this type of ribbed decoration in the Meroitic and post-Meroitic periods. It is worth noting that similar ribbing features only on C-Group wares (2400–2000 BC), and that a cup or goblet (with small base-ring) with exactly the same decoration was discovered at Faras in an unidentified grave (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 369–370; Nordström 1962, 41, Pl. VIII). An almost identical cup was discovered at the Gerf Husein X-Group cemetery (Firth 1912, 35–40, Pl. 50b). A similar cup was found at Qasr Ibrim cemetery 193, dated to the X-Group—Christian period (Mills 1982, 63, Pl. LXIX).

6.2 *Group 11—Bowls*

This group consists of nine types of bowls. Types 11.1–11.7 comprise a variety of small bowls, while types 11.8 and 11.9 are large storage bowls. Single examples of various bowls are presented under the heading 'Varia' at the end of this section. Bowls of types 11.1–11.5 have been broadly discussed in earlier published articles and needed only a brief review (Klimaszewska-Drabot 2010b; Czyżewska-Zalewska 2016).

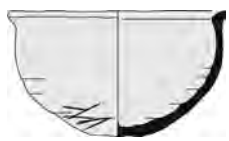
6.2.1 Type 11.1 [Cat. 65–73, Fig. 7.92]

Ledge-rimmed bowls which are deep or medium-deep and medium-sized. Vessels of this type were made on the wheel (1).

Variant 11.1a

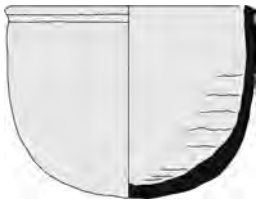
Ledge-rimmed bowls with a modelled rim (Fig. 3.1: M R-9a–c) and rounded base (Fig. 3.2: B-1). These are medium-deep and deep, medium-sized bowls, predominantly 9–12 cm high with a rim diameter of 13–18 cm. Both surfaces are covered with slip and burnished. They occur in macroscopic fabric ZF3.

Variant 11.1a$_1$



Only one example was discovered at the El-Zuma cemetery. This ledge-rimmed bowl has a modelled rim, but the rim is turned in (Fig. 3.1: M R-9d) and the base is flattened (Fig. 3.2: B-2). It is a medium-deep, medium-sized bowl with a height of 7.7 cm and a rim diameter of 12.5–13.5 cm. Both surfaces were slipped but not burnished.

Variant 11.1b



Ledge-rimmed bowls with a modelled rim (Fig. 3.1: M R-9a–c) and rounded, or sometimes pointed, base (Fig. 3.2: B-1, B-3). These medium-deep and deep, medium-sized bowls are predominantly 9–10 cm high with a rim diameter of 11–14 cm. In comparison to variant 11.1a, the base is more rounded and the walls are taller and straight. Both surfaces are covered with slip and burnished. They occur in macroscopic fabrics ZF2 and ZF3.

Parallels and Dating for Type 11.1

Bowls of this type are of Meroitic origin, ledge-rimmed bowls with round or flat bases having been discovered, for example, at the Gabati cemetery (Edwards 1998, I:24–27); similar bowls were also found in a Meroitic grave at El-Kadada (Lenoble 1987, 90–99, Pl. IV:20, 29, 30). In El-Detti bowls of this type are dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation). Bowls from tomb TNQ87 at Tanqasi are dated to AD 250–390 (Klimaszewska-Drabot 2008, 484–485, Fig. 10:3; 2010a, 220–221, Figs 3, 4), while examples from Hagar Sail are dated to the Late Meroitic period (Mahmoud El-Tayeb and Kołosowska 2007a, 16, 21). Bowls of this type were also found in post-Meroitic graves at Khor El-Greyn (El-Nur and Bandi 1994, 325–327, Fig. 2:1), and examples from Gabati are dated to the Meroitic period (Edwards 1998, I:26, 27: 4103, 4101, 4105; 49: 12203, 12204). Berber cemetery vessels similar to *variant 1a*$_1$ are dated to the 3rd century AD (Bashir and David 2011, 127, Fig. 6:3), while examples found at Abu Rtela (Abu Erteila) are dated to the Late Meroitic period, 1st–3rd century AD (Malykh 2017, 147–149, 170–172, Figs 8, 9).

6.2.2 Type 11.2 [Cat. 74–110, Figs 7.93–7.95]

Small and medium-sized hemispherical bowls with flattened bases, sometimes deformed. Straight walls, slightly turned in or straight in the upper part. Rims are unmodelled and flat, rounded or pointed. Five variants were distinguished.

Variant 11.2a

Bowls of slightly conical shape with unmodelled rims (Fig. 3.1: Un R-1c, Un R-2c, Un R-3c), slightly flattened or rounded bases (Fig. 3.2: B-1, B-2) and incurved walls in the upper part. The body diameter is at its largest near the lip and exceeds the rim diameter. These are low or medium-deep, medium-sized or small-sized vessels. Medium-deep bowls are predominantly 11–12 cm high with a rim diameter of 7–9 cm. Small-sized ones are predominantly 6–7 cm high with a rim diameter of 9–10 cm. Vessels of this variant were made on the wheel (1); both surfaces were slipped and burnished. They occur in macroscopic fabrics ZF1, ZF2 and ZF3.

Variant 11.2b

These hemispherical bowls are deeper than those of variant 11.2a. Rims are unmodelled and rounded, pointed or flat (Fig. 3.1: Un R-1c, Un R-2a–b, Un R-3a,c), and bases are mainly rounded, sometimes flattened (Fig. 3.2: B-1, B-2). Walls are slightly incurved, but the point of the maximum body diameter lies more or less at the mid-height of the vessel, that is, lower than in variant 11.2a. These are medium-deep or deep, medium-sized bowls which are predominantly 8–10 cm high with a rim diameter of 11–13 cm. Vessels of this variant were made on the wheel (1); both surfaces were slipped and burnished. They occur in macroscopic fabrics ZF1, ZF3, occasionally ZF2, and ZF4.

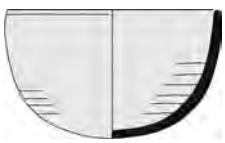
Variant 11.2b$_1$

In this subvariant, bowls were slipped but not burnished (see Cat. 92, p. 290). It occurs in macroscopic fabric ZF3.

Variant II.2c

Hemispherical bowls, slightly shallower than II.2d, with straight walls. Rims are unmodelled and rounded or sometimes flat (Fig. 3.1: Un R-1a, Un R-3a), and bases are rounded or flattened (Fig. 3.2: B-1, B-2). The maximum body diameter is more or less equal to the rim diameter. These are medium-deep and medium-sized bowls or low and small-sized ones. Medium-sized vessels are predominantly 8–10 cm high with a rim diameter of 11–15 cm. Small-sized bowls are predominantly 5–7 cm high with a rim diameter of 11–12 cm. Vessels of this variant were made on the wheel (1); both surfaces were slipped and burnished. They occur in macroscopic fabrics ZF1, ZF2, and occasionally ZF5.

Variant II.2d



Hemispherical bowls, similar to variant II.2c, but deeper. Walls are straight and taller than in variant II.2c. Rims are unmodelled and mainly rounded or flat but straight (Fig. 3.1: Un R-1a, Un R-3a), and bases are rounded or flattened (Fig. 3.2: B-1, B-2). The maximum body diameter is more or less equal to the rim diameter, as seen in variant II.2c. These are medium-deep and deep, medium-sized vessels, predominantly 8–10 cm high with a rim diameter of 10–14 cm. One larger bowl was discovered measuring 12 cm in height and 20 cm in rim diameter. Vessels of this variant were made on the wheel (1); both surfaces were slipped and burnished. They occur in macroscopic fabrics ZF1, ZF2, and ZF3.

Variant II.2e

Hemispherical bowls like type II.2a but low, with unmodelled, rounded, pointed or flat rims (Fig. 3.1: Un R-1c, Un R-2c, Un R-3c) and flattened or flat base (Fig. 3.2: B-2, B-4). Walls are slightly incurved, but the point of the maximum body diameter lies more or less at the mid-height of the vessel. These are low and medium-sized vessels, predominantly 6–7 cm high with a rim diameter of 11–12 cm. Vessels of this variant were made on the wheel (1); both surfaces were slipped and burnished. The only example found is incomplete and in macroscopic fabric ZF3.

Parallels and Dating for Type II.2

Similar bowls were found at: Qasr Ibrim cemetery 193, dated to the X-Group—Christian period (Mills 1982, 48, Pl. LII: 30.10, 30.17, 30.18); Hammur 2, dated to the post-Meroitic period (Mahmoud El-Tayeb 2003, 136–139, Fig. 23); Usli, dated to the post-Meroitic period (Żurawski 2002, 83–84, Pl. 9); El-Detti dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); Tanqasi, in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2008, 484–485, Fig. 10:4–7; 2010a, 220–221, Figs 3, 4); and at El-Kassinger, site HP77, dated to AD 130–340, and site HP45 dated to AD 350–540 (Mahmoud El-Tayeb and Kołosowska 2007b, 39, 45–46). Bowls of similar shape were discovered at: Saffi Island, dated to the post-Meroitic period (Żurawski 2005, 216–218); Saffi 56, in post-Meroitic graves (Żurawski 2007b, 195–196, Fig. 13); Jebel Kulgeili, dated to the post-Meroitic period (Ali Mohammed and Hussein 1999, 65–68); and Akad, in post-Meroitic Grave 6—bowls dated after Adams to AD 200–350 (Ali 2002, 50–51, Fig. 5:5).

Examples were also recovered from a cow burial at El-Tereif dated to the post-Meroitic period (Welsby and Welsby Sjöström 2011, 473: 982, 494).

6.2.3 Type II.3 [Cat. 111–122, Figs 7.95–7.96]

Bowls similar in shape to type II.2 but made on the wheel (2). The walls are thinner, and in most cases, traces of trimming are visible. Both surfaces are usually slipped but not burnished.

Variant II.3a

Bowls of slightly conical shape with unmodelled, rounded or flat rims (Fig. 3.1: Un R-1a,c, Un R-3c) and slightly flattened or rounded bases (Fig. 3.2: B-1, B-2). The walls curve in towards the rim, though some of these bowls have straight walls. The body diameter is at its largest near the lip and exceeds the rim diameter. Mainly low and small-sized vessels, predominantly 5–6 cm high with a rim dia-

meter of 10–11 cm. The macroscopic fabrics of only two examples could be examined: one represents ZF1 and the other represents ZF4.

Variant 11.3b

Bowls of conical shape with incurved walls in the upper part, deeper than variant 11.3a, with unmodelled mainly flat rims; rounded rims are rare (Fig. 3.1: Un R-3a,c, Un R-1c). Bases are slightly flattened or rounded (Fig. 3.2: B-1, B-2). The body diameter is at its largest near the lip and exceeds the rim diameter. These are medium-deep and medium-sized vessels predominantly 7–9 cm high with a rim diameter of 10–14 cm. Traces of trimming are clearly visible on the surface. In most cases both surfaces were slipped; a few examples were slipped and polished. They occur in macroscopic fabrics ZF1, ZF4, occasionally ZF2, and ZF3.

Parallels and Dating for Type 11.3

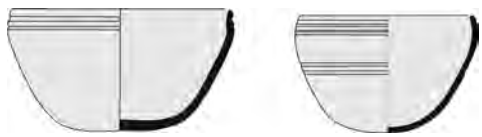
It is difficult to identify parallels for this type of bowl from other sites. These bowls are very similar in shape to type 11.2 but differ in the shape of the bottom part of the vessel, in production technology (wheel-made [2]) and surface finishing (polished not burnished). In many cases there is a lack of detailed information about specific vessels in reports and articles.

Examples have been found at: El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation); probably at Usli 1, dated to the Late Meroitic/early post-Meroitic period (AD 500–650) (Phillips and Mahmoud El-Tayeb 2003, 403–404, Fig. 30b); and on Saffi Island, in post-Meroitic graves at Saffi 56 (Żurawski 2007b, 195–196, Fig. 13).

6.2.4 Type 11.4 [Cat. 123–145, Figs 7.97–7.98]

The typology of these bowls was detailed by the author in a previous article; however, after having examined the whole assemblage it needs some modification in the variants. The four subvariants (a–d) previously identified (Czyżewska-Zalewska 2017, 356–358) have been limited to two main subtypes: a and b. These bowls are conical with rounded bases. The walls curve in towards the top of the vessel, as in variant 11.2a. Rims are unmodelled, rounded or pointed, sometimes flat or bevelled (Fig. 3.1: Un R-1–4), while bases are mainly rounded, sometimes flattened (Fig. 3.2: B-1, B-2). Medium-deep and medium-sized, these vessels are predominantly 7–8 cm high with a rim diameter of 10–13 cm. Several lower examples were recorded measuring 5–7 cm high. These bowls were made on the wheel (2), slipped and polished and adorned with grooved decoration on the body (Czyżewska-Zalewska 2017, 358). They occur in macroscopic fabrics ZF1, ZF3, ZF4, and occasionally in ZF2, ZF5.

Variant 11.4a



This variant is characterized by grooved decoration on the external surface. Two to four (sometimes spiral) grooves occur either exclusively below the rim or in conjunction with an additional 1–3 spiral grooves at mid-height.

Variant 11.4b

This variant is characterized by grooved decoration on the external surface, as in variant 11.4a, but with painted decoration on the rim and sometimes on the external walls.

These bowls could be an imitation of metal bowls, similar in shape and with grooved decoration below the rim. Such metal bowls are noted among X-Group period finds, with examples known from Ballana and Qustul (Emery and Kirwan 1938, Pl. 71:G) as well as Qasr Ibrim (Millet 1963, 162, Fig. 16).

Parallels and Dating for Type 11.4

Bowls of this type have been discovered at: El-Ghaddar in the South Cemetery, dated to the 4th–6th centuries (Mahmoud El-Tayeb 1994, 65–66, 68); Hammur 2, dated to the Transitional/Early Dongola period (AD 500–600) (Phillips and Mahmoud El-Tayeb 2003, 459, 461, Figs 1, 4); and El-Kassinger Bahry, dated to AD 350–540 (Daszkiewicz and Goedicke 2007; Mahmoud El-Tayeb and Kołosowska 2007b, 38–39).

6.2.5 Type 11.5 [Cat. 146–149, Fig. 7.99]

Footed bowls (Fig. 3.2: B-5) with flared sides and flared flat rims (Fig. 3.1: Un R-3a), decorated with horizontal grooves on the body. Only four examples were discovered at El-Zuma. These are medium-deep and medium-sized bowls with a rim diameter of about 13–14 cm and a height of 8–9 cm. These vessels were made on the wheel (2), and their surfaces were slipped and polished. They occur in macroscopic fabric ZF1.

Parallels and Dating for Type 11.5

Similar footed bowls were discovered in post-Meroitic graves at Sesebi and dated to AD 350–550 (Edwards 1994, 170: 38, 39; Osman and Edwards 2012, 134–136, Fig. 5.10: 38, 39).

This type probably represents an Egyptian tradition (Shinnie 1967, 119–120, Fig. 40). Similarities can also be observed with wheel-made, slipped red ware with a polished surface, which was inspired by Roman bowls and dated to Classic X-Group (Adams 1986, 469, Figs 265–266). Straight-sided cups similar in shape to these bowls were found among X-Group remains in the Qustul and Ballana cemeteries, a few examples of which were red-coated. Grooves below the rim and decoration were also present (Williams 1991, 48, 55, Fig. 9f, h).

6.2.6 Type 11.6 [Cat. 150–153, Fig. 7.100]

Globular bowls with straight or incurved walls in the upper part, modelled rims (Fig. 3.1: M R-5a,c) and rounded or flattened bases (Fig. 3.2: B-1, B-2). These medium-deep and medium-sized vessels are predominantly 7–9 cm high with a rim diameter of 11–13 cm. Bowls of this type were made on the wheel (2); both surfaces were slipped and sometimes polished. Grooved decoration features on the external surface below the rim and at mid-height. They occur in macroscopic fabric ZF4, which suggests that they were probably imported from Lower Nubia (see Fig. 3.8).

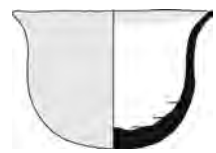
Parallels and Dating for Type 11.6

To the best of our knowledge, this vessel has no parallel elsewhere in Nubia (Mahmoud El-Tayeb and Czyżewska 2011, 116–117), but it shares some characteristics with bowls from the cemeteries at Abkur 18 dated to the Early Dongola period (AD 600–685), which are similar in shape but have grooved decoration at mid-height (Żurawski 2003, 211–212), and with bowls of the Early Christian period recovered from the Arduan cemetery in the Third Cataract region (Osman and Edwards 2012, 132, Pl. 105).

6.2.7 Type 11.7 [Cat. 154–157, Fig. 7.101]

Tulip-shaped bowls with straight walls and flared rims. Made on the wheel (1) and slipped on both surfaces, the external surface with red slip, the internal with white slip.

Variant 11.7a



Bowl with broadly flared walls, unmodelled rounded rim (Fig. 3.1: Un R-1b) and rounded base (Fig. 3.2: B-1). This is a medium-deep and medium-sized vessel with a height of 8.5 cm and a rim diameter of 12 cm. Made in macroscopic fabric ZF3.

Variant 11.7b

Bowls with flared walls, but not as broadly flared as in variant 11.7a, with unmodelled rounded rim (Fig. 3.1: Un R-1b, Un R-3b) and rounded though more pointed base than in variant 11.7a (Fig. 3.2: B-1). These medium-deep bowls are larger than variant 11.7a. Two examples measure 12 cm in height with a rim diameter of 20 cm, and one bigger vessel is 19 cm high with a rim diameter of 29 cm. Only four vessels were discovered in this variant, all of them occur in macroscopic fabric ZF3.

Parallels and Dating for Type 11.7

Close parallels for such bowls were recorded at El-Firaikha (2 km north of Dangeil), where a wheel-made bowl with white paint inside and red slip outside was discovered and ascribed a probable late-Meroitic date (Ahmed 1993, 335, 341 Pl. 1). Bowls of similar shape were found at Abkur 48 and dated to the Early Dongola period (AD 600–850) (Żurawski 2003, 220).

6.2.8 Type 11.8 [Cat. 158–165, Fig. 7.102]

Large, globular bowls. Handmade mainly using the paddle-and-ground and beating method (lower part of the vessel) and/or coiling technique (wall building) (because vessels are preserved fragmentarily, full reconstruction of the production technique is not possible). Both techniques were observed in complete bowl Z11/16 and in fragmentarily preserved vessel Z24/11+Z24/10, both of which represent type 11.9; however, large bowls of both types 11.8 and 11.9 were produced in the same manner. Type 11.8 bowls have a modelled or unmodelled flat rim and straight walls, and the maximum body diameter is more or less equal to the rim diameter. These bowls were mainly slipped on both surfaces, though sometimes slip is present only on the interior of the vessels. A few plain examples were found. Rim diameter is more than 30 cm. All examples are fragmentary and occur in either macroscopic fabric ZF9 or ZF10.

Variant 11.8a

This is a shallower variant of large bowls, with a modelled or unmodelled flat rim (Fig. 3.1: M R-7a, Un R-3b). Most are slipped on both surfaces (only one vessel was slipped inside, and one vessel was plain). Rim diameter is predominantly 50–60 cm, but in some cases even 70 cm.

Variant 11.8b

This is a deeper variant of large bowls, mostly with a modelled, sometimes unmodelled, flat rim (M R-7b, M R-10, Un R-3c). Mainly slipped on both surfaces (several vessels were slipped inside only, and a few vessels were plain). Rim diameter is predominantly 50–60 cm.

Parallels and Dating for Type 11.8

Similar examples of large bowls were discovered at: Argi 3, dated to the Early Dongola to Classic Dongola period (AD 600–1000) (Żurawski 2003, 181); and at El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation).

6.2.9 Type 11.9 [Cat. 166–169, Fig. 7.103]

Deeper than type 11.8. Handmade mainly using the paddle-and-ground and beating method (lower part of the vessel) and/or coiling technique (wall building) (both techniques were observed in complete bowl Z11/16, and fragmentarily preserved vessel Z24/11+Z24/10). These bowls have modelled or unmodelled flat rims. Most were slipped on both surfaces, though sometimes slip is present only on the interior of the vessels. A few plain examples were found. Rim diameter is more than 40 cm. All examples are fragmentary and occur in macroscopic fabrics ZF9 and ZF10.

Variant 11.9a

Deep large bowls with incurved walls in the upper part and a flat unmodelled or modelled rim (Fig. 3.1: M R-7a, Un R-3a). Mainly slipped on both surfaces (several vessels were slipped inside only, and a few vessels were plain). Rim diameter is predominantly 50–60 cm. Only one example was discovered complete, and has a flattened base (Fig. 3.2: B-2) and rim with incised decoration.

Variant 11.9b

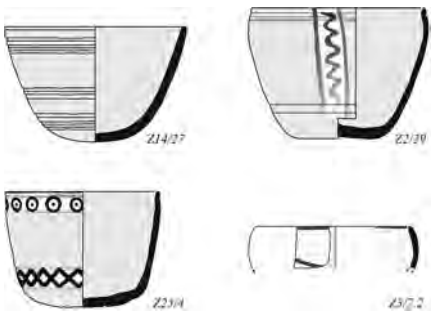
Deep large bowls with straight walls in the upper part and a flat unmodelled or modelled rim (Fig. 3.1: M R-7b, Un R-3c). Mainly slipped on both surfaces (several vessels were slipped inside only, and a few vessels were plain). Rim diameter is predominantly 40–60 cm.

Parallels and Dating for Type 11.9

Similar examples of large bowls were discovered at Argi 3 and dated to the Early Dongola to Classic Dongola period (AD 600–1000) (Żurawski 2003, 181). Large bowls red slipped on both surfaces with incised decoration on the rim were discovered in a cow grave at: El-Tereif, dated to the post-Meroitic period (Welsby and Welsby Sjöström 2011, 473: 992x, 474); and at El-Detti, dated to the Early Makurian period

(Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation).

6.2.10 Bowls—Varia [Cat. 170–187, Figs 7.104–7.105]



Bowl **Z14/27** has straight flared walls in the upper part, an unmodelled rounded rim (Fig. 3.1: Un R-1b) and a rounded base (Fig. 3.2: B-1). Medium-deep and medium-sized, this vessel is 7.5 cm high with a rim diameter of 12 cm. This bowl was made on the wheel (2). Both surfaces are slipped, and grooved decoration adorns the external surface below the rim and at mid-height.

Parallels and Dating
There are no exact parallels for this grooved bowl/cup; the closest analogy, of similar shape but with fewer grooves and painted decoration, was found at El-Kassinger Bahry, site HP47, dated to AD 130–340 (Daszkiewicz and Goedicke 2007; Mahmoud El-Tayeb and Kołosowska 2007b, fig. 30).

Bowl **Z2/29** is conical in shape with an unmodelled rim (Fig. 3.1: Un R-1c) and a flat base (Fig. 3.2: B-4). Medium-deep and medium-sized, it is 8.5 cm high with a rim diameter of 11.5 cm. This vessel was made on the wheel (2), and both surfaces were slipped and polished. Decoration occurs in the form of grooves below the rim and close to the base, together with painted decoration. This bowl is similar to bowls of type II.4.

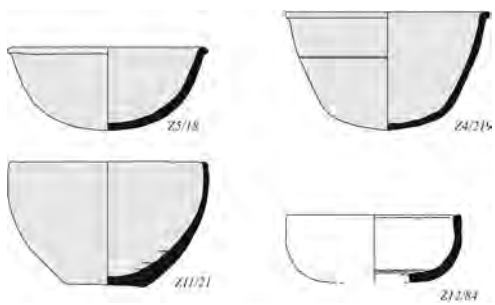
Parallels and Dating
A bowl of similar shape was discovered at El-Kassinger Bahry, site HP47, dated to AD 130–340 and HP45, dated to AD 350–540 (Daszkiewicz and Goedicke 2007; Mahmoud El-Tayeb and Kołosowska 2007b, 43: 45.1.14, 47, Fig. 1 p, q; 49: 47.5.49).

Bowl **Z23/4** also features grooved and painted decoration, but differs in shape to Z2/29. This bowl has straight flared walls, the rim is unmodelled and flat (Fig. 3.1: Un R-3a) and the base is rounded (Fig. 3.2: B-1). Medium-sized and medium-deep, it is 7.6 cm high with a rim diameter of 10 cm. It was made on the wheel (2) and both surfaces were slipped and polished.

Parallels and Dating
Similar examples were found at Qasr Ibrim cemetery 19a, dated to the X-Group period (Mills 1982, 19, Pl. XX:23.19).

Bowl **Z3/7.2** is part of a globular bowl with incurved walls and unmodelled rounded rim (Fig. 3.1: Un R-1c). This vessel was made on the wheel (2). Both surfaces were slipped and probably adorned with painted decoration. It has a rim diameter of 10 cm. The fracture suggests that it was probably imported from Lower Nubia (see Fig. 3.8).

Parallels and Dating
Only a very small fragment of this bowl survives and it is difficult to identify any analogies. The closest parallel could be a wheel-made bowl found at the Awlib Temple Complex, dated to the Meroitic period, which has painted decoration on the rim and below the rim, but this analogy is uncertain (Mahmoud El-Tayeb and Kołosowska 2005, 148).



Bowl **Z5/18** has straight flared walls, a modelled rim (Fig. 3.1: M R-5b) and rounded base (Fig. 3.2: B-1). Low and small-sized, it is 5.5 cm high with a rim diameter of 13 cm. This vessel was made on the wheel (1) and both surfaces were slipped. It occurs in macroscopic fabric ZF6.

Parallels and Dating
This vessel probably represents a Meroitic tradition, but earlier than Z4/219. Similar vessels were discovered at the Nuri cemetery, for example in tomb Nu. 37 dated to 342–328 BC and tomb Nu. 47 dated to 503–487 BC (Dunham 1955, 245: 17-3-356 DW; 173, 174: 98-1-163).

Z4/219 is a bowl with flared walls, modelled rim (Fig. 3.1: M R-6b) and rounded base (Fig. 3.2: B-1). Medium-deep and medium-sized, this bowl is 7.3 cm high with a rim diameter of 12.6 cm. It was made on the wheel (2) and both

surfaces were slipped and polished. One groove features at mid-height as a form of decoration. It is made in macroscopic fabric ZF3.

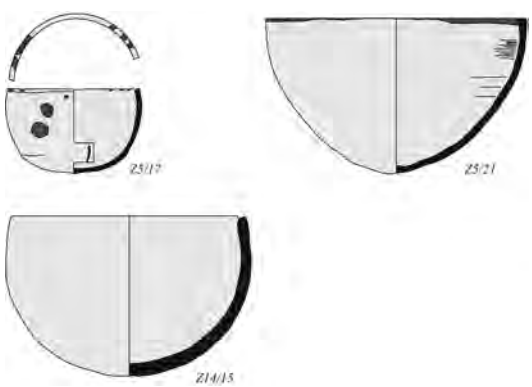
Parallels and Dating
This bowl probably represents a Meroitic tradition. A bowl of similar shape was discovered in Meroe at the North Cemetery and ascribed a probable date of AD 128–150 (King Ariteñyesbēkhe) (Dunham 1957, 164–165, 22-1-27a).

Bowl **Z11/21** is similar to bowls of type 11.2. Its walls are straight, the rim is unmodelled and pointed (Fig. 3.1: Un R-2a) but the base is flat (Fig. 3.2: B-4). Medium-deep and medium-sized, it is 8.5 cm high with a rim diameter of 13–14 cm. This bowl was made on the wheel (1) and both surfaces were slipped and burnished. It is made in macroscopic fabric ZF3.

Parallels and Dating
No parallels have been found at any Nubian sites, but the vessel probably represents a Meroitic tradition (Edwards 1998, 1:26–27, Fig. 2.9: 4101).

Bowl **Z12/84** is a low bowl with straight walls. The rim is unmodelled and flat (Fig. 3.1: Un R-3a) and measures 12 cm in diameter. Made on the wheel (1), both surfaces of this vessel were slipped and polished. It is made in macroscopic fabric ZF4.

Parallels and Dating
No parallels have been found at other Nubian sites.



Bowl **Z5/17** is globular in shape with a modelled rim (Fig. 3.1: M R-5c) and rounded base (Fig. 3.2: B-1). Medium-deep and medium-sized, it is 7 cm high with a rim diameter of 11 cm. Made on the wheel (2), both surfaces of this vessel were slipped, and painted decoration adorned the walls and the rim.

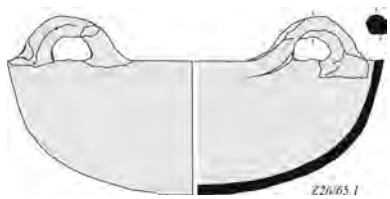
Parallels and Dating
No parallels have been found at other Nubian sites.

Bowl **Z5/21** is conical in shape with an unmodelled flat rim (Fig. 3.1: Un R-3a) and a pointed base (Fig. 3.2: B-3). Medium-deep and medium-sized, this bowl is 12.8 cm high with a rim diameter of 20 cm. It was made on the wheel (2), both surfaces were slipped, and painted decoration was applied to the rim.

Parallels and Dating
Similar fragments were found in the Third Cataract region at the Early Christian cemetery of Arduan (Osman and Edwards 2012, 132, Pl. 105).

Bowl **Z14/15** is similar in shape to bowl 11.2b, with a rounded unmodelled rim (Fig. 3.1: Un R-1c) and rounded base (Fig. 3.2: B-1), but it is handmade. Both surfaces were slipped. Medium-deep and medium-sized, this vessel is 10 cm high with a rim diameter of 14.5 cm. It is made in macroscopic fabric ZF3.

Parallels and Dating
No parallels have been found at other Nubian sites.

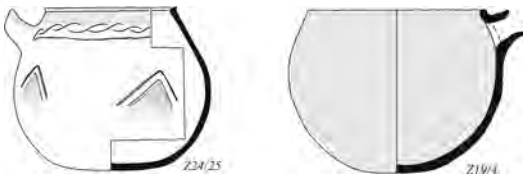


Bowl **Z26/65.1** is hemispherical with straight walls, an unmodelled bevelled rim (Fig. 3.1: Un R-4c) and rounded base (Fig. 3.2: B-1). This large shallow bowl with a rim diameter of 43 cm and a height of 15.5 cm was handmade (probably using the paddle-and-ground and beating method), both surfaces were slipped and burnished, and two 'basket' handles (probably two, but only one survives) were attached to the rim. It is made in macroscopic fabric ZF9.

Parallels and Dating
Similar bowls were found at Selib 3 and dated to the 5th–6th centuries AD (Aneta Cedro, personal communication).

6.3 ***Group III—Spouted Bowls*** [Cat. 188–190, Fig. 7.106] Globular in shape, these bowls have a spout attached below the rim. Rims are unmodelled and rounded (Fig. 3.1: Un R-1a–c), while bases are rounded or flattened (Fig. 3.2: B-1, B-2).

6.3.1 Type III.1



Handmade vessel (made using the paddle-and-ground and beating method) with attached spout (also handmade). Two almost complete vessels and one fragmentary example of this type were recorded at the cemetery.

Z19/4 is markedly globular with its maximum body diameter at mid-height, and the base is rounded (Fig. 3.2: B-1). This bowl is 16.5 cm high and the rim is 18 cm in diameter. Both surfaces were slipped. A similar fragment of spout and rim slipped on both surfaces was discovered in tumulus 7 (Z7/17). Both are made in macroscopic fabric ZF10.

Parallels and Dating

Similar examples have been found at Abu Rtela (Abu Erteila) and dated to the Late Meroitic period (1st–3rd century AD) (Malykh 2017, 139, 154, Fig. 3i). Examples were also found at Soba in contexts dated to the 6th–9th centuries AD (Welsby 1998, Fig. 45: 93.1).

Z24/25 is squatter in shape and the base is more flattened (Fig. 3.2: B-2). Incised and slipped decoration is visible on the external surface of this bowl. Incised bands and a plait motif occur below the rim, while the belly is adorned with incised lines and triangles executed in slip. Slip only features on the external surface as decoration. This vessel is 15.5 cm high and the rim is 15 cm in diameter. It is similar to Z19/4 but probably represents an Eastern Desert Ware import (see Fig. 3.8).

Parallels and Dating

The Eastern Desert is a region in Egypt and evidence of activity in this region dates from the 1st century BC to the 7th century AD (Gates-Foster 2012, 738–741). Eastern Desert Ware was found between the First and Fifth Cataracts and in the Eastern Desert up to the Red Sea coast in 4th–6th-century contexts. A similar example to Z24/25 was discovered at Berenike (Barnard 2008, 22–23; Rose and Barnard 2007).

6.3.2 Type III.2

This vessel was made on the wheel (2) and has an attached spout (also wheel-made). Only one vessel of this type was discovered at the El-Zuma cemetery: Z6/13. It is similar in shape to Z19/4 (type III.1); its maximum body diameter is at mid-height and the base is rounded (Fig. 3.2: B-1). This vessel is 20.5 cm high and the rim measures 18.5 cm in diameter. The spout is broader and longer than in type III.1 and executed more carefully than in type III.1. Only the external surface was slipped, and grooved decoration was executed below the rim and at mid-height. It is made in macroscopic fabric ZF6.

Spouted bowls, which have a long tradition in Upper Nubia, were known in earlier times in Ancient Nubia. Examples were found at the El-Kurru cemetery and dated to 750–700 BC (Dunham 1950, 47: 272).

Parallels and Dating for Type III.2

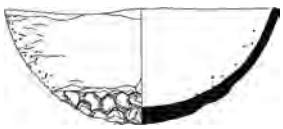
These bowls were probably an imitation of metal vessels. A bronze example was discovered in both Ballana and Qustul and dated to the 4th–6th centuries; similar ceramic vessels found in Ballana and Qustul were interpreted as cooking vessels because of soot present on the base (Emery and Kirwan 1938, 387, 394, Pl. III:79, 64:B14–15). A bowl of this type was found at Serra West in a tomb dated to the X-Group period (Verwers 1962, 26–27, Pl. V), and examples with incised decoration were discovered at Gabati and dated to the post-Meroitic period (Edwards 1998, I:183–185, 193).

6.4 ***Group IV—Bowls***

Hemispherical handmade bowls with an additional layer of clay added to the base. The clay layer could be modelled by hand (most commonly) or using some kind of tool (rarely) [see **Fig. 3.35**]. Traces of fire and soot are often visible on the base. In the typology established by Edyta Klimaszewska-Drabot during the 2007–2009 excavation seasons, bowls attributed in this volume to groups IV and V were classified as cooking vessels (see also Chapter 4, this volume). However, after having examined the entire assemblage, it was clear that this earlier typology would have to be slightly modified and expanded to include new types and variants (Klimaszewska-Drabot 2010b, 482–484).

6.4.1 Type IV.1 [Cat. 191–194, Fig. 7.107]
Shallow and medium-sized hemispherical bowls, mostly with plain surfaces, with clay added to the base and modelled by hand. This type occurs in two variants.

Variant IV.1a



Hemispherical bowls mainly with a rounded base (Fig. 3.2: B-1) and rounded or flat unmodelled rim (Fig. 3.1: Un R-1b, Un R-3b). Shallow and medium-sized, these bowls are predominantly 6.9–9.2 cm high with a rim diameter of 19–22 cm. They are handmade (1) and both surfaces are mostly plain. One example has a slipped and burnished internal surface. The additional layer of clay attached to the base was modelled by hand. They occur mainly in macroscopic fabrics ZF8, and occasionally in ZF10.

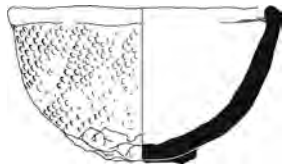
Variant IV.1b

Only one example of this variant was recorded. It was made in a mould. The bowl is shallower and the walls are thinner than in variant IV.1a. The base is rounded (Fig. 3.2: B-1) and the rim is rounded and unmodelled (Fig. 3.1: Un R-1b). Both surfaces are plain without burnish, as in variant IV.1a. The additional layer of clay attached to the base was modelled by hand. This vessel is made in macroscopic fabric ZF10.

Parallels and Dating for Type IV.1
Cooking bowls of this type were discovered at: Hammur 2, dated to AD 500–650 (Phillips and Mahmoud El-Tayeb 2003, 460, 462, Fig. 7a,c,d); and Tanqasi, tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 221, Figs 3, 4).

6.4.2 Type IV.2 [Cat. 195–198, Fig. 7.107]
Medium-deep hemispherical bowls but deeper and with thicker walls than type IV.1, and more irregular in shape than IV.1. Rims are rounded, both surfaces are mostly plain. Clay added to the base was modelled by hand. This type occurs in two variants.

Variant IV.2a



Hemispherical bowls with thick walls. The bases are flattened (Fig. 3.2: B-1) and the rims are rounded and unmodelled (Fig. 3.1: Un R-1a, b). Mainly medium-deep and medium-sized, these bowls are predominantly 7–8 cm high with a rim diameter of 12–18 cm. They are handmade (1). Both surfaces are unslipped with a mat-impressed pattern (pattern 2) on the external surface. The additional layer of clay attached to the base was modelled by hand. They occur in macroscopic fabrics ZF9 and ZF10.

Variant IV.2b

In variant IV.2b there is no mat-impressed pattern on the external surface, and the internal surface is slipped and burnished. The walls of the vessel are thinner and more regular than in variant IV.2a. The only vessel of this variety recorded at the El-Zuma cemetery is made in macroscopic fabric ZF10.

Parallels and Dating for Type IV.2
No parallels have been found at other Nubian sites.

6.4.3 Type IV.3 [Cat. 199–206, Fig. 7.107]
Shallow and medium-deep hemispherical bowls, similar in shape to type IV.2, but with unmodelled, flat or bevelled rims. Clay added to the base was modelled by hand or using a tool. This type occurs in two variants.

Variant IV.3a

Hemispherical bowls with rounded bases (Fig. 3.2: B-1) and unmodelled, flat or bevelled rims (Fig. 3.1: Un R-3a,b, Un R-4b). Shallow and medium-sized, these bowls are pre-

dominantly 6–7 cm high with a rim diameter of 12–16 cm (a little bit smaller than type IV.2). Handmade (1), both surfaces are unslipped, and some examples have a burnished interior. A mat-impressed pattern (pattern 1) features on the external surface, and incised decoration adorns the rim. The additional layer of clay attached to the base was modelled by hand. These bowls occur mainly in macroscopic fabric ZF10.

Variant IV.3b

The bowls are shallower in this variant. Both surfaces are plain and the additional layer of clay attached to the base was modelled using a tool. The bowls are of a similar depth to those of variant IV.3a. Only two vessels of this variant were recorded at El-Zuma.

Parallels and Dating for Type IV.3

Such bowls probably represent a Napatan tradition. Similar examples were discovered at: Usli 1 Temple, dated to the Napatan period (900–300 BC) (Phillips and Mahmoud El-Tayeb 2003, 399–401, Fig. 19 d); Abu Rtela (Abu Erteila), dated to the Late Meroitic period, 1st–3rd century AD (Malykh 2017, 139, 159, Fig. 3h); Es-Sada 1, in post-Meroitic burials (Osypiński 2010, 437) and at El-Kassinger Bahry HP 402/2, dated to the post-Meroitic period (Paner, Pudło, and Borcowski 2010, 72–72, Fig. 13).

6.4.4 Type IV.4 [Cat. 207–209, Fig. 7.108]

This type occurs in three variants at the El-Zuma cemetery, each one represented by a single bowl. In comparison to earlier described types in this group, bowls of type IV.4 are shallower and broader with a flattened base (Fig. 3.2: B-2) and flat rim (Fig. 3.1: Un R-3b,c), and they do not have any mat impressions on the external surface.

This type of cooking bowl is also known as a *doka* (a ceramic vessel used for baking *kisra* bread). The *doka* is first noted during the Meroitic period, occurring in all Late Meroitic phases at Umm Muri, dating from the 2nd–3rd centuries AD to the Early Christian period (Thomas 2008, 65–66, 68–70, Figs 3.1, 3.7,8).

Variant IV.4a

This variant of hemispherical bowl was handmade (1). Shallow and medium-sized, this bowl is 7 cm high with a rim diameter of 15.6 cm. The internal surface is slipped and burnished. The additional layer of clay attached to the base was modelled using a tool.

Variant IV.4b

This variant of bowl was made in a mould (handmade 3). The walls are incurved at the top of the vessel. Shallow and medium-sized, this bowl is 7.5 cm high with a rim diameter of 17 cm. Both surfaces are plain. The additional layer of clay attached to the base was modelled by hand. Incised decoration features on the rim. It is made in macroscopic fabric ZF5.

Variant IV.4c

This variant of bowl was made in a mould (handmade 3). Shallow and medium-sized, it is 8.8 cm high with a rim diameter of 24 cm. The base is broader and flatter than in variant IV.4b. Both surfaces are plain. The additional layer of clay attached to the base was probably modelled using a tool. Incised decoration adorns the rim. This bowl is made in macroscopic fabric ZF9.

Parallels and Dating for Type IV.4

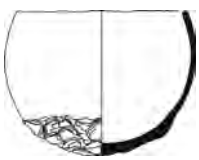
A *doka* was recorded at Selib 3 and dated to the 6th–early 7th century AD (Cedro 2017, 318–319). The same type of cooking bowl was found at: Tanqasi in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4); at the Merowe Sheriq cemetery and fort, dated to the Transitional/Early Christian period (Klimaszewska-Drabot 2008, 481–483, Fig. 9); several examples were also discovered at Suegi fortress and dated to the Transitional/Early Christian period, 6th–7th century AD

(Pluskota 2005, 128–129); and at El-Sadda 1 in post-Meroitic burials (Osypiński 2010, 437). They occur at Soba East throughout the Christian period, appearing in contexts dated to the 6th–9th centuries. A wide range of pottery was made at Soba East, where pottery kilns associated with the production of *qawadis* and *dokat* were discovered in the western part of mound B (Welsby and Daniels 1991, 12; Welsby 1998, 100–101, 112, Figs 42–43).

6.5 *Group V—Pots*

Pots in this group are globular in shape with incurved walls in the upper part. All vessels were handmade (1) and are deep or medium-deep. The clay layer added to the base could be modelled by hand or using some kind of tool in the same way as in bowls of group IV. Traces of fire and soot are often visible on the base.

6.5.1 Type V.1 [Cat. 210–213, Fig. 7.109]



Pots with rounded bases (Fig. 3.2: B-1) and unmodelled rounded or flat rims (Fig. 3.1: Un R-1c, Un R-3c). Deep and medium-sized, these vessels are 12–14 cm high with a rim diameter of 14–17 cm. In most cases both surfaces are plain, though sometimes the interior of the pot was slipped and burnished. The additional layer of clay attached to the base was modelled by hand. They occur mainly in macroscopic fabric ZF8.

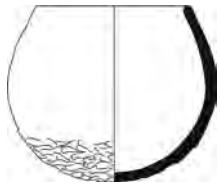
Parallels and Dating for Type V.1

No parallels have been found at other Nubian sites. These bowls probably represent a Napatan tradition. Similar examples were discovered at Dar al-Manasir and dated to the Napatan period (Budka 2006, 51, Fig. 3).

6.5.2 Type V.2 [Cat. 214–216, Fig. 7.109]

Deep and medium-sized, these vessels are more closed and their walls are more incurved than type V.1. Clay added to the base was modelled by hand or using a tool. This type occurs in two variants.

Variant V.2a



Pots with rounded bases (Fig. 3.2: B-1) and unmodelled flat (sometimes rounded) rims (Fig. 3.1: Un R-3c, Un R-1c). Deep and medium-sized, these vessels have a height of 11–12 cm and a rim diameter of 9–11 cm. The internal surface is burnished. The additional layer of clay attached to the base was modelled by hand. They occur mainly in macroscopic fabric ZF10.

Variant V.2b

In this variant the form is more closed than in variant V.2a and the additional layer of clay attached to the base was modelled using a tool. Only one complete example of this variant was recorded at the El-Zuma cemetery.

Parallels and Dating for Type V.2

Examples were recorded at: Qustul, in tombs dated to the 4th–6th centuries AD (Williams 1991, 9:63, Fig. 19:b); the Hammur 2 cemetery, dated to AD 500–650 (Phillips and Mahmoud El-Tayeb 2003, 460, 462, Fig. 7); and Tanqasi, in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4).

6.5.3 Type V.3 [Cat. 217–224, Figs 7.109–7.110]

Deep and medium-sized vessels. The walls are thicker than in types V.1 and V.2 and vessels are more irregular (similar to type IV. 2). Clay added to the base was modelled by hand or using a tool. This type occurs in two variants.

Variant v.3a

Pots with rounded bases (Fig. 3.2: B-1) and unmodelled rounded (sometimes flat) rims (Fig. 3.1: Un R-1c, Un R-3c). Deep and medium-sized, these pots are 11–12 cm high with a rim diameter of 9–11 cm. Both surfaces are unslipped. A mat-impressed pattern adorns the outer surface (mainly pattern 2, rarely pattern 1). The additional layer of clay attached to the base was modelled by hand. These vessels occur mainly in macroscopic fabric ZF10.

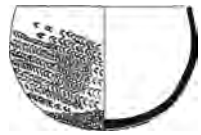
Variant v.3b

In this variant, the walls are thinner and the shape is more regular than in v.3. Pots have rounded bases (Fig. 3.2: B-1) and unmodelled rounded (sometimes flat) rims (Fig. 3.1: Un R-1c, Un R-3c). The internal surface is burnished in some cases. A mat-impressed pattern features on the outer surface (mainly pattern 2, rarely pattern 5). The additional layer of clay attached to the base was modelled using a tool. These pots occur in macroscopic fabric ZF10.

Parallels and Dating for Type v.3
Such vessels were found in post-Meroitic graves at El-Sadda (Osypiński 2007, 350–353).

6.5.4 Type v.4 [Cat. 225–234, Fig. 7.110]
Medium-deep and medium-sized pots with a wide mouth (similar to type v.1), rounded base and flat rim with incised decoration. Clay added to the base was modelled using a tool (mostly) or by hand (rarely). This type occurs in three variants.

Variant v.4a

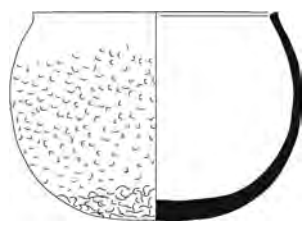


Pots with a rounded, sometimes flattened, base (Fig. 3.2: B-1, B-2) and unmodelled flat rim (Fig. 3.1: Un R-3c). Medium-deep and medium-sized, these pots are predominantly 10–11 cm high with a rim diameter of 12–13 cm. Both surfaces are usually plain, though sometimes the interior is burnished. A mat-impressed pattern adorns the outer surface (pattern 1) and incised decoration features on the rim. The additional layer of clay attached to the base was modelled by hand. These vessels occur mainly in macroscopic fabric ZF10.

Variant v.4b

In this variant the rim is unmodelled, flat or bevelled (Fig. 3.1: Un R-3c, Un R-4c) and walls are more incurved towards the top. The additional layer of clay attached to the base was modelled using a tool. This variant occurs in macroscopic fabric ZF10.

Variant v.4c



This variant is represented by a single vessel. It is more squat than other type v.4 pots. The rim is unmodelled and flat (Fig. 3.1: Un R-3c), and the base is flattened (Fig. 3.2: B-2). This pot is 17.8 cm high with a rim diameter of 21.1 cm. Both surfaces are plain and the additional layer of clay attached to the base was modelled using a tool. It is probably made in macroscopic fabric ZF10.

Parallels and Dating for Type V.4

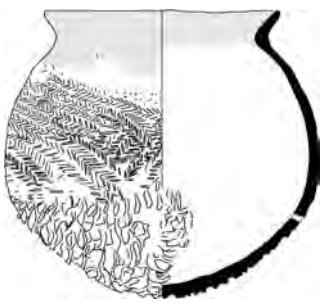
Large pots of this type were found at Tanqasi in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4).

6.6 *Group VI—Pots*

Group of handmade (handmade 1) closed-form globular pots.

The mat-impressions on the body, which, as with the jars, could be interpreted as traces of the forming process or as decoration, in this case were probably a functional feature providing additional friction and making the vessel easier to grip.

6.6.1 Type VI.1 [Cat. 235–237, Fig. 7.111]

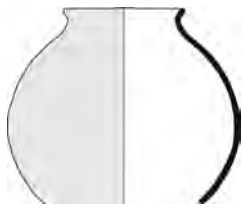


Globular pot with a short neck and broad mouth. Only three fragmentary vessels were discovered at El-Zuma. Rims are unmodelled and rounded (Fig. 3.1: Un R-1b) and bases were probably rounded (only one vessel base survives). Rim diameter is 13 cm or 20 cm. The rim and neck were slipped. Incised decoration is visible on one pot, and two pots are covered with mat impressions (pattern 1). In one example, the bottom part of the vessel survives together with an additional layer of clay attached to the base; this layer was probably modelled by hand by pinching(?) the clay. These pots occur in macroscopic fabric ZF9.

Parallels and Dating for Type VI.1

A similar example was discovered at the X-Group cemetery at Serra East in Lower Nubia (Williams 1993, 230–232). Further parallels were found at: Argi 3, dated to the Early Dongola to Classic Dongola periods (AD 500–850) (Żurawski 2003, 179–180); and Abkur 60, dated to the Early Dongola period (AD 500–625) (Phillips and Mahmoud El-Tayeb 2003, 416). Vessels with an everted rim and mat impression on the body or incised decoration below the rim (see Cat. 235–237) were recorded at Selib 3 and dated to the 6th–early 7th century AD (Cedro 2017, 317–318), at a post-Meroitic/medieval cemetery at Wadi Abu Dom (Lohwasser, n.d., 23), and in post-Meroitic graves on Saffi Island (Phillips and Klimaszewska-Drabot 2005, 120, Fig. 9). Cooking jars of this type were also discovered in the Fourth Cataract region, at medieval settlement 3-N-140, and dated to the classic Christian period (AD 600–850) (Wolf and Nowotnick 2007, 29–30, Pl. 8). Similar fragments were found at Abu Geili in structures dated to the Meroitic period, which suggests a Meroitic tradition (Crawford and Addison 1951, 67, Pl. XLVIb).

6.6.2 Type VI.2 [Cat. 238–239, Fig. 7.111]

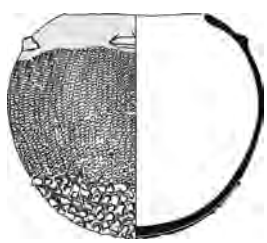


These pots are similar in shape to type VI.1, but the mouth is narrower and the rim is flat (Fig. 3.1: Un R-3b). Both surfaces are smooth and either both or only the external surfaces are slipped. This type is represented by two vessels made in macroscopic fabrics ZF9 and ZF10.

Parallels and Dating for Type VI.2

Similar examples come from: Qustul, dated to the 4th–6th century AD (Emery and Kirwan 1938, 64, Fig. 20:e); Hambukol, from a post-Meroitic cemetery dated to the 4th–5th century AD (Grzymski 1991, 18–19, 23:8); and Abkur 34, dated to the Early Dongola period (AD 600–850) (Żurawski 2003, 215).

6.6.3 Type VI.3 [Cat. 240, Fig. 7.111]



A globular pot without neck, the external surface was slipped in the upper part and small horizontal handles were attached below the rim (only one handle survives). Mat impressions (pattern 3) are visible on the external surface of the body. An additional layer of clay was attached to the base in a similar way to that noted in type VI.1. This type occurs in macroscopic fabric ZF9.

Parallels and Dating for Type VI.3

A vessel of similar shape was discovered at Bakhit and dated to the Transitional/Very Early Dongola period (AD 550–625) (Phillips and Mahmoud El-Tayeb 2003, 411–412, 416, Fig. 38a).

6.7 *Group VII—Jars and Bottles*

This group consists of handmade bottles or jars often referred to in the literature as beer jars or beer bottles (see also Chapter 4; Mahmoud El-Tayeb 2012, 87–94, 98–99). This group is divided into four main types: jars with a broad mouth and shoulders; jars with a narrow mouth; bottles with a short neck; and bottles with a long neck. These are in turn subdivided into variants based on decoration and surface treatment. The differences between jars and bottles based on morphological features have been widely discussed in previous articles (Czyżewska-Zalewska 2016, 730–732) and needs only a brief review. Jars are characterized by a globular body and broad neck. The neck gradually merges into a globular body. The rim is unmodelled and usually rounded. Bottles also have a globular body, and the neck is short or long but much more slender than in jars, and narrower with straight or slightly concave walls. Rims are unmodelled, straight or flared. Jars are larger than bowls and occur in three sizes: large with a body diameter of 40–60 cm and a height of 40–75 cm; medium with a body diameter of 25–39 cm and a height of 30–39 cm; and small with a body diameter of 20–25 cm and a height of 20–35 cm.

In previous publications bottles were presented in two sizes: medium with a body diameter of 15–30 cm and a height of 20–35 cm; and small with a body diameter of 12–15 cm and a height of 14–19 cm (Mahmoud El-Tayeb 2012, 97), but examination of all materials from the El-Zuma cemetery has led to the identification of large bottles with a body diameter of 40–60 cm and a height of 40 cm to as much as 74 cm.

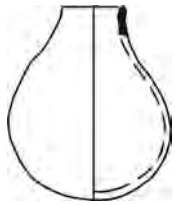
As mentioned in Chapter 3, the typology presented in an earlier published article (Czyżewska-Zalewska 2016, 727–733) needed to be modified.

These vessels were probably shaped in a hollow in the ground (handmade [1]). The neck and rim were handmade separately and attached to the vessel; traces of the joins are visible on the internal surface, and often vessels cracked along this join [see **Fig. 3.36**].

6.7.1 Type VII.1 [Cat. 241–249, Figs 7.112–7.113]

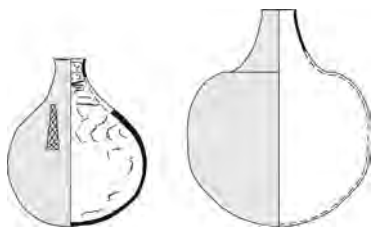
This type of jar has a broad mouth and shoulders; the neck is short to long and the belly is globular. Rims are mainly rounded, very occasionally flat (Fig. 3.1: Un R-1a,b, Un R-3a), and the base is always rounded (Fig. 3.2: B-1). Four variants were distinguished within this type.

Variant VII.1a



Pear-shaped jars with a short and broad neck, and a shoulder gently merging into the belly. The external surfaces are plain or slipped, sometimes slipped and burnished. Small and medium-sized vessels were recorded in this variant, of which there are only four examples. They occur in macroscopic fabrics ZF9 and ZF10.

Variant VII.1b



Bag-shaped and broad globular jars with a broad but longer neck than seen in variant VII.1a. The junction between the neck and belly is much more visible. The external surfaces were plain or slipped and burnished; in some cases, impressions left by mats used in the shaping process are discernible beneath the slip. These jars occur in three sizes and in macroscopic fabrics ZF9, ZF10, and occasionally ZF7.

Variant VII.1c

Broad globular jars with a broad, long neck; the junction between the neck and belly is much more pronounced than in variant VII.1b, and sometimes there is an indentation at the point where pressure was applied around the base of the neck to attach it to the belly. The external surfaces were plain or slipped and burnished; in some cases, mat impressions left by the shaping process are dis-

FIGURE 3.35 Additional layer of clay on the base of pots: modelled by hand (left), modelled with a tool (right)
PHOTOS BY O. BIAŁOSTOCKA (LEFT), AND T. WOJTCZAK (RIGHT)

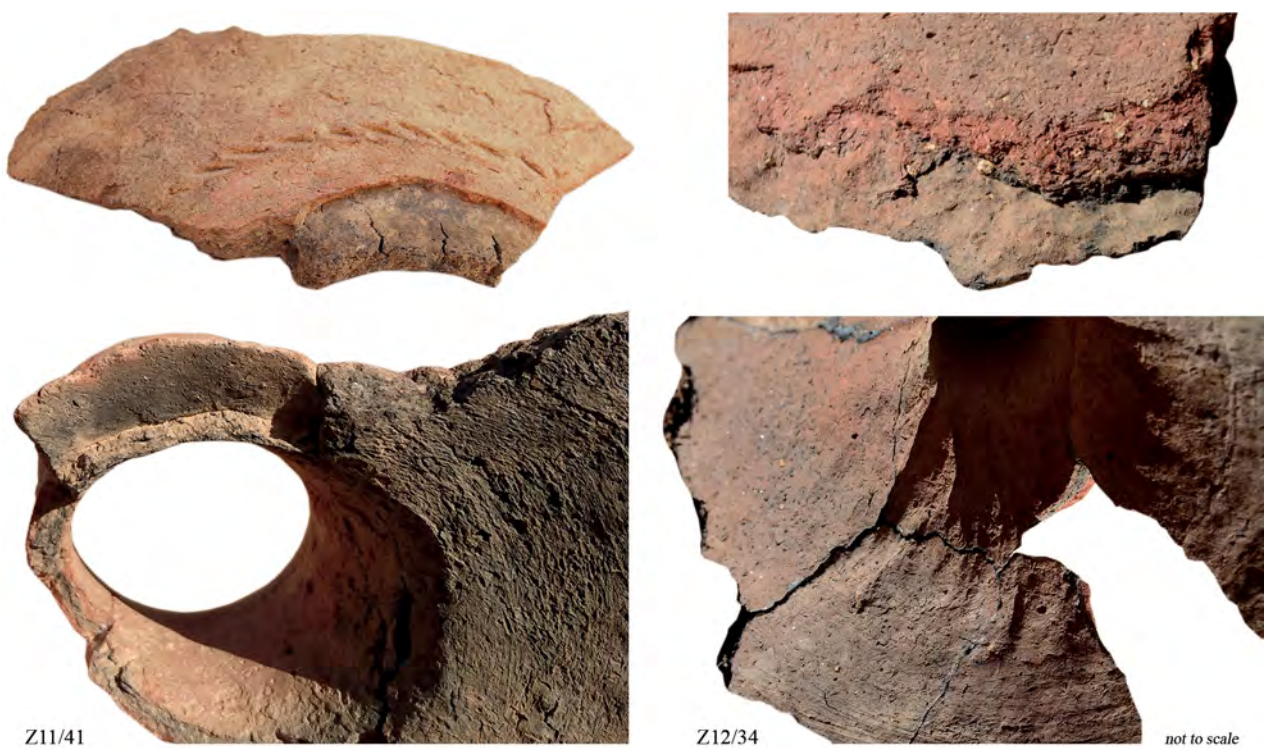


FIGURE 3.36 Traces of the join between the neck and body of jars
PHOTOS BY E. CZYŻEWSKA-ZALEWSKA

cernible beneath the slip. Only three examples (of three sizes) were discovered at El-Zuma in macroscopic fabrics ZF9, ZF10, and ZF11. Only one small, broad, globular jar, slipped and burnished on the outside, has small bosses attached on the shoulder as decoration (Czyżewska-Zalewska 2018, 292–294).

Variant VII.1d

Broad, bag-shaped, medium-sized and large jars were recorded. The external surface of the neck is slipped and burnished, and the shoulders are decorated with slipped bands. Mat impressions are noted on the belly (patterns 1 and 3). These jars occur in macroscopic fabrics ZF9 and ZF10.

Parallels and Dating for Type VII.1

Similar jars have been found at: El-Ghaddar in the South Cemetery, dated to the 4th–6th centuries (Mahmoud El-Tayeb 1994, 71–73); Usli, dated to the Late Meroitic to early post-Meroitic period (AD 300–550) (Phillips and Mahmoud El-Tayeb 2003, 403–407, Fig. 29a); El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); Tanqasi, dated to the Meroitic and post-Meroitic periods (Czyżewska-Zalewska 2018, 292–294); Jebel Kulgeili, dated to the post-Meroitic period (Ali Mohammed and Hussein 1999, 65–68); El-Kassinger Bahry site HP45, dated to AD 350–540 (Mahmoud El-Tayeb and Kołosowska 2007b, 40; Daszkiewicz and Goedicke 2007); El-Sadda, in post-Meroitic graves (Osypiński 2007, 350–353); Hagar El-Beida, dated to the Late Meroitic/post-Meroitic period (Chłodnicki and Stępnik 2013, 314–318); Gabati, dated to the post-Meroitic period (Edwards 1998, I:110, Pls 85, 94); and at El-Hobagi cemeteries III and IV, dated to the 4th century (Lenoble 2018, 58–83, 183–191). Jars of similar shape with four bosses on the shoulder but with mat-impressed decoration on the body were found at the North Cemetery at Musawwarat es-Sufra, dated to the post-Meroitic period (AD 350–550) (Joachim 2014, 201–203, Fig. 17). In Sabaloka a post-Meroitic grave also yielded such a jar (Varadzinová Suková et al. 2015), and a similar vessel was found at the Meroitic cemetery in Gereif and dated to the Late Meroitic period (Sakamoto 2016b, 87, Fig. 6).

Parallels and Dating for Variant VII.1a

Examples of slipped and unslipped bag-shaped jars dated to the 5th century Middle Noubadian X-Group are known from Serra West (Fuscaldo 2011, 210: 105, 106, Fig. 15). Other parallels come from: El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation); El-Kassinger Bahry site HP47, dated to AD 130–340 (Mahmoud El-Tayeb and Kołosowska 2007b, 44–45; Daszkiewicz and Goedicke 2007); Jebel Kulgeili, dated to the post-Meroitic period (Ali Mohammed and Hussein 1999, 65–68); Es-Sadda in post-Meroitic graves (Osypiński 2007, 358–359); and Akad post-Meroitic cemetery, dated to AD 350 (Faroug, Saeed, and Tsakos 2007, 105–106, Pl. 6: 06-PL-10).

Parallels and Dating for Variant VII.1b

Comparable examples have been noted at: El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); Wadi Abu Dom, at a post-Meroitic cemetery (Lohwasser, n.d., 24); Saffi Island, dated to the post-Meroitic period (Żurawski 2005, 216–218); Es-Sadda, in post-Meroitic graves (Osypiński 2007, 358–359); Akkad (slipped jar), dated to AD 350 (Faroug, Saeed, and Tsakos 2007, 105–106, Fig. 6:06-PL-27); Kabbashi cemetery, dated to the 4th–5th centuries (Caneva 1994, 89–91, Fig. 6a); Khor El-Greyn, at a post-Meroitic cemetery (El-Nur and Bandi 1994, 325–327, fig. 2: 3); El-Kadada, in a post-Meroitic grave (Lenoble 1987, 92–93, pl. XII); and at Al-Khiday post-Meroitic cemetery, where black-fired slipped jars were discovered (Salvatori et al. 2014, 251–252, 255).

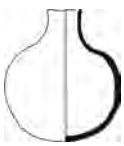
Parallels and Dating for Type VII.1c

Jars of this variety have been recorded at: El-Kassinger Bahry site HP45, dated to 350–540 AD (Mahmoud El-Tayeb and Kołosowska 2007b, 40; Daszkiewicz and Goedicke 2007); Jebel Kulgeili, dated to the post-Meroitic period (Ali Mohammed and Hussein 1999, 65–68); El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); Sabaloka, in a post-Meroitic grave (Varadzinová Suková 2015); and El-Ghaddar, in the South Cemetery, dated to the 4th–6th century AD (Mahmoud El-Tayeb 1994, 71–73). Similar examples were discovered at: Tanqasi, dated to the Meroitic and post-Meroitic periods (Czyżewska-Zalewska 2018, 292–294); Gabati, dated to the post-Meroitic period (Edwards 1998, I:110, Pls 85, 94); El-Sadda, in post-Meroitic graves (Osypiński 2007, 350–353); Hagar El-Beida, dated to the Late Meroitic/post-Meroitic period (Chłodnicki and Stępnik 2013, 314–318); and El-Hobagi, cemeteries III and IV, dated to the 4th century AD (Lenoble 2018, 58–83, 183–191). Jars of similar shape, with four bosses on the shoulder but with mat-impressed decoration on the body were found in the North Cemetery at Musawwarat es-Sufra, dated to the post-Meroitic period (AD 350–550) (Joachim 2014, 201–203, Fig. 17). A similar

vessel was also found at the Meroitic cemetery in Gereif and dated to the Late Meroitic period (Sakamoto 2016b, 87, Fig. 6).

6.7.2 Type VII.2 [Cat. 250–258, Figs 7.114–7.115]
Jars of this type have a narrower neck than type VII.1; the neck is short or medium-long and the belly is globular. The rim is usually rounded, or very occasionally flat (Fig. 3.1: Un R-1a,b, Un R-3a), and the base is always rounded (Fig. 3.2: B-1). These jars occur in all three sizes. Three variants of this type were distinguished.

Variant VII.2a



In this variant, the neck is short or medium-long. These vessels are broad and small to large. External surfaces are plain or slipped and burnished. They occur mainly in macroscopic fabrics ZF9 and occasionally in ZF10.

Variant VII.2b

In this variant, the neck is medium-long and long. These vessels are broad and occur in two sizes: large and medium-sized. External surfaces are slipped and often burnished. Two small bosses were attached to the shoulders as decoration. They occur mainly in macroscopic fabric ZF9 and occasionally in ZF10.

Variant VII.2c

In this variant, the neck is medium-long and long. Only two vessels are recorded in this variant and they are medium-broad and medium-sized. External surfaces feature mat impressions on the body (patterns 1 and 7), and incised decoration below the rim and on the neck. One vessel occurs in macroscopic fabric ZF7.

Parallels and Dating for Variant VII.2a
Jars of this sort have been found at: Sesebi in the Third Cataract region, in post-Meroitic graves dated to the 4th–5th centuries AD (Osman and Edwards 2012, 136, Fig. 5.11: 7); Tanqasi, in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4) and in a tomb dated to AD 350–550 (Wyżgoł and Mahmoud El-Tayeb 2018, 287; Czyżewska-Zalewska 2018, 292, 293, Fig. 3); Wadi Abu Dom, at the post-Meroitic cemetery (Lohwasser, n.d., 24); El-Sadda, in post-Meroitic tombs (Osypiński 2007, 358–359); and Khor El-Greyn, at a post-Meroitic cemetery (El-Nur and Bandi 1994, 325–327, Fig. 2: 5).

Parallels and Dating for Variant VII.2b
Examples are known from: El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); and Jebel Kulgeili, dated to the post-Meroitic period (Ali Mohammed and Hussein 1999, 67–68).

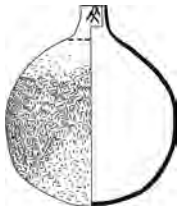
Parallels and Dating for Variant VII.2c
Similar jars have been recorded at: Mansourkuti, in the Late Meroitic to post-Meroitic parts of cemetery DS2 (Bashir 2014, 157–159, P. 3); and Saffi Island, dated to the post-Meroitic period (Żurawski 2005, 216–218). A jar featuring a mat impression on the body and a red-slipped neck and shoulder with decoration on the rim was discovered in a cow grave at El-Tereif dated to the post-Meroitic period (Welsby and Welsby Sjöström 2011, 471, 473: 979x).

6.7.3 Type VII.3 [Cat. 259–261, Fig. 7.116]
Jars or bottles with a short and narrow neck; the belly is broader and squat. Rims are unmodelled and rounded (Fig. 3.1: Un R-1a,b) and bases are rounded (Fig. 3.2: B-1). These vessels are all of large size. They occur in macroscopic fabric ZF9.

Variant VII.3a

Only one vessel of this variant was recorded. The rim is slightly flared and the external surface was smoothed and burnished.

Variant VII.3b



Only two vessels of this variant were recorded. The rim is straight, the external surface has mat impressions on the body (pattern 1), and incised decoration can occur below the rim and on the neck. These vessels are complete and the fabric cannot be determined.

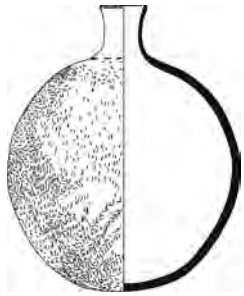
Parallels and Dating for Type VII.3
Similar jars were found at the Hammur 2 cemetery and dated to the Transitional/Early Dongola period (AD 500–650) (Phillips and Mahmoud El-Tayeb 2003, 460–461, Pl. 5). Jars of similar shape were discovered: on Saffi Island and dated to the post-Meroitic period (Żurawski 2005, 216–218); and in Wadi Abu Dom, at the post-Meroitic cemetery (Lohwasser, n.d., 24).

6.7.4 Type VII.4 [Cat. 262–268, Figs 7.117–7.118]
Bottles of this type have a long and straight neck; the belly is globular. Rims are unmodelled, mainly rounded, sometimes flat (Fig. 3.1: Un R-1b, Un R-3a), and bases are rounded (Fig. 3.2: B-1). They occur in large and medium sizes and are broad or medium-broad. Mat impressions feature on the body (mainly pattern 1, occasionally patterns 2 and 4). They occur mostly in macroscopic fabrics ZF9 and ZF10.

Variant VII.4a

In this variant, the neck is straight, long and quite broad. These vessels occur in two sizes: large and medium, and they are broad or medium-broad. The neck is sometimes slipped and burnished, and in some cases incised decoration is noted below the rim and on the shoulders. Although most of these vessels are complete, they have been observed in macroscopic fabrics ZF9 and ZF10.

Variant VII.4b



In this variant, the neck is medium-long and narrow with slightly concave walls. These vessels occur in two sizes: large and medium, and they are broad or medium-broad. The neck is sometimes slipped and burnished, and incised decoration features on the neck and below the rim. They occur in macroscopic fabrics ZF8 and ZF9.

Parallels and Dating for Type VII.4
Bottles of this sort have been found at: El-Ghaddar, Rom 32, post-Meroitic cemetery dated to the 4th–5th centuries AD (Grzymski 1991, 18–19, 22:5); Usli 1, dated to the Late Meroitic/early post-Meroitic period (AD 300–500) (Phillips and Mahmoud El-Tayeb 2003, 403–407, Fig. 27a); El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419); and at Tanqasi, in post-Meroitic tomb Tnq 1/07 (Żurawski 2007a, 334–335). Vessels of similar shape were discovered on Saffi Island and dated to the post-Meroitic period (Żurawski 2005, 216–218), and at El-Kassinger Bahry, where they were dated to AD 130–340 (Daszkiewicz and Goedicke 2007).

6.7.5 Type VII.5 [Cat. 269–276, Figs 7.119–7.120]
Predominantly bag-shaped bottles with a medium-long neck which has walls more concave than in variant VII.4b. Rims are unmodelled, mainly rounded, though sometimes flat (Fig. 3.1: Un R-1b, Un R-3b), and bases are rounded (Fig. 3.2: B-1). They occur in three sizes and are broad and medium-broad.

Variant VII.5a

Bottles of this variant are more irregular in shape. They are medium-sized and medium-broad vessels. The external surface is usually slipped and burnished, though several

examples were discovered with plain surfaces. They occur in macroscopic fabrics ZF9 and ZF10.

Variant VII.5b

In this variant bottles are more regular in shape than in variant VII.5a. The neck is slender, medium-long and long. They occur in all sizes and are medium-broad and broad. The external surface is usually slipped and burnished, though several examples were discovered with plain surfaces. Two small bosses are attached on the shoulders as decoration. They occur in macroscopic fabric ZF9, and one example was noted in ZF11.

Variant VII.5c

In this variant, bottles have a slender and medium-long neck. These vessels occur in two sizes: large and medium-sized, and they are broad and medium-broad. The neck is slipped and mat impressions feature on the body (mainly pattern 3, rarely patterns 1 and 6). They occur in macroscopic fabric ZF10, and occasionally in ZF7.

Parallels and Dating for Type VII.5

Bottles of this type have been recorded at: El-Detti, dated to the Early Makurian period (Mahmoud El-Tayeb et al. 2016; Czyżewska-Zalewska, in preparation); Tanqasi, in post-Meroitic tombs TNQ 1/07 and TNQ 23 (Żurawski 2007a, 334–335; Czyżewska-Zalewska 2018, 292–294); and El-Sadda, in post-Meroitic tumuli (Osypiński 2007, 350–353).

Parallels and Dating for Variant VII.5a

Comparable examples have been discovered at: Usli, dated to the post-Meroitic period (Żurawski 2002, 83–84, Pl. 9); Tanqasi, in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 220–221, Figs 3, 4) and in tomb TNQ23 dated to AD 350–550 (Wyżgoł and Mahmoud El-Tayeb 2018, 287; Czyżewska-Zalewska 2018, 292, 293, Fig. 4).

6.7.6 Type VII.6 [Cat. 277–286, Figs 7.121–7.122]

These bottles are globular in shape and have a medium-long or long neck with concave walls. Rims are unmodelled and usually rounded, sometimes flat (Fig. 3.1: Un R-1a,b, Un R-3b), and bases are rounded (Fig. 3.2: B-1). They occur in three sizes and are broad and medium-broad.

Variant VII.6a

In this variant the neck is long and the external surface is usually slipped. Observed in macroscopic fabric ZF9.

Variant VII.6b

In this variant the neck is medium-long and its external surface is slipped; sometimes slipped bands occur as decoration. Mat impressions feature on the body (usually pattern 2, rarely 1 or 6). These vessels are large and broad. They occur in macroscopic fabric ZF10.

Variant VII.6c

Bottles of this variant have a medium-long or long neck. They are medium-sized and broad. The external surface is usually slipped and burnished, though sometimes plain. Two small bosses are attached on the shoulders as decoration. They occur in macroscopic fabric ZF9, and occasionally in ZF10.

Variant VII.6d

Bottles of this variant have a medium-long or long neck. These vessels are medium-sized and broad. The external surface is slipped and burnished. Two lugs are attached on the shoulders as decoration. They occur in macroscopic fabric ZF9, and occasionally in ZF10.

Parallels and Dating for Type VII.6
Examples are known from El-Detti, dated to the same horizon as El-Zuma (Mahmoud El-Tayeb et al. 2016, 418–419).

Parallels and Dating for Variant VII.6a
Comparable vessels were discovered at: Usli, dated to the Meroitic and post-Meroitic periods (Żurawski 2002, 83–83; 2007, Figs 3, 4); and Khor El-Greyn, at a post-Meroitic cemetery (El-Nur and Bandi 1994, 325–327, Fig. 2: 4).

Parallels and Dating for Variant VII.6b
Similar jars were found at: Akad, dated to AD 350 (Faroug, Saeed, and Tsakos 2007, 105–106, Figs 6:06-PL-19), and Tanqasi, in tomb TNQ23 dated to AD 350–550 (Wyżgoł and Mahmoud El-Tayeb 2018, 287; Czyżewska-Zalewska 2018, 292, 294, Fig. 5:23/23).

Parallels and Dating for Variant VII.6d
Jars of this type were recorded at Tanqasi in tomb TNQ87, dated to AD 250–390 (Klimaszewska-Drabot 2010a, 221, Figs 3, 4).

6.7.7 Jars—Varia [Cat. 287–292, Fig. 7.123]

Z12/51 is a large, broad and globular, handmade (1) jar with a broad and medium-long neck. The external surface was washed, and incised decoration was executed on the shoulders. It is made in macroscopic fabric ZF11.

Parallels and Dating
No parallels have been found at any other Nubian sites.

Z25/2 is also a large handmade (1) jar, but without a neck and with a broad mouth. The external surface was slipped; punctuated and painted decoration features below the rim. This jars is made in macroscopic fabric ZF9.

Parallels and Dating
Storage jars of similar shape were discovered at Umm Muri in post-Meroitic occupation levels (Thomas 2008, 66, 69, Fig. 4:8).

Z11/42 is some kind of bottle, also handmade (1), with a medium-short neck with conical walls. The neck was slipped and burnished, and part of a mat impression (pattern 1) is visible on the body. Two small bosses were attached to the shoulder. This is the only example of a jar featuring both mat impressions and bosses. It is only in cooking pots of type VI that such bosses were recorded. Evidence of fire and soot on the surface suggests that this jar was used for cooking. It is made in macroscopic fabric ZF10.

Parallels and Dating
No parallels have been found at any other Nubian sites.

Z12/133.1 is a globular, handmade (1) jar with a flattened base. The external surface was slipped, and the neck features a ring/flange as decoration. It is made in macroscopic fabric ZF7. Traces of repair can be seen on the neck.

Parallels and Dating
A similar example comes from El-Kassinger Bahry, site HP45, dated to AD 350–540 (Mahmoud El-Tayeb and Kołosowska 2007b, 40; Daszkiewicz and Goedicke 2007).

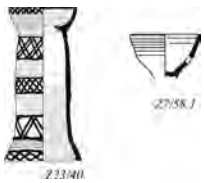
Z12/52 is a large, ovoid, wheel-made (2) jar. It survives to a height of 65 cm. The external surface was slipped and burnished. The neck was also wheel-made and attached to the belly. The macroscopic fabric is similar to ZF4. Traces of repair are visible on the neck of this vessel.

Parallels and Dating
No parallels have been found at any other Nubian sites.

Z10/25 is a globular bottle with a very long neck, made on the wheel (2). The external surface was slipped.

Parallels and Dating
Similar bottles were found at the Gebel Adda cemeteries dated from the Late Meroitic to early Christian periods (Huber and Edwards 2012, Pl. 14).

6.8 *Group VIII—Stands*



6.8.1 Type VIII.1 [Cat. 293, Fig. 7.124]
This is a unique stand with an unmodelled rounded rim (Fig. 3.1: Un R-1b) and a flat base (Fig. 3.2: Un R-4b). Measuring 9.5 cm in diameter and 21.5 cm high, it is decorated with geometric painted motifs. No other stand of this shape has been discovered in Nubia. Meroitic and post-Meroitic stands from the south are different in shape (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 12–13). This stand was made on the wheel (2).

Parallels and Dating for Type VIII.1
The nearest analogy to this shape was recorded at Gabati, but the stand discovered there was broader at the base, tapering towards the top, and decorated in horizontal bands. It was dated to the Meroitic period (Edwards 1998, I:145, 148).

6.8.2 Type VIII.2 [Cat. 294, Fig. 7.124]
One small fragment of stand survives, probably from an example larger than type VIII.1, with an unmodelled rim (Fig. 3.1: Un R-1b) of 12.2 cm in diameter. It seems to be slenderer than type VIII.1, is uncoated and without any decoration. No stand of similar shape has been discovered. This stand was made on the wheel (2) in macroscopic fabric ZF10.

Parallels and Dating for Type VIII.2
The closest parallels were discovered at Abu Rtela (Abu Erteila) and dated to the Late Meroitic period (1st–3rd centuries AD) (Malykh 2017, 151, 176–177, Fig. 12).

6.9 *Group IX—Goblets*

6.9.1 Type IX.1 [Cat. 295, Fig. 7.125]

This is a globular goblet with incurved walls, unmodelled, everted rim (Fig. 3.1: Un R-1b), and a narrow foot (Fig. 3.2: B-7). It has a rim diameter of 7.6 cm, and a preserved height of 11 cm. The surfaces were slipped and polished; painted and grooved decoration features on the external surface. This goblet was made on the wheel (2) in macroscopic fabric ZF4. Goblets of this type, like type IX.3, were apparently manufactured in Lower Nubia, and their appearance in the Dongola Reach must have been the result of trade with the north (Mahmoud El-Tayeb 2012, 9, 104–105)

Parallels and Dating for Type IX.1
The closest parallels to this shape were discovered at: Qasr Ibrim cemetery 192, dated to the X-Group, and cemetery 193, dated to the X-Group–Christian period (Mills 1982, 13, Pl. V:2.61; 56, Pl. LX: 108.1); and at the Sesebi post-Meroitic cemetery, dated to the 4th–5th centuries AD (Osman and Edwards 2012, 134–136, Fig. 5.10: 36). The shape of these two examples is somewhere between types IX.2 and IX.1. The foot is higher and more slender than in type IX.2, but not as narrow as in type IX.1, and the rim is modelled as in type IX.1.

6.9.2 Type IX.2 [Cat. 296, Fig. 7.125]

This is a globular goblet with incurved walls, unmodelled rounded rim (Fig. 3.1: Un R-1c) and a base-ring (Fig. 3.2: B-5). Medium-tall and medium-sized, this goblet has a height of 11.5 cm and a rim diameter of 9.3 cm. Painted and incised decoration adorns the external surface. This goblet was made on the wheel (2). The fabric was not possible to determine. Only one example was discovered at the El-Zuma cemetery. Probably originating from Lower Nubia, goblets of this type were common in the X-Group period and are dated to the 4th–5th centuries AD (Klimaszewska-Drabot 2010b, 484–485).

Parallels and Dating for Type IX.2

Twenty-seven vessels of this type were discovered at the Gerf Husein X-Group cemetery (Firth 1912, 35–38, 89, Pl. 50). Other examples come from Aman Daud X-Group cemetery 92 (Firth 1912, 201), while goblets found at Bab Kalabsha were dated to the end of the 4th century and the X-Group period (Ricke 1967, 46, 49, 56, 62, 65–68). Goblets of similar shape and size (height about 9 cm and diameter 11–12 cm) but decorated with different patterns were found at the Karanog Romano-Nubian Cemetery and dated to the Meroitic period (Woolley and Randall-MacIver 1910, 51–57, 273, Pl. 90:8698, 8699). Comparable vessels are known from Qasr Ibrim cemetery 192, dated to the X-Group period (Mills 1982, 13, Pl. V), and the Meroitic cemetery at Aksha (Vila 1967, 334–335). Examples found in graves at the Mounds of Goha were identified as imports from Egypt and dated to the 4th–6th centuries AD (Emery 1932, 38–44, fig. 3:5,6). Numerous similar goblets were discovered at: Ballana and Qustul, dated to the 4th–6th centuries (Emery and Kirwan 1938, 394, Pl. 114, 82c, 85b); Serra West, in a tomb dated to the X-Group period (Verwers 1962, 26–27, Pl. V). Goblets from Serra West recorded in Middle Noubadian X-Group contexts were dated to the 5th century AD (Fuscaldo 2011, 194–195, 200–201, Figs 11–12).

In Lower Nubia, goblets of this sort were discovered in Gudhi (near Buhen) at an X-Group cemetery (Reisner 1910, 149–154, Pl. 73b).

6.9.3 Type IX.3 [Cat. 297, Fig. 7.125]

This globular goblet with incurved walls and unmodelled, everted rim (Fig. 3.1: Un R-1b) has a rim diameter of 7.6 cm, and a preserved height of 7.2 cm. The surface was slipped and polished; painted and grooved decoration features on the external surface. This goblet was made on the wheel (2) in macroscopic fabric ZF4. It is similar in shape and size to type IX.1, and maybe it is the same type; however, because the base is missing it is not obvious whether this vessel had a footed base, a ring base or a flat base.

Parallels and Dating for Type IX.3

It is difficult to identify any parallels because of the missing base.

The most similar vessels were found at Qasr Ibrim cemetery 192, dated to the X-Group period (Mills 1982, 21, 25, Pls XXV:28.2–6; XXVIII:51.4). It is possible that this goblet had a rounded base without foot, like the examples discovered at El-Kassinger Bahry site HP45, dated to AD 350–540 (Daszkiewicz and Goedicke 2007; Mahmoud El-Tayeb and Kołosowska 2007b, 41, 45.1.7).

6.10 *Group X—Oil Lamps* – *by Aneta Cedro* [Cat. 298–302, Fig. 7.126]

Among the pottery finds from El-Zuma cemetery, a set of five oil lamps were discovered. Although small in number, these artefacts provide valuable information about some of the after-burial history of the graves. They were all found inside the tunnels: three in T.4 and one each in T.6 and T.7, so in type I tombs (i.e. those with the largest mounds).

All of these lamps belong to a type that is traditionally described in the literature as an "Aladdin lamp", the term having been introduced by William Y. Adams (1986, 98, 104). The shape of this lamp is generally reminiscent of a small, squat bottle with a narrow neck, a nozzle attached to the body at its maximum diameter and a curled handle on the opposite side. This general form has many variants, however, and there are no two identical lamps among the finds from El-Zuma. They vary in the proportion of height (from 5 to 6.5 cm) to maximum diameter (from 7.5 to 10.5 cm), and in details such as the form of the base (rounded or flat), handle, or the height of the neck. Except for one, Z6/21, all are red-slipped, and three of them have polished surfaces.

Two of these lamps feature incised symbols which were made before firing. On the shoulder of Z6/21 is a simple cross, while on the base of Z4/61 there is also an incised cross, but of the crosslet type. This last lamp is also the only one with decoration: a pair of palm branches, incised on the shoulder before firing, stem symmetrically from the neck downwards. Although lamps of the Aladdin type were usually devoid of any ornamentation, the motif from El-Zuma has a very close parallel from the church in Selib, where a lamp of the same type with identical decoration was discovered in a context dated to the 6th/7th century (Żurawski et al. 2014, 332, Fig. 5). The palm branch itself is a commonly used motif in the decoration of moulded lamps, widespread from Italy to the Levant and North Africa. In Egypt, it was also a popular maker's mark, noted on the base of Roman-period lamps (see Bailey 1988, 114–115, 140, Fig. 146; Młynarczyk 2012, Fig. 45, Pls 12–14).

The wheel-thrown, bottle-like lamp is probably the first Nubian type of lighting vessel. Its appearance is usually dated to the 5th century, and its popularity continued

for about two centuries. At this period of time the entire Mediterranean basin, Egypt included, was dominated by lamps manufactured using moulds with elaborate ornamentation. Such objects were also discovered in Nubia, but almost entirely as imports from the Aswan region. Both the Aladdin type and imported moulded lamps were acknowledged by Adams as diagnostic forms of the X-Group and very Early Christian periods (Adams 1986, 104). The greatest number of both types was first discovered at cemeteries, and for a long time their use was associated mostly with burial rituals.

Close analogies for the lamps from El-Zuma can be found among the objects recovered from the cemeteries excavated a century ago in Faras (Griffith 1927, 69, Pls LVIII–LX) and Armina (Junker 1925, 153, 162–163). Archaeological prospection along the Nile Valley delivered further examples of Aladdin lamps connected with typical Christian graves. They were discovered, among other places, within the concession area of the Scandinavian Joint Expedition (Save-Söderbergh 1981, 32–34, Pl. 16), at Nag Hileiwe (Almagro, Presedo, and Pellicer 1963, 186, Fig. 5) and Farki (Vila 1978, 74–75, Figs 28-A, C, 53–59). But lamps of this type were also recovered from non-Christian burials, appearing among the inventory of a few tumuli at Sai (Siguoirt and Corsiez 2012, 223, Fig. 3, 241–242, Fig. 14), while in Sesebi, an Aladdin lamp accompanied by two moulded examples and a few X-Group vessels was found in the ring-ditch beneath the mound (Edwards 1994, 173–174, Pl. XXX.1); therefore, it was not placed there as an item of burial equipment but was used in some rituals, perhaps similar to the Christian custom of leaving lamps beside graves. This practice was quite common from the beginning of the Christian period in Nubia (Adams 1998, 24). For that purpose, quite often a "lamp box" or a special niche was made in the tombs' superstructures. The early opinion of some scholars that oil lamps were mostly used for veneration has changed significantly after numerous discoveries in domestic contexts. A considerable number of Aladdin lamps was discovered in the town-sites at Armina West (Weeks 1967, 65, Fig. 47), Debeira West (Shinnie and Shinnie 1978, 79, Fig. 105, Pl. XLVa) and Meinarti (Adams 2000, 86–87). It should be stressed, however, that although they do appear in settlements, in the Early Christian period, illuminating houses with oil lamps was not a widespread or frequent practice. We cannot know how valuable these objects were, but considering that they needed some amount of fuel (mostly plant oils), using them might have been expensive.

Looking at the list of sites mentioned above, where numerous Aladdin lamps were found, it should be noted that all of them are located in Lower Nubia, where these lamps were presumably also produced. It is only two decades or so since the first lamps of this type were identified among pottery from an area south of the Third Cataract. It is somewhat surprising that so far only one Aladdin lamp has been found in Old Dongola, the capital city of Makuria, where excavations have been ongoing since the 1960s. A lamp was found in a church of very early date, located on Kom E (Żurawski 1997, 187, Fig. 5). Six complete lamps and fragments of several others were also discovered at the nearby site in Selib, in a church context dated to the 6th century (Żurawski et al. 2014, 232, Fig. 5; Cedro 2015, 400, Fig. 2; 2016, 371–372, Fig. 20). Other examples have been noted at the fortresses of Abkur[2] in the Southern Dongola Reach and Umm Kieb in the Fourth Cataract region (Pluskota 2008, 132, Fig. 7). Considering how rare discoveries of Aladdin lamps are in Upper Nubia, the objects from El-Zuma are of great importance.

Perhaps one of the most significant questions that these objects raise is: Who placed them inside the tunnels of the great tumuli, and when and why did they do so? One of the possible answers is that they were left by robbers during the act of plundering. However, considering the uniqueness of these lamps and their symbolic significance, some form of ritual usage cannot be completely ruled out.

6.11 *Group XI*—Qawadis [Cat. 303–311, Fig. 7.127]

The *qadus* is a vessel used for drawing water in conjunction with a waterwheel (*saqiya*). These vessels have a knob-ended base. The bottom part of the *qadus* is broader than the top. The rim is modelled (Fig. 3.1: M R-8b) and measures 15–17 cm. Vessels of this type were made on the wheel (2). They occur in macroscopic fabric ZF6.

Parallels and Dating for Type XI

Vessels of this type were discovered in Ballana and Qustul, one example having been found on the ramp of a grave close to a sacrificed cow (Emery and Kirwan 1938, 390). At Serra West, vessels of this sort were recovered from Middle Noubadian X-Group contexts dated to the 5th century AD (Fuscaldo 2011, 211: 108, 109; Fig. 16), whilst at the Umm Muri settlement site, *qadus* sherds were found in a deposit dated to the 3rd–4th centuries AD in Christian period contexts (Thomas 2008, 66, 69, Fig. 4:10–

2 Personal observation made by the author during her visit to the Abkur fortress in 2014.

17). Further examples were noted at: Argi 3, dated to the Early Dongola to early Classic Dongola period (AD 600–850) (Żurawski 2003, 179, 181); Selib 3, dated to the 6th–early 7th centuries AD (Cedro 2017, 322–323); Merowe Sheriq cemetery and fort, dated to the Transitional/Early Christian period (Klimaszewska-Drabot 2008, 479–481, Fig. 6:10–13); Suegi fortress, dated to the Transitional/Early Christian period, 6th–7th centuries AD (Pluskota 2005, 128–129); and at Soba East, where a wide range of pottery vessels was locally made, *qawadis* were represented throughout the Christian period. Pottery kilns discovered in the western part of mound B at Soba East were associated with the production of *qawadis* and *dokat* (Welsby and Daniels 1991, 12).

6.12 *Group XII—Amphorae*

6.12.1 Type XII.1 [Cat. 312–318, Fig. 7.128]

The Late Roman "Dongolan" amphora (Pluskota type A) has an internal ledge rim (Fig. 3.1: M R-10), a medium-broad long neck, and a round base with a navel-shaped foot (B-6). The height of a complete vessel is 54 cm. Rim diameter is between 7.7 cm and 9.5 cm. Amphorae of this type were made on the wheel (2). The fabric is similar to the Dongolan ALF 1 fabric (Danys 2015, 118–119) (see Chapter 3.3 and Fig. 3.8, this volume). Attributable to Adams' Class Z (Adams 1986, 1 and 2:177).

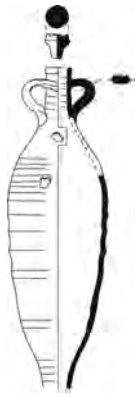
This type is the earliest of the Dongolan amphorae.

Parallels and Dating for Type XII.1

The earliest use of the Dongola pottery workshop took place about AD 600–950 (Danys 2015, 118; Pluskota 2001, Fig. 9).

Vessels of this type have been found in Lower Nubia at: Qasr Ibrim cemetery 193, dated to the X-Group to Christian period (Mills 1982, 64, Pl. LXX:151.10); Gebel Adda, at cemeteries dated from the Late Meroitic to Early Christian period (Huber and Edwards 2012, 86–87, Pl. 14); Ballana and Qustul, dated to the 4th–6th centuries (Emery and Kirwan 1938, 389, Pl. 111:7b, 7d); Sesibi (Sesebi), in post-Meroitic burial 201, dated to AD 350–550 (Edwards 1994, 164–167); the Lower Church in Banganarti, dated to the 6th–7th centuries AD (Żurawski 2008, 307–309); and Selib 3, dated to the 6th–early 7th centuries AD (Cedro 2017, 321).

6.12.2 Type XII.2 [Cat. 319, Fig. 7.128]



This slender LRA 3 amphora has a rectangular modelled rim (Fig. 3.1: M R-6c), long narrow neck, and toe-base re-used as a plug. It has a rim diameter of 3.8 cm and a preserved height of 48.7 cm, and was made on the wheel (2) in fabric LRA3 (see Chapter 3.3 and Fig. 3.8, this volume). Only one example was discovered at the El-Zuma cemetery.

This type probably comes from Western Asia Minor, although the main production centre is not known (Riley 1975, 31–32). The earliest examples of this type have only one handle. Two-handled amphorae appeared in the late 4th century in Rome and were probably in use from the end of the 4th century to the 6th century (Peacock and Williams 1986, 188–189).

Parallels and Dating for Type XII.2

Vessels of this type were found in Ancient Nubia: at Qasr Ibrim cemetery 193, dated to the X-Group to Christian period (Mills 1982, 67, Pl. LXXIV:162:11); in graves at the Mounds of Goha, dated to the 4th–6th centuries AD (Emery 1932, 38–44, Fig. 3:4); in the royal tombs at Ballana and Qustul, dated to the 4th–6th centuries AD (Emery and Kirwan 1938, 390–399); and at Gebel Adda, in the Late Meroitic graves of Cemetery 3 (Huber and Edwards 2012, 85, Pl. 11).

6.12.3 Type XII.3 [Cat. 320–321, Fig. 7.129]

A tall, slender, torpedo-like shape, the LRA 4 (Majcherek type 4) (Majcherek 1995, 164, 169, Fig. 3:4) amphora has

a rounded modelled rim (Fig. 3.1: M R-5a), no neck, and a toe base (Fig. 3.2: B-7). Rim diameter is 8.5 cm. This vessel is broader at the shoulder and tapers towards the base. It was made on the wheel (2) in Gaza fabric (see Chapter 3.3 and Fig. 3.8, this volume).

Parallels and Dating for Type XII.3

These vessels, which probably come from Gaza in Palestine, were common in the south-eastern Mediterranean and North Africa. They are dated to the 4th–6th centuries AD (Peacock and Williams 1986, 198–199). LRA4 (Majcherek type 4) amphorae were common in Egypt, for example, at Kom el-Dikka in Alexandria, where they were found in Late Roman deposits dated to the 6th century (Majcherek 1995, 164, 169, Fig. 3:4). Amphorae of this type were also recovered from Tell El-Amarna (Faiers and Clackson 2005, 176–177, figs 2.69: 432, 433) and Elephantine, where an example was dated to the 3rd–4th centuries AD (Gempeler 1992, 190 Forme K709, Fig. 121).

These amphorae were also present in the royal tombs at Ballana and Qustul, dated to the 5th–6th centuries AD (Emery and Kirwan 1938, 390, Pl. 111:10); and at Dongola, in contexts of the late 6th century and early 7th century (Danys 2015, 117, 125, 148–149).

6.12.4 Type XII.4 [Cat. 322–324, Fig. 7.129]

A small table amphora with rounded, modelled rim (Fig. 3.1: M R-5a), a medium-long neck, and a base-ring (Fig. 3.2: B-5). Rim diameter is 5.3 cm and height is 30 cm. A spiral design was painted on the external surface. Amphorae of this type were made on the wheel (2). Most examples were slipped on the external surface.

Parallels and Dating for Type XII.4

Examples were found in Egypt at Elephantine, dated to the 4th–5th centuries AD (Gempeler 1992, 185, Fig. 118:1), and at Karanis, dated to the 3rd–4th centuries AD (Johnson 1981, 1–2, Pl. 2.16). They were also recorded at: Qasr Ibrim cemetery 192, dated to the X-Group period (Mills 1982, 28, Pl. XXXII: 74.2); Ballana and Qustul, dated to the 4th–6th centuries AD (Emery and Kirwan 1938, 391, Pl. 113:39b); and Gabati, in graves dated to the post-Meroitic period (Edwards 1998, I:76–78).

6.12.5 Type XII.5 [Cat. 325–326, Fig. 7.129]

A small table amphora with rounded, unmodelled rim (Fig. 3.1: Un R-1b), a short neck and a base-ring (Fig. 3.2: B-5). Rim diameter is 3.4 cm and height is 17.9 cm. Slipped on the external surface. Made on the wheel (2). Only one complete example was found at El-Zuma, the second one survives in fragments.

Parallels and Dating

The closest parallels were discovered in Egypt at Karanis and dated to the 3rd–4th centuries AD (Johnson 1981, 67, Pl. 58:430).

6.12.6 Type XII.6 [Cat. 327, Fig. 7.129]

This is a large amphora with rounded, unmodelled rim (Fig. 3.1: Un R-1b), a short and narrow neck, small loop-shaped handles, and a base-ring (Fig. 3.2: B-5). The external surface is slipped. The broad shoulders are adorned with grooved and painted decoration. Rim diameter is 4 cm and preserved height is 36 cm. This vessel was made on the wheel (2) in macroscopic fabric ZF5.

Parallels and Dating for Type XII.6

An amphora of similar shape and comparably decorated was discovered: at Gerf Husein X-Group cemetery 72 (Firth 1912, 88, Pl. 50); in the Dakka area at cemetery 100, dated to the 3rd century AD (Firth 1915, 34, Pls 23–24); at Qasr Ibrim cemetery 192, dated to the X-Group period (Mills 1982, 12, 19, Pls XI: 2.5; XXII: 23.17); at Ballana and Qustul, dated to the 4th–6th centuries (Emery and Kirwan 1938, 391, Pl. 113:40 b); and in grave 201 at the post-Meroitic cemetery (AD 350–500) in Sesebi, dated to the 4th–5th centuries AD (Edwards 1994, 166, 168; Osman and Edwards 2012, 134–135, Fig. 5.10: 2).

6.12.8 Amphorae—Varia [Cat. 328–330, Fig. 7.129]

A fragmentary amphora with a broad mouth, modelled rim (Fig. 3.1: M R-8a), large handles, and uncoated surface. Made on the wheel (2), only one such amphora was discovered at El-Zuma.

Parallels and Dating

The closest parallels for this type were discovered in Qasr Ibrim at Cemetery 192, dated to the X-Group period (Mills 1982, 25, Pl. XXVIII: 49.2).

6.13 *Group XIII—Bottles*

6.13.1 Type XIII.1 [Cat. 331–332, Fig. 7.130]

A small bottle with a narrow mouth, a short and narrow neck and broad globular body, with a rounded and unmodelled rim (Fig. 3.1: Un R-1b) and rounded base (Fig. 3.2: B-1). The walls are very thin (0.3–0.4 cm) and the external surface was slipped. This bottle was made on the wheel (2). Only two examples were discovered at the El-Zuma cemetery. One of them is made in a fabric that indicates an Egyptian origin (Aswan area).

Parallels and Dating for Type XIII.1

An example from Egypt was found in Karanis and dated to the 4th century AD (Johnson 1981, 19, Figs 1:1–3).

Comparable vessels were found at Qasr Ibrim Cemetery 192A, dated to the X-Group period (Mills 1982, 39, Pl. XLII:19.1), and at Ballana and Qustul, dated to the 4th–6th centuries (Emery and Kirwan 1938, 393, Pl. 113:57a–c). A similar oil bottle was discovered in a post-Meroitic grave at Sesebi and dated to AD 350–550 (Edwards 1994, 170–171, Fig. 6: 41; Osman and Edwards 2012, 134–136, Fig. 5.10: 41).

6.13.2 Type XIII.2 [Cat. 333, Fig. 7.130]

This bottle has a broader mouth than type XIII.1, a rounded and unmodelled rim (Fig. 3.1: Un R-1b), short and narrow neck, and a base ring (Fig. 3.2: B-5). The lower part of the vessel is broader than the top. Rim diameter is 5.2 cm and height is 23 cm. Made on the wheel (2). Only one such vessel was discovered at the El-Zuma cemetery, and the fabric indicates the Aswan area.

Parallels and Dating for Type XIII.2

Examples were found in Egypt at Elephantine, dated to 4th–6th centuries AD (Gempeler 1992, 134, Fig. 76:12, 16), and at Karanis, dated to the 3rd–4th centuries AD (Johnson 1981, 20, Pl. 2.13).

Bottles of this type were also discovered in Lower Nubia: at Gudhi (near Buhen) on an X-Group cemetery site (Reisner 1910, 149–154, Pl. 73b); at Serra West, dated to the Meroitic period—phase IIA–B, dated to the 1st–2nd centuries AD (Fuscaldo 2011, 168, 188:47); and at Gabati in graves dated to the post-Meroitic period (Edwards 1998, I:192, 184–185).

6.13.3 Type XIII.3 [Cat. 334, Fig. 7.130]

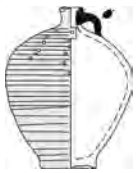
This is a small bottle with a narrow mouth, a medium-long and narrow neck, and a broad globular body. The rim is rounded and modelled (Fig. 3.1: M R-5b) and the base is flattened (Fig. 3.2: B-2). Rim diameter is 5 cm and height is 24 cm. The external surface was slipped. Made on the wheel (2). Only one complete vessel was discovered at the El-Zuma cemetery. The fabric is not possible to determine.

Parallels and Dating for Type XIII.3

Examples found in Ballana and Qustul were dated to the 4th–6th centuries (Emery and Kirwan 1938, 391, Pl. 112:37b).

6.14 *Group XIV—Jugs*

6.14.1 Type XIV.1 [Cat. 335, Fig. 7.131]



A jug with a narrow mouth, rounded unmodelled rim (Fig. 3.1: Un R-1b), short neck, small loop handle, and a base ring (Fig. 3.2: B-5). The shoulders are broad, and the sides of the vessel taper towards the base. Rim diameter is 2.5 cm and height is 18 cm. The external surface is slipped and adorned with punctuated decoration. Made on the wheel (2). Only one complete jug was discovered at the El-Zuma cemetery, and although the fabric could not be determined, observation of the surface suggests that it is of Egyptian origin.

Parallels and Dating for Type XIV.1

Similar examples from Egypt have been excavated at: Elephantine, dated to the 4th–6th centuries AD (Gempeler 1992, 140, Fig. 79:3); and Karanis, dated to the 3th–5th centuries AD (Johnson 1981, 19, Pl. 1:5–7).

In Ancient Nubia jugs of the type were found: at the Gerf Husein X-Group cemetery, which yielded 72 examples (Firth 1912, 94); in the graves at the Mounds of Goha, where they represent imports from Egypt and were dated to the 4th–6th centuries AD (Emery 1932, 38–44, Figs 3:12–13); at Gebel Adda, in the Late Meroitic graves at Cemetery 3 (Huber and Edwards 2012, 85, Pl. 11); at Serra West, in burial contexts dated to the Meroitic and X-Group periods (Verwers 1962, 26–27, Pl. V) and to the Middle Noubadian X-Group (5th century AD) (Fuscaldo 2011, 211:111, Fig. 16); and at Ballana and Qustul, dated to the 4th–6th centuries (Emery and Kirwan 1938, 392, Pl. 113:50a).

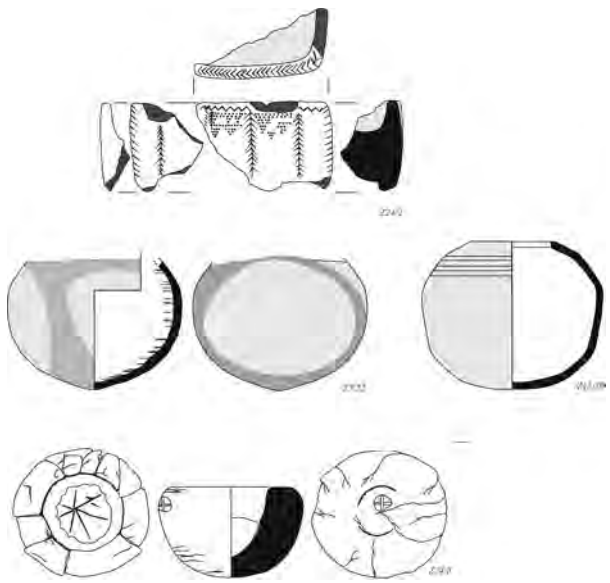
6.14.2 Type XIV.2 [Cat. 336, Fig. 7.131]

This squat jug is irregular in shape with a broad mouth, rounded modelled rim (Fig. 3.1: M R-5b), short and broad neck, one handle, and a flat base (Fig. 3.2: B-2). The external surface is slipped and adorned with painted and incised decoration. Made on the wheel (2). Only one such jug was discovered at the El-Zuma cemetery.

Parallels and Dating

No parallels have been found at other sites.

6.15 *Miscellaneous* [Cat. 337–341, Fig. 7.132]



6.15.1 Z24/2

Possible basin. This fragmentary vessel is rectangular in shape with a thick bottom. The rim is flat and unmodelled (Fig. 3.1: Un R-3a) and the base is flat (Fig. 3.2: B-4). The external surface was smoothed and adorned with punctuated and incised decoration, while the internal surface was slipped. Handmade. Only one fragment was discovered at the El-Zuma cemetery.

Parallels and Dating

The closest parallels are found at Bab Kalabsha (the Kalabsha area) in the form of rectangular vessels with a rim of 11 cm × 10 cm and a height of 7 cm, but made in sandstone. They are dated to the end of the 4th century and attributed to the X-Group (Ricke 1967, 69–70, Pl. 69). Similar examples were discovered at Gabati, though these vessels were not slipped or burnished, but only smoothed and adorned with incised decoration. Although they are of uncertain function, the author suggests that they may have been used as offering trays (Edwards 1998, I:179–180, 189). Similar fragments were discovered at Soba in mound B and dated to the 6th–9th centuries (Welsby and Daniels 1991, 206–207, Fig. 121).

6.15.2 Z15/50

Z15/50 is a jar with a broad mouth, a flat unmodelled rim (Fig. 3.1: Un R-3c) and a flat base (Fig. 3.2: B-2). Rim diameter is 13.5 cm and height is 22.5 cm. The external surface was slipped. Made on the wheel (2).

Parallels and Dating

Only one example was found, and there are no comparable vessels from other sites, but the shape suggests a Meroitic tradition. The most similar wheel-made and handmade pots were found at the Awlib Temple complex, dated to the Meroitic period (Mahmoud El-Tayeb and Kołosowska 2005, 151–157).

6.15.3 Z24/8

This clay stopper was handmade in a very soft unfired clay. It is cylindrical in shape with a diameter of 15 cm and a height of 10.6 cm. Sandy clay is abundant with organic inclusions. Incised decoration features on the inside and stamped crosses decorate the external surface.

Parallels and Dating

The closest parallels were discovered at Dongola, in the form of amphorae stoppers dated to the 7th century. The shape is close to Dongolan type 1 stoppers, but the decoration is similar to Dongolan type 3 stoppers (Dzierzbicka 2015).

6.15.4 Z5/22

Z5/22 is the bottom part of a probable jar with pointed base (Fig. 3.2: B-3). The external surface was slipped in two different shades (lighter and darker), creating a kind of decorative pattern. Made on the wheel (2).

Parallels and Dating

No parallels have been found, but it is feasible that this vessel represents a Meroitic tradition of wheel-made pottery such as that discovered at Gabati and dated to the Meroitic period (Edwards 1998, 1:142–143, 157, Fig. 6.11:5510).

CHAPTER 4

The Function of Vessels from the El-Zuma Repertoire

As mentioned in Chapter 2, the function of the El-Zuma pottery should be analysed from both social and religious perspectives, hence we need to examine its function in domestic life and also its symbolic function in the realm of ritual and burial ceremonies. Looking at the function of individual vessel types and their role as grave deposits, the author has analysed the material, taking into consideration three main aspects: pottery as containers for grave goods; pottery as a symbol of funerary customs; and pottery as a tool used in the looting of burials. The vessel capacities cited in this chapter have been estimated using the "Calculation of the capacity of a vessel from its profile" guidelines set out by the Centre de Recherches en Archéologie et Patrimoine (http://capacity.ulb.ac.be/sendimage.php?langue=en), and based on the assumption that vessels were filled up to a level of 1 cm below the rim.

1 Vessel Function in the Grave Context

From a social perspective, the tomb is the last 'house' for the physical body of the deceased, and a symbol of the end of earthly life. If we look at the pottery as a part of domestic life, we can distinguish kitchen ware (vessels for the serving and consumption of food and liquids), storage vessels, transport vessels, and specialized vessels such as *qawadis*, oil lamps, and stands. The function of the vessels is determined from their shape, technological features, traces on their surfaces (e.g. soot), and by examining their context in the grave and studying analogies in the literature.

Globular pots and bowls (Adams' Class U) corresponding to El-Zuma types IV.1–IV.3, V, VI (Adams 1986, 1 and 2:35, 161–162, Figs 72:3, 4, 5; 73:10, 11, 13). The capacity of bowls of type IV ranges from 0.28 l to 0.8 l in vessels with a rim diameter of less than 20 cm and a height of 6.5–8 cm. Larger vessels with a rim diameter greater than 20 cm and a height of more than 8 cm could hold from 1.2 l to 3.7 l. Pots of type V have a capacity ranging from 0.6 l to 1.3 l, while larger pots, such as Z28/7, could hold about 5 l. Clay was added to the base in order to disperse heat during the cooking process. Mahmoud El-Tayeb has pointed out that these vessels can be compared with modern handmade Sudanese pans used for frying meat, which differ in form but also have an extra layer added to the base (Mahmoud El-Tayeb 2012, 100). In the El-Zuma assemblage, some bowls and pots were used as containers for food offerings. Animal bones were found inside these vessels, probably representing parts of animal carcasses prepared as meat cuts (see Volume I, Chapter 8). A large group of pots was burnished, only a few examples were also slipped inside, suggesting that they could have been used for liquids. Traces of fire and soot are visible on the bases of many vessels, which implies that they had been used. However, some examples seem to have served only as grave goods given that they were made from very fragile clay with a large number of seeds used as temper. Such vessels fall apart when handled and probably could not have been in use before their deposition in a grave.

Bowls (Adams' Class C) corresponding to El-Zuma vessels of types II.1–II.3 (Adams 1986, 1 and 2:116, Fig. 26:11, 14; 117, Fig. 27:26; 121, Fig. 29:42–43) and also bowls of type II.4. The capacity of these bowls ranges from 0.3 l to 1.5 l, with larger vessels holding up to 2.2 l. However, the most common capacity in these types is 0.35–0.6 l. Most of these bowls, like the goblets and cups presented below, have slipped surfaces, enabling them to hold liquids. Bowls placed in tumuli were probably used as containers for food offerings, as in some tumuli (e.g. T.12, T.13, T.26) they were found to contain animal bones (see Volume I, Chapter 8).

Cups and goblets used for serving food and beverages (Adams' Classes A and B) (Adams 1986, 1 and 2:35, 109 Fig. 19: 9–11, 18; 113 Fig. 23) corresponding to El-Zuma cups of group I, and El-Zuma goblets of group IX. The capacity of cups of types I.1–I.4 ranges from 0.15 l to as much as 0.6 l, but the average (most common) capacity is 0.3–0.45 l. Type I.5 cups, which are of more globular shape, have a capacity of 0.6–0.7 l. Goblets (IX) have a similar capacity to cups of types I.1–I.4: approximately 0.4 l. Most of the cups and goblets are slipped and burnished on both surfaces, which would have made them suitable for holding liquids, and cups could be used as drinking vessels too. Cups were very often grouped inside the graves together with small bowls (described below), and positioned near animal bones deposited as food offerings [**Fig. 4.1**, T.2 Chamber 3]. Dates and animal bones were discovered inside the goblets found at Ballana and Qustul (Emery and Kirwan 1938, 394). Cups also served a second function as lids for large handmade jars [**Fig. 4.1**]. During the excavations, such vessels were found *in situ*, placed upside down over the mouth of a jar, or sometimes the right way up with the base of the cup blocking the mouth of the jar. This

practice has also been noted at another archaeological site, namely El-Hobagi, where vessels similar to El-Zuma bowls II.2–II.3 were used as lids (Lenoble 2018, 322). An alternative to using this type of lid was to stop a vessel with organic material. This method of closure can sometimes still be observed in Sudanese households (Mahmoud El-Tayeb, personal communication).

Large bowls (Adams' Class T) corresponding to El-Zuma types II.7, II.8 and II.9 (Adams 1986, 1 and 2:35, 159, Fig. 70:1, 6, 7; 160, Fig. 71:13). Only one large handmade bowl was found *in situ* in the burial chamber of T.11, and its capacity is approximately 40 l. Some animal bones were found inside this bowl, suggesting that it may have been used as a food-serving vessel in the grave (Volume I, Chapter 8; Mahmoud El-Tayeb and Czyżewska 2011, 116–117).

Jugs (Adams' Class I) corresponding to El-Zuma type XIV.2 jugs (Adams 1986, 1 and 2:35, 141, Fig. 52:12), and **table amphorae** (Adams' Class J) corresponding to El-Zuma types XII.4, XII.5 and XII.6 (Adams 1986, 1 and 2:35, 143 Fig. 54: 4, 5; 144 Fig. 55:10). Jug Z15/26 (XIV.2) has a capacity of 3.5 l. The smaller amphora Z15/56 (XII.4) has a capacity of 0.6 l, amphora Z15/5 has capacity of 1.6 l, while the largest specimen of this type (Z2/32) could hold 3.0 l. Small amphora Z25/6 (XII.5) has a capacity of about 1.0 l, and the larger amphora Z4/2+Z4/10.11 (XII.6) has a capacity of 5.5 l. Jugs and table amphorae found in tumuli could have been used for serving liquids as a burial offering.

Jars (Adams' Class W) corresponding to El-Zuma jars of group VII (Adams 1986, 1 and 2:36, 168, Fig. 79:16; 170, Fig. 81:31), and transport **amphorae** for wine or oil (Adams' Class Z) corresponding to El-Zuma amphorae of types XII.1, XII.2 and XII.3 (Adams 1986, 1 and 2:36, 178, Fig. 89:6, 9; 180, Fig. 91:17) could have been used as storage vessels in grave contexts. Jars of type VII differ in shape and size, occurring in small, medium, and large varieties with a narrow or broad belly. All of these parameters have a huge impact on the capacity of the vessels. Small jars of up to 20 cm in height have a capacity of between 1.5 l and 3.0 l, vessels with a height of 20–30 cm have a capacity of 3.0–8.0 l, jars and bottles measuring 30–40 cm high have a capacity of 12.0–20.0 l, and the larger ones that are over 40 cm high have a capacity ranging from 18.0 l to as much as 34.0 l. Some of the jars in the El-Zuma assemblage have slipped surfaces, suggesting that they could have been used for storing liquids, but there is also a large group of jars and bottles without any additional surface treatment that are more likely to have served as containers for solids.

Small jugs/juglets imported from Egypt and the Mediterranean area (Adams' Class M) corresponding to El-Zuma jugs of type XIV.1 (Adams 1986, 1 and 2:36, 147 Fig. 58: 9), and **bottles** (Adams' Class N) (Adams 1986, 1 and 2:36, 148 Fig. 59: 8, 10) corresponding to El-Zuma vessels of types XIII.1 and XIII.2 (Adams' Class G) (Adams 1986, 1 and 2:36, 137 Fig. 48: 32) could have contained ointments. Small bottle Z6/7 (XIII.1) has a capacity of 0.4 l, and bottle Z23/31 has a capacity of 1.3 l. Vessels of this sort found at Ballana and Qustul were filled with a heavy, greasy substance which, according to Emery, may have been some kind of ointment (Emery and Kirwan 1938, 391).

The function of **spouted bowls** found at El-Zuma is uncertain. The assemblage includes large, handmade, spouted bowls which occur in open and closed forms. Their capacity is between 3.0 l and 5.0 l. Only one vessel, from four recorded, was found in the main burial chamber; the rest were found in shafts or tunnels and their original location is uncertain, which makes it difficult to draw any conclusions about the function of these bowls in the burial rite. They may have been used in beer production (see Chapter 3.6, this volume) or, as Mahmoud El-Tayeb suggests, they may have been employed in a purification ceremony that was part of a burial custom (Mahmoud El-Tayeb 2012, 101). We cannot rule out that these vessels could have been used either as containers for food and drink or as liturgical vessels that were used in a purification ritual.

Lamps (Adams' Class P) (Adams 1986, 1 and 2:36, 152 Fig. 63: 14–15) corresponding to El-Zuma vessels of group X. Lamps in the El-Zuma repertoire are likely to be connected with burial looting. Lamps were discovered inside the tunnels, close to the walls or, for example, at the top of the fill of tunnels (see Volume I, Chapter 3, Fig. 3.34).

Qawadis (Adams' Class V) (Adams 1986, 1 and 2:36, 165 Fig. 76) corresponding to El-Zuma vessels of group XI. These jars were used in conjunction with a *saqiya*. The *saqiya* was invented in Egypt somewhere between the 2nd and 1st centuries BC. A painting in the tomb at Waradin depicts a *saqiya* turned by two oxen goaded on by a young boy (Venit 1989). The *saqiya* waterwheel was probably introduced into Ancient Nubia from Egypt in the very Late Meroitic period, first appearing in the Dodekaschoinos in Romano-Egyptian contexts. In the 4th and 5th centuries AD, large numbers of *qadus* jars from *saqiya* wheels occurred in post-Meroitic contexts in Lower and Upper Nubia (Edwards, n.d., 153, 203–204, see also Volume I, Chapter 1.2). In the El-Zuma repertoire, *qawadis* are probably linked to the activity of grave robbers or maybe grave builders, but they did not serve as funerary goods. Most sherds of this type in the El-Zuma repertoire were used as scrapers and were found in the tumulus superstructures or the fill of shafts and tunnels (see below, Chapter 4.3).

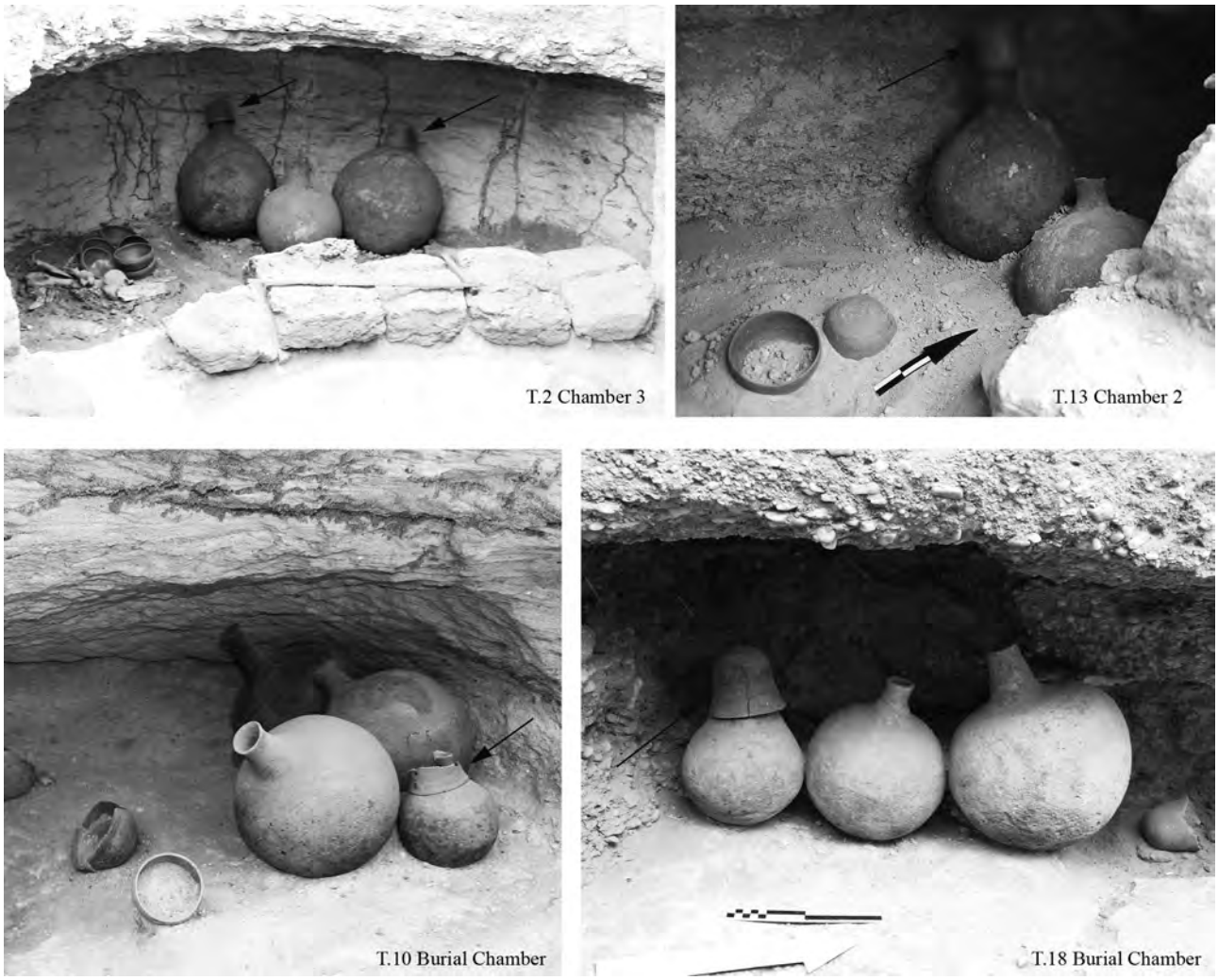


FIGURE 4.1 Cups used as lids for jars and bottles
T.2 PHOTO BY A. OBŁUSKI, T.13 PHOTO BY O. BIAŁOSTOCKA, T.10 AND T.18 PHOTOS BY K. KOTLEWSKI

2 Evidence of Vessel Use

Pottery analysis and observation of the vessel surfaces prompted the following question: Were the ceramic grave goods new, and made especially for the burial ritual, or had they been in use before their deposition? Some vessels look like they were placed in the grave brand new, but in many instances traces of use are visible on the pottery surface. Scratches, scrape marks, and surface sheen from wear can be seen inside the vessels, especially at the bottom. Changes in surface colour inside the vessels and traces of soot on the external surface could also be indicative of vessel use. Sometimes it is difficult to say whether or not vessels had been used because both surfaces are damaged as a result of their deposition in the grave.

In the case of small vessels for serving food and drink and cooking vessels it is possible that some of them were placed in the grave as new, but others were used items.

Traces of use are clearly visible on jars and large bowls in the form of scratch marks/decoration and repairs to these vessels. Scratched decoration appears mainly on large jars and was executed on the neck and shoulder. This type of decoration may have been added to the vessel by its owner (Czyżewska-Zalewska 2016, 738). Scratched motifs also occur on a small bowl of type 11.3 in the El-Zuma assemblage (see Chapter 7, Cat. 119, this volume). A similar example of incised decoration on the shoulder and neck of jars was recorded at Abu Rtela (Malykh 2017). Patterns like those on the pottery were depicted in rock art and on the walls of temples in Musawwarat es-Sufra, and can be interpreted as an owner's mark, but may also have had a protective or magical meaning (Kleinitz 2009). We cannot say at the moment whether these signs and/or protective symbols were executed especially for the deceased, who was the owner of the grave, or whether they were connected with the buried individual or their family, who used

the vessel for some time before its deposition in the grave. From a religious perspective, such decoration could easily be interpreted as magical and protective symbols.

Repairs to a vessel, as described in an earlier article (Czyżewska-Zalewska 2016, 376–379), show that it was used for a considerable span of time before being deposited in the burial. In the El-Zuma assemblage, traces of vessel repairs have been observed in large bowls and jars. The handmade bowl discovered in the burial chamber of T.11 (see Chapter 7, Cat. 167, this volume) has a number of small holes perforated on both sides of a long crack extending from top to bottom (Mahmoud El-Tayeb and Czyżewska 2011, 116–117). The walls were joined, probably using some kind of organic material like string, but no trace of any organic substance survives in any of the perforations. Small holes perforated in the broken neck of some jars also provide evidence of repairs (see Chapter 7, Cat. 246, 290, 291, this volume). In such cases, the neck and rim were probably restored with organic materials, but no trace of them survived in El-Zuma. A jar that had had its neck restored using organic material was recorded at site 45 in El-Kassinger Bahry. The neck had been lost in antiquity and replaced with leather, which in turn disintegrated when the grave was opened (Mahmoud El-Tayeb 1998, 37). This repair technique was known prior to the Early Makurian period. Vessels with holes were discovered, for example, in C-Group contexts in Lower Nubia and dated to 2500–1200 BC (Williams 1993, 68). Repaired vessels were also deposited in graves at the El-Hobagi cemetery (Lenoble 2018, 40, 60–63). This technique is still used today in Sudan, where large vessels are mended by drilling holes in their broken walls and lashing them together with a string or wire (Czyżewska-Zalewska and Kowarska, forthcoming).

3 Reused Pottery

Another important aspect of the pottery is the 'second life' of vessels and sherds. In the El-Zuma assemblage this category is not connected with the deceased and burial customs, but with the looting or possibly building of tumuli.

3.1 *Scrapers/Digging Tools*

Large bowls (types 11.7, 11.8 and 11.9); ***qawadis*** (group XI); **storage jars** (group VII). Sherds of these vessels were used as digging tools/scrapers [**Fig. 4.2**]. Such scrapers were discovered mainly in the shaft fill, tunnels or superstructure fills. The practice of using sherds as digging tools or scrapers was known in antiquity. They were used either by grave robbers or by grave constructors to excavate the original structure, for example during the Kerma period (Old Kush) at Hosh el-Guruf (Emberling and Williams 2010, 25).

3.2 *Lampshade*

Reuse of an imported amphora (of type XII.2) as a lamp, or more precisely as a **lampshade** (see Chapter 7, Cat. 319, this volume). This vessel was found in two pieces. Several large holes (1–2 cm in diameter) had been made at the top of the vessel, while the internal surface was smoked, suggesting that looters might have used amphorae as lampshades to protect the flame when plundering a grave. The bottom part of the vessel is broken off (the join spot is too small to reconstruct the vessel), but the interior of the base is clean without any traces of smoke. The broken toe of the vessel was used as a plug for the amphora. No parallel for the reuse of an amphora as a lampshade has been attested. It should be noted that four oil lamps were also found in the tunnel of T.4.

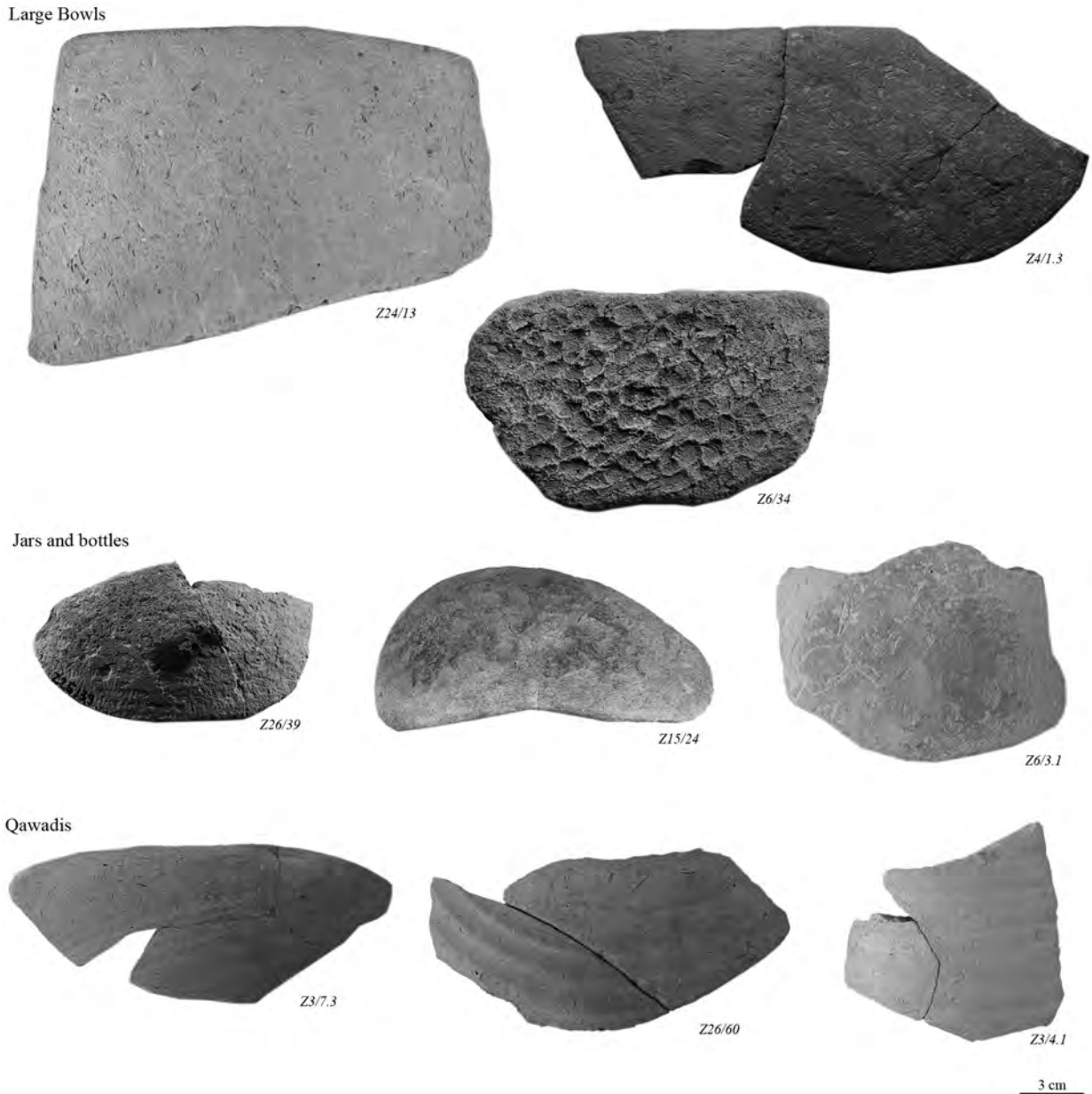


FIGURE 4.2 Scrapers/digging tools made from different types of vessels
PHOTOS BY A. KAMROWSKI

CHAPTER 5

Vessel Distribution at the Site

An essential aspect in the examination of this pottery assemblage is the distribution of vessels inside the graves. An overview of this distribution is presented in Chapter 7.18, where the vessels are presented in their archaeological context (see p. 319, this volume). The distribution of the pottery needs more detailed discussion, and analysis should focus on several aspects, showing the placement of individual vessel types, groups of similar types, and vessel function. Tumuli of types I and II all have multiple chambers, and it is only the smallest tumuli (type III) that do not. It is important to look at the distribution and arrangement of vessels, not only in the context of specific tumulus types, but also in the context of individual chambers within a given tumulus. Can we observe any significant differences in the pottery deposited in particular chambers? All of these issues are discussed by the author in this chapter. The majority of the excavated vessels were discovered complete, almost complete, or were reconstructed from sherds. In those instances where vessels were fragmentary, the statistics presented below were established based on minimum vessel numbers.

Legend to figures and tables:

	feature not present in given tumulus
?	feature not excavated; number of chambers not possible to establish
Tum.	tumulus number
Ch.	chamber
E Tun.	Eastern tunnel
W Tun.	Western tunnel

Based on minimum vessel numbers

1 Distribution by Type

The distribution of the vessels presented below encompasses only those vessels attributed to particular (identified) types. The author presents the distribution of vessel types inside the tumuli and inside the burial chambers, highlighting the arrangement of particular types.

The distribution shown in this chapter does not include vessels presented in the catalogue as *varia* or *miscellaneous objects*. Some examples of pottery rarely noted at the El-Zuma cemetery (goblets [group IX] and amphorae [type XII.3]) were only recorded by photographing them *in situ* because the burial chambers in which they were found could not be excavated due to safety concerns. These vessels are, however, included in the calculations presented in this chapter (see also Volume I, Chapter 3, T.6 and T.7).

1.1 *Group I—Cups*

TABLE 5.1 Cups of type I.1, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						2	2	4
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4		1	1	2		?	?	4
T.6					?	?	?	
T.7	2				?	?	?	2
Total	10							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13			2				2
T.14	1	2	1				4
T.15	3	2	2				7
T.23	1	2	4				7
T.24	1	2		1			4
T.25		1	1	5			7
T.26	2	4					6
T.16							
T.9							
T.11							
Total	37						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		1	1
T.17			
T.18			
T.19			
T.20	1		1
T.22			
T.27			
T.21	1		1
T.28			
Total	3		

Vessel type I.1 = 50

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TABLE 5.2 Cups of type I.2, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tunnel	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2									
T.3						?	?	?	
T.5	1					1	1		3
T.8						?	?	?	
T.1						?	?	?	
T.4							?	?	
T.6		2				?	?	?	2
T.7						?	?	?	
Total	5								

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12		1		8			9
T.13							
T.14		1					1
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11	1	3	3				7
Total	17						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		5	5
T.17			
T.18		2	2
T.19	1	1	2
T.20			
T.22		1	1
T.27			
T.21			
T.28	1	2	3
Total	13		

Vessel type I.2 = 35

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.3 Cups of type I.3, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12				3			3
T.13							
T.14		1	1	1			3
T.15	1						1
T.23		4	2				6
T.24							
T.25							
T.26							
T.16							
T.9							
T.11			1				1
Total	14						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		1	1
T.17			
T.18			
T.19			
T.20			
T.22		2	2
T.27		1	1
T.21			
T.28		1	1
Total	5		

Vessel type I.3 = 19

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.4 Cups of type I.4, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12				2			2
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26		1					1
T.16							
T.9							
T.11							
Total	3						

Vessel type I.4 = 3

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.5 Cups of type I.5, distribution inside the tumuli

Tumuli type II							
Tum.	**Shaft**	**Ch.1**	**Ch.2**	**Ch.3**	**Ch.4**	**Ch.5**	=
T.12					■	■	
T.13							
T.14					■	■	
T.15					■	■	
T.23				■	■	■	
T.24						■	
T.25					■	■	
T.26						■	
T.16				■	■	■	
T.9					■	■	
T.11		2		■	■	■	2
Total	2						

Vessel type I.5 = 2

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

Cups of type I.1 were rare in type I tumuli, and only ten of the fifty type I.1 cups found at El-Zuma were recorded in this category of tumulus. In T.2, which was fully excavated, such cups were discovered *in situ* in chambers 2 and 3. In the second fully excavated type I burial, T.5, no such cups were recorded. All other vessels of this type found in type I tumuli were recovered from the tunnel or external shaft (in T.4 and T.7). The most numerous group of thirty-seven type I.1 cups came from type II tumuli. Some examples were recorded in the shafts, but most vessels were found *in situ* in the main burial chamber and additional chambers. A similar situation to that in tumuli of type I was observed in type III tumuli, where only three such vessels were recorded, all of them either in a shaft or burial chamber.

Cups of type I.2 presented a similar picture. Only five of the thirty-five vessels of this type were discovered in the largest tumuli (type I), three examples being found in T.5 and only two in the external shaft of T.6. In graves of type II, sixteen vessels were recorded *in situ*, and one in a shaft. They represent half of the assemblage of type I.2 cups, but these vessels came from only three tombs (T.12, T.14 and T.11), so they cannot be regarded as common vessels in this type of tumulus. These cups seem to be most common in type III graves, where thirteen examples were discovered in five tombs, eleven of them *in situ*.

Cups of type I.3 were only recorded in burials of types II and III. Most of these cups (fourteen of nineteen) were excavated in five graves of type II, and most of them were found *in situ* in the main chamber and in additional chambers (T.12, T.14, T.23 and T.11). T.15 was the only tomb in which such a vessel was found in the shaft. In type III tumuli only five vessels were found *in situ* in four graves.

Cups of types I.4 and I.5 occur sporadically. Only three type I.4 vessels were found inside two graves of type II: T.12 and T.26. All examples were found *in situ* in chambers. Two type I.5 cups were recorded in the main chamber inside T.11 (type II).

Some cups of types I.1–I.4 were present inside the unexcavated burial chambers in T.6 and T.7 (see Volume I, Chapter 3, Fig. 3.35 and Fig. 3.41). This observation was based on photographic records, and it was not possible to establish the exact types represented, but it is, nonetheless, essential to note that such cups were deposited in these type I tumuli.

Generally, cups are abundant in tumuli of type II.

1.2 *Group II—Bowls*

1.2.1 II.1–II.7 Small Bowls

TABLE 5.6 Bowls of type II.1, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8					?	?	?	
T.1					?	?	?	
T.4						?	?	
T.6		4			?	?	?	4
T.7					?	?	?	
Total	4							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12			1				1
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11			4				4
Total	5						

Tumuli type III

Tum.	Mound	Shaft	Ch.1	=
T.10			2	2
T.17				
T.18				
T.19		1	1	2
T.20				
T.22				
T.27				
T.21	1			1
T.28				
Total	5			

Vessel type II.1 = 14

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.7 Bowls of type 11.2, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						1		1
T.3		1			?	?	?	1
T.5								
T.8					1	?	?	1
T.1		1			?	?	?	1
T.4		1	1		?	?	?	2
T.6					?	?	?	
T.7					?	?	?	
Total	6							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	16			20			36
T.13	1		2	4	3	2	12
T.14		1	3	3			7
T.15	1	2	4				7
T.23		5	8				13
T.24	1	4					5
T.25			5	3			8
T.26		4	18	1	4		27
T.16							
T.9		1					1
T.11							
Total	116						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		4	4
T.17			
T.18			
T.19			
T.20			
T.22			
T.27			
T.21	1		1
T.28			
Total	5		

Vessel type 11.2 = 127

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TABLE 5.8 Bowls of type II.3, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6		2			?	?	?	**2**
T.7					?	S	?	
Total	**2**							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	11			1			**12**
T.13							
T.14							
T.15		1					**1**
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11	1	4	3				8
Total	**21**						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		4	**4**
T.17			
T.18			
T.19			
T.20			
T.22			
T.27			
T.21		1	**1**
T.28			
Total	**5**		

Vessel type II.3 = 28

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TABLE 5.9 Bowls of type 11.4, distribution inside the tumuli

Tumuli type 1

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						18	7	**25**
T.3	2				?	?	?	**2**
T.5								
T.8						?	?	
T.1	2	1			?	?	?	**3**
T.4		14	7			?	?	**21**
T.6					?	?	?	
T.7		1	8		?	?	?	**9**
Total	**60**							

Tumuli type 11

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	1						**1**
T.13				1			**1**
T.14			1	1			**2**
T.15							
T.23			5				**5**
T.24							
T.25							
T.26			1				**1**
T.16							
T.9	3						**3**
T.11							
Total	**13**						

Vessel type 11.4 = 73

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TABLE 5.10 Bowls of type II.5, distribution inside the tumuli

Tumuli type II							
Tum.	**Shaft**	**Ch.1**	**Ch.2**	**Ch.3**	**Ch.4**	**Ch.5**	=
T.12					■	■	
T.13							
T.14					■	■	
T.15	2	2			■	■	**4**
T.23				■	■	■	
T.24						■	
T.25					■	■	
T.26						■	
T.16				■	■	■	
T.9					■	■	
T.11				■	■	■	
Total	**4**						

Vessel type II.5 = 4

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Fourteen bowls of type II.1 were recorded at the cemetery. Four of them were found in the tunnel of T.6 (type I), five examples were recorded *in situ* in T.12 and T.11 (type II), and a further five vessels were found in three tumuli of the smallest type (III): two in the burial chamber in T.10 and one in the shaft, and one in the burial chamber in T.19.

A different situation was observed with bowls of type II.2. Seven of these vessels were found in the largest, type I, tumuli: six in the tunnels of T.3, T.1, and T.4, and one in chamber 1 in T.8. Single vessels were also recorded in type III tumuli: four in the burial chamber of T.10 and one in the shaft of T.21. In type II tumuli these bowls were much more numerous. One hundred and sixteen bowls were discovered in these tombs, examples being noted in every tumulus except T.11 and T.16. Most of this assemblage was found *in situ*. Only sixteen bowls were recorded as one group in the shaft of T.12. Single examples were found in the shafts of T.13, T.15, and T.24. This is the most numerous type of small bowl at the El-Zuma cemetery.

Twenty-eight bowls of type II.3 were discovered, and their distribution is similar to that of type II.2 bowls. In the largest graves (type I) there were only two such vessels, both found in the T.6 tunnel. In tumuli of type III, five examples were found *in situ* in two tumuli (T.10 and T.21), and a further twenty-one vessels were recorded in T.12, T.15, and T.11. Eleven vessels were discovered as one large group in the shaft of T.12 (see Volume I, Chapter 3).

Bowls of type II.4 were only found in graves of types I and II. Most of these vessels (sixty of seventy-three) were recorded in type I tumuli: twenty-five of them were found *in situ* in T.2, while thirty-five (mostly incomplete or fragmentary) were recovered from the tunnels or external shafts in T.3, T.1, T.4 and T.7. Thirteen vessels were found in six tumuli of type II, mainly *in situ*.

Bowls of types II.1–3 and II.4 were recorded *in situ* in the chamber of T.7, which was unexcavated because of safety concerns (see Volume I, Chapter 3, Fig. 3.41).

Type II.5 bowls are represented by four vessels discovered in one type II tumulus (T.15): two were found in the shaft and two in the main chamber.

Type II.6 bowls are also represented by four vessels. One fragmentarily preserved bowl was recovered from the mound of T.7, and its original context is uncertain, but the other three bowls were discovered in the chambers of T.13 and T.14.

Type II.7 is the last group of small bowls and is also represented by four vessels. Two of them were discovered in the external shaft of type I tumulus T.6, and the other two examples were found in chamber 2 of T.11 (type II).

TABLE 5.11 Bowls of type II.6, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2									
T.3						?	?	?	
T.5									
T.8							?	?	
T.1						?	?	?	
T.4							?	?	
T.6						?	?	?	
T.7	1					?	?	?	1
Total	1								

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13					1		1
T.14				2			2
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	3						

Vessel type II.6 = 4

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Bowls of types II.1–II.3 are wheel-made, red-slipped, and burnished. They were quite common in tumuli types II and III and were mainly found *in situ*. In type I tumuli, such bowls were found sporadically and mainly in the external shafts and tunnels. Wheel-made, slipped, and polished bowls of type II.4, with grooved decoration, were abundant in graves of type I, and only a small number were found *in situ* in the side chambers of four tumuli of type II. Of the seventy-three type II.4 vessels, sixty were discovered in type I tumuli and only thirteen in type II tumuli. Bowls of types II.5, II.6, and II.7 occur sporadically and their number is too small for meaningful analysis.

TABLE 5.12 Bowls of type 11.7, distribution inside the tumuli

Tumuli type 1

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6	2				?	?	?	2
T.7					?	?	?	
Total	2							

Tumuli type 11

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11			2				2
Total	2						

Vessel type 11.7 = 4
based on minimal vessel number

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1.2.2 II.8–II.9 Large Bowls

TABLE 5.13 Bowls of type II.8, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3		1			?	?	?	1
T.5	1							1
T.8		1				?	?	1
T.1					?	?	?	
T.4		1				?	?	1
T.6		2			?	?	?	2
T.7		1			?	?	?	1
Total	7							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24	1						1
T.25							
T.26	1						1
T.16							
T.9							
T.11							
Total	2						

Tumuli type III

Tum.	Mound	Shaft	Ch.1	=
T.10				
T.17				
T.18				
T.19				
T.20				
T.22				
T.27				
T.21	1			1
T.28				
Total	1			

Vessel type II.8 = 10

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TABLE 5.14 Bowls of type 11.9, distribution inside the tumuli

Tumuli type 1

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1	1				?	?	?	**1**
T.4						?	?	
T.6		1			?	?	?	**1**
T.7		1			?	?	?	**1**
Total	**3**							

Tumuli type 11

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24	0.5		0.5				**1**
T.25							
T.26							
T.16							
T.9							
T.11			1				**1**
Total	**2**						

Vessel type 11.9 = 5

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Large bowls of types 11.8 and 11.9 were represented by numerous sherds. Only one large bowl was found *in situ* (in T.11) and was complete. The rest of the fragmented vessels were discovered mainly in the tunnels, shafts, or superstructures of the graves, and most of them had been used as scrapers (see below, Chapter 5.2).

1.3 *Group III—Spouted Bowls*

TABLE 5.15 Bowls of types III.1 and III.2, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7	1				?	?	?	1
Total	1							

Vessel type III.1 = 3

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24		1					1
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10			
T.17			
T.18			
T.19	1		1
T.20			
T.22			
T.27			
T.21			
T.28			
Total	1		

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TABLE 5.15 Bowls of types III.1 and III.2, distribution inside the tumuli (*cont.*)

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6	1				?	?	?	**1**
T.7					?	?	?	
Total	**1**							

Vessel type III.2 = 1

Four bowls were recorded at this site. Two almost complete examples, restored from sherds Z19/4, Z24/25 and spout fragment Z7/17, represent handmade bowls of type III.1, while Z6/13 is a complete wheel-made bowl of type III.2. Only one vessel, Z24/25, was found *in situ* in chamber 1 of T.24. The rest of these vessels were recorded in the shafts. Their small number is insufficient for broader analysis.

1.4 *Group IV—Bowls*

TABLE 5.16 Bowls of type IV.1, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11	2						2
Total	2						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		1	1
T.17			
T.18		1	1
T.19			
T.20			
T.22			
T.27			
T.21			
T.28			
Total	2		

Vessel type IV.1 = 4

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TABLE 5.17 Bowls of type IV.2, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24		1					1
T.25			3	1			4
T.26							
T.16							
T.9							
T.11							
Total	5						

Vessel type IV.2 = 5

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.18 Bowls of type IV.3, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23			1				1
T.24							
T.25							
T.26			3		3		6
T.16	1						1
T.9							
T.11							
Total	8						

Vessel type IV.3 = 8

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.19 Bowls of type IV.4, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12				1			1
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26			1				1
T.16							
T.9							
T.11							
Total	2						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10			
T.17			
T.18			
T.19			
T.20			
T.22			
T.27			
T.21			
T.28		1	1
Total	1		

Vessel type IV.4 = 3

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The numbers of bowls classified as group IV (handmade bowls with clay added to the bottom) are insufficient for any robust analysis. Four complete bowls of type IV.1 were found, two of them in the shaft of T.11 (type II), and another two in the chambers of T.10 and T.18 (type III). Five bowls of type IV.2 were found in the chambers in T.24 and T.25 (type II). Bowls of type IV.3, eight in total, were only recorded in type II tumuli: in T.23 and T.26 (in the chambers), and in T.16 (one example was found in the shaft). There were three examples of type IV.4 bowls: two were discovered in T.12 and T.26 (type II), and one in T.28 (type III). Such vessels were also present in the largest graves (type I). In the main burial chamber of T.6 (unexcavated because of safety concerns) a shallow bowl was recognized from the photographic record (see Volume I, Chapter 3, Fig. 3.35).

1.5 *Group V—Pots*

TABLE 5.20 Pots of type V.1, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11	1		1				2
Total	2						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		1	1
T.17			
T.18	1		1
T.19			
T.20			
T.22			
T.27			
T.21			
T.28			
Total	2		

Vessel type V.1 = 4

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A similar situation to that of the type IV bowls exists with the group V pots. The small size of this group rules out any meaningful analysis. Type V.1 is represented by four vessels: two were found in T.11 (type II), one in T.10, and one in T.18 (type III). Type V.2 was noted only in type II tumuli: two examples came from T.24, one from T.25, and another one from T.26. Types V.3 and V.4 were more numerously represented. Ten bowls of type V.3 were recorded *in situ* in graves of type II (T.14, T.25, T.26, T.9, and T.11). There were also ten type V.4 vessels; nine of them were found *in situ* in burials of type II (T.12, T.24, T.26), and one was recorded in the burial chamber of T.28 (type III).

TABLE 5.21 Pots of type V.2, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24		2					**2**
T.25				1			**1**
T.26				1			**1**
T.16							
T.9							
T.11							
Total	**4**						

Vessel type V.2 = 4

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TABLE 5.22 Pots of type V.3, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14		1					**1**
T.15							
T.23	1						**1**
T.24							
T.25			1	2			**3**
T.26		1	2				**3**
T.16							
T.9		1					**1**
T.11		1					**1**
Total	**10**						

Vessel type V.3 = 10

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TABLE 5.23 Pots of type V.4, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12				1			**1**
T.13							
T.14							
T.15							
T.23							
T.24		1					**1**
T.25							
T.26		3	1	1	2		7
T.16							
T.9							
T.11							
Total	**9**						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10			
T.17			
T.18			
T.19			
T.20			
T.22			
T.27			
T.21			
T.28		1	**1**
Total	**1**		

Vessel type V.4 = 10

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1.6 *Group VI—Pots*

TABLE 5.24 Pots of type VI.1, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5		1						1
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7					?	?	?	
Total	1							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11	2						2
Total	2						

Vessel type VI.1 = 3

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.25 Pots of type VI.2, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2									
T.3						?	?	?	
T.5									
T.8							?	?	
T.1						?	?	?	
T.4							?	?	
T.6						?	?	?	
T.7	1					?	?	?	1
Total	1								

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11	1						1
Total	1						

Tumuli type III

Tum.	Mound	Shaft	Ch.1	=
T.10				
T.17				
T.18				
T.19				
T.20				
T.22				
T.27	1			1
T.21				
T.28				
Total	1			

Vessel type VI.2 = 3

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TABLE 5.26 Pots of type VI.3, distribution inside the tumuli

Tumuli type II							
Tum.	**Shaft**	**Ch.1**	**Ch.2**	**Ch.3**	**Ch.4**	**Ch.5**	=
T.12					■	■	
T.13							
T.14					■	■	
T.15					■	■	
T.23				■	■	■	
T.24						■	
T.25					■	■	
T.26						■	
T.16				■	■	■	
T.9					■	■	
T.11	1			■	■	■	**1**
Total	**1**						

Vessel type VI.3 = 1

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Six fragmentarily preserved vessels were attributed to this group. Type VI.1 was represented by three vessels, one of which was found in the tunnel of T.5 (type I), while sherds from a further two vessels were recovered from the shaft of T.11 (type II). In type VI.2 one example was discovered in the mound of T.7 (its original context is uncertain), one in the shaft of T.11 and one in the superstructure of T.27. One pot of type VI.3 was found in the shaft of T.11.

Not all of the recorded examples were found *in situ*. Some were discovered in the shaft fill, in the tunnel, or the tumulus superstructure. The only type II tumulus that yielded group VI sherds was T.11 (all of them recovered from the shaft).

1.7 *Group VII—Jars and Bottles*

TABLE 5.27 Jars of type VII.1, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	2	3	1				6
T.13							
T.14							
T.15							
T.23							
T.24				1			1
T.25							
T.26							
T.16							
T.9				1			1
T.11							
Total	8						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10			
T.17			
T.18		2	2
T.19			
T.20	1	1	2
T.22			
T.27			
T.21			
T.28	1	2	3
Total	7		

Vessel type VII.1 = 15

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The group VII pottery is divided into six types of vessels. Fifteen examples of type VII.1 jars were recorded in tumuli of types II and III: eight of them were discovered in T.12, T.24, and T.9 (type II), and seven in T.18, T.20, and T.28 (type III). Jars of type VII.2 are represented by twenty-one examples. More than half of them were recorded in graves of type II: ten examples were found in T.12, and one apiece in T.13, T.15, and T.25. Seven vessels were discovered in five modestly equipped tumuli of type III, and one jar was discovered in the main burial chamber of T.2, a type I tumulus. Jars of type VII.3 are represented by one specimen found in chamber 3 of T.2. Type VII.4 is represented by twelve vessels. Four of them were discovered in T.2 and T.5 (type I), and eight of them were recovered from T.12, T.14, T.16, and T.11 (type II). Bottles of types VII.5 and VII.6 are the most numerously represented at this site. Twenty-five were recorded in total, examples being found in each type of tomb, most abundantly in type II tumuli. Twenty vessels or fragments of type VII.5 bottles were recorded, featuring in almost all tumuli of type II, where twelve examples were found in the chambers and eight in the burial shafts. Only two such vessels were excavated in T.2 (type I), and three examples came from the burial chambers of T.10 and T.22 (type III). Nineteen type VII.6 bottles were discovered in seven tumuli of type II: eight were found in the shaft, one in the superstructure, and ten in the burial chambers. Only one jar was noted in a type I tumulus, namely the fully excavated T.5. In type III tumuli, five examples were discovered *in situ*.

TABLE 5.28 Jars of type VII.2, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2					1			1
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7					?	?	?	
Total	1							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	7	2		1			10
T.13			1				1
T.14							
T.15		1					1
T.23							
T.24					1		1
T.25							
T.26							
T.16							
T.9							
T.11							
Total	13						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		2	2
T.17		2	2
T.18		1	1
T.19			
T.20			
T.22		1	1
T.27			
T.21		1	1
T.28			
Total	7		

Vessel type VII.2 = 21

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.29 Jars of type VII.3, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2							**1**	**1**
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7					?	?	?	
Total	**1**							

Vessel type VII.3 = 1

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TABLE 5.30 Bottles of type VII.4, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2							1	2	3
T.3						?	?	?	
T.5							1		1
T.8							?	?	
T.1						?	?	?	
T.4							?	?	
T.6						?	?	?	
T.7						?	?	?	
Total	4								

Tumuli type II

Tum.	Mound	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12		1						1
T.13								
T.14					1			1
T.15		1	2	1				4
T.23								
T.24								
T.25								
T.26								
T.16			1					1
T.9								
T.11	1							1
Total	8							

Vessel type VII.4 = 12

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TABLE 5.31 Bottles of type VII.5, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						2		2
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7					?	?	?	
Total	2							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	1	1	1				3
T.13	2		1				3
T.14	2						2
T.15		2	1				3
T.23							
T.24	2	2					4
T.25			2				2
T.26				1			1
T.16		1					1
T.9							
T.11	1						1
Total	20						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		2	2
T.17			
T.18			
T.19			
T.20			
T.22		1	1
T.27			
T.21			
T.28			
Total	3		

Vessel type VII.5 = 25

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TABLE 5.32 Bottles of type VII.6, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5					1			1
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7					?	?	?	
Total	1							

Tumuli type II

Tum.	Mound	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12		6	2	1	2			11
T.13				1				1
T.14	1							1
T.15								
T.23								
T.24		1						1
T.25								
T.26		1			1			2
T.16								
T.9				2				2
T.11				1				1
Total	19							

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		1	1
T.17			
T.18		1	1
T.19			
T.20		2	2
T.22			
T.27		1	1
T.21			
T.28			
Total	5		

Vessel type VII.6 = 25

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1.8 *Groups VIII—Stands and IX—Goblets*

TABLE 5.33 Stands of types VIII.1 and VIII.2, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					1	?	?	1
T.7		1			?	?	?	1
Total	2							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23		1					1
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Vessel type VIII = 3

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TABLE 5.34 Goblets of types IX.1, IX.2 and IX.3, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4		1				?	?	1
T.6					?	?	?	
T.7					1	?	?	1
Total	2							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24		1					1
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		1	1
T.17			
T.18			
T.19			
T.20			
T.22			
T.27			
T.21			
T.28			
Total	1		

Vessel type IX = 4

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These two groups of vessels are represented by very few examples, and broader analysis of either type is not possible. Only one complete stand was discovered in T.23 (type II), and another fragmented example was found in the tunnel of T.7. A third stand was noted in the main burial chamber of T.6. Although this tomb was not excavated because of safety concerns, the pot stand can be seen in photographs, next to the blocking wall (see Volume I, Chapter 3, Fig. 3.34).

Three examples of goblets were found, one in each type of tumulus. A goblet of type IX.1 was recorded in T.24 (type II), a goblet of type IX.2 in T.10 (type III) and a goblet of type IX.3 in the tunnel of T.4 (type I). Another goblet of completely different shape and form was recorded in the unexcavated chamber of T.7 (type I), on the blocking wall (bottom course) of the chamber (see Volume I, Chapter 3, Fig. 3.41).

1.9 *Group X—Oil Lamps*

TABLE 5.35 Oil lamps of type X, distribution inside the tumuli

Type I tumuli								
Tum.	**Shaft**	**Tun.**	**E Tun.**	**W Tun.**	**Ch.1**	**Ch.2**	**Ch.3**	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4		1	1	1		?	?	**3**
T.6			1		?	?	?	**1**
T.7			1		?	?	?	**1**
Total	5							

Vessel type X = 5

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Five oil lamps were found in three tumuli of type I: three lamps in T.4, one in T.6, and one in T.7. The lamps from T.4 were found in the fill of the E and W tunnels, while lamps from another two tombs were found at the top of the E tunnel fill and are probably connected with robber activity (see Volume I, Chapter 3, Fig. 3.34; Chapter 3.6, this volume).

1.10 *Group XI*—Qawadis

TABLE 5.36 *Qawadis* of type XI, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3		1			?	?	?	1
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6		2			?	?	?	2
T.7					?	?	?	
Total	3							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13	1						1
T.14							
T.15							
T.23							
T.24							
T.25	1						1
T.26	3						3
T.16							
T.9							
T.11	1						1
Total	6						

Vessel type XI = 9

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Only fragmented examples were found. More than 120 sherds were recorded, some of which could be pieced together and attributed to 23 vessels or groups of sherds (recorded in the database). The minimum number of vessels is nine. All sherds were found in the shafts and tunnels of type I and II tumuli, and most of them had been used as scrapers (see below, Chapter 5.2).

1.11 *Group XII—Amphorae*

TABLE 5.37 Amphorae of type XII.1, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4			2			?	?	2
T.6					?	?	?	
T.7		1			?	?	?	1
Total	3							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23							
T.24	1						1
T.25							
T.26		1					1
T.16							
T.9							
T.11							
Total	2						

Vessel type XII.1 = 5

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TABLE 5.38 Amphorae of type XII.2, distribution inside the tumuli

Tumuli type I								
Tum.	**Shaft**	**Tun.**	**E Tun.**	**W Tun.**	**Ch.1**	**Ch.2**	**Ch.3**	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4			1			?	?	1
T.6					?	?	?	
T.7					?	?	?	
Total	1							

Vessel type XII.2 = 1

TABLE 5.39 Amphorae of type XII.3, distribution inside the tumuli

Tumuli type I								
Tum.	**Shaft**	**Tun.**	**E Tun.**	**W Tun.**	**Ch.1**	**Ch.2**	**Ch.3**	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7		sh	sh	sh	1	?	?	3
Total	3							

Vessel type XII.3 = 3

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Six types of amphorae were identified at the El-Zuma cemetery. There were five fragmented examples of type XII.1 Dongolan transport amphorae. Three examples came from type I tumuli (T.4 and T.7), where the sherds were recorded in the fill of the tunnels. Another two amphorae were found in tumuli of type II: one in the shaft of T.24, and another (the only amphora found *in situ*) in the main burial chamber of T.26. Some sherds of this type of amphora were used as scrapers. Imported amphorae from Asia Minor (XII.2) are represented by only one example, found in the tunnel of T.4. This vessel was reused as a lamp (note that the other three oil lamps were also discovered in this tomb: see Chapter 3.6, this volume). Type XII.3, another type of transport amphora from Palestine, was represented by sherds found in the tunnels of T.7. Two vessels were restored from these sherds. It is highly probable that these amphorae were removed from the burial chamber, given that another broken amphora can be seen in photographs

TABLE 5.40 Amphorae of type XII.4, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						1		1
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6					?	?	?	
T.7					?	?	?	
Total	1							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15	2	1					3
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	3						

Vessel type XII.4 = 4

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taken of the unexcavated burial chamber of T.7 (see Volume I, Chapter 3, Fig. 3.41 bottom). Type XII.4 is a type of table amphora imported from the Aswan region. One example was found in chamber 2 of T.2 (type I), and three examples were discovered in T.15 (type II). Type XII.5 amphorae are represented by one complete and one fragmented specimen recovered from two tumuli of type II. Only one amphora represents type XII.6 and was found, in pieces, in the shaft and tunnel of T.4.

TABLE 5.41 Amphorae of type XII.5, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=	=
T.12								
T.13								
T.14								
T.15								
T.23								
T.24								
T.25				1				1
T.26								
T.16		1						1
T.9								
T.11								
Total	2							

Vessel type XII.5 = 2

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TABLE 5.42 Amphorae of type XII.6, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4	1					?	?	1
T.6					?	?	?	
T.7					?	?	?	
Total	1							

Vessel type XII.6 = 1

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1.12 *Group XIII—Bottles and XIV—Jugs*

TABLE 5.43 Bottles of type XIII.1, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4						?	?	
T.6		1			?	?	?	1
T.7					?	?	?	
Total	1							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13	1						1
T.14							
T.15							
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Vessel type XIII.1 = 2

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TABLE 5.44 Bottles of type XIII.2, distribution inside the tumuli

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15							
T.23		1					1
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Vessel type XIII.2 = 1

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TABLE 5.45 Bottles of type XIII.3, distribution inside the tumuli

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10			
T.17			
T.18			
T.19			
T.20			
T.22			
T.27			
T.21		1	1
T.28			
Total	1		

Vessel type XIII.3 = 1

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.46 Jugs of type XIV.1, distribution inside the tumuli

Tumuli type II							
Tum.	**Shaft**	**Ch.1**	**Ch.2**	**Ch.3**	**Ch.4**	**Ch.5**	=
T.12							
T.13							
T.14							
T.15	1						1
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Vessel type XIV.1 = 1

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 5.47 Jugs of type XIV.2, distribution inside the tumuli

Tumuli type II							
Tum.	**Shaft**	**Ch.1**	**Ch.2**	**Ch.3**	**Ch.4**	**Ch.5**	=
T.12							
T.13							
T.14							
T.15			1				1
T.23							
T.24							
T.25							
T.26							
T.16							
T.9							
T.11							
Total	1						

Vessel type XIV.2 = 1

PRODUCED BY E. CZYŻEWSKA-ZALEWSKA

Bottles in group XIII are represented by four bottles of three different types. One bottle of type XIII.1 was found in the tunnel of T.6 (type I) and another one was recovered from the shaft of T.13 (type II). A single bottle of type XIII.2 was discovered in the burial chamber of T.23, and one bottle of type XIII.3 was found in T.21 (type III). The small number of vessels and type differentiation preclude any meaningful analysis of this group.

A similar situation exists with the group XIV jugs, of which there were only two, each representing a different type. Both were discovered in the same type II tumulus (T.15).

2 Distribution by Function

The author tries to assign vessels to particular places inside the tumuli and determine the typical set of grave goods that was deposited in each type of tumulus.

The distribution of vessels presented below is based on the minimum number of vessels and encompasses all vessels attributed to specific groups, such as cups, bowls, or bottles, and includes vessels presented in the catalogue as *varia*. In the case of cups, bowls, goblets, and amphorae, objects photographed inside the unexcavated burial chambers of T.6 and T.7 (but not removed), are also included in this chapter.

2.1 *Group I, Cups*

Cups are widely represented in tumuli of type II: 77 of the 117 examples noted were recorded in this type of burial. Their occurrence in the chambers is varied. There is no specific pattern to their distribution. Various numbers were placed in the main burial chambers and additional chambers in almost all tumuli (except T.16). The greatest numbers of cups were found in T.12, T.14, T.23, and T.11. In the only two fully excavated type I tumuli (T.2 and T.5) several cups were found in different chambers, but there were also further examples in other graves of this type, where cups were found in the tunnels and external shafts. We cannot rule out that there may have been more of them in the burial chambers of these tumuli. The presence of cups was confirmed in the unexcavated burial chambers of T.6 and T.7 (see Volume I, Chapter 3, Fig. 3.35, Fig. 3.41 bottom). The situation with type III tombs is more straightforward, as cups were found in all graves of this type except T.17.

TABLE 5.48 Group I, cups of all types, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2							2	2	4
T.3						?	?	?	
T.5	5					1	1		7
T.8							?	?	
T.1						?	?	?	
T.4			1	1	2		?	?	4
T.6		2				3?	?	?	2 (5?)
T.7	1	2				1?	?	?	4
Total	23 (24?)								

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	1	1		13			15
T.13			2				2
T.14	1	5	2	3			11
T.15	4	2	2				8
T.23	1	5	6				12
T.24	1	2		1			4
T.25		1	1	5			7
T.26	1	7					8
T.16							
T.9							
T.11	1	5	4				10
Total	77						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		7	7
T.17			
T.18		1	1
T.19	1	1	2
T.20	1		1
T.22		2	2
T.27		1	1
T.21	1		1
T.28	1	3	4
Total	19		

Group I, cups = 117

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2.2 *Group II, Small Bowls, Types II.1–II.7*

TABLE 5.49 Group II, small bowls of types II.1–II.7, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2							20	7	**27**
T.3		3	1			?	?	?	**4**
T.5	2		1						**3**
T.8						1	?	?	**1**
T.1		2	1			?	?	?	**3**
T.4			15	8	1	?	?	?	**24**
T.6		2	8	1	1	1?	?	?	**13**
T.7	1		2	8		6?	?	?	**17**
Total	**92**								

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12	28		1	21			**50**
T.13	1		2	5	4	2	**14**
T.14		2	4	6			**12**
T.15	3	5	4				**12**
T.23		6	13				**19**
T.24	1	4					**5**
T.25			5	3			**8**
T.26	1	4	20	1	4		**30**
T.16							
T.9	3	1					**4**
T.11	1	4	10				**15**
Total	**169**						

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		11	**11**
T.17			
T.18			
T.19		1	**1**
T.20			
T.22			
T.27			
T.21	2	1	**3**
T.28			
Total	**15**		

Group II, small bowls of types II.1-II.7 = 276

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Of the 276 small bowls noted, two-thirds (169 vessels) were recorded in tumuli of type II. Like cups, bowls were placed in different chambers but were present in greater numbers than cups and in the same type II tumuli as cups (except T.16). A large number of bowls was recorded in the fully excavated T.2 (27 vessels), but in all tumuli of this type bowls were found in the external shafts or in the tunnels. They were also noted in the unexplored chambers of T.6 and T.7 (see Volume I, Chapter 3, Fig. 3.35, Fig. 3.41 bottom). Bowls were recorded in only three of the smallest variety of tumuli (type III), the majority in the most richly furnished grave, T.10. Small bowls were less common than cups in tumuli of type III.

It is necessary to look at the cups and small bowls as a set of vessels that may have served a common function in the graves. Large numbers of bowls were found inside the chambers together with animal bones. Most of the vessels were placed in groups, though in some cases they were spread out inside the chambers (see, for example, Chapter 7.19, Fig. 7.153, this volume). Sometimes a single cup was discovered among a set of bowls, but the number of bowls was always greater (see Volume I, Chapter 3, Fig. 3.7 bottom; Fig. 3.73 bottom; Fig. 3.63; Fig. 3.84; Fig. 105 bottom; Fig. 109 bottom).

The cups found in the burial chambers had another function, serving as lids for the large jars of group VII (see Volume I, Chapter 3, Fig. 3.7 top; Fig. 109 top; Fig. 3.117).

2.3 *Group IV–VI, Bowls and Pots*

Pots of type VI are not represented among the grave goods; all examples were discovered in the shafts or the superstructure. But bowls and pots with an additional layer of clay added to the bottom (groups IV and V) were placed inside the burial chambers intentionally. Generally, they were abundant in type II burials. Fifty of the sixty recorded pots and bowls occurred in almost all tumuli of type II (except T.13). Most of these tumuli contained only a few vessels of this type, T.26 and T.11 featuring the greatest numbers. In type III burials, solitary examples of cooking vessels were recorded in only three tumuli.

If we look at the arrangement of grave goods inside the burial chambers, we can see that such vessels were deposited together with the sets of bowls and cups described above (see Volume I, Chapter 3, Fig. 3.73; Fig. 3.117; Fig. 3.84; Fig. 3.89), and in the case of the group IV bowls, animal bones were also recorded inside these vessels (see Volume I, Chapter 8). An interesting example of the arrangement of these vessels was recorded in the atypical tumulus T.28 (see Volume I, Chapter 3), where a pot and bowls were deposited together with large jars in a niche, the bowl being positioned vertically. In this case, the bowl was not used as a container for a food offering, but seems to have been some kind of spare/supplementary vessel.

TABLE 5.50 Groups IV–VI, bowls and pots, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun-nel	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2									
T.3						?	?	?	
T.5			1						1
T.8			1			?	?	?	1
T.1						?	?	?	
T.4			1				?	?	1
T.6						?	?	?	
T.7	1		0.1			?	?	?	1
Total	4								

Tumuli type II

Tum.	Mound	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12					2			2
T.13								
T.14			1					1
T.15								
T.23		1		1				2
T.24			4					4
T.25				4	4			8
T.26		1	4	10	2	5		22
T.16		1						1
T.9			1					1
T.11		7	1	1				9
Total	50							

Tumuli type III

Tum.	Mound	Shaft	Ch.1	=
T.10			2	2
T.17				
T.18		1	1	2
T.19				
T.20				
T.22				
T.27				
T.21				
T.28			2	2
Total	6			

Groups IV–VI, bowls and pots = 60

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2.4 *Group VII, Jars and Bottles*

TABLE 5.51 Group VII, jars, distribution inside the tumuli

Tumuli type I

Tum.	Mound	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						1	3	3	7
T.3						?	?	?	
T.5		1				1	1		3
T.8							?	?	
T.1						?	?	?	
T.4							?	?	
T.6				1		2?	?	?	3
T.7						2?	1?	?	3
Total	16								

Tumuli type II

Tum.	Mound	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12		19	8	4	3			34
T.13		2		3				5
T.14	1	2			1			4
T.15		1	5	2				8
T.23		1						1
T.24		3	2		1	1		7
T.25				2				2
T.26		1			2			3
T.16			2					2
T.9				2	1			3
T.11	2	2		1				5
Total	74							

Tumuli type III

Tum.	Shaft	Ch.1	=
T.10		6	6
T.17		2	2
T.18		4	4
T.19			
T.20	1	3	4
T.22		2	2
T.27		1	1
T.21	1	1	2
T.28	1	2	3
Total	24		

Group VII, jars and bottles = 114

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Beer jars were recorded in all types of tumuli. Among the 225 recorded vessels or fragmented vessels, 113 were discovered complete, almost complete or in the form of diagnostic sherds, while the rest consisted of undiagnostic fragments or sherds used as scrapers. In the fully excavated type I tumuli, T.2 and T.5, several examples of jars were discovered in different chambers, and they were also recorded in the unexcavated chambers of T.6 and T.7. However, jars do not appear to have been abundant in these largest tumuli (see Volume I, Chapter 3, Fig. 3.35; Fig. 3.41). Like the cups and bowls discussed above, jars of group VII were abundant in type II graves and were discovered in all tumuli of this category. The richest in jars was T.12, where thirty-four of them were found. There is no order in the arrangement of jars. In four graves they were discovered in the main burial chamber, and in almost all tumuli they were found in additional chambers. T.23 was the only tomb in which jars were recovered from the shaft. Of the type III graves, T.19 was the only one in which a jar was not found. It seems that they were common in this type of grave, and together with cups they may have constituted a typical set of grave pottery deposited in the smallest burials.

In many graves they were placed inside the burial chamber against the walls, and often together in a group (see Volume I, Chapter 3, Fig. 3.117; Fig. 3.49 bottom; Fig. 3.63; Fig. 3.41). Some were deposited in the central part of the chamber, but also as part of a set of vessels (see Volume I, Chapter 3, T.2 Fig. 3.7 top; Fig. 3.48 bottom). In graves of type III, the fact that they were placed against the wall is no surprise given the small size of the burial chamber. Jars (as well as other vessels) were often put in the corners of the burial chamber, or positioned at the feet and head of the deceased (see Chapter 7.19, T.10 Fig. 7.142; T.27 Fig. 7.168, this volume). In some cases, robber activity had severely disturbed the original contexts, and it was impossible to reconstruct the burial arrangement (see Chapter 7.19, T.21 Fig. 7.169; T.19 Fig. 7.165, this volume). An interesting situation was observed in T.18, where the vessels were arranged in a row and occupied the entire length of the chamber (see Chapter 7.19, T.18 Fig. 7.164, this volume).

2.5 *Group XII, Amphorae*

TABLE 5.52 Group XII, transport amphorae of types XII.1–XII.3, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2								
T.3					?	?	?	
T.5								
T.8						?	?	
T.1					?	?	?	
T.4			3			?	?	**3**
T.6					?	?	?	
T.7		1	1	1	1	?	?	**4**
Total	**7**							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13	Sh.						
T.14	1						**1**
T.15							
T.23							
T.24							
T.25							
T.26		1					**1**
T.16							
T.9							
T.11							
Total	**2**						

Group XII, transport amphorae, types XII.1–3 = 9

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TABLE 5.53 Group XII, table amphorae of types XII.4–XII.6, distribution inside the tumuli

Tumuli type I

Tum.	Shaft	Tun.	E Tun.	W Tun.	Ch.1	Ch.2	Ch.3	=
T.2						1		1
T.3	1				?	?	?	1
T.5		1						1
T.8						?	?	
T.1					?	?	?	
T.4	1	1				?	?	2
T.6					?	?	?	
T.7					?	?	?	
Total	5							

Tumuli type II

Tum.	Shaft	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	=
T.12							
T.13							
T.14							
T.15	2	1					3
T.23							
T.24							
T.25			1				1
T.26							
T.16	1						1
T.9							
T.11							
Total	5						

Group XII, table amphorae, types XII.4–6 and varia = 10

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Transport amphorae of types XII.1–XII.3 were not abundant at this site. Eleven amphorae were discovered in tombs of types I and II, but none were recorded in type III tumuli. The only amphora found *in situ* among the type I tumuli came from T.7 (see Volume I, Chapter 3, Fig. 3.41). T.26 (type II) was the only tomb in which a Dongolan amphora was found *in situ* in the main burial chamber, close to the remains of the deceased (see Chapter 7.3, Fig. 7.157, this volume).

Table amphorae of types XII.4–6 were recorded in the same types of tumuli. In T.2 one table amphora was discovered *in situ* together with a group of small bowls (see Volume I, Chapter 3, Fig. 3.7). Two amphorae were also found *in situ* in the burial chambers of T.15 and T.25, close to groups of small vessels such as cups or bowls.

2.6 *Other Vessels*

Other vessels, such as spouted bowls (group III), stands (group VIII), goblets (group IX), bottles (group XIII), and jugs (group XIV), were recorded in small numbers and only a few examples were discovered *in situ* (see above, Chapter 5.1). These vessels were deposited together with bowls and cups. The arrangement of the stand and bottle from T.23 could not be ascertained because they were placed in the main chamber, which was disturbed by looting, but they were found in pieces together with bowls and cups (see Volume I, Chapter 3, Fig. 3.7 top). One goblet recorded in the burial chamber of T.10 was recorded in a group together with cups and bowls and animal bones (see Volume I, Chapter 3, T.10, Fig. 3.109 bottom). In T.24, a goblet was discovered inside the chamber together with spouted bowls and pots of group V.

2.7 *Scrapers*

Some vessels served a secondary function by being reused as scrapers. Among all of the recorded pottery there were 209 scrapers. The largest groups of vessels represented among the scrapers were jars and large bowls [**Fig. 5.1**].

Large bowls are broadly discussed in Chapter 5.1. The only vessel discovered *in situ* was the one in T.11. Most of the recorded sherds were used as scrapers. In Chapter 5.1 the minimum number of vessels is presented by the author. All bowls (except for the one found in T.11) were discovered in pieces, and among the 59 recorded sherds forty-one had been used as scrapers. Sherds were found in the external shafts and tunnels of type I tumuli, and in the shafts (predominantly) of type II tumuli. Several examples were also recovered from the shafts of type III tumuli.

The scrapers that made up the most significant group were made from jars of different types and were discovered in all types of tumuli, mainly in their shafts or tunnels, although a few examples were found in the chambers [**Fig. 5.2**].

Twenty-five scrapers were made from *qawadis*. Among the 120 *qadus* sherds there were some broken scrapers that could be pieced together (see Chapter 4, this volume). All sherds were discovered in the shafts or tunnels, and there is no evidence that these vessels had served as grave goods at the El-Zuma cemetery, despite the fact that the *saqiya* had been known in Ancient Nubia since Meroitic times (see Chapter 4, this volume).

Several sherds of transport amphorae were used as scrapers, but this was not a common function of this vessel type.

Scrapers were recorded in almost all tumuli at the El-Zuma cemetery. Their function is obvious, but it was not possible to date their usage. Jars, *qawadis*, amphorae, and large bowls were known in Early Makurian times but are also noted at sites dating from the later period of the Makurian Kingdom (see Chapter 3.6, this volume). We should bear in mind that scrapers may have been used by tomb builders, as suggested by the scraper discovered

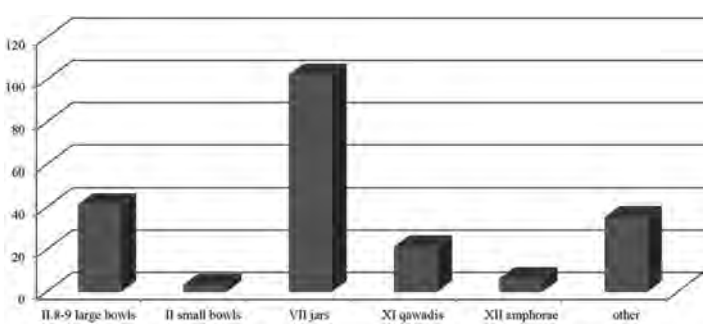

FIGURE 5.1
Occurrence of scrapers among various types of vessels
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TABLE 5.54 Scrapers, distribution inside the tumuli

	T.2					T.3		T.5						T.8			T.1					T.4				T.6				T.7					
	sh.	t.	ch.1	ch.2	ch.3	sh.	t.	M.	sh.	t.	ch.1	ch.2	ch.3	M.	sh.	t.	M.	Sh.	t.	E t.	W t.	sh.	t.	E t.	W t.	sh.	t.	E t.	W t.	M.	sh.	t.	E t.	W t.	
11.8–9 large bowls						1				3								1					2				15						3	1	2	28
11 small bowls varia																											1					1	1		3
VII jars/ bottles						2	9	6		3	1				1			1					3	4			17						1	1	49
XI qawadis						1	2																												3
XII amphorae																																	1		1
unidentified							1			1				3			1						1		1		4		1			2	1	2	18
total	0					16		14						4			3					11				38				16					102

TABLE 5.54 Scrapers, distribution inside the tumuli (*cont.*)

	T.12				T.13							T.14					T.15				T.23			T.24					T.25				T.26						
	sh.	ch.1	ch.2	ch.3	M.	sh.	ch.1	ch.2	ch.3	ch.4	ch.5	M.	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	sh.	ch.1	ch.2	ch.3	ch.4	sh.	ch.1	ch.2	ch.3	M.	sh.	ch.1	ch.2	ch.3	ch.4	
II.8–9 large bowls	4																							4		1								1					10
VII jars/ bottles	4			1									1				4							1					5				2	6		1			25
XI qawadis					8	1						8																												17
XII amphorae						1							1																					2		1				5
misc	4												2				3																						9
total	13				10							12					7				0			6					5				13						66

	T.16				T.9					T.11				T.10		T.17			T.18		T.19			T.20		T.22		T.27			T.21			T.28			
	M.	sh.	ch.1	ch.2	M.	sh.	ch.1	ch.2	ch.3	M.	sh.	ch.1	ch.2	sh.	ch.1	M.	sh.	ch.1	sh.	ch.1	M.	sh.	ch.1	sh.	ch.1	sh.	ch.1	M.	sh.	ch.1	M.	sh.	ch.1	M.	sh.	ch.1	
II.8–9 large bowls		1														1															1						3
IV bowls		1																																			1
VII jars/ bottles		5			1	7					3	1				1								2						1	2			3	1	1	28
XI qawadis																						1															1
misc					1	5								1																		1						8
total	7				14					4				1		2			0		1			2		0		1			4			5			41

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sh—shaft
t.—tunnel
ch.—chamber
W t.—West tunnel
E t.—East tunnel
M.—mound

FIGURE 5.2
A scraper found in the burial chamber of tumulus 17
PHOTO O. BIAŁOSTOCKA

inside the intact chamber 3 in T.12 (see Volume I, Chapter 3.3). Another possibility is, of course, that they were used by grave robbers. The majority of scrapers were discovered in the fills of shafts and tunnels.

3 Discussion

In the smallest type of burials (type III), which have only one chamber, we can observe that vessels were deposited mostly close to the head of the deceased and close to the legs. Such arrangements were recorded in T.28 (see Fig. 7.170), T.27 (see Fig. 7.168), T.17 (see Fig. 7.163), and T.10 (see Fig. 7.162). An interesting layout was noted in T.18 (see Fig. 7.164), where vessels were lined up alongside the chamber, which was quite narrow. Because of robber activity we cannot, of course, be sure if this was their original placement. In some tumuli, the original position was significantly disturbed, as in T.22 and T.19, where the bodies had been removed and left in the shaft together with burial equipment and vessels, in most cases broken (see Figs 7.165, 7.167).

In type II tumuli, which feature multiple chambers, the distribution of the vessels seems to be fairly random. In graves with two chambers, such as T.23 and T.11 (see Figs 7.153, 7.161), both chambers were abundantly equipped with pottery, and chamber 2 had more vessels than the main chamber, where the deceased was buried. In a few of the tumuli with three chambers, both of the additional chambers were provided with multiple vessels, as observed in T.25 (Fig. 7.156), T.14 (Fig. 7.150), and probably also T.12 (Fig. 7.144). In these instances, the pottery placed in the main chamber comprised a smaller assemblage than in the additional chambers. In tumuli with 4–5 chambers, we can see that the further from the main chamber, the fewer the number of grave goods. In T.26 (Fig. 7.157) and T.13 (Fig. 7.149) the largest quantity of pottery was found in chamber 2, while chamber 5 contained only a few vessels. In both of these graves, the main chamber also held only a few vessels. A different situation was noted in T.24, where a sizeable collection was recorded in the main chamber, while the additional chambers contained only single vessels.

The distribution of grave goods in the chambers of type I tumuli is difficult to determine because only two of them were fully excavated: T.2 (see Fig. 7.135) and T.5 (Fig. 7.137). While a substantial amount of pottery was recorded in both additional chambers of T.2, which were entirely filled with grave goods, only several specimens were recorded in T.5.

CHAPTER 6

Pottery in the Funerary Context of El-Zuma Tumuli

1 Timeline and Geographical Distribution of Vessels

As mentioned in Chapter 2, we do not have much information about the period between the fall of the Meroitic Kingdom and the rise of the Kingdom of Makuria in the Dongola Reach. The time between the 4rd and 7th centuries AD was a period of political and cultural transitions during which three Kingdoms came into being in Ancient Nubia: Nobadia in the north, Makuria in the middle, and Alwa in the south. In the Dongola Reach the main source of information about this period are burials. No contemporaneous habitation site has been discovered in the vicinity of the El-Zuma cemetery.

Because we do not have much information about this period, we should also look at the pottery from a historical perspective. Do we have continuity of Meroitic traditions or maybe earlier traditions? What changes in pottery can we observe, and what was new in the pottery assemblage?

The timeline of vessel types and their geographical distribution, as outlined in this chapter and illustrated in the accompanying figures and maps, is based on evidence from excavated or surveyed archaeological sites dated to the Meroitic to post-Meroitic period, which is presented in Chapter 2, and on analogies described in Chapter 3.6 (see Chapter 2, Table 2.1, Chapter 3.6, this volume).

1.1 *Cups* [*Figs 6.1 and 6.2*]

Slipped and burnished cups of types I.1–I.4 are mainly dated to the post-Meroitic period and were widely distributed throughout the Dongola Reach region. Type I.1 seems to have been a long-lived form known since the Meroitic period. Such forms evolved from cups with tall and straight walls (Edwards 2004, 171, Fig. 6.9). In the El-Zuma graves these types are most common among the assemblage of complete cups. Type I.5 is not as well represented, but examples were found at other sites in the Dongola Reach, and they are probably imitations of short X-Group cups, usually decorated with two or three incised grooves on the lower part, just above the base, like the ones found at the grave ROM 32/1 (Mahmoud El-Tayeb and Czyżewska 2011, 116; Phillips 1987; Grzymski 1991), and the fabric suggests a Lower Nubian origin. Z14/14, Z14/11, Z14/8 and Z9/2, which were found in El-Zuma as solitary examples of their respective types, are also of Lower Nubian origin. Similar examples were found at Gerf Hussein, Karanog, Qasr Ibrim, Qustul, and Faras, and most of them are dated to the post-Meroitic period. Only one cup similar to Z14/14 was also found in the south, in Upper Nubia at Hamdab, and the timeline suggests that such cups had been known since the Meroitic period.

1.2 *Small Bowls* [*Figs 6.3 and 6.4*]

Burnished and slipped bowls of types II.1–II.2, which were found in El-Zuma graves accompanied by burnished and slipped cups of types I.1–I.4, represent the same ware. The timeline for the use of both sorts of vessels is similar, but bowls had a much wider distribution in Ancient Nubia, especially across the southern part of the Dongola Reach, as observed at Hammur, El-Ghaddar, and El-Kassinger (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 11–12) and south of the Dongola Reach, between the Fourth and Sixth Cataracts. Only single examples have been discovered in Lower Nubia.

Bowls of types II.1 and II.2 testify to cultural continuity, originating in the Classic Meroitic period and remaining in production with continuous modifications until the Second Phase of the Early Makurian period. The simplest form was found at El-Kadada in a Meroitic burial. A larger variant of this vessel was discovered in the West Cemetery at Meroe (Dunham 1963, 189, Fig. 135c; 342, Fig. F). In the Dongola Reach, bowls of this type were found in a Late Meroitic burial at Hagar Sail, at the post-Meroitic cemetery in El-Kassinger Bahry, and in T.87 at Tanqasi (Klimaszewska-Drabot 2010a, 221, Fig. 3). Type II.3 probably shares the same timeline as types II.1 and II.2, but slightly differs from them in shape and technology. There is insufficient information from other sites to be able to recognize this type elsewhere.

Type II.4 should be considered as a new type of bowl which appeared in the post-Meroitic period. These small, red, wheel-made, grooved bowls were regularly deposited in graves in the Dongola Reach. They might be an imitation of metal bowls, similar in shape and also adorned with grooved decoration, examples of which were found in X-Group period graves at Ballana and Qustul (see Chapter 3.6, this volume). With slight modifications, these vessels remained in use until the Christian period. Grooved bowls became shallower with straight walls, and grooved decoration became more delicate. Examples of this type found at Selib 3, and dated to the 6th–early 7th century AD, could be interpreted as the successors of such bowls (Cedro 2017, 312–313). The same can be said of

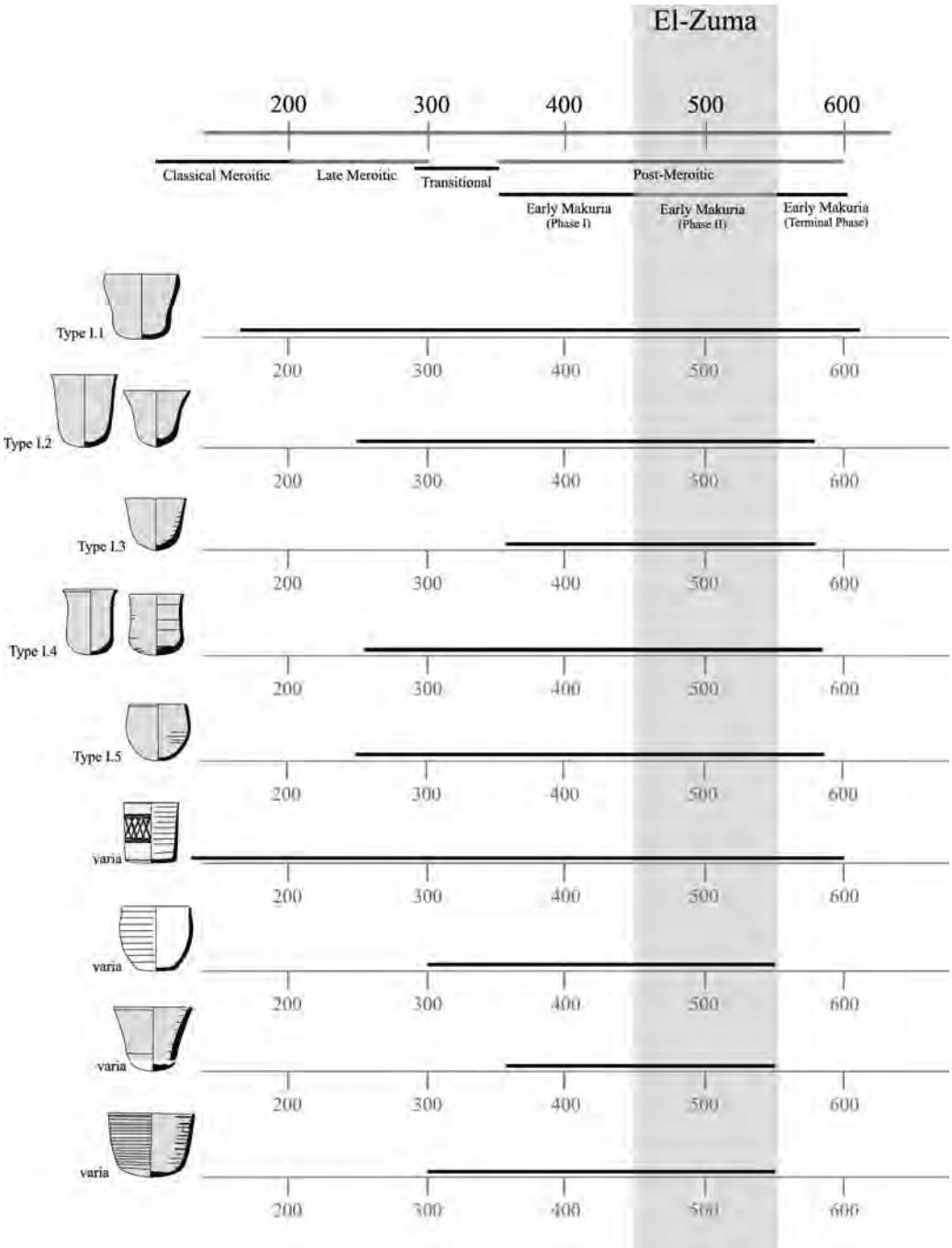

FIGURE 6.1 Dating of the cups in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

examples found in Old Dongola and dated to the end of the 6th century and beginning of the 7th century (Danys, n.d., 272, 274–275).

Types 11.5 and 11.6 are unique. Type 11.5 has only ever been found at El-Zuma. The closest parallel comes from Sesebi in the Third Cataract region. These bowls may be an imitation of Egyptian vessels. The fabric suggests local production, but they can also be considered as a new type dated to the post-Meroitic period (see Chapter 3.6, this volume, Czyżewska-Zalewska 2016, 730). Type 11.6 bowls were also rare among the vessels found in the tumuli at El-Zuma, and possibly represent a new type of pottery, but they seem to be a little late, being dated to the Early Makurian and Christian periods. This type has no exact parallel from any other site in Nubia, but the closest analogies were found at Abkur in the Dongola Reach and slightly further north at Sesebi. The fabric suggests a Lower Nubian origin.

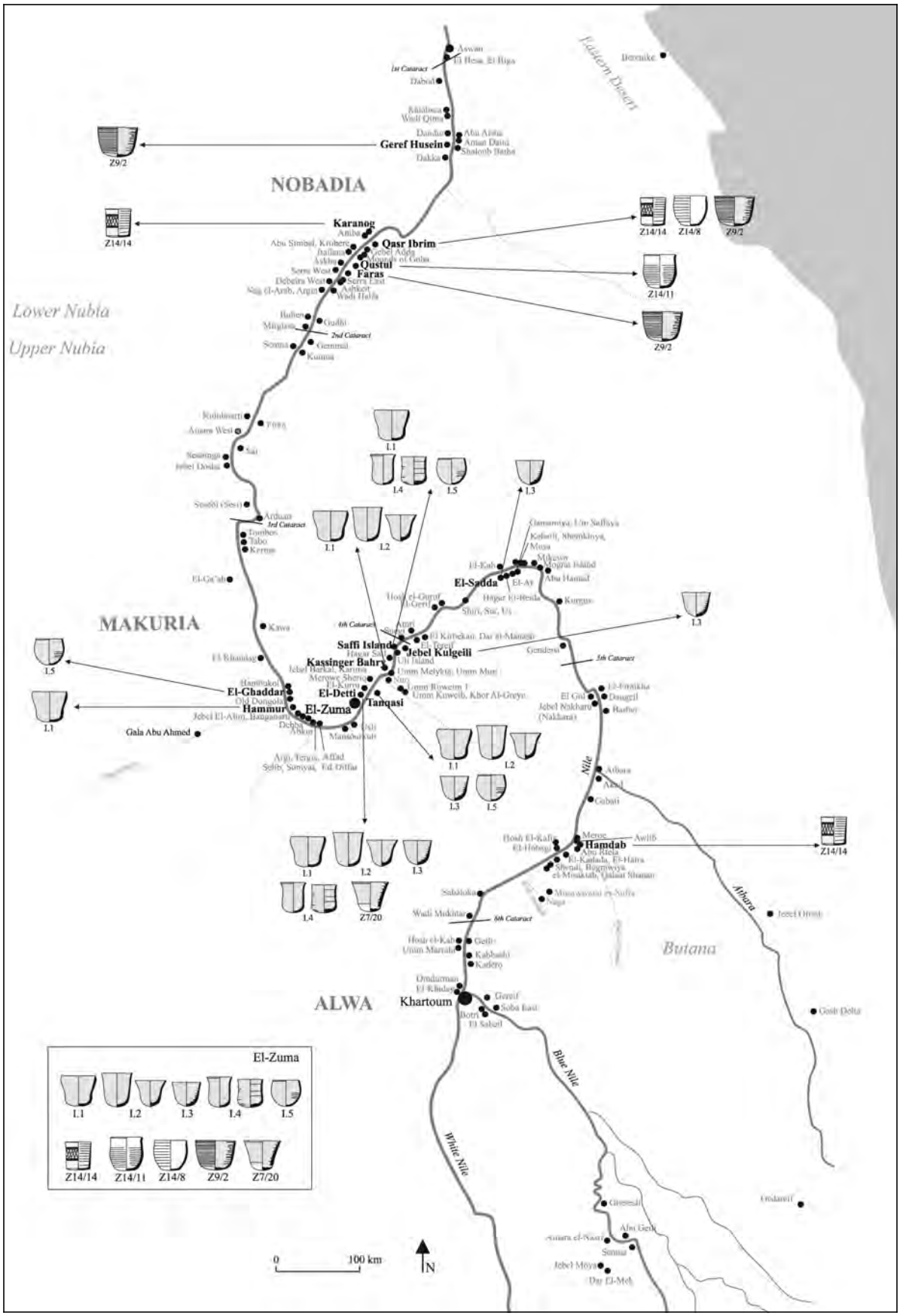

FIGURE 6.2 References and analogies to the cups from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

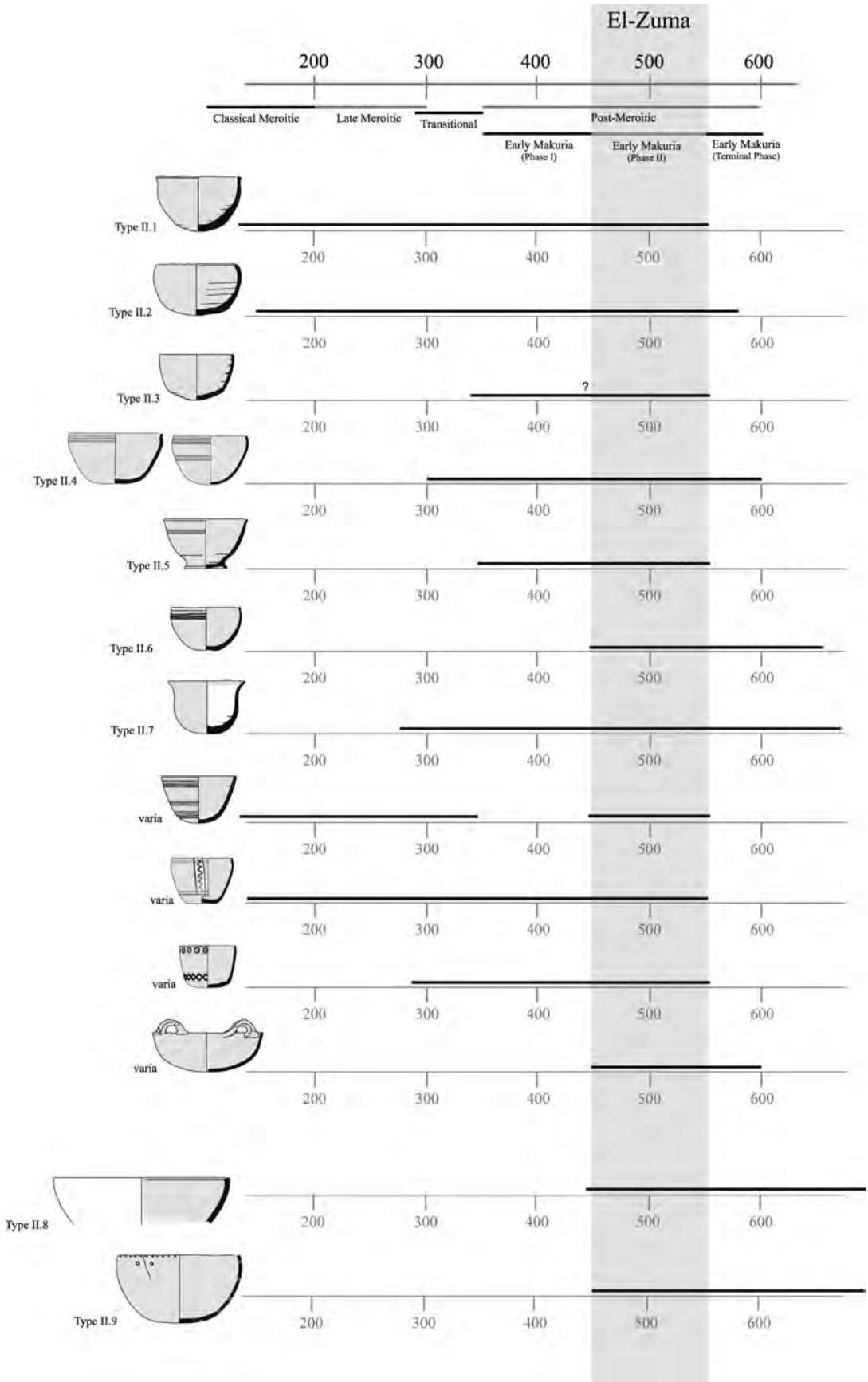

FIGURE 6.3 Dating of the bowls in the El-Zuma repertoire
ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

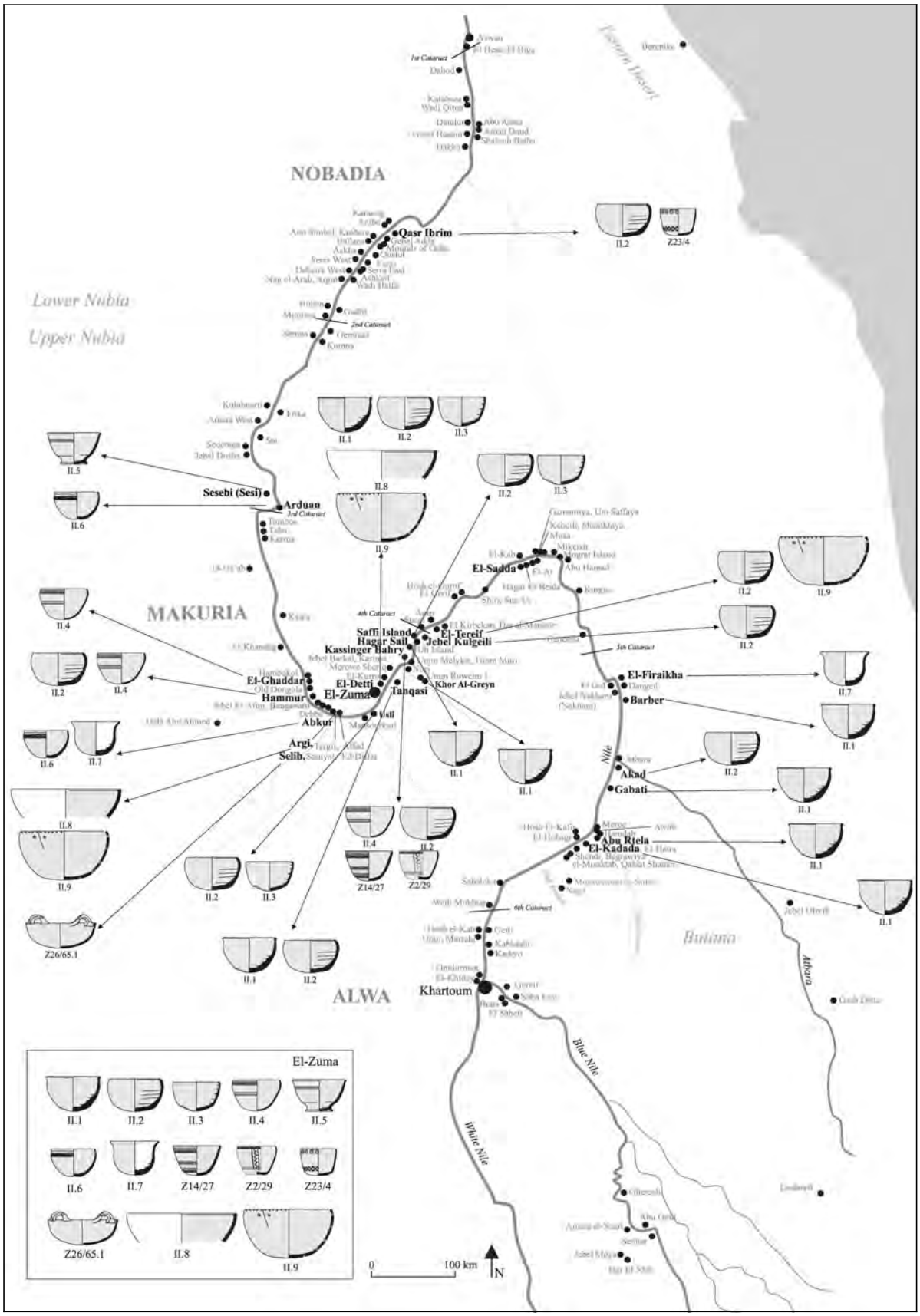

FIGURE 6.4 References and analogies to the bowls from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

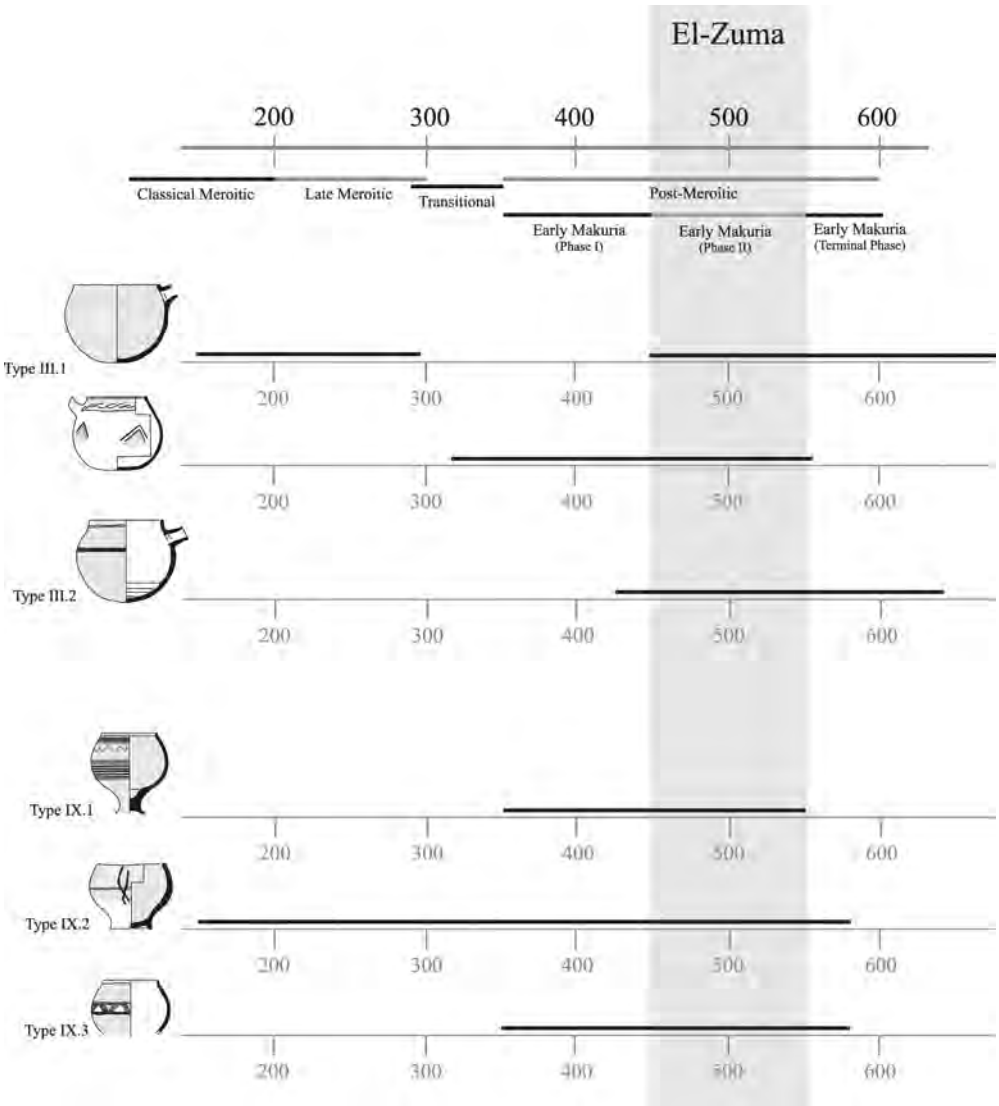

FIGURE 6.5 Dating of the spouted bowls and goblets in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

Type 11.7 is also uncommon. Small and large examples were discovered at the El-Zuma site. These vessels were probably of Late Meroitic origin and survived into the 7th century or even later. They are probably of Upper Nubian tradition. Examples were found in the Dongola Reach region and below the Fifth Cataract.

1.3 *Large Bowls* [*Figs 6.3 and 6.4*]

Large bowls of type 11.9 were found in T.11 at El-Zuma. One example features a number of holes perforated on both sides of a long crack evidencing a repair, which implies that this vessel was used for a considerable span of time before being deposited in the burial. Animal bones found *in situ* inside the bowl suggest that it was used for serving food (Mahmoud El-Tayeb and Czyżewska 2011, 117). Such bowls are generally dated from the Early Makurian to the Christian period. Most of the large bowls in the El-Zuma repertoire are connected with plundering activity and were re-used as scrapers or digging tools (see Chapter 5, this volume).

1.4 *Goblets* [*Figs 6.5 and 6.6*]

Goblets are not common in the El-Zuma repertoire; they are represented by only three examples. The most prevalent is type IX.2, which has a long tradition dating back to the Meroitic period. This type was also popular in the post-Meroitic period, with examples recorded at Lower Nubian cemeteries dated to the 4th–6th centuries. Their sparse representation in the Early Makurian pottery at El-Zuma suggests that they may have been less popular in the Dongola Reach during the 5th–6th centuries.

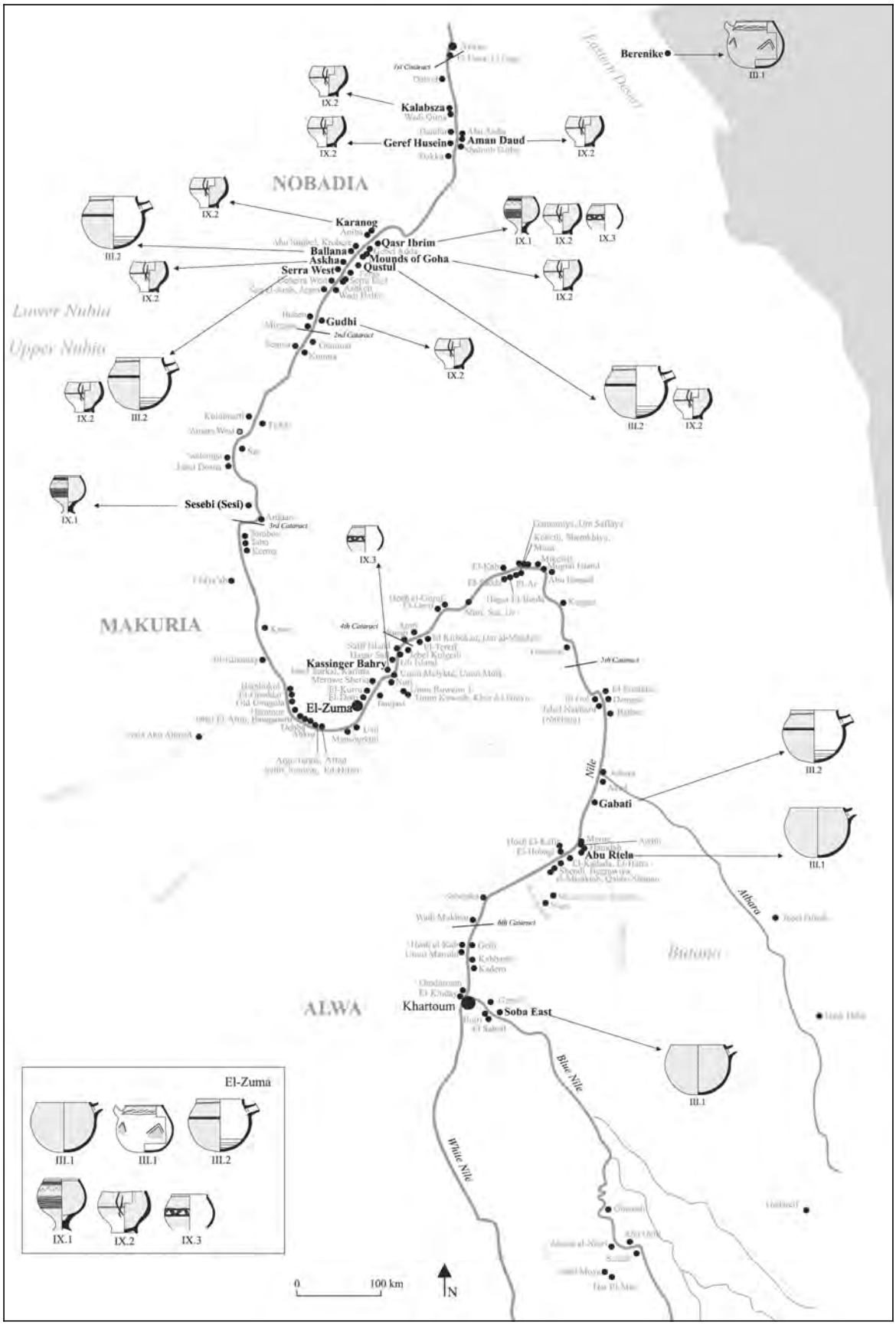

FIGURE 6.6 References and analogies to the spouted bowls and goblets from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

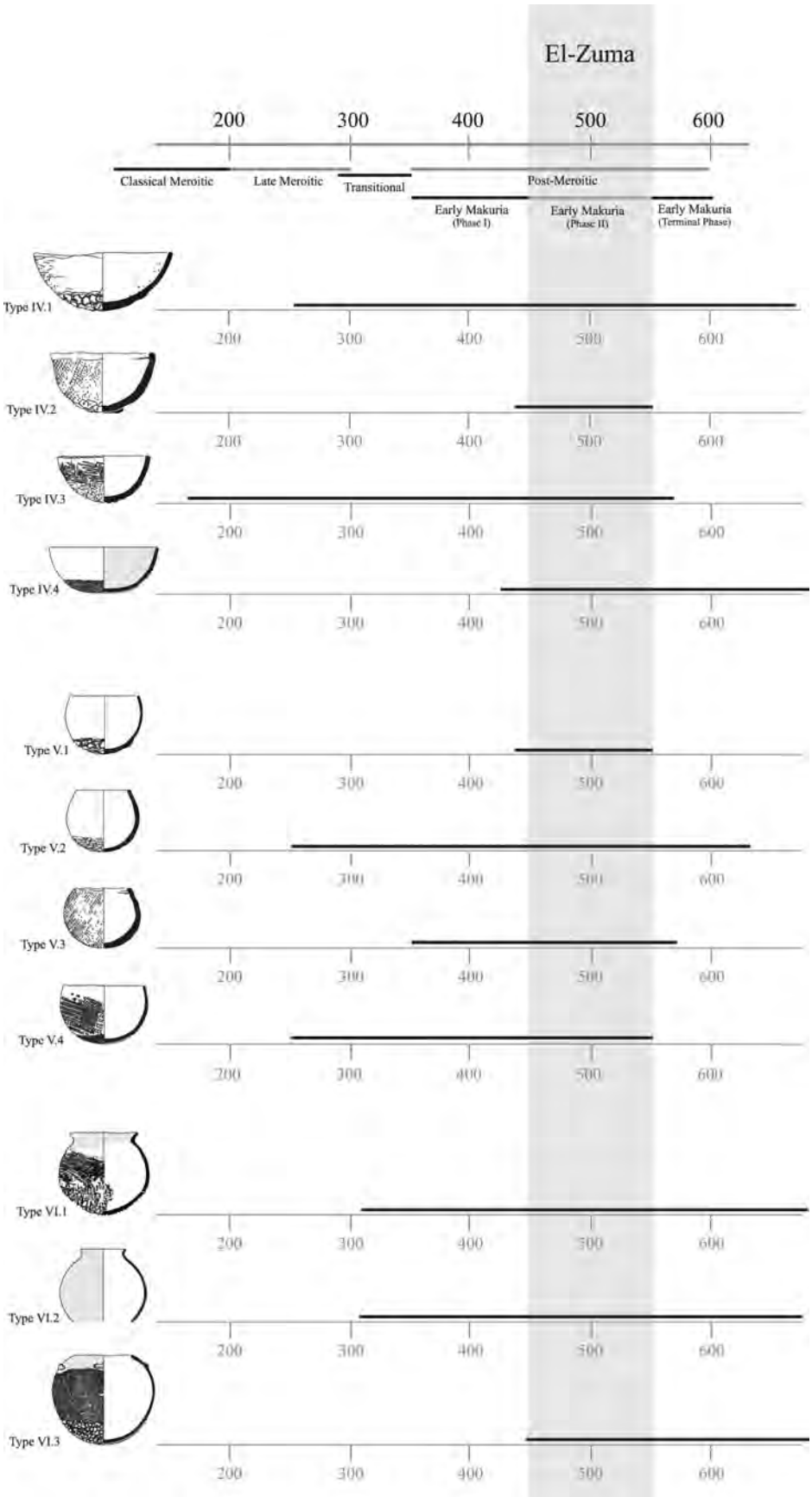

FIGURE 6.7 Dating of the bowls and pots in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

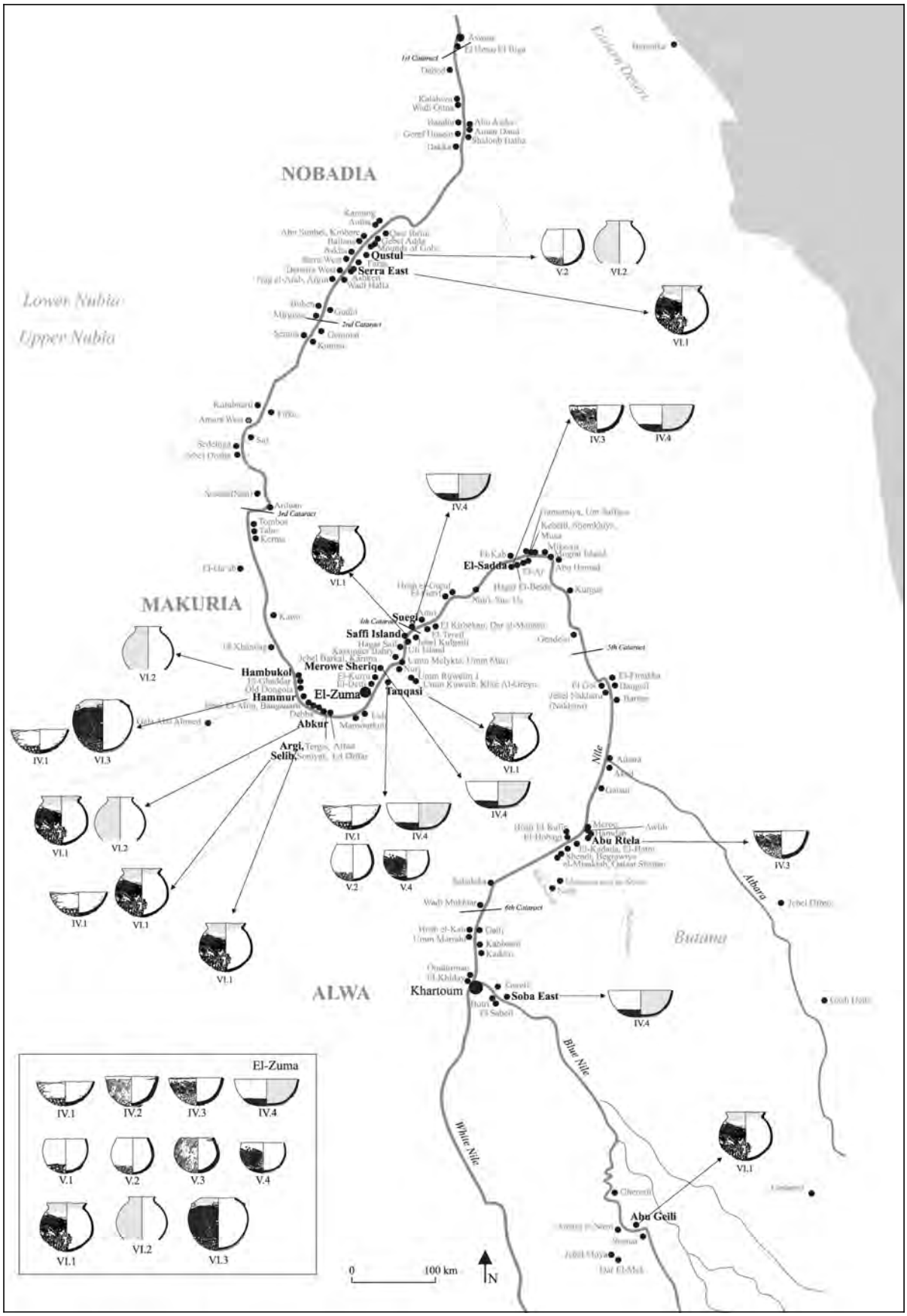

FIGURE 6.8 References and analogies to the bowls and pots from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

1.5 ***Spouted Bowls*** [***Figs 6.5 and 6.6***]
These spouted bowls occur in open and closed forms. According to Mahmoud El-Tayeb, the closed form was less popular and the open one was more common and noted in El-Zuma graves. Spouted bowls were known in Nubia in the Neolithic, throughout the Kerma and Meroitic periods up to the post-Meroitic period (Mahmoud El-Tayeb 2012, 101). As mentioned above (see Chapter 4, this volume), the exact function of this vessel is unclear. It may have been used in beer production or in purification ceremonies. Examples similar to type III.1 are dated to the Classic Meroitic and Late Meroitic periods. They were also discovered in post-Meroitic and Early Christian period contexts and seem to be connected with a southern tradition (South of Dongola Reach). Similar examples were found at Abu Rtela and Soba East. One example of this type was an import from the Eastern Desert. An almost identical vessel was discovered in Berenike, Egypt. Type III.2 seems to represent a northern tradition. Bowls of this type were found in Lower Nubia at Ballana, Qustul, and Serra West, while in the south similar vessels are known only from Gabati. As mentioned earlier, these jars were probably imitations of metal vessels. Bronze examples were discovered in Ballana and Qustul and are dated to the post-Meroitic period.

1.6 ***Bowls and Pots—Kitchen Ware*** [***Figs 6.7 and 6.8***]
These vessels differ in size, but they share some common features. They are all handmade with an extra layer of clay added at the base and pitted in order to disperse heat. The external surface of some of these forms is occasionally covered with a mat-impressed pattern. In some cases, the inner surface and rim are coated with red slip and burnished. Such bowls with a layer of clay added to the base are known in a variety of sizes, and are globular or shallow and hemispherical in shape. Examples have been found at other cemeteries such as Tanqasi (Klimaszewska-Drabot 2008, Fig. 14; 2010a), and Hammur (Phillips and Mahmoud El-Tayeb 2003, Pl. 7). They are very characteristic of the post-Meroitic period, especially in the Dongola Reach (see Fig. 6.8), but occur less frequently in Lower Nubia (Williams 1991, Figs 185, 121) and south of the Dongola Reach area (Edwards 1998, I:178–193; Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13). As mentioned earlier (see Chapter 3.6, this volume), shallow bowls are probably of Napatan tradition and survived throughout the Meroitic period to the post-Meroitic. Bowls of types IV.1 and V.1 are known from Classic and Late Meroitic period sites, while types IV.2 and IV.4 seem to be later and are dated to the Early Makurian period. *Dokat* (IV.4) appeared in the Meroitic period; they were found in all Late Meroitic phases at Umm Muri, dated to between the 2nd–3rd century AD and the Early Christian period (Thomas 2008, 65–66, 68–70, Figs 3.1, 3.7,8). In pots of group V, types V.2 and V.4 originated in the Late Meroitic period and remained in use up to the Christian period, while types V.1 and V.3 seem to be later types introduced in the Early Makurian period. Type VI pots also represent a long-lived tradition. They occur from the Transitional to the Christian period, but in the El-Zuma repertoire this type of pot was recorded outside the burial chambers, mainly in the fill of shafts or tumulus superstructures.

1.7 ***Jars and Bottles*** [***Figs 6.9 and 6.10***]
Jars and bottles of group VII were very common across the whole of the Dongola Reach in post-Meroitic and Early Makurian graves.

Jars and bottles of types VII.1–VII.4 are of Meroitic origin. Their wide distribution extends beyond the Dongola Reach into areas further south between the Fourth and Sixth Cataracts.

Mat-impressed vessels are represented in every type of jar in the El-Zuma repertoire, but they are not very common. Among the 225 complete or almost complete jars, 25 have mat impressions on the body, and these vessels originated in the Meroitic period (see Fig. 6.9). Jars with a long, broad neck, usually red-slipped and with a smoothed and burnished globular body or a rough, undecorated surface, are characteristic of the Early post-Meroitic period (*c.* AD 350–450) and are more common in the El-Zuma assemblage. They seem to be of later origin, and are dated to the Late Meroitic or Transitional period. Mat-impressed vessels are more common among these types (20 examples were recorded) than among types VII.5 and VII.6.

Handmade beer bottles with an ovoid body (types VII.5 and VII.6), a relatively long, narrow neck and a mouth with a flared rim occur in the Transitional and Early Makurian periods. Variants with mat-impressions are present but are not as prevalent as other types (only 5 examples were recorded). The two distinctive bosses or loops placed symmetrically opposite one another seem to be an evolution of the numerous bosses applied as decoration on the shoulders and neck of jars of the Meroitic and post-Meroitic periods. It seems that such decoration was limited to only two bosses on the shoulders in the Early Makurian period, and the new applied loop detail appears in the Early Makurian period (VII.6d). Among the 225 complete or almost complete vessels, 33 feature decoration in the form of applied bosses. Most of them (27 examples) belong to types VII.5 and VII.6, with five examples classified as type VII.2, and one as type VII.4. Bosses of this sort are present on vessels without mat-impressed patterns.

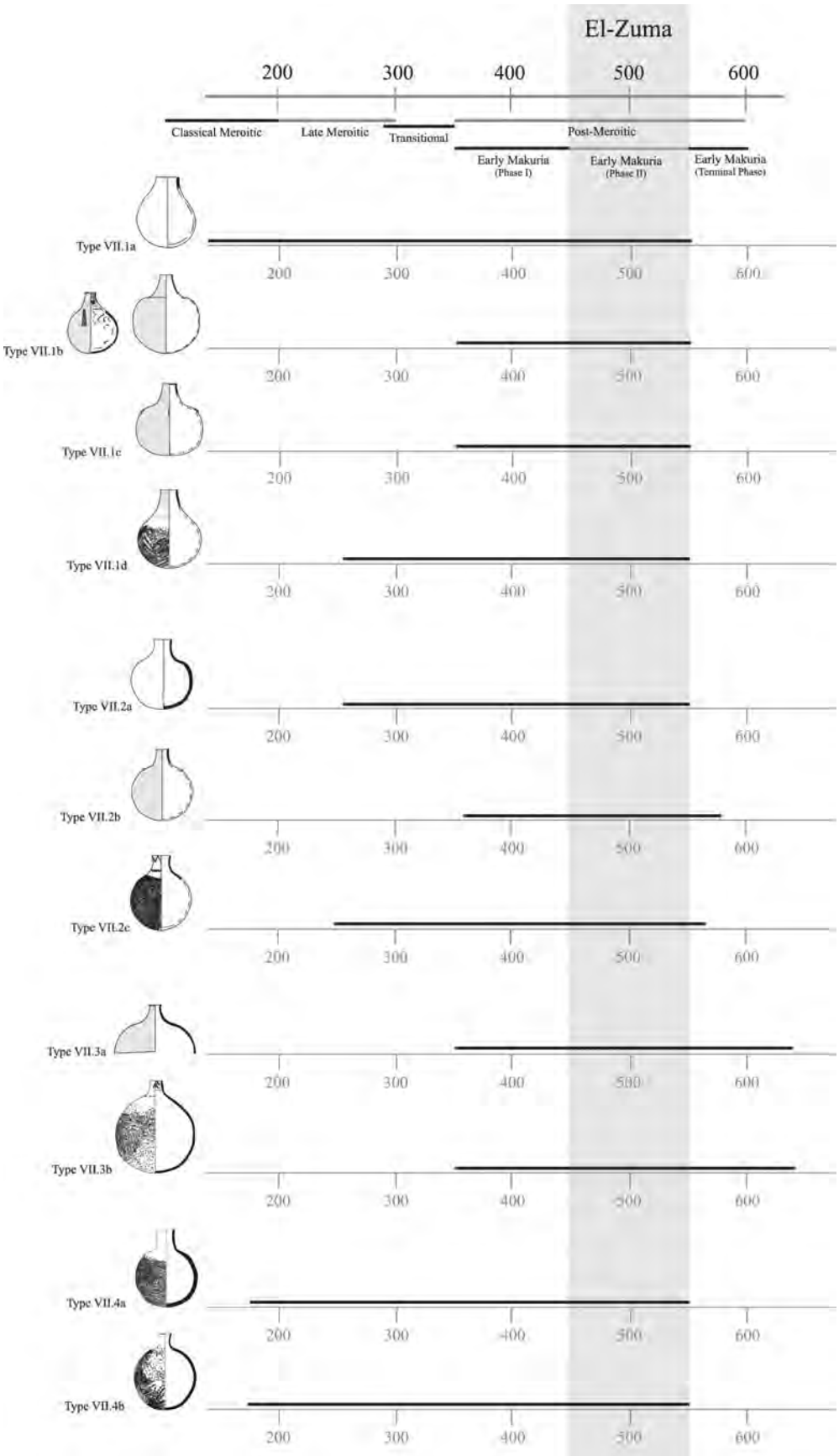

FIGURE 6.9A Dating of the jars and bottles in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

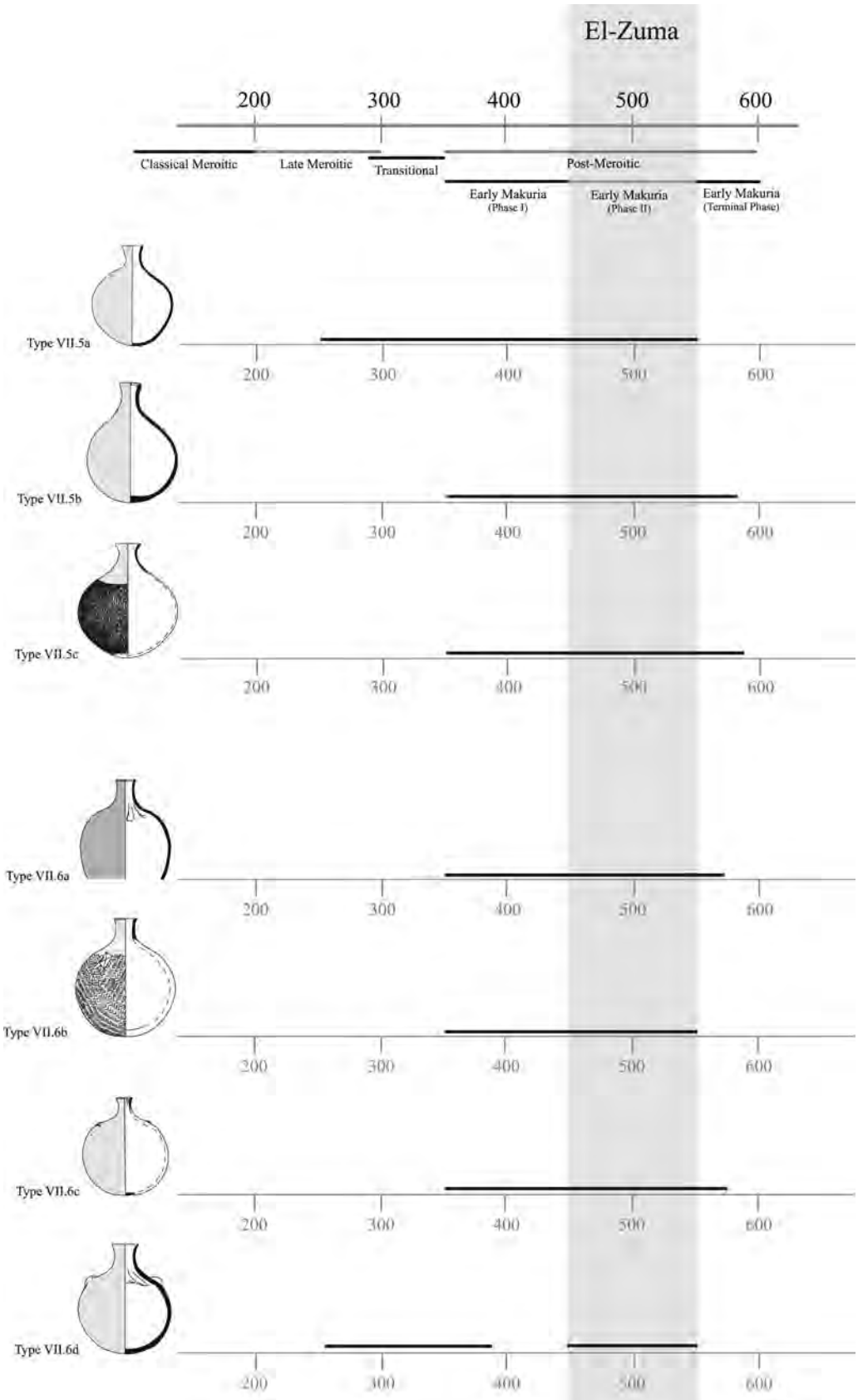

FIGURE 6.9B Dating of the jars and bottles in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

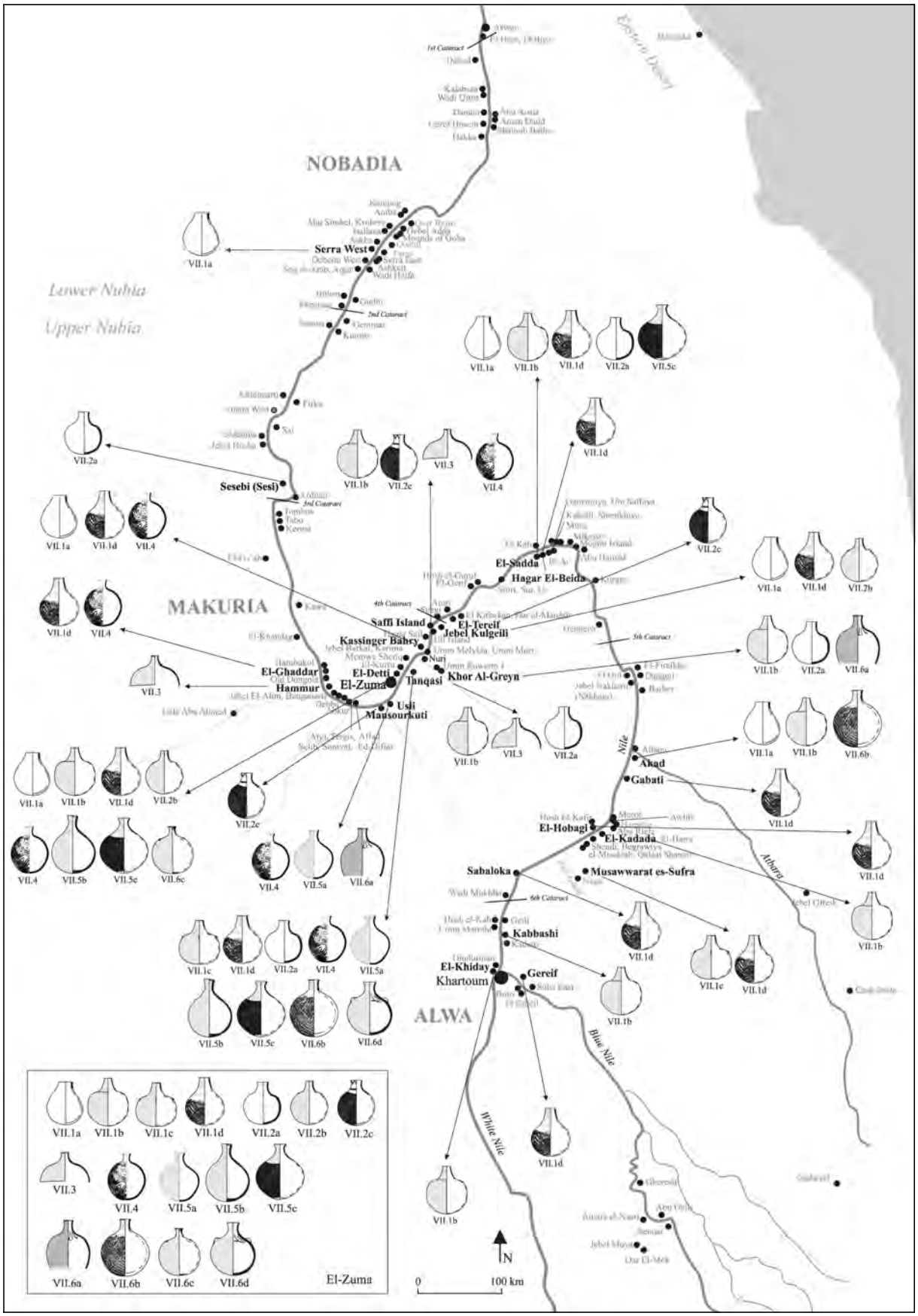

FIGURE 6.10 References and analogies to the jars and bottles from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

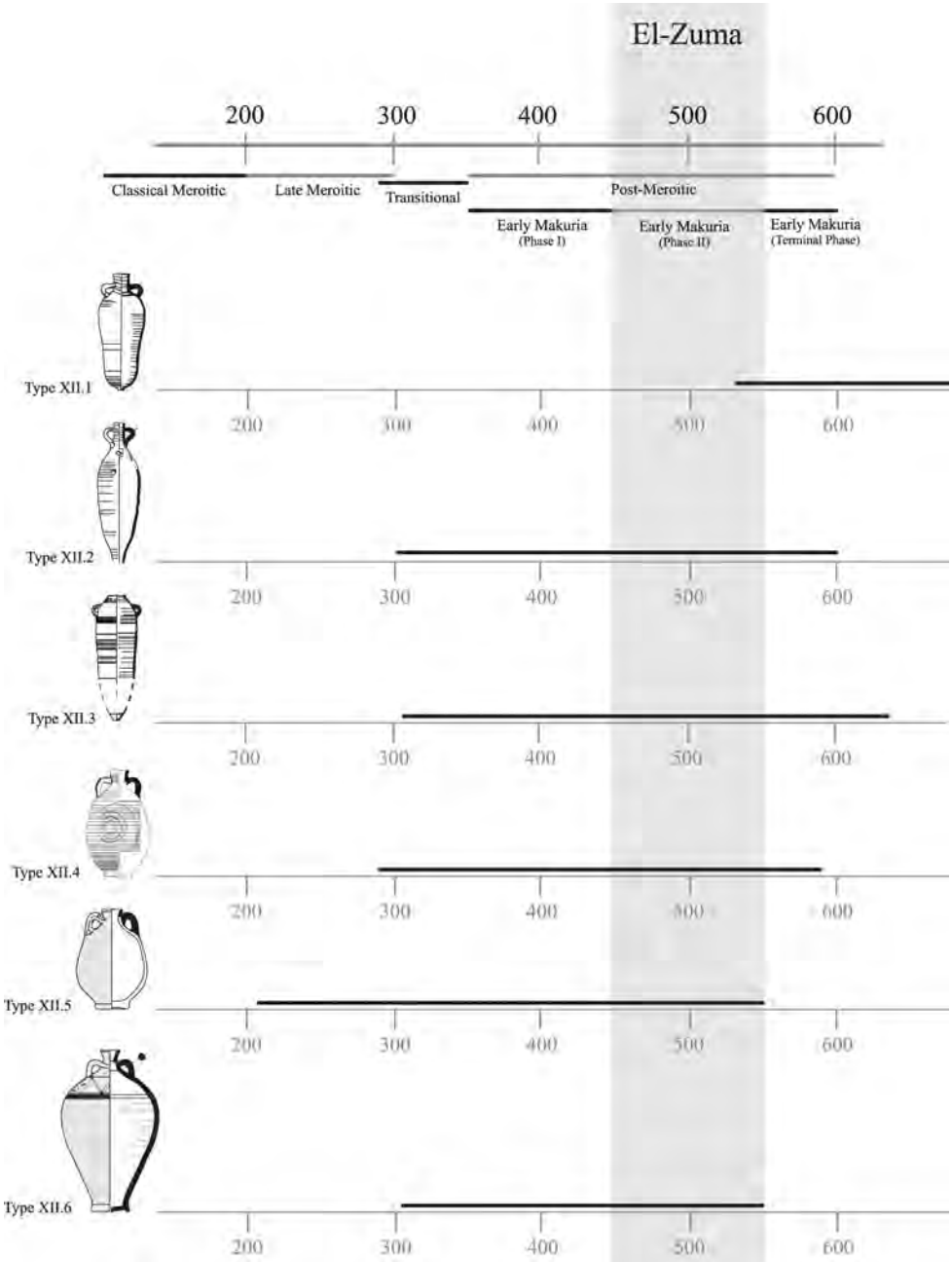

FIGURE 6.11 Dating of the amphorae in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

Group VII jars have been found at various sites in Upper Nubia, which points to the spread of the southern tradition of pottery making (Mahmoud El-Tayeb 1998, 37). Mahmoud El-Tayeb suggests that they were probably first manufactured in workshops in the Shendi Reach (Mahmoud El-Tayeb 2012, 86).

1.8 *Amphorae* [*Figs 6.11 and 6.12*]

Transport and table amphorae represented in the El-Zuma repertoire are imports from Old Dongola, Lower Nubia, and Egypt. These amphorae appear in graves of the Transitional period. They were found in small number in the El-Zuma tumuli, and were not a regular feature of burial goods in the Dongola Reach. Amphorae were common in graves in Lower Nubia (see Fig. 6.12). A few examples of Dongolan amphorae indicate that the El-Zuma necropolis was still in use during the early days of Old Dongola.

1.9 *Bottles and Jugs* [*Figs 6.13 and 6.14*]

Bottles and jugs are represented in small number in the El-Zuma repertoire and are unique in the Dongola Reach

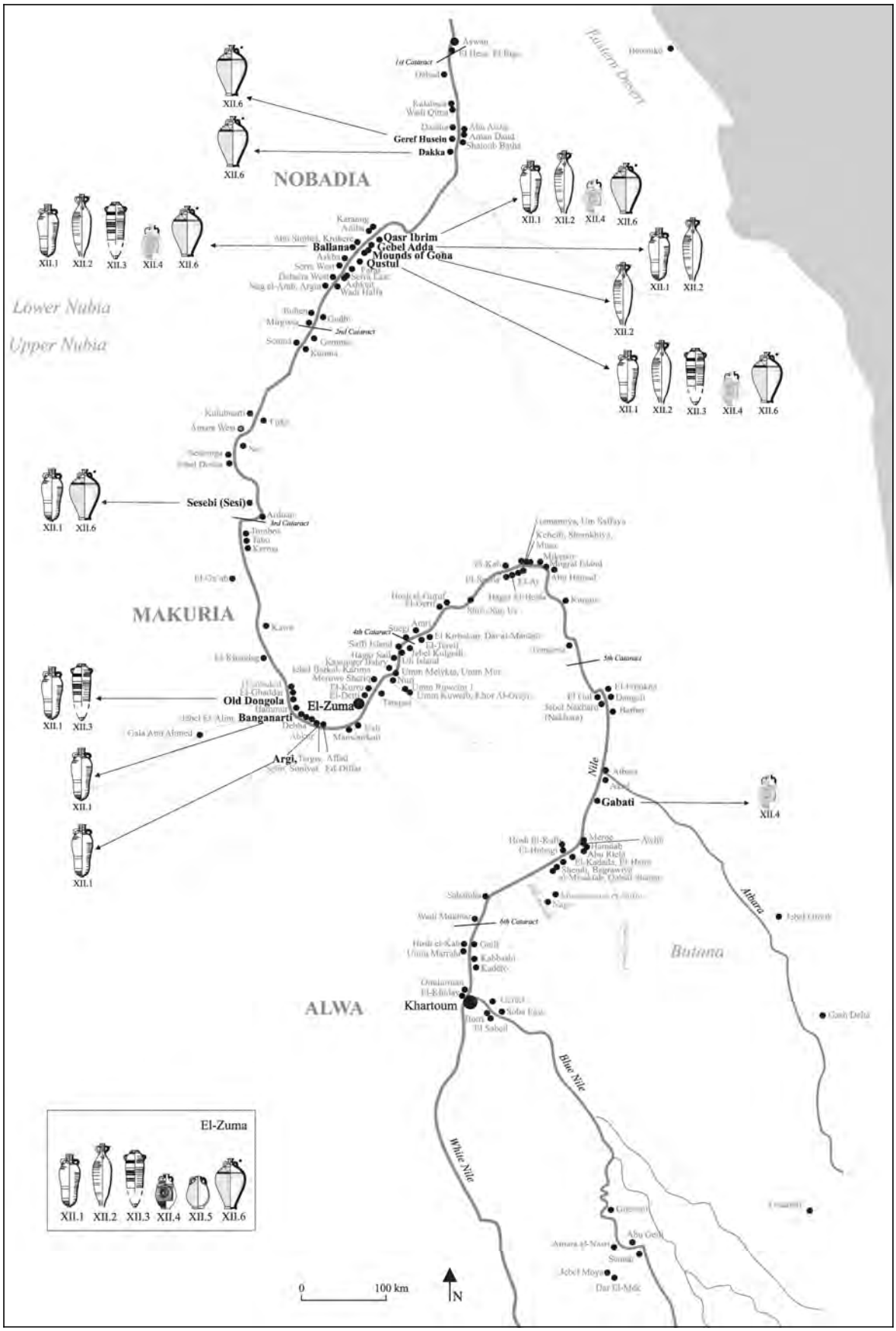

FIGURE 6.12 References and analogies to the amphorae from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

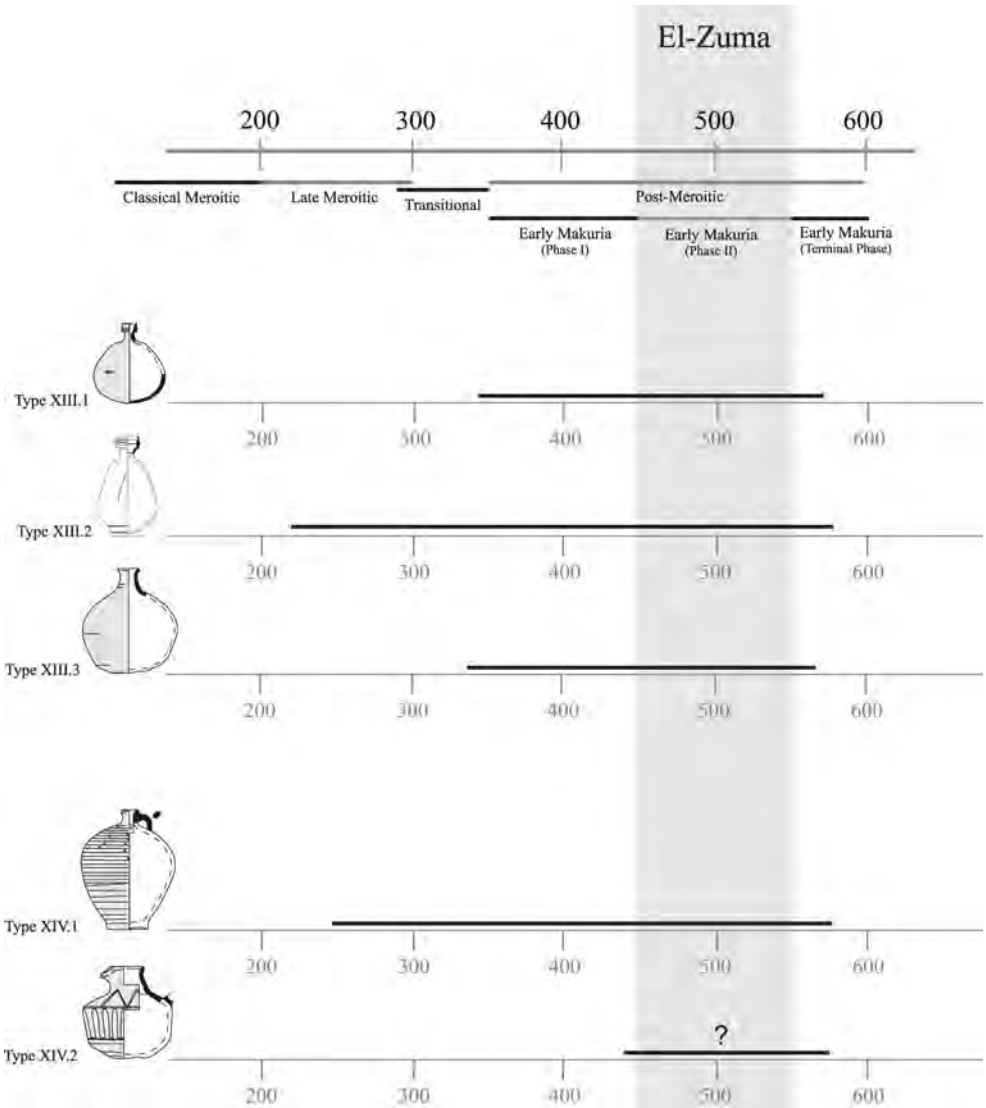

FIGURE 6.13 Dating of the bottles and jugs in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

region. Like amphorae, they were imports and are connected with Lower Nubian traditions. They are known from the Late Meroitic and Transitional periods. Examples were discovered mainly at Lower Egyptian cemeteries such as Ballana, Qustul, Serra West, and Gebel Adda. In Upper Nubia they were recorded at El-Zuma and Gabati (see Fig. 6.14).

1.10 *Lamps* [***Figs 6.15 and 6.16***]

Lamps in the El-Zuma repertoire are most probably associated with grave looting (as mentioned in Chapter 4). They were discovered inside the tunnels, close to the walls or, for example, at the top of the fill of the tunnel, and are dated from the Early Makurian to the Christian period. Lamps were more commonly represented in Lower Nubian repertoires. They also occur in the Dongola Reach region, especially at Christian sites. Further south, vessels of this type are almost entirely absent.

1.11 Qawadis [***Figs 6.15 and 6.16***]

Jars used in conjunction with the *saqiya* waterwheel were introduced in Ancient Nubia during the Late Meroitic period. In the El-Zuma repertoire they are connected with the activity of grave robbers or maybe grave builders, but did not serve as grave goods. Most sherds of these vessels were used as scrapers, and were found in tumulus superstructures and the fills of shafts and tunnels. Vessels similar to those excavated at the El-Zuma cemetery are dated from the Early Makurian to the Christian period and were mainly discovered at settlements, but are virtually unknown as grave goods.

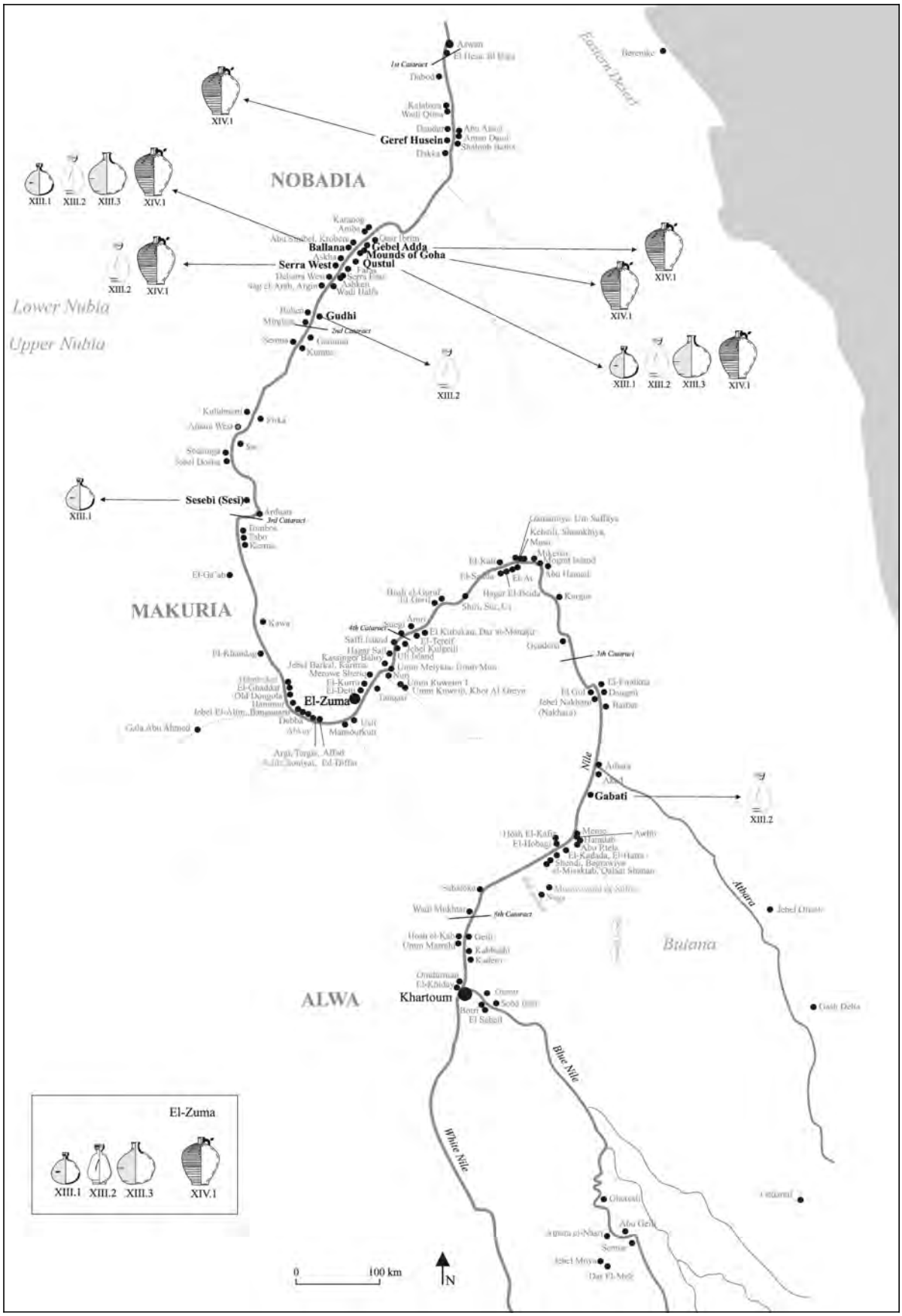

FIGURE 6.14 References and analogies to the bottles and jugs from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

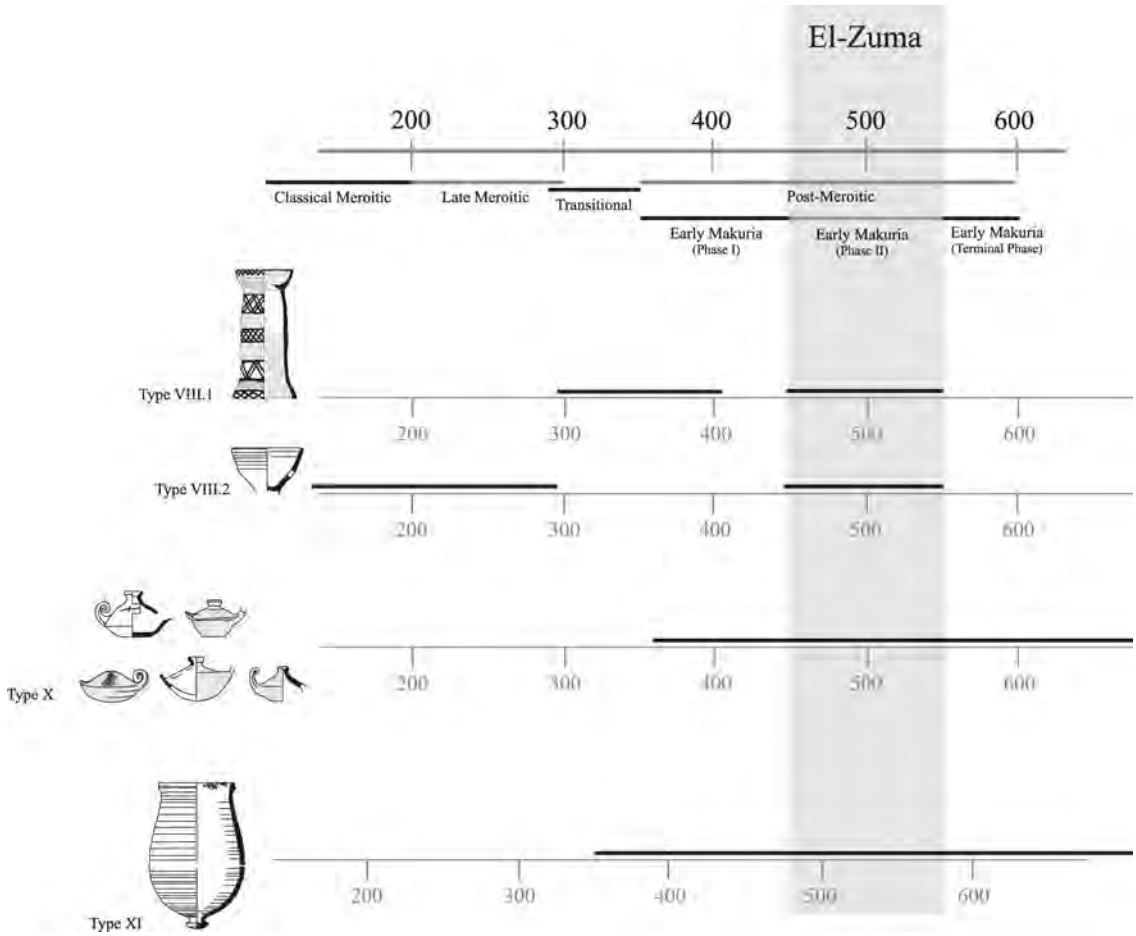

FIGURE 6.15 Dating of the specialized vessels in the El-Zuma repertoire ESTABLISHED BY E. CZYŻEWSKA-ZALEWSKA

1.12 *Stands* [***Figs 6.15 and 6.16***]

Stands are very rare at the El-Zuma cemetery. Single examples, probably of Meroitic origin, were discovered there. They are equally uncommon at other archaeological sites of the post-Meroitic period.

2 Pottery as Grave Goods

The use of pottery as containers for grave goods was connected with burial customs in which food and drink played a significant role.

From 4500 BC the occurrence of different types of drinking vessels like small cups, beakers, and goblets increases. The occurrence of both plain and decorated drinking vessels indicates a difference in what was consumed by commoners and the elite. Elaborately shaped ceramic vessels were most likely used for serving drinks such as beer on festive occasions (Haaland 2012, 332–333). Reliefs from temples and tomb chapels, as well as painted designs on some ceramics, depict the use of wine and wine amphorae in religious and funerary rites. Evidence for the large-scale consumption of beer increased during the Kerma period, but is more evident during the Meroitic period and manifest in a number of massive deposits of broken jars, as well as smaller bowls and cups, on hilltop locations in the Meroe area (Haaland 2012, 335–336).

An important factor in the consumption of beer was the innovation of the *saqiya*. In Lower Nubia during the Meroitic period, the use of the *saqiya* led to an increase in the cultivation of wheat and barley in the winter season, and sub-Saharan crops such as sorghum in the summer season (Fuller 2014, 165). Further south, sorghum was discovered at Meroe, Dangeil, and Abu Geili. According to Edwards (2004), sorghum was important in the Meroitic period and was associated with making beer, which was stored in jars (Fuller 2014, 169–171). The consumption of beer had important health benefits because it contained antibiotic tetracycline. Beer was made from grain kept in mud stores where it became contaminated by the bacterium *Streptomyces*, which produces tetracycline,

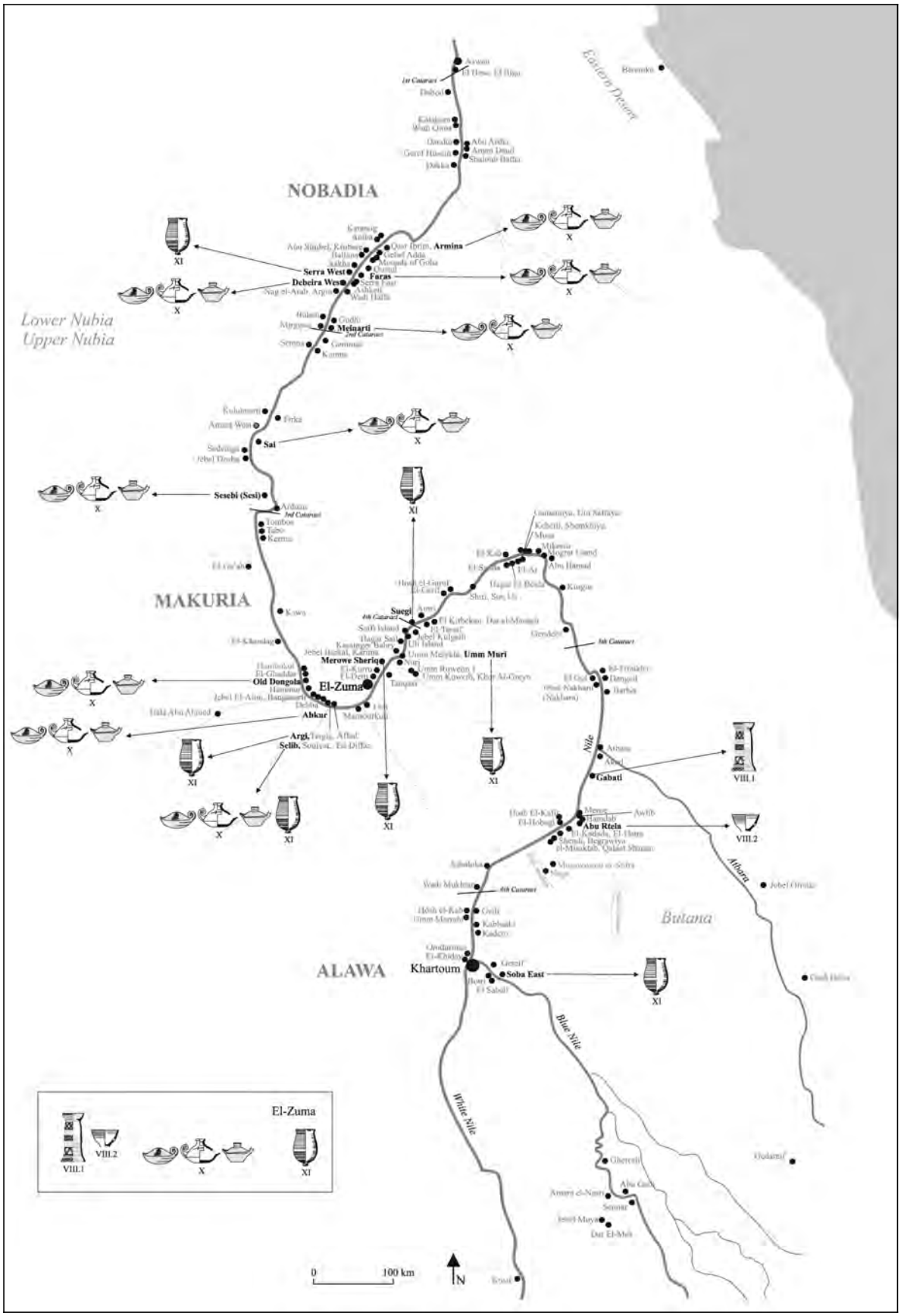

FIGURE 6.16 References and analogies to the specialized vessels from the El-Zuma repertoire identified by E. CZYŻEWSKA-ZALEWSKA

which is why beer was probably important both nutritionally and medically (Haaland 2012, 333–334). The origins of Nubian sorghum are obscure, but it had been known since Neolithic times. In the Meroitic period sorghum had a symbolic meaning and was depicted as one of the divine rewards or was depicted in the hand of a god, as seen in a royal burial at Qustul dated to the post-Meroitic period (Fuller 2014, 169–171).

Food is represented, together with beverages, in the burial customs at El-Zuma. Animal food offerings were found in a large number of tumuli at this site (see Volume I, Chapter 8), but agrarian products were noted only in small quantities. Some vegetable matter was recorded in T.5, and basket remains with seeds (seed analysis in preparation) were discovered in T.26 (see Volume III, Chapter 18).

Other interesting aspects worth mentioning here are the evidence of fire noted in grave contexts and the question of ceremonial feasts. Traces of fire have been recorded in some Meroitic and post-Meroitic burials in the Dongola Reach and the Fourth Cataract area, as well as further south (Lenoble 1994, 95–96). Pieces of charcoal and burnt bones were sometimes found in and around the hearth area. Lenoble suggested that meat had been cooked and consumed during the inhumation process, and before the burial was finally sealed, as part of a "Funerary Banquet" (Lenoble 1994, 95–96). At El-Zuma, pieces of charcoal were found on the top surface of the pier in T.25, and at the bottom of the external shaft of the tunnel in T.5. Fires may have been used to purify the burial chamber before depositing a body in it or to provide a source of light for grave robbers. In Mahmoud El-Tayeb's opinion, burial purification seems to be the most acceptable interpretation for the existence of hearths in or around the grave shaft (Mahmoud El-Tayeb 2012, 9, 83–84). Another interesting phenomenon observed in the tumuli at El-Zuma was the accumulation of pottery left in the shaft rather than in any of the grave chambers. Pottery was found deposited inside the shaft together with animal bones in T.12 (see Volume I, Chapter 3, Fig. 3.45). The placement of ceramic vessels outside burial chambers was recorded in earlier times, in the Kerma period, when large deposits of pottery were left both inside graves and on the surface. Masses of sherds, sometimes associated with burnt animal bones, that probably accumulated over an extended period were almost certainly deposited during ceremonial feasts and sacrifices (Haaland 2012, 335–336).

The ceramic assemblage from El-Zuma is discussed here by examining three main aspects: pottery as vessels for serving food and drink; pottery as evidence of burial customs, rituals, and traditions; and pottery as evidence of grave building or looting activity.

In the first instance, the consumption and serving of food are attested by the presence of cups, goblets, and small bowls. Food, consisting mainly of small pieces of meat, was deposited in the burial chamber in bowls and cups (see Chapters 4 and 5, this volume; Volume I, Chapters 3 and 8). It is interesting that vessels of types IV–V featured among the grave goods. Their diversity in shape and size suggests that they may have been used not only for cooking; in grave contexts they could be interpreted as vessels for serving food. The presence inside the tumuli of storage containers, such as jars and bottles, amphorae (probably for wine) and large bowls used as storage vessels, can be interpreted as a means of providing the deceased with supplies for the afterlife. Small bottles, jugs, and maybe small amphorae were probably part of the personal equipment of the deceased.

In the case of rituals, religion, and burial customs, it is difficult to recognize these practices in the archaeological record. Pieces of charcoal found on the pier in T.25 and at the bottom of the external shaft of the tunnel in T.5, or the accumulation of pottery left in the shaft, may suggest some kind of funerary customs. The symbols scratched on some vessels could have had protective and magical meanings associated with beliefs.

In the third case, looking at pottery as evidence of grave building or looting activity, discussion focuses on lamps and digging tools or scrapers (see Chapters 4 and 5, this volume). Lamps may have been used by builders or grave robbers as a source of light, while digging tools made from *qawadis* and large bowls or jars could have been used to build the graves or to plunder them. It is not possible to establish when these graves were looted.

3 Conclusions

According to David and Salvatori, "the main features of the ceramic productions established during the post-Meroitic period—the dichotomy of the former Meroitic kingdom with a gradual rise of the handmade tradition in the south, while the north promotes wheel-made mass production—lay the foundations for the situation of the subsequent medieval period" (David and Salvatori 2019, 19).

Meroitic traditions are still evident in the El-Zuma assemblage, which includes vessels of the Meroitic period, but with a limited range of forms and decoration. Imported pottery occurs sporadically, and local production is predominant. Fineware, which was common in the Meroitic period, is not represented in the El-Zuma assem-

blage. New forms appeared in the Transitional and post-Meroitic periods and remained in use until the Christian period.

In the Early Meroitic repertoire, wheel- and handmade wares were limited. They mainly comprised bowls of different profiles and jars, and black ware was more common. Decoration consisted mostly of impressed dots, often in a geometrical design, and also reflected the savannah environment, with depictions of animals, birds, plants and human figures indigenous to the region. In the Classic Meroitic period, or shortly afterwards, wheel-made painted pottery dominated a widespread area—between the First and the Sixth Cataracts—and was produced in major Meroitic centres, such as Meroe itself, Musawwarat es-Sufra and Faras. Many motifs used in painted decoration were derived from earlier traditions, with continued use of dotted-impressed motifs and representations of human figures, animals, birds, reptiles, plants, and some ceremonial scenes, despite northern inspiration from Roman Egypt (Mahmoud El-Tayeb 2010c, 9–12).

In the Early Makurian period wheel-made pottery is still predominant in the El-Zuma assemblage, but the difference in quantity between wheel-made and handmade pottery is not big [**Diagram 6.2**]. There is also a visible decrease in the amount of painted pottery. There are only a few examples of painted cups, goblets, and small bowls, and the design repertoire is limited to simple geometrical patterns, with no depictions of animals, birds, plants, or human figures. Looking at the maps presented above, it is evident that the influence of the northern (see, for example, Figs 6.6, 6.12, 6.14) and southern traditions (see, for example, Figs 6.4, 6.8, 6.10) meet in the Dongola Reach, and this is clearly reflected in the pottery assemblage. Some forms, such as goblets and bottles, as well as imported pottery, originated in Lower Nubia. Some represent an Upper Nubian tradition, among them beer jars, cooking vessels, slipped and burnished cups and bowls, which seem to have originated in the Dongola Reach region. The imports from the north, from Egypt or Lower Nubia, were not significant, and most of the pottery discovered at the cemetery is of local production [**Diagram 6.1**]. It seems that the Early Makurian period marked a decline in imported pottery, which was more common during the Meroitic period.

Looking at the pottery from the El-Zuma cemetery, we can identify a basic set of vessels that was placed in the graves [**Table 6.1** and **Diagram 6.3**]. This set consists of slipped and burnished bowls, cups and beer jars, cooking pots and bowls. They are present in all types of tumuli. The distribution of pottery types within individual types of tumuli [**Table 6.2** and **Diagram 6.4**] shows that cups, small bowls, and jars were very common, especially in type II tumuli. Although they were less abundant in type I mounds, they were still present in large quantities. Imported vessels were noted mainly in tumuli of types I and II. In type III tumuli, which were the most modestly furnished and smallest graves, the majority of the excavated pottery consisted of vessels from the basic repertoire: cups, bowls, and jars. We should also note that certain forms survived from the Meroitic period and remained in use, the original Meroitic design having been slightly modified in some cases, but new forms also appeared in the Early Makurian period and survived into the Christian period (see Chapter 6.1). Analysis of human bones suggests that this necropolis was in use during AD 350–600, in the post-Meroitic and Early Makurian periods (see Volume I, Chapter 7). The pottery, especially the presence of Dongolan amphorae (found *in situ*), suggests that the site was still in use at least until pottery production began at Old Dongola (Pluskota 2001, 2005).

As mentioned in volume I, the El-Zuma cemetery was attributed to a specific period between the fall of the Meroitic state and the rise of the Kingdom of Makuria, and our knowledge of this time is limited. Changes in political systems were often not synonymous with the usually slower and more gradual changes that took place in everyday life and religious practices in different parts of Ancient Nubia.

The term "Early Makurian period" was introduced by Mahmoud El-Tayeb in the light of discoveries made at the El-Zuma necropolis, where Meroitic traditions continued and mingled with Makurian traditions. Evolution and gradual changes are evident in the construction of the tombs at El-Zuma, from the simple structures of type III tumuli, which are rooted in earlier Meroitic traditions, to the emergence of a new type of grave with a U-shaped shaft and additional side chambers (tumuli types I and II). Meroitic traditions are still evident in the pottery and personal adornments (see also Volume III, Chapters 2–8), and coexist with the beginnings of Makurian culture. Pottery ascribed to Makurian times, such as Dongolan amphorae, or jewellery such as the crosses discovered at the El-Zuma cemetery, may have been precursors of the Makurian tradition. Dates obtained from human teeth recovered from three tumuli: T.18—AD 83–311; T.21—AD 387–538; and T.24—AD 264–535 (see Volume I, Chapter 7), and the Dongolan pottery discovered in T.26 suggest that this necropolis was in use from the Late Meroitic to the advent of the Makurian period.

However, we should be careful with the analysis of the archaeological material from this period. Robber activity

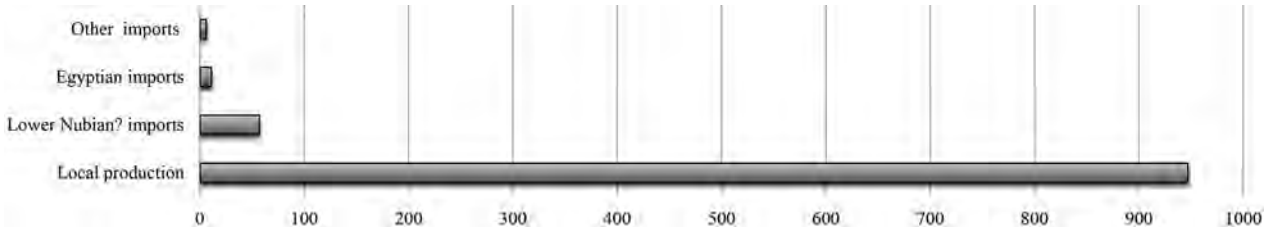

DIAGRAM 6.1 Graph showing the representation of local and imported pottery in the whole El-Zuma ceramic assemblage
MADE BY E. CZYŻEWSKA-ZALEWSKA

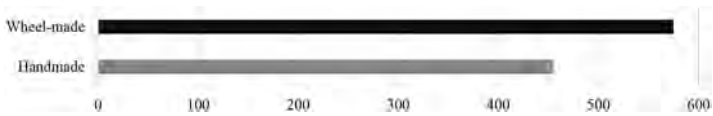

DIAGRAM 6.2
Graph showing the proportion of wheel-made and handmade pottery in the whole El-Zuma ceramic assemblage
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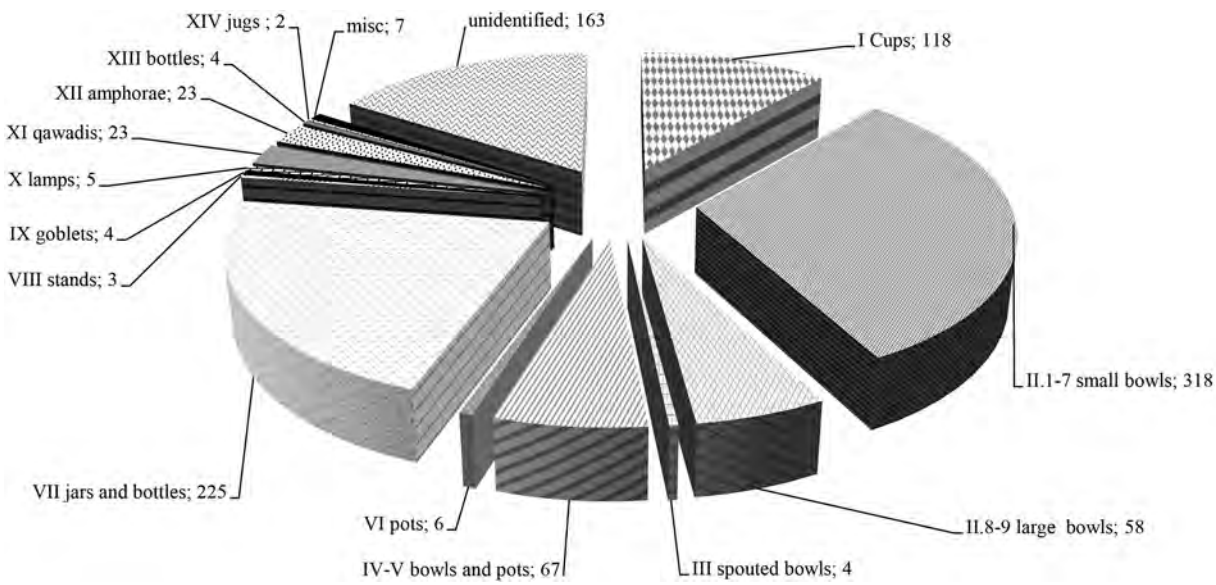

DIAGRAM 6.3 Pie chart showing the number of individual types of pottery in the whole El-Zuma ceramic assemblage
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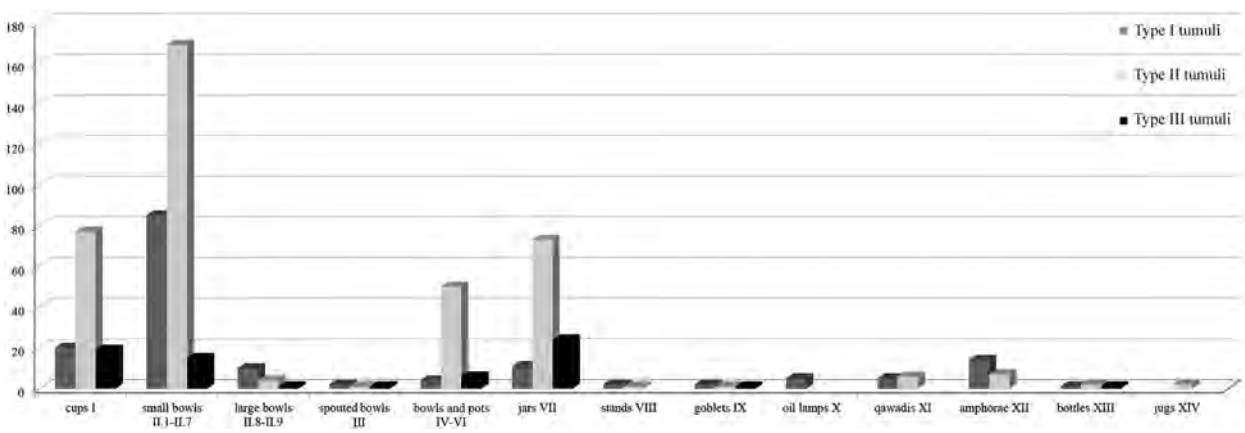

DIAGRAM 6.4 Graph showing the number of specific types of pottery found in individual types of tumuli
MADE BY E. CZYŻEWSKA-ZALEWSKA

TABLE 6.1 Total registered pottery vessels in the El-Zuma assemblage

	All registered objects
I Cups	118
II.1–7 small bowls	318
II.8–9 large bowls	58
III spouted bowls	4
IV–V bowls and pots	67
VI pots	6
VII jars and bottles	225
VIII stands	3
IX goblets	4
X lamps	5
XI *qawadis*	23
XII amphorae	23
XIII bottles	4
XIV jugs	2
misc	7
unidentified	163
total	**1030**
Handmade	455
Wheel-made	575
Local production	947
Lower Nubian? imports	57
Egyptian imports	11
Other imports	6

COMPILED BY E. CZYŻEWSKA-ZALEWSKA

also makes the analysis of artefacts and skeletons more difficult, as it resulted in their being removed from their original contexts, and often tombs remained open for a long time, leaving the material exposed to external factors. This situation is evidenced by damage to the pottery in the form of bite marks left by rodents that probably gnawed the sherds to wear down their teeth [**Fig. 6.17**] (see also Volume I, Chapter 8). Such sherds were found mainly in the tunnels of the largest tumuli, which suggests that the tombs or tunnels were left open for quite some time.

Social variation is also apparent at the El-Zuma necropolis. The differentiation of the grave goods in the three types of tumuli reflects the grave occupant's status in the local hierarchy. A range of personal adornments, including jewellery and royal regalia such as that noted at Ballana and Qustul, was found primarily in type I graves, whilst examples of jewellery recovered from graves of types II and III were less opulent (Volume III, Chapters 2–5, Volume I, Final Discussion). Better and more varied types of meat were found in type I graves, whilst the other two grave types contained fewer varieties and smaller quantities of meat (see Volume I, Chapter 8). Larger numbers and greater varieties of vessels were found in type I tumuli, which also featured imported pottery. Although type II tumuli sometimes contained significant quantities of ceramics, the types of vessels were far less diverse and imports were noted only sporadically. The sets of pottery found in type III tumuli were very modest, comprising several vessels of two or three types. We can conclude that the largest tombs (types I and II) were the most elite, whilst the smallest ones were the graves of individuals ranked lower in the social hierarchy, and that El-Zuma was the cemetery of the Early Makurian elite.

TABLE 6.2A Types of pottery found in individual tumuli

	T.2					T.3		T.5						T.8		T.1				T.4				T.6				T.7				
	sh.	t.	ch.1	ch.1	ch.3	sh.	t.	M.	sh.	t.	ch.1	ch.2	ch.3	sh.	t.	sh.	t.	E t.	W t.	sh.	t.	E t.	W t.	sh.	t.	E t.	W t.	M.	sh.	t.	E t.	W t.
I cups				2	2			5			1	1									1	1	2	2					2			
I varia																												1				
II.1–7 small bowls				18	7	2	1									2	2				15	8			6			1		1	8	
II.8–9 large bowls							1		1						1	1					1				3					2		
II small bowls varia				1		1		2		2												1	1		2	1			1	1		
III spouted bowls																								1					1			
IV bowls																																
V pots																												1				
VI pots										1																						
VII jars/ bottles			1	4	2						1	1																				
VII varia																																
VIII stands																														1		
IX goblets																					1				1							
X lamps																						1	1		2					1		
XI *qawadis*							1																									
XII amphorae					1					1										1		3			1					1	1	1

TABLE 6.2A Types of pottery found in individual tumuli (*cont.*)

	T.2					T.3		T.5						T.8		T.1				T.4				T.6				T.7				
	sh.	t.	ch.1	ch.1	ch.3	sh.	t.	M.	sh.	t.	ch.1	ch.2	ch.3	sh.	t.	sh.	t.	E t.	W t.	sh.	t.	E t.	W t.	sh.	t.	E t.	W t.	M.	sh.	t.	E t.	W t.
XII varia						1				1											1											1
XIII bottles																																
XIV jugs																																
misc										1																						
total	38					6		18						1		5				39				19				25				
sex								M (?)						F (?)														M (?)				
age								30–50						34–45														25–45				

COMPILED BY E. CZYŻEWSKA-ZALEWSKA

TABLE 6.2B Types of pottery found in individual tumuli (*cont.*)

	T.12				T.13						T.14					T.15				T.23			T.24					T.25				T.26				
	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	ch.4	ch.5	M.	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	sh.	ch.1	ch.2	ch.3	ch.4	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	ch.4
I cups		1		13			2					1	4	2	1	1	2	2		1	6	6	1	2		1			1	1	5	2	5			
I varia	1												1		3																		1			
II.1–7 small bowls	28		1	21	1		2	6	3	2			1	6	4	3	5	4			5	13	1	4						5	8		4	19	1	4
II.8–9 large bowls																							1	1	1							1				
II small bowls varia	1												1	1			1															1		1		
III spouted bowls																								1												
IV bowls				1																		1		1						3	1			4		3
V pots				1									1							1				3						1	3		4	3	2	2
VI pots																																				
VII jars/ bottles	17	8	3	3	2		3				1	2			1	1	5	2					2	2	1		1			2		1			2	
VII varia	2		1																									1								
VIII stands																					1															
IX goblets																								1												
X lamps																																				
XI *qawadis*					1																							1				3				
XII amphorae					sh							1				2	1													1			1			

TABLE 6.2B Types of pottery found in individual tumuli (*cont.*)

	T.12				T.13						T.14					T.15				T.23			T.24					T.25				T.26				
	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	ch.4	ch.5	M.	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	sh.	ch.1	ch.2	ch.3	ch.4	sh.	ch.1	ch.2	ch.3	sh.	ch.1	ch.2	ch.3	ch.4
XII varia											1																								
XIII bottles				1													1																		
XIV jugs																1	1																		
misc																1	1						1												
total	103				23						32					34				34								33				64				
sex					M (?)						F (?)					F (?)							F (?)					F				F				
age					30–40						20–30					21–24							15–17					24–35				45–55+				

TABLE 6.2C Types of pottery found in individual tumuli (*cont.*)

	T.16				T.9				T.11				T.10		T.17		T.18		T.19		T.20		T.22		T.27			T.21			T.28	
	M.	sh.	ch.1	ch.2	sh.	ch.1	ch.2	ch.3	M.	sh.	ch.1	ch.2	sh.	ch.1	sh.	ch.1	sh.	ch.1	sh.	ch.1	sh.	ch.1	sh.	ch.1	M.	sh.	ch.1	M.	sh.	ch.1	sh.	ch.1
I cups										1	3	4		7				2	1	1	1			3	1		1		1		1	3
I varia					1																											
II.1–7 small bowls					3	1				1	4	7		10					1	1								1	1	1		
II.8–9 large bowls	1											1																1				
II small bowls varia												1		1																		
III spouted bowls																			1													
IV bowls		1								2				1				1														1
V pots						1				1	1	1		1			1															1
VI pots										4															1							
VII jars/ bottles			3				2	1	1	1		1		5		2		4			1	3		2	1		1			1	1	2
VII varia									2					1															1			
VIII stand			1																													
IX goblets														1																		
X lamps																																
XI *qawadis*										1																						
XII amphorae	1																															

TABLE 6.2C Types of pottery found in individual tumuli (*cont.*)

	T.16				T.9				T.11				T.10		T.17		T.18		T.19		T.20		T.22		T.27			T.21			T.28	
	M.	sh.	ch.1	ch.2	sh.	ch.1	ch.2	ch.3	M.	sh.	ch.1	ch.2	sh.	ch.1	sh.	ch.1	sh.	ch.1	sh.	ch.1	sh.	ch.1	sh.	ch.1	M.	sh.	ch.1	M.	sh.	ch.1	sh.	ch.1
XII varia																																
XIII bottles																														1		
XIV jugs																																
misc																																
total	7				9				37				27		2		8		5		5		5		5			8			9	
sex	M (??)				M (??)				?				M		M		F (?)		M (?)		M (??)		M		M			M			F	
age	16–24				25–30				16–18				30–40		40–50		50+		35–45		50+		35–45		35–45			35–45			40–55	

sh.—shaft
t.—tunnel
ch.—chamber
W t.—West tunnel
E t.—East tunnel
M.—mound

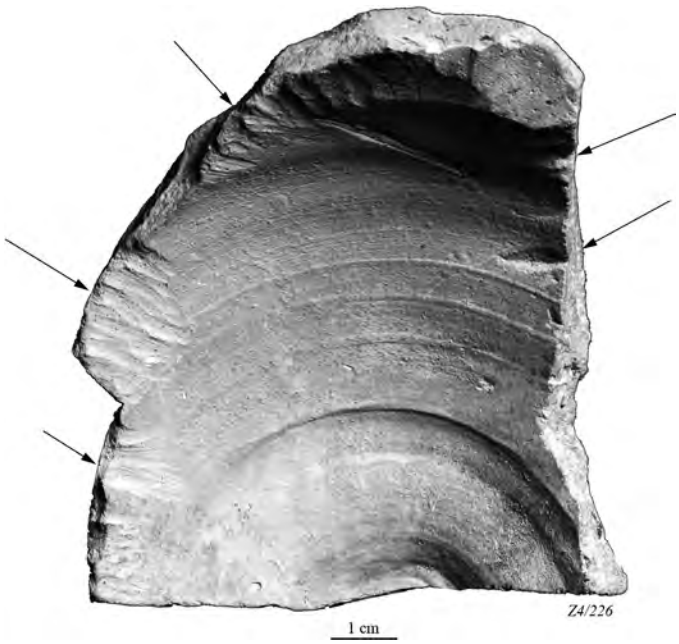

FIGURE 6.17
Rodent tooth marks on a pottery sherd
PHOTO BY A. KAMROWSKI

CHAPTER 7

Pottery Presentation

1 Catalogue

1.1 *Explanatory Notes for the Catalogue*

Construction/Techniques
Wheel-made (1)—simple wheel
Wheel-made (2)—compound wheel
Handmade (1)—paddle-and-ground and beating method
Handmade (2)—coiling method
Handmade (3)—moulding method
Handmade—unrecognised technique

State of Preservation
Complete: when a vessel survives intact.
Complete or almost complete, restored from sherds: when a vessel was found in pieces but restored and all fragments survive.
Incomplete: when a few parts of the vessel are missing, but the vessel is almost complete.
Fragmentary: when only part of a vessel survives, without a complete profile and/or more than a few parts of the vessel are missing.

Measurements
Dr = rim diameter
D_b = base diameter
H = height
$_pH$ = preserved height

Surface Treatment
Burnish descriptions (for cups I, bowls II, cooking pots IV–VI):
Burnish 1 = *Dense*, applied with overlapping strokes; the whole surface is smooth, wheel marks scarcely visible.
Burnish 2 = *Medium dense*, without overlap of strokes of the burnishing tool; gaps between burnishing marks narrower than the strokes and each one of the same width.
Burnish 3 = *Thin/rare*, with narrow burnishing marks, sometimes with wavy lines which look like decoration of some kind; gaps between marks are wider than in the above groups.
Burnish can be carefully or carelessly executed.
Polish—a glossy lustre on the surface, executed by rubbing surface with yielding tool.

Slipped and burnished on both surfaces—describes burnish and slip applied to both the external and internal surface.

Smoothed surface—when the surface is carefully smoothed.

The *hardness* of the vessels is expressed in terms of the Mohs scale (see Glossary, this volume):
2 soft—surface can be scratched by a fingernail;
3 medium hard—surface easily scratched by a copper wire;
4 hard—surface easily scratched by a knife.

Illustrations
Red slip is represented in grey; two different shades of grey denote two different shades of slip: light and dark red.
White/cream slip is described as such.

The colour of the internal and external surface, slip and fresh breaks/cores are described using Munsell Colour Charts (*The Munsell Soil Color Book 2013*), "deep black" is added to the description of the core, to describe black similar to the coal colour (Munsell Colour Charts).

The term "not possible to determine" is used:
– in relation to the fabric and colour of a break when a vessel is complete;
– in relation to the fabric and colour of a break when a vessel is almost complete, any losses in the vessel are unclean and it was not possible to make a fresh break;
– in relation to an external or internal surface which is poorly preserved, abraded and dirty, making it impossible to describe the colour.

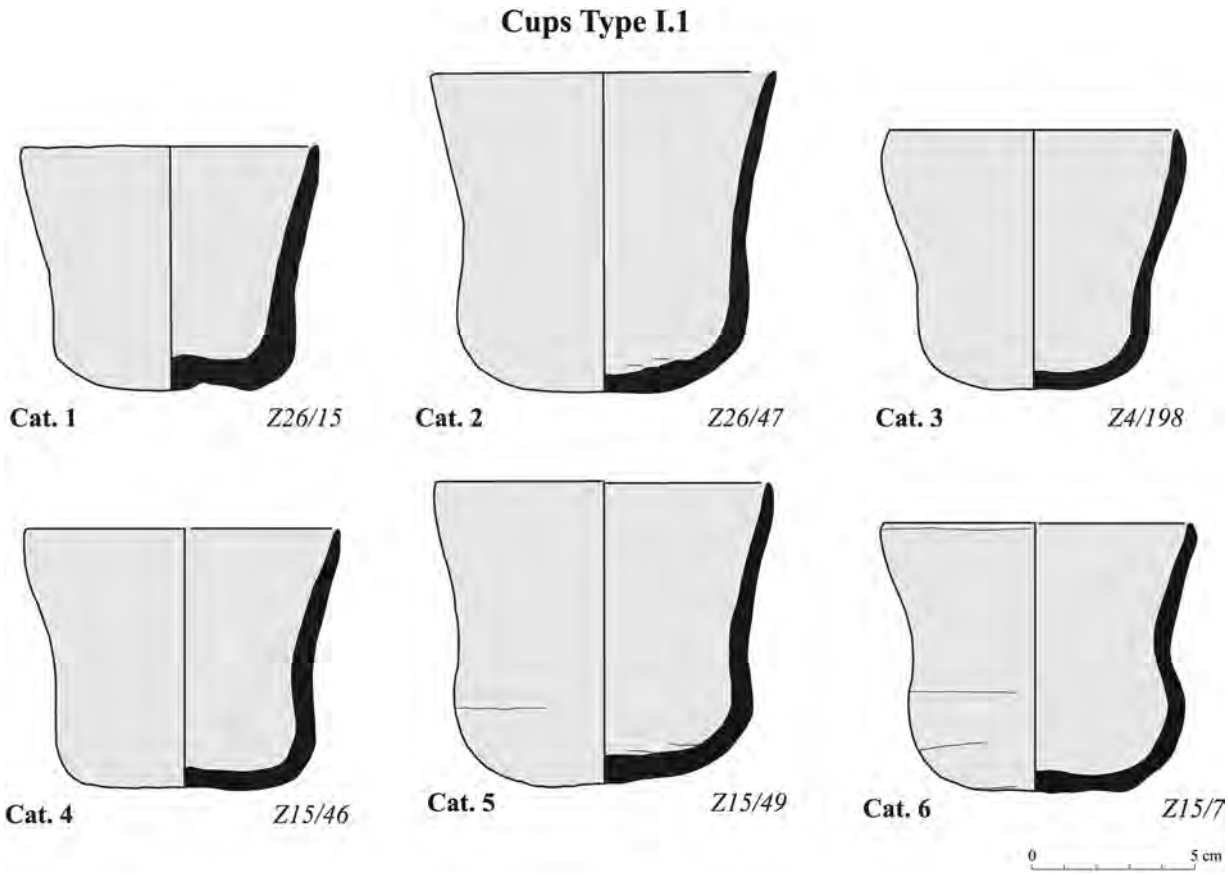

FIGURE 7.1 Cups of type I.1 with clearly visible S-shaped profile

2 Group 1—Cups

2.1 *Cups Type 1.1* [*Figs 7.86–7.87*]

Cat. 1
Cup
Inv. no: **Z26/15**
Provenance: Tumulus 26, chamber 1, eastern part
Construction: wheel-made (1)
State of preservation: incomplete, 92% of rim
Measurements: Dr = 9 cm; H = 7.5 cm
Fabric: not possible to determine, group ZF1
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 2
Cup
Inv. no: **Z26/47**
Provenance: Tumulus 26, chamber 1, central part
Construction: wheel-made (1)
State of preservation: incomplete, 86% of rim
Measurements: Dr = 10.5 cm; H = 9.7 cm
Fabric: not possible to determine, group ZF1
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1, carefully executed in the upper part, less carefully executed in the lower part
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: 5YR 5/6 yellowish red

Cat. 3
Cup
Inv. no: **Z4/198**
Provenance: Tumulus 4, fill of E tunnel
Construction: wheel-made (1)
State of preservation: fragmentary, 16% of rim, body fragments missing
Measurements: Dr = 9.5 cm; H = 7.9 cm
Fabric: ZF2
Hardness: 3

Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, less carefully executed
Surface colour: external, slip—2.5YR 4/4 reddish brown; internal, slip—10R 3/4 dusky red
Colour of break: 5YR 5/6 yellowish red

Cat. 4
Cup
Inv. no: **Z15/46**
Provenance: Tumulus 15, main burial chamber, inside vessel Z15/45
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 9.5–9.8 cm; H = 8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 on the upper part, burnish 2 on the lower part, carefully executed
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine

Cat. 5
Cup
Inv. no: **Z15/49**
Provenance: Tumulus 15, main burial chamber, eastern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 10.3 cm; H = 9.2 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 on the upper part, burnish 3 on the lower part, carelessly executed
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine

Cat. 6
Cup
Inv. no: **Z15/7**
Provenance: Tumulus 15, shaft, southern part, close to blocking wall of main burial chamber
Construction: wheel-made (1)
State of preservation: incomplete, 58% of rim
Measurements: Dr = 9.2–9.5 cm; H = 8.2 cm
Fabric: ZF2
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 10YR 5/4 yellowish brown
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 7
Cup
Inv. no: **Z15/22**
Provenance: Tumulus 15, shaft, southern part, close to blocking wall of main burial chamber
Construction: wheel-made (1)
State of preservation: incomplete, 87% of rim
Measurements: Dr = 9.7 cm; H = 8.5 cm
Fabric: ZF2
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 on the upper part, burnish 2 on the lower part, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/4 weak red
Colour of break: 10YR 5/4 yellowish brown

Cat. 8
Cup
Inv. no: **Z25/5**
Provenance: Tumulus 25, chamber 1, central part
Construction: wheel-made (1)
State of preservation: incomplete, 70% of rim, wall fragments missing
Measurements: Dr = 9.2 cm; H = 8.3 cm
Fabric: ZF2
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, less carefully executed; internal—burnish 1, less carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 7.5YR 3/3 dark brown
References: (Klimaszewska-Drabot 2010, 480–481)

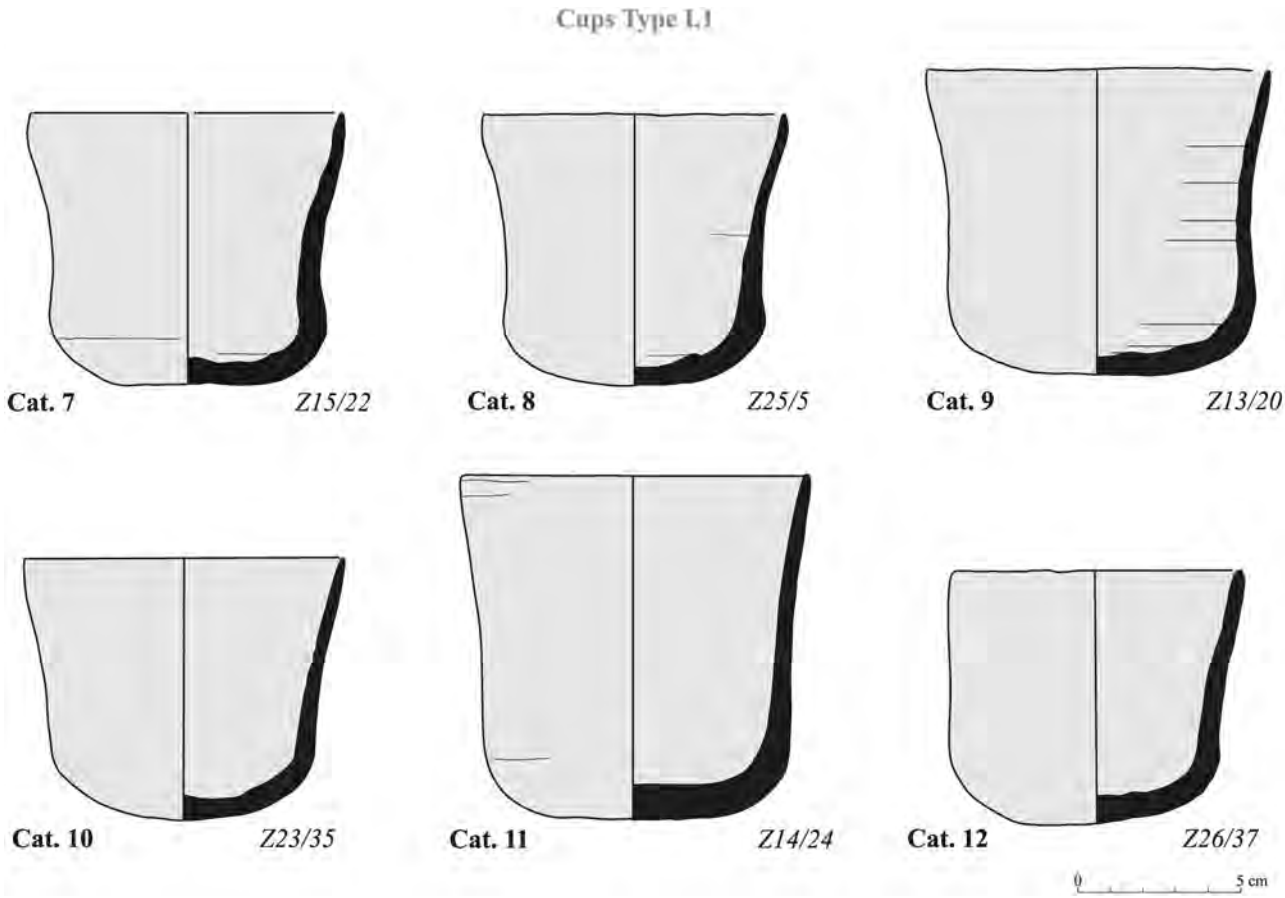

FIGURE 7.2 Cups of type I.1 with clearly visible S-shaped profile

Cat. 9
Cup
Inv. no: **Z13/20**
Provenance: Tumulus 13, chamber 2, northern part, found on the rim of bottle Z13/19
Construction: wheel-made (1)
State of preservation: incomplete, 69% of rim, wall fragments missing
Measurements: Dr = 10.5 cm; H = 9.4 cm
Fabric: ZF2
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 in the upper part, carefully executed, burnish 2 in the lower part, less carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 5YR 5/4 reddish brown

Cat. 10
Cup
Inv. no: **Z23/35**
Provenance: Tumulus 23, chamber 1
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 9.6 cm; H = 8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 11
Cup
Inv. no: **Z14/24**
Provenance: Tumulus 14, chamber 2, central part
Construction: wheel-made (1)
State of preservation: incomplete, 88% of rim, wall fragments missing

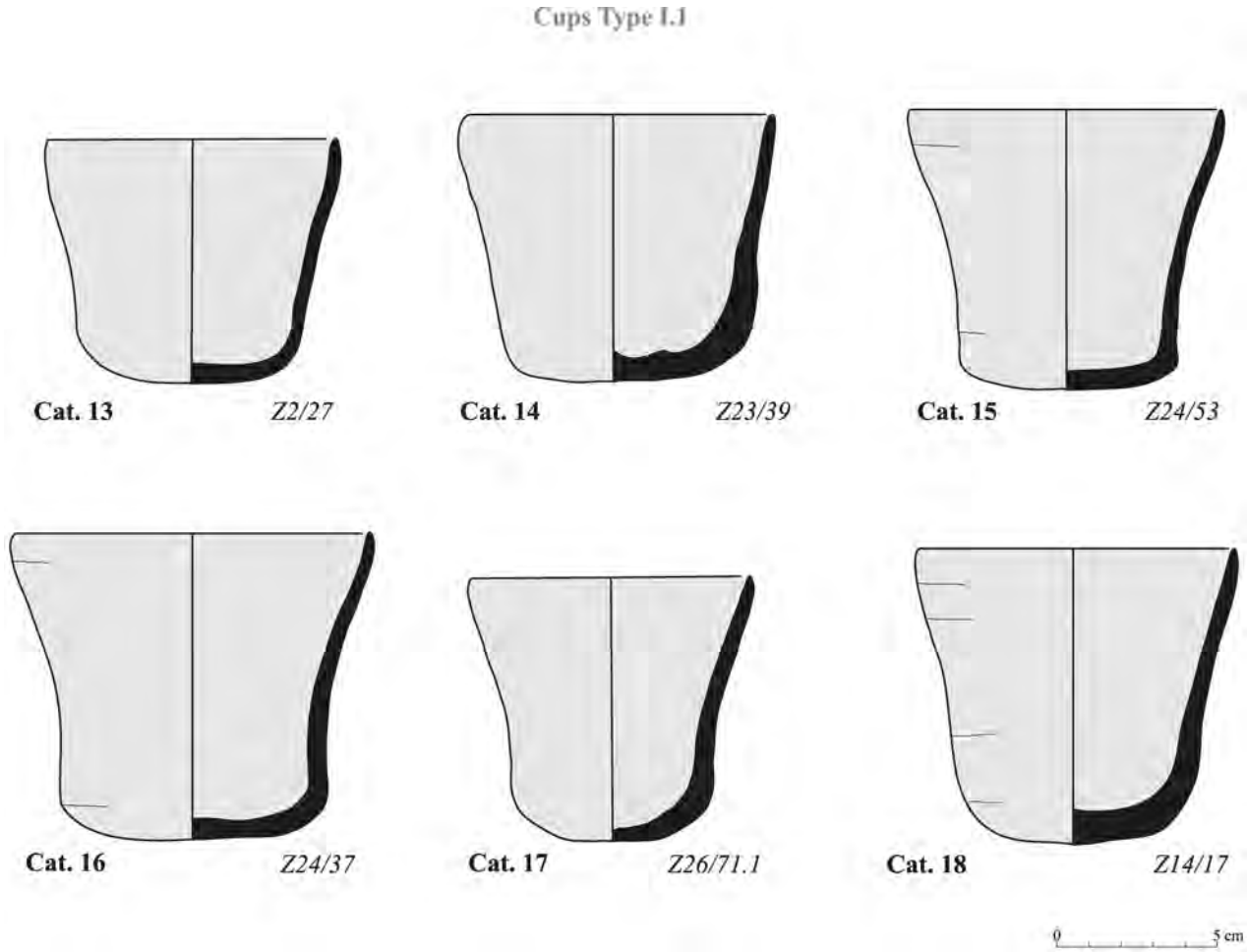

FIGURE 7.3 Cups of type I.1 with less pronounced S-shaped profile

Measurements: Dr = 10.5 cm; H = 10.5 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed, on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 5YR 4/6 yellowish red

Cat. 12
Cup
Inv. no: **Z26/37**
Provenance: Tumulus 26, chamber 1, central part
Construction: wheel-made (1)
State of preservation: incomplete, 86% of rim, wall fragments missing
Measurements: Dr = 8.9 cm; H = 7.5 cm
Fabric: ZF3
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed, on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 10YR 3/3 dark brown

Cat. 13
Cup
Inv. no: **Z2/27**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 9 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed, on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 14
Cup
Inv. no: **Z23/39**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (1)
State of preservation: incomplete, 95% of rim
Measurements: Dr = 10.5 cm; H = 8.4 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed, on both surfaces
Surface colour: external, slip—2.5YR 6/4 light yellow-brown; internal, slip—2.5YR 5/6 red
Colour of break: not possible to determine

Cat. 15
Cup
Inv. no: **Z24/53**
Provenance: Tumulus 24, chamber 1
Construction: wheel-made (1)
State of preservation: incomplete, restored from sherds, 95% of rim, body fragments missing
Measurements: Dr = 9.5 cm; H = 8.5 cm
Fabric: ZF3
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed, on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 5Y 2.5/1 black

Cat. 16
Cup
Inv. no: **Z24/37**
Provenance: Tumulus 24, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, body fragments missing
Measurements: Dr = 11.3 cm; H = 9.5 cm
Fabric: ZF3
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed, on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/4 weak red
Colour of break: 2.5Y 3/1 very dark grey

Cat. 17
Cup
Inv. no: **Z26/71.1**
Provenance: Tumulus 26, fill of shaft
Construction: wheel-made (1)
State of preservation: fragmentary, 34% of rim, body fragments missing
Measurements: Dr = 9 cm; H = 8.1 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed, on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 10YR 4/2 dark greyish brown

Cat. 18
Cup
Inv. no: **Z14/17**
Provenance: Tumulus 14, chamber 1, central part
Construction: wheel-made (1)
State of preservation: incomplete, 50% of rim
Measurements: Dr = 9.8 cm; H = 9.2 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 on the upper part, burnish 2 on the lower part, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 10R 5/3 weak red

Variant 1.1a
Cat. 19
Cup
Inv. no: **Z21/6**
Provenance: Tumulus 21, shaft, central part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 6.8 cm; H = 8.2 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; internal—burnish 3 on the upper part, carelessly executed
Surface colour: external—5YR 5/6 yellowish red, slip—10R 4/6 red; internal—5YR 5/6 yellowish red, slip—10R 4/6 red

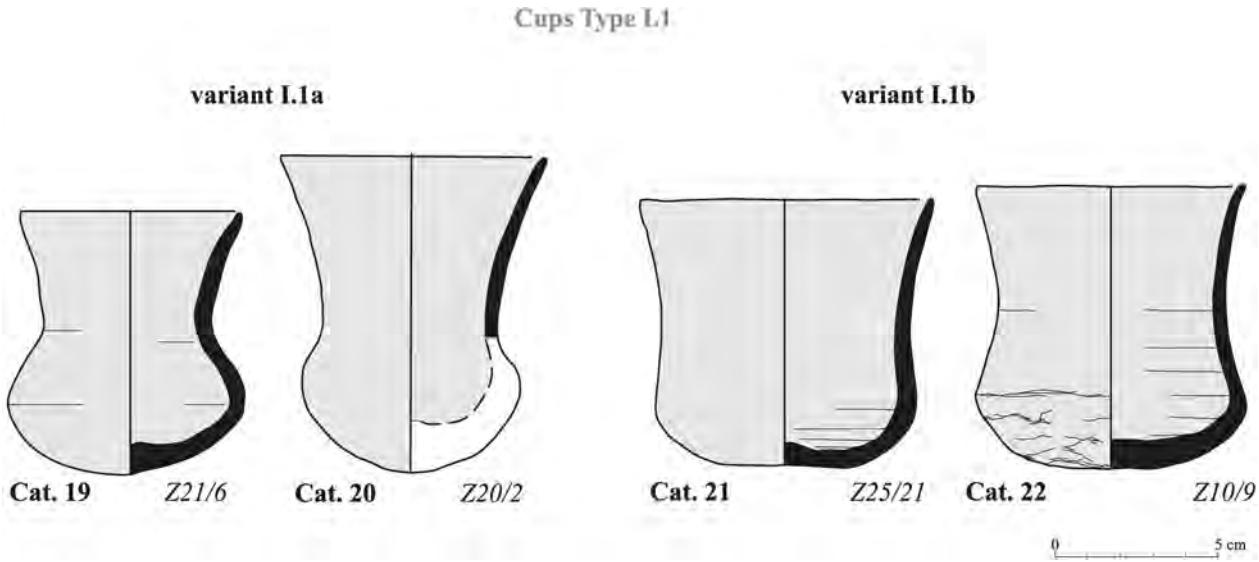

FIGURE 7.4 Cups of type I.1 with less pronounced S-shaped profile with two variants: variant I.1a and I.1b

Colour of break: not possible to determine
Notes: external surface rubbed off, slip fragmentary, burnish not possible to determine
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 20
Cup
Inv. no: **Z20/2**
Provenance: Tumulus 20, shaft, south-western part
Construction: wheel-made (1)
State of preservation: incomplete, 55% of rim
Measurements: Dr = 8 cm; H = 9.7 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carelessly executed, internal—burnish 3 on the upper part, carelessly executed
Surface colour: external—5YR 5/6 yellowish red, slip—10R 4/6 red; internal—5YR 5/6 yellowish red, slip—10R 4/6 red
Colour of break: 10R 5/3 weak red
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367, 369–371)

Variant I.1b
Cat. 21
Cup
Inv. no: **Z25/21**
Provenance: Tumulus 25, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 8.9 cm; H = 8.2 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 22
Cup
Inv. no: **Z10/9**
Provenance: Tumulus 10, burial chamber, southern part
Construction: wheel-made (1)
State of preservation: incomplete, 75% of rim
Measurements: Dr = 7.8–8.1 cm; H = 8.7 cm
Fabric: ZF2
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—5R 4/8 red; internal, slip—7.5R 4/4 weak red
Colour of break: 2.5Y 3/2 very dark greyish brown

2.2 *Cups Type I.2* [*Figs 7.87–7.89*]

Cat. 23
Cup
Inv. no: **Z22/2**
Provenance: Tumulus 22, burial chamber
Construction: wheel-made (1)
State of preservation: incomplete, 87% of rim

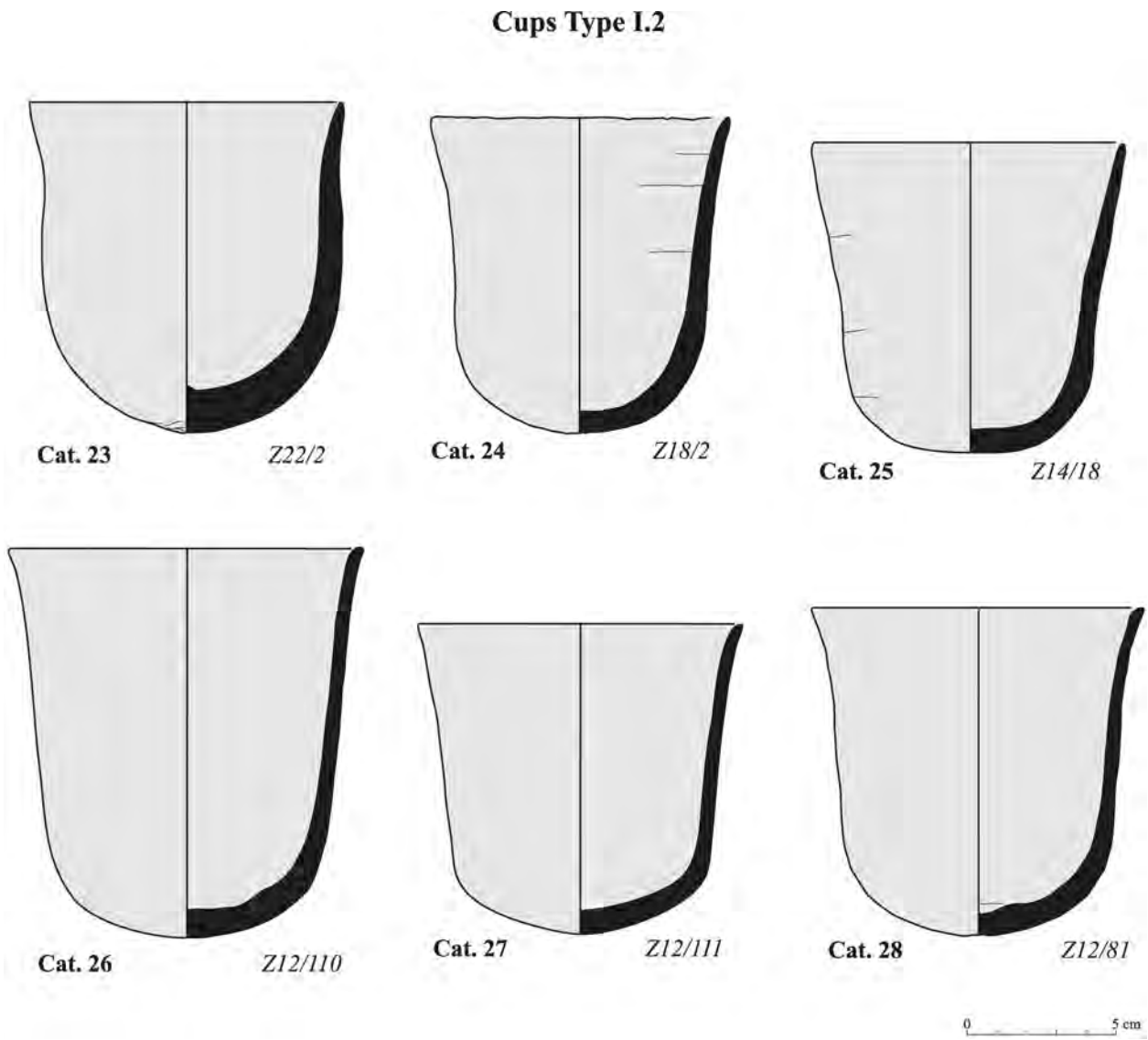

FIGURE 7.5 Cups of type I.2 with a slightly pointed base and flared walls

Measurements: Dr = 10.4 cm; H = 11 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 4/8 red; internal, slip—10R 4/6 red
Colour of break: 10R 4/8 red
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 24
Cup
Inv. no: **Z18/2**
Provenance: Tumulus 18, burial chamber, central part
Construction: wheel-made (1)
State of preservation: incomplete, 59% of rim, wall fragments missing
Measurements: Dr = 10 cm; H = 10.6 cm
Fabric: ZF1
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 10YR 4/2 dark greyish brown
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 25
Cup
Inv. no: **Z14/18**

Provenance: Tumulus 14, chamber 1, central part
Construction: wheel-made (1)
State of preservation: incomplete, 97 % of rim
Measurements: Dr = 10.4 cm; H = 10.3 cm
Fabric: ZF1
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed on the upper part, less carefully executed on the lower part; internal—burnish 1 on the upper part, burnish 2 on the lower part, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 2.5YR 6/6 light red

Cat. 26
Cup
Inv. no: **Z12/110**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, 66 % of rim, wall fragments missing
Measurements: Dr = 12 cm; H = 13 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 3, carelessly executed
Surface colour: external—10R 5/6 red, slip—10R 4/4 weak red; internal—10R 4/6 red, slip—10R 4/4 weak red
Colour of break: 7.5YR 4/3 brown

Cat. 27
Cup
Inv. no: **Z12/111**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 10.8 cm; H = 10.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, less carefully executed; internal—burnish 3, less carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

Cat. 28
Cup
Inv. no: **Z12/81**
Provenance: Tumulus 12, chamber 1, eastern part
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 11 % of rim, base complete, body fragments missing
Measurements: Dr = 11 cm; H = 10.5 cm
Fabric: ZF3
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 3, less carefully executed; internal—burnish 2, less carefully executed
Surface colour: external—2.5YR 5/6 red, slip—2.5YR 4/4 reddish brown; internal—2.5YR 5/6 red, slip—5YR 3/3 dark reddish brown
Colour of break: 7.5YR 4/4 dark brown

Cat. 29
Cup
Inv. no: **Z5/1**
Provenance: Tumulus 5, superstructure
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 2 % of rim, 50 % of base, body fragments missing
Measurements: Dr = 8.2 cm; H = 8.7 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 3, less carefully executed; internal—burnish 2, less carefully executed
Surface colour: external—5YR 5/4 reddish brown, slip—10R 5/4 weak red; internal, slip—10R 4/6 red
Colour of break: 5YR 6/6 reddish yellow

Cat. 30
Cup
Inv. no: **Z5/4**
Provenance: Tumulus 5, chamber 1, western part
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 6 % of rim, body fragments missing
Measurements: Dr = 10 cm; H = 8.2 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2, less carefully executed on both surfaces

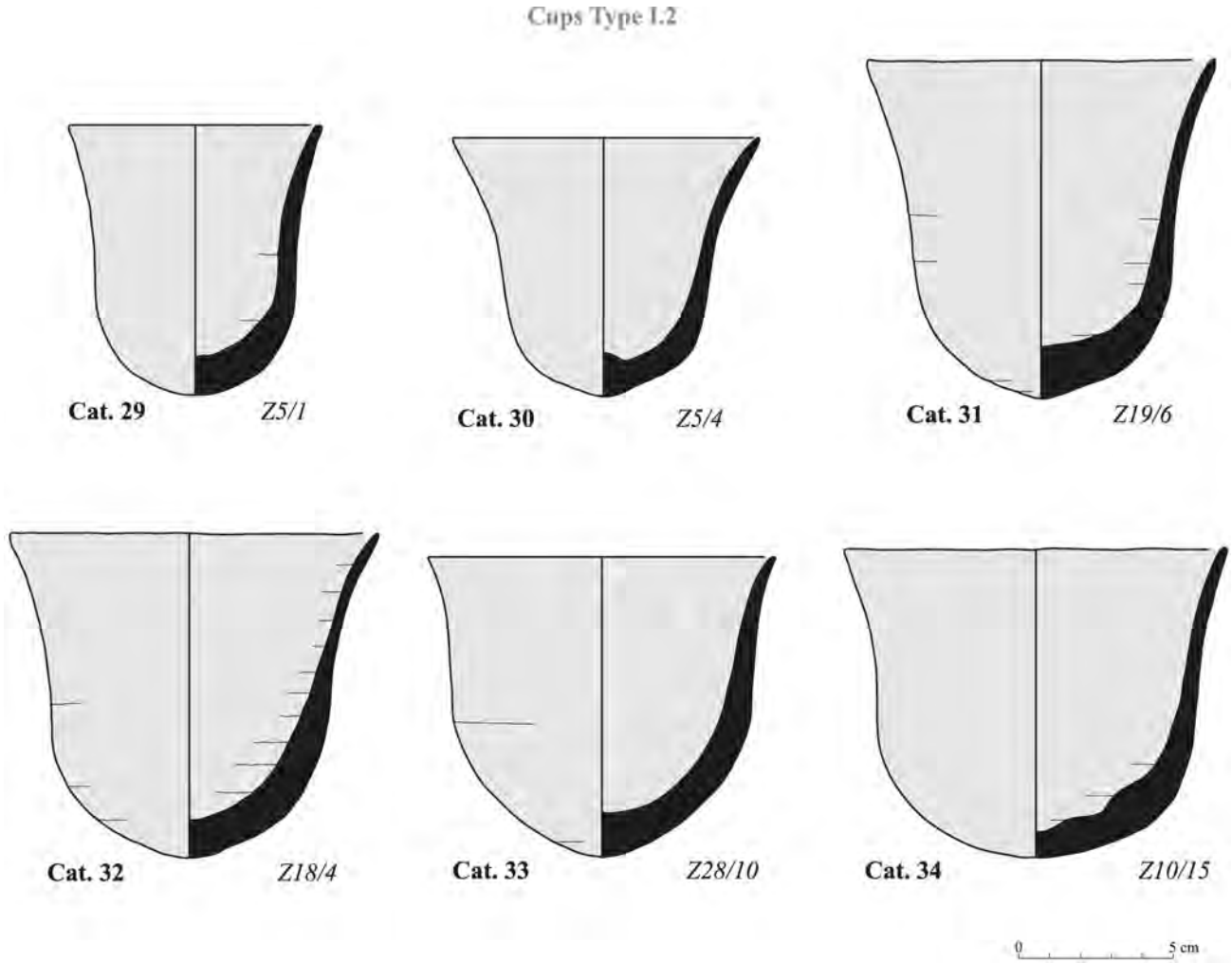

FIGURE 7.6 Cups of type I.2 with a slightly pointed base and flared walls

Surface colour: external, slip—7.5R 5/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: 7.5YR 4/4 dark brown
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 31
Cup
Inv. no: **Z19/6**
Provenance: Tumulus 19, burial chamber
Construction: wheel-made (1)
State of preservation: incomplete, 44% of rim
Measurements: Dr = 11.2 cm; H = 10.8 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 7.5YR 5/6 strong brown
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 32
Cup
Inv. no: **Z18/4**
Provenance: Tumulus 16, burial chamber, found on rim of bottle Z18/6
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 11.3 cm; H = 10.4 cm
Fabric: not possible to determine
Hardness: 3
Firing: oxidized?
Surface treatment: slipped and burnished on both surfaces; external—surface dirty and burnish difficult to determine; internal—burnish 2, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 33
Cup
Inv. no: **Z28/10**
Provenance: Tumulus 28, burial chamber, southern part
Construction: wheel-made (1)
State of preservation: incomplete, 61% of rim, wall fragments missing
Measurements: Dr = 11 cm; H = 9.7 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 2 on the upper part, burnish 3 on the lower part, carelessly executed
Surface colour: external, slip—7.5YR 5/6 strong brown; internal, slip—7.5YR 5/6 strong brown
Colour of break: 10YR 3/2 very dark greyish brown

Cat. 34
Cup
Inv. no: **Z10/15**
Provenance: Tumulus 10, burial chamber, southern part
Construction: wheel-made (1)
State of preservation: incomplete, 85% of rim
Measurements: Dr = 13 cm; H = 10 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—7.5YR 5/6 strong brown; internal, slip—7.5YR 5/6 strong brown
Colour of break: 10YR 3/2 very dark greyish brown
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 35
Cup
Inv. no: **Z12/95**
Provenance: Tumulus 12, chamber 3, western part
Construction: wheel-made (1)
State of preservation: incomplete, 75% of rim
Measurements: Dr = 10.3 cm; H = 10.3 cm
Fabric: ZF3
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, less carefully executed; internal—burnish 3, less carefully executed
Surface colour: external—2.5YR 6/8 light red, slip—2.5YR 5/6 red; internal—2.5YR 6/8 light red, slip—2.5YR 5/6 red
Colour of break: 7.5YR 5/6 strong brown
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 36
Cup
Inv. no: **Z12/92**
Provenance: Tumulus 12, chamber 3, western part
Construction: wheel-made (1)
State of preservation: incomplete, 93% of rim
Measurements: Dr = 12 cm; H = 12 cm
Fabric: ZF3
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external—2.5YR 5/8 red, slip—10R 5/6 red; internal—2.5YR 5/8 red, slip—10R 5/4 weak red
Colour of break: 7.5YR 6/4 light brown
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 37
Cup
Inv. no: **Z6/15+Z6/18**
Provenance: Tumulus 6, tunnel, western part
Construction: wheel-made (1)
State of preservation: incomplete, chipped rim, 91% of rim
Measurements: Dr = 11 cm; H = 10.4 cm
Fabric: ZF3
Hardness: 3
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—7.5R 5/8 red; internal, slip—2.5YR 5/6 red
Colour of break: 7.5YR 6/4 light brown

Cat. 38
Cup
Inv. no: **Z11/11**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 11 cm; H = 10.1 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—10R 5/8 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

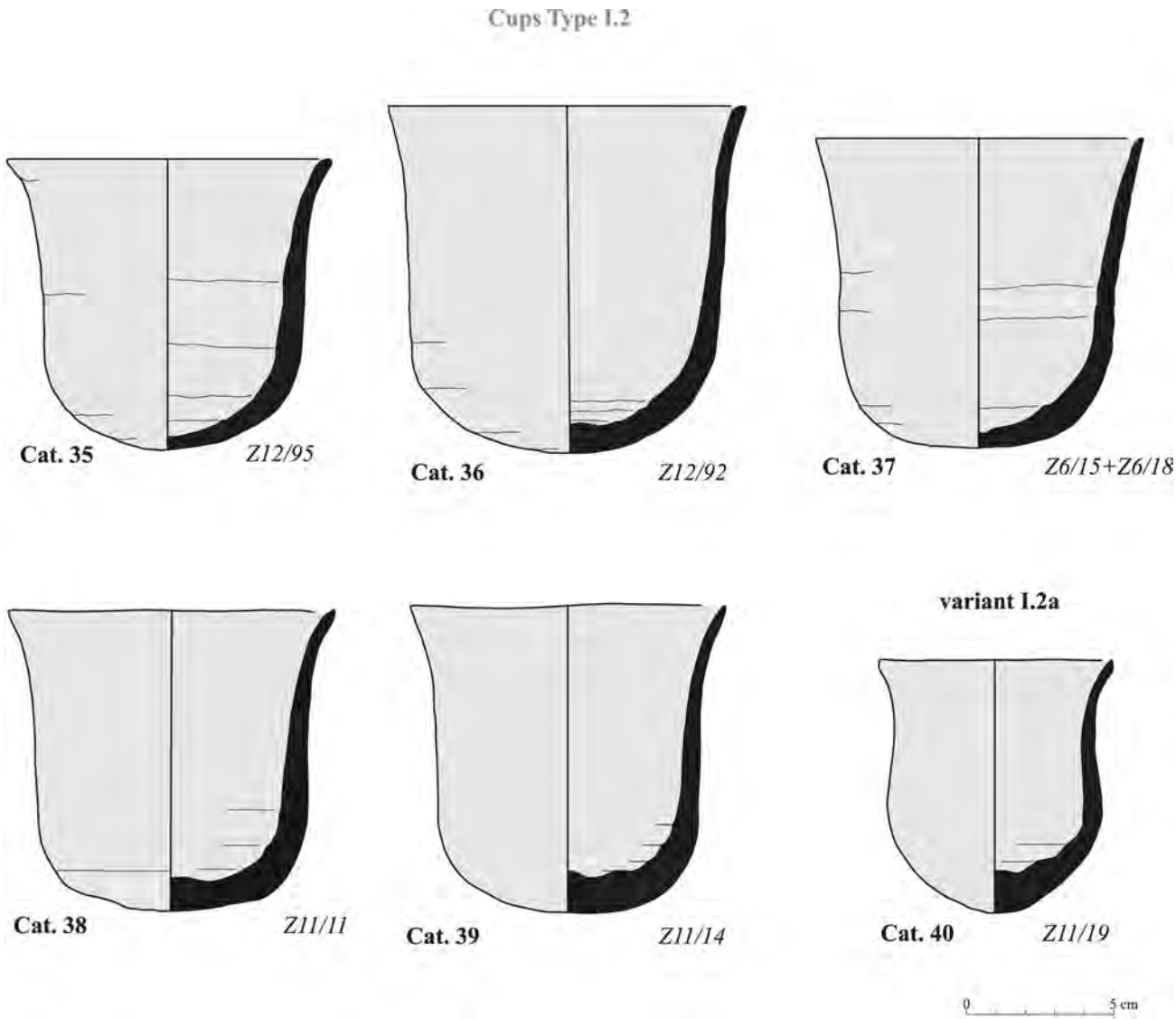

FIGURE 7.7 Cups of type I.2 with a slightly pointed base and flared walls

References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 39
Cup
Inv. no: **Z11/14**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (1)
State of preservation: incomplete, 51% of rim
Measurements: Dr = 10.7 cm; H = 10.3 cm
Fabric: ZF1
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—2.5YR 5/6 red
Colour of break: 5YR 4/4 reddish brown
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Variant I.2a
Cat. 40
Cup
Inv. no: **Z11/19**
Provenance: Tumulus 11, chamber 2, central part
Construction: wheel-made (1)
State of preservation: incomplete, 97% of rim
Measurements: Dr = 7.9–8.4 cm; H = 8.6 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized?
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red

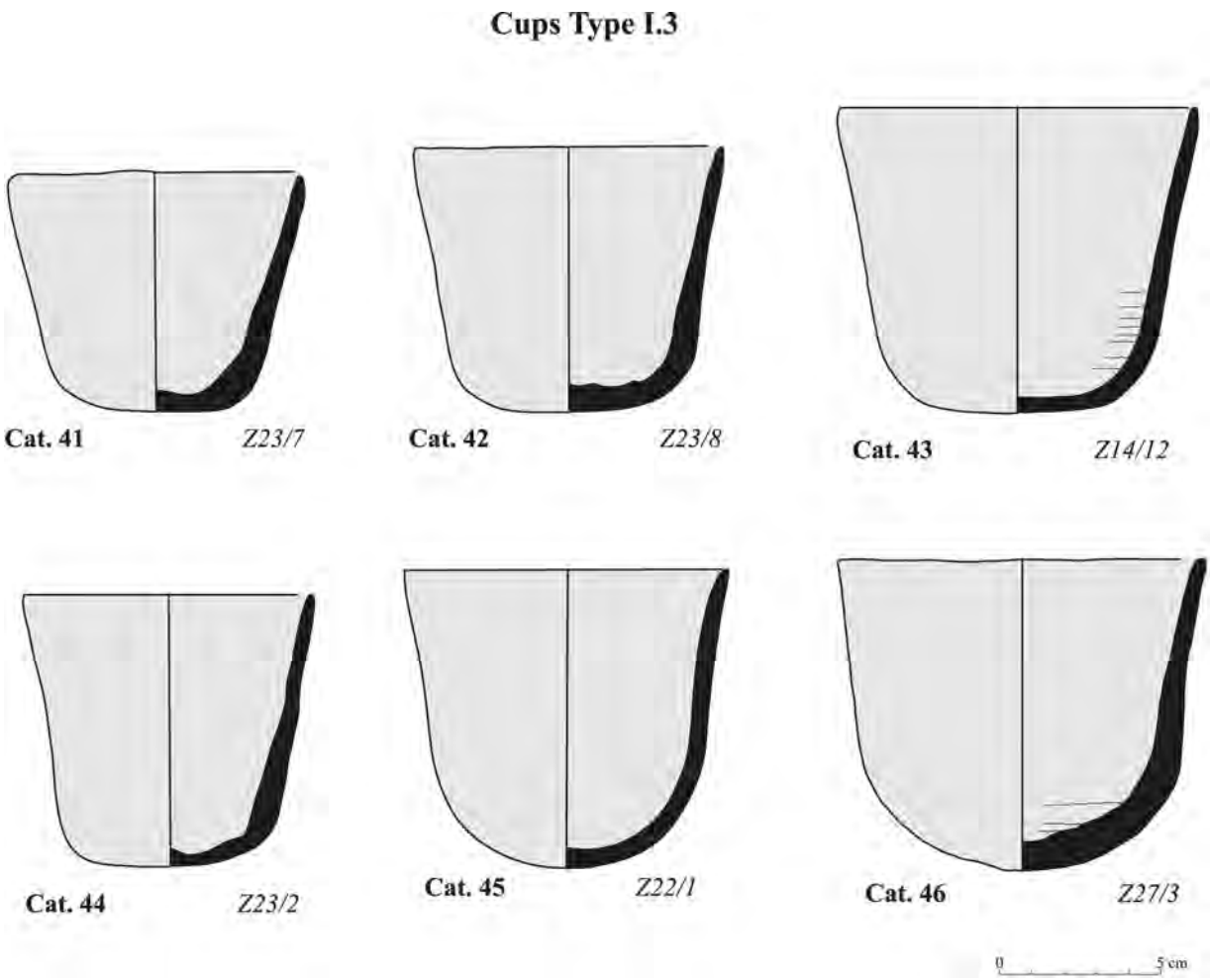

FIGURE 7.8 Tulip-shaped cups of type I.3 with flared walls

Colour of break: 2.5YR 5/6 red
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

2.3 *Cups Type I.3* [*Figs 7.89–7.90*]

Cat. 41
Cup
Inv. no: **Z23/7**
Provenance: Tumulus 23, chamber 1
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 9 cm; H = 7.4 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, less carefully executed
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 42
Cup
Inv. no: **Z23/8**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 9.5 cm; H = 8.1 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed on both surfaces
Surface colour: external, slip—2.5YR 4/6 red; internal, slip—2.5YR 4/4 reddish brown
Colour of break: not possible to determine

Cat. 43
Cup
Inv. no: **Z14/12**
Provenance: Tumulus 14, chamber 3, central part
Construction: wheel-made (1)

State of preservation: complete
Measurements: Dr = 11 cm; H = 9.3 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 3, less carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

Cat. 44
Cup
Inv. no: **Z23/2**
Provenance: Tumulus 23, chamber 1
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 8.9 cm; H = 8.3 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 on the upper part, burnish 2 on the lower part, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 45
Cup
Inv. no: **Z22/1**
Provenance: Tumulus 22, burial chamber
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 10 cm; H = 9 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 3, carefully executed; internal—burnish 2, less carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 46
Cup
Inv. no: **Z27/3**
Provenance: Tumulus 27, burial chamber, southern corner
Construction: wheel-made (1)
State of preservation: incomplete, 83 % of rim
Measurements: Dr = 11.2 cm; H = 9.5 cm
Fabric: ZF2
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2, carelessly executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 5YR 5/6 yellowish red
References: (Klimaszewska-Drabot and Czyżewska 2012, 364)

Cat. 47
Cup
Inv. no: **Z12/90**
Provenance: Tumulus 12, chamber 3, western part
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 43 % of rim, body fragments missing
Measurements: Dr = 12 cm; H = 10.5 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 3, less carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 10YR 5/4 yellowish brown
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 48
Cup
Inv. no: **Z12/124**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 11.7–12 cm; H = 11 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 3, less carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/8 red
Colour of break: not possible to determine

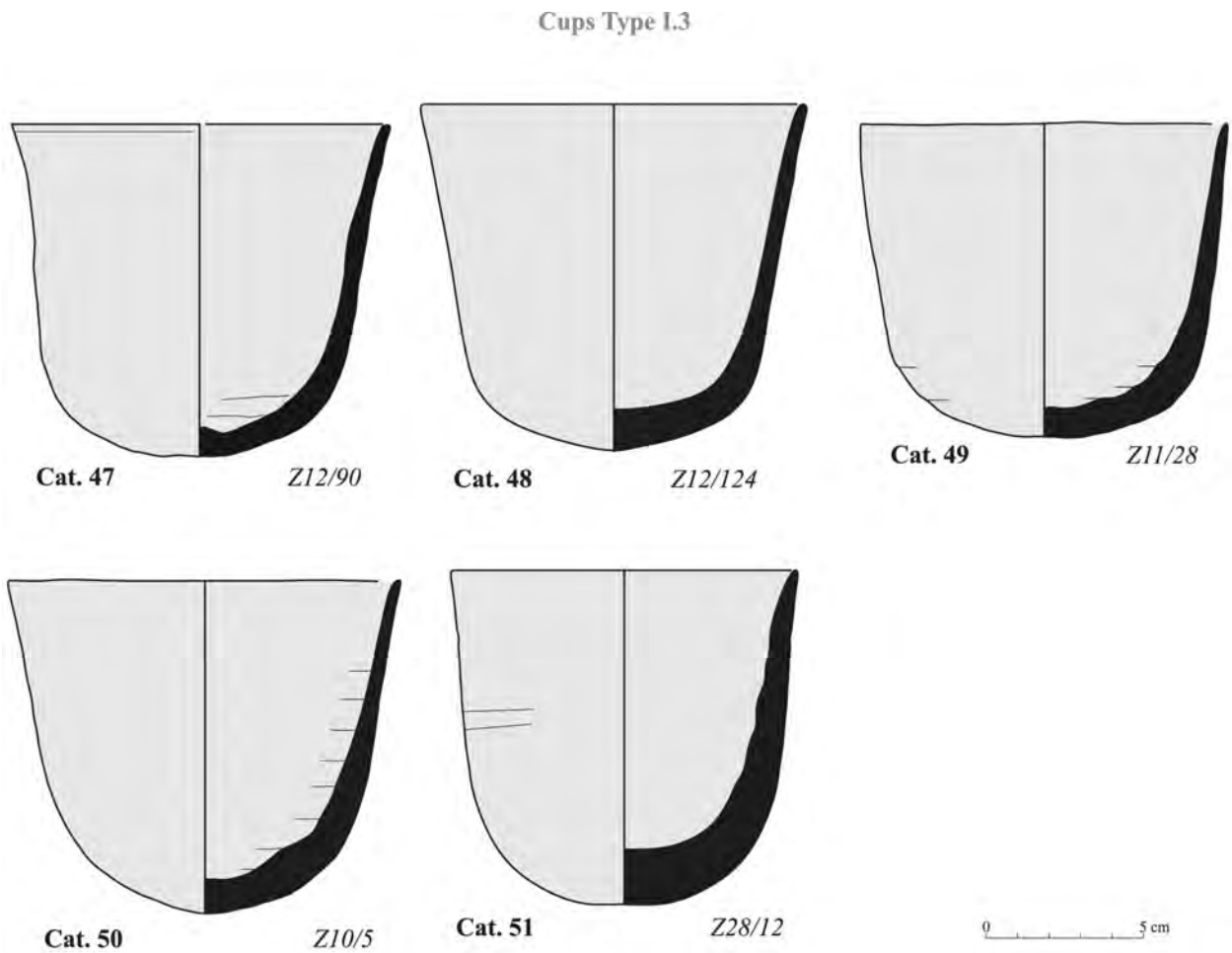

FIGURE 7.9 Tulip-shaped cups of type I.3 with flared walls

Cat. 49
Cup
Inv. no: **Z11/28**
Provenance: Tumulus 11, chamber 2, southern part
Construction: wheel-made (1)
State of preservation: incomplete, 82% of rim
Measurements: Dr = 11.5 cm; H = 9.8 cm
Fabric: ZF3
Hardness: 2/3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 3, carelessly executed; internal—burnish 2, less carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 5YR 4/6 yellowish red
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 50
Cup
Inv. no: **Z10/5**
Provenance: Tumulus 10, burial chamber, southern part
Construction: wheel-made (1)
State of preservation: incomplete, 95% of rim
Measurements: Dr = 12.1 cm; H = 10.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: oxidized?
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed on both surfaces
Surface colour: external, slip—7.5R 4/4 weak red; internal, slip—7.5R 4/3 weak red
Colour of break: 7.5YR 5/6 strong brown
References: (Klimaszewska-Drabot 2010, 480–481)

Cat. 51
Cup
Inv. no: **Z28/12**
Provenance: Tumulus 28, burial chamber, southern part

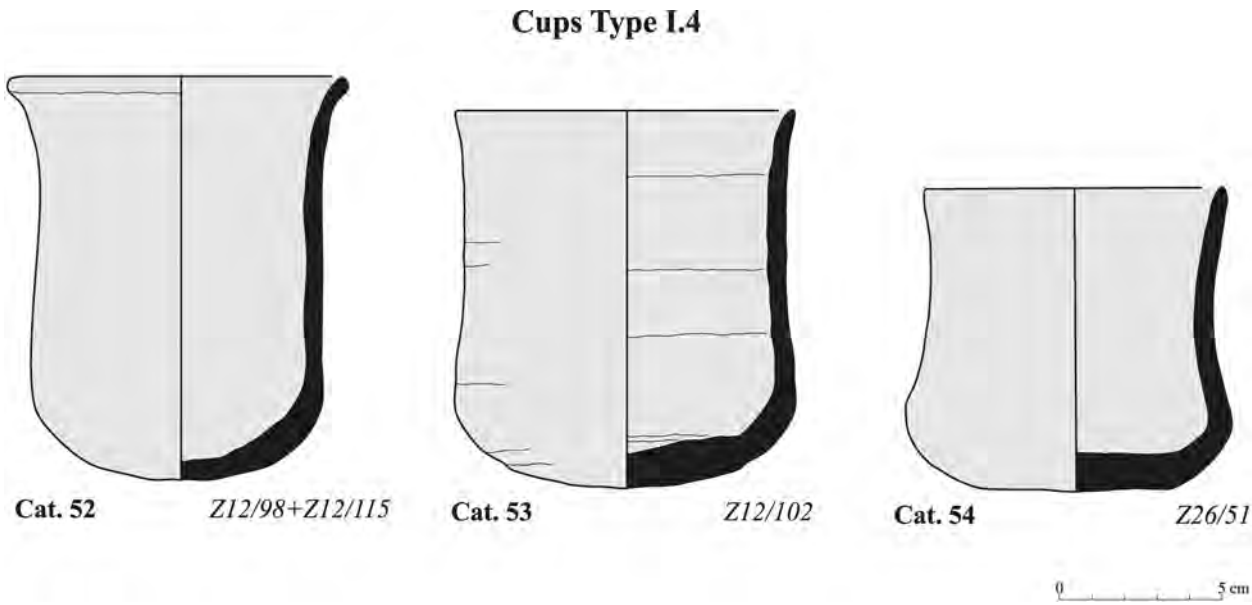

FIGURE 7.10 Slender cups of type I.4 with straight or concave walls

Construction: wheel-made (1)
State of preservation: incomplete, 88% of rim
Measurements: Dr = 10.5 cm; H = 10.5 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed, internal—burnish 1, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 7.5YR 5/6 strong brown

2.4 *Cups Type I.4* [*Fig. 7.90*]

Cat. 52
Cup
Inv. no: **Z12/115+Z12/98**
Provenance: Tumulus 12, chamber 3, western part
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 43% of rim, body sherds missing
Measurements: Dr = 10 cm; H = 12 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 3, less carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 7.5YR 5/4 brown
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 53
Cup
Inv. no: **Z12/102**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, 62% of rim
Measurements: Dr = 10 cm; H = 11 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 3, less carefully executed on both surfaces
Surface colour: external—10R 5/8 red, slip—10R 4/4 weak red; internal—2.5YR 5/8 red, slip—10R 4/4 weak red
Colour of break: 7.5YR 5/4 brown
References: (Czyżewska-Zalewska 2016, 727–728)

Cat. 54
Cup
Inv. no: **Z26/51**
Provenance: Tumulus 26, chamber 1, southern part
Construction: wheel-made (1)
State of preservation: incomplete, chipped rim, 96% of rim
Measurements: Dr = 9 cm; H = 9 cm
Fabric: ZF1
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 3/4 dusky red
Colour of break: 7.5YR 5/6 strong brown

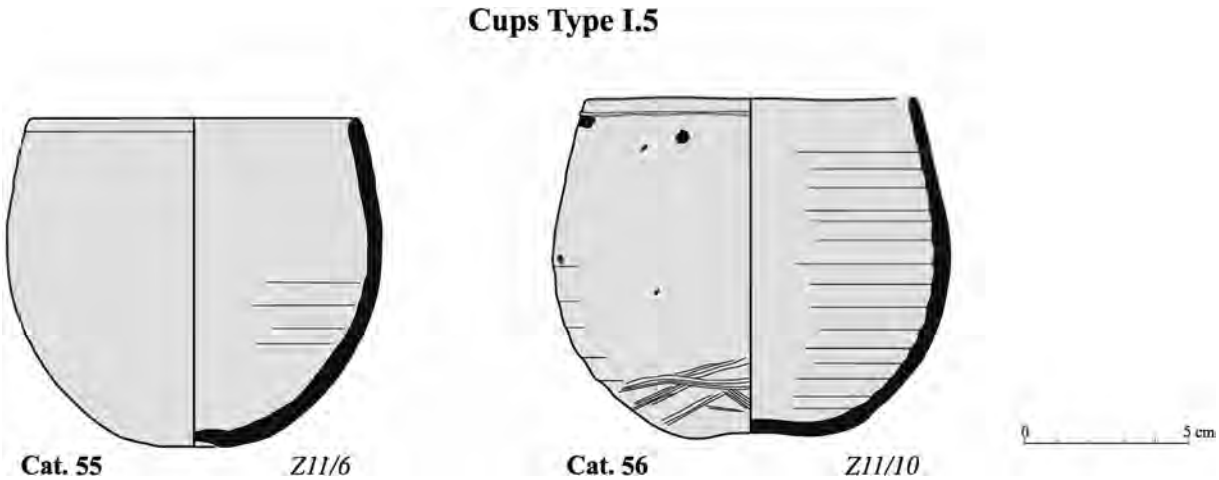

FIGURE 7.11 Globular cups of type I.5

2.5 ***Cups Type I.5*** [*Fig. 7.90*]

Cat. 55
Cup
Inv. no: **Z11/6**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: almost complete, 97% of rim
Measurements: Dr = 10 cm; H = 10 cm
Fabric: difficult to determine, probably ZF4
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 5/8 red; internal, slip—10R 5/8 red
Colour of break: 10R 5/8 red
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 56
Cup
Inv. no: **Z11/10**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10–10.2 cm; H = 10.2 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372; Mahmoud El-Tayeb and Czyżewska 2011, 115–117)

2.6 ***Cups Varia*** [*Figs 7.90–7.91*]

Cat. 57
Cup
Inv. no: **Z14/14**
Provenance: Tumulus 14, chamber 1, south-eastern corner
Construction: wheel made (2)
State of preservation: incomplete, 19% of rim, wall fragment missing, complete profile
Measurements: Dr = 9.2 cm, H = 10 cm
Fabric: Lower Nubian?
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external, slip—7.5YR 7/3 pink; internal, slip—7.5YR 8/2 pinkish white
Colour of break: 7.5YR 5/4 brown
Decoration: painted and grooved decoration on external surface; grooves on body forming border for painted decoration of brown diagonally crossed lines—5YR 3/3 dark reddish brown

Cat. 58
Cup
Inv. no: **Z26/52**
Provenance: Tumulus 26, chamber 1, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 9 cm; H = 8.9 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: uncoated
Surface colour: external—5YR 5/6 yellowish red; internal—5YR 4/3 reddish brown
Colour of break: not possible to determine

Cat. 59
Cup
Inv. no: **Z14/8**
Provenance: Tumulus 14, chamber 3, western part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10.5 cm; H = 9.5 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: not possible to determine
Surface treatment: uncoated
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 5/4 reddish brown
Colour of break: not possible to determine

Cat. 60
Cup
Inv. no: **Z14/11**
Provenance: Tumulus 14, chamber 3, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 9.3 cm; H = 10 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: not possible to determine
Surface treatment: uncoated
Surface colour: external—5YR 6/4 light reddish brown; internal—5YR 6/4 light reddish brown
Colour of break: not possible to determine

Cat. 61
Cup
Inv. no: **Z14/5**
Provenance: Tumulus 14, chamber 3, western part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 11.3 cm; D_b = 4 cm; H = 7.6 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: uncoated
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 5/4 reddish brown
Colour of break: not possible to determine

Cat. 62
Cup (similar to type 1.3)
Inv. no: **Z12/68**
Provenance: Tumulus 12, fill of shaft
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 9.3 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external—5YR 5/6 yellowish red, slip—10R 4/4 weak red; internal—5YR 5/6 yellowish red, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 63
Cup
Inv. no: **Z7/20**
Provenance: Tumulus 7, topsoil, probably modern dump
Construction: wheel-made (2)
State of preservation: fragmentary, 50 % of rim, base almost complete, body sherds missing
Measurements: Dr = 9 cm; $_pH$= *c.* 9 cm
Fabric: ZF4
Hardness: 3
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/6 red on both surfaces
Colour of break: 10R 5/6 red

Cat. 64
Cup
Inv. no: **Z9/2**
Provenance: Tumulus 9, fill of shaft
Construction: wheel-made (2)
State of preservation: incomplete, 61 % of rim, body fragment missing
Measurements: Dr = 9.5 cm; H = 7.2 cm
Fabric: ZF4
Hardness: 3
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: 10R 4/6 red
Decoration: on the external surface; incised—grooves on whole external surface
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367, 369–371)

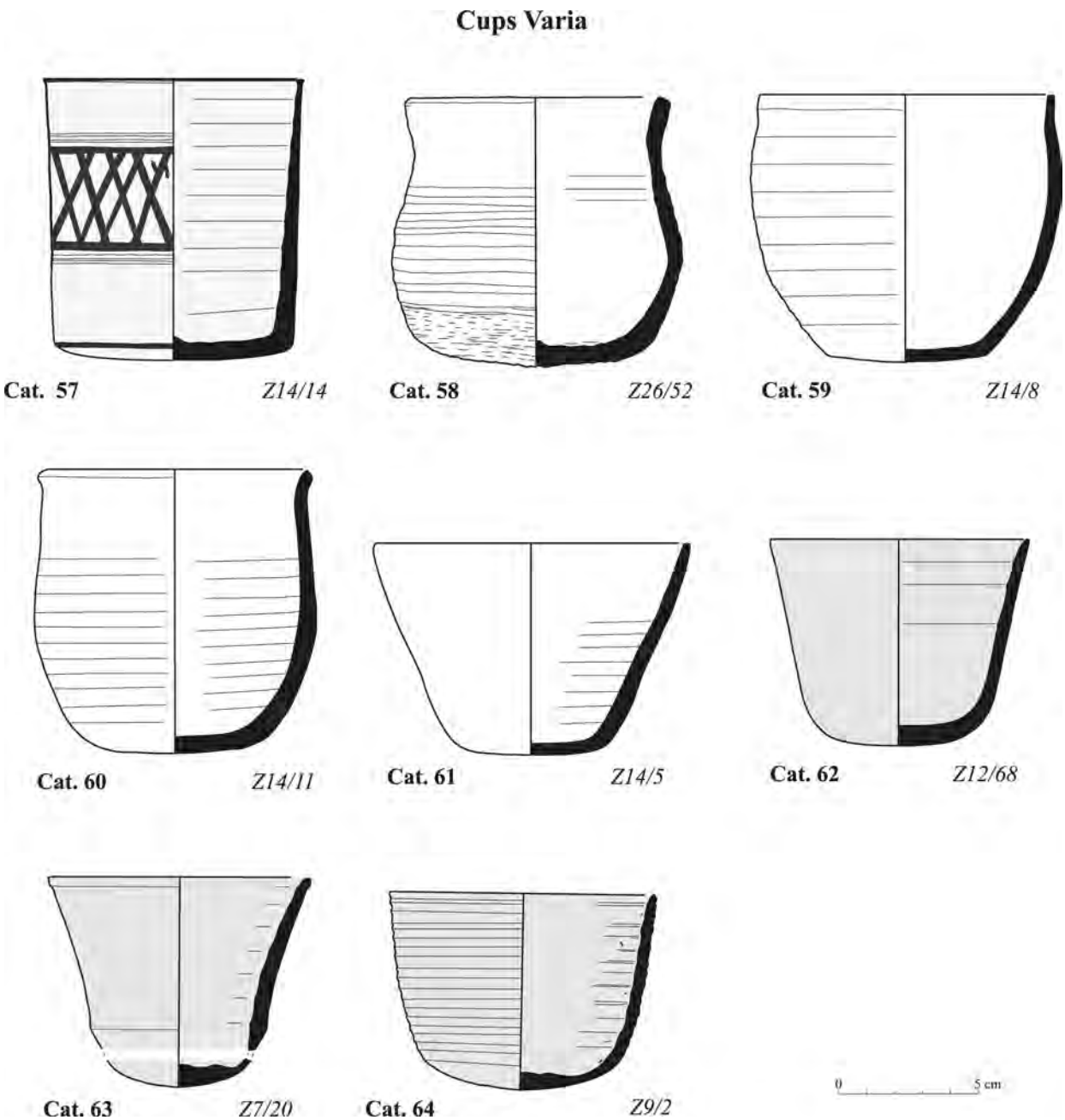

FIGURE 7.12 Cups of different shapes

3 Group 11—Bowls

3.1 *Bowls Type 11.1* [*Fig. 7.92*]

Variant 11.1a

Cat. 65

Bowl

Inv. no: **Z19/5**

Provenance: Tumulus 19, burial chamber

Construction: wheel-made (1)

State of preservation: incomplete, body fragment missing

Measurements: Dr = 16 cm; H = 11.1 cm

Fabric: ZF3?

Hardness: 3

Firing: oxidized

Surface treatment: slipped on both surfaces; external—burnish 2, carelessly executed; internal—burnish 2, carefully executed

Surface colour: external natural surface—5YR 6/3 light reddish brown, slip—7.5R 4/6 red; internal, slip—7.5R 4/6 red

Colour of break: 7.5YR 5/4 brown

References: (Klimaszewska-Drabot 2010, 481)

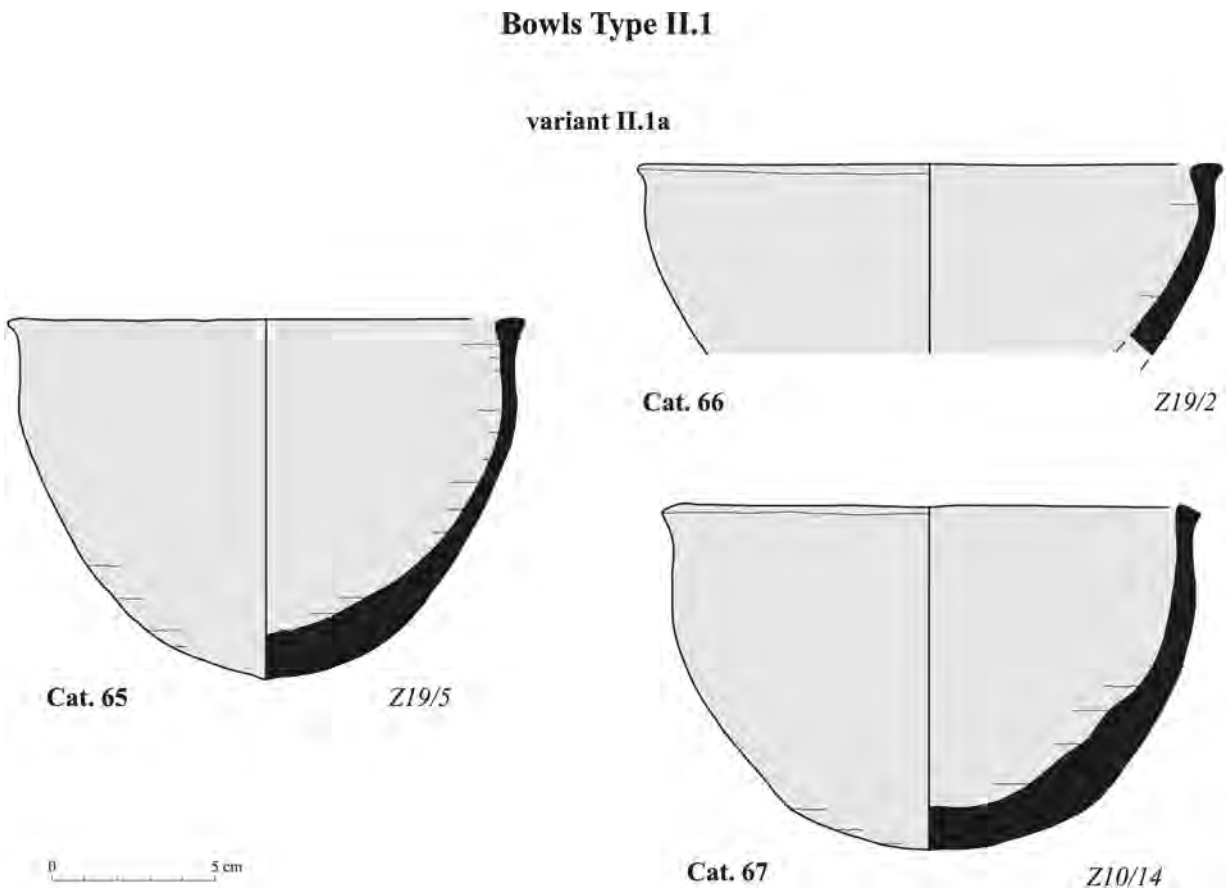

FIGURE 7.13 External ledge-rimmed bowls of type II.1, variant a

Cat. 66
Bowl
Inv. no: **Z19/2**
Provenance: Tumulus 19, fill of shaft
Construction: wheel-made (1)
State of preservation: fragmentary, 9 % of rim
Measurements: Dr = 18 cm; $_{p}$H = 5.8 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped on both surfaces; external—burnish 2, carefully executed; internal—surface corroded, burnish not possible to determine
Surface colour: external, slip—10R 5/6 red; internal natural surface—7.5YR 6/4 light brown, slip—10R 6/6 light red
Colour of break: 10YR 4/2 dark greyish brown

Cat. 67
Bowl
Inv. no: **Z10/14**
Provenance: Tumulus 10, burial chamber, northern part
Construction: wheel-made (1)
State of preservation: incomplete, 82 % of rim
Measurements: Dr = 16.5 cm; H = 10.6 cm
Fabric: ZF3
Hardness: 3
Firing: oxidized
Surface treatment: slipped on both surfaces; burnish 2, carefully executed on both surfaces
Surface colour: external, slip—7.5R 4/6 red; internal, slip—7.5R 4/6 red
Colour of break: 7.5YR 5/4 brown
References: (Klimaszewska-Drabot 2010, 481)

Cat. 68
Bowl
Inv. no: **Z10/18**
Provenance: Tumulus 10, burial chamber, southern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 18 cm; H = 12.2 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped on both surfaces; burnish 1, carefully executed on both surfaces

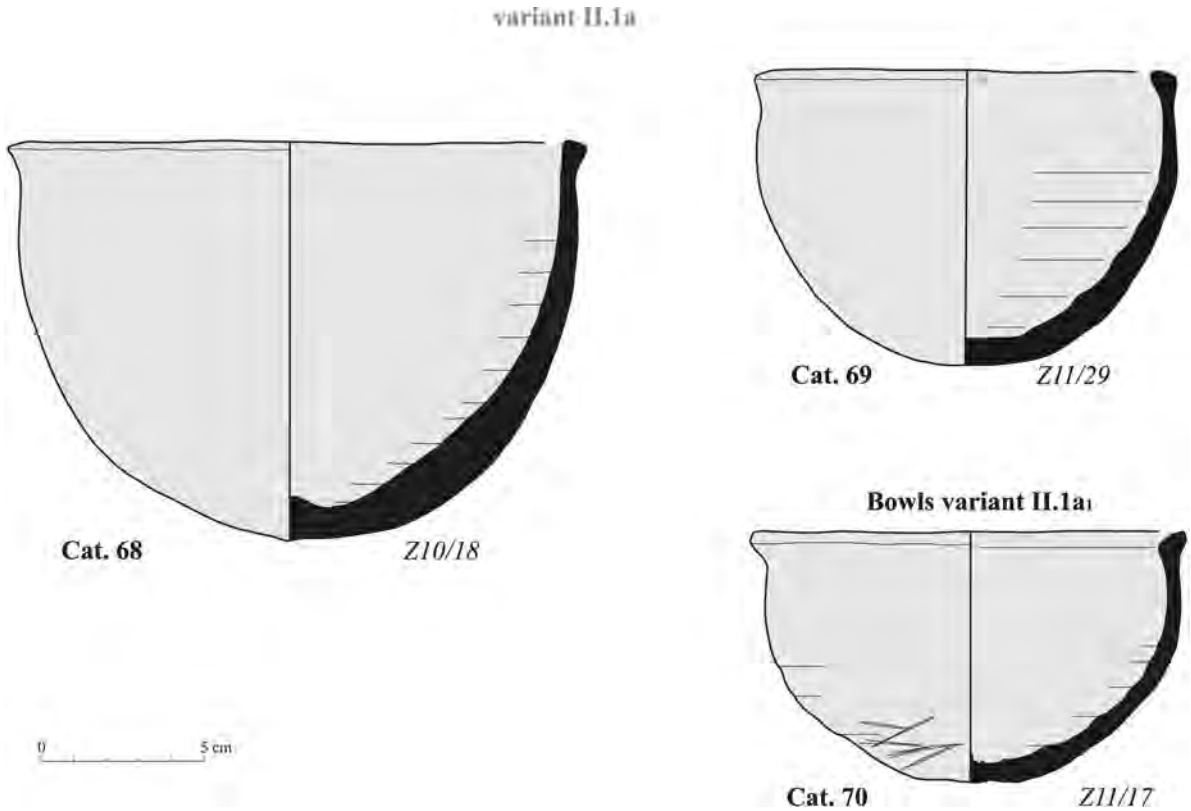

FIGURE 7.14 External ledge-rimmed bowls of type II.1, variant a

Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot 2010, 481)

Cat. 69
Bowl
Inv. no: **Z11/29**
Provenance: Tumulus 11, chamber 2, southern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 9 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped on both surfaces; external—burnish 2, carefully executed; internal—burnish 2, carelessly executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Variant II.1a$_1$
Cat. 70
Bowl
Inv. no: **Z11/17**
Provenance: Tumulus 11, chamber 2
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13.5 cm; H = 7.7 cm
Fabric: not possible to determine
Hardness: medium hard (3/4)
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372; Mahmoud El-Tayeb and Czyżewska 2011, 115–117)

Variant II.1b
Cat. 71
Bowl
Inv. no: **Z6/16+Z6/20.1**
Provenance: Tumulus 6, Eastern tunnel, near entrance to tunnel
Construction: wheel-made (1)
State of preservation: incomplete, 80% of rim, body fragment missing

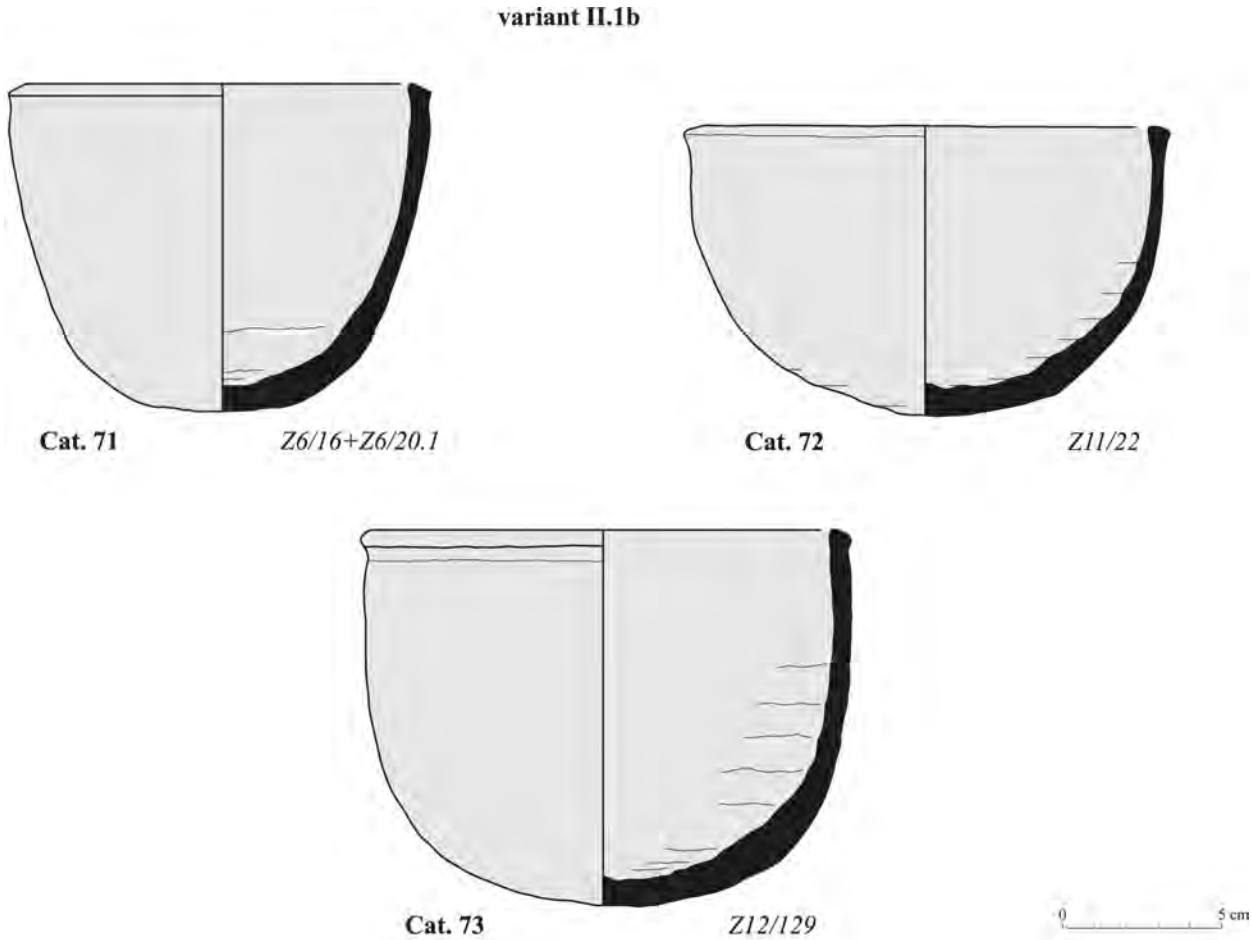

FIGURE 7.15 External ledge-rimmed bowls of type II.1, variant b

Measurements: Dr = 12 cm; H = 10.3 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped on both surfaces; external—burnish 3, carefully executed; internal—burnish 2, carefully executed
Surface colour: external, slip—7.5R 5/8 red; internal, slip—7.5R 5/8 red
Colour of break: 7.5YR 4/6 strong brown

Cat. 72
Bowl
Inv. no: **Z11/22**
Provenance: Tumulus 11, chamber 2, central part, near blocking wall of chamber
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 14.5–15.3 cm; H = 9 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: slipped on both surfaces, burnish 2, carelessly executed on both surfaces
Surface colour: external, slip—2.5YR 5/6 red; internal, slip—2.5YR 5/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 73
Bowl
Inv. no: **Z12/129**
Provenance: Tumulus 12, chamber 2, southern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 14.5–15 cm; H = 12 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped on both surfaces; external—burnish 2 on upper part and burnish 1 on lower

part, carefully executed; internal—burnish 2, carefully executed
Surface colour: external natural surface—2.5YR 5/6 red, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

3.2 *Bowls Type 11.2* [*Figs 7.93–7.95*]
Variant 11.2a

Cat. 74
Bowl
Inv. no: **Z26/75**
Provenance: Tumulus 26, chamber 2, northern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 11 cm; H = 5.7 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine

Cat. 75
Bowl
Inv. no: **Z23/16**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (1)
State of preservation: incomplete, chipped rim, 94% of rim
Measurements: Dr = 11.8 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 weak red
Colour of break: 2.5YR 5/4 reddish brown

Cat. 76
Bowl
Inv. no: **Z26/80**
Provenance: Tumulus 26, chamber 4, southern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 7.4 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/8 red; internal, slip—10R 2.5/1 reddish black
Colour of break: not possible to determine

Cat. 77
Bowl
Inv. no: **Z26/43**
Provenance: Tumulus 26, chamber 2, northern part
Construction: wheel-made (1)
State of preservation: incomplete, 94% of rim
Measurements: Dr = 10 cm; H = 6.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 2 less carefully executed; internal—burnish 2, less carefully executed on the upper part, carelessly executed on the lower part
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/8 red
Colour of break: 10YR 5/3 brown

Cat. 78
Bowl
Inv. no: **Z12/46**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, restored from sherds, 66% of rim, body sherds missing
Measurements: Dr = 12.6 cm; H = 8.5 cm
Fabric: ZF2
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external natural surface—2.5YR 5/8 red, slip—10YR 5/3 brown; internal, slip—10R 4/6 red
Colour of break: 10YR 5/3 brown

Cat. 79
Bowl
Inv. no: **Z12/119**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, 97% of rim
Measurements: Dr = 10.5 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 3/4

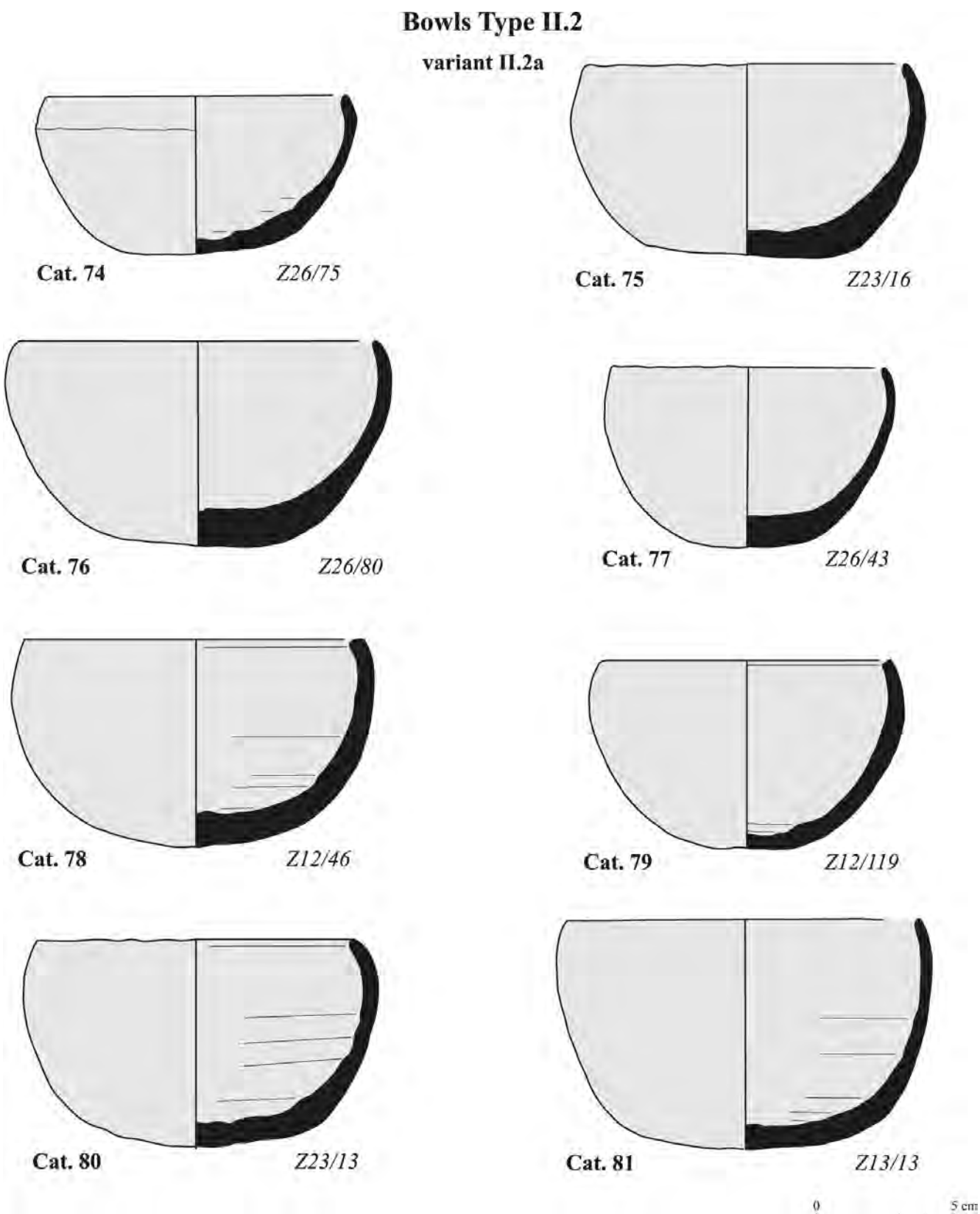

FIGURE 7.16 Hemispherical bowls of type II.2 with incurved walls, variant a

Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

Cat. 80
Bowl
Inv. no: **Z23/13**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (1)
State of preservation: incomplete, chipped rim, 94 % of rim
Measurements: Dr = 11 cm; H = 7.7 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, carefully executed
Surface colour: external, slip—7.5YR 4/4 dark brown; internal, slip—7.5YR 4/6 strong brown
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 81
Bowl
Inv. no: **Z13/13**
Provenance: Tumulus 13, chamber 4, central part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13.2 cm; H = 8.3 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 82
Bowl
Inv. no: **Z26/50+Z26/83.2**
Provenance: Tumulus 26, chamber 2, southern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 10.5 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, carefully executed
Surface colour: external natural surface—7.5YR 5/4 brown, slip—10R 4/6 red; internal, slip—2.5YR 4/4 reddish brown
Colour of break: not possible to determine

Cat. 83
Bowl
Inv. no: **Z14/13**
Provenance: Tumulus 14, chamber 3, north-western corner
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 12 cm; H = 7.1 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

Cat. 84
Bowl
Inv. no: **Z24/19**
Provenance: Tumulus 24, chamber 1, eastern part
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 88 % of rim, body-sherd fragments missing
Measurements: Dr = 11.8 cm; H = 7.2 cm
Fabric: ZF3
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, carefully executed
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: 2.5YR 3/2 dusky red

Cat. 85
Bowl
Inv. no: **Z14/10**
Provenance: Tumulus 14, chamber 3, central part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 9 cm
Fabric: not possible to determine

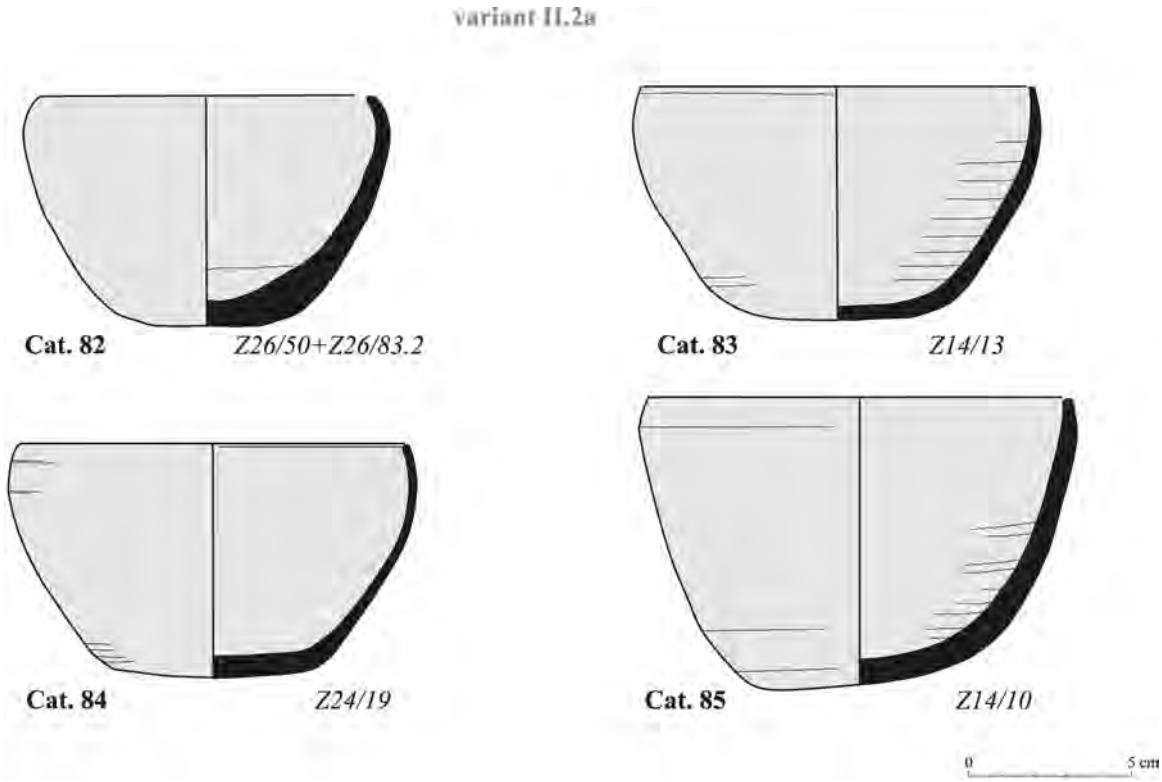

FIGURE 7.17 Hemispherical bowls of type II.2 with incurved walls, variant a

Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, carelessly executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

Variant II.2b
Cat. 86
Bowl
Inv. no: **Z12/35**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, body-sherd fragments missing
Measurements: Dr = 10.2 cm; H = 6.8 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 5/6 red
Colour of break: 5YR 4/6 yellowish red

Cat. 87
Bowl
Inv. no: **Z12/97**
Provenance: Tumulus 12, chamber 3, western part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 12.3 cm; H = 8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: not possible to determine

Cat. 88
Bowl
Inv. no: **Z12/123**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 16.2–16.5 cm; H = 10.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine

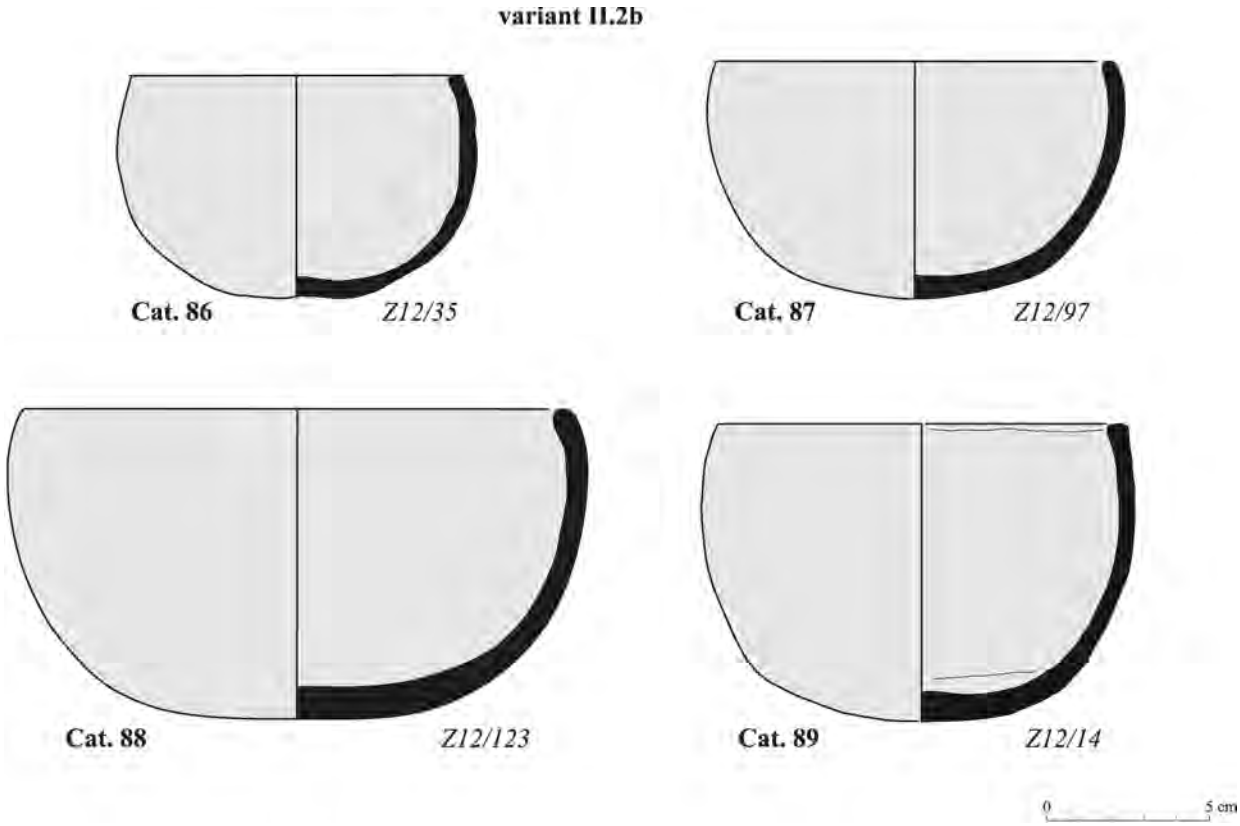

FIGURE 7.18 Hemispherical bowls of type II.2 with incurved walls and maximum diameter at mid-H, variant b

Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1 on the upper part, burnish 2 on the lower part, carefully executed
Surface colour: external, slip—10R 5/4 weak red; internal, slip—10R 5/4 weak red
Colour of break: not possible to determine

Cat. 89
Bowl
Inv. no: **Z12/14**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, body-sherd fragments missing
Measurements: Dr = 12.8 cm; H = 9.2 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, less carefully executed
Surface colour: external, slip—10R 4/8 red; internal, slip—2.5YR 5/6 red
Colour of break: 7.5YR 5/4 brown
References: (Czyżewska-Zalewska 2016, 728–730)

Cat. 90
Bowl
Inv. no: **Z12/44**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, 90% of rim, body-sherd fragments missing
Measurements: Dr = 12 cm; H = 9.5 cm
Fabric: ZF2
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, carefully executed
Surface colour: external natural surface—7.5YR 5/6 strong brown, slip—2.5YR 4/4 reddish brown; internal, slip—2.5YR 5/6 red
Colour of break: 5YR 4/6 yellowish red

Cat. 91
Bowl
Inv. no: **Z12/106**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, 91% of rim, body-sherd fragments missing

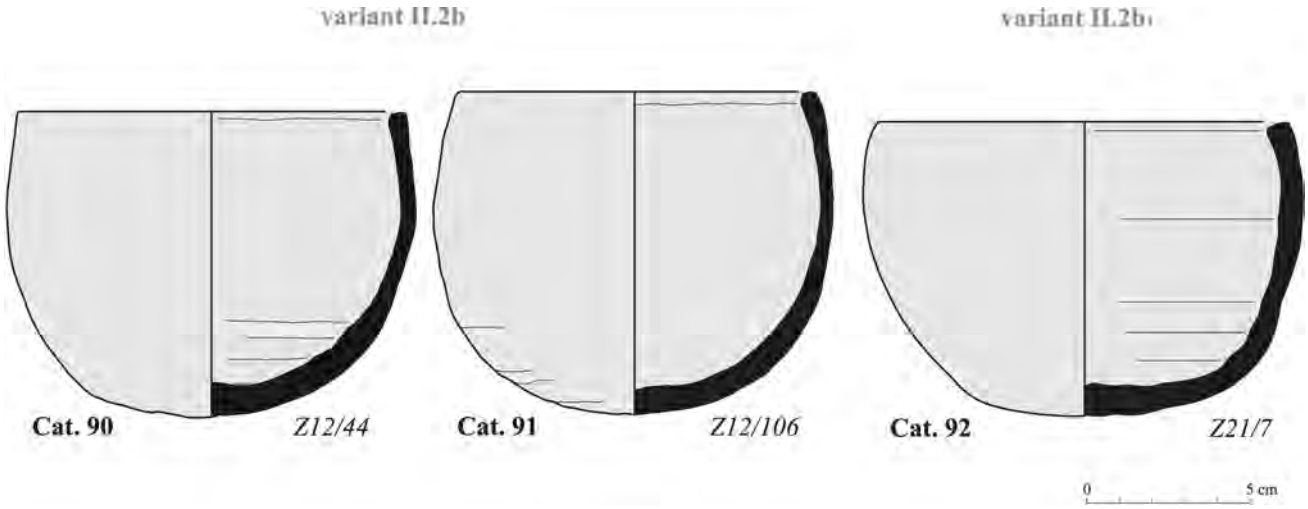

FIGURE 7.19 Hemispherical bowls of type II.2 with straight walls and maximum diameter at mid-H, variant b

Measurements: Dr = 11 cm; H = 9.8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 3 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: 7.5YR 5/4 brown
References: (Czyżewska-Zalewska 2016, 728–730)

Variant II.2b$_1$
Cat. 92
Bowl
Inv. no: **Z21/7**
Provenance: Tumulus 21, burial chamber
Construction: wheel-made (1)
State of preservation: almost complete, 92% of rim, lip chipped off
Measurements: Dr = 13 cm; H = 9.2 cm
Fabric: ZF3
Hardness: 3/4
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—7.5YR 6/4 light brown, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: Gley2 3/5PB very dark bluish grey

Variant II.2c
Cat. 93
Bowl
Inv. no: **Z12/41**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, 55% of rim, body-sherd fragments missing
Measurements: Dr = 11.5 cm; H = 5.9 cm
Fabric: ZF2
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external natural surface—10R 4/8 red, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: 7.5YR 3/1 very dark grey

Cat. 94
Bowl
Inv. no: **Z12/15**
Provenance: Tumulus 12, chamber 2, southern part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 12.8 cm; H = 6.8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2—less carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Czyżewska-Zalewska 2016, 728–730)

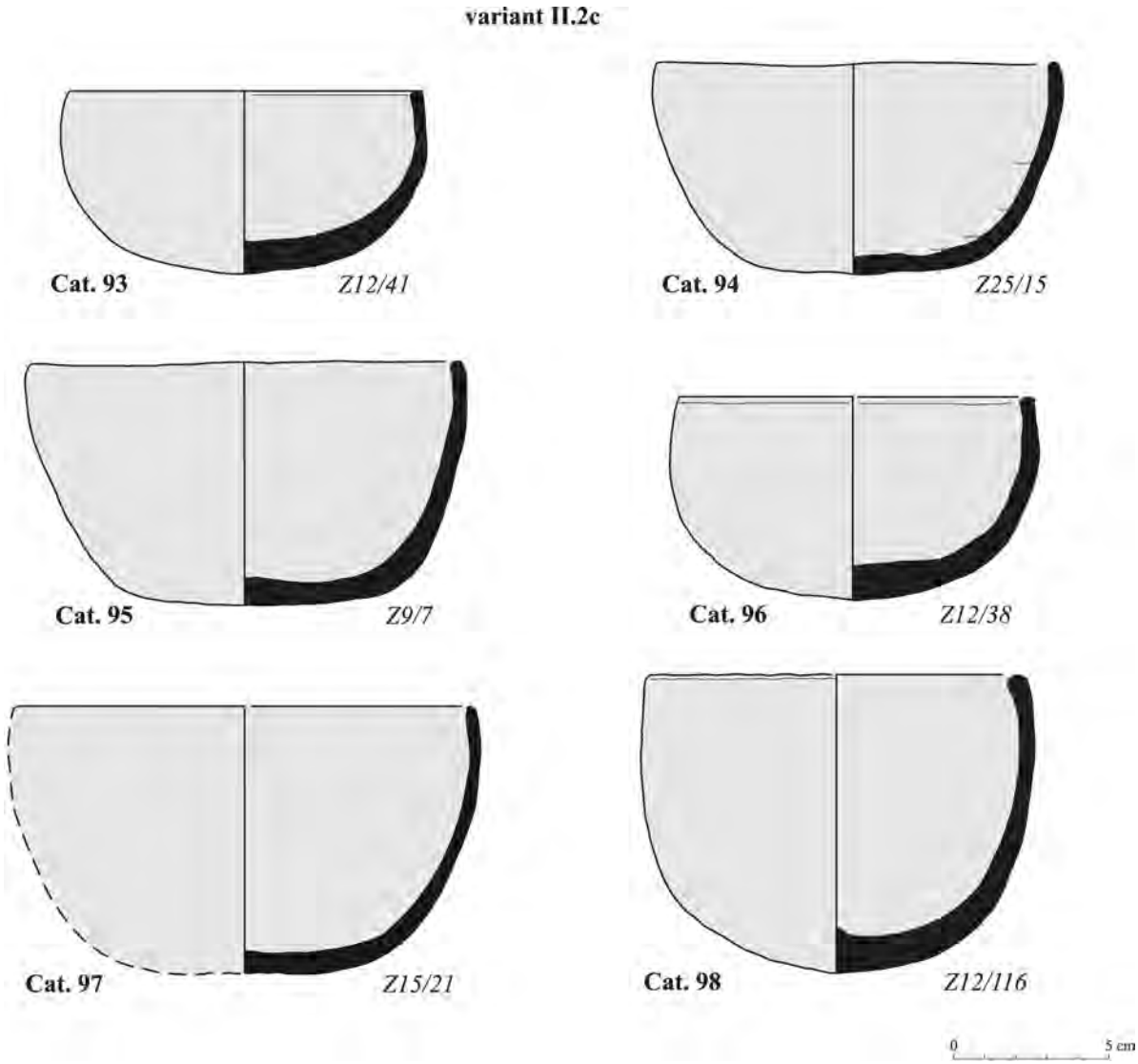

FIGURE 7.20 Low hemispherical bowls of type II.2 with straight walls, variant c

Cat. 95
Bowl
Inv. no: **Z9/7**
Provenance: Tumulus 9, chamber 1, central part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 14 cm; H = 7.8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 2—less carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 96
Bowl
Inv. no: **Z12/38**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, 47% of rim, body-sherd fragments missing
Measurements: Dr = 11.5 cm; H = 6.8 cm
Fabric: Z F1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 10YR 5/4 yellowish brown

Cat. 97
Bowl
Inv. no: **Z15/21**
Provenance: Tumulus 15, fill of shaft, southern part, near blocking wall of main burial chamber
Construction: wheel-made (1)
State of preservation: incomplete, 37 % of rim, body-sherd fragments missing
Measurements: Dr = 15 cm; H = 8.4 cm
Fabric: ZF5
Hardness: 3
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1 on both surfaces, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 10YR 5/4 yellowish brown

Cat. 98
Bowl
Inv. no: **Z12/116**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 12 cm; H = 9.7 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 3 on both surfaces, carelessly executed
Surface colour: external natural surface—2.5YR 5/8 red, slip—10R 5/6 red; internal, slip—2.5YR 5/4 reddish brown
Colour of break: not possible to determine

Variant 11.2d
Cat. 99
Bowl
Inv. no: **Z26/85+Z26/86**
Provenance: Tumulus 26, chamber 4, central part
Construction: wheel-made (1)
State of preservation: complete, restored from sherds
Measurements: Dr = 11 cm; H = 6.6 cm
Fabric: ZF1
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, carefully executed
Surface colour: external, slip—5YR 5/4 reddish brown; internal, slip—5YR 4/3 reddish brown
Colour of break: 2.5Y 2.5/1 black

Cat. 100
Bowl
Inv. no: **Z12/101**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, less carefully executed
Surface colour: external natural surface—2.5YR 5/8 red, slip—10YR 4/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine

Cat. 101
Bowl
Inv. no: **Z12/126**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 8.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 2, carefully executed; internal—burnish 1, carefully executed
Surface colour: external natural surface—10R 5/6 red, slip—10R 4/6 red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine
Notes: bowl much heavier than other vessels of this type

Cat. 102
Bowl
Inv. no: **Z14/7**
Provenance: Tumulus 14, chamber 3, western part
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 14 cm; H = 8.2 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, carefully executed
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

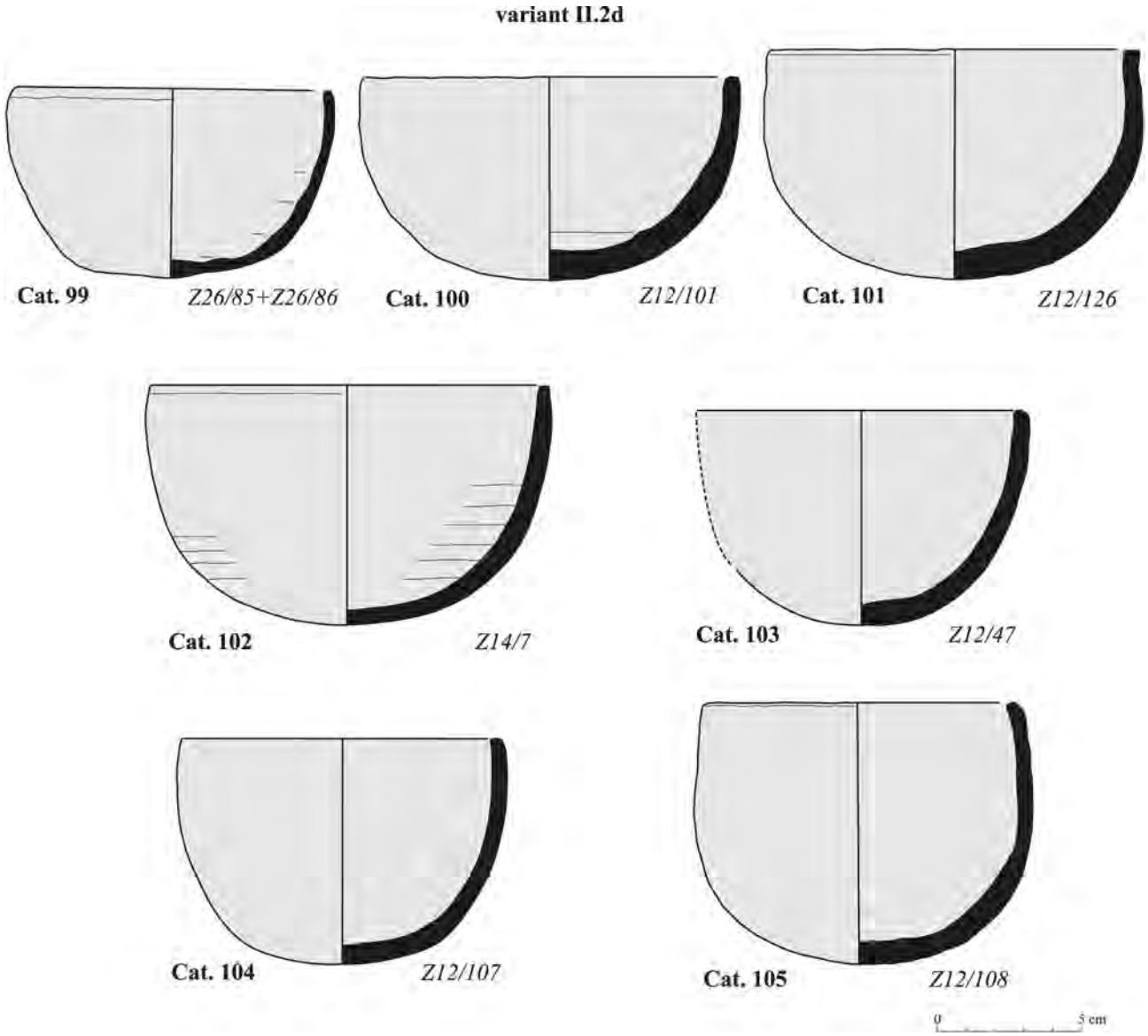

FIGURE 7.21 Deep and medium-deep hemispherical bowls of type II.2 with straight walls, variant d

Cat. 103
Bowl
Inv. no: **Z12/47**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: fragmentary, restored from sherds, 40 % of rim, body-sherd fragments missing
Measurements: Dr = 11.4 cm; H = 8.4 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 2 on both surfaces, less carefully executed
Surface colour: external, slip—10R 4/4 weak red; internal, slip—2.5YR 5/4 reddish brown
Colour of break: 7.5YR 4/4 dark brown

Cat. 104
Bowl
Inv. no: **Z12/107**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 11 cm; H = 8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, carefully executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine

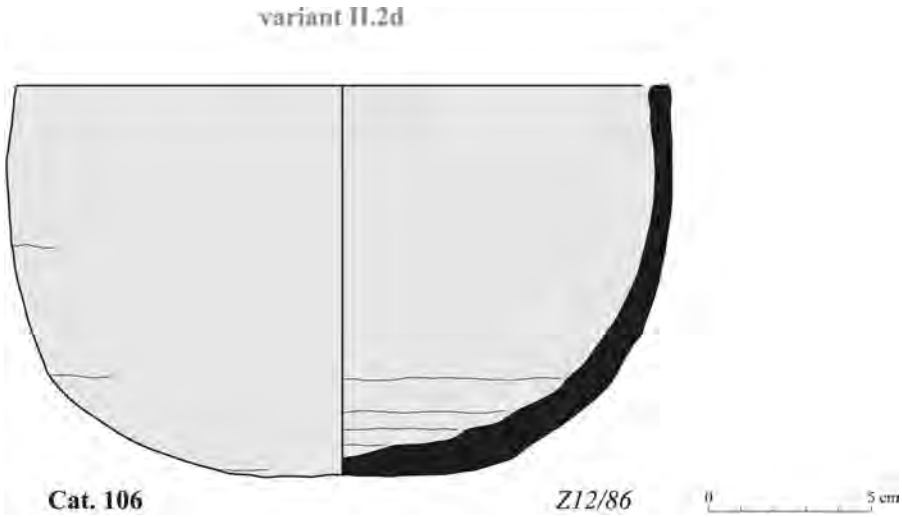

FIGURE 7.22 Deep hemispherical bowl of type II.2 with straight walls, variant d

Cat. 105
Bowl
Inv. no: **Z12/108**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, chipped rim, 97% of rim
Measurements: Dr = 11 cm; H = 9 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 3, less carefully executed; internal—burnish 3, carelessly executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

Cat. 106
Bowl
Inv. no: **Z12/86**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (1)
State of preservation: incomplete, 88% of rim
Measurements: Dr = 20 cm; H = 12 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, carefully executed
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/4 weak red
Colour of break: 10YR 4/1 dark grey
References: (Czyżewska-Zalewska 2016, 728–730)

Variant II.2e
Cat. 107
Bowl
Inv. no: **Z25/11**
Provenance: Tumulus 25, chamber 2, southern part
Construction: wheel-made (1)
State of preservation: incomplete, chipped rim, 91% of rim
Measurements: Dr = 11.4 cm; H = 6.8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 2, carelessly executed
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 5/6 red
Colour of break: 5YR 5/6 yellowish red
References: (Klimaszewska-Drabot 2010, 481)

Cat. 108
Bowl
Inv. no: **Z12/37**
Provenance: Tumulus 12, fill of shaft, south-eastern part
Construction: wheel-made (1)
State of preservation: incomplete, 84% of rim, body sherds missing
Measurements: Dr = 11.6 cm; H = 6.5 cm
Fabric: ZF3
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 10YR 5/4 yellowish brown

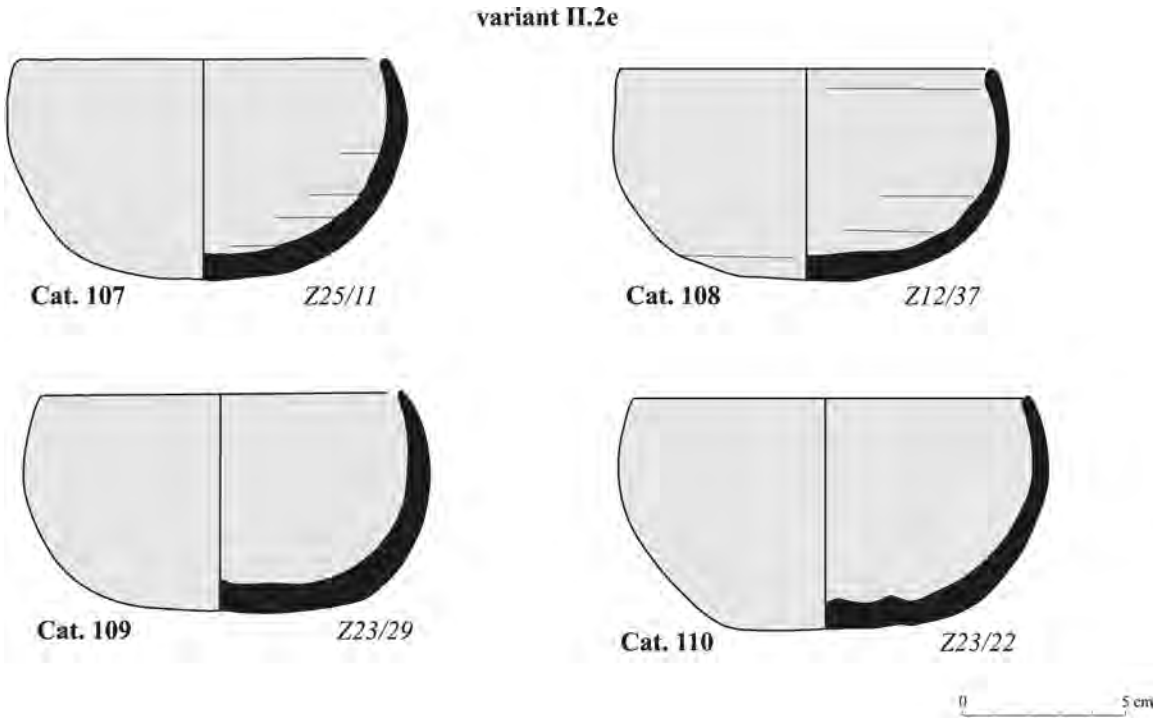

FIGURE 7.23 Low hemispherical bowls of type 11.2 with incurved walls and maximum diameter at mid-H, variant e

Cat. 109
Bowl
Inv. no: **Z23/29**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 11–11.5 cm; H = 6.7 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; burnish 1, carefully executed on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/4 weak red
Colour of break: not possible to determine

Cat. 110
Bowl
Inv. no: **Z23/22**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (1)
State of preservation: complete
Measurements: Dr = 12.4 cm; H = 7.2 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on both surfaces; external—burnish 1, carefully executed; internal—burnish 1, less carefully executed
Surface colour: external, slip—10R 5/4 weak red; internal, slip—10R 4/6 red
Colour of break: not possible to determine

3.3 *Bowls Type 11.3* [*Figs 7.95–7.96*]

Variant 11.3a
Cat. 111
Bowl
Inv. no: **Z12/18**
Provenance: Tumulus 12, fill of shaft
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10.5 cm; H = 5.6 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Czyżewska-Zalewska 2016, 728–730)

Cat. 112
Bowl
Inv. no: **Z12/17**

Provenance: Tumulus 12, fill of shaft
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 11.5 cm; H = 5.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: external, slip—2.5YR 4/4 reddish brown; internal, slip—5YR 4/3 reddish brown
Colour of break: not possible to determine
References: (Czyżewska-Zalewska 2016, 728–730)

Cat. 113
Bowl
Inv. no: **Z12/42**
Provenance: Tumulus 12, fill of shaft
Construction: wheel-made (2)
State of preservation: incomplete, 65 % of rim, body sherds missing
Measurements: Dr = 10.8 cm; H = 6 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: 5YR 5/6 yellowish red

Cat. 114
Bowl
Inv. no: **Z10/1**
Provenance: Tumulus 10, burial chamber, southern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10.6 cm; H = 6.7 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—2.5YR 5/6 red, slip—7.5YR 4/6 strong brown; internal, slip—7.5R 4/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot 2010, 481)

Cat. 115
Bowl
Inv. no: **Z10/6**
Provenance: Tumulus 10, burial chamber, central part
Construction: wheel-made (2)
State of preservation: complete but broken
Measurements: Dr = 14 cm; H = 8.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 2.5YR 5/6 red
References: (Klimaszewska-Drabot 2010, 481)

Cat. 116
Bowl
Inv. no: **Z12/117**
Provenance: Tumulus 12, chamber 3
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 14.4 cm; H = 8.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 5/6 red on both surfaces
Colour of break: not possible to determine

Cat. 117
Bowl
Inv. no: **Z11/25**
Provenance: Tumulus 11, chamber 2, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 14 cm; H = 8.4 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/8 red on both surfaces
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 118
Bowl
Inv. no: **Z11/27**
Provenance: Tumulus 11, chamber 2, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.2 cm; H = 7.6 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine

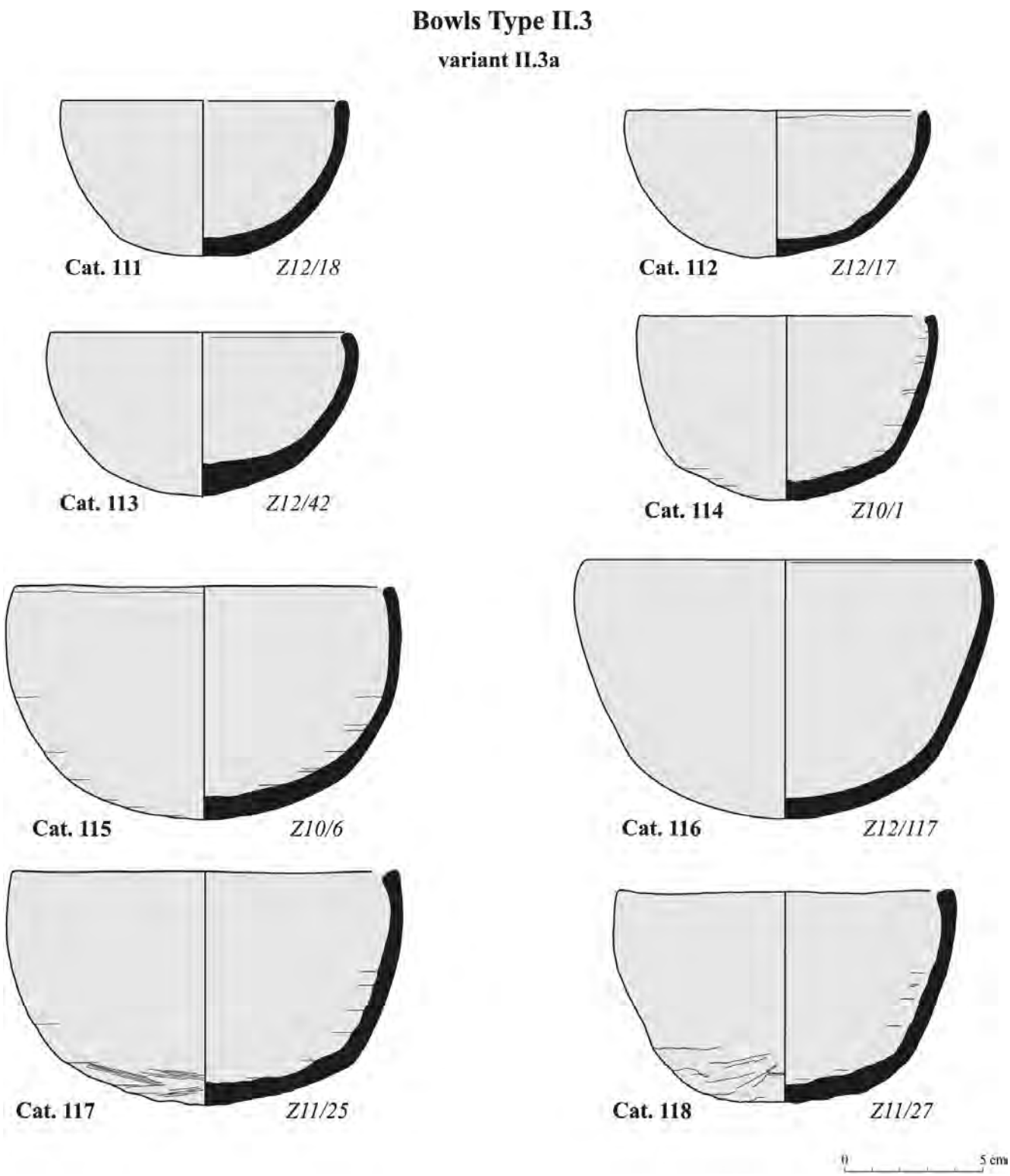

FIGURE 7.24 Hemispherical bowls of type II.3 with incurved walls, variant a

Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10YR 5/6 yellowish brown
Colour of break: not possible to determine

Variant II.3b
Cat. 119
Bowl
Inv. no: **Z12/39**
Provenance: Tumulus 12, fill of shaft

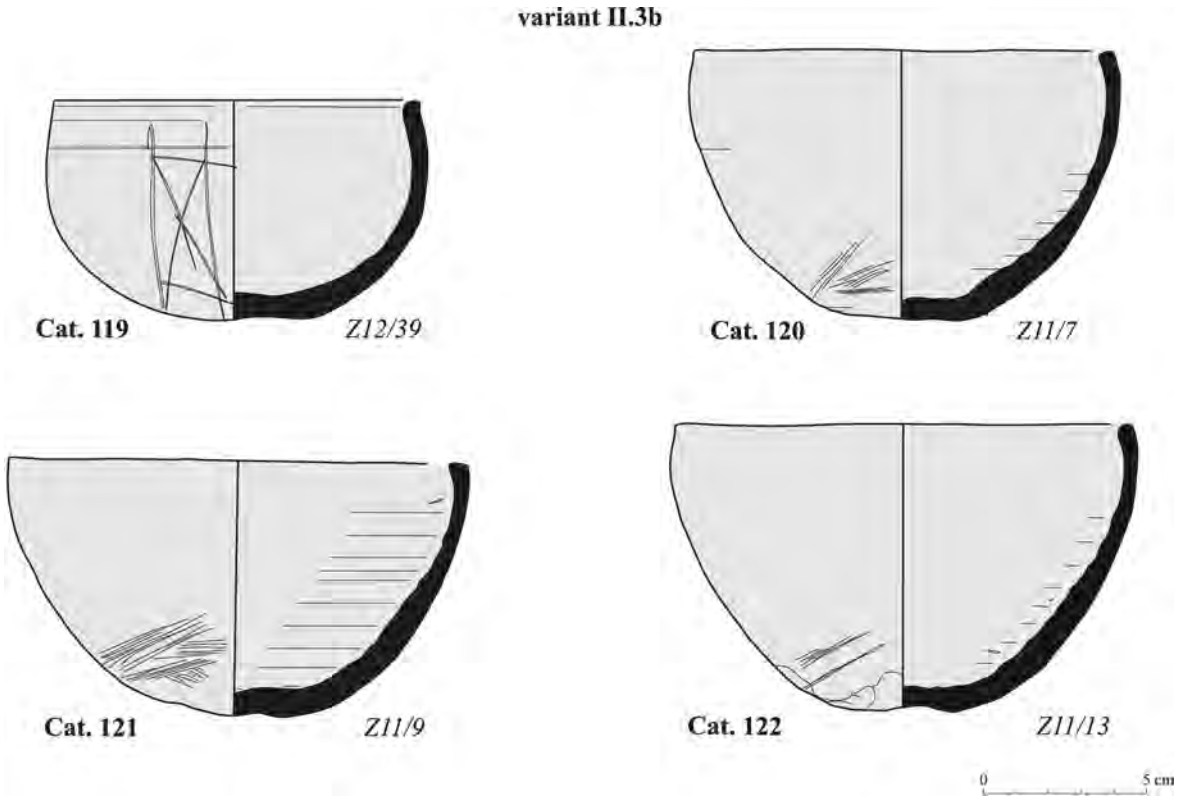

FIGURE 7.25 Hemispherical bowls of type II.3 with incurved walls, variant b

Construction: wheel-made (2)
State of preservation: fragmentary, 43% of rim, lower part complete
Measurements: Dr = 11.2 cm; H = 6.8 cm
Fabric: ZF1
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 7.5YR 5/1 grey

Cat. 120
Bowl
Inv. no: **Z11/7**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: incomplete, 97% of rim, lip chipped off
Measurements: Dr = 12.9 cm; H = 8.3 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/6 red on both surfaces
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 121
Bowl
Inv. no: **Z11/9**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: incomplete, 88% of rim, body fragment missing
Measurements: Dr = 14 cm; H = 8 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/8 red on both surfaces
Colour of break: 10R 5/8 red
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 122
Bowl
Inv. no: **Z11/13**
Provenance: Tumulus 11, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: complete

Measurements: Dr = 14 cm; H = 8.8 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/8 red on both surfaces
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372; Mahmoud El-Tayeb and Czyżewska 2011, 115–117)

3.4 *Bowls Type 11.4* [*Figs 7.97–7.98*]

Variant 11.4a

Cat. 123
Bowl
Inv. no: **Z4/254**
Provenance: Tumulus 4, E tunnel, southern part
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 17% of rim, wall fragments survive
Measurements: Dr = 12.6 cm; H = 5.2 cm
Fabric: ZF3
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: 2.5YR 5/6 red
Decoration: incised—one groove below rim

Cat. 124
Bowl
Inv. no: **Z14/6**
Provenance: Tumulus 14, chamber, western part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.5 cm; H = 7.6 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—one to two spiral grooves below rim

Cat. 125
Bowl
Inv. no: **Z4/134+Z4/34**
Provenance: Tumulus 4, W tunnel
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 11.6 cm; H = 7.3 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—two to three spiral grooves below rim

Cat. 126
Bowl
Inv. no: **Z2/24**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (2)
State of preservation: incomplete, body sherd missing
Measurements: Dr = 13.4 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—two grooves below rim

Cat. 127
Bowl
Inv. no: **Z7/46**
Provenance: Tumulus 7, sherds scattered in different places, context 2, fill of shaft
Construction: wheel-made (2)
State of preservation: incomplete, 87% of rim, base fragment missing
Measurements: Dr = 12.2 cm; H = 8 cm
Fabric: ZF1
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—2.5YR 5/6 red on both surfaces
Colour of break: 2.5YR 5/8 red
Decoration: incised—three grooves below rim

Cat. 128
Bowl
Inv. no: **Z1/1**
Provenance: Tumulus 1, trench 2, tunnel entrance, eastern side
Construction: wheel-made (2)
State of preservation: fragmentary, 25% of rim, body sherds missing
Measurements: Dr = 10.5 cm; H = 6 cm
Fabric: ZF3
Hardness: 4

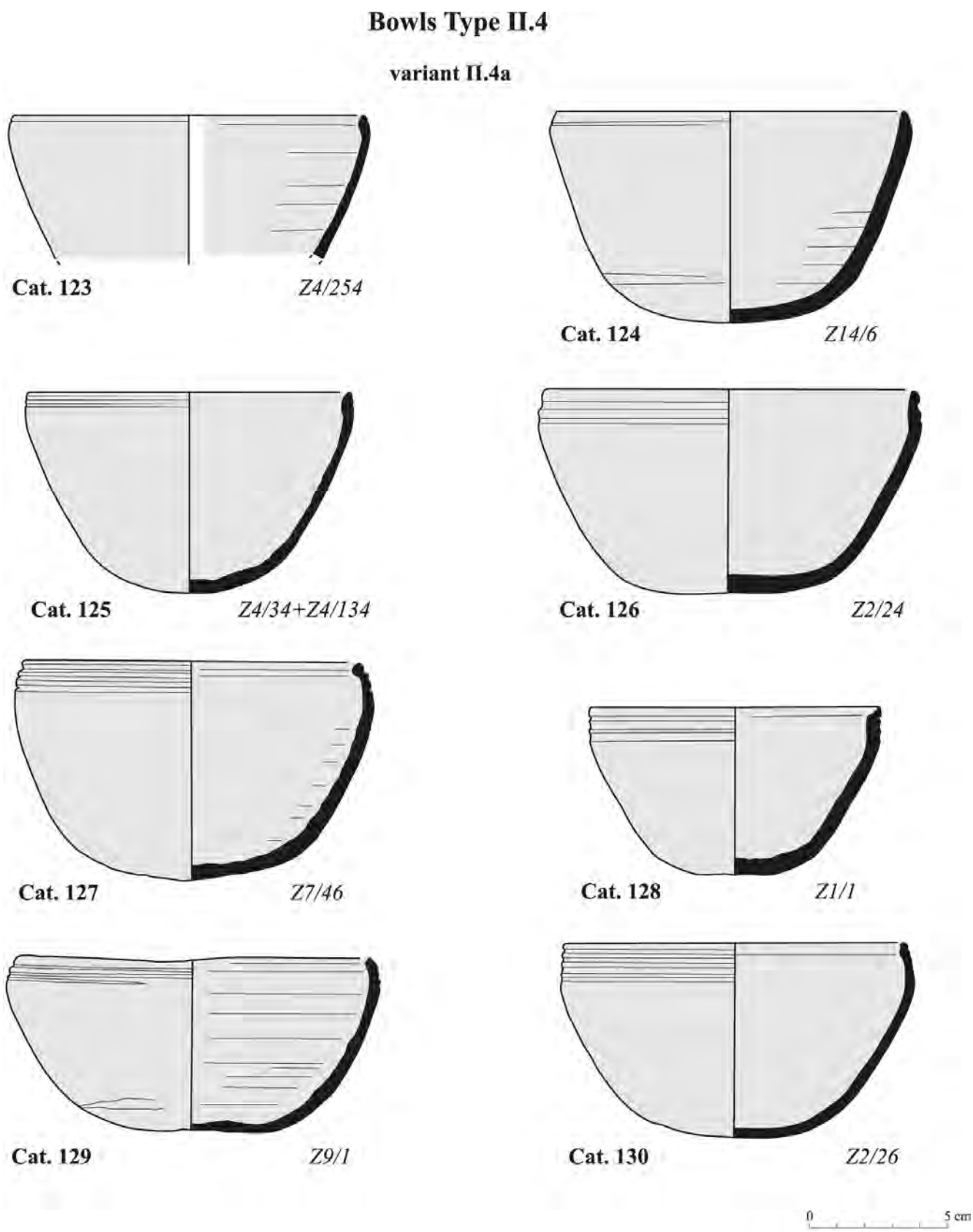

FIGURE 7.26 Conical bowls of type II.4 with incurved walls and grooves below the rim, variant a

Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/6 red on both surfaces
Colour of break: 7.5YR 5/3 brown
Decoration: incised—three grooves below rim

Cat. 129
Bowl
Inv. no: **Z9/1**
Provenance: Tumulus 9, bottom of shaft, southern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.5 cm; H = 6.3 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—three to four spiral grooves below rim
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367, 369–371)

Cat. 130
Bowl
Inv. no: **Z2/26**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.2 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—four to five spiral grooves below rim

Cat. 131
Bowl
Inv. no: **Z2/4**
Provenance: Tumulus 2, chamber 3
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 11 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red, on both surfaces
Colour of break: not possible to determine
Decoration: incised—two grooves below rim, one groove at mid-H

Cat. 132
Bowl
Inv. no: **Z23/26**
Provenance: Tumulus 23, chamber 2
Construction: wheel-made (2)
State of preservation: incomplete, 94% of rim
Measurements: Dr = 12.1 cm; H = 8.2 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 5/8 red; internal, slip—10R 5/6 red
Colour of break: 10R 5/8 red
Decoration: incised—two grooves below rim, one groove at mid-H

Cat. 133
Bowl
Inv. no: **Z4/35**
Provenance: Tumulus 4, W tunnel
Construction: wheel-made (2)
State of preservation: incomplete, restored from sherds, 97% of rim, body-sherd fragments missing
Measurements: Dr = 12.6 cm; H = 7.2 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—7.5R 4/6 red
Colour of break: 2.5YR 5/6 red
Decoration: incised—two grooves below rim, one groove at mid-H

Cat. 134
Bowl
Inv. no: **Z2/19**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10.6 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red, on both surfaces

Colour of break: not possible to determine
Decoration: incised—two to three grooves below rim, two grooves at mid-H

Cat. 135
Bowl
Inv. no: **Z4/201**
Provenance: Tumulus 4, E tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, 58% of rim, body-sherd fragments missing
Measurements: Dr = 12 cm; H = 7.6 cm
Fabric: Z F1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 3/6 dark red; internal, slip—10R 4/6 red
Colour of break: 5YR 5/6 yellowish red
Decoration: incised—two to three grooves below rim, one groove at mid-H

Cat. 136
Bowl
Inv. no: **Z2/28**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.2 cm; H = 7.3 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red, on both surfaces
Colour of break: not possible to determine
Decoration: incised—three grooves below rim, two grooves at mid-H

Cat. 137
Bowl
Inv. no: **Z2/5**
Provenance: Tumulus 2, chamber 3
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 11.5 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red, on both surfaces
Colour of break: not possible to determine
Decoration: incised—three to four spiral grooves below rim, two grooves at mid-H

Cat. 138
Bowl
Inv. no: **Z2/22**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10.6 cm; H = 6.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 5/8 red; internal, 10R 4/8 red
Colour of break: not possible to determine
Decoration: incised—four grooves below rim, two grooves at mid-H
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Variant 11.4b
Cat. 139
Bowl
Inv. no: **Z4/14.3a**
Provenance: Tumulus 4, tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, 51% of rim, body sherds and base missing
Measurements: Dr = 11 cm; H = 8.2 cm
Fabric: Z F1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: 5YR 5/6 yellowish red
Decoration: incised—two to three spiral grooves below rim;
painted—sets of white bands with four black dots on rim (two sets extant)

Cat. 140
Bowl
Inv. no: **Z25/19**
Provenance: Tumulus 25, chamber 3, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 13.5 cm; H = 8.3 cm
Fabric: not possible to determine
Hardness: 4

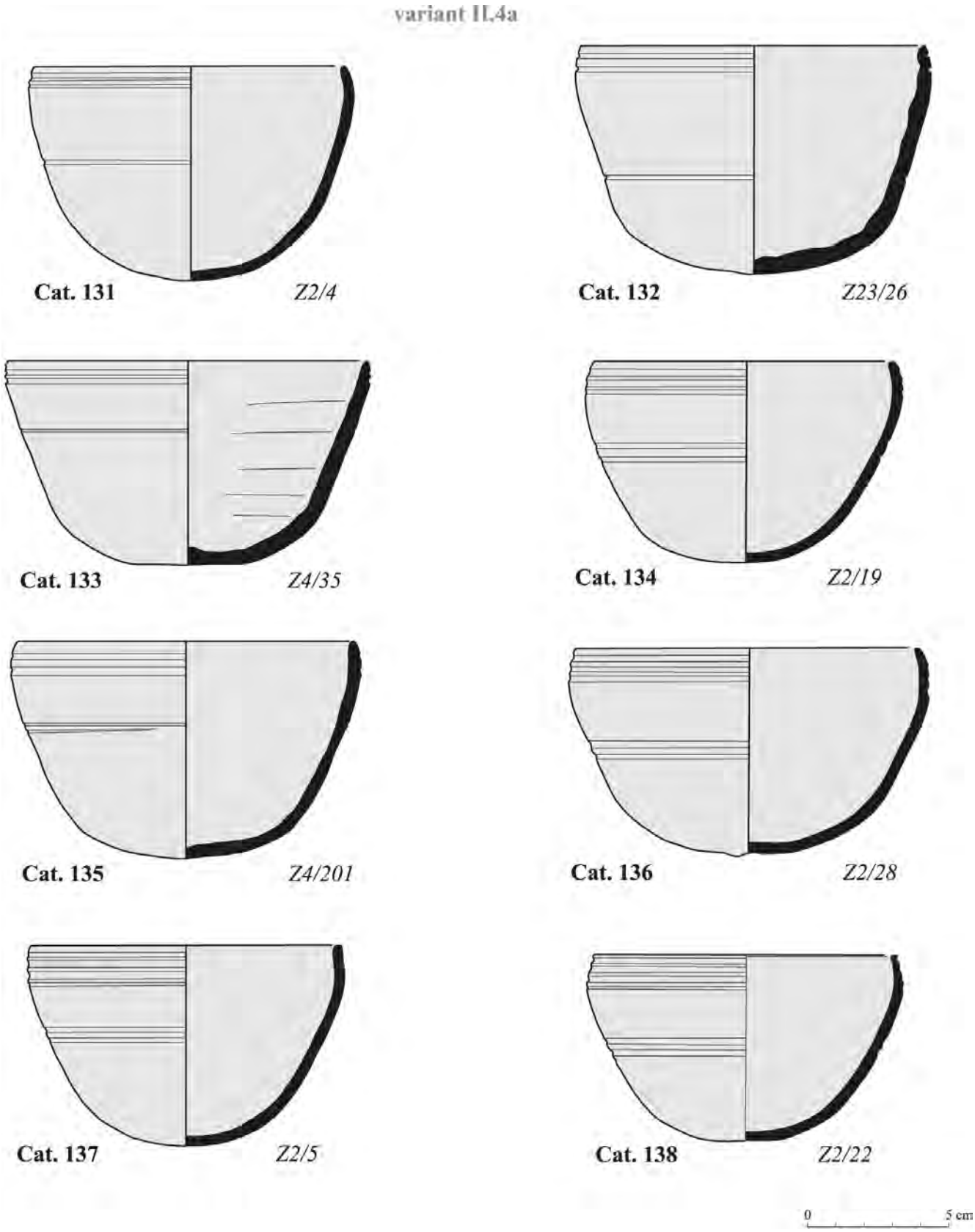

FIGURE 7.27 Conical bowls of type II.4 with incurved walls and grooves below the rim, variant a

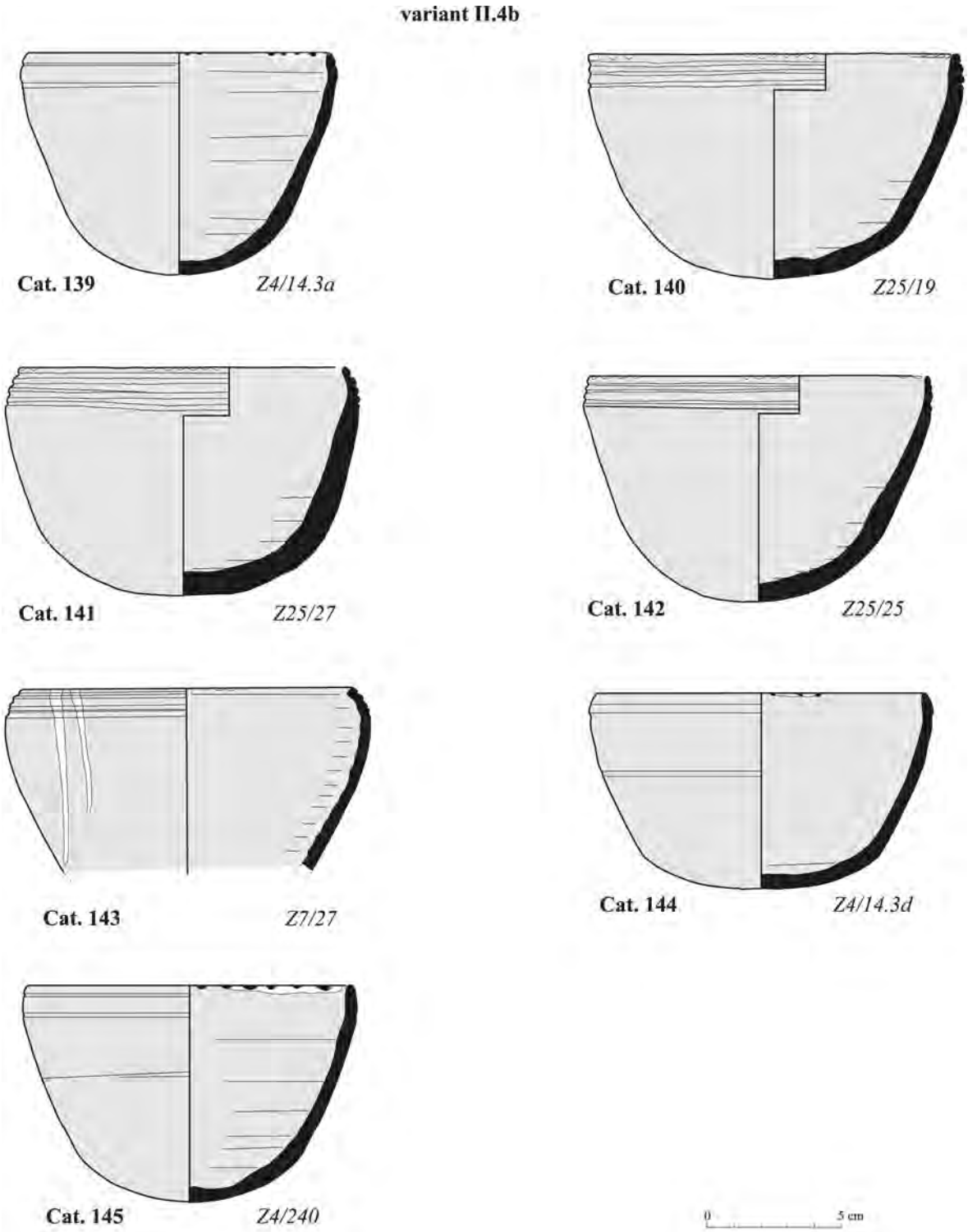

FIGURE 7.28 Conical bowls of type II.4 with incurved walls, grooves below the rim and painted decoration, variant b

Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
Decoration: incised—three grooves below rim;
painted—three sets of five white dots, and one set of six white dots on rim
References: (Klimaszewska-Drabot 2010, 481)

Cat. 141
Bowl
Inv. no: **Z25/27**
Provenance: Tumulus 25, chamber 3, southern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.3 cm; H = 8.4 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
Decoration: incised—four to five spiral grooves below rim;
painted—four sets of five white dots on rim
References: (Klimaszewska-Drabot 2010, 481; Czyżewska-Zalewska 2016, 728–730)

Cat. 142
Bowl
Inv. no: **Z25/25**
Provenance: Tumulus 25, chamber 3, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12.4 cm; H = 8.3 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—three to four spiral grooves below rim;
painted—four sets of six white dots on rim
References: (Klimaszewska-Drabot 2010, 481)

Cat. 143
Bowl
Inv. no: **Z7/27**
Provenance: Tumulus 7, context 1, fill of shaft
Construction: wheel-made (2)
State of preservation: fragmentary, 58 % of rim, bottom part and body sherds missing
Measurements: Dr = 12 cm; H = 6.7 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: 7.5YR 5/4 brown
Decoration: incised—three to four spiral grooves below rim;
painted—two sets of two white lines extending downwards from rim

Cat. 144
Bowl
Inv. no: **Z4/14.3d**
Provenance: Tumulus 4, tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, 20 % of rim, body-sherd fragments missing
Measurements: Dr = 12 cm; H = 7.3 cm
Fabric: ZF4
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/4 weak red, on both surfaces
Colour of break: 5YR 4/4 reddish brown
Decoration: incised—two grooves below rim, one groove at mid-H;
painted—remnants of two sets of white bands with black dots extant on rim

Cat. 145
Bowl
Inv. no: **Z4/240**
Provenance: Tumulus 4, E tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, 71 % of rim, body-sherd and base fragments missing
Measurements: Dr = 12 cm; H = 8.1 cm
Fabric: ZF3
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: 5YR 4/6 yellowish red
Decoration: incised—two to three spiral grooves below rim, one to two spiral grooves at mid-H; painted—

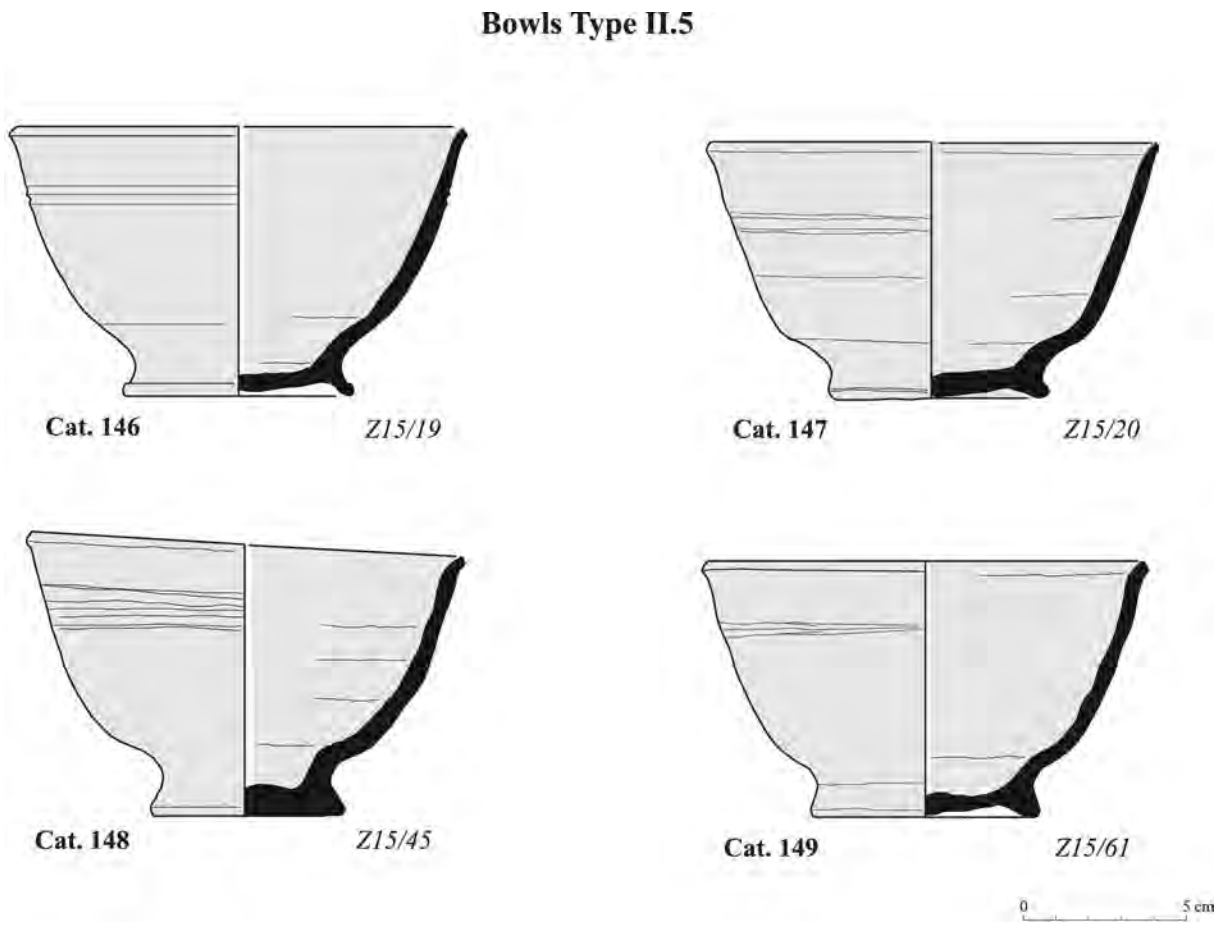

FIGURE 7.29 Footed bowls of type II.5 with flared walls and grooved decoration

fragments of two sets of white bands with six and seven black dots extant on rim

3.5 ***Bowls Type II.5*** [*Fig. 7.99*]

Cat. 146
Bowl
Inv. no: **Z15/19**
Provenance: Tumulus 15, shaft (southern part), near blocking wall of main burial chamber
Construction: wheel-made (2)
State of preservation: fragmentary, rim and wall fragments missing, 28% of rim, almost complete base
Measurements: Dr = 14 cm; H = 8.2 cm; D_b = 6.9 cm
Fabric: ZF1
Hardness: 3
Firing: oxidized
Surface treatment: slipped on both surfaces and polished
Surface colour: external—10R 5/8 red, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 5YR 5/6 yellowish red
Decoration: incised—grooves on the external surface

Cat. 147
Bowl
Inv. no: **Z15/20**
Provenance: Tumulus 15, shaft (southern part), near blocking wall of main burial chamber
Construction: wheel-made (2)
State of preservation: incomplete, 96% of rim, complete base
Measurements: Dr = 13.8 cm; H = 8 cm; D_b = 6.2 cm
Fabric: ZF1
Hardness: 3
Firing: oxidized
Surface treatment: slipped on both surfaces and polished
Surface colour: external—10R 5/8 red, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 5YR 5/4 reddish brown

Cat. 148
Bowl
Inv. no: **Z15/45**
Provenance: Tumulus 15, main burial chamber, eastern part
Construction: wheel-made (2)
State of preservation: incomplete, 88% of rim, complete base

Measurements: Dr = 13.7 cm; H = 8.9 cm; D_b = 6.1 cm
Fabric: ZF1
Hardness: 3
Firing: oxidized
Surface treatment: slipped on both surfaces and polished
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: 2.5YR 5/4 reddish brown
Decoration: incised—grooves on external surface
References: (Czyżewska-Zalewska 2016, 728–730)

Cat. 149
Bowl
Inv. no: **Z15/61**
Provenance: Tumulus 15, main burial chamber, eastern part
Construction: wheel-made (2)
State of preservation: fragmentary, rim and wall fragments missing, 42% of rim, complete base
Measurements: Dr = 13.6 cm; H = 7.8 cm; D_b = 6.9 cm
Fabric: ZF1
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped on both surfaces and polished
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 5YR 5/6 yellowish red
Decoration: incised—grooves on external surface

3.6 *Bowls Type 11.6* [*Fig. 7.100*]

Cat. 150
Bowl
Inv. no: **Z13/28**
Provenance: Tumulus 13, chamber 3, central part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 13 cm; H = 8.4 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 5/6 red
Colour of break: not possible to determine
Decoration: on external surface; incised—three grooves below rim
References: (Klimaszewska-Drabot and Czyżewska 2012, 365–367; Mahmoud El-Tayeb and Czyżewska 2011, 115–117)

Cat. 151
Bowl
Inv. no: **Z7/21**
Provenance: Tumulus 7, superstructure
Construction: wheel-made (2)
State of preservation: fragmentary, 11% of rim, wall fragment
Measurements: Dr = 13.2 cm; H = 7 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—5YR 6/3 light reddish brown, slip—10R 4/6 red; internal—slip—10R 4/6 red
Colour of break: 10YR 7/3 very pale brown
Decoration: on external surface; incised—six grooves below rim

Cat. 152
Bowl
Inv. no: **Z14/26**
Provenance: Tumulus 14, chamber 2, western part
Construction: wheel-made (2)
State of preservation: incomplete, 95% of rim, body sherd missing
Measurements: Dr = 11.6 cm; H = 7.4 cm
Fabric: Lower Nubian?
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red
Colour of break: 5YR 6/4 light reddish brown
Decoration: on external surface; incised—three grooves below rim and two grooves on lower part of body

Cat. 153
Bowl
Inv. no: **Z14/28**
Provenance: Tumulus 14, chamber 2, southern part
Construction: wheel-made (2)
State of preservation: incomplete, body-sherd fragment missing
Measurements: Dr = 12.5 cm; H = 8.3 cm
Fabric: Lower Nubian?
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: 7.5YR 7/4 pink
Decoration: on external surface; incised—six grooves on body

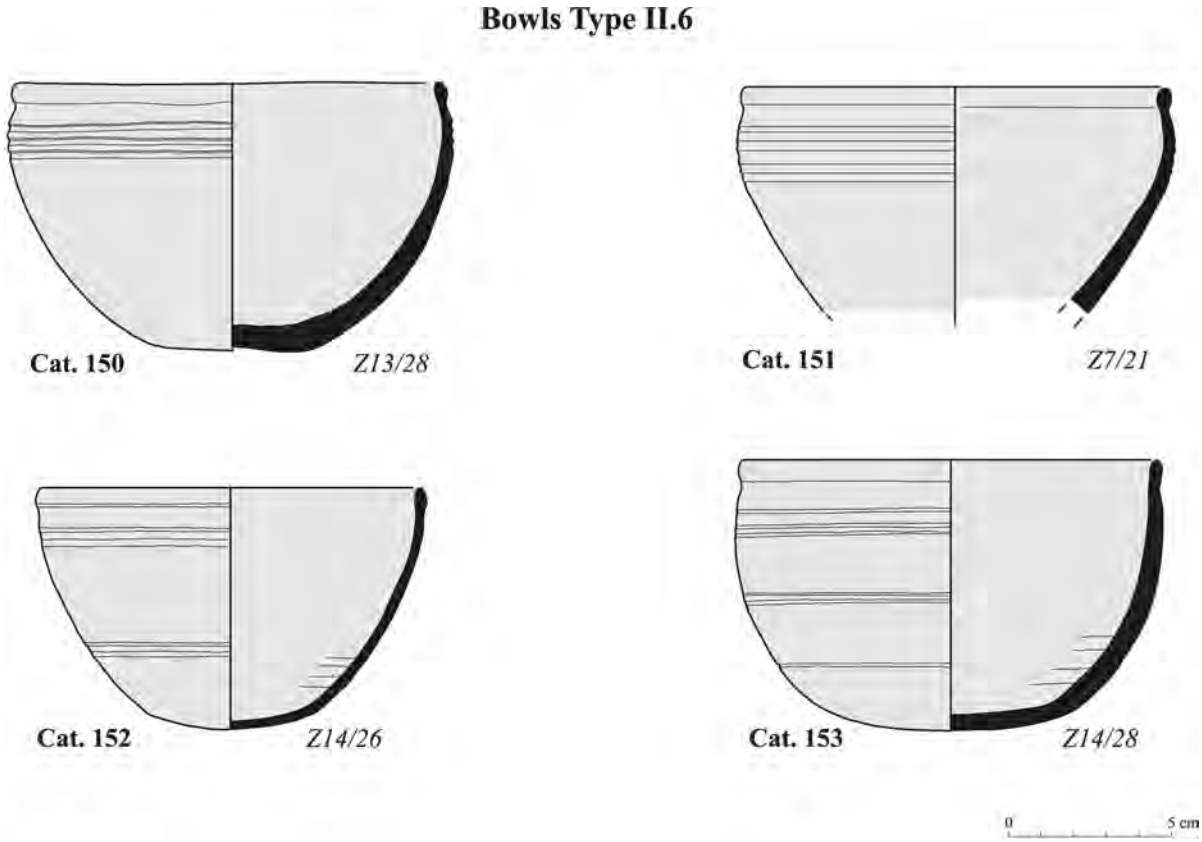

FIGURE 7.30 Bowls of type II.6 with modelled rims and grooved decoration

3.7 ***Bowls Type II.7*** [*Fig. 7.101*]

Variant II.7a

Cat. 154

Bowl

Inv. no: **Z11/30**

Provenance: Tumulus 11, chamber 2, central part

Construction: wheel-made (1)

State of preservation: incomplete, rim and fragment missing, 90% of rim

Measurements: Dr = 12 cm; H = 8.4 cm

Fabric: ZF3

Hardness: 3

Firing: oxidized/reduced

Surface treatment: slipped on both surfaces

Surface colour: external, slip—2.5YR 5/6 red; internal, slip—10YR 8/1 white

Colour of break: 5YR 3/2 dark reddish brown

References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372; Mahmoud El-Tayeb and Czyżewska 2011, 115–117)

Variant II.7b

Cat. 155

Bowl

Inv. no: **Z11/34**

Provenance: Tumulus 11, chamber 1, southern part

Construction: wheel-made (1)

State of preservation: incomplete, 93% of rim

Measurements: Dr = 18.5 cm; H = 13 cm

Fabric: ZF3

Hardness: 3

Firing: oxidized

Surface treatment: slipped on both surfaces

Surface colour: external, slip—10R 4/6 red; internal, slip—5YR 8/2 pinkish white

Colour of break: 2.5YR 3/6 dark red

Cat. 156

Bowl

Inv. no: **Z6/12.1**

Provenance: Tumulus 12, tunnel, blocking wall, central part near N wall

Construction: wheel-made (1)

State of preservation: fragmentary, restored from sherds, rim and wall fragments missing, 34% of rim, complete base

Measurements: Dr = 20 cm; H = 12.6 cm

Fabric: ZF3

Hardness: 4

Firing: oxidized

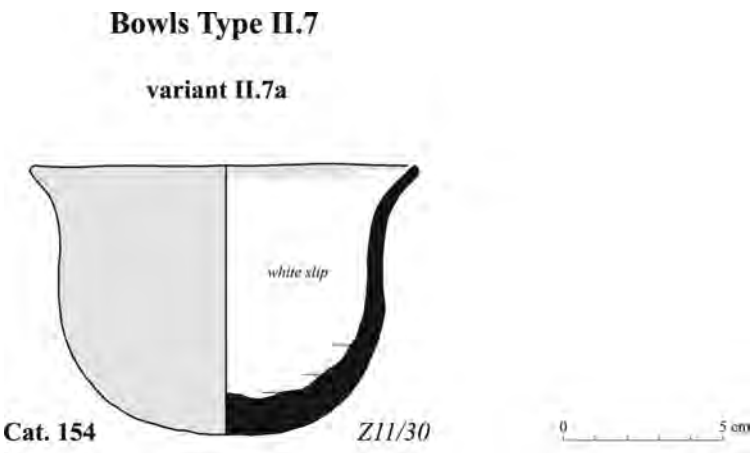

FIGURE 7.31 Hemispherical bowl "tulip-shaped" of type II.7 with flared walls—variant a (medium deep)

Surface treatment: slipped on both surfaces
Surface colour: external, slip—7.5R 5/8 red; internal—7.5YR 6/6 reddish yellow, slip—7.5YR 8/1 white
Colour of break: 5YR 6/8 reddish yellow

Cat. 157
Bowl
Inv. no: **Z6/12.2**
Provenance: Tumulus 12, tunnel, blocking wall, central part near N wall
Construction: wheel-made (1)
State of preservation: incomplete, restored from sherds, rim and wall fragments missing, 62% of rim, complete base
Measurements: Dr = 29 cm; H = 19 cm
Fabric: ZF3
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external—7.5YR 5/6 strong brown, slip—10R 5/8 red; internal, slip—7.5YR 8/2 pinkish white
Colour of break: 7.5YR 6/6 reddish yellow

3.8 *Bowls Type II.8* [*Fig. 7.102*]

Variant II.8a
Cat. 158
Doka bowl
Inv. no: **Z6/3.3+Z28.1+Z35.4+Z39+Z41.2+Z56+Z58.2**
Provenance: Tumulus 6, fragments of vessel scattered inside tunnel
Construction: handmade (1) and (2)
State of preservation: fragmentary, 42% of rim, base missing
Measurements: Dr = 54 cm; $_{p}$H = 13.4 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: uncoated on both surfaces
Surface colour: external—2.5YR 6/4 light yellow-brown; internal—2.5YR 6/4 light yellow brown
Colour of break: Gley1 2.5/N black
Notes: mat impression barely visible on external surface; sherds of this vessel were used as digging tools

Cat. 159
Bowl
Inv. no: **Z6/22.1**
Provenance: Tumulus 6, fill of tunnel
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 20% of rim
Measurements: Dr = 52 cm; $_{p}$H = 8 cm
Fabric: ZF10
Hardness: 2/3
Firing: reduced
Surface treatment: slipped on internal surface
Surface colour: external—7.5R 4/4 weak red; internal, slip—7.5R 5/4 weak red
Colour of break: 5Y 2.5/1 black

Cat. 160
Bowl
Inv. no: **Z4/1.3+Z4/4**
Provenance: Tumulus 4, tunnel, ahead of entrance
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 30% of rim
Measurements: Dr = 57 cm; $_{p}$H =6.7 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces

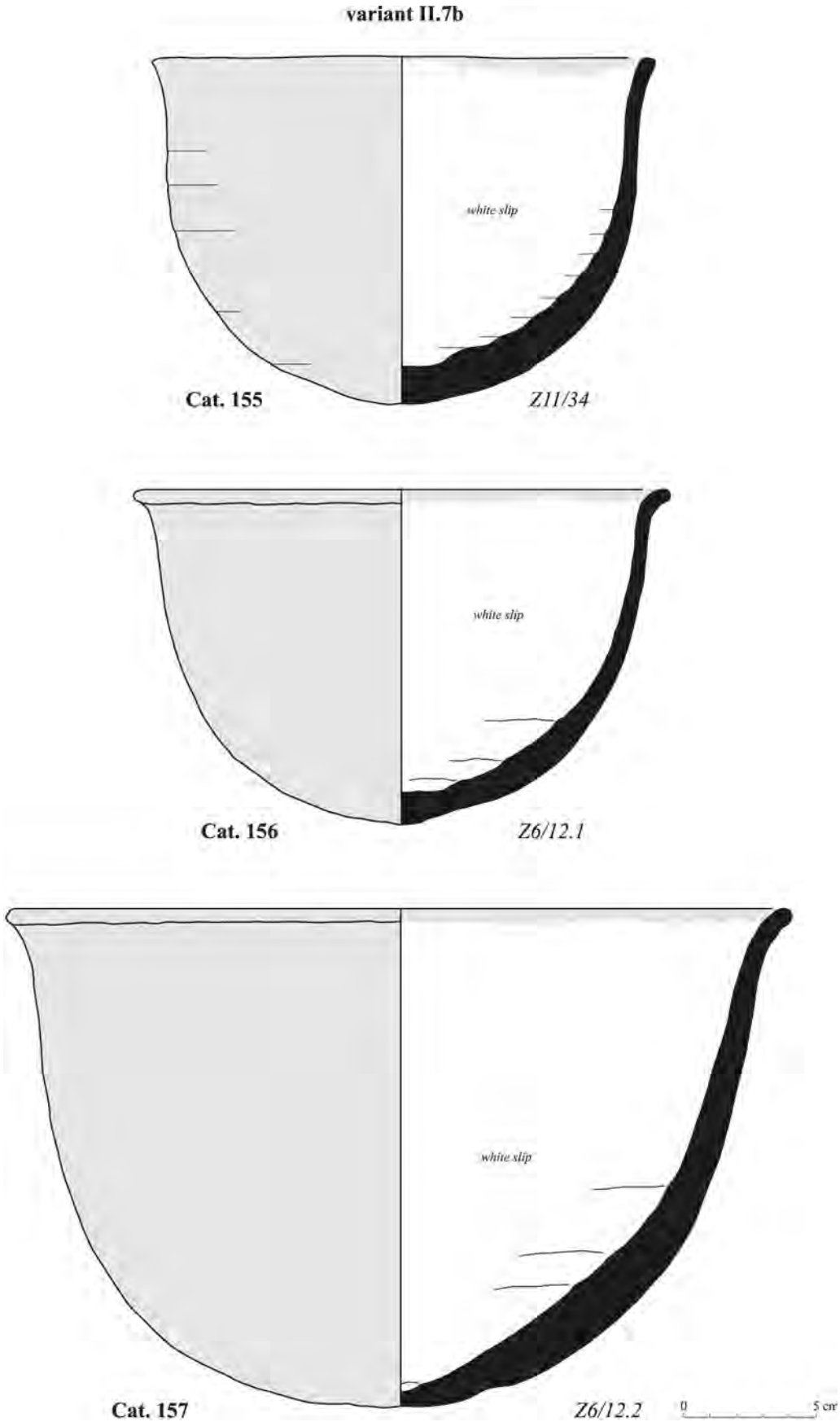

FIGURE 7.32 Hemispherical bowl "tulip-shaped" of type II.7 with flared walls—variant b (deep)

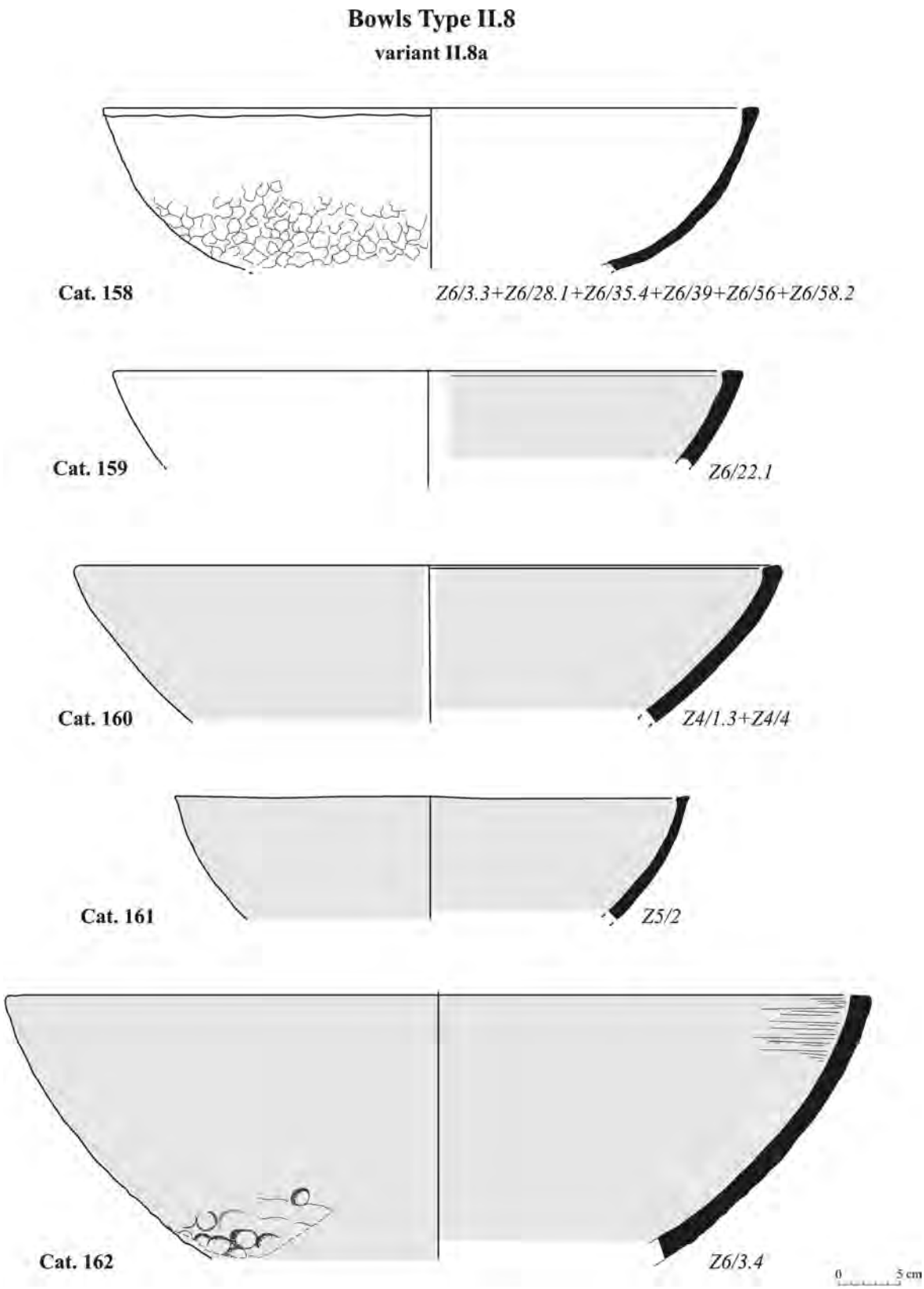

FIGURE 7.33 Large, shallow bowls of type II.8, variant a

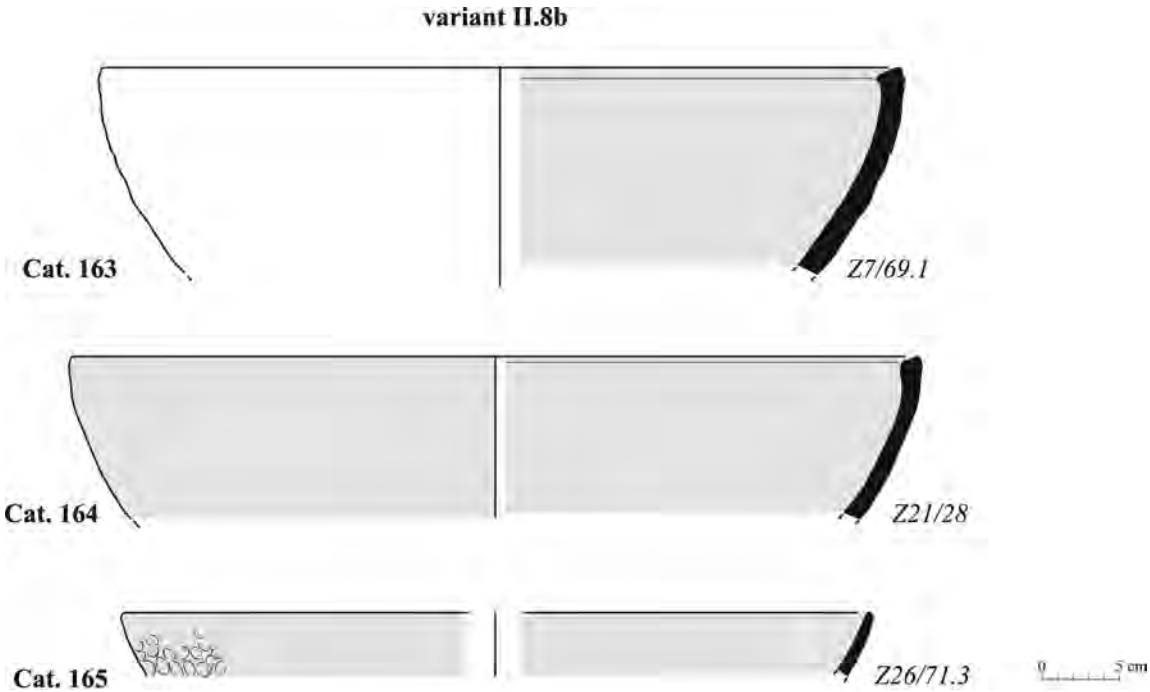

FIGURE 7.34 Large, shallow bowls of type II.8, variant b

Surface colour: external natural surface—10R 5/4 weak red, slip—7.5R 5/6 red; internal natural surface—2.5YR 5/4 reddish brown, slip—7.5R 5/6 red
Colour of break: Gley1 2.5/N black
Notes: sherds of this vessel were used as digging tools

Cat. 161
Bowl
Inv. no: **Z5/2**
Provenance: Tumulus 5, superstructure
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 6% of rim
Measurements: Dr = 42 cm; $_{p}$H = 10 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—2.5YR 6/6 light red, slip—10R 5/6 red; internal natural surface—2.5YR 6/6 light red, slip—10R 5/6 red
Colour of break: 2.5Y 4/1 dark grey
Notes: sherds of this vessel were used as digging tools

Cat. 162
Bowl
Inv. no: **Z6/3.4**
Provenance: Tumulus 6, E Tunnel
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 6% of rim
Measurements: Dr = 70 cm; $_{p}$H = 21.6 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 5/6 red
Colour of break: 5Y 4/2 olive grey
Notes: sherds of this vessel were used as digging tools

Variant II.8b
Cat. 163
Bowl
Inv. no: **Z7/69.1**
Provenance: Tumulus 7, W tunnel
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 8% of rim
Measurements: Dr = *c.* 43 cm; $_{p}$H = 13.6 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on internal surface
Surface colour: external—7.5YR 5/4 brown; internal natural surface—7.5YR 5/4 brown, slip—10R 4/6 red
Colour of break: deep black
Notes: sherds of this vessel were used as digging tools

Cat. 164
Bowl
Inv. no: **Z21/28**
Provenance: Tumulus 21, superstructure
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 6 % of rim
Measurements: Dr = 55 cm; $_{p}$H = 10.6 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—7.5YR 4/3 brown, slip—10R 4/4 weak red; internal natural surface—7.5YR 3/1 very dark grey, slip—10R 4/4 weak red
Colour of break: 7.5YR 3/2 dark brown

Cat. 165
Bowl
Inv. no: **Z26/71.3**
Provenance: Tumulus 26, fill of shaft (0.3 m below surface level)
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, rim fragment
Measurements: Dr = ? cm; $_{p}$H = 4 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: 5Y 2.5/1 black

3.9 *Bowls Type 11.9* [*Fig. 7.103*]

Variant 11.9a

Cat. 166
Bowl
Inv. no: **Z24/11+Z24/10**
Provenance: Tumulus 24, shaft
Construction: handmade (1) and (2)
State of preservation: fragmentary, 30 % of rim
Measurements: Dr = *c.* 70 cm; $_{p}$H =27.4 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external, slip—5R 5/4 weak red; internal, slip—10R 5/6 red
Colour of break: 5Y 5/1 grey
Notes: sherds of this vessel were used as digging tools

Cat. 167
Bowl
Inv. no: **Z11/16**
Provenance: Tumulus 11, chamber 2, northern part
Construction: handmade (1) and (2)
State of preservation: incomplete, restored from sherds, rim and base complete
Measurements: Dr = 46.4 cm; H = 25.2 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—7.5YR 6/4 light brown, slip—10R 5/6 red; internal natural surface—7.5R 6/4 pale red, slip—10R 5/6 red
Colour of break: deep black
Decoration: incised—strokes on rim
Notes: evidence of repairs to vessel—holes drilled (after firing) in vessel walls
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372; Mahmoud El-Tayeb and Czyżewska 2011, 115–117)

Cat. 168
Bowl
Inv. no: **Z1/21+Z1/22**
Provenance: Tumulus 1, fill of shaft
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 7 % of rim
Measurements: Dr = 59 cm; $_{p}$H = 24 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: deep black

Cat. 169
Bowl
Inv. no: **Z7/50+Z7/69**
Provenance: Tumulus 7, W tunnel
Construction: handmade (1) and/or (2)
State of preservation: fragmentary, 27 % of rim
Measurements: Dr = *c.* 46 cm; $_{p}$H = 23.4 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—5YR 5/3 reddish brown, slip—10R 4/6 red; internal natural surface—5YR 5/4 reddish brown, slip—10R 4/4 weak red

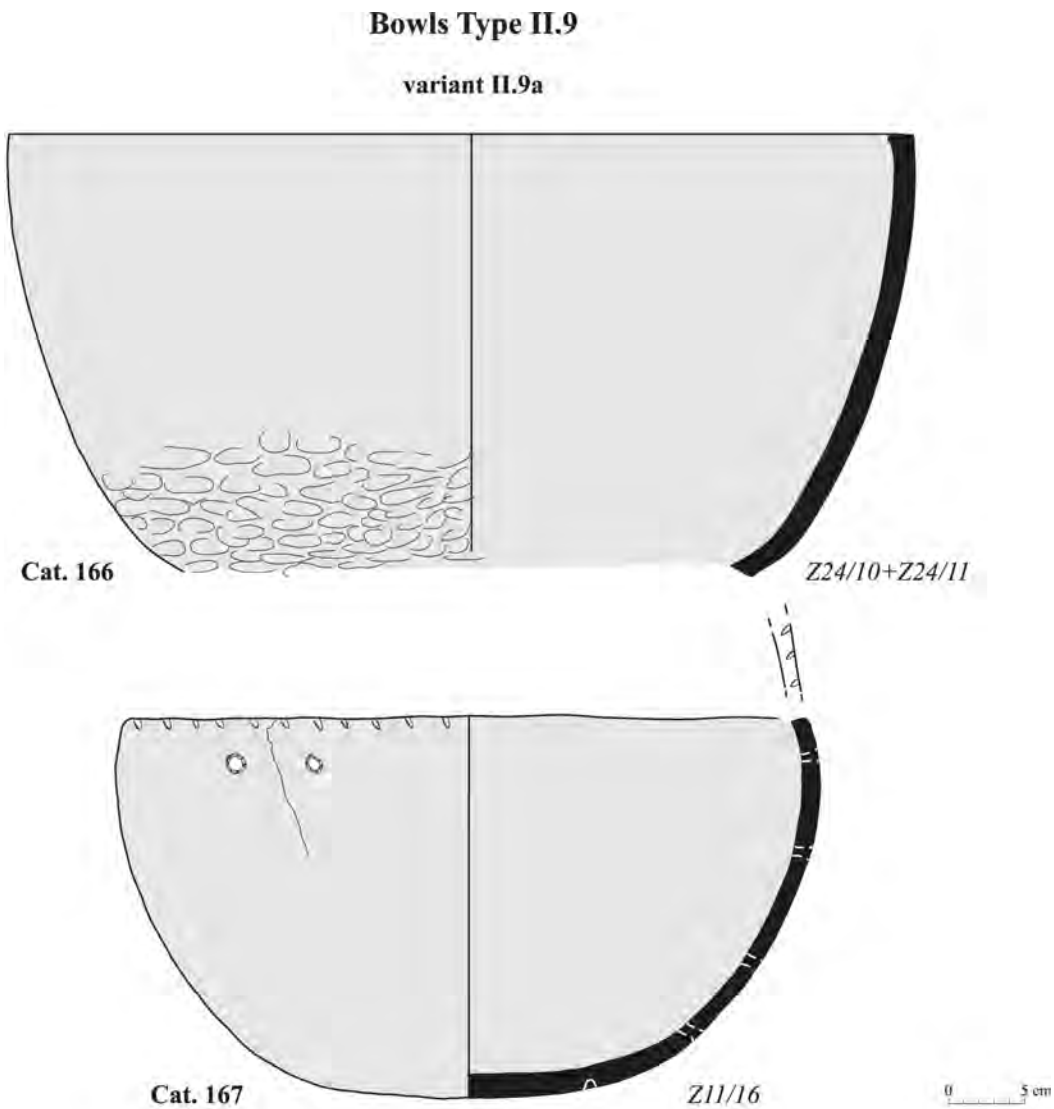

FIGURE 7.35 Large, deep bowls of type II.9, variant a

Colour of break: Gley1 2.5/N black
Decoration: incised—strokes on rim
Notes: evidence of repairs to vessel—holes drilled (after firing) in vessel walls

3.10 *Bowls Varia* [*Figs 7.104–7.105*]

Cat. 170
Bowl
Inv. no: **Z14/27**
Provenance: Tumulus 14, chamber 2, southern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 12 cm; H = 7.5 cm
Fabric: not possible to determine
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: not possible to determine
Decoration: on external surface; incised—nine grooves on body

Cat. 171
Bowl
Inv. no: **Z2/29**
Provenance: Tumulus 2, chamber 2
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 11.5 cm; H = 8.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/8 red; internal, slip—10R 4/6 red

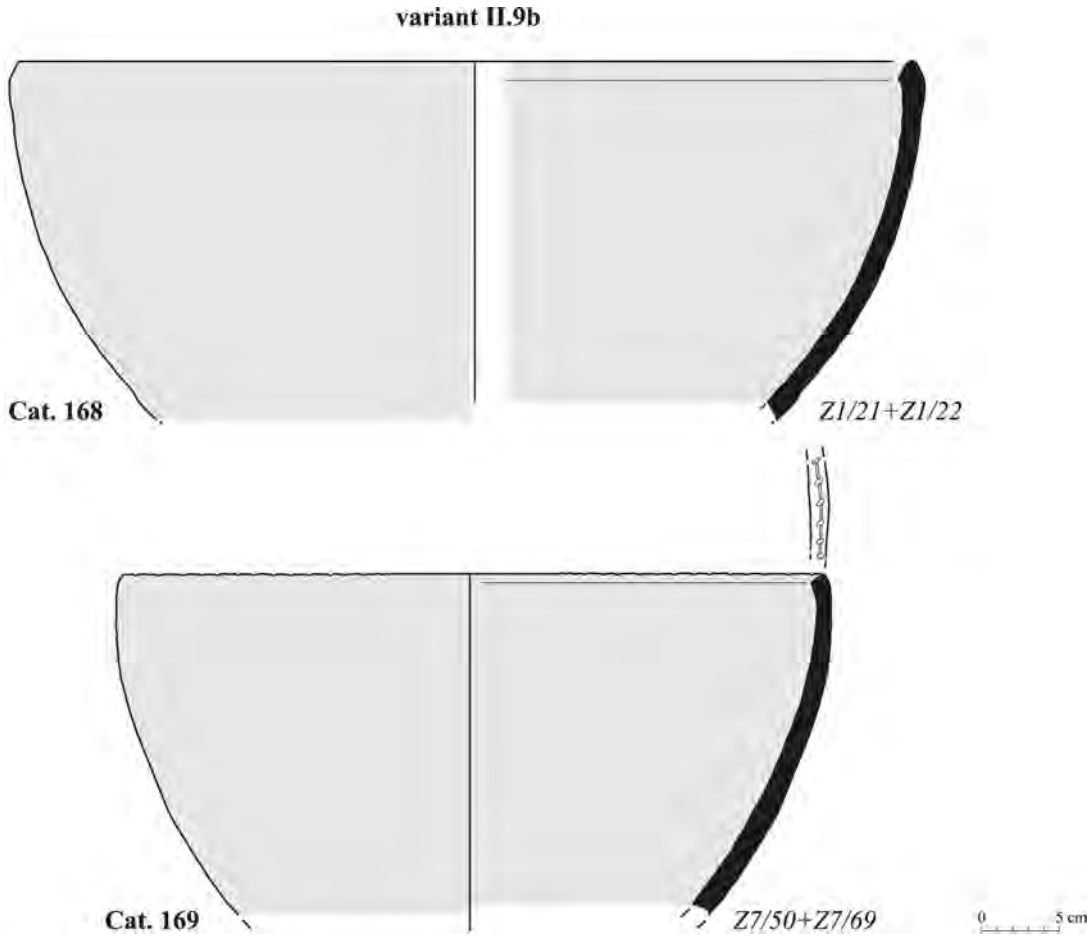

FIGURE 7.36 Large, deep bowls of type II.9, variant b

Colour of break: not possible to determine
Decoration: incised—two grooves below rim and two on lower part of vessel; painted—three vertical stripes composed of a white background with black outlines and filled with a zigzag design painted in black
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 172
Bowl
Inv. no: **Z23/4**
Provenance: Tumulus 23, chamber 1
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 10 cm; H = 7.6 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/8 red on both surface
Colour of break: not possible to determine
Decoration: incised—two grooves below rim and two on lower part of vessel forming border for painted decoration; painted—below rim, one white band as background for black circles with dots; lower part of vessel, one white band as background for black crossed lines
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 173
Bowl
Inv. no: **Z3/7.2**
Provenance: Tumulus 3, fill of external shaft
Construction: wheel made (2)
State of preservation: fragmentary, 6 % of rim
Measurements: Dr = 10 cm, $_{p}$H = 2.7 cm
Fabric: Lower Nubian?
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—7.5YR 9/2 pale yellowish pink; internal, slip—7.5YR 9/1 white
Colour of break: 7.5R 2.5/1 reddish black
Decoration: painted brown bands (5YR 3/2 dark reddish brown) on top of rim and on external surface

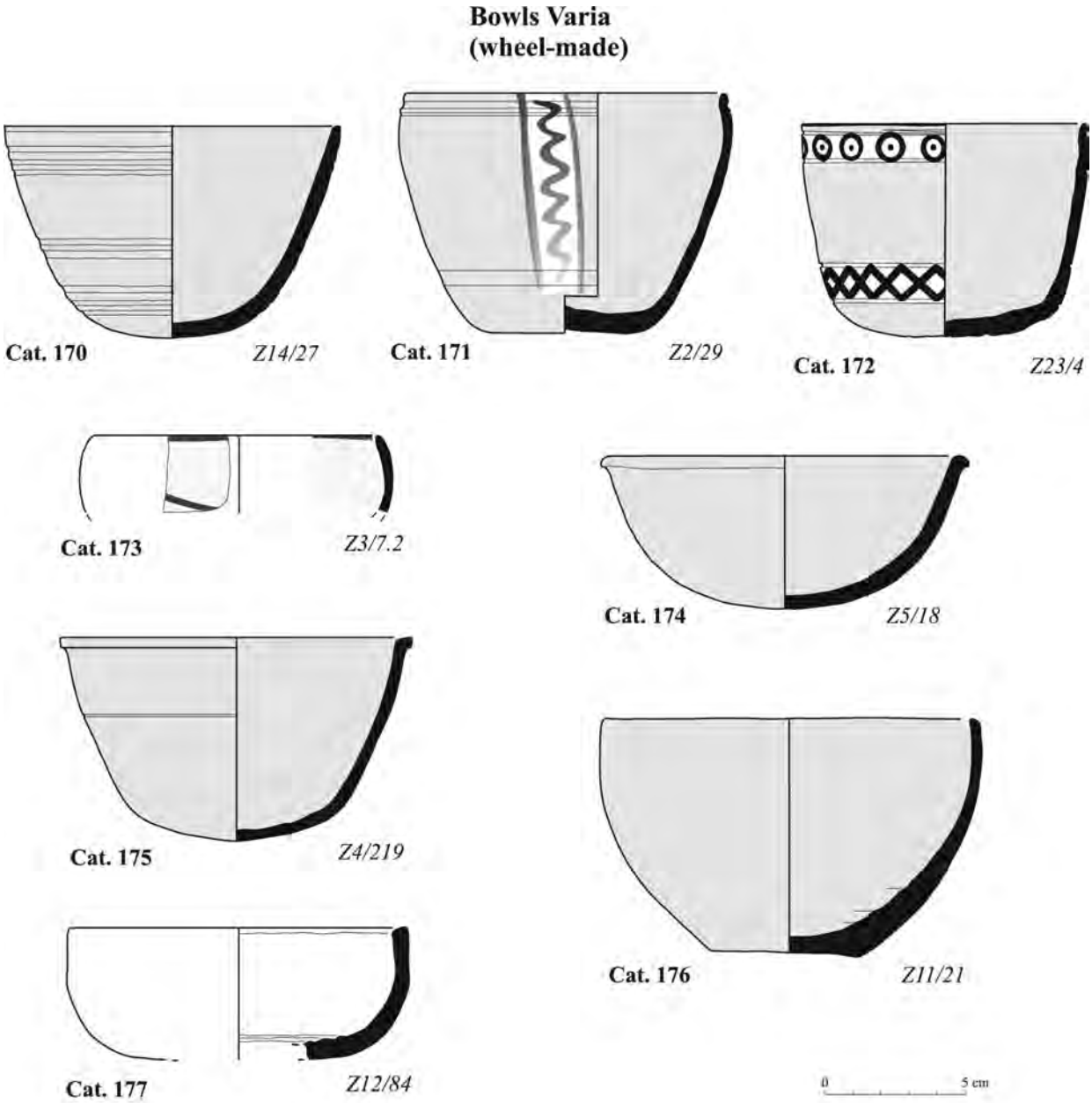

FIGURE 7.37 Bowls of different types

Cat. 174
Bowl
Inv. no: **Z5/18**
Provenance: Tumulus 5, tunnel fill
Construction: wheel-made (1)
State of preservation: fragmentary, 15% of rim
Measurements: Dr = 13 cm; H = 5.5 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—5YR 5/4 reddish brown; slip—10R 4/6 red, on both surfaces
Colour of break: 7.5YR 4/1 dark grey

Cat. 175
Bowl
Inv. no: **Z4/219**
Provenance: Tumulus 4, E tunnel
Construction: wheel-made (2)
State of preservation: incomplete, 15% of rim, body sherd missing
Measurements: Dr = 12.6 cm; H = 7.3 cm
Fabric: ZF3?
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces

Colour of break: 7.5YR 7/3 pink
Decoration: incised—one groove at mid-H

Cat. 176
Bowl
Inv. no: **Z11/21**
Provenance: Tumulus 11, chamber 2
Construction: wheel-made (1)
State of preservation: almost complete, 97% of rim, lip chipped off
Measurements: Dr = 13.3–14.3 cm; H = 8.5 cm
Fabric: ZF3
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on both surfaces, burnish 2 on both surfaces, carefully executed
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: 5YR 4/6 yellowish red
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 177
Bowl
Inv. no: **Z12/84**
Provenance: Tumulus 12, fill of shaft
Construction: wheel-made (1)
State of preservation: fragmentary, 21% of rim
Measurements: Dr = 12 cm; $_{p}$H = 4 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: 5YR 5/4 reddish brown

Cat. 178
Bowl
Inv. no: **Z5/17**
Provenance: Tumulus 5, sondage on S side of tumuli
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 60% of rim, 27% of base, complete profile
Measurements: Dr = 11 cm; H = 7 cm
Fabric: undefined
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: 7.5YR 4/4 dark brown
Decoration: painted—dark dots (5YR 3/2 dark reddish brown) on top of rim and on external surface

Cat. 179
Bowl
Inv. no: **Z5/21**
Provenance: Tumulus 5, tunnel fill
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 27% of rim, rim and body fragment
Measurements: Dr = 20 cm; $_{p}$H = 12.8 cm
Fabric: undefined
Hardness: 4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 4/8 red; internal, slip—10R 5/6 red
Colour of break: 10YR 3/1 very dark grey
Decoration: painted—dark band (10R 2.5/2 very dusky) on top of rim

Cat. 180
Bowl
Inv. no: **Z6/2.1+Z6/3.5+Z6/55**
Provenance: Tumulus 6, sherds scattered in fill of external shaft and E tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 39% of rim, rim and body fragments
Measurements: Dr = 16.7 cm; $_{p}$H = 9 cm
Fabric: Egypt?
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—5YR 4/4 reddish brown, slip—10R 4/8 red; internal natural surface—5YR 4/4 reddish brown, slip—5R 4/8 red
Colour of break: 5YR 5/3 reddish brown

Cat. 181
Bowl
Inv. no: **Z5/35**
Provenance: Tumulus 5, fill of superstructure
Construction: wheel-made (2)
State of preservation: fragmentary, 11% of rim
Measurements: Dr = 20 cm; $_{p}$H = 6 cm
Fabric: ZF4
Hardness: 4
Firing: reduced
Surface treatment: slipped and burnished on both surfaces, burnish 1 on both surfaces
Surface colour: external, slip—10R 4/4 weak red; internal, slip—10R 4/6 red
Colour of break: Gley1 2.5/N black
Decoration: incised decoration on top of rim

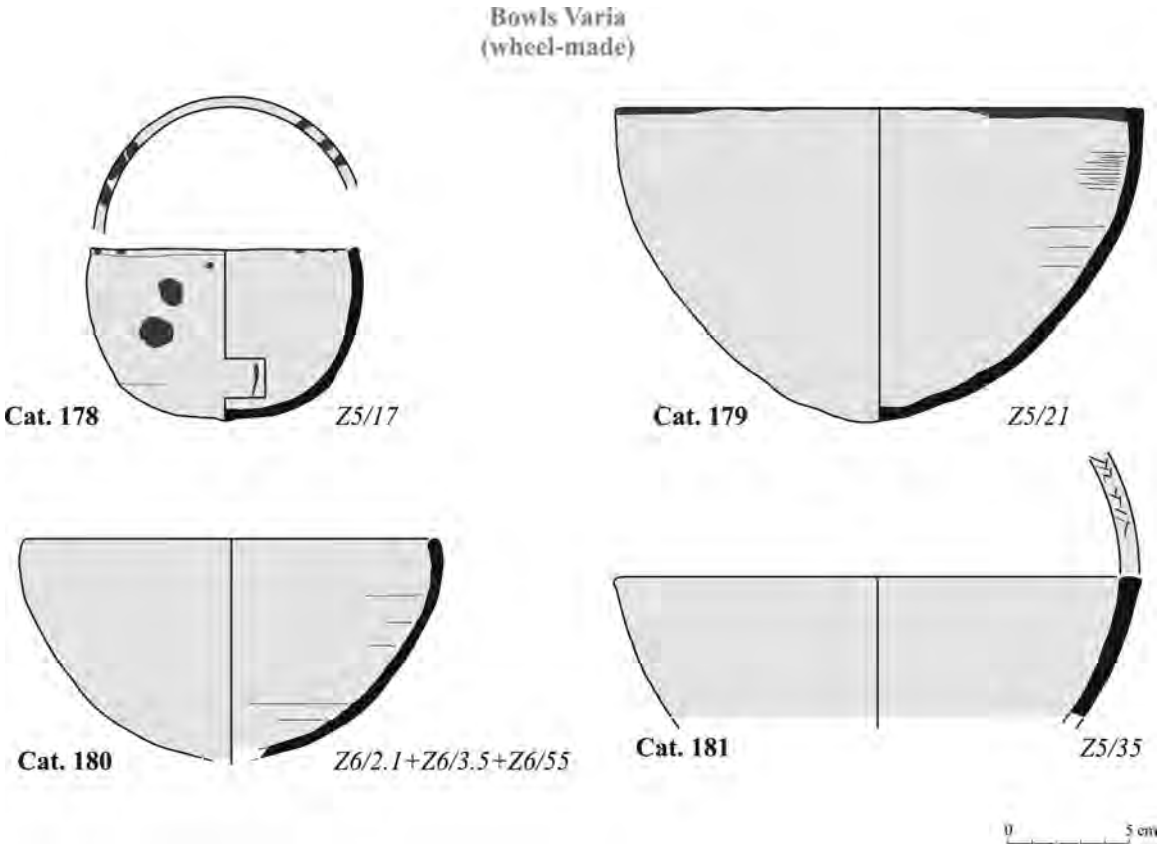

FIGURE 7.38 Bowls of different types

Cat. 182
Bowl
Inv. no: **Z6/25.3**
Provenance: Tumulus 6, shaft/tunnel
Construction: handmade
State of preservation: fragmentary, 25% of rim
Measurements: Dr = 14 cm; $_{p}$H = 6 cm
Fabric: ZF7
Hardness: 3
Firing: reduced
Surface treatment: uncoated
Surface colour: external—10R 5/8 red; internal—5YR 5/4 reddish brown
Colour of break: 2.5YR 3/1 dark reddish grey

Cat. 183
Bowl
Inv. no: **Z14/15**
Provenance: Tumulus 14, chamber 1, south-eastern corner
Construction: handmade
State of preservation: incomplete, 83% of rim, lip chipped off
Measurements: Dr = 14.5 cm; H = 9.9 cm
Fabric: ZF3
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 5/6 red on both surfaces
Colour of break: 10YR 3/2 very dark greyish brown

Cat. 184
Bowl
Inv. no: **Z7/68**
Provenance: Tumulus 7, W tunnel, close to fifth pillar
Construction: handmade
State of preservation: fragmentary, 42% of rim
Measurements: Dr = 20.6 cm; $_{p}$H = 13.3 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—5YR 4/4 reddish brown, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: deep black

Cat. 185
Pot
Inv. no: **Z26/87**
Provenance: Tumulus 26, chamber 2, southern part
Construction: handmade

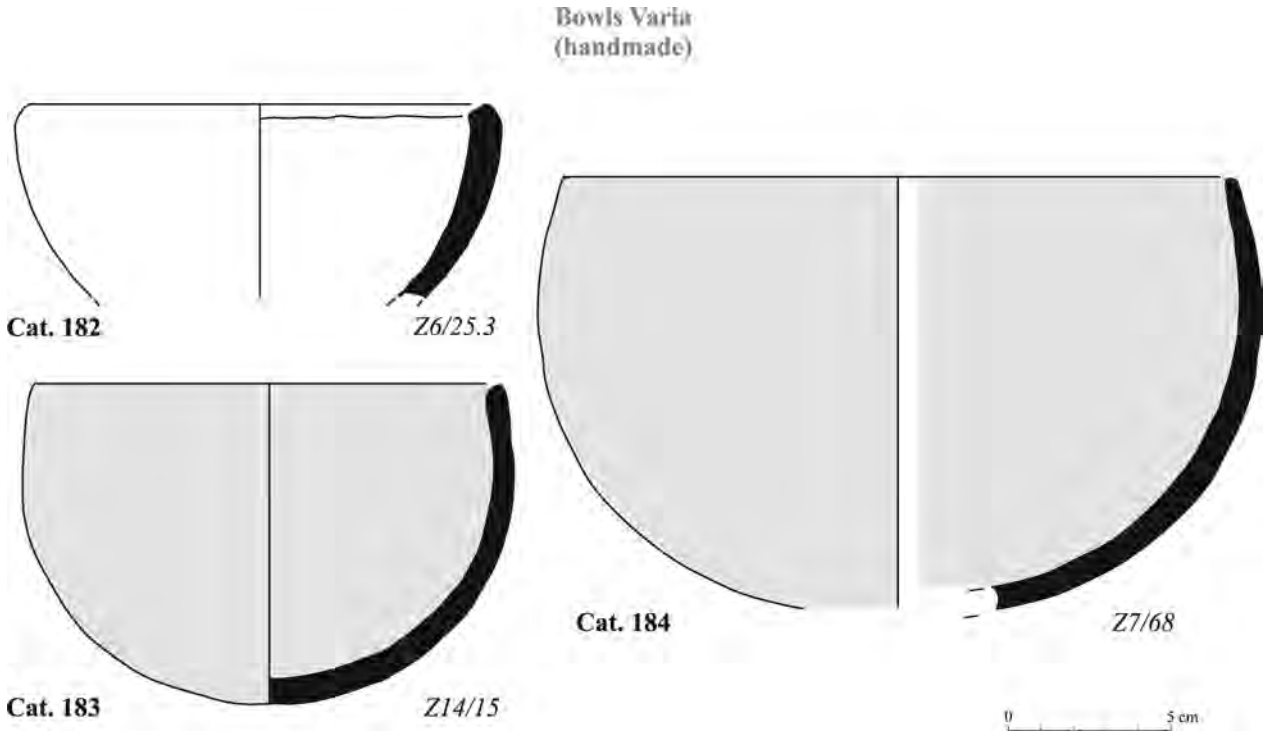

FIGURE 7.39 Bowls of different types

State of preservation: fragmentary, 69% of rim, upper part of vessel
Measurements: Dr = 20 cm; $_{p}$H = 7.5 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—7.5R 5/8 red; internal natural surface—5YR 5/4 reddish brown, slip—7.5R 5/8 red
Colour of break: Gley2 2.5/5PB bluish black

Cat. 186
Pot
Inv. no: **Z10/28**
Provenance: Tumulus 10, burial chamber, under vessel Z10/11
Construction: handmade
State of preservation: fragmentary, 12% of rim
Measurements: Dr = *c.* 24 cm; $_{p}$H = 8.5 cm?
Fabric: ZF10
Hardness: 2/3
Firing: reduced
Surface treatment: uncoated
Surface colour: external—5YR 5/4 reddish brown; internal—10YR 4/2 dark greyish brown
Colour of break: Gley1 2.5/N black

Cat. 187
Bowl with horizontal handle on rim
Inv. no: **Z26/65.1**
Provenance: Tumulus 26, shaft
Construction: handmade
State of preservation: fragmentary, 27% of rim, complete profile
Measurements: Dr = 43 cm; H = 15.5 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on both surfaces; burnish 3, badly executed on both surfaces
Surface colour: slip—10R 4/6 red on both surfaces
Colour of break: deep black

4 Group III—Spouted Bowls

4.1 *Spouted Bowls Type III.1* [*Fig. 7.106*]

Cat. 188
Spouted bowl
Inv. no: **Z19/4**
Provenance: Tumulus 19, burial chamber and bottom of shaft under destroyed blocking wall
Construction: handmade (1)
State of preservation: incomplete, restored from sherds, 90% of rim, complete base

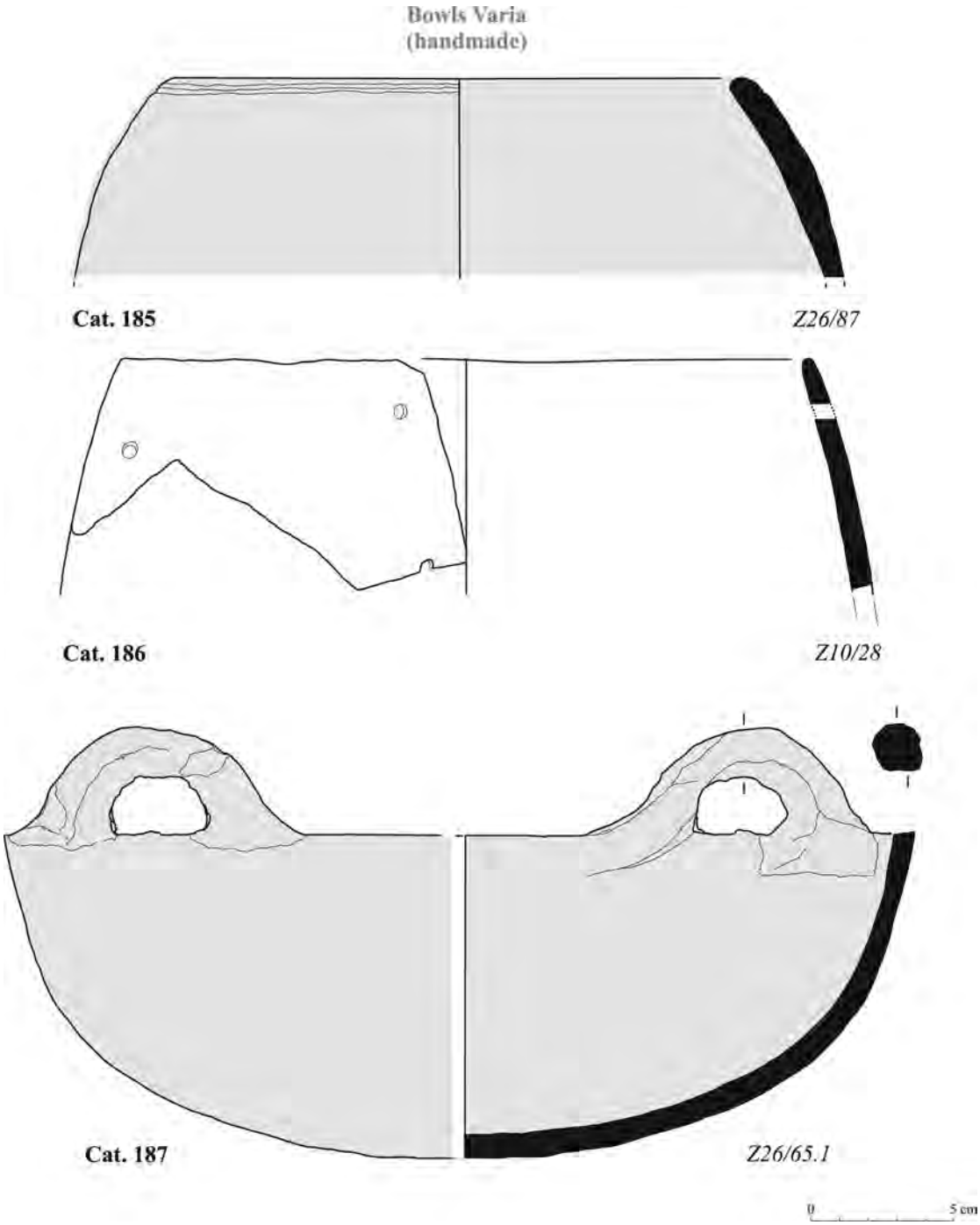

FIGURE 7.40 Bowls of different types

Measurements: Dr = 18.2 cm; H = 16.5 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 4/6 red
Colour of break: Gley1 2.5/10Y greyish black
References: (Klimaszewska-Drabot 2010, 482)

Cat. 189
Spouted bowl
Inv. no: **Z24/25**
Provenance: Tumulus 24, chamber 1, north-eastern corner
Construction: handmade (1)
State of preservation: incomplete, restored from sherds, rim and base complete, small body fragment missing
Measurements: Dr = 15 cm; H = 17.5 cm
Fabric: Eastern Desert Ware?

Hardness: 3
Firing: reduced
Surface treatment: untreated
Surface colour: external—2.5YR 5/6 red; internal—5YR 5/4 reddish brown
Colour of break: 10YR 2/1 black
Decoration: incised geometrical decoration below rim and on belly: intertwined lines, horizontal strokes and triangles; red slip used as part of decoration: red slipped triangles combined with incised lines (on belly) and slipped band below rim

4.2 *Spouted Bowl Type III.2* [*Fig. 7.106*]
Cat. 190
Spouted bowl
Inv. no: **Z6/13**
Provenance: Tumulus 6, shaft
Construction: wheel-made (2)
State of preservation: incomplete, restored from sherds, 94% of rim
Measurements: Dr = 18.5 cm; H = 20.5 cm
Fabric: ZF6
Hardness: 3
Firing: reduced
Surface treatment: slipped on external surface
Surface colour: external, slip—10R 6/8 light red; internal—2.5YR 6/6 light red
Colour of break: Gley1 2.5/N black
Decoration: incised—one groove below rim, four–five grooves at mid-H

5 Group IV—Bowls

5.1 *Bowls Type IV.1* [*Fig. 7.107*]
Variant IV.1a
Cat. 191
Bowl
Inv. no: **Z11/1**
Provenance: Tumulus 11, bottom part of shaft, central part
Construction: handmade (1)
State of preservation: incomplete, 80% of rim
Measurements: Dr = 21.7–24.8 cm; H = 9.2 cm
Fabric: ZF8
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on internal surfaces
Surface colour: external—5YR 6/4 light reddish brown; internal—5YR 6/4 light reddish brown
Colour of break: deep black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot and Czyżewska 2012, 369–372)

Cat. 192
Bowl
Inv. no: **Z11/2**
Provenance: Tumulus 11, bottom part of shaft, central part
Construction: handmade (1)
State of preservation: incomplete, 80% of rim
Measurements: Dr = 22 cm; H = 8.7 cm
Fabric: ZF8
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on internal surfaces
Surface colour: external—7.5YR 6/4 light brown; internal—7.5YR 6/4 light brown
Colour of break: deep black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot and Czyżewska 2012, 369–372)

Cat. 193
Bowl
Inv. no: **Z10/13**
Provenance: Tumulus 10, burial chamber, central part
Construction: handmade (1)
State of preservation: incomplete, 55% of rim, fragments of upper part of vessels missing
Measurements: Dr = 17.4 cm; H = 6.6 cm
Fabric: ZF8
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on both surfaces; burnished and slipped inside
Surface colour: external—7.5YR 5/4 brown; internal, slip—2.5YR 4/4 reddish brown
Colour of break: 5YR 2.5/1 black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Variant IV.1b
Cat. 194
Bowl
Inv. no: **Z18/3**
Provenance: Tumulus 18, burial chamber, central part
Construction: mould (handmade [3])
State of preservation: incomplete, 78% of rim
Measurements: Dr = 19.4–19.7 cm; H = 6.9 cm
Fabric: ZF10
Hardness: 2/3
Firing: reduced

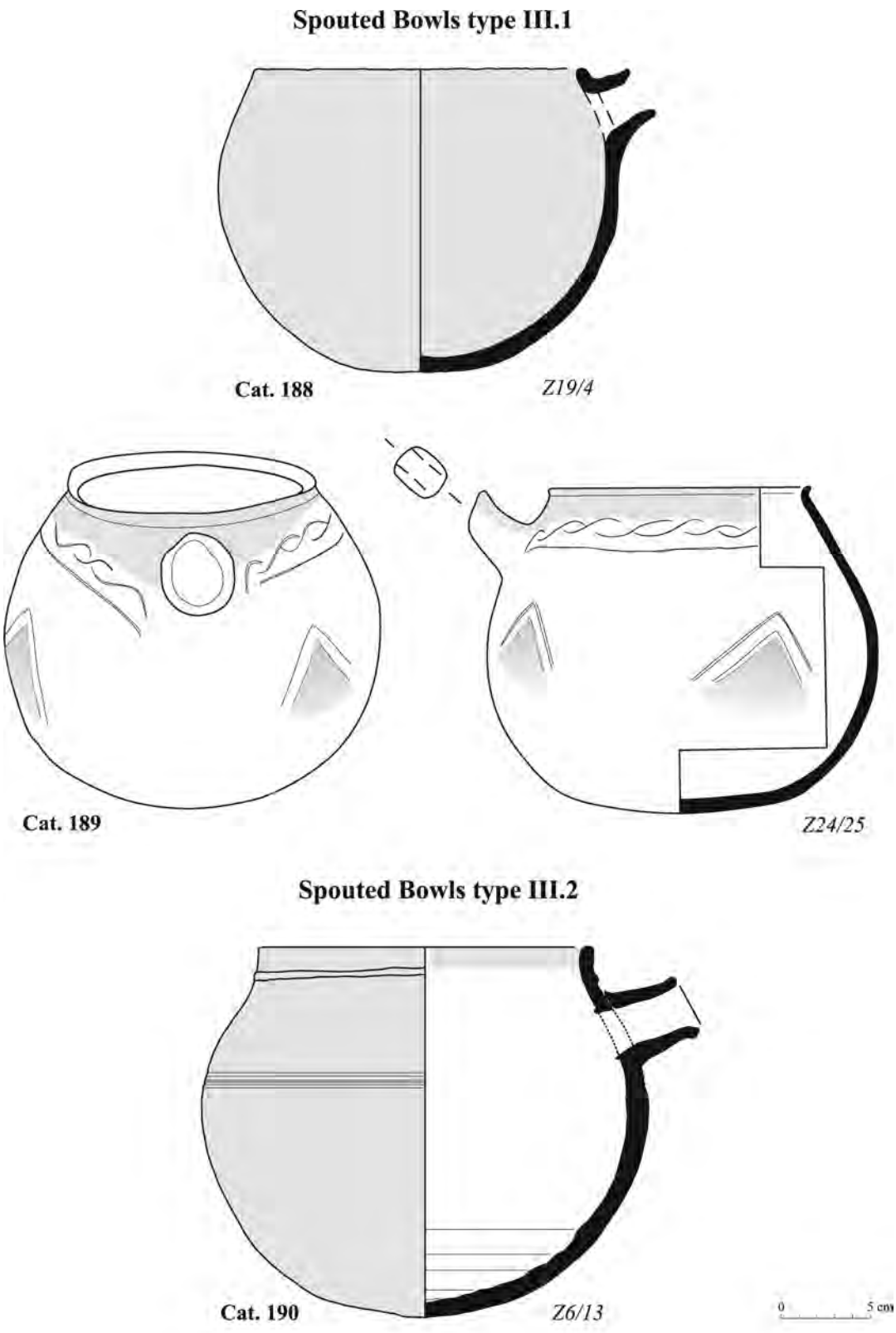

FIGURE 7.41 Spouted bowls of types III.1 and III.2

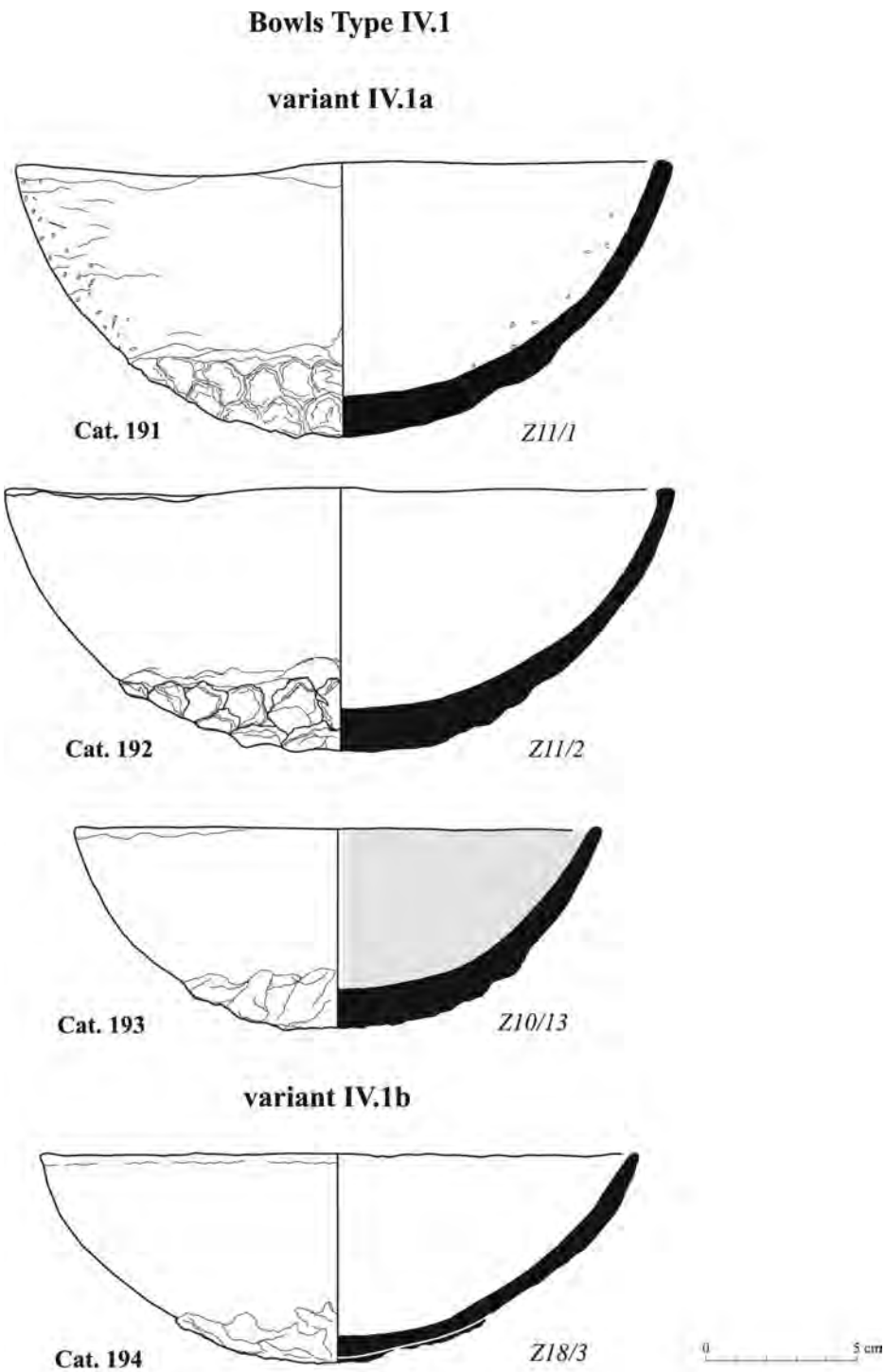

FIGURE 7.42 Shallow bowls of type IV.1 with clay added to the base, variants a and b

Surface treatment: uncoated on both surfaces
Surface colour: external—7.5YR 6/4 light brown; internal—5YR 6/4 light reddish brown
Colour of break: 5Y 2.5/1 black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

5.2 *Bowls Type IV.2* [*Fig. 7.107*]
Variant IV.2a
Cat. 195
Bowl
Inv. no: **Z25/9**
Provenance: Tumulus 25, chamber 2, central part
Construction: handmade (1)

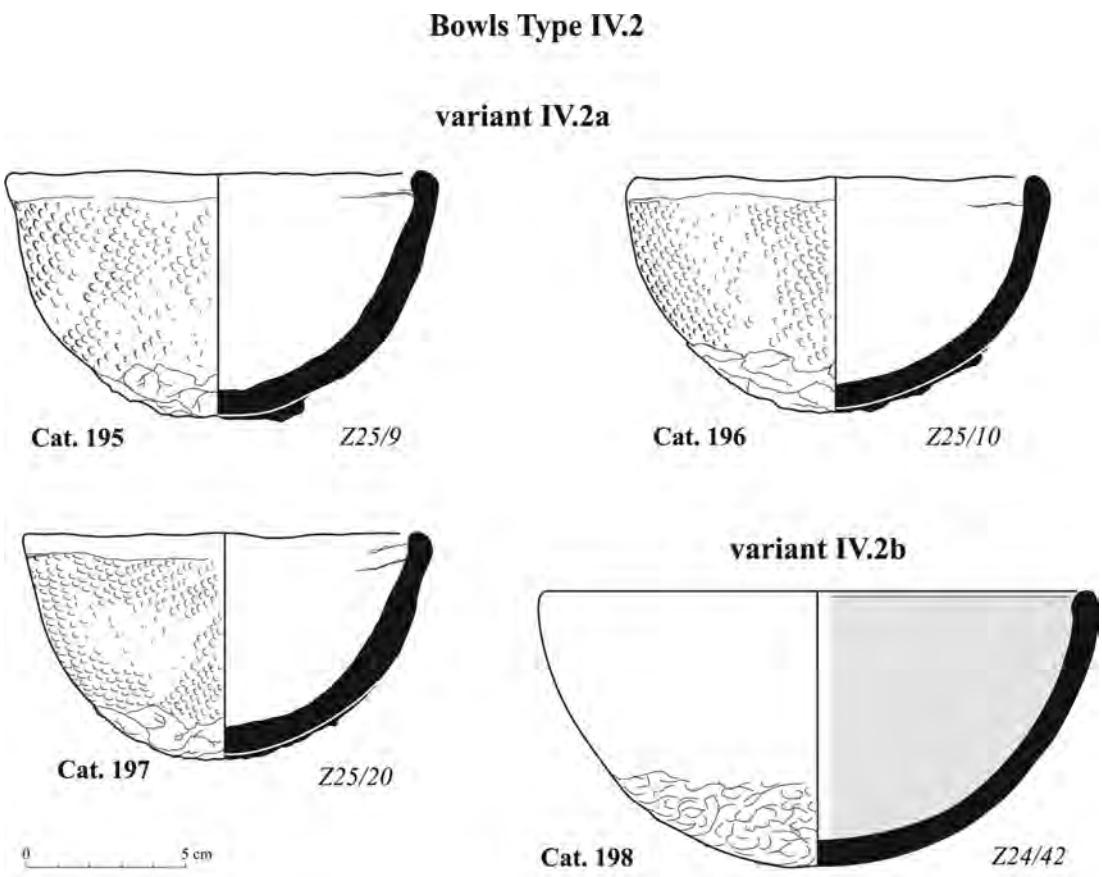

FIGURE 7.43 Shallow bowls of type IV.2 with clay added to the base, variants a and b

State of preservation: complete
Measurements: Dr = 12.9–13.5 cm; H = 7.7 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 2; internal—uncoated
Surface colour: external—7.5YR 5/3 brown; internal—7.5YR 6/3 light brown
Colour of break: not possible to determine
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Cat. 196
Bowl
Inv. no: **Z25/10**
Provenance: Tumulus 25, chamber 2, central part
Construction: handmade (1)
State of preservation: incomplete, restored from sherds, body fragments missing
Measurements: Dr = 13.3 cm; H = 7.4 cm
Fabric: ZF9
Hardness: 2/3
Firing: reduced
Surface treatment: external—mat-impressed, pattern 2; internal—uncoated
Surface colour: external—7.5YR 5/4 brown; internal—7.5YR 5/3 brown
Colour of break: 5YR 2.5/1 black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Cat. 197
Bowl
Inv. no: **Z25/20**
Provenance: Tumulus 25, chamber 3, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 11.8–12.5 cm; H = 7.2 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 2; internal—uncoated
Surface colour: external—5YR 6/4 light reddish brown; internal—7.5YR 5/3 brown
Colour of break: not possible to determine
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Variant IV.2b
Cat. 198
Bowl
Inv. no: **Z24/42**
Provenance: Tumulus 24, chamber 1
Construction: handmade (1)
State of preservation: incomplete, body fragments missing
Measurements: Dr = 17.5–18.5 cm; H = 8.5 cm
Fabric: ZF10
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on both surfaces; burnished and slipped inside
Surface colour: external—7.5YR 7/4 pink; internal, slip—10R 5/6 red
Colour of break: deep black
Notes: clay added to base and modelled by hand

5.3 ***Bowls Type IV.3*** [*Fig. 7.107*]
Variant IV.3a
Cat. 199
Bowl
Inv. no: **Z26/21**
Provenance: Tumulus 26, chamber 2, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 14.5 cm; H = 7.3 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—5YR 6/4 light reddish brown; internal—10R 5/6 red
Colour of break: not possible to determine
Decoration: incised decoration on rim almost indiscernible
Notes: clay added to base and modelled by hand

Cat. 200
Bowl
Inv. no: **Z26/78**
Provenance: Tumulus 26, chamber 4, southern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 13.6 cm; H = 6.8 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—2.5YR 4/4 reddish brown; internal—5YR 5/3 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Cat. 201
Bowl
Inv. no: **Z23/30**
Provenance: Tumulus 23, chamber 2
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 15.7 cm; H = 6.8 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—7.5YR 5/4 brown; internal—5YR 5/4 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Cat. 202
Bowl
Inv. no: **Z26/49**
Provenance: Tumulus 26, chamber 3, south-western part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 13.3 cm; H = 6.4 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—2.5YR 4/4 reddish brown; internal—5YR 4/3 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Cat. 203
Bowl
Inv. no: **Z26/73**
Provenance: Tumulus 26, chamber 4, southern part
Construction: handmade (1)
State of preservation: incomplete, body fragment missing
Measurements: Dr = 16 cm; H = 6.1 cm
Fabric: ZF10
Hardness: 3

Firing: reduced
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—2.5YR 2.5/4 dark reddish brown; internal—10R 4/4 weak red
Colour of break: 10YR 3/2 very dark greyish brown
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Cat. 204
Bowl
Inv. no: **Z26/79**
Provenance: Tumulus 26, chamber 2, northern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 11.7 cm; H = 6.8 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—7.5YR 5/3 brown; internal—2.5YR 5/6 red
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Variant IV.3b
Cat. 205
Bowl
Inv. no: **Z26/18**
Provenance: Tumulus 26, chamber 4, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 14.5 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—7.5YR 5/4 brown; internal—2.5YR 5/4 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

Cat. 206
Bowl
Inv. no: **Z26/19**
Provenance: Tumulus 26, chamber 2, southern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 14.7 cm; H = 6.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—7.5YR 5/4 brown; internal—2.5YR 5/4 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

5.4 *Bowls Type IV.4* [*Fig. 7.108*]

Variant IV.4a
Cat. 207
Bowl
Inv. no: **Z12/125**
Provenance: Tumulus 12, chamber 3
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 15.2–15.6 cm; H = 7 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: external—uncoated, pattern 1; internal—smoothed, burnished and slipped
Surface colour: external—10R 5/6 red; internal, slip—10R 4/6 red
Colour of break: not possible to determine
Notes: clay added to base and modelled using a tool

Variant IV.4b
Cat. 208
Bowl
Inv. no: **Z26/55**
Provenance: Tumulus 26, chamber 2, northern part
Construction: mould (handmade [3])
State of preservation: incomplete, 91% of rim
Measurements: Dr = 17 cm; H = 7.4 cm
Fabric: ZF5
Hardness: 4
Firing: oxidized
Surface treatment: uncoated on both surfaces
Surface colour: external—5YR 5/4 reddish brown; internal—2.5YR 4/4 reddish brown
Colour of break: 2.5Y 4/2 dark greyish brown
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

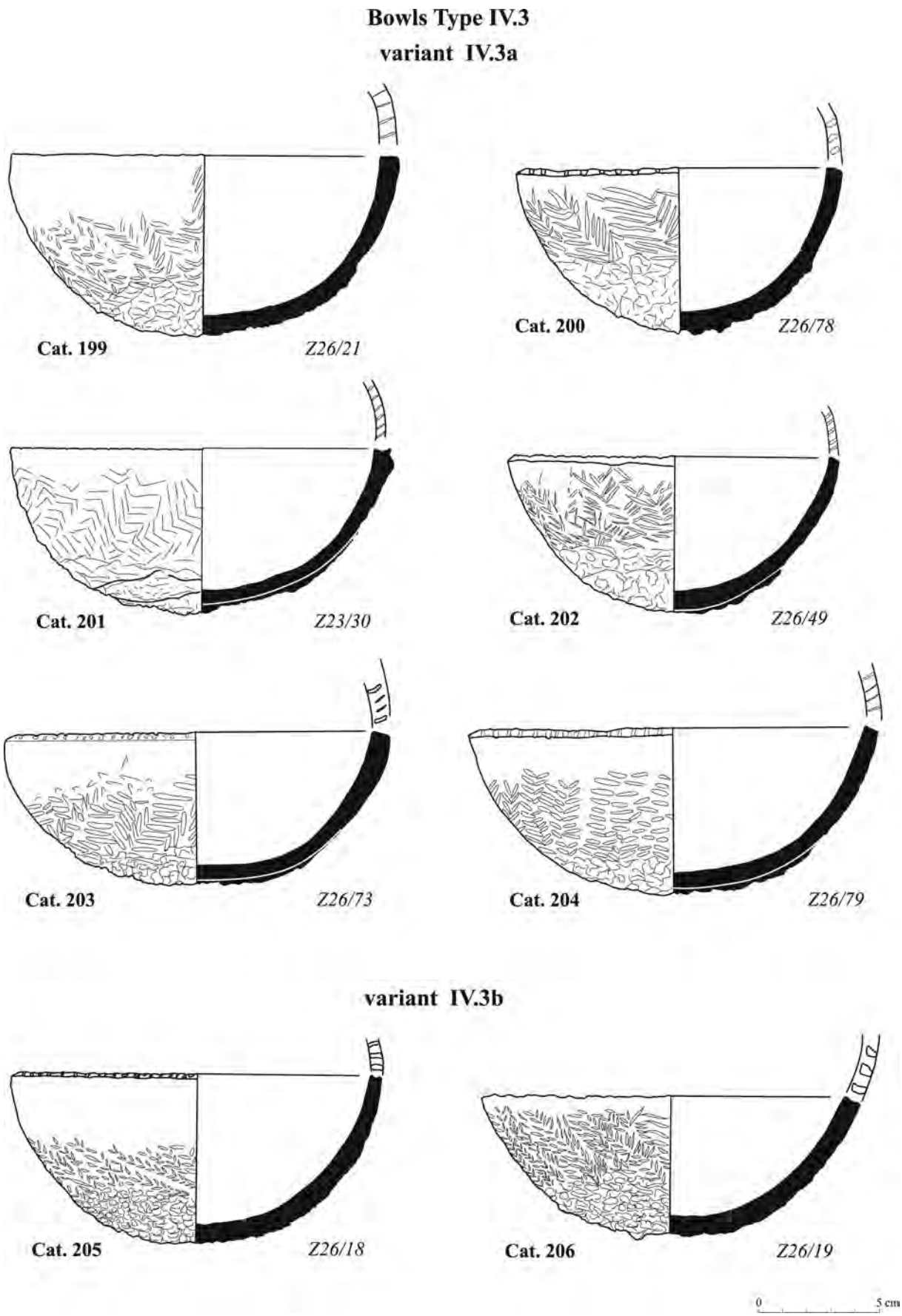

FIGURE 7.44 Shallow bowls of type IV.3 with clay added to the base, variants a and b

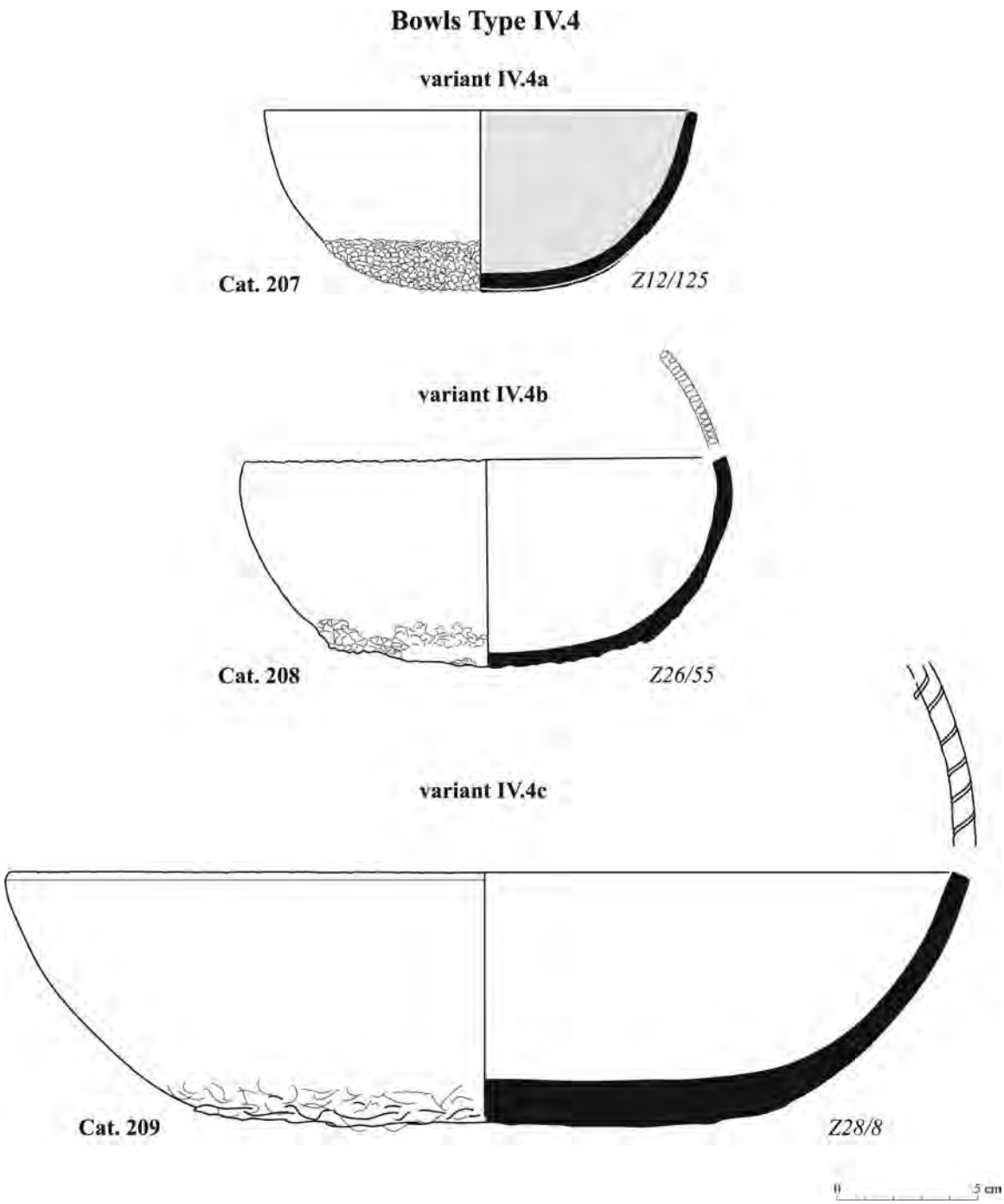

FIGURE 7.45 Shallow bowls of type IV.4 with clay added to the base, variants a, b and c

Variant IV.4c
Cat. 209
Bowl
Inv. no: **Z28/8**
Provenance: Tumulus 28, burial chamber, central part
Construction: mould (handmade [3])
State of preservation: complete
Measurements: Dr = 24 cm; H = 8.8 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: uncoated on both surfaces
Surface colour: external—2.5YR 5/6 red; internal—5YR 5/4 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled, probably using a tool

6 Group V—Pots

6.1 *Pots Type V.1* [*Fig. 7.109*]

Cat. 210
Pot
Inv. no: **Z18/1**
Provenance: Tumulus 18, shaft, eastern part, near blocking wall of burial chamber
Construction: handmade (1)
State of preservation: incomplete, 84% of rim
Measurements: Dr = 17–17.5 cm; H = 14 cm
Fabric: ZF8
Hardness: 2/3
Firing: oxidized
Surface treatment: smoothed on both surfaces
Surface colour: external—7.5YR 6/3 light brown; internal—5YR 6/3 light reddish brown
Colour of break: 7.5YR 6/3 light brown
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Cat. 211
Pot
Inv. no: **Z11/3**
Provenance: Tumulus 11, bottom of shaft, central part
Construction: handmade (1)
State of preservation: incomplete, 86% of rim
Measurements: Dr = 14 cm; H = 11.9 cm
Fabric: ZF8
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on both surfaces
Surface colour: external—7.5YR 6/4 light brown; internal—7.5YR 6/4 light brown
Colour of break: deep black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot and Czyżewska 2012, 369–372)

Cat. 212
Pot
Inv. no: **Z11/23**
Provenance: Tumulus 11, chamber 2, central part
Construction: handmade (1)
State of preservation: incomplete, 75% of rim, fragments of upper part of vessel missing
Measurements: Dr = 14 cm; H = 11.5 cm
Fabric: ZF8
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on both surfaces
Surface colour: external—7.5YR 6/4 light brown; internal—7.5YR 6/4 light brown
Colour of break: Gley1 2.5/N black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 213
Pot
Inv. no: **Z10/10**
Provenance: Tumulus 10, burial chamber, central part
Construction: handmade (1)
State of preservation: incomplete, 58% of rim
Measurements: Dr = 14 cm; H = 11.5 cm
Fabric: ZF8
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on both surfaces; burnished and slipped inside
Surface colour: external—7.5YR 6/4 light brown; internal natural surface—7.5YR 5/4 brown, slip—7.5R 5/8 red
Colour of break: deep black
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

6.2 *Pots Type V.2* [*Fig. 7.109*]

Variant V.2a
Cat. 214
Pot
Inv. no: **Z24/17**
Provenance: Tumulus 24, chamber 1, eastern part
Construction: handmade (1)
State of preservation: incomplete, 72% of rim, fragments of upper part of vessel missing
Measurements: Dr = 10.7 cm; H = 12.1 cm
Fabric: ZF10
Hardness: 3
Firing: oxidized
Surface treatment: smoothed on both surfaces; burnished inside
Surface colour: external—5YR 6/6 yellowish red; internal—5YR 5/6 yellowish red
Colour of break: 10R 4/8 red
Notes: clay added to base and modelled by hand

Cat. 215
Pot
Inv. no: **Z24/21**
Provenance: Tumulus 24, chamber 1, eastern part
Construction: handmade (1)
State of preservation: complete

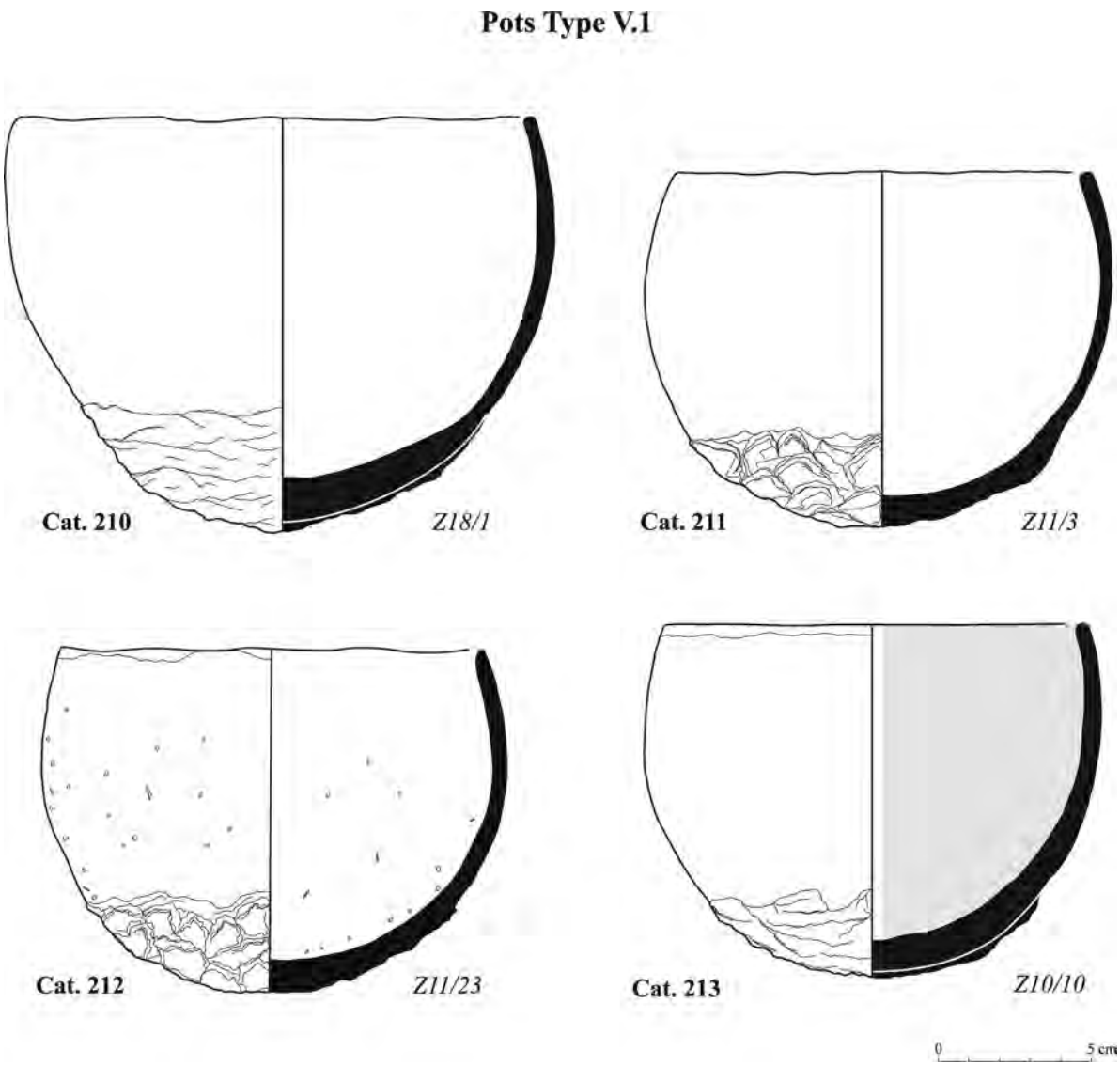

FIGURE 7.46 Deep globular pots of type V.1 with clay added to the base

Measurements: Dr = 10.6 cm; H = 12.1 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: reduced
Surface treatment: smoothed on both surfaces; burnished inside
Surface colour: external—7.5YR 5/4 brown; internal—7.5YR 5/4 brown
Colour of break: not possible to determine
Notes: clay added to base and modelled by hand

Variant V.2b
Cat. 216
Pot
Inv. no: **Z25/16**
Provenance: Tumulus 25, chamber 3, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 8.8–9 cm; H = 10.8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: smoothed and burnished on both surfaces
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 4/4 reddish brown
Colour of break: not possible to determine
Notes: clay added to base and modelled using a tool
References: (Klimaszewska-Drabot 2010, 482)

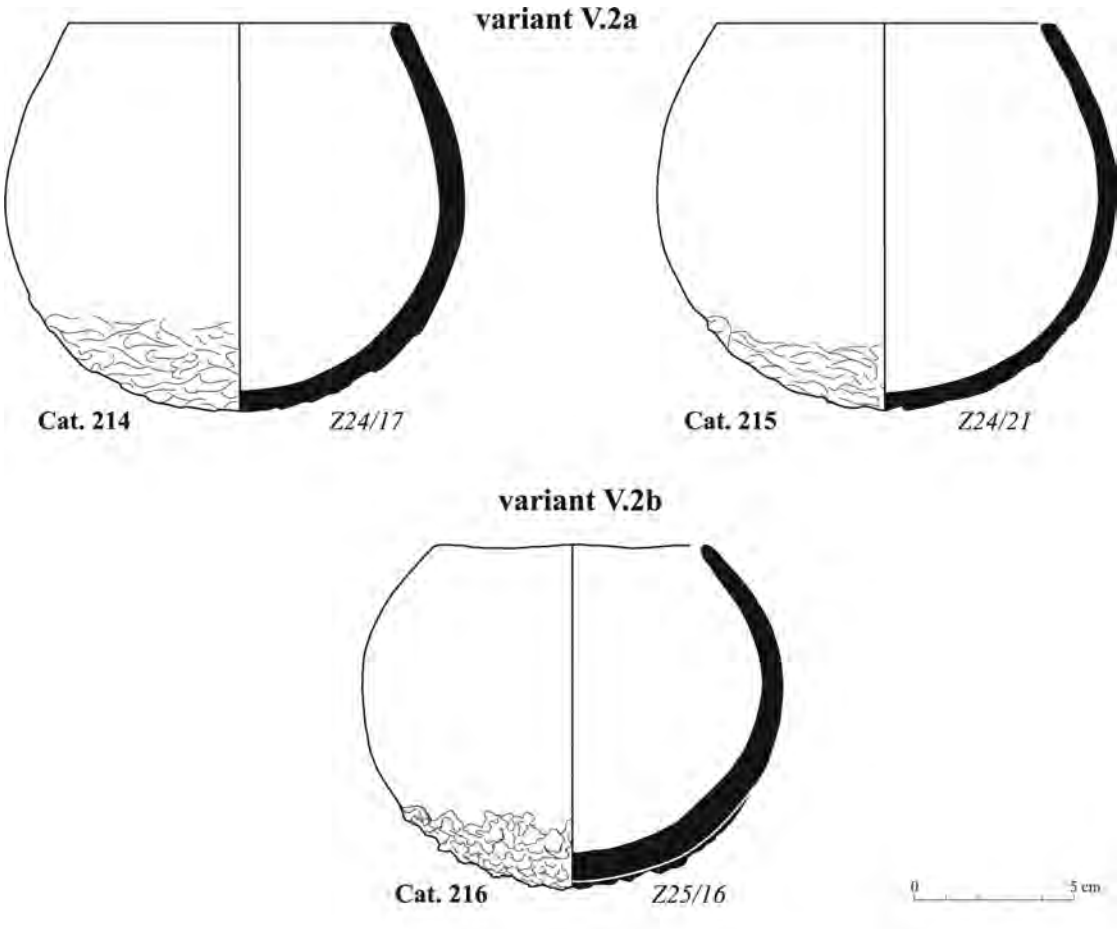

FIGURE 7.47 Deep globular pots of type V.2 with clay added to the base, variants a and b

6.3 ***Pots Type V.3*** [*Figs 7.109–7.110*]

Variant V.3a

Cat. 217
Pot
Inv. no: **Z23/1**
Provenance: Tumulus 23, fill of shaft
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 9.6 cm; H = 12.2 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—2.5YR 5/6 red; internal—2.5YR 4/6 red
Colour of break: not possible to determine
Notes: mat impression poorly visible on surface
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13)

Cat. 218
Pot
Inv. no: **Z25/31**
Provenance: Tumulus 25, chamber 3, southern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 9.5 cm; H = 10.3 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 2; internal—uncoated
Surface colour: external—7.5YR 6/4 light brown; internal—7.5YR 6/4 light brown
Colour of break: not possible to determine
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Cat. 219
Pot
Inv. no: **Z25/26**
Provenance: Tumulus 25, chamber 3, central part

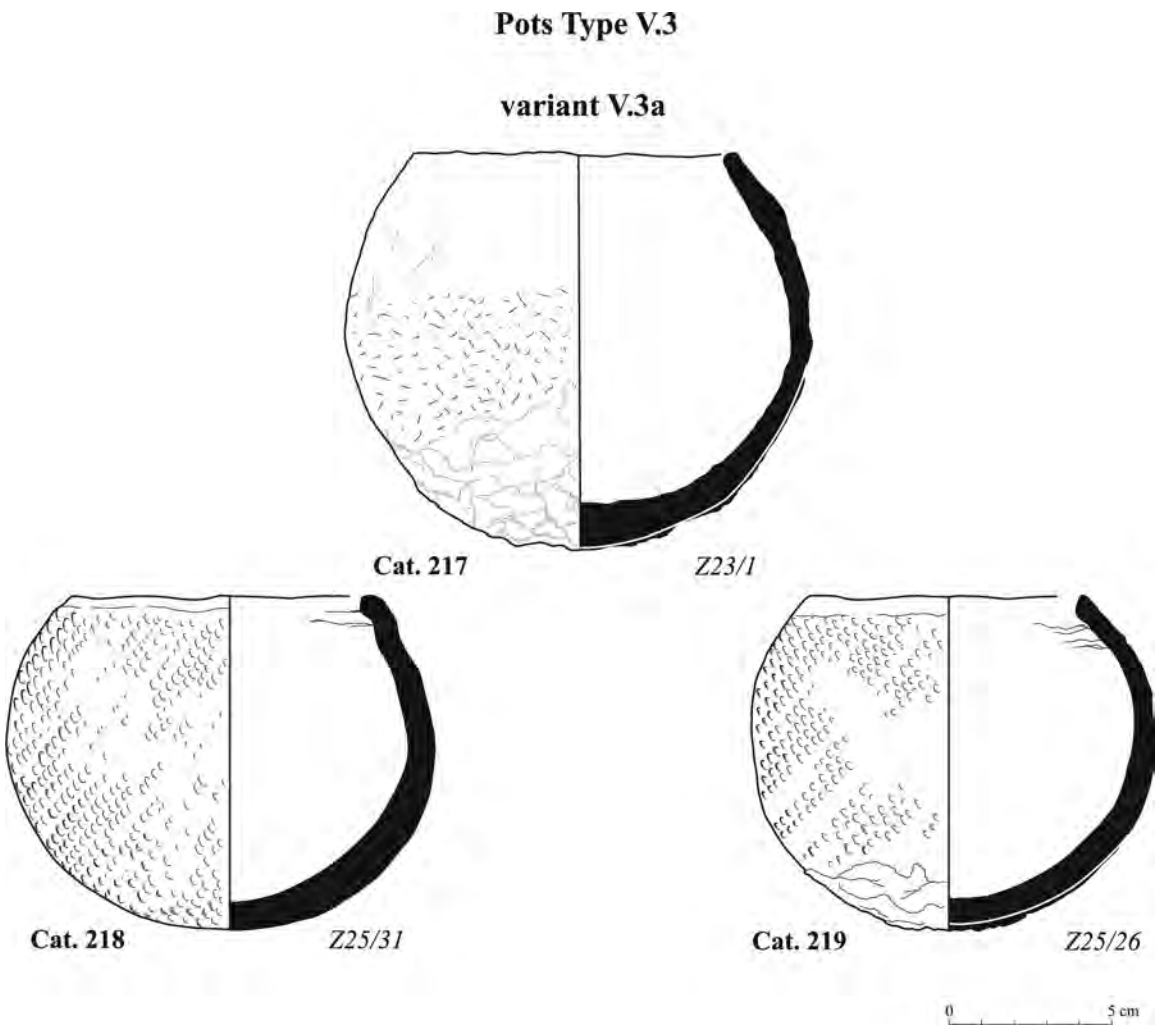

FIGURE 7.48 Deep globular pots of type V.3 with clay added to the base, variant a

Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 8.1–8.6 cm; H = 10.3 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 2; internal—uncoated
Surface colour: external—7.5YR 6/3 light brown; internal—7.5YR 5/4 brown
Colour of break: not possible to determine
Notes: clay added to base and modelled by hand
References: (Klimaszewska-Drabot 2010, 482)

Variant V.3b
Cat. 220
Pot
Inv. no: **Z26/16**
Provenance: Tumulus 26, chamber 1, south-western part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 10.8 cm; H = 11.4 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 2; internal—smoothed
Surface colour: external—5YR 4/4 reddish brown; internal—5YR 4/6 yellowish red
Colour of break: not possible to determine
Notes: clay added to base and modelled using a tool

Cat. 221
Pot
Inv. no: **Z26/22**
Provenance: Tumulus 26, chamber 2, southern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 11.7 cm; H = 11 cm
Fabric: not possible to determine

Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 2; internal—smoothed
Surface colour: external—5YR 4/4 reddish brown; internal—5YR 4/4 reddish brown
Colour of break: not possible to determine
Notes: clay added to base and modelled using a tool

Cat. 222
Pot
Inv. no: **Z9/21**
Provenance: Tumulus 9, chamber 1, western part
Construction: handmade (1)
State of preservation: incomplete, restored from sherds, body fragments missing
Measurements: Dr = 11 cm; H = 9.2 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: external—mat-impressed, pattern 5; internal—smoothed
Surface colour: external—5YR 4/4 reddish brown; internal—5YR 4/4 reddish brown
Colour of break: Gley1 2.5/N black
Notes: clay added to base and modelled using a tool
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367, 369–371)

Cat. 223
Pot
Inv. no: **Z26/23**
Provenance: Tumulus 26, chamber 2, southern part
Construction: handmade (1)
State of preservation: incomplete, 73 % of rim
Measurements: Dr = 11.5 cm; H = 12.1 cm
Fabric: ZF10
Hardness: 2/3
Firing: reduced
Surface treatment: external—mat-impressed, pattern 2; internal—smoothed and burnished
Surface colour: external—5YR 4/4 reddish brown; internal—5YR 4/6 yellowish red
Colour of break: deep black
Notes: clay added to base and modelled using a tool

Cat. 224
Pot
Inv. no: **Z14/20**
Provenance: Tumulus 14, chamber 1, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 9.8 cm; H = 10 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: external—mat-impressed, pattern 2; internal—smoothed and burnished
Surface colour: external—7.5YR 4/4 dark brown; internal—5YR 4/4 reddish brown
Colour of break: 2.5Y 3/1 very dark grey

6.4 *Pots Type v.4* [*Fig. 7.110*]

Variant v.4a
Cat. 225
Pot
Inv. no: **Z26/17**
Provenance: Tumulus 26, chamber 3, northern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 11.5 cm; H = 9.7 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—5YR 4/4 reddish brown; internal—5YR 4/6 yellowish red
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Cat. 226
Pot
Inv. no: **Z12/96**
Provenance: Tumulus 12, chamber 3, western part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 10 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—2.5YR 5/6 red; internal—2.5YR 6/6 light red
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

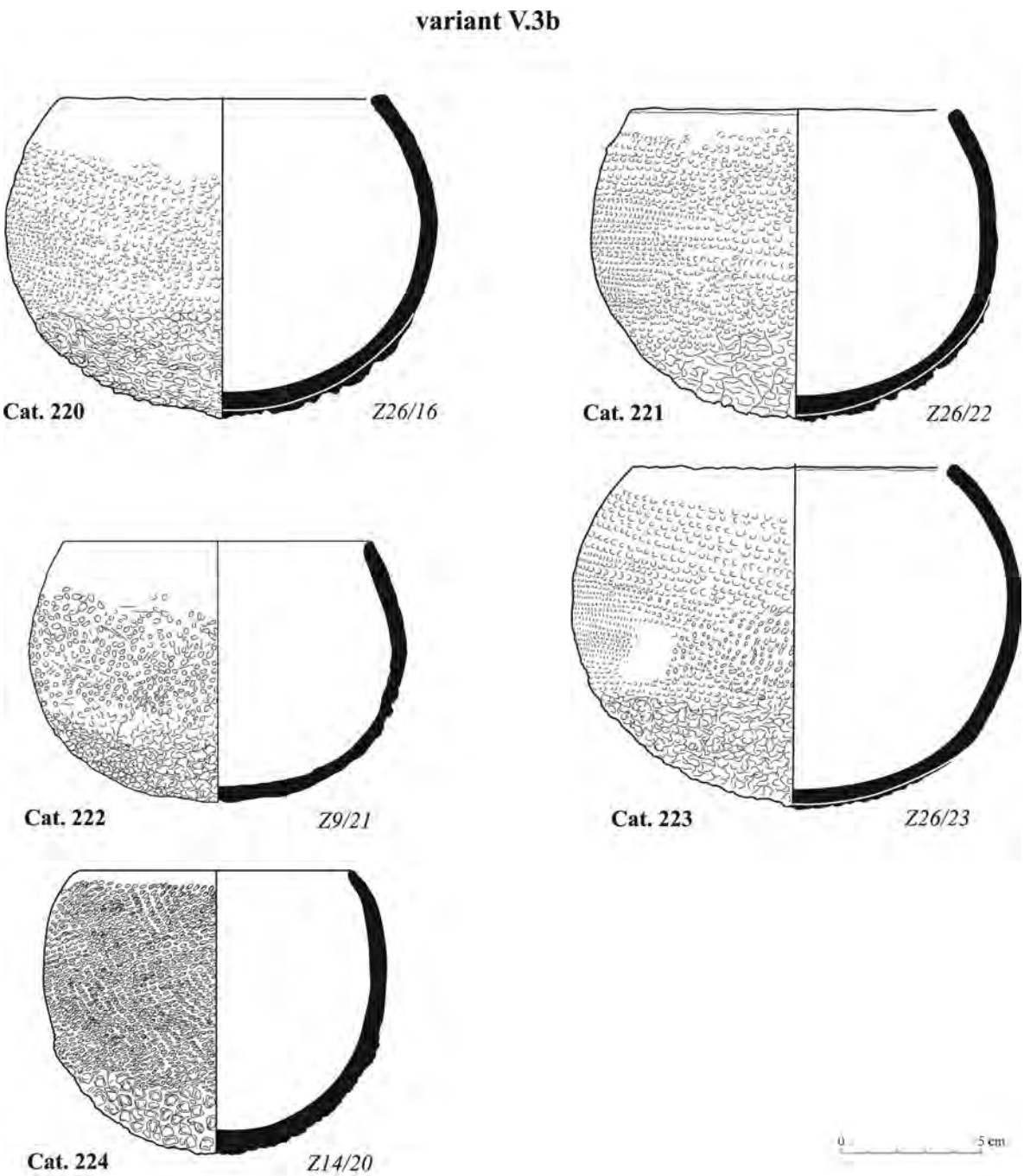

FIGURE 7.49 Deep globular pots of type V.3 with clay added to the base, variant b

Cat. 227
Pot
Inv. no: **Z24/36**
Provenance: Tumulus 24, chamber 1, eastern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 12.5 cm; H = 11.2 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—10YR 6/3 pale brown; internal—10YR 5/4 yellowish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

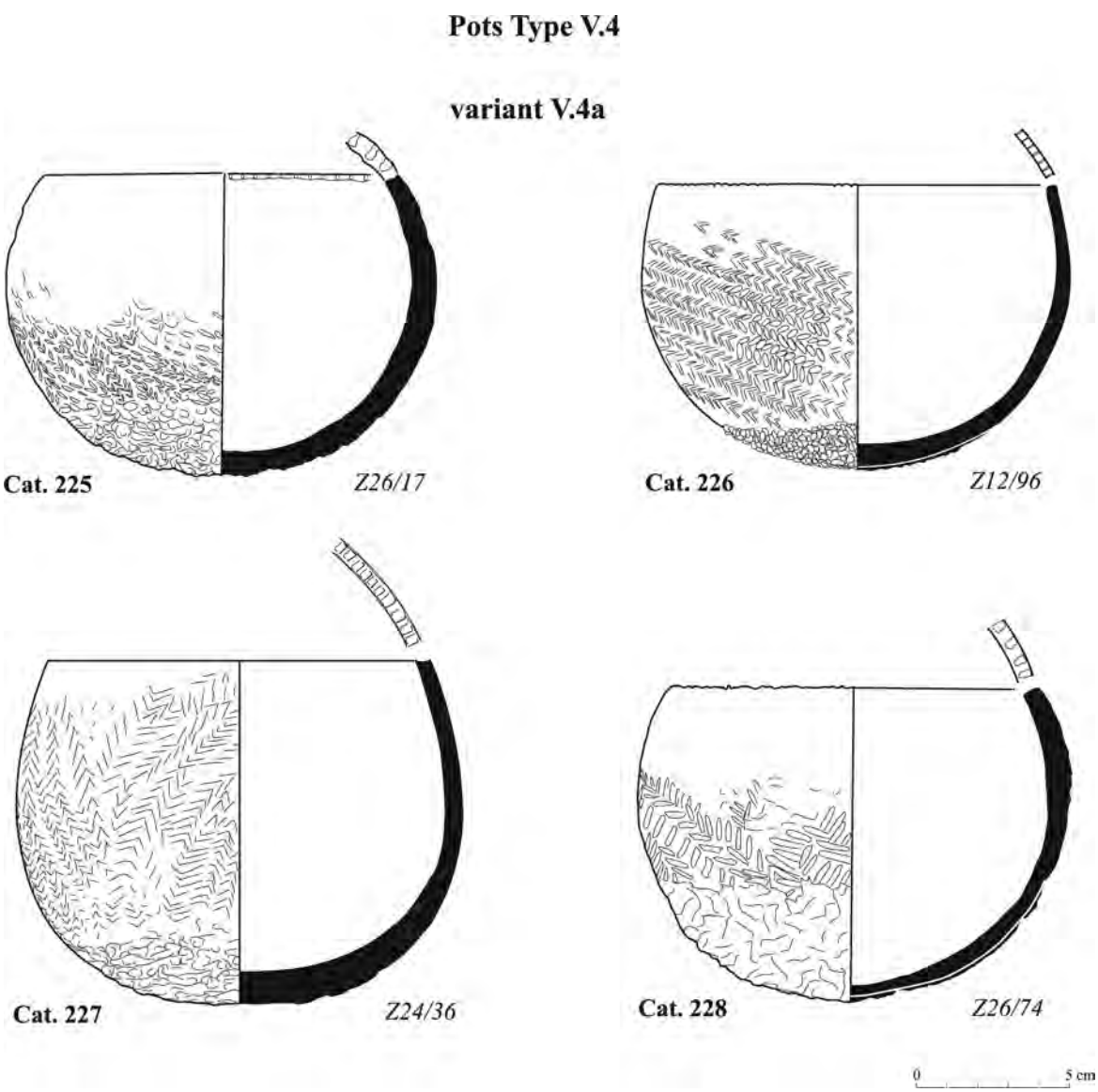

FIGURE 7.50 Deep globular pots of type V.4 with clay added to the base, variant a

Cat. 228
Pot
Inv. no: **Z26/74**
Provenance: Tumulus 26, chamber 2, southern part
Construction: handmade (1)
State of preservation: incomplete, 92% of rim
Measurements: Dr = 12 cm; H = 10.3 cm
Fabric: ZF10
Hardness: 2/3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—7.5YR 5/3 brown; internal—7.5YR 5/4 brown
Colour of break: 5YR 2.5/1 black
Decoration: incised decoration on rim
Notes: clay added to base and modelled by hand

Variant V.4b
Cat. 229
Pot
Inv. no: **Z26/59**
Provenance: Tumulus 26, chamber 1, central part
Construction: handmade (1)
State of preservation: incomplete, restored from sherds, 98% of rim
Measurements: Dr = 12 cm; H = 9.7 cm
Fabric: ZF10
Hardness: 3
Firing: oxidized
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—5YR 5/6 yellowish red; internal—5YR 5/3 reddish brown

Colour of break: 2.5YR 4/8 red
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

Cat. 230
Pot
Inv. no: **Z26/82**
Provenance: Tumulus 26, chamber 4, southern part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 11 cm; H = 9.7 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 4/3 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

Cat. 231
Pot
Inv. no: **Z26/20**
Provenance: Tumulus 26, chamber 4, the central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 13 cm; H = 10.4 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: reduced
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—5YR 4/4 reddish brown; internal—5YR 4/6 yellowish red
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

Cat. 232
Pot
Inv. no: **Z26/48**
Provenance: Tumulus 26, chamber 1, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 12 cm; H = 11 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 4/4 reddish brown
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

Cat. 233
Pot
Inv. no: **Z26/58**
Provenance: Tumulus 26, chamber 1, central part
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 14 cm; H = 9.8 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: external—mat-impressed, pattern 1; internal—smoothed and burnished
Surface colour: external—5YR 4/6 yellowish red; internal—5YR 4/6 yellowish red
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

Variant V.4c
Cat. 234
Pot
Inv. no: **Z28/7**
Provenance: Tumulus 28, burial chamber
Construction: handmade (1)
State of preservation: complete
Measurements: Dr = 21.2 cm; H = 17.8 cm
Fabric: not possible to determine, probably ZF10
Hardness: 3
Firing: reduced
Surface treatment: external—mat-impressed, pattern 2; internal—smoothed
Surface colour: external—2.5YR 4/8 red; internal—2.5YR 4/6 red
Colour of break: not possible to determine
Decoration: incised decoration on rim
Notes: clay added to base and modelled using a tool

7 Group VI—Pots

7.1 *Pots Type VI.1* [*Fig. 7.111*]

Cat. 235
Pot with slipped rim and incised decoration
Inv. no: **Z5/19**
Provenance: Tumulus 5, tunnel
Construction: handmade (1)

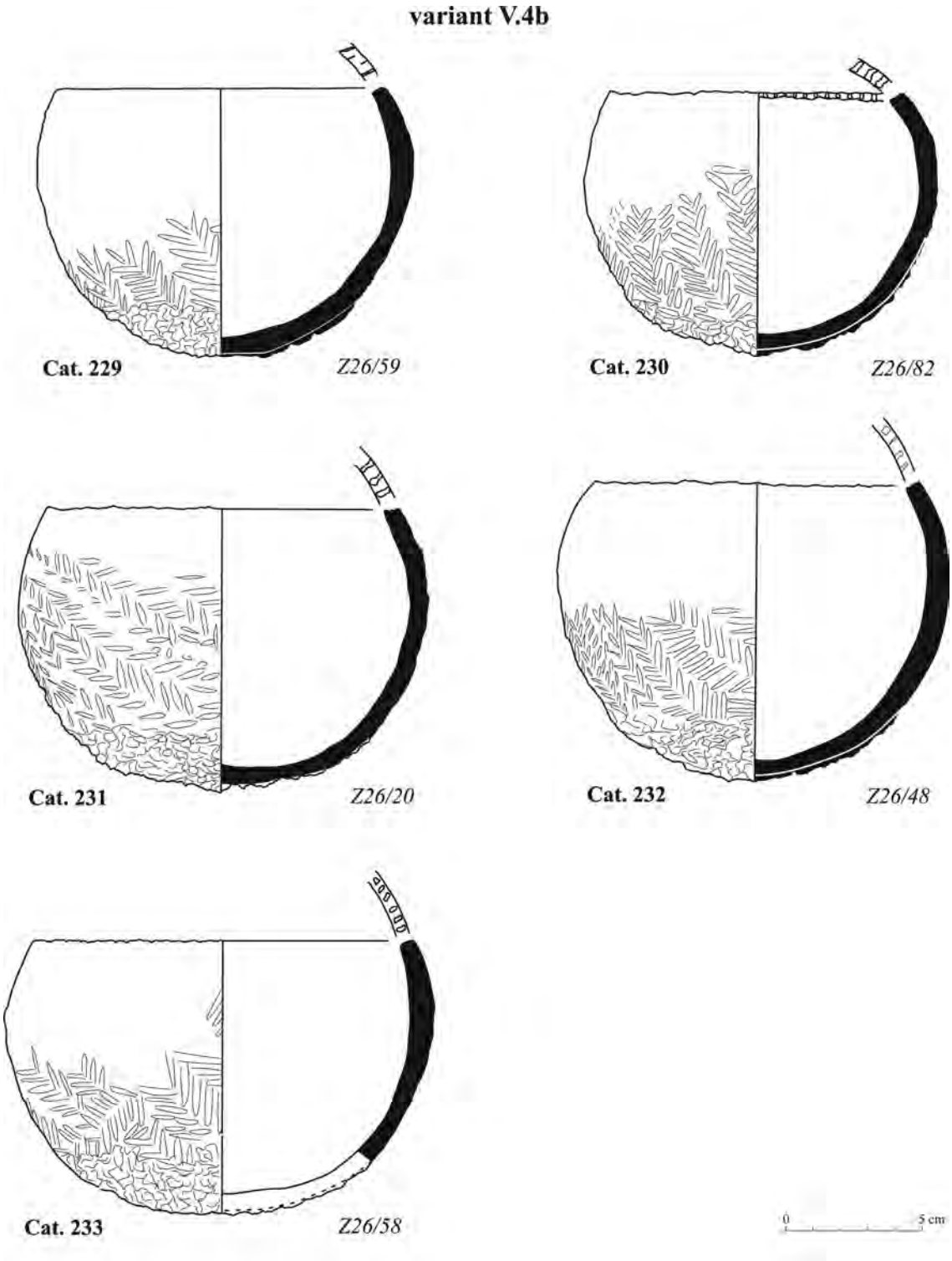

FIGURE 7.51 Deep globular pots of type V.4 with clay added to the base, variant b

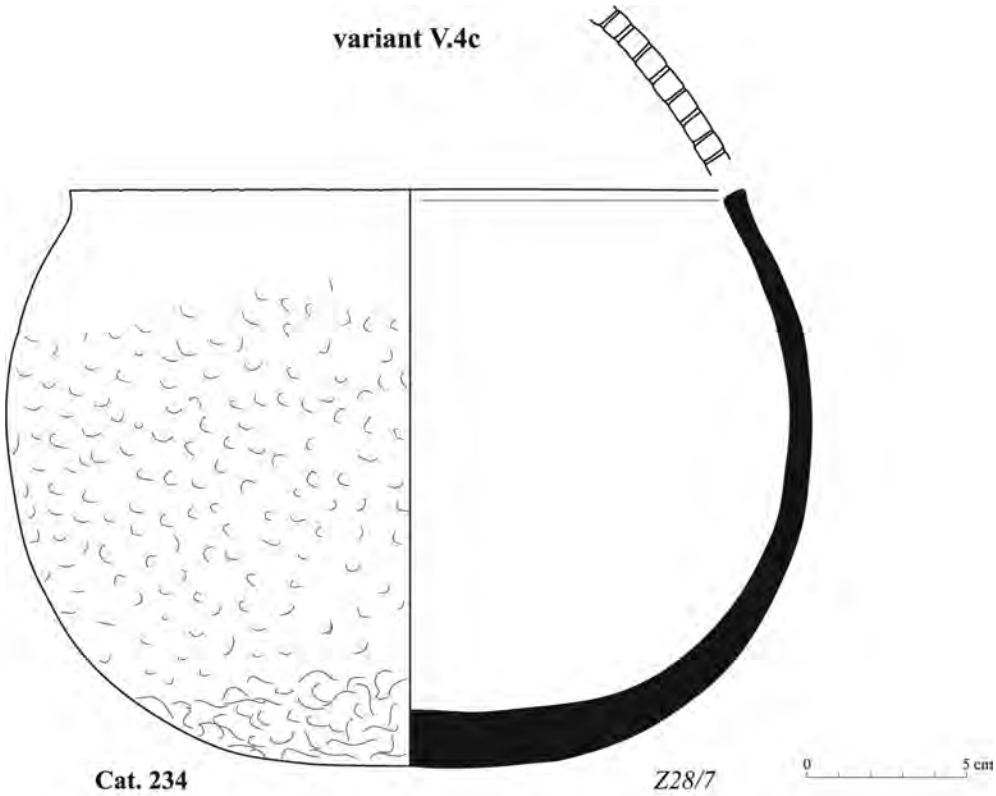

FIGURE 7.52 Deep globular pot of type V.4 with clay added to the base, variant c

State of preservation: fragmentary, 10 % of rim, wall fragment
Measurements: Dr = 13.2 cm; $_{p}$H = 4.4 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on rim
Surface colour: external natural surface—5YR 4/6 yellowish red, slip—10R 4/6 red; internal—5YR 3/1 very dark grey
Colour of break: deep black

Cat. 236

Pot with slipped rim and mat impressions on body
Inv. no: **Z11/45**
Provenance: Tumulus 11, fill of shaft
Construction: handmade (1)
State of preservation: fragmentary, restored from pieces, fragments of rim and body, 91 % of rim
Measurements: Dr = 20.2 cm; $_{p}$H = 16 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on rim and mat-impressed on body
Surface colour: external natural surface—5YR 5/4 reddish brown, slip—10R 4/6 red; internal—7.5YR 5/4 brown
Colour of break: deep black
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 237

Pot with slipped rim, mat impressions on body and clay added to bottom
Inv. no: **Z11/46**
Provenance: Tumulus 11, fill of shaft
Construction: handmade (1)
State of preservation: fragmentary, restored from sherds, survives in four pieces, fragments of rim, body and base, 55 % of rim
Measurements: Dr = 20 cm; $_{p}$H = 17.6 cm (upper part) + 7 cm (bottom part)
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on rim, mat-impressed on body
Surface colour: external natural surface—5YR 5/4 reddish brown, slip—10R 4/6 red; internal—7.5YR 5/4 brown
Colour of break: 5R 2.5/1 reddish black
Notes: clay at bottom of vessel was added by pinching
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

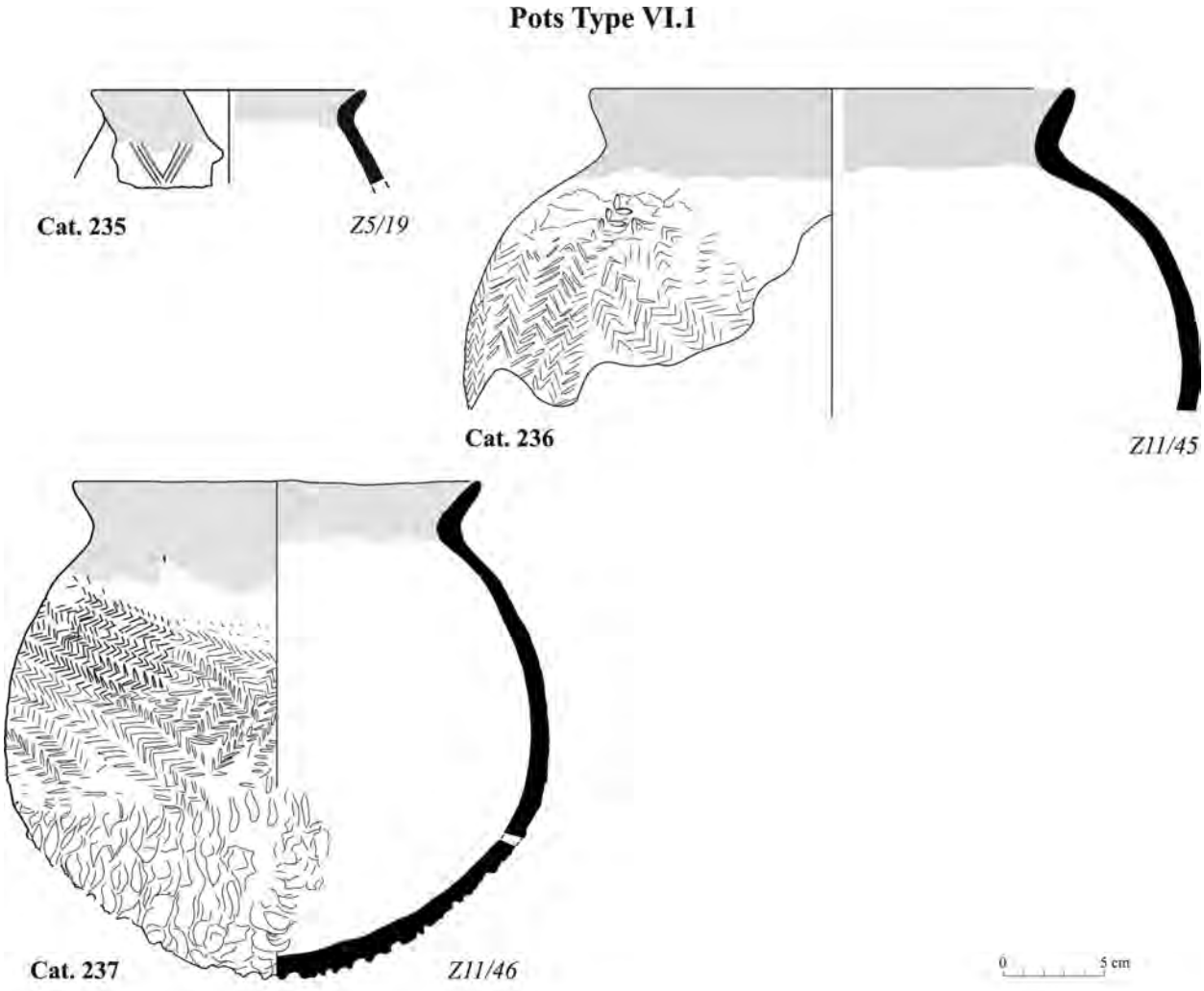

FIGURE 7.53 Pots of type VI.1

7.2 *Pots Type VI.2* [*Fig. 7.111*]

Cat. 238

Pot

Inv. no: **Z27/12**

Provenance: Tumulus 27, superstructure

Construction: handmade (1)

State of preservation: fragmentary, sherds, 8% of rim

Measurements: Dr = 16 cm; $_{p}$H = 26.8 cm

Fabric: ZF10

Hardness: 3

Firing: reduced

Surface treatment: slipped external surface

Surface colour: external, slip—10R 3/3 dusky red; internal—2.5YR 2.5/1 reddish black

Colour of break: deep black

Cat. 239

Pot

Inv. no: **Z11/48**

Provenance: Tumulus 11, fill of shaft

Construction: handmade (1)

State of preservation: fragmentary, restored from sherds, rim and wall fragments, 69% of rim

Measurements: Dr = 25.5 cm; $_{p}$H = 16.3 cm

Fabric: ZF9

Hardness: 2/3

Firing: reduced

Surface treatment: slipped on both surfaces

Surface colour: external, slip—10R 5/6 red; internal—10R 5/6 red

Colour of break: 5R 2.5/1 reddish black

References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

7.3 *Pots Type VI.3* [*Fig. 7.111*]

Cat. 240

Pot

Inv. no: **Z11/44**

Provenance: Tumulus 11, fill of shaft
Construction: handmade (1)
State of preservation: fragmentary, restored from sherds, survives in three pieces, 75% of rim
Measurements: Dr = 15.5 cm; H = 24 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped on rim, mat-impressed body
Surface colour: external natural surface—5YR 4/4 reddish brown, slip—10R 5/6 red; internal—5YR 5/4 reddish brown
Colour of break: deep black
Notes: four horizontal bosses added below rim; clay added to bottom of vessel by hand using different method to that noted on Z11/46
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

8 Group VII—Jars/Bottles

8.1 *Jars Type VII.1* [*Figs 7.112–7.113*]

Variant VII.1a
Cat. 241
Jar (small, broad)
Inv. no: **Z18/6**
Provenance: Tumulus 18, burial chamber, southern part
Construction: handmade
State of preservation: incomplete, 77% of rim
Measurements: Dr = 7.4 cm; max body Dr = 19.4 cm; H = 23.5 cm
Fabric: ZF9
Hardness: 2/3
Firing: reduced
Surface treatment: uncoated on both surfaces
Surface colour: external—5YR 6/4 light reddish brown
Colour of break: deep black
References: (Klimaszewska-Drabot 2010, 483–484)

Cat. 242
Jar (medium-sized, broad)
Inv. no: **Z20/5**
Provenance: Tumulus 20, burial chamber, central part
Construction: handmade
State of preservation: incomplete, 55% of rim, body sherds missing
Measurements: Dr = 10.7 cm; max body diam. = 34 cm; H = 36.8 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 4/4 weak red
Colour of break: deep black
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367–368)

Variant VII.1b
Cat. 243
Jar (large, broad)
Inv. no: **Z9/3**
Provenance: Tumulus 9, chamber 3, southern part
Construction: handmade
State of preservation: incomplete, body sherd missing
Measurements: Dr = 9.3 cm; max body diam. = 40 cm; H = 48 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 4/6 red; internal natural surface—deep black
Colour of break: deep black
Decoration: scratched—on belly and shoulder, one drawing, geometrical motif
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367–368)

Cat. 244
Jar (medium-sized, broad)
Inv. no: **Z18/8**
Provenance: Tumulus 28, burial chamber, southern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 5.2 cm; max body diam. = 30 cm; H = 34.1 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—2.5Y 3/1 very dark grey
Colour of break: not possible to determine

Variant VII.1c
Cat. 245
Jar (medium-sized, broad)
Inv. no: **Z28/9**
Provenance: Tumulus 28, chamber 1, western part

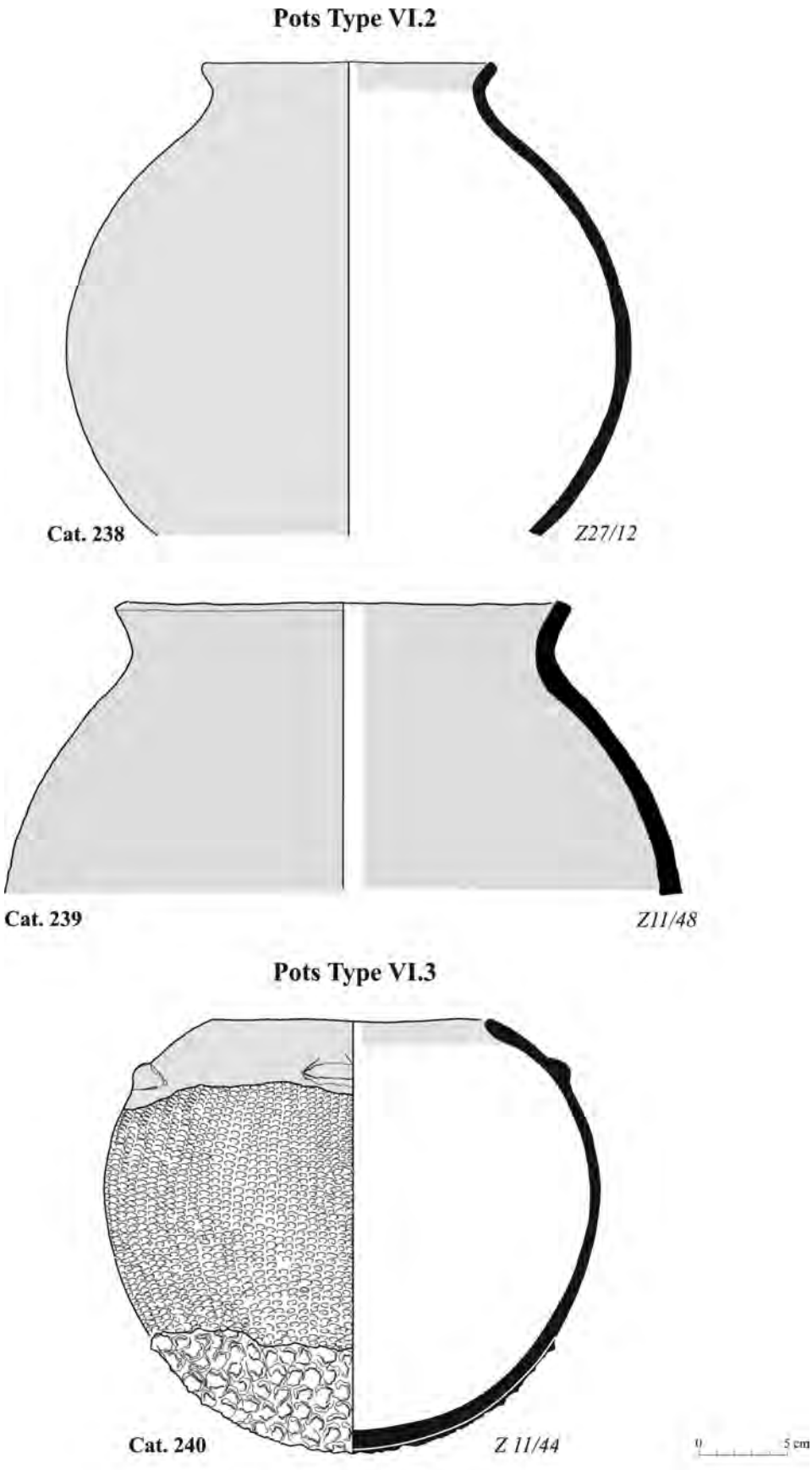

FIGURE 7.54 Pots of types VI.2 and VI.3

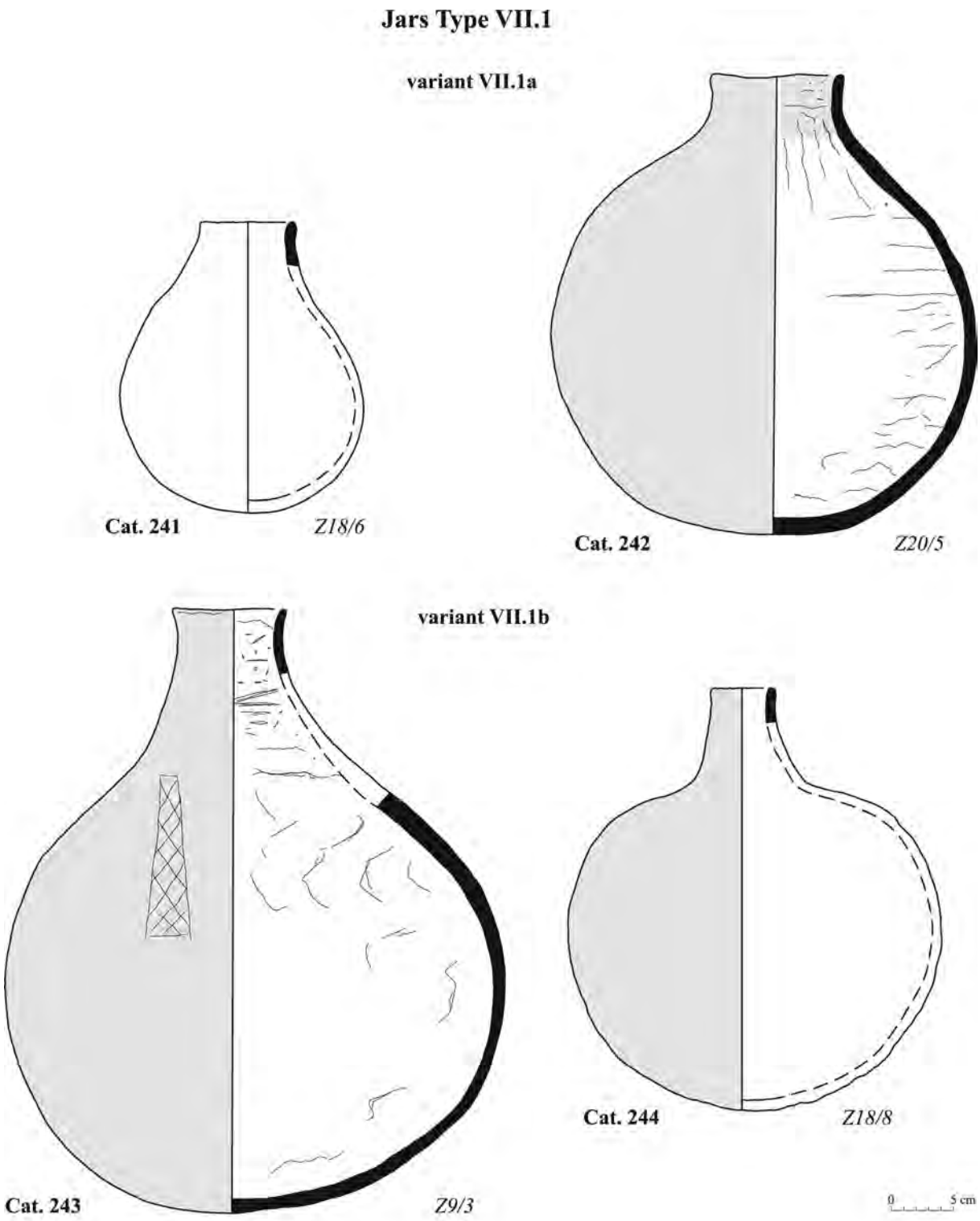

FIGURE 7.55 Bag-shaped jars of type VII.1, variants a and b

Construction: handmade
State of preservation: complete
Measurements: Dr = 5.3 cm; max body diam. = 27 cm; H = 31.8 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 5/8 red
Colour of break: not possible to determine

Cat. 246
Jar (large, broad)
Inv. no: **Z12/71+Z12/78**
Provenance: Tumulus 12, chamber 1, central part
Construction: handmade
State of preservation: incomplete, restored from sherds, rim missing, body fragments missing
Measurements: max body diam. = 40 cm; $_{p}$H = 45.5 cm
Fabric: ZF11
Hardness: 3
Firing: reduced
Surface treatment: slipped, burnished on external surface and mat-impressed
Surface colour: external, slip—7.5YR 2.5/2 very dark brown
Colour of break: Gley 1 2.5/N black
Notes: mat impression visible beneath slip; evidence of repairs to vessel—holes executed in neck
References: (Czyżewska-Zalewska 2016, 735–737)

Cat. 247
Jar (small, broad)
Inv. no: **Z28/6**
Provenance: Tumulus 28, chamber 1, eastern part
Construction: handmade
State of preservation: almost complete, 95% of rim
Measurements: Dr = 5.3 cm; max body diam. = 24 cm; H = 25.4 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 5/6 red
Colour of break: not possible to determine
Decoration: applied—four small bosses on shoulder

Variant VII.1d
Cat. 248
Jar (medium-sized, broad)
Inv. no: **Z24/39**
Provenance: Tumulus 24, chamber 3, southern part
Construction: handmade
State of preservation: almost complete, 75% of rim
Measurements: Dr = 8 cm; max body diam. = 29 cm; H = 35 cm
Fabric: ZF10
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 1
Surface colour: external natural surface—7.5YR 6/4 light brown, slip—7.5R 4/6 red
Colour of break: Gley1 2.5/N black
Decoration: slip on neck and band of slip on shoulder with mat-impressed pattern on body

Cat. 249
Jar (large, broad)
Inv. no: **Z12/72**
Provenance: Tumulus 12, chamber 1, eastern part
Construction: handmade
State of preservation: fragmentary, restored from sherds, upper part of vessel, rim missing
Measurements: max body diam. = 49 cm; $_{p}$H = 42 cm
Fabric: ZF9
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 3
Surface colour: external natural surface—2.5YR 6/8 light red, slip—7.5R 4/4 weak red; internal—10YR 7/3 very pale brown
Colour of break: deep black
Decoration: slip on neck and band of slip on shoulder with mat-impressed pattern on body
References: (Czyżewska-Zalewska 2016, 735–737)

8.2 *Jars Type VII.2* [*Figs 7.114–7.115*]

Variant VII.2a
Cat. 250
Jar (small, broad)
Inv. no: **Z18/7**
Provenance: Tumulus 18, burial chamber, northern part
Construction: handmade
State of preservation: incomplete, 50% of rim, fragments of bottom part of vessel missing
Measurements: Dr = 5.2 cm; max body diam. = 16.6 cm; H = 19.1 cm
Fabric: ZF9
Hardness: soft (2)

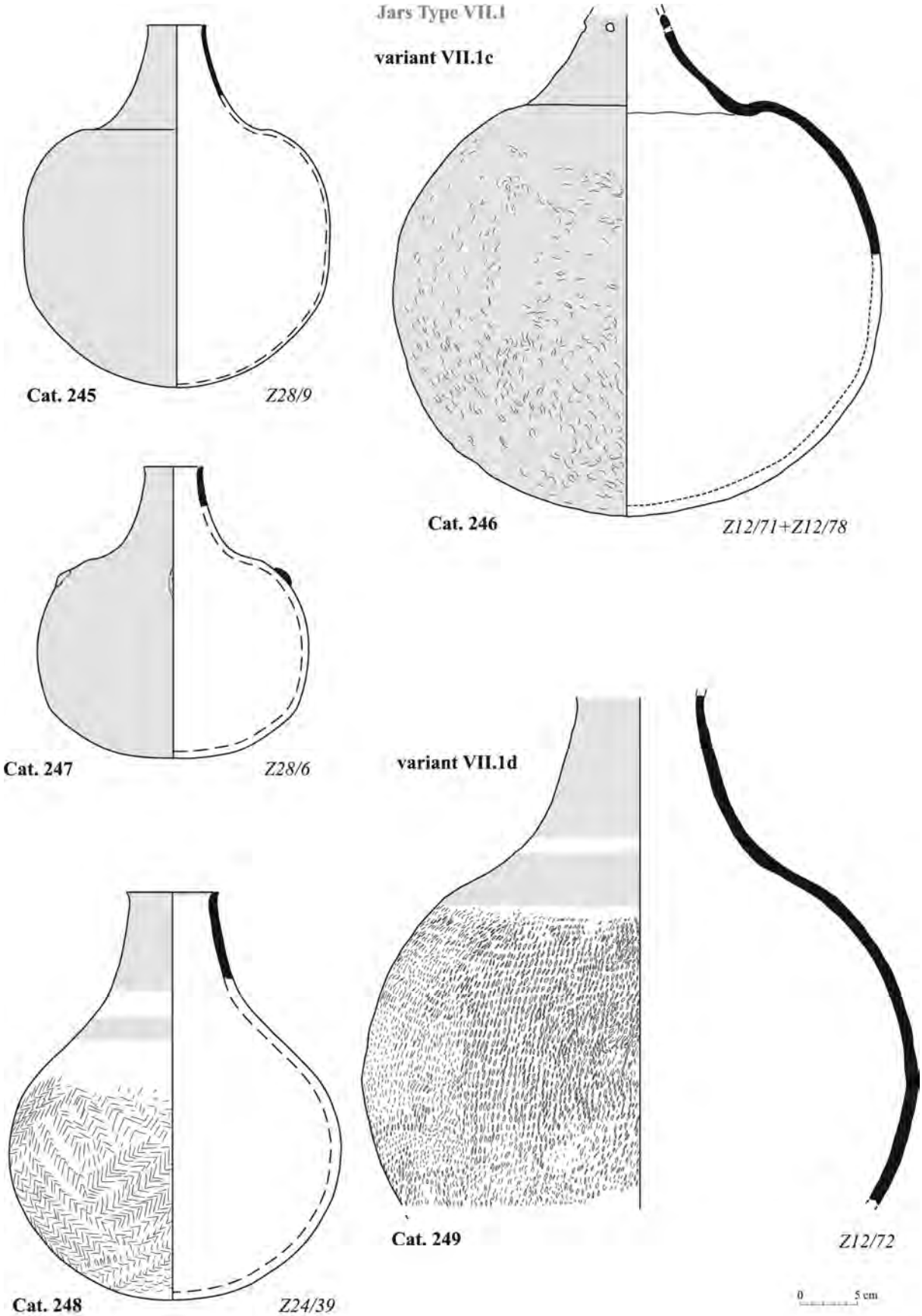

FIGURE 7.56 Bag-shaped jars of type VII.1, variants c and d

Firing: reduced
Surface treatment: uncoated on both surfaces
Surface colour: external—10YR 5/3 brown
Colour of break: deep black
References: (Klimaszewska-Drabot 2010, 483–484)

Cat. 251
Jar (large, broad)
Inv. no: **Z13/21**
Provenance: Tumulus 13, chamber 2, northern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 6 cm; max body diam. = 30.5 cm; H = 40 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: uncoated on both surfaces
Surface colour: external—10R 5/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 252
Jar (medium-sized/large, broad)
Inv. no: **Z12/135**
Provenance: Tumulus 12, shaft
Construction: handmade
State of preservation: incomplete, 98% of rim, restored from sherds, some body sherds missing
Measurements: Dr = 7 cm; max body diam. = 33 cm; H = 39.5 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: uncoated on both surfaces
Surface colour: external—5YR 6/6 reddish yellow—2.5YR 5.6 red—2.5YR 5/8 red
Colour of break: deep black

Cat. 253
Jar (small, broad)
Inv. no: **Z21/9**
Provenance: Tumulus 21, burial chamber, western part
Construction: handmade
State of preservation: complete
Measurements: Dr = 5 cm; max body diam. = 17.3 cm; H = 21 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—5Y 2.5/1 black
Colour of break: not possible to determine

Cat. 254
Jar (small, broad)
Inv. no: **Z17/2**
Provenance: Tumulus 17, burial chamber, southern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 4.5 cm; max body diam. = 19 cm; H = 22.2 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—Gley1 2.5/N black
Colour of break: not possible to determine
Decoration: scratched—on belly and shoulder, two drawings, floral and geometrical motifs
References: (Klimaszewska-Drabot and Czyżewska 2012, 362–363)

Variant VII.2b
Cat. 255
Jar (large, broad)
Inv. no: **Z12/134**
Provenance: Tumulus 12, shaft
Construction: handmade
State of preservation: incomplete, body fragments missing
Measurements: Dr = 7.3 cm; max body diam. = 45 cm; H = 44 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on the external surface
Surface colour: external natural surface—2.5YR 5/6 red, slip—7.5R 5/6 red; internal—Gley 1 2.5/1 greenish black
Colour of break: deep black
Decoration: applied—two small bosses on shoulder
References: (Czyżewska-Zalewska 2016, 730–733)

Cat. 256
Jar (large, broad)
Inv. no: **Z24/40**
Provenance: Tumulus 24, chamber 4, central part
Construction: handmade
State of preservation: complete

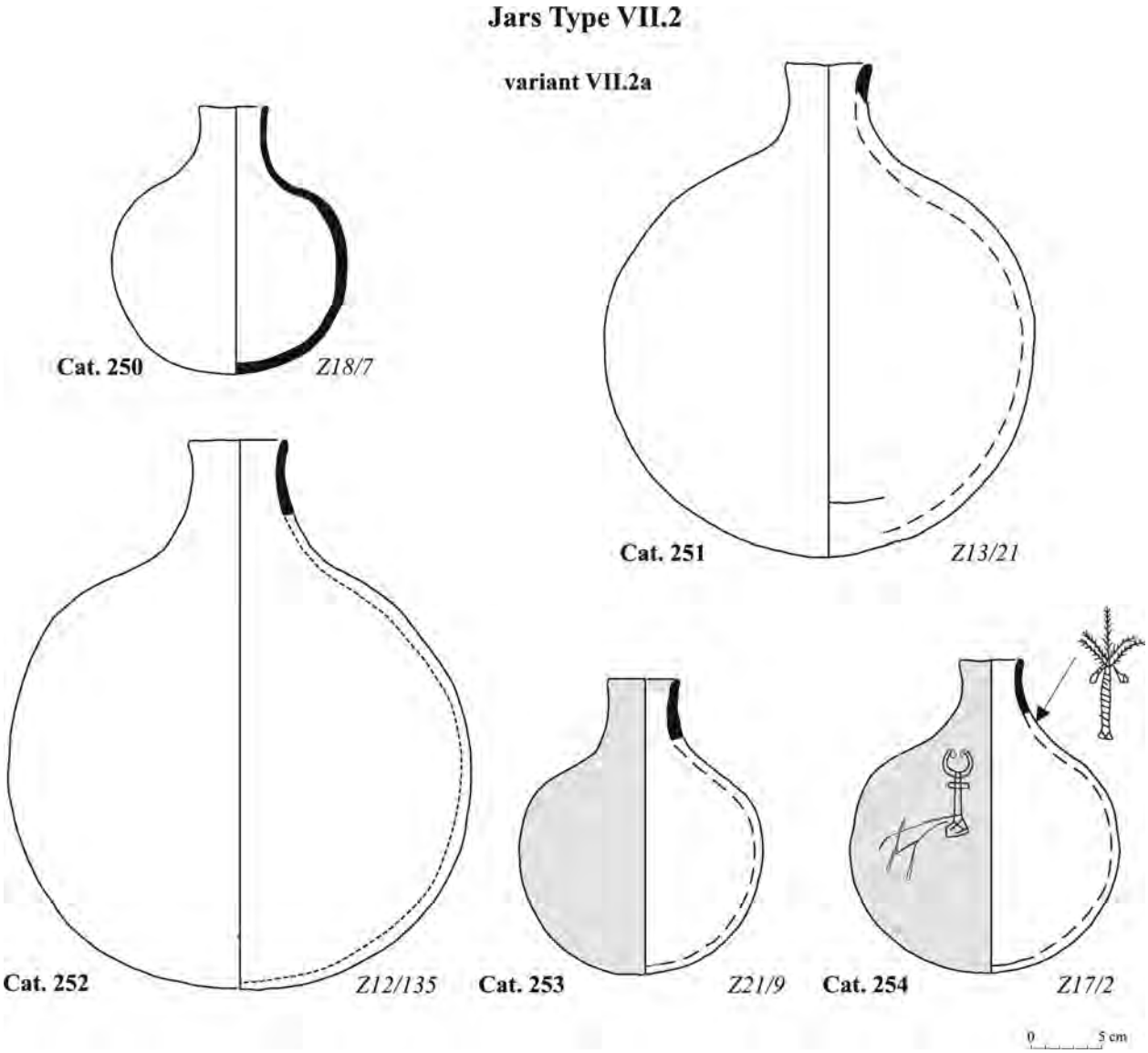

FIGURE 7.57 Globular jars of type VII.2, variant a

Measurements: Dr = 8.5 cm; max body diam. = 40 cm; H = 47 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10YR 4/6 dark yellowish brown
Colour of break: not possible to determine
Decoration: applied—two small bosses on shoulder

Variant VII.2c
Cat. 257
Jar (medium-sized, broad)
Inv. no: **Z15/52**
Provenance: Tumulus 15, chamber 1, eastern part
Construction: handmade
State of preservation: incomplete, upper part of vessel
Measurements: Dr = 8 cm; max body diam. = 26.5 cm; $_{p}$H = 33 cm
Fabric: ZF7
Hardness: 3
Firing: reduced
Surface treatment: mat-impressed on external surface, pattern 7
Surface colour: external natural surface—5YR 6/6 reddish yellow
Colour of break: 5YR 3/1 very dark grey
Decoration: incised—geometrical motifs below rim and wavy lines on neck of vessel

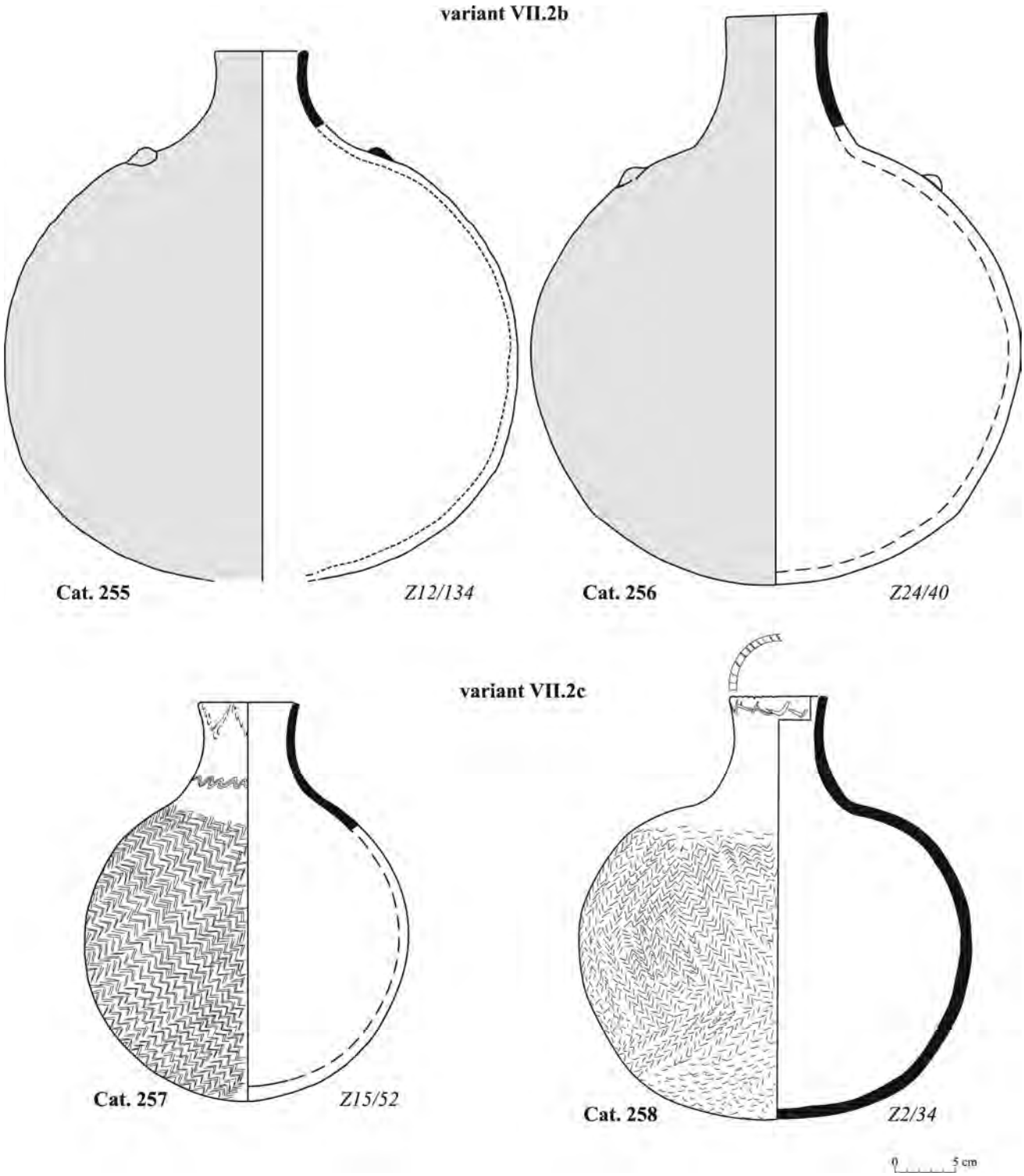

FIGURE 7.58 Globular jars of type VII.2, variants b and c

Cat. 258
Jar (medium-sized, medium broad)
Inv. no: **Z2/34**
Provenance: Tumulus 2, chamber 2
Construction: handmade
State of preservation: complete
Measurements: Dr = 8 cm; max body diam. = 32 cm; H = 35 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: mat-impressed on external surface, pattern 1

Surface colour: external natural surface—7.5YR 6/4 light brown
Colour of break: not possible to determine
Decoration: incised—geometrical motifs below rim and strokes on rim of vessel
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

8.3 *Jars Type VII.3* [*Fig. 7.116*]

Variant VII.3a
Cat. 259
Jar (large, broad)
Inv. no: **Z12/24.1**
Provenance: Tumulus 24, fill of shaft, south-eastern part
Construction: handmade
State of preservation: fragmentary, 24% of rim, upper part of vessel
Measurements: Dr = 6.5 cm; max body diam. = 44.5 cm; $_{p}$H = 28.5 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external natural surface—5YR 6/6 reddish yellow, slip—10R 5/6 red—10R4/6 red—10R 4/8 red; internal natural surface—5YR 5/6 yellowish red—2.5Y 2.5/1 black
Colour of break: deep black

Variant VII.3b
Cat. 260
Jar (large, broad)
Inv. no: **Z2/39**
Provenance: Tumulus 2, chamber 3
Construction: handmade
State of preservation: almost complete, 94% of rim
Measurements: Dr = 5.5 cm; max body diam. = 36.4 cm; H = 42.8 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: reduced
Surface treatment: mat-impressed on external surface, pattern 1
Surface colour: external natural surface—7.5YR 6/4 light brown
Colour of break: not possible to determine
Decoration: incised—herringbone pattern below rim; punctuated—oval shapes on shoulder
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

Cat. 261
Jar (large, broad)
Inv. no: **Z14/9**
Provenance: Tumulus 14, chamber 3, central part
Construction: handmade
State of preservation: complete
Measurements: Dr = 6.8 cm; max body diam. = 46 cm; H = 49 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: mat-impressed on external surface, pattern 1
Surface colour: external natural surface—2.5YR 5/8 red
Colour of break: not possible to determine

8.4 *Bottles Type VII.4* [*Figs 7.117–7.118*]

Variant VII.4a
Cat. 262
Bottle (medium-sized, medium broad)
Inv. no: **Z2/36**
Provenance: Tumulus 2, chamber 3
Construction: handmade
State of preservation: almost complete, 5% of rim
Measurements: Dr = 7.6 cm; max body diam. = 27 cm; H = 34.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: mat-impressed on external surface, pattern 4
Surface colour: external natural surface—5YR 5/4 reddish brown
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

Cat. 263
Bottle (large, broad)
Inv. no: **Z2/38**
Provenance: Tumulus 2, chamber 3
Construction: handmade
State of preservation: complete
Measurements: Dr = 8.6 cm; max body diam. = 40 cm; H = 48.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: mat-impressed on external surface, pattern 4
Surface colour: external natural surface—5YR 5/3 reddish brown

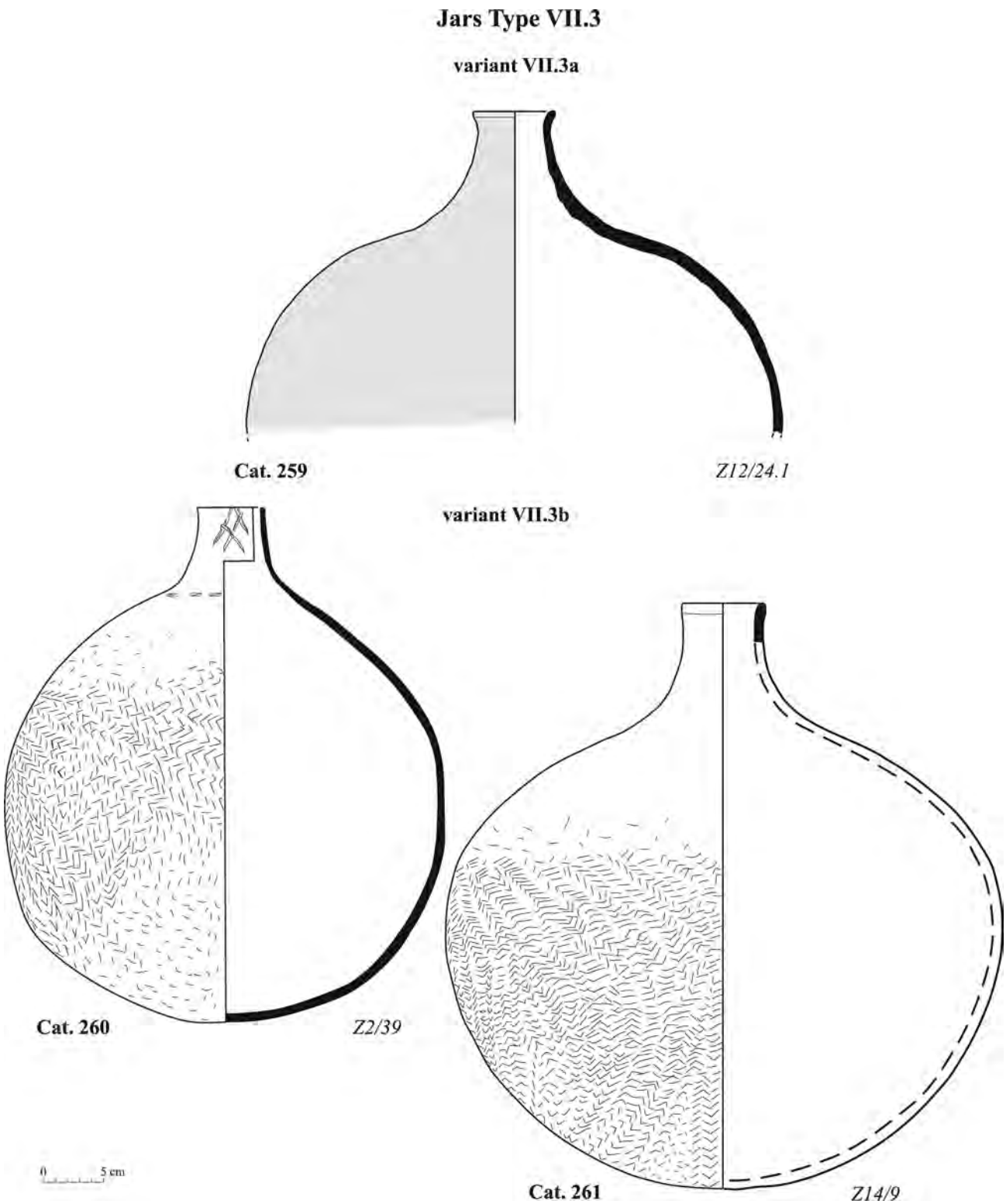

FIGURE 7.59 Globular jars of type VII.3, variants a and b

Colour of break: not possible to determine
Decoration: incised—strokes below rim
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

Cat. 264
Bottle (large, broad)
Inv. no: **Z15/27**
Provenance: Tumulus 15, chamber 2, southern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 8.7 cm; max body diam. = 43 cm; H = 55 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 1
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—2.5YR 4/6 red
Colour of break: not possible to determine
Decoration: slip on rim and neck with mat-impressed pattern on body; punctuated—oval shapes on shoulder
References: (Czyżewska-Zalewska 2016, 735–737)

Cat. 265
Bottle (large, medium broad)
Inv. no: **Z15/59**
Provenance: Tumulus 15, chamber 1, eastern part
Construction: handmade
State of preservation: incomplete, 44 % of rim
Measurements: Dr = 7.4 cm; max body diam. = 43.5 cm; H = 56 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 1
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—10R 5/6 red
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body; punctuated—oval shapes on shoulder
References: (Czyżewska-Zalewska 2016, 730–733)

Variant VII.4b
Cat. 266
Bottle (large, broad)
Inv. no: **Z2/37**
Provenance: Tumulus 2, chamber 2
Construction: handmade
State of preservation: complete
Measurements: Dr = 7.6 cm; max body diam. = 42.5 cm; H = 51.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: mat-impressed on external surface, pattern 1
Surface colour: external natural surface—5YR 5/4 reddish brown
Colour of break: not possible to determine
Decoration: incised—strokes below rim; punctuated—oval shapes on shoulder
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

Cat. 267
Bottle (large, broad)
Inv. no: **Z9/4**
Provenance: Tumulus 9, chamber 2, central part
Construction: handmade
State of preservation: almost complete, 50 % of rim
Measurements: Dr = 8.2 cm; max body diam. = 39 cm; H = 48.5 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck and base; mat-impressed, pattern 2
Surface colour: external natural surface—5YR 5/4 reddish brown, slip—10R 4/6 red; internal natural surface—7.5YR 5/2 brown
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367–368)

Cat. 268
Bottle (large, broad)
Inv. no: **Z13/16**
Provenance: Tumulus 13, chamber 2, central part
Construction: handmade
State of preservation: almost complete, 75 % of rim
Measurements: Dr = 8.1 cm; max body diam. = 37 cm; H = 45.7 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck and base; mat-impressed, pattern 1

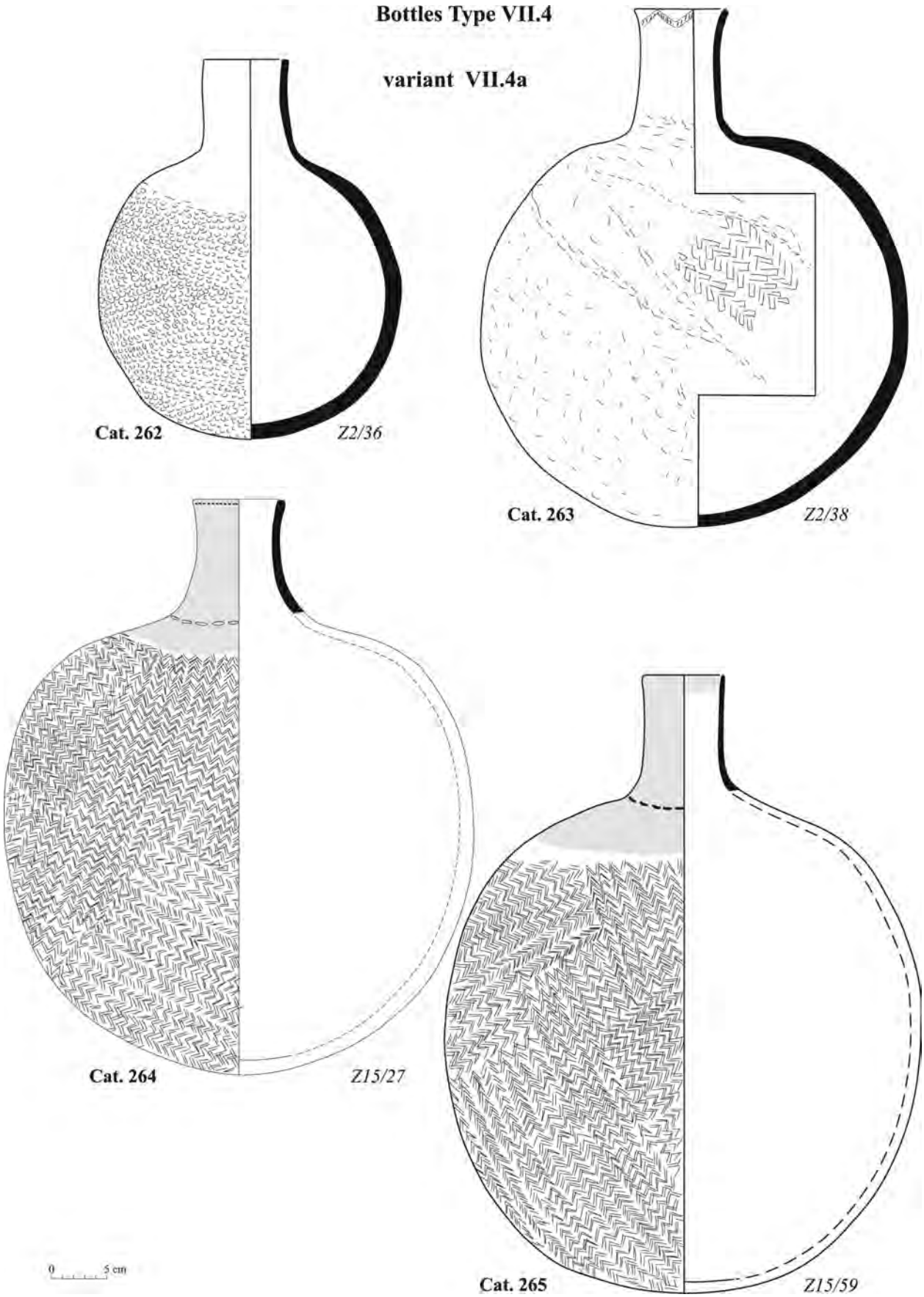

FIGURE 7.60 Globular bottles of type VII.4, variant a

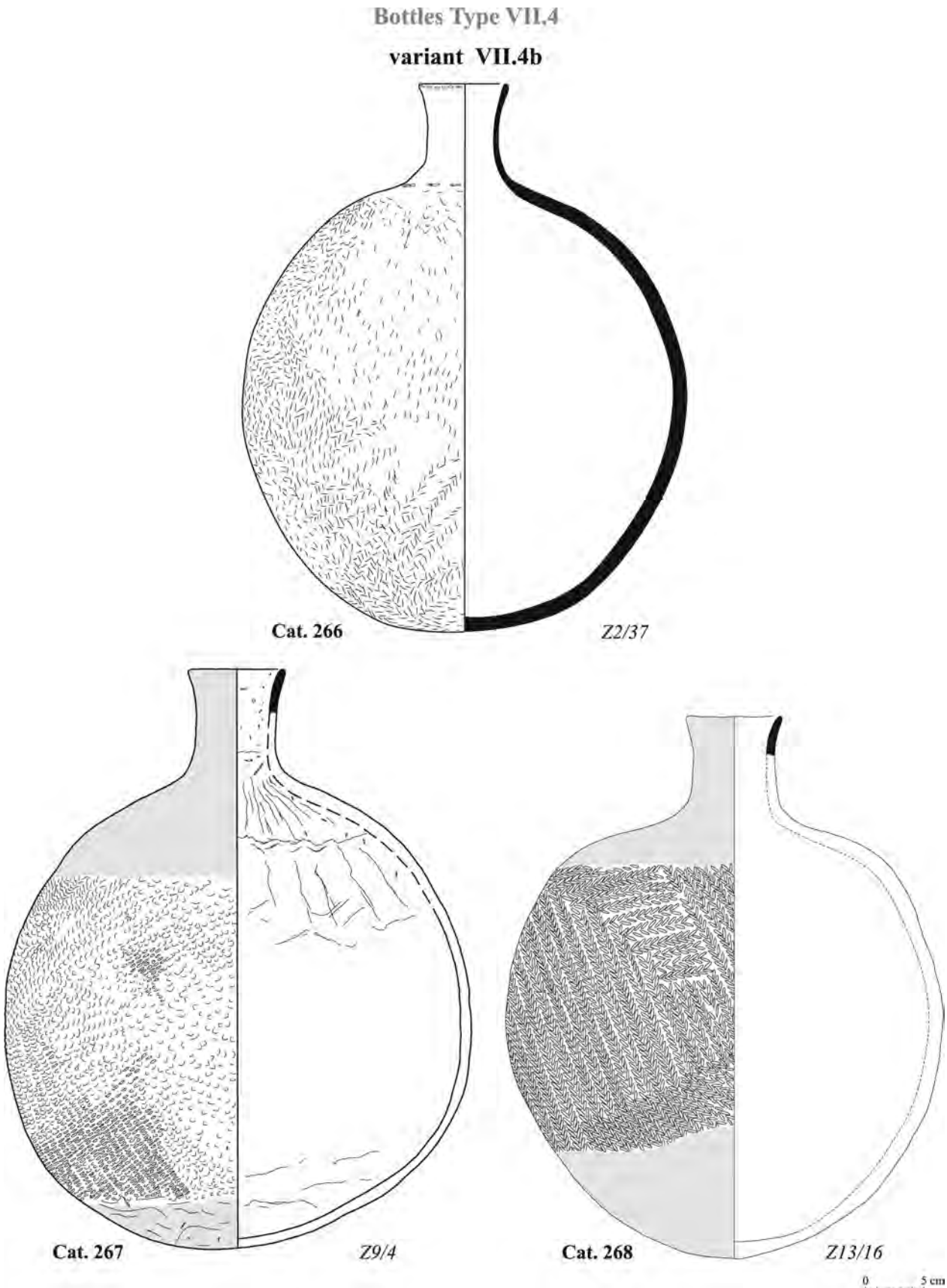

FIGURE 7.61 Globular bottles of type VII.4, variant b

Surface colour: external natural surface—5YR 5/4 reddish brown, slip—10R 4/6 red
Colour of break: Gley1 2.5/N black
Decoration: slip on rim and neck with mat-impressed pattern on body
References: (Klimaszewska-Drabot and Czyżewska 2012, 365–367)

8.5 *Bottles Type VII.5* [*Figs 7.119–7.120*]

Variant VII.5a

Cat. 269
Bottle (medium-sized, medium broad)
Inv. no: **Z12/75**
Provenance: Tumulus 12, chamber 1, eastern part
Construction: handmade
State of preservation: almost complete, 92% of rim
Measurements: Dr = 4.5 cm; max body diam. = 16.6 cm; H = 22 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—7.5YR 2.5/2 very dark brown
Colour of break: Gley 1 2.5/N black

Cat. 270
Bottle (medium-sized, broad)
Inv. no: **Z22/5**
Provenance: Tumulus 22, burial chamber
Construction: handmade
State of preservation: incomplete, 97% of rim
Measurements: Dr = 6.3 cm; max body diam. = 23.5 cm; H = 29 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 4/6 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

Variant VII.5b

Cat. 271
Bottle (small, broad)
Inv. no: **Z10/22**
Provenance: Tumulus 10, burial chamber, northern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 3.8 cm; max body diam. = 14.7 cm; H = 17.2 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: uncoated
Surface colour: external—10R 5/4 weak red
Colour of break: not possible to determine
Decoration: applied—two small bosses on shoulder
References: (Klimaszewska-Drabot 2010, 483–484)

Cat. 272
Bottle (large, medium broad)
Inv. no: **Z2/35**
Provenance: Tumulus 2, chamber 2
Construction: handmade
State of preservation: complete
Measurements: Dr = 7.1 cm; max body diam. = 33 cm; H = 43 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—2.5YR 5/6 red
Colour of break: not possible to determine
Decoration: applied—two small bosses on shoulder
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 13–15)

Cat. 273
Bottle (medium-sized, medium broad)
Inv. no: **Z25/3**
Provenance: Tumulus 25, chamber 1, western part
Construction: handmade
State of preservation: incomplete, 94% of rim, body fragment missing
Measurements: Dr = 5.4 cm; max body diam. = 22.7 cm; H = 30 cm
Fabric: ZF9
Hardness: 2/3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 4/6 red
Colour of break: deep black
Decoration: applied—two small bosses on shoulder

Variant VII.5c

Cat. 274
Bottle (medium-sized, broad)
Inv. no: **Z15/51**

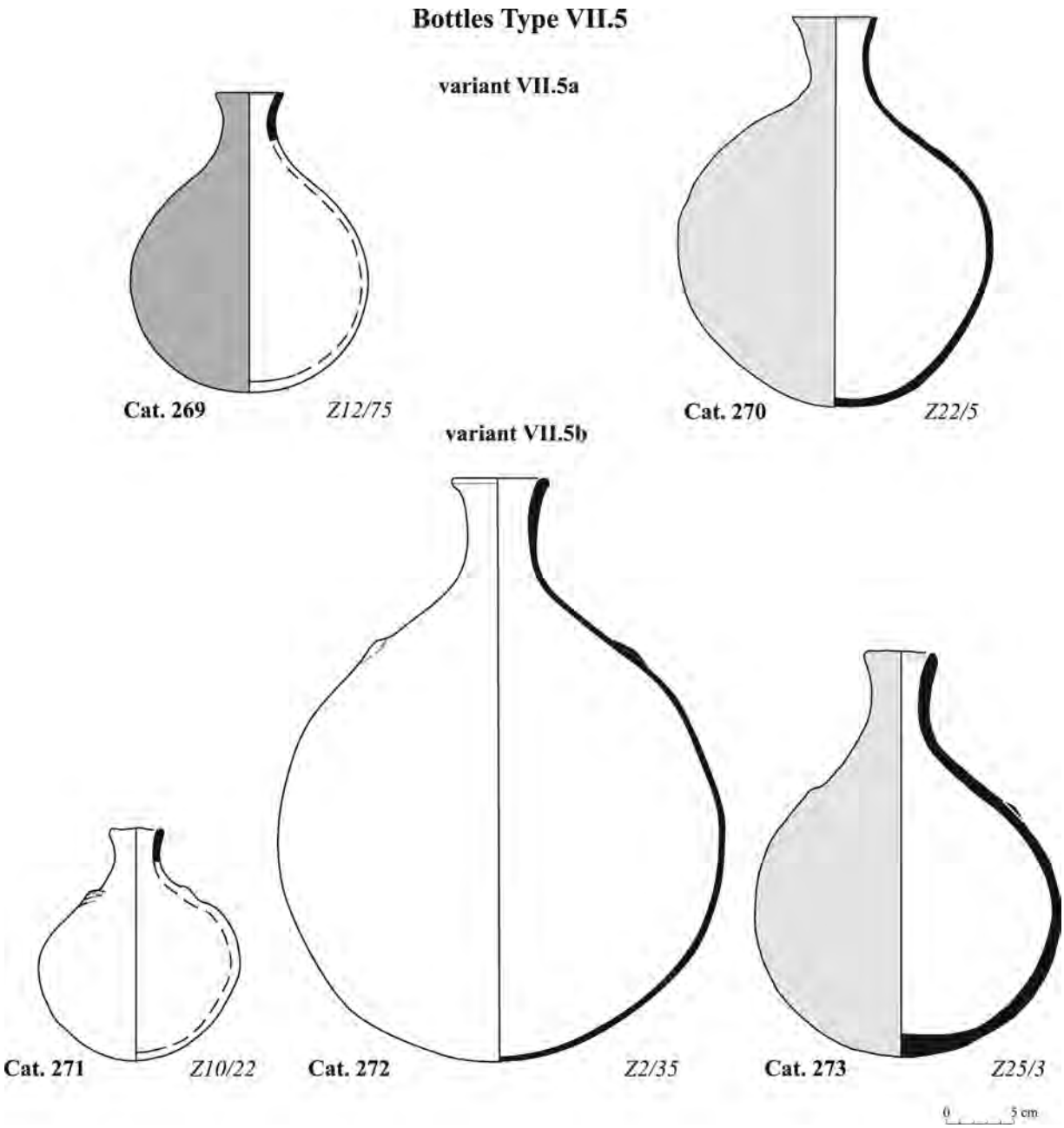

FIGURE 7.62 Bag-shaped bottles of type VII.5, variants a and b

Provenance: Tumulus 15, chamber 1
Construction: handmade
State of preservation: incomplete, body fragments missing
Measurements: Dr = 7 cm; max body diam. = 27 cm; H = 31 cm
Fabric: ZF7
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 3
Surface colour: external natural surface—7.5YR 5/4 brown, slip—10YR 4/6 dark yellowish brown
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body

Cat. 275
Bottle (large, broad)
Inv. no: **Z26/35**
Provenance: Tumulus 26, chamber 3, eastern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 9.6 cm; max body diam. = 38 cm; H = 44.5 cm

Fabric: not possible to determine
Hardness: 2/3
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 1
Surface colour: external natural surface—10YR 8/3 very pale brown, slip—7.5R 4/8 red
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body

Cat. 276
Bottle (large, medium broad)
Inv. no: **Z14/33**
Provenance: Tumulus 14, shaft, southern part
Construction: handmade
State of preservation: fragmentary, restored from sherds, complete profile, body fragments missing
Measurements: Dr = 8 cm; max body diam. = 43 cm; H = 54 cm
Fabric: ZF10
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 6
Surface colour: external natural surface—10R 6/6 light red, slip—10R 5/6 red; internal natural surface—Gley1 3/N black
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body

8.6 *Bottles Type VII.6* [*Figs 7.121–7.122*]

Variant VII.6a
Cat. 277
Bottle (medium-sized, broad)
Inv. no: **Z5/3**
Provenance: Tumulus 5, chamber 1, near southern wall of chamber
Construction: handmade
State of preservation: fragmentary, complete rim, upper part of vessel
Measurements: Dr = 4.7 cm; max body diam. = 22.4 cm; $_{p}$H = 24.8 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—7.5YR 4/3 brown
Colour of break: deep black
References: (Klimaszewska-Drabot 2010, 483–484)

Variant VII.6b
Cat. 278
Bottle (medium-sized, medium broad)
Inv. no: **Z15/53**
Provenance: Tumulus 15, chamber 1, eastern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 5.5 cm; max body diam. = 23 cm; H = 30 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 1
Surface colour: external natural surface—7.5YR 4/3 brown, slip—2.5YR 4/4 reddish brown
Colour of break: not possible to determine
Decoration: slip on neck and band of slip on shoulder with mat-impressed pattern on body; scratched—geometric pattern on shoulder

Cat. 279
Bottle (medium-sized, broad)
Inv. no: **Z15/8**
Provenance: Tumulus 15, fill of shaft
Construction: handmade
State of preservation: incomplete, restored from sherds, 97 % of rim, body fragments missing
Measurements: Dr = 6 cm; max body diam. = 26.5 cm; H = 32.5 cm
Fabric: ZF8
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck; mat-impressed, pattern 1
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—10R 5/6 red
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body

Variant VII.6c
Cat. 280
Bottle (medium-sized, broad)
Inv. no: **Z12/120**
Provenance: Tumulus 12, chamber 3, eastern part
Construction: handmade
State of preservation: complete
Measurements: Dr = 7.5 cm; max body diam. = 31 cm; H = 36.5 cm
Fabric: not possible to determine
Hardness: 3

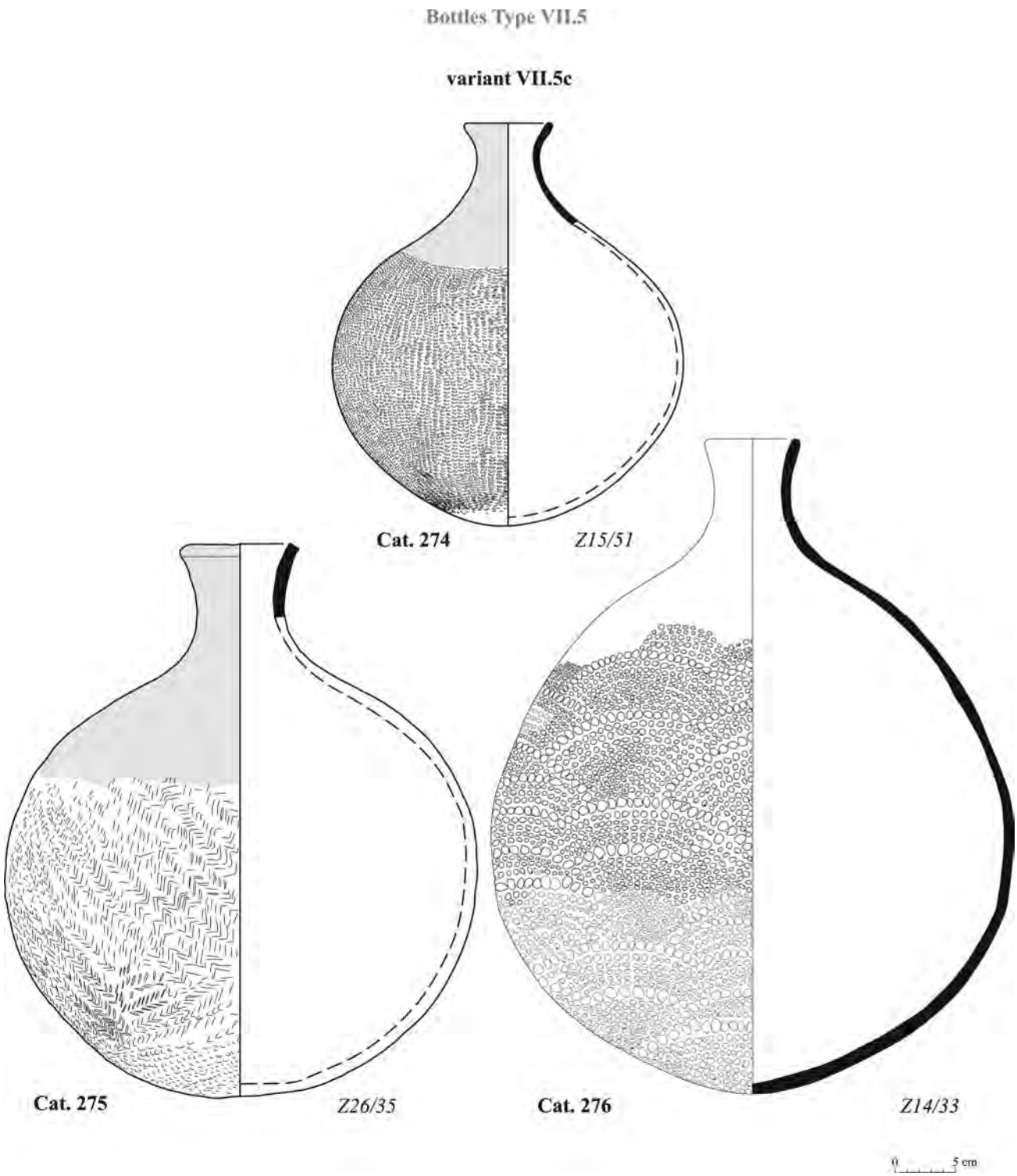

FIGURE 7.63 Bag-shaped bottles of type VII.5, variant c

Firing: reduced
Surface treatment: uncoated
Surface colour: external—2.5YR 5/6 red
Colour of break: not possible to determine
Decoration: applied—two small bosses on shoulder; incised—five sets of two vertical strokes below rim

Cat. 281
Bottle (small, broad)
Inv. no: **Z20/3**
Provenance: Tumulus 20, burial chamber, central part
Construction: handmade
State of preservation: incomplete, restored from sherds, body fragment missing

Measurements: Dr = 5.5 cm; max body diam. = 21 cm; H = 25.7 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—deep black
Colour of break: deep black
Decoration: applied—two small bosses on shoulder
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367–368)

Cat. 282
Bottle (medium-sized, broad)
Inv. no: **Z20/4**
Provenance: Tumulus 20, burial chamber, central part
Construction: handmade
State of preservation: complete
Measurements: Dr = 4.7 cm; max body diam. = 25 cm; H = 28.5 cm
Fabric: not possible to determine
Hardness: 2/3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 4/8 red
Colour of break: not possible to determine
Decoration: applied—two small bosses on shoulder

Variant VII.6d
Cat. 283
Bottle (small, broad)
Inv. no: **Z11/26**
Provenance: Tumulus 11, chamber 2, central part
Construction: handmade
State of preservation: incomplete, restored from sherds, 75 % of rim, body fragments missing
Measurements: Dr = 3.5 cm; max body diam. = 12.3 cm; H = 14.4 cm
Fabric: ZF9
Hardness: 3/4
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 2.5/2 very dusky red; internal natural surface—10R 2.5/1 reddish black
Colour of break: deep black
Decoration: applied—two lugs on shoulder
References: (Klimaszewska-Drabot and Czyżewska 2012, 368–372)

Cat. 284
Bottle (large, broad)
Inv. no: **Z12/121**
Provenance: Tumulus 12, chamber 3, eastern part
Construction: handmade
State of preservation: incomplete, rim missing
Measurements: max body diam. = 36 cm; $_{p}$H = 43 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—10R 4/8 red
Colour of break: not possible to determine
Decoration: applied—two lugs on shoulder
Notes: evidence of repairs to vessel—holes executed in neck

Cat. 285
Bottle (large, broad)
Inv. no: **Z9/5**
Provenance: Tumulus 9, chamber 2, northern part
Construction: handmade
State of preservation: incomplete, one lug missing
Measurements: Dr= 8.7 cm; max body diam. = 37.5 cm; H = 46 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped and burnished on external surface
Surface colour: external, slip—10R 4/6 red
Colour of break: not possible to determine
Decoration: applied—two lugs on shoulder
Notes: evidence of repairs to vessel—holes executed in neck

Cat. 286
Bottle (large, broad)
Inv. no: **Z12/21**
Provenance: Tumulus 12, fill of shaft
Construction: handmade
State of preservation: incomplete, restored from sherds, 80 % of rim, bottom part missing
Measurements: Dr = 10 cm; max body diam. = 39 cm; $_{p}$H = 46 cm
Fabric: ZF9
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished on external surface

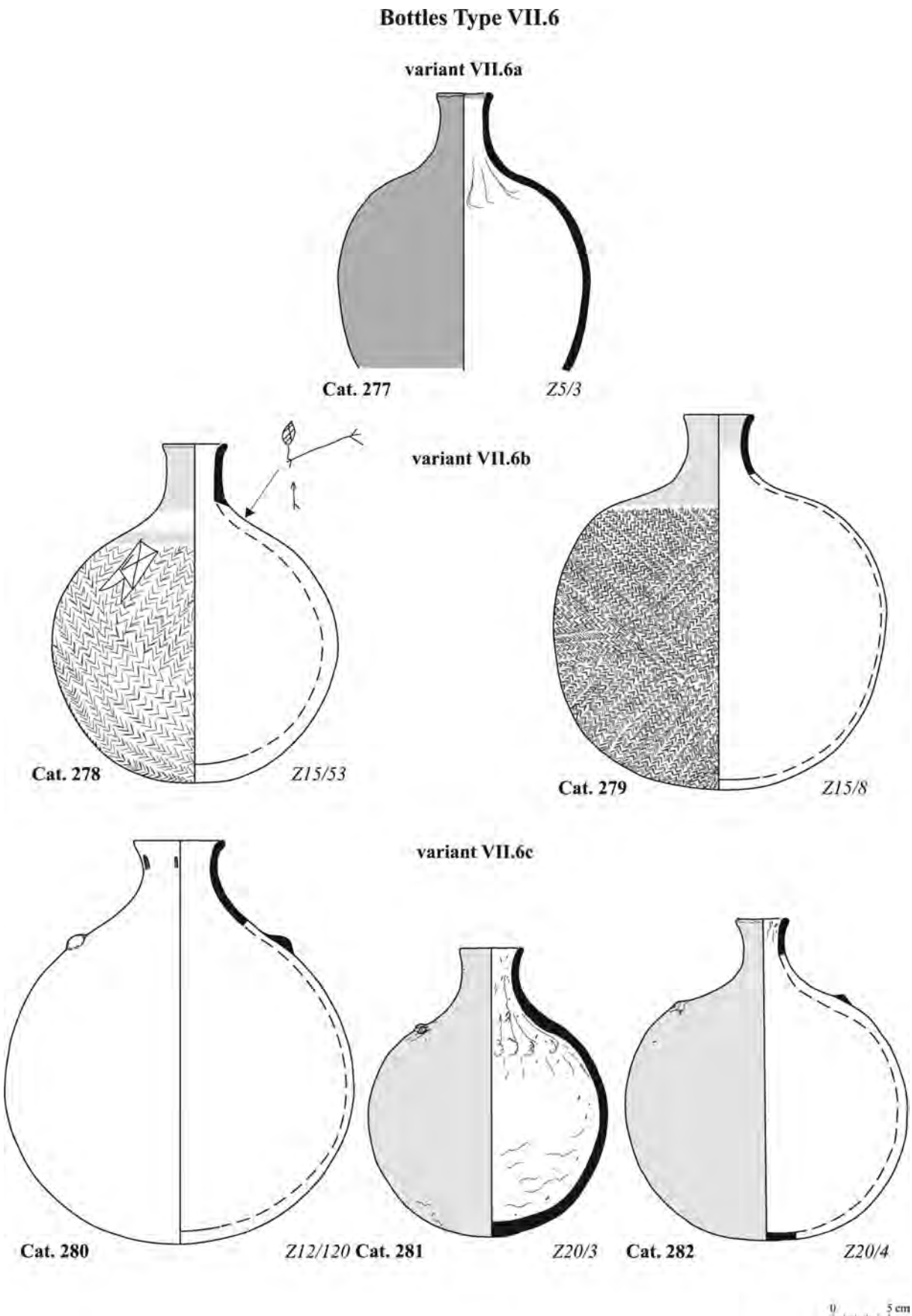

FIGURE 7.64 Globular bottles of type VII.6, variants a, b and c

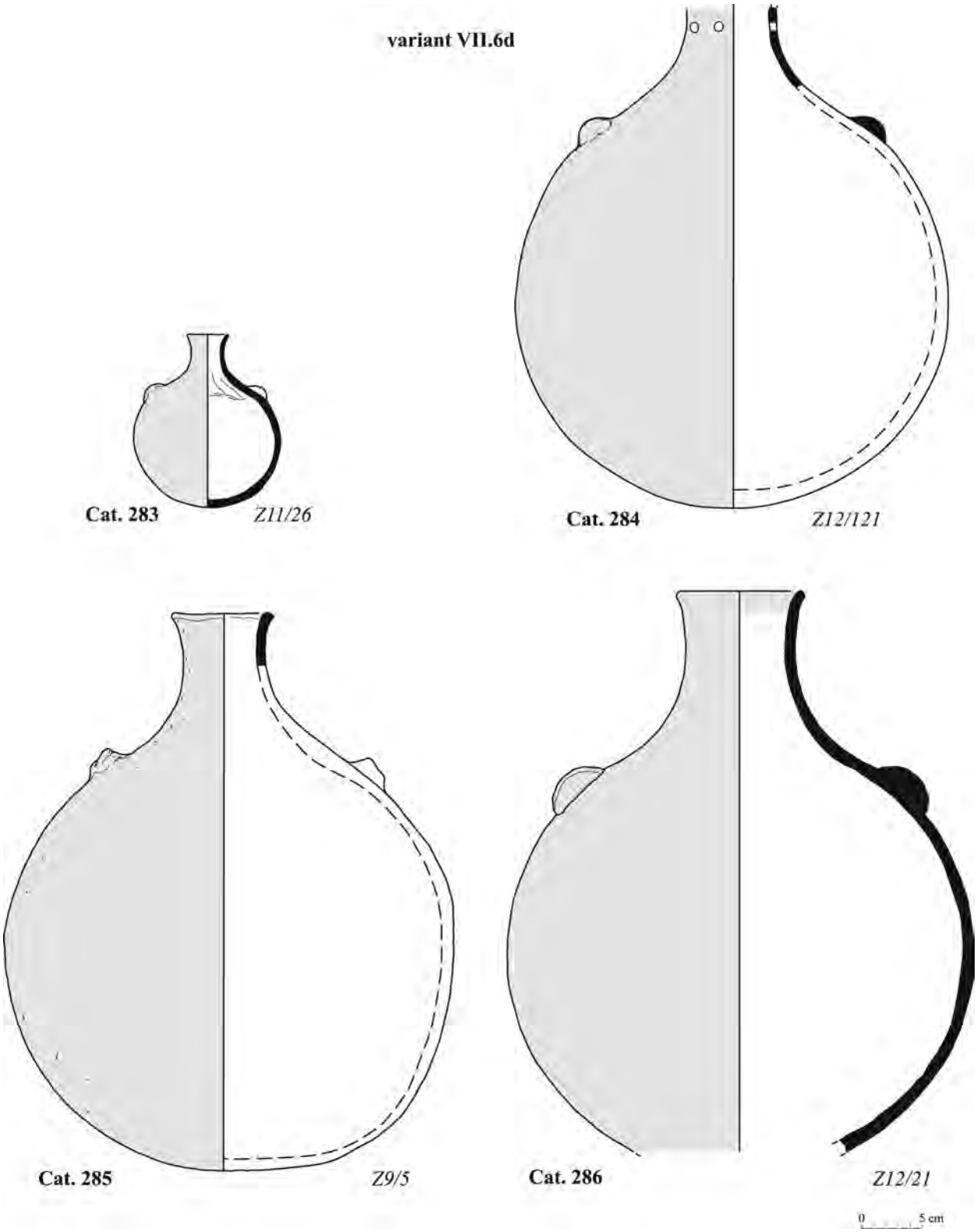

FIGURE 7.65 Globular bottles of type VII.6, variant d

Surface colour: external natural surface—2.5YR 5/6 red, slip—10R 5/6 red; internal natural surface—2.5YR 3/1 dark reddish grey
Colour of break: deep black
Decoration: applied—two lugs on shoulder

9 Jars Varia [*Fig. 7.123*]

Cat. 287
Jar (large, broad)
Inv. no: **Z12/51**
Provenance: Tumulus 12, fill of shaft
Construction: handmade
State of preservation: fragmentary, restored from sherds
Measurements: Dr = 13.5 cm
Fabric: ZF11
Hardness: 3/4
Firing: reduced
Surface treatment: slip on external surface
Surface colour: external natural surface—2.5YR 5/8 red, slip—7.5YR 8/2 pinkish white; internal—2.5YR 5/8 red (upper part), 2.5 Y 3/1 very dark grey
Colour of break: 5Y 2.5/1 black
Decoration: incised—lines on shoulders and neck

Cat. 288
Jar (large, broad)
Inv. no: **Z25/2**
Provenance: Tumulus 25, upper part of shaft
Construction: handmade
State of preservation: fragmentary, 25% of rim, upper part of vessel
Measurements: Dr = 18.5 cm; $_{p}$H = 26 cm
Fabric: ZF9
Hardness: 3/4
Firing: reduced
Surface treatment: slipped on external surface
Surface colour: external, slip—2.5YR 5/4 reddish brown; internal—5YR 6/4 light reddish brown
Colour of break: deep black
Decoration: painted—white strip on wall; incised—below rim

Cat. 289
Jar
Inv. no: **Z11/42**
Provenance: Tumulus 11, robber shaft
Construction: handmade
State of preservation: fragmentary, 72% of rim, neck and shoulder fragment with one boss
Measurements: Dr = 9.3 cm; $_{p}$H =10 cm
Fabric: ZF10
Hardness: 3
Firing: reduced
Surface treatment: slipped and burnished neck, and mat-impressed body, pattern 1
Surface colour: external, slip—10R 5/8 red; internal—10YR 5/4 yellowish brown
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body; applied—one boss extant on shoulder
References: (Klimaszewska-Drabot and Czyżewska 2012, 372–377)

Cat. 290
Jar (large, broad)
Inv. no: **Z12/133.1**
Provenance: Tumulus 12, chamber 2, southern part
Construction: handmade
State of preservation: fragmentary, restored from sherds, rim missing
Measurements: max body diam. = 56 cm; $_{p}$H = 55 cm
Fabric: ZF7
Hardness: 3
Firing: reduced
Surface treatment: slipped on external surface
Surface colour: external, slip—10R 5/8 red; internal—10YR 5/4 yellowish brown
Colour of break: deep black
Decoration: slip on rim and neck with mat-impressed pattern on body; applied—one boss extant on shoulder

Cat. 291
Jar (small, broad)
Inv. no: **Z12/52**
Provenance: Tumulus 12, fill of shaft
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, rim and base missing
Measurements: max body diam. = *c.* 55.5 cm; $_{p}$H = 65 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped and burnished on external surface
Surface colour: external natural surface—2.5YR 6/6 light red, slip—10R 5/6 red—10R 4/6 red; internal—5YR 6/6 reddish yellow (upper part), 7.5YR 6/3–6/4 light brown (lower part)
Colour of break: 5YR 5/6 yellowish red

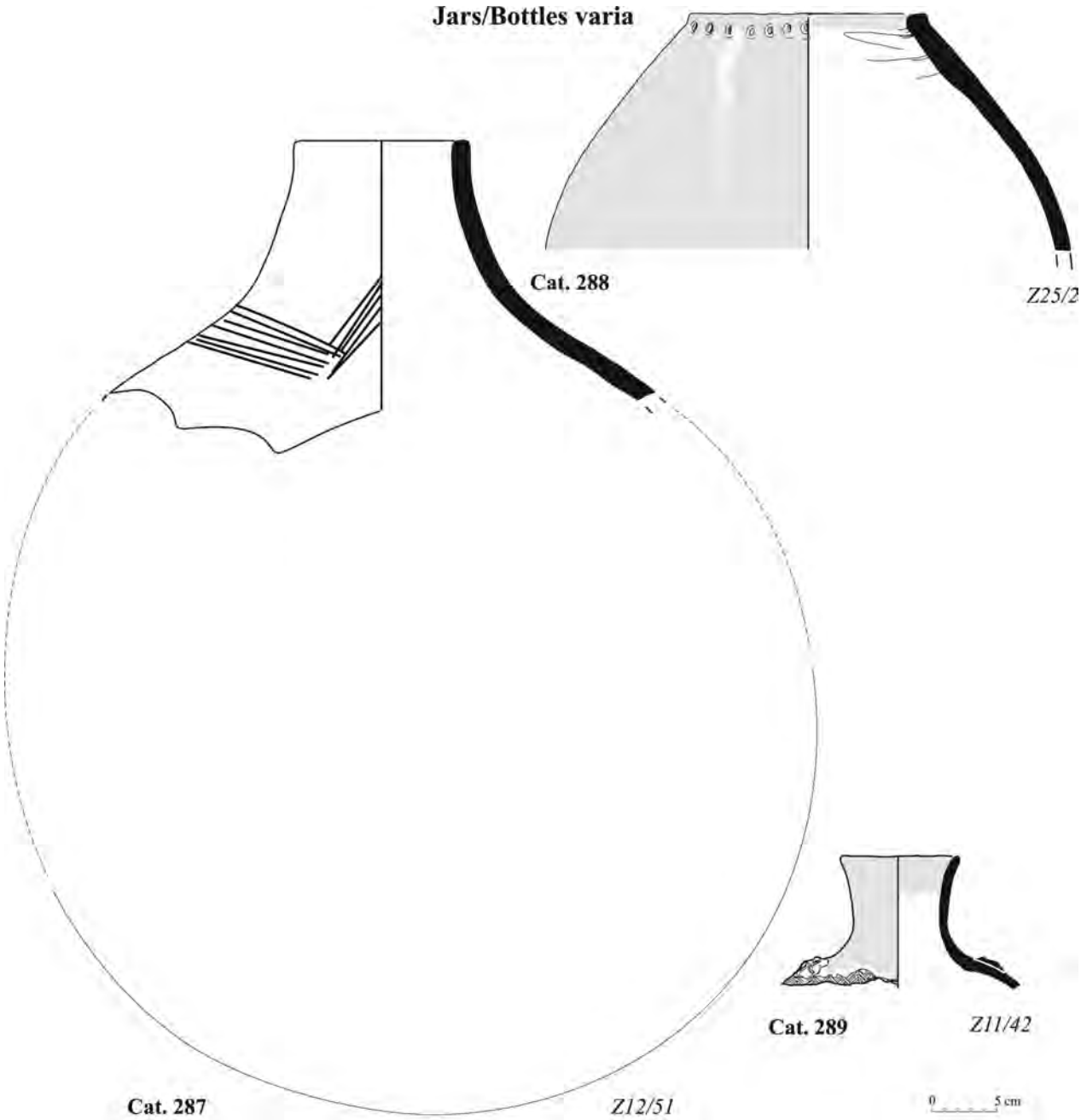

FIGURE 7.66 Globular jars of different types

Cat. 292
Bottle
Inv. no: **Z10/25**
Provenance: Tumulus 10, burial chamber, northern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 6.1 cm, max body diam. = 33.9 cm, H = 42.9 cm
Fabric: not possible to determine
Hardness: 2
Firing: oxidized
Surface treatment: uncoated
Surface colour: 10YR 6/2 light brownish grey on both surfaces
Colour of break: 10YR 6/2 light brownish grey
Decoration: incised—star pattern inside stopper, badly executed; stamped decoration on external wall and top of stopper
References: (Klimaszewska-Drabot 2010, 484–485)

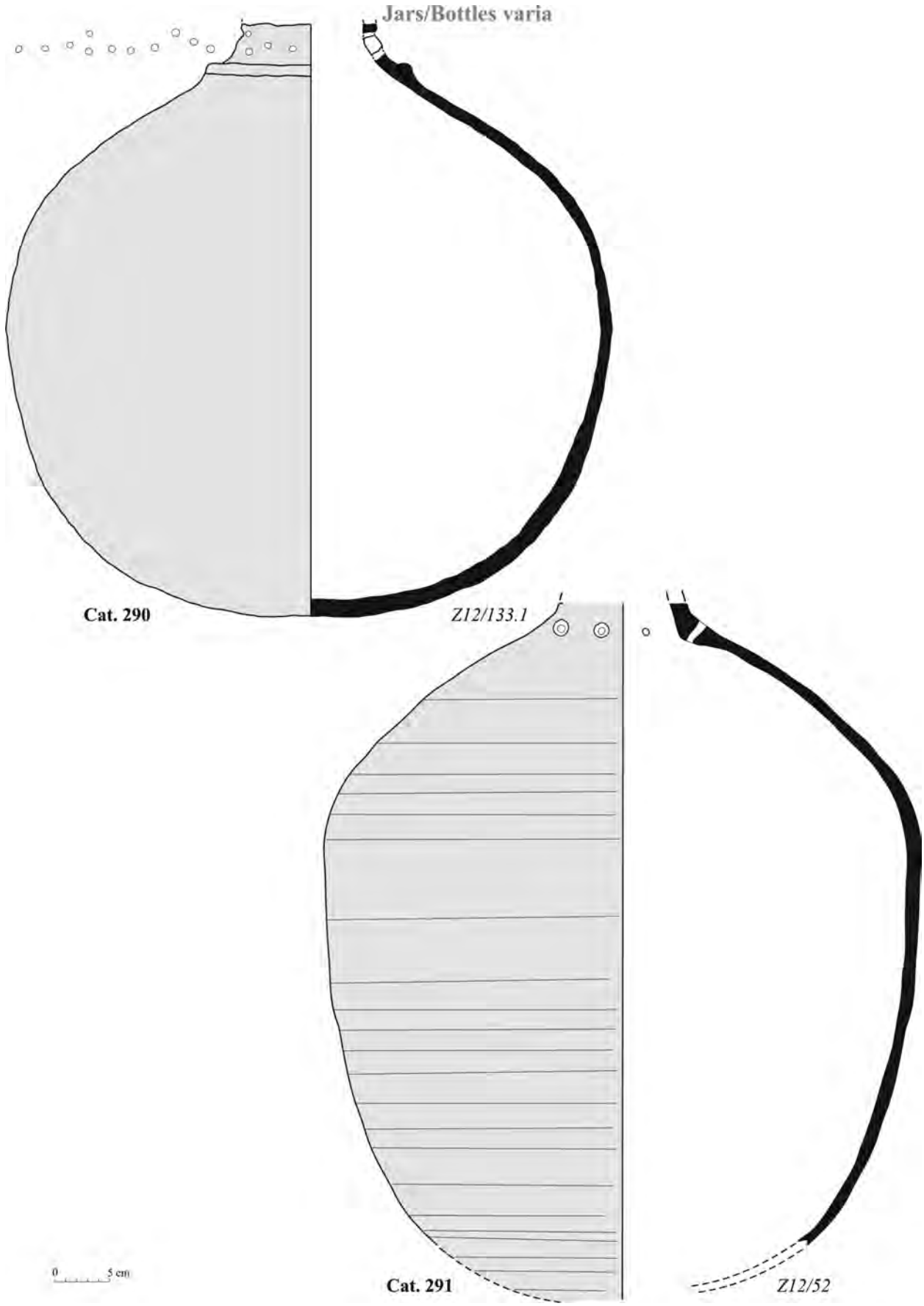

FIGURE 7.67 Globular jars of different types

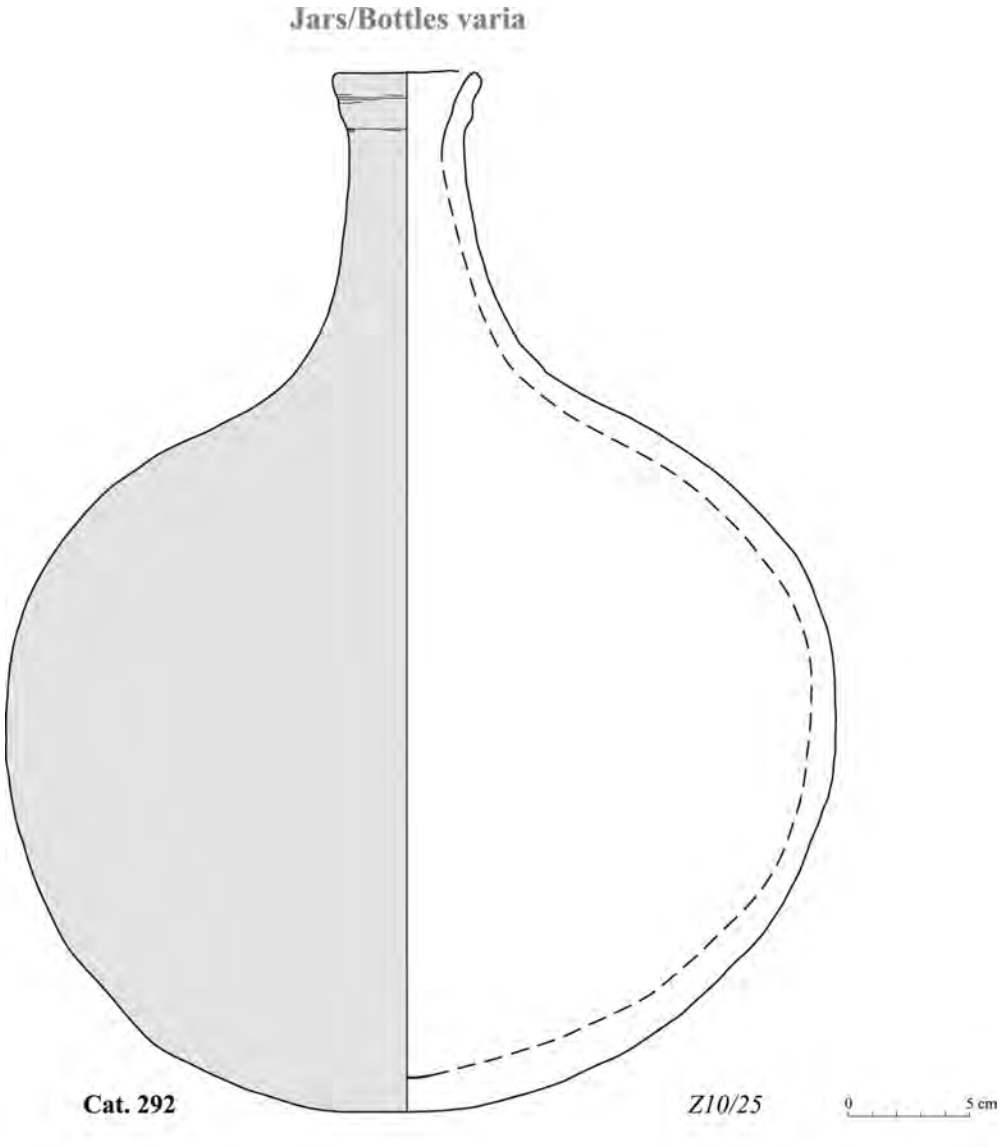

FIGURE 7.68 Globular jars of different types

10 **Group VIII—Stands** [*Fig. 7.124*]

Cat. 293
Stand
Inv. no: **Z23/40**
Provenance: Tumulus 23, chamber 1
Construction: wheel-made (2)
State of preservation: incomplete, 75% of rim, complete base
Measurements: Dr = 9.5 cm; D_b = 10.6 cm; H = 21.5 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on external surface; internal surface partially slipped
Surface colour: slip—2.5YR 5/6 red on both surfaces
Colour of break: not possible to determine
Decoration: incised—one set of five grooves below rim, and second set above base; three sets of two grooves on body forming border for painted decoration; painted—five sets (one on rim, three below body, one on base) of white background bands with geometrical black decoration
References: (Klimaszewska-Drabot and Mahmoud El-Tayeb 2014, 10–13)

Cat. 294
Stand?
Inv. no: **Z7/58.1**
Provenance: Tumulus 7, W tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, 14% of rim

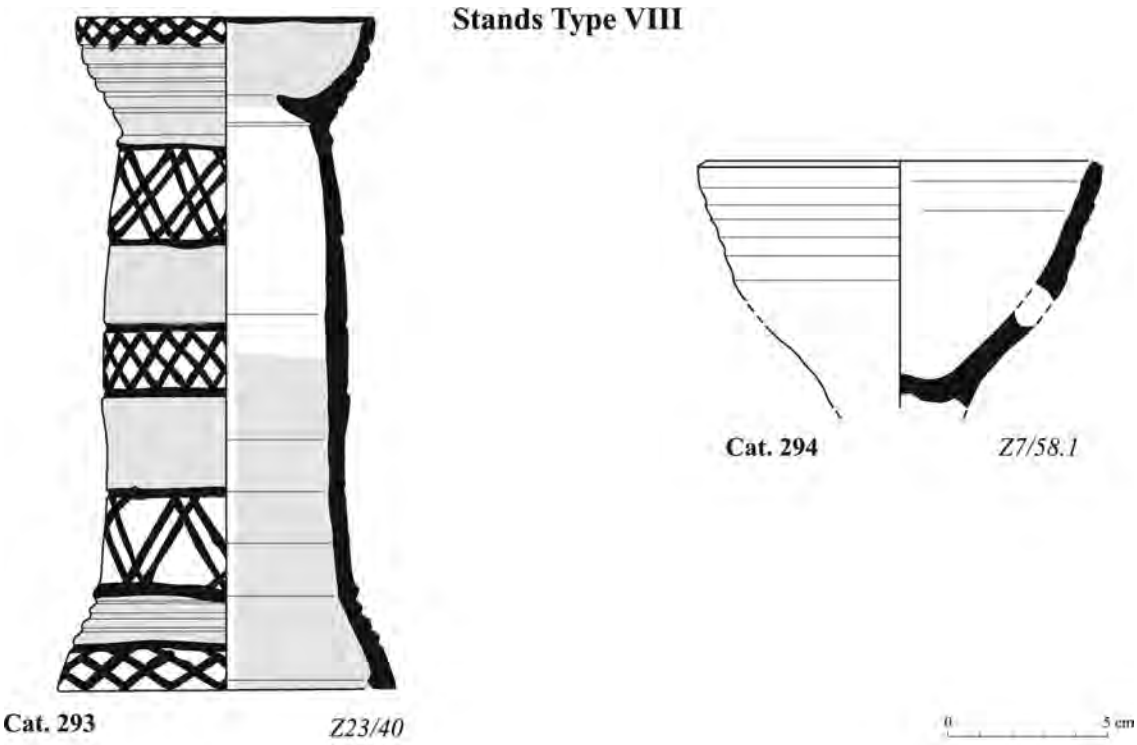

FIGURE 7.69 Stands

Measurements: Dr = 12.2 cm; $_{p}$H = 7.8 cm
Fabric: ZF10
Hardness: 3/4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 5/4 reddish brown
Colour of break: 10YR 4/2 dark greyish brown

11 Group IX—Goblets

11.1 *Goblet Type IX.1* [*Fig. 7.125*]

Cat. 295
Goblet
Inv. no: **Z24/20**
Provenance: Tumulus 24, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: incomplete, restored from sherds, 66% of rim, foot missing
Measurements: Dr = 7.6 cm; max body diam. = 10.7 cm; $_{p}$H = 11 cm
Fabric: ZF4
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: 5YR 5/6 yellowish red
Decoration: on external surface; incised—four grooves below rim and seven on belly; painted—two dark bands and zigzag lines on belly, badly preserved

11.2 *Goblet Type IX.2* [*Fig. 7.125*]

Cat. 296
Goblet
Inv. no: **Z10/7**
Provenance: Tumulus 10, burial chamber, southern part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 9.3 cm; max body diam. = 11.5 cm; H = 9 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slipped on both surfaces
Surface colour: slip—10R 4/6 red, on both surfaces
Colour of break: not possible to determine
Decoration: on external surface; incised—one groove at mid-H; painted—groups of white vertical and horizontal lines arranged alternately, black vertical wavy lines
References: (Klimaszewska-Drabot 2010, 484–485; Mahmoud El-Tayeb 2010, 214–216) incorrectly published as cup from tumulus 25

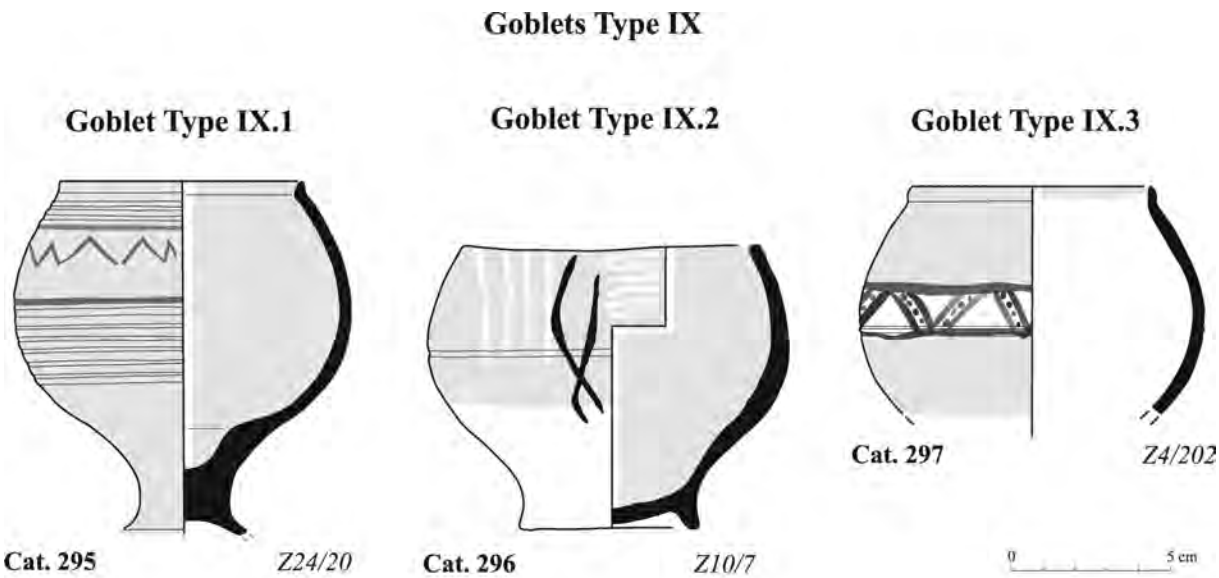

FIGURE 7.70 Goblets of types IX.1, IX.2 and IX.3

11.3 ***Goblet Type IX.3*** [*Fig. 7.125*]

Cat. 297
Cup?
Inv. no: **Z4/202**
Provenance: Tumulus 4, E tunnel
Construction: wheel-made (2)
State of preservation: fragmentary, 21% of rim, body sherds
Measurements: Dr = 7.6 cm; max body diam. = 11 cm; $_{p}$H = 7.2 cm
Fabric: ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on both surfaces
Surface colour: external, slip—10R 4/6 red; internal, slip—10R 5/6 red
Colour of break: 10R 5/6 red
Decoration: on external surface; incised—two grooves at mid-H; painted—white background bands, two horizontal black outlines, dark zigzag strokes forming outlines with dark dots between them

12 Group X—Oil Lamps [*Fig. 7.126*]

Cat. 298
Oil lamp
Inv. no: **Z6/21**
Provenance: Tumulus 6, E tunnel
Construction: wheel-made (2)
State of preservation: incomplete, chipped surface
Measurements: Dr = 2.3 cm; D_b = 4.1 cm; H = 6.7 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: smoothed on external surface
Surface colour: external natural surface—2.5YR 5/6 red
Colour of break: not possible to determine
Decoration: incised—cross on upper part of the lamp
Notes: potmark on base

Cat. 299
Oil lamp
Inv. no: **Z7/49**
Provenance: Tumulus 7, context 8
Construction: wheel-made (2)
State of preservation: incomplete, broken handle, lip chipped off
Measurements: Dr = 2.3 cm; D_b = 3.8 cm; H = 5.9 cm
Fabric: similar to ZF4
Hardness: 4
Firing: oxidized
Surface treatment: slipped and polished on external surface
Surface colour: external, slip—10R 5/6 red
Colour of break: 5YR 5/6 yellowish red

Cat. 300
Oil lamp
Inv. no: **Z4/61**
Provenance: Tumulus 4, W tunnel
Construction: wheel-made (2)
State of preservation: incomplete, rim and body sherd missing
Measurements: D_b = 2.9 cm; H = 4.5 cm

Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on external surface
Surface colour: external, slip—10R 4/6 red–2.5YR 4/6 red, internal natural surface—5YR 6/3 light reddish brown
Colour of break: not possible to determine
Decoration: incised—herringbone pattern on upper part of lamp
Notes: potmark on base

Cat. 301
Oil lamp
Inv. no: **Z4/200**
Provenance: Tumulus 4, E tunnel
Construction: wheel-made (2)
State of preservation: incomplete, handle and body sherds missing
Measurements: Dr = 2.4 cm; D_b = 3 cm; H = 6.6 cm
Fabric: similar to ZF4
Hardness: 3
Firing: oxidized
Surface treatment: slipped on the external surface
Surface colour: external natural surface—5YR 7/4 pink, slip—10R 5/8 red
Colour of break: 5YR 6/6 reddish yellow

Cat. 302
Oil lamp
Inv. no: **Z4/10.7**
Provenance: Tumulus 4, tunnel
Construction: wheel-made (2)
State of preservation: incomplete, 75% of rim, body sherds missing
Measurements: Dr = 1.3 cm; $_pH$ = 3.6 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: oxidized
Surface treatment: slipped and polished on external surface
Surface colour: external natural surface—5YR 5/4 reddish brown, slip—10R 5/6 red, internal natural surface—5YR 6/4 light reddish brown
Colour of break: not possible to determine

13 Group XI—*Qawadis* Type XI [*Fig. 7.127*]

Cat. 303
Qadus
Inv. no: **Z11/43+Z11/47**
Provenance: Tumulus 11, robber shaft
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 50% of rim, upper part of body, 100% of toe, one lower body sherd
Measurements: Dr = 16.6 cm; $_pH$ = 31 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—10R 5/6 red; internal—2.5YR 5/6 red
Colour of break: Gley1 3/N black
References: (Klimaszewska-Drabot and Czyżewska 2012, 372–377)

Cat. 304
Qadus
Inv. no: **Z6/19.1+Z6/19.2+Z6/38.1**
Provenance: Tumulus 6, fill of robber shaft, tunnel and central part of external shaft 3 m below surface level
Construction: wheel-made (2)
State of preservation: fragmentary, rim and wall fragments, 82% of rim
Measurements: Dr = 16 cm; $_pH$ = 8.5 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—5YR 5/4 reddish brown; internal—5YR 6/3 light reddish brown
Colour of break: 2.5Y 4/1 dark grey

Cat. 305
Qadus
Inv. no: **Z26/60.2,3+Z26/63.3+Z26/62+Z26/69+Z26/67+Z26/64**
Provenance: Tumulus 26, shaft fill, robber hole
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 38% of rim, fragments of upper part of vessel, sherds of lower part of vessel
Measurements: Dr = 15.6 cm; $_pH$ = 15 cm
Fabric: ZF6
Hardness: 4
Firing: reduced

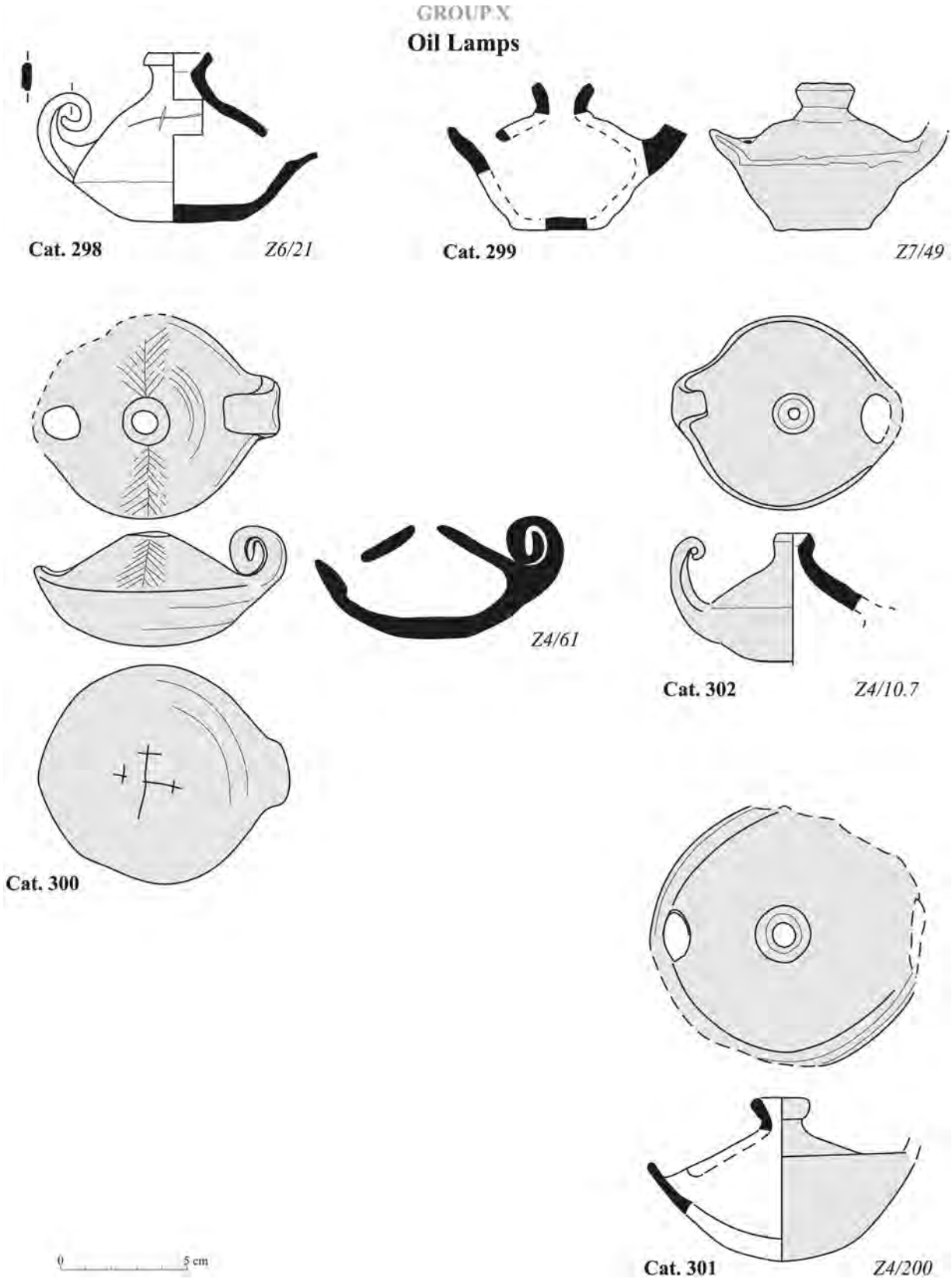

FIGURE 7.71 Oil lamps of group X

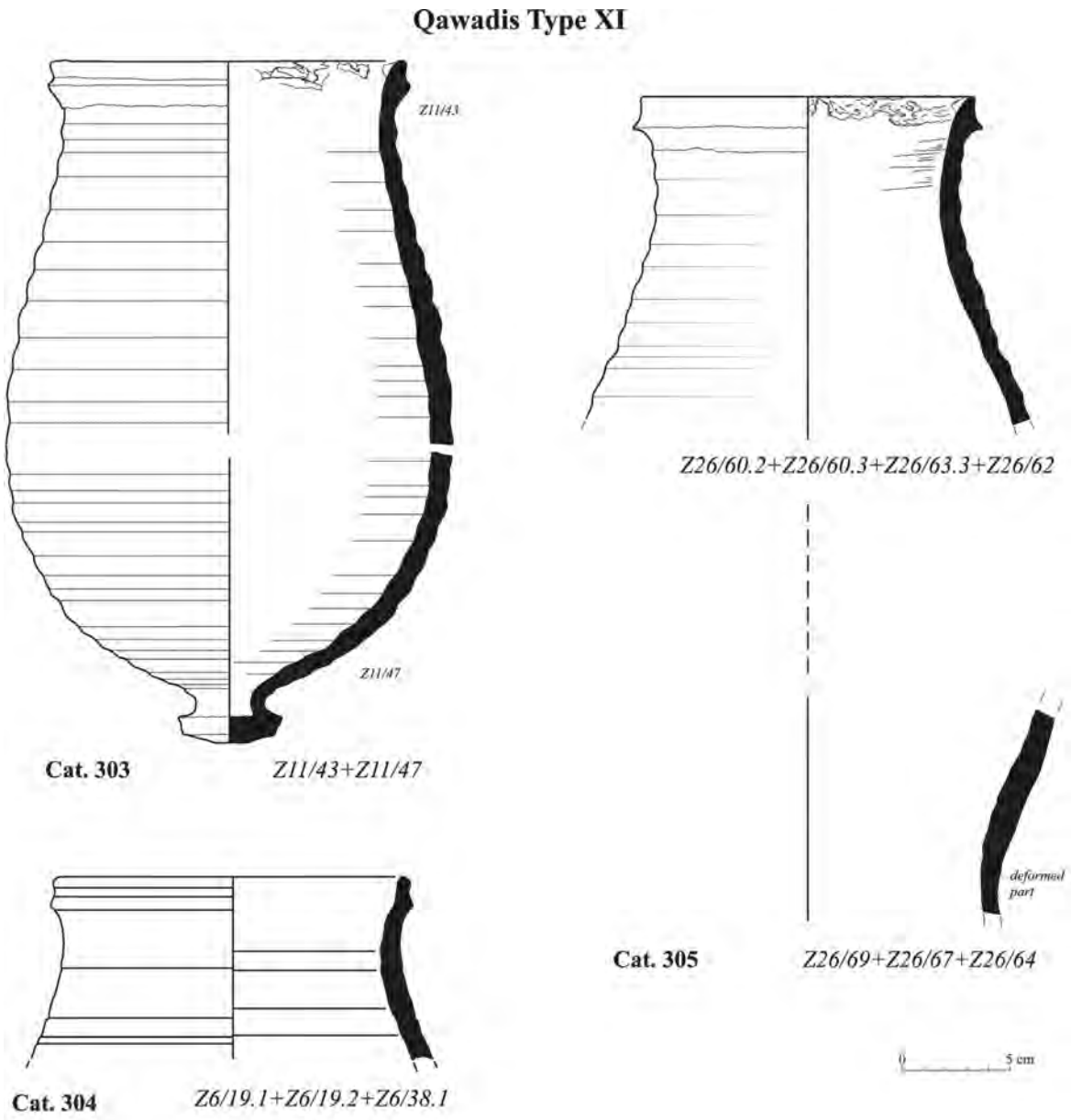

FIGURE 7.72 *Qawadis* of group XI

Surface treatment: uncoated
Surface colour: external—2.5YR 5/4 reddish brown; internal—2.5YR 5/6 red
Colour of break: Gley1 2.5/N black
Notes: visible deformation of lower part of vessel

Cat. 306
Qadus
Inv. no: **Z26/60.1+Z26/41+Z26/68+Z26/71**
Provenance: Tumulus 26, shaft fill
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, 93% of rim, fragments of upper part of vessel
Measurements: Dr = 16.3 cm; $_{p}$H = 16.4 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—5YR 6/4 light reddish brown; internal—5YR 5/2 reddish grey
Colour of break: 10YR 3/1 very dark grey

Cat. 307
Qadus
Inv. no: **Z26/68.2**
Provenance: Tumulus 26, shaft, near S chamber
Construction: wheel-made (2)

State of preservation: fragmentary, restored from sherds, upper part of vessel, 27 % of rim
Measurements: Dr = 17 cm; $_{p}$H = 16.5 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—2.5YR 5/6 red; internal—2.5YR 5/8 red
Colour of break: 2.5Y 4/1 dark grey

Cat. 308
Qadus
Inv. no: **Z26/65.2**
Provenance: Tumulus 26, shaft fill, near W wall of shaft
Construction: wheel-made (2)
State of preservation: fragmentary, rim and wall fragments, 41 % of rim
Measurements: Dr = 15 cm; $_{p}$H = 11 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—10R 5/6 red; internal—10R 5/4 weak red
Colour of break: 5YR 4/1 dark grey

Cat. 309
Qadus
Inv. no: **Z26/70.1**
Provenance: Tumulus 26, shaft fill, NW corner of shaft
Construction: wheel-made (2)
State of preservation: fragmentary, 20 % of rim
Measurements: Dr = 15 cm; $_{p}$H = 4.5 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—2.5YR 5/6 red; internal—2.5YR 5/4 reddish brown
Colour of break: Gley1 3/N black

Cat. 310
Qadus
Inv. no: **Z26/69.3**
Provenance: Tumulus 26, shaft fill, robber shaft
Construction: wheel-made (2)
State of preservation: fragmentary, 22 % of rim
Measurements: Dr = 21 cm; $_{p}$H = 6.5 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—5YR 6/9 light reddish brown; internal—5YR 6/9 light reddish brown
Colour of break: 2.5Y 4/1 dark grey

Cat. 311
Qadus
Inv. no: **Z25/1**
Provenance: Tumulus 26, shaft fill
Construction: wheel-made (2)
State of preservation: fragmentary, 100 % of base
Measurements: D_b = 3.5 cm; $_{p}$H = 3.4 cm
Fabric: ZF6
Hardness: 4
Firing: reduced
Surface treatment: uncoated
Surface colour: external—5YR 5/6 yellowish red; internal—2.5YR 5/6 red
Colour of break: 2Y 2.5/1 black

14 Group XII—Amphorae

14.1 *Amphorae Type XII.1* [*Fig. 7.128*]

Cat. 312
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z26/32**
Provenance: Tumulus 26, chamber 1, central part
Construction: wheel-made (2)
State of preservation: incomplete, restored from sherds, rim and base complete
Measurements: Dr = 7.7 cm; H = 54 cm; D_b = 2.5 cm
Fabric: similar to the Dongolan ALF 1 fabric
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—10R 6/3 pale red, internal—5YR 6/4 light reddish brown
Colour of break: 10R 6/3 pale red

Cat. 313
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z4/14.6**
Provenance: Tumulus 4, tunnel
Construction: wheel-made (2)
State of preservation: incomplete, survives in two parts, 55 % of rim, 35 % of base
Measurements: Dr = 8 cm; H = 55 cm; D_b = 3.5 cm
Fabric: similar to the Dongolan ALF 1 fabric

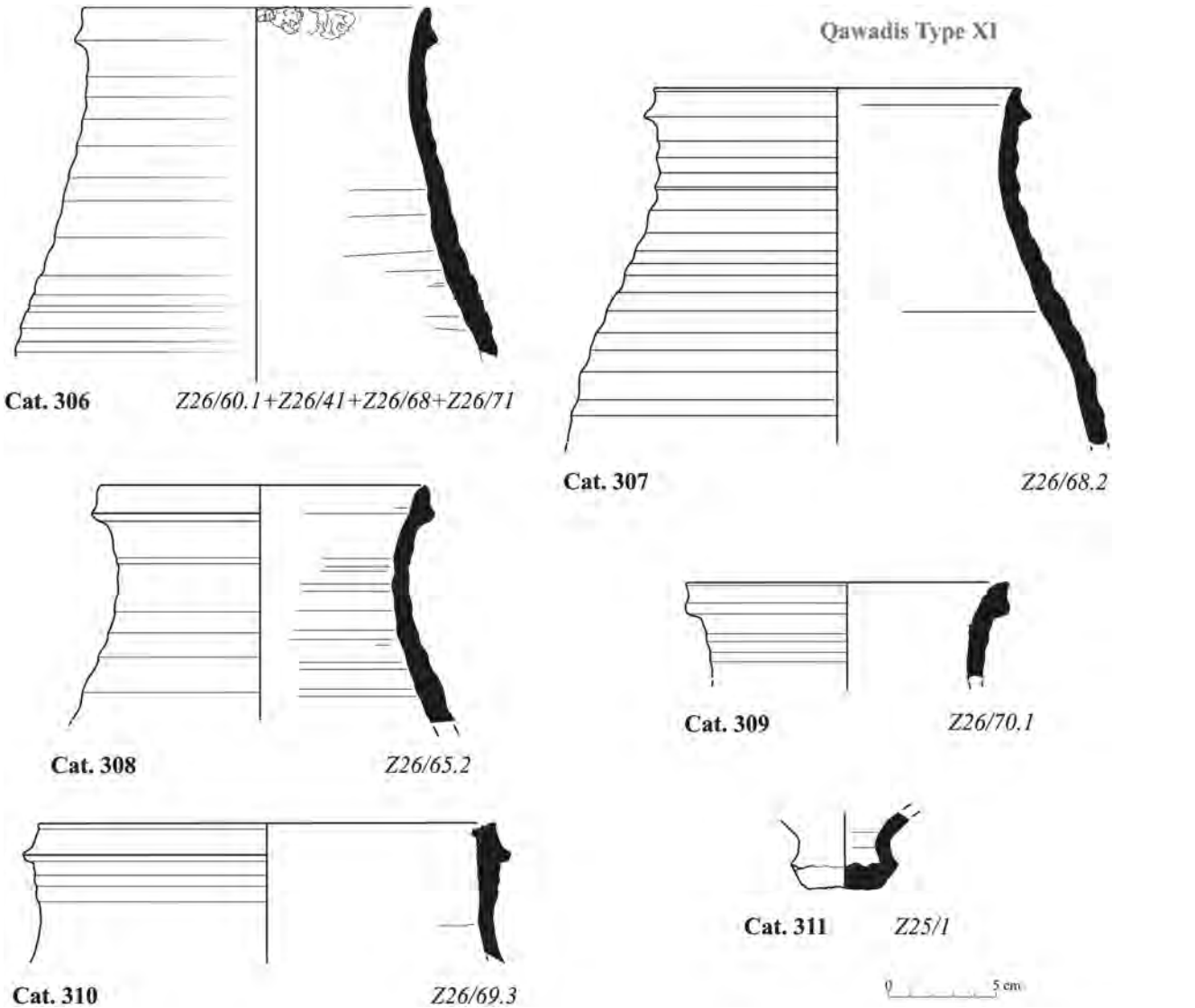

FIGURE 7.73 *Qawadis* of group XI

Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—10R 5/6 red, internal—10R 7/4 pale red
Colour of break: 7.5YR 8/4 pink

Cat. 314
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z24/29**
Provenance: Tumulus 24, south-eastern part of shaft
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, rim and base missing
Measurements: $_{p}$H = 50.6 cm
Fabric: similar to the Dongolan ALF 1 fabric
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—2.5YR 4/6 red, internal—2.5YR 5/6 red
Colour of break: 2.5YR 5/6 red

Cat. 315
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z7/25**
Provenance: Tumulus 7, fragments scattered in different places: topsoil, probably modern dump; contexts 1, 2, 3, 5, fill of external shaft
State of preservation: fragmentary, restored from sherds, survives in two pieces, rim and base missing
Construction: wheel-made (2)
Measurements: H: upper part = 24.6 cm, lower part = 12.7 cm

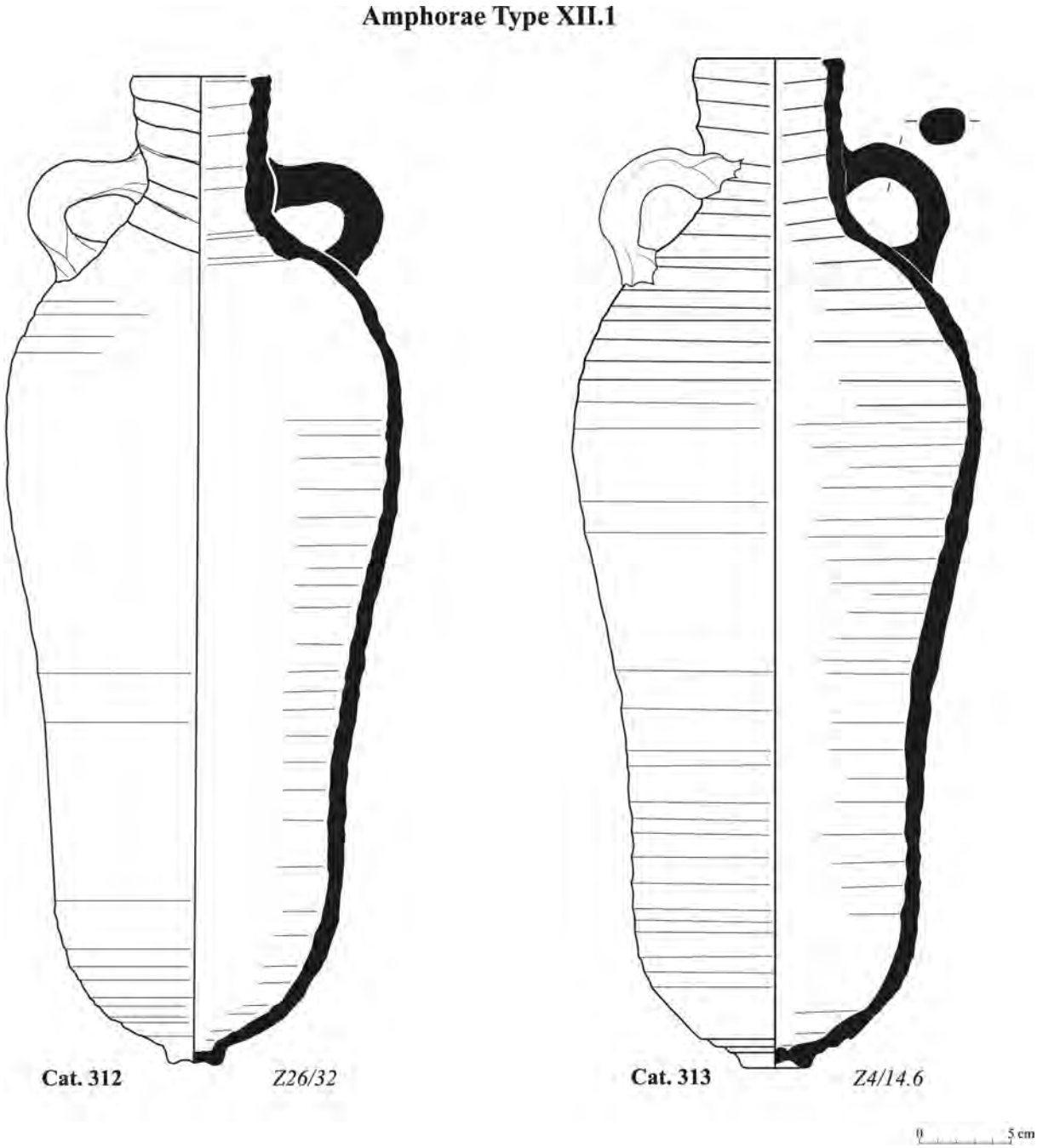

FIGURE 7.74 Transport amphorae of type XII.1, LRA "Dongola" (Pluskota A amphorae)

Fabric: similar to the Dongolan ALF 1 fabric
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—10R 5/6 red, internal—5YR 8/3 pink
Colour of break: 5YR 6/4 light reddish brown

Cat. 316
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z4/31**
Provenance: Tumulus 4, fragments scattered in different places: fill of external shaft; fill of W tunnel (3.40–4.25 m from edge of shaft), layer 5
Construction: wheel-made (2)
State of preservation: fragmentary, 49 % of rim, part of neck and shoulders, one handle
Measurements: Dr = 9.4 cm; $_{p}$H = 13.5 cm
Fabric: similar to the Dongolan ALF 1 fabric
Hardness: 3
Firing: oxidized
Surface treatment: uncoated

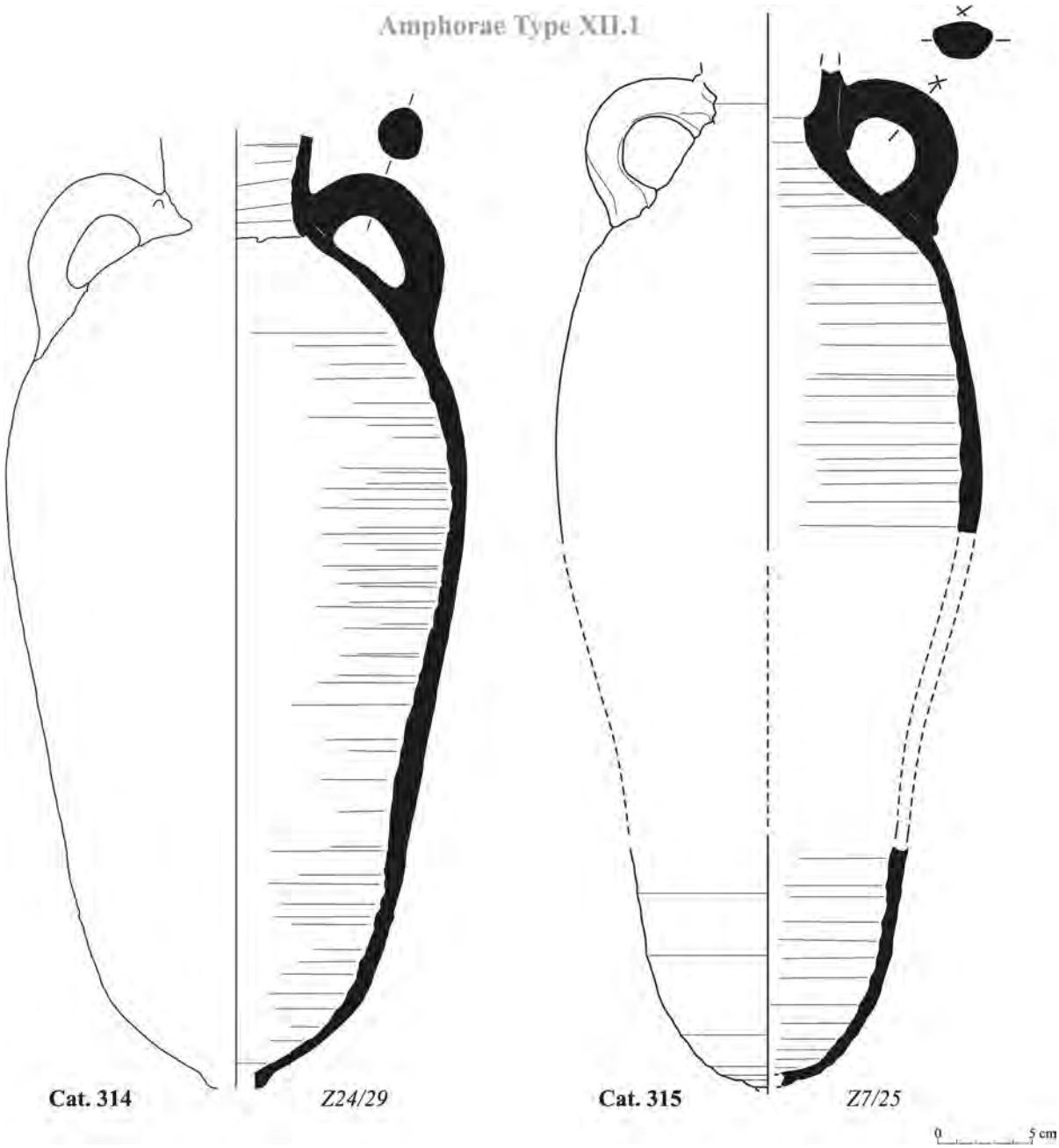

FIGURE 7.75 Transport amphorae of type XII.1, LRA "Dongola" (Pluskota A amphorae)

Surface colour: external—10R 5/6 red, internal—10R 5/6 red
Colour of break: 2.5YR 7/4 pale yellow

Cat. 317
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z4/225**
Provenance: Tumulus 4, Eastern tunnel
State of preservation: fragmentary, 80% of rim
Construction: wheel-made (2)
Measurements: Dr = 8.3 cm; $_{p}$H = 6.5 cm
Fabric: similar to the Dongolan ALF 2 fabric
Hardness: 3
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—10R 5/4 weak red, internal—10R 5/6 red
Colour of break: 2.5YR 6/6 light red

Cat. 318
Amphora ("Dongolan" amphora Pluskota type A)
Inv. no: **Z4/226**
Provenance: Tumulus 4, E tunnel
State of preservation: fragmentary, 50% of base

Construction: wheel-made (2)
Measurements: D_b = 3.6 cm; $_pH$ = 7 cm
Fabric: similar to the Dongolan ALF 2 fabric
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—7.5R 4/8 red; internal—10R 7/4 pale red
Colour of break: 10R 6/6 light red

14.2 *Amphora Type XII.2* [*Fig. 7.128*]

Cat. 319
Amphora LRA 3 with plug
Inv. no: **Z4/224**
Provenance: Tumulus 4, E tunnel
State of preservation: incomplete, survives in two pieces, complete rim, base missing
Construction: wheel-made (2)
Measurements: Dr = 3.8 cm; $_pH$ = 48.7 cm
Fabric: Asia Minor
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—10R 5/6 red, internal—2.5YR 4/6 red
Colour of break: 10R 4/8 red

14.3 *Amphorae Type XII.3* [*Fig. 7.129*]

Cat. 320
Gazan Amphora (Majcherek Type 4)
Inv. no: **Z7/22**+**Z7/54** (upper part) + **Z7/41** (body) + **Z7/54** (bottom)
Provenance: Tumulus 7, fragments scattered in different places: topsoil, probably modern dump; contexts 1, 2, 3, 5, 8, 10; fill of external shaft
State of preservation: fragmentary, restored from sherds, 100 % of rim, 83 % of base
Construction: wheel-made (2)
Measurements: Dr = 11 cm; D_b = 3.6 cm; $_pH$ = 19.4 cm (upper part) + 30 cm (body) + 5 cm (bottom); D_b = 2.5 cm
Fabric: Gaza
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—5YR 6/4 light reddish brown; internal—5YR 6/4 light reddish brown
Colour of break: 5YR 5/6 yellowish red
Notes: upper part of vessel (Z7/22+Z7/54) can be reassembled with body section (Z7/41) and bottom of vessel (Z7/54)

Cat. 321
Gazan Amphora (Majcherek Type 4)
Inv. no: **Z7/93**+**Z7/54** (bottom)
Provenance: Tumulus 7, fill of external shaft
State of preservation: fragmentary, restored from sherds, 52 % of rim, shoulders and handle fragments
Construction: wheel-made (2)
Measurements: Dr = 11 cm; D_b = 3.6 cm; $_pH$ = 13.6 cm (upper part) + 5 cm (bottom)
Fabric: Gaza
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—5YR 6/4 light reddish brown; internal—5YR 6/4 light reddish brown
Colour of break: 5YR 5/6 yellowish red
Notes: upper part of vessel (Z7/93) can be reassembled with bottom of vessel (Z7/54)

14.4 *Amphorae Type XII.4* [*Fig. 7.129*]

Cat. 322
Amphora
Inv. no: **Z2/32**
Provenance: Tumulus 2, chamber 2
State of preservation: complete
Construction: wheel-made (2)
Measurements: Dr = 5.3 cm; D_b = 7.7 cm; H = 30 cm
Fabric: probably Aswan
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—10 R 6/4 light red
Colour of break: 5 YR 7/4 pink
Decoration: dark spiral lines painted on body

Cat. 323
Amphora
Inv. no: **Z15/5**
Provenance: Tumulus 15, fill of shaft, southern part, near E wall
State of preservation: complete
Construction: wheel-made (2)
Measurements: Dr = 6.5 cm; D_b = 7 cm; H = 23.5 cm
Fabric: probably Aswan
Hardness: 3/4
Firing: oxidized
Surface treatment: slip on external surface
Surface colour: external natural surface—5YR 7/4 pink, slip—2.5 YR 5/4 reddish brown
Colour of break: not possible to determine

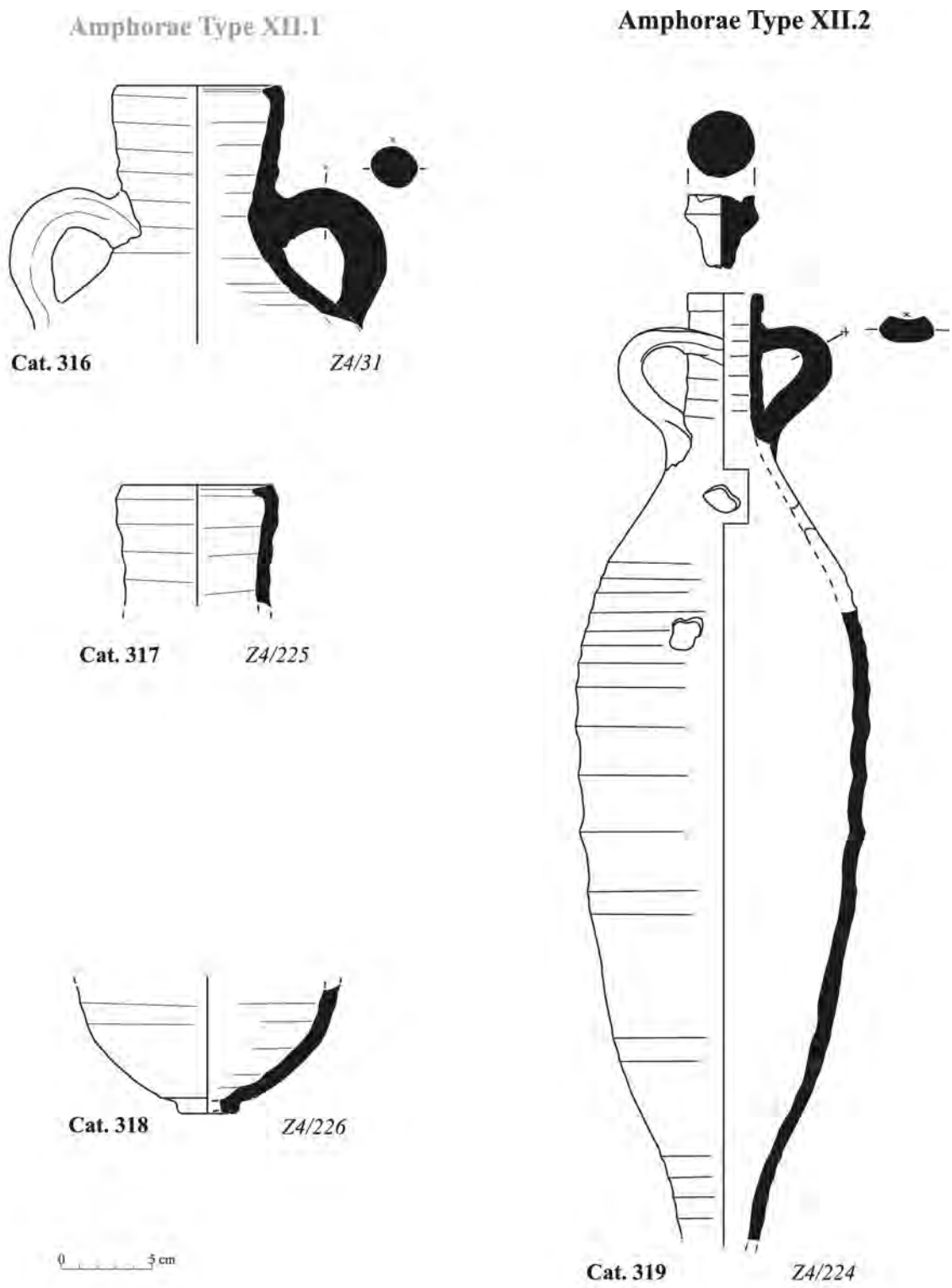

FIGURE 7.76 Transport amphorae of type XII.1, LRA "Dongola" (Pluskota A amphorae) and type XII.2, LRA 3 (Asia Minor)

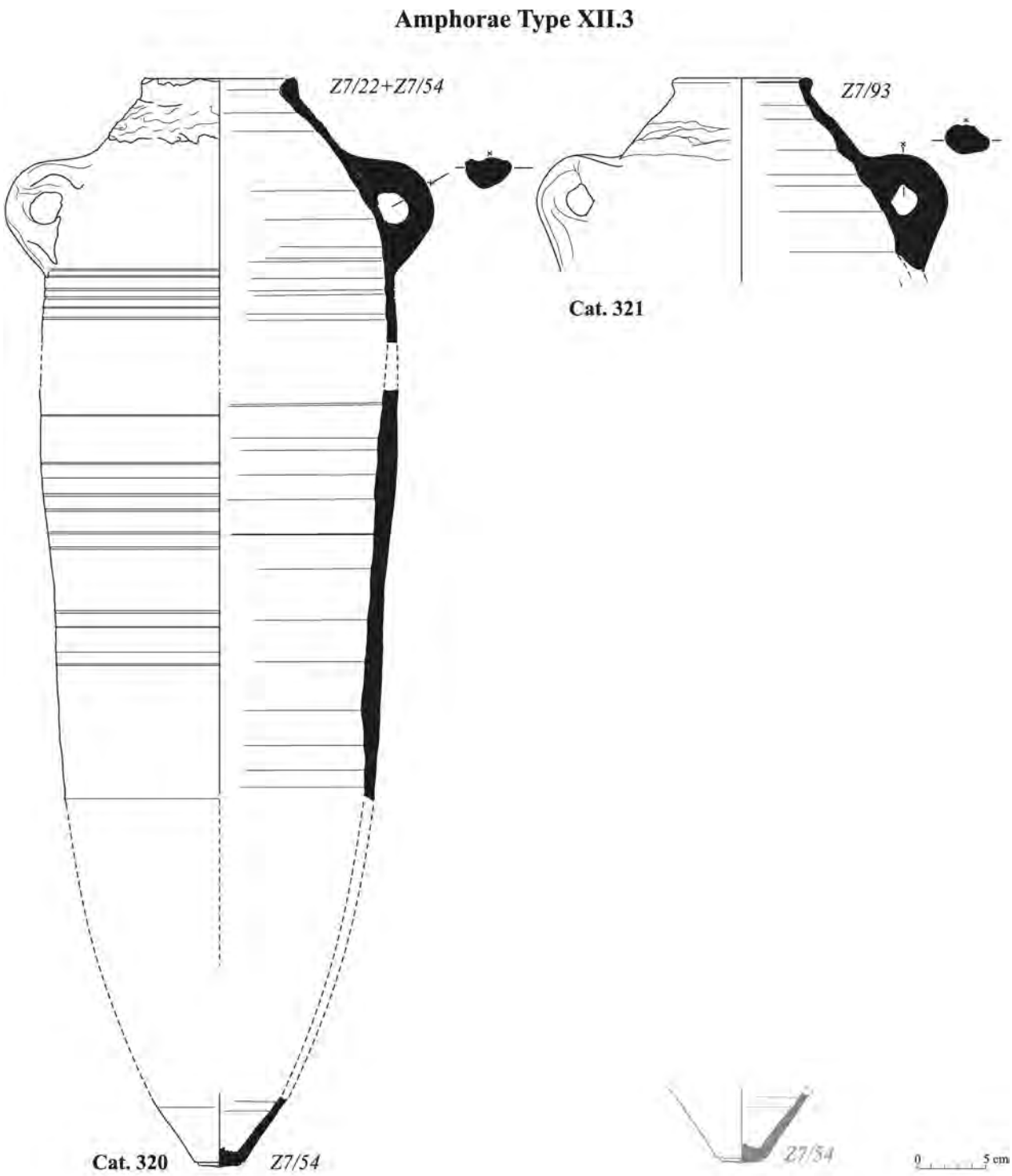

FIGURE 7.77 Transport amphorae of type XII.3, LRA 4

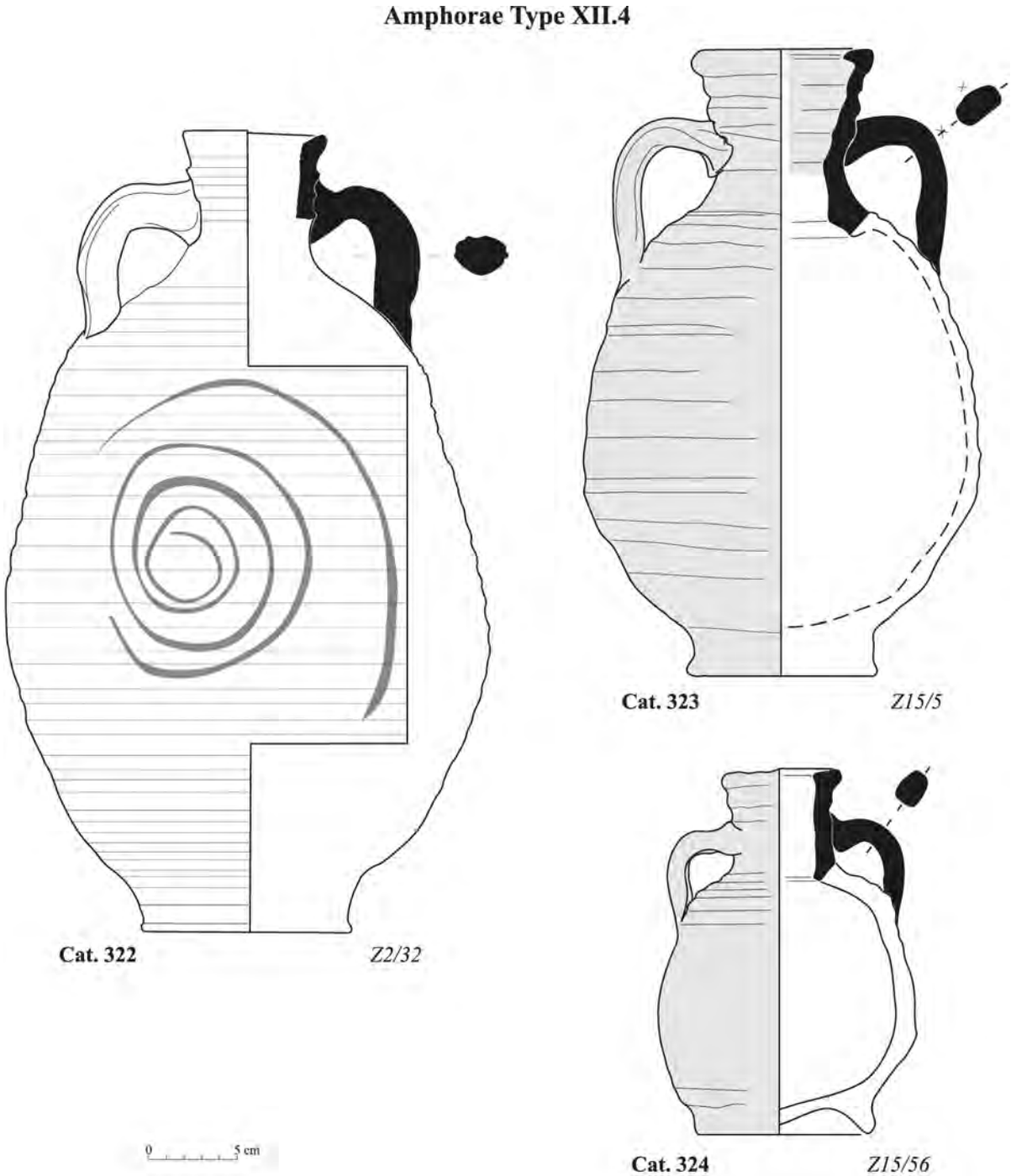

FIGURE 7.78 Small table amphorae of type XII.4

Cat. 324
Amphora
Inv. no: **Z15/56**
Provenance: Tumulus 15, main burial chamber, eastern part, near south wall
State of preservation: complete
Construction: wheel-made (2)
Measurements: Dr = 4.4 cm; D_b = 6.8 cm; H = 13.6 cm
Fabric: Aswan area, different to fabric of Z15/5 and Z2/32; poor quality, more sandy and friable
Hardness: soft (2/3)
Firing: oxidized?
Surface treatment: slip on external surface
Surface colour: external natural surface—5YR 6/6 reddish yellow, slip—10R 6/6 light red
Colour of break: not possible to determine
Notes: surface very corroded

FIGURE 7.79 Small table amphorae of type XII.5

14.5 ***Amphorae Type XII.5*** [*Fig. 7.129*]
Cat. 325
Amphora
Inv. no: **Z25/6**
Provenance: Tumulus 25, chamber 2, central part
State of preservation: complete
Construction: wheel-made (2)
Measurements: Dr = 3.4 cm; D_b = 6.1 cm; H = 17.9 cm
Fabric: not possible to determine
Hardness: 3/4
Firing: not possible to determine
Surface treatment: slip on external surface
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—10R 4/8 red
Colour of break: not possible to determine
References: (Klimaszewska-Drabot 2010, 484–485; Mahmoud El-Tayeb 2010, 214–216)

Cat. 326
Amphora
Inv. no: **Z16/1**
Provenance: Tumulus 16, fill of shaft, north-eastern part
State of preservation: fragmentary, body sherds and one handle
Construction: wheel-made (2)
Measurements: $_pH$ = 10 cm
Fabric: Lower Nubian?
Hardness: 4
Firing: oxidized
Surface treatment: slip on external surface
Surface colour: external, slip—10R 4/6 red; internal—2.5YR 6/4 light yellow brown
Colour of break: 2.5YR 6/8 light red
References: (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 367, 369–371)

14.6 ***Amphorae Type XII.6*** [*Fig. 7.129*]
Cat. 327
Amphora
Inv. no: **Z4/2+Z4/10.11**
Provenance: Tumulus 4, tunnel
State of preservation: fragmentary, rim complete, 36% of base, body sherds missing
Construction: wheel-made (2)
Measurements: Dr = 4 cm; D_b = 8.5 cm; H = 36 cm
Fabric: ZF5
Hardness: 4
Firing: oxidized
Surface treatment: slipped on external surface
Surface colour: external natural surface—5YR 6/6 reddish yellow, slip—10R 5/4 weak red; internal 5YR 4/1 dark grey
Colour of break: Gley2 4/5PB dark bluish grey
Decoration: incised—five grooves on upper part of body; painted—geometrical pattern, white bands and black dots on shoulder of vessel

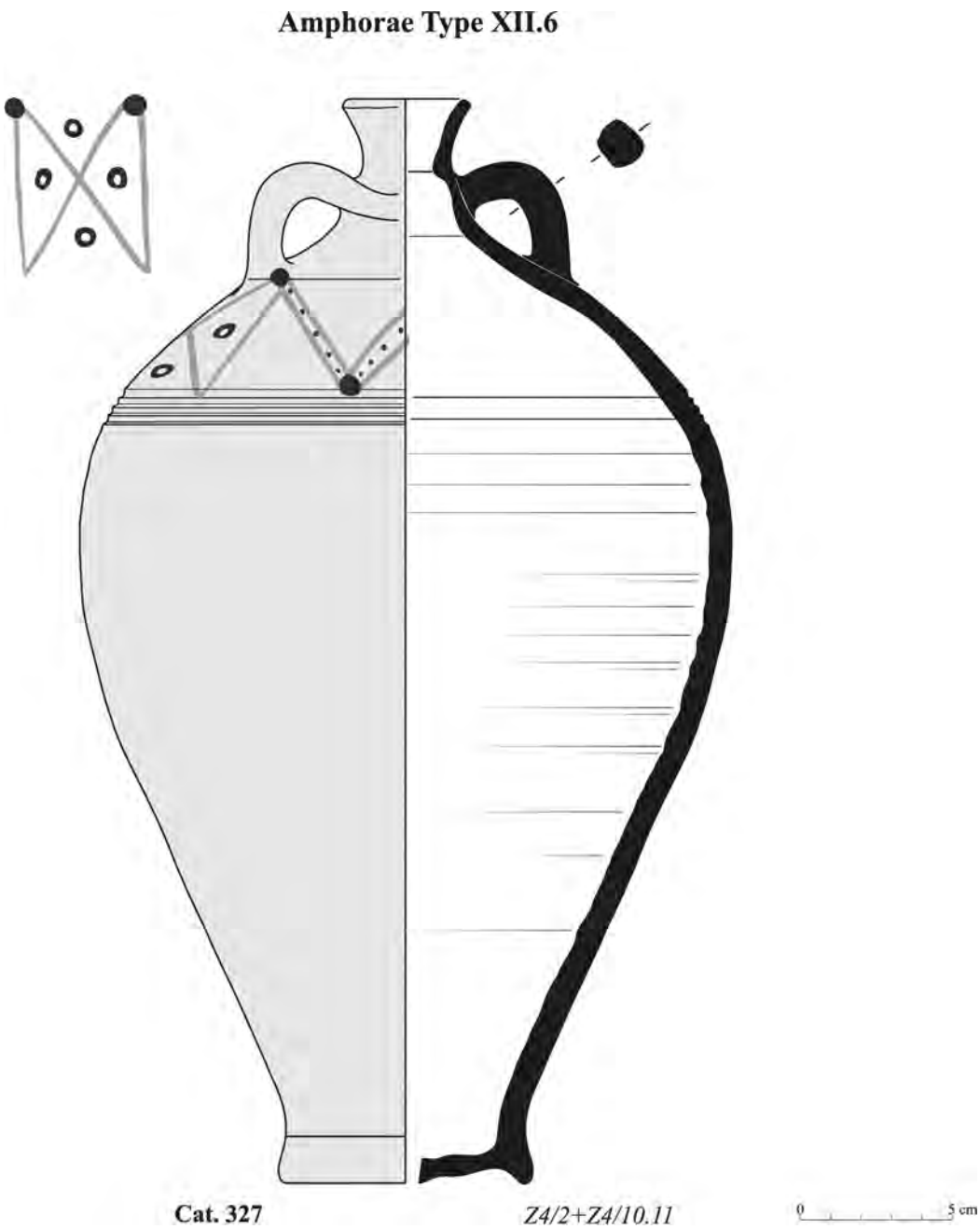

FIGURE 7.80 Amphora of type XII.6

14.7 ***Amphorae Varia*** [*Fig. 7.129*]

Cat. 328
Amphora
Inv. no: **Z4/10.9**
Provenance: Tumulus 4, tunnel
State of preservation: fragmentary, 16% of rim, neck fragment and one handle
Construction: wheel-made (2)
Measurements: Dr = 8.6 cm; $_{p}$H = 4.5 cm
Fabric: Egyptian?
Hardness: medium hard/hard (3/4)
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—2.5YR 6/6 light red; internal—2.5YR 7/6 light red
Colour of break: 10YR 5/4 yellowish brown

Cat. 329
Amphora
Inv. no: **Z3/6.1+Z3/7.1**
Provenance: Tumulus 3, fill of external shaft
State of preservation: fragmentary, neck and one handle
Construction: wheel-made (2)
Measurements: $_{p}$H = 3.8 cm

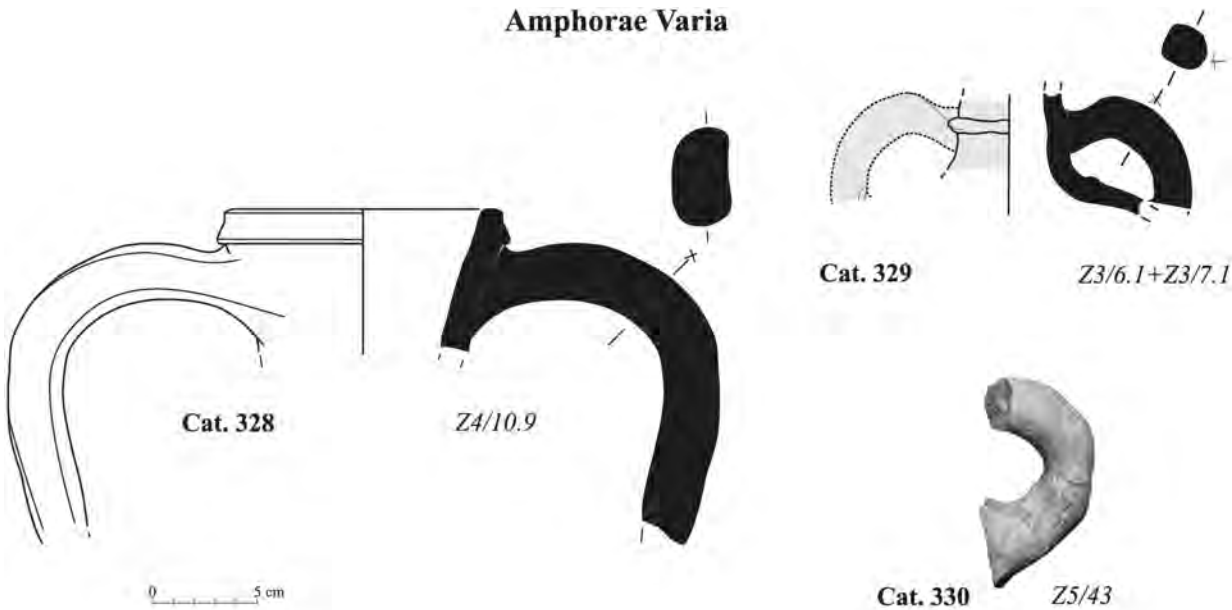

FIGURE 7.81 Small amphorae of different types

Fabric: Aswan area
Hardness: 4
Firing: oxidized
Surface treatment: slip on external surfaces
Surface colour: external natural surface—2.5YR 6/6 light red, slip—10R 5/6 red; internal—2.5YR 6/4 light yellow brown
Colour of break: 2.5YR 5/6 red

Cat. 330
Amphora
Inv. no: **Z5/43**
Provenance: Tumulus 5, tunnel
State of preservation: fragmentary, one handle
Construction: handmade
Measurements: $_{p}$H = *c.* 6.5 cm
Fabric: Aswan area
Hardness: 3/4
Firing: oxidized
Surface treatment: slip on white background on external surface
Surface colour: external natural surface—2.5YR 6/4 light yellow-brown, slip—5YR 6/8 reddish yellow
Colour of break: 2.5YR 5/6 red

15 Group XIII—Bottles

15.1 *Bottles Type XIII.1* [*Fig. 7.130*]

Cat. 331
Small bottle
Inv. no: **Z6/7**
Provenance: Tumulus 6, external shaft and tunnel
Construction: wheel-made (2)
State of preservation: fragmentary
Measurements: Dr = 2 cm; H = 11.8 cm
Fabric: Aswan area?
Hardness: 4
Firing: oxidized
Surface treatment: slip on external surface
Surface colour: external natural surface—7.5YR 8/4 pink, slip—7.5YR 7/6 reddish yellow; internal—7.5YR 8/2 pinkish white
Colour of break: 7.5YR 8/3 pink

Cat. 332
Small bottle
Inv. no: **Z13/22**
Provenance: Tumulus 13, shaft, near blocking wall of chamber 1
Construction: wheel-made (2)
State of preservation: fragmentary, part of neck and body
Measurements: $_{p}$H = 5.5 cm
Fabric: Mediterranean?
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—7.5YR 7/3 pink, internal—7.5YR 8/2 pinkish white
Colour of break: 7.5YR 6/4 light brown

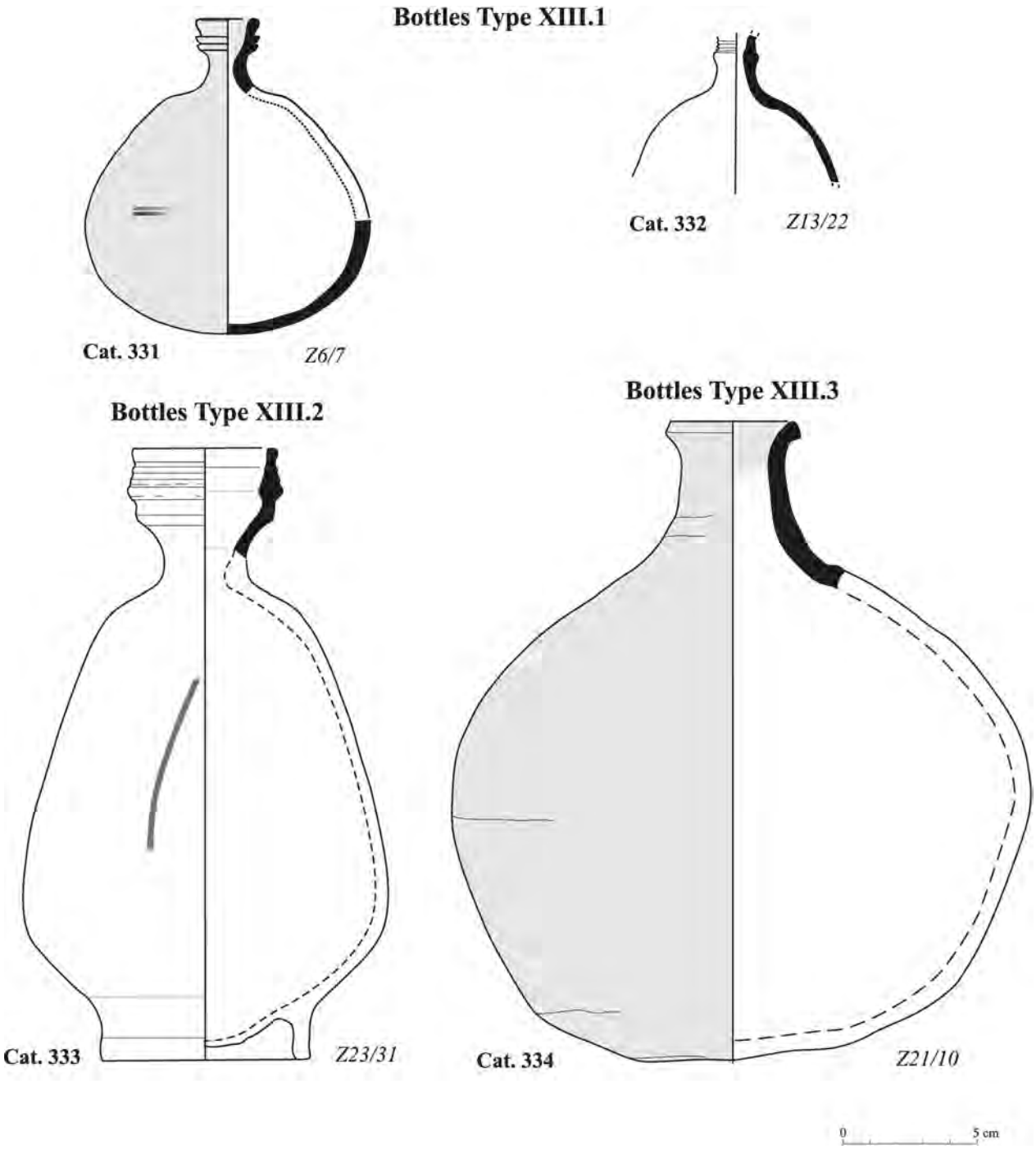

FIGURE 7.82 Small bottles of types XIII.1, XIII.2 and XIII.3

15.2 ***Bottles Type XIII.2*** [*Fig. 7.130*]
Cat. 333
Medium bottle
Inv. no: **Z23/31**
Provenance: Tumulus 23, chamber 1
Construction: wheel-made (2)
State of preservation: almost complete, complete rim, 77% of base
Measurements: Dr = 5.2 cm, D_b = 7.5 cm, H = 23 cm
Fabric: Aswan area
Hardness: 4
Firing: oxidized
Surface treatment: uncoated
Surface colour: external—5YR 6/4 light reddish brown
Colour of break: 5YR 7/4 pink
Decoration: traces of decoration visible on body—fragment of dark line

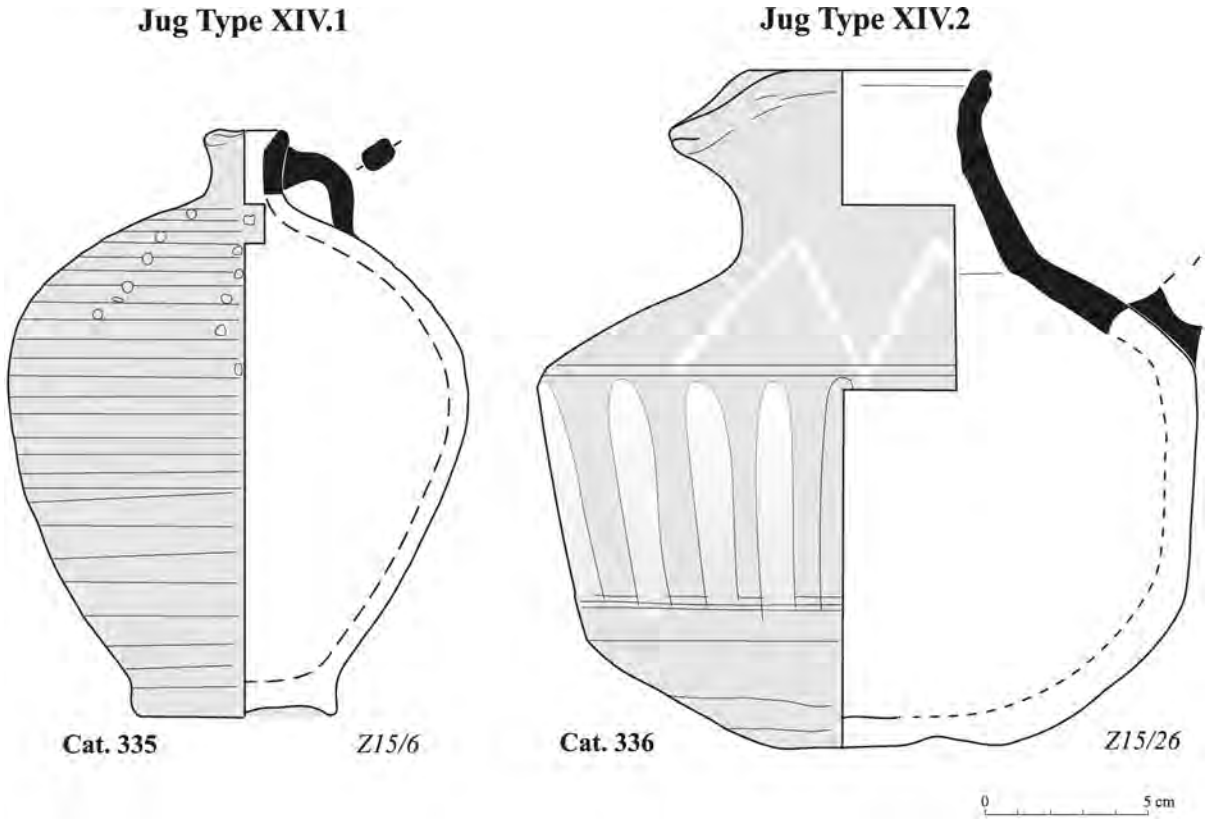

FIGURE 7.83 Jugs of types XIV.1 and XIV.2

15.3 ***Bottles Type XIII.3*** [*Fig. 7.130*]
Cat. 334
Medium bottle
Inv. no: **Z21/10**
Provenance: Tumulus 21, burial chamber, south-western part
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 5 cm, H = 24 cm
Fabric: not possible to determine
Hardness: 4
Firing: not possible to determine
Surface treatment: slip on external surface
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—2.5YR 5/6 red
Colour of break: not possible to determine

16 Group XIV—Jugs

16.1 ***Jugs Type XIV.1*** [*Fig. 7.131*]
Cat. 335
Jug
Inv. no: **Z15/6**
Provenance: Tumulus 15, fill of shaft, southern corner
Construction: wheel-made (2)
State of preservation: complete
Measurements: Dr = 2.5 cm, D_b = 6.2 cm, H = 18 cm
Fabric: not possible to determine
Hardness: 3
Firing: not possible to determine
Surface treatment: slip on external surface
Surface colour: external natural surface—5YR 6/6 reddish brown, slip—2.5YR 5/8 red
Colour of break: not possible to determine
Decoration: four vertical lines of punctuated dots (probably executed using some kind of reed) on shoulder of vessel

16.2 ***Jugs Type XIV.2*** [*Fig. 7.131*]
Cat. 336
Jug
Inv. no: **Z15/26**
Provenance: Tumulus 15, chamber 2, south part
Construction: wheel-made (2)
State of preservation: incomplete, 61% of rim, complete base, handle missing
Measurements: Dr = 10 × 7.2 cm, H = 21 cm
Fabric: not possible to determine
Hardness: 3/4

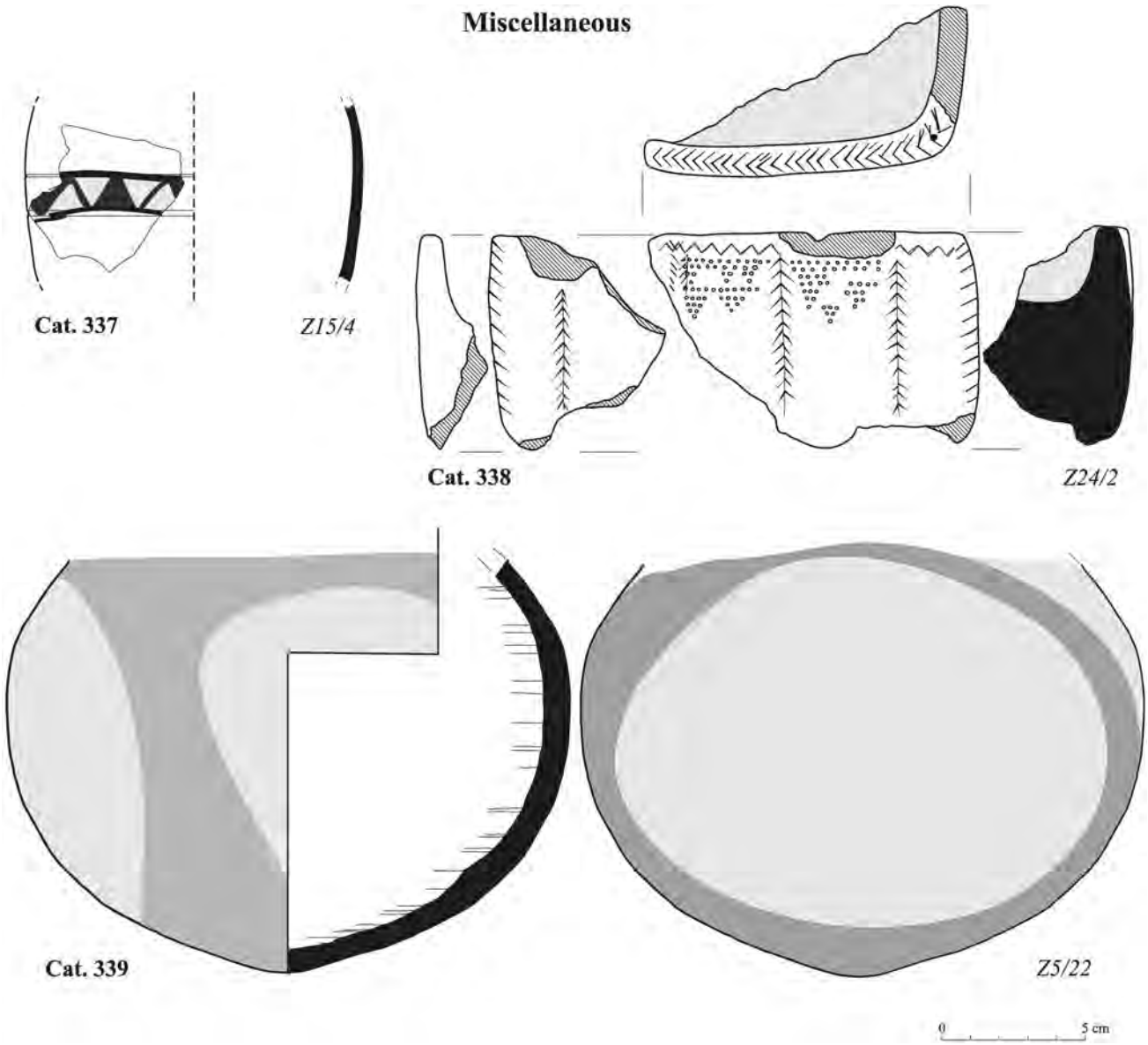

FIGURE 7.84 Miscellaneous wheel-made and handmade vessels

Firing: not possible to determine
Surface treatment: slip on external surface
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—10R 4/6 red
Colour of break: not possible to determine
Decoration: painted decoration on shoulders—white strokes; belly accentuated with concave vertical lines filled with white

17 Miscellaneous [*Fig. 7.132*]

Cat. 337
Body sherd
Inv. no: **Z15/4**
Provenance: Tumulus 15, fill of shaft
Construction: wheel-made
State of preservation: single sherd
Fabric: ZF1
Hardness: 3
Firing: oxidized
Surface treatment: slipped on external surface
Surface colour: external, slip—10R 5/8 red
Colour of break: 7.5YR 4/4 dark brown
Decoration: incised—two poorly executed grooves forming border for decoration; painted—white band as background and black triangles as decorative pattern

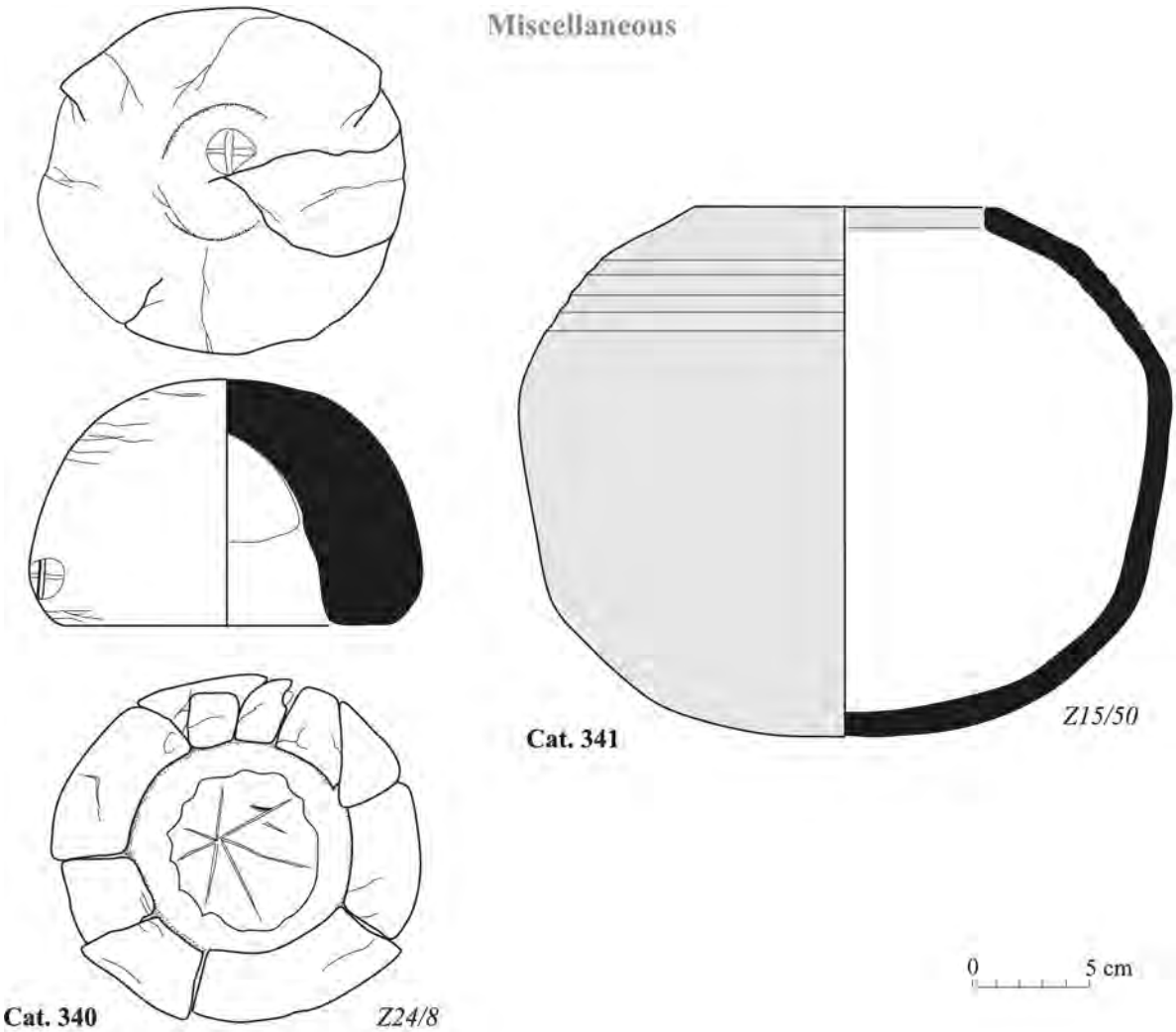

FIGURE 7.85 Miscellaneous wheel-made and handmade vessels

Cat. 338
Basin?
Inv. no: **Z24/2**
Provenance: Tumulus 24, superstructure
Construction: handmade
State of preservation: fragmentary
Measurements: $_{p}$H = 7.2 cm
Fabric: similar to ZF9
Hardness: 4
Firing: reduced
Surface treatment: slipped on internal surface
Surface colour: external—7.5YR 5/4 brown; internal natural surface—7.5YR 5/3 brown, slip—10R 3/4 dusky red
Colour of break: 10YR 2/1 black
Decoration: punctuated and incised decoration on external wall and top of rim; herringbone and dots arranged in triangles

Cat. 339
Pot?
Inv. no: **Z5/22**
Provenance: Tumulus 5, tunnel fill
Construction: wheel-made (2)
State of preservation: fragmentary, restored from sherds, lower part
Measurements: $_{p}$H = 14 cm
Fabric: similar to ZF9
Hardness: 4
Firing: reduced
Surface treatment: slipped on external surface
Surface colour: external natural surface—5YR 6/6 reddish yellow, slip 1—10R 5/4 weak red, slip 2—7.5R 4/4 weak red; internal natural surface—10YR 5/3 brown
Colour of break: 2.5Y 2.5/1 black
Decoration: painted—with slip, slip 1 as background, and slip 2 as top layer applied in circles

Cat. 340
Stopper
Inv. no: **Z24/8**
Provenance: Tumulus 24, robber shaft
Construction: handmade
State of preservation: fragmentary, 50 % of rim
Measurements: Dr = 15 cm, H = 10.6 cm
Fabric: not possible to determine, abundant in fine to large organics, medium quantity of small to medium-sized white particles and small stones
Hardness: 2
Firing: probably dried
Surface treatment: uncoated
Surface colour: 10YR 6/2 light brownish grey on both surfaces
Colour of break: 10YR 6/2 light brownish grey
Decoration: incised—star pattern inside stopper, badly executed; stamped decoration on external wall and top of stopper

Cat. 341
Jar (small, broad)
Inv. no: **Z15/50**
Provenance: Tumulus 15, chamber 1, eastern part
Construction: wheel-made (2)
State of preservation: incomplete, 97 % of rim, lip chipped off
Measurements: Dr = 13.5 cm; max body Dr = 26.5 cm; H = 22.5 cm
Fabric: not possible to determine
Hardness: 3
Firing: reduced
Surface treatment: slipped on external surface
Surface colour: external natural surface—5YR 5/6 yellowish red, slip—2.5R 6/4 red light reddish brown
Colour of break: not possible to determine

18 Colour Plates

FIGURE 7.86 Cups of type I.1
Z26/15, Z26/47, Z4/198, Z15/46, Z15/49, Z15/7, Z15/22 PHOTOS BY A. KAMROWSKI; Z25/5 PHOTO BY K. KOTLEWSKI; Z13/20 PHOTO BY O. BIAŁOSTOCKA; Z23/35 PHOTO BY K. KOTLEWSKI; Z14/24 PHOTO BY T. WOJTCZAK; Z26/37 PHOTO BY A. KAMROWSKI

FIGURE 7.87 Cups of types I.1 and I.2
Z2/27, 23/39 PHOTOS BY K. KOTLEWSKI; Z24/53, Z24/37 PHOTOS BY T. WOJTCZAK; Z26/71.1 PHOTO BY A. KAMROWSKI; Z14/17 PHOTO BY T. WOJTCZAK; Z21/6 PHOTO BY R. MAHLER; Z20/2 PHOTO BY E. CZYŻEWSKA-ZALEWSKA; Z25/21, Z10/9 PHOTOS BY K. KOTLEWSKI; Z22/2 PHOTO BY A. KAMROWSKI; Z18/2 PHOTO BY K. KOTLEWSKI; Z14/18 PHOTO BY T. WOJTCZAK

I.2

FIGURE 7.88 Cups of type I.2
Z12/110, Z12/111 photos by E. Skowrońska; Z12/81 photo by A. Kamrowski; Z5/1, Z5/4, Z19/6, Z18/4 photos by K. Kotlewski; Z28/10 photo by T. Wojtczak; Z10/15 photo by K. Kotlewski; Z12/95, Z12/92, Z6/15+Z6/18 photos by A. Kamrowski

FIGURE 7.89 Cups of types I.2 and I.3
Z11/11, Z11/14, Z11/19 PHOTOS BY O. BIAŁOSTOCKA; Z23/7, Z23/8 PHOTOS BY K. KOTLEWSKI; Z14/12 PHOTO BY T. WOJTCZAK; Z23/2, Z22/1 PHOTOS BY K. KOTLEWSKI; Z27/3 PHOTO BY O. BIAŁOSTOCKA; Z12/90 PHOTO BY A. KAMROWSKI; Z12/124 PHOTO BY E. SKOWROŃSKA; Z11/28 PHOTO BY O. BIAŁOSTOCKA

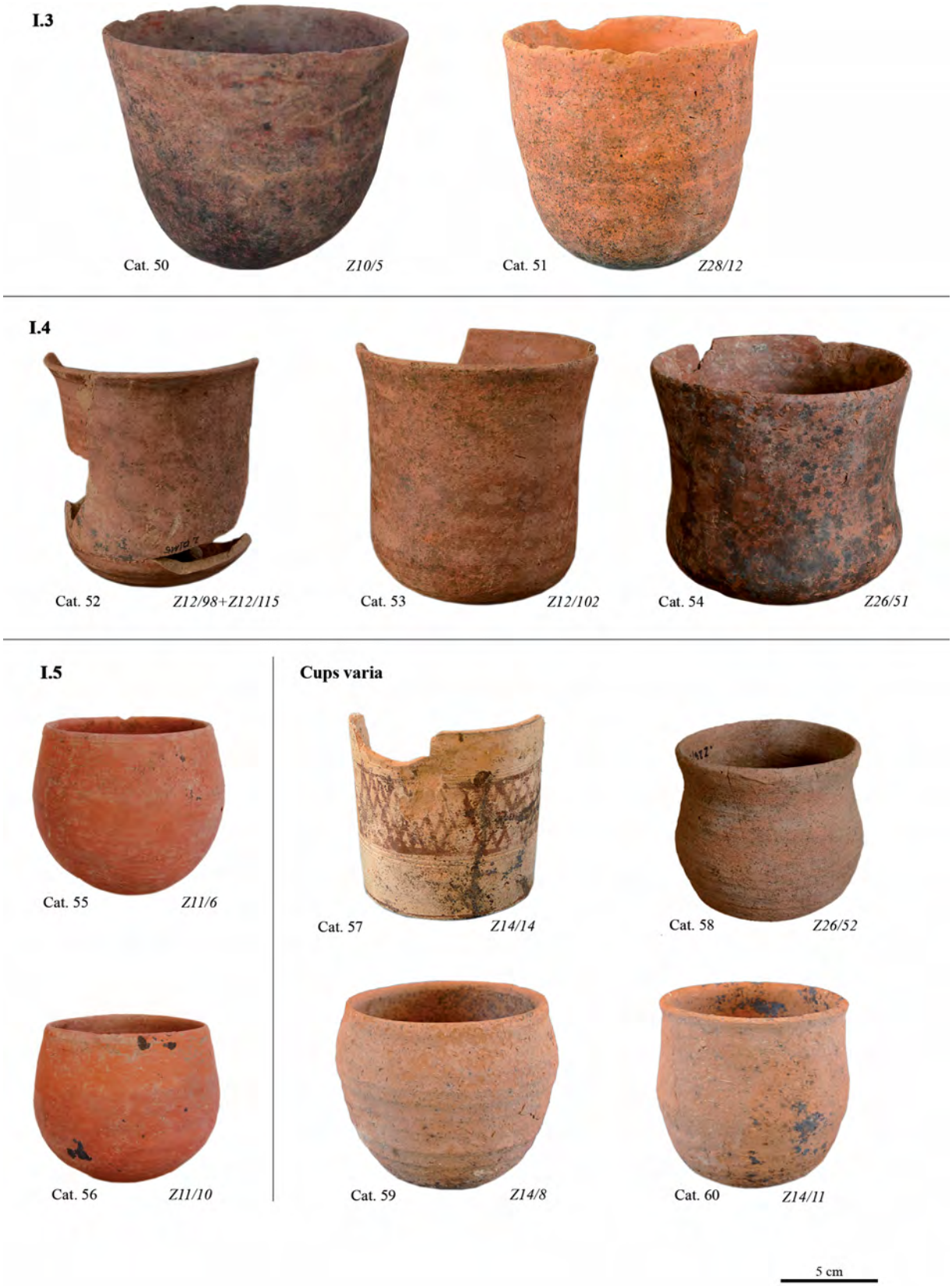

FIGURE 7.90 Cups of types I.3, I.4, I.5 and varia
Z10/5 PHOTO BY K. KOTLEWSKI; Z28/12 PHOTO BY T. WOJTCZAK; Z12/98+Z12/115, Z12/102, Z26/51.1 PHOTOS BY A. KAMROWSKI; Z11/6, Z11/10 PHOTOS BY O. BIAŁOSTOCKA; Z14/14 PHOTO BY T. WOJTCZAK; Z26/52 PHOTO BY A. KAMROWSKI; Z14/8, Z14/11 PHOTOS BY T. WOJTCZAK

FIGURE 7.91 Cups varia
Z14/5 PHOTO BY T. WOJTCZAK; Z12/68 PHOTO BY E. SKOWROŃSKA; Z7/20 PHOTO BY A. KAMROWSKI; Z9/2 PHOTO BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 7.92 Bowls of type II.1
Z19/5, Z19/2, Z10/14, Z10/18 PHOTOS BY K. KOTLEWSKI; Z11/29, Z11/17 PHOTOS BY O. BIAŁOSTOCKA; Z6/16+Z6/20.1 PHOTO BY A. KAMROWSKI; Z11/22 PHOTO BY O. BIAŁOSTOCKA; Z12/129 PHOTO BY A. KAMROWSKI

FIGURE 7.93 Bowls of type II.2
Z26/75 PHOTO BY A. KAMROWSKI; Z23/16 PHOTO BY K. KOTLEWSKI; Z26/80, Z26/43 PHOTOS BY A. KAMROWSKI; Z12/46 PHOTO BY Z. KOWARSKA; Z12/119 PHOTO BY A. KAMROWSKI; Z23/13 PHOTO BY K. KOTLEWSKI; Z13/13 PHOTO BY O. BIAŁOSTOCKA; Z26/50+Z26/83.2 PHOTO BY A. KAMROWSKI; Z14/13, Z24/19, Z14/10 PHOTOS BY T. WOJTCZAK; Z12/35 PHOTO BY R. MAHLER; Z12/97, Z12/123 PHOTOS BY E. SKOWROŃSKA

FIGURE 7.94 Bowls of type II.2
Z12/14, Z12/44 PHOTOS BY R. MAHLER; Z12/106 PHOTO BY A. KAMROWSKI; Z21/7, Z12/41 PHOTOS BY R. MAHLER; Z25/15 PHOTO BY K. KOTLEWSKI; Z9/7 PHOTO BY E. CZYŻEWSKA-ZALEWSKA; Z12/38 PHOTO BY R. MAHLER; Z15/21, Z12/116 PHOTOS BY A. KAMROWSKI; Z26/85+Z26/86, Z12/101, Z12/126 PHOTOS BY A. KAMROWSKI

FIGURE 7.95 Bowls of types II.2 and II.3
Z14/7 PHOTO BY T. WOJTCZAK; Z12/47 PHOTO BY R. MAHLER; Z12/107 PHOTO BY E. SKOWROŃSKA; Z12/108, Z12/86 PHOTOS BY A. KAMROWSKI; Z25/11 PHOTO BY K. KOTLEWSKI; Z12/37 PHOTO BY R. MAHLER; Z23/29, Z23/22 PHOTOS BY K. KOTLEWSKI; Z12/18 PHOTO BY R. MAHLER; Z12/17 PHOTO BY A. KAMROWSKI; Z12/42 PHOTO BY R. MAHLER; Z10/1, Z10/6 PHOTOS BY K. KOTLEWSKI; Z12/117 PHOTO BY E. SKOWROŃSKA

FIGURE 7.96 Bowls of type II.3
Z11/25, Z11/27 PHOTOS BY O. BIAŁOSTOCKA; Z12/39 PHOTO BY E. SKORWOŃSKA; Z11/7, Z11/9, Z11/13 PHOTOS BY O. BIAŁOSTOCKA

FIGURE 7.97 Bowls of type II.4
Z4/254 PHOTO BY A. KAMROWSKI; Z14/6 PHOTO BY T. WOJTCZAK; Z4/134+Z4/34 PHOTO BY A. KAMROWSKI; Z2/24 PHOTO BY K. KOTLEWSKI; Z7/46, Z1/1 PHOTOS BY A. KAMROWSKI; Z9/1 PHOTO BY E. CZYŻEWSKA-ZALEWSKA; Z2/26 PHOTO BY K. KOTLEWSKI

FIGURE 7.98 Bowls of type II.4
Z2/4, Z23/26 PHOTOS BY K. KOTLEWSKI; Z4/35 PHOTO BY A. KAMROWSKI; Z2/19 PHOTO BY K. KOTLEWSKI; Z4/201 PHOTO BY A. KAMROWSKI; Z2/28, Z2/5, Z2/22 PHOTOS BY K. KOTLEWSKI; Z4/14.3A PHOTO BY A. KAMROWSKI; Z25/19, Z25/27, Z25/25 PHOTOS BY K. KOTLEWSKI; Z7/27, Z4/14.3D PHOTOS BY A. KAMROWSKI

FIGURE 7.99 Bowls of type II.5
Z15/19 PHOTO BY R. MAHLER; Z15/20, Z15/45, Z15/61 PHOTOS BY A. KAMROWSKI

FIGURE 7.100 Bowls of type II.6
Z13/28 PHOTO BY O. BIAŁOSTOCKA; Z7/21 PHOTO BY A. KAMROWSKI; Z14/26, Z14/28 PHOTOS BY T. WOJTCZAK

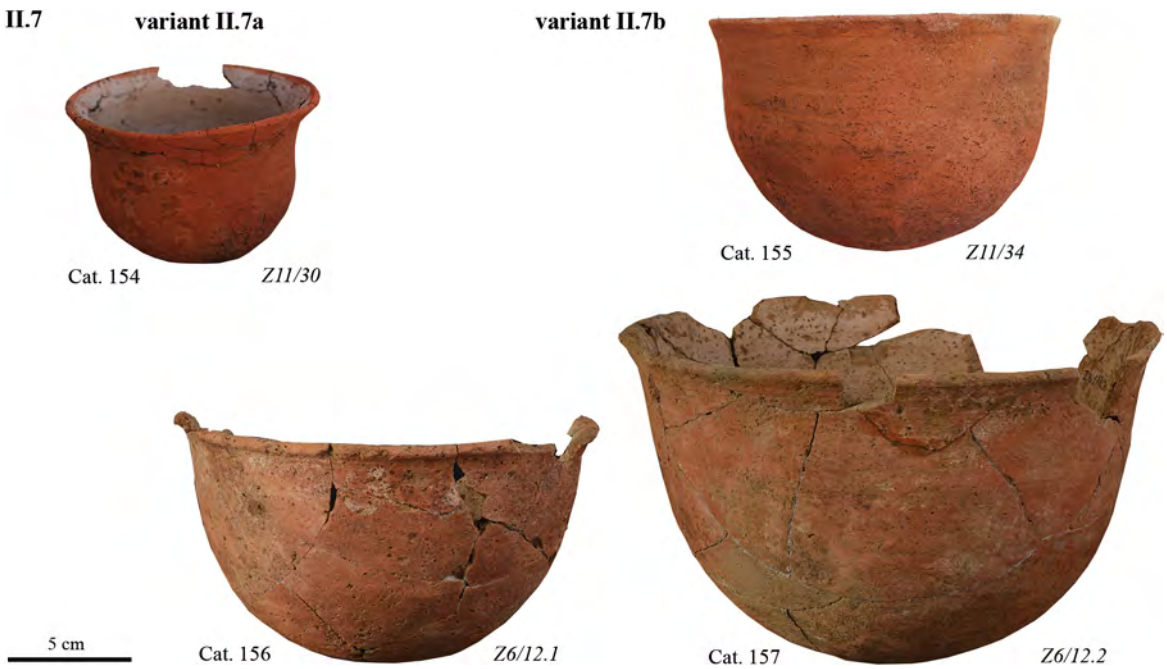

FIGURE 7.101 Bowls of type II.7
Z11/30, Z11/34 PHOTOS BY O. BIAŁOSTOCKA; Z6/12.1. Z6/12.2 PHOTOS BY A. KAMROWSKI

FIGURE 7.102 Bowls of type II.8
Z6/3.3+Z6/28.1+Z6/35.4+Z6/39+Z6/56+Z6/58.2, Z4/1.3+Z4/4 PHOTOS BY A. KAMROWSKI; Z5/2 PHOTO BY K. KOTLEWSKI; Z6/3.4, Z7/69.1 PHOTOS BY A. KAMROWSKI; Z21/28 PHOTO BY Z. KOWARSKA; Z26/71.3 PHOTO BY A. KAMROWSKI

FIGURE 7.103 Bowls of type II.9
Z24/10+Z24/11 PHOTO BY T. WOJTCZAK; Z11/16 PHOTO BY O. BIAŁOSTOCKA;
Z1/21+Z1/22, Z7/50+Z7/69 PHOTOS BY A. KAMROWSKI

FIGURE 7.104 Bowls varia
Z14/27 PHOTO BY T. WOJTCZAK; Z2/29 PHOTO BY K. KOTLEWSKI; Z23/4, Z3/7.2 PHOTOS BY A. KAMROWSKI; Z5/18 PHOTO BY K. KOTLEWSKI; Z4/219 PHOTO BY A. KAMROWSKI; Z11/21 PHOTO BY O. BIAŁOSTOCKA; Z12/84 PHOTO BY A. KAMROWSKI; Z5/17, Z5/21 PHOTOS BY K. KOTLEWSKI; Z6/2.1+Z6/3.5+Z6/55, Z5/35, Z6/25.3 PHOTOS BY A. KAMROWSKI; Z14/15 PHOTO BY T. WOJTCZAK; Z7/68, Z26/87 PHOTOS BY A. KAMROWSKI

FIGURE 7.105 Bowls varia
Z10/28 PHOTO BY K. KOTLEWSKI; Z26/65.1 PHOTO BY A. KAMROWSKI

FIGURE 7.106 Spouted bowls of types III.1 and III.2
Z19/4 PHOTO BY K. KOTLEWSKI; Z24/25 PHOTO BY T. WOJTCZAK; Z6/13 PHOTO BY A. KAMROWSKI

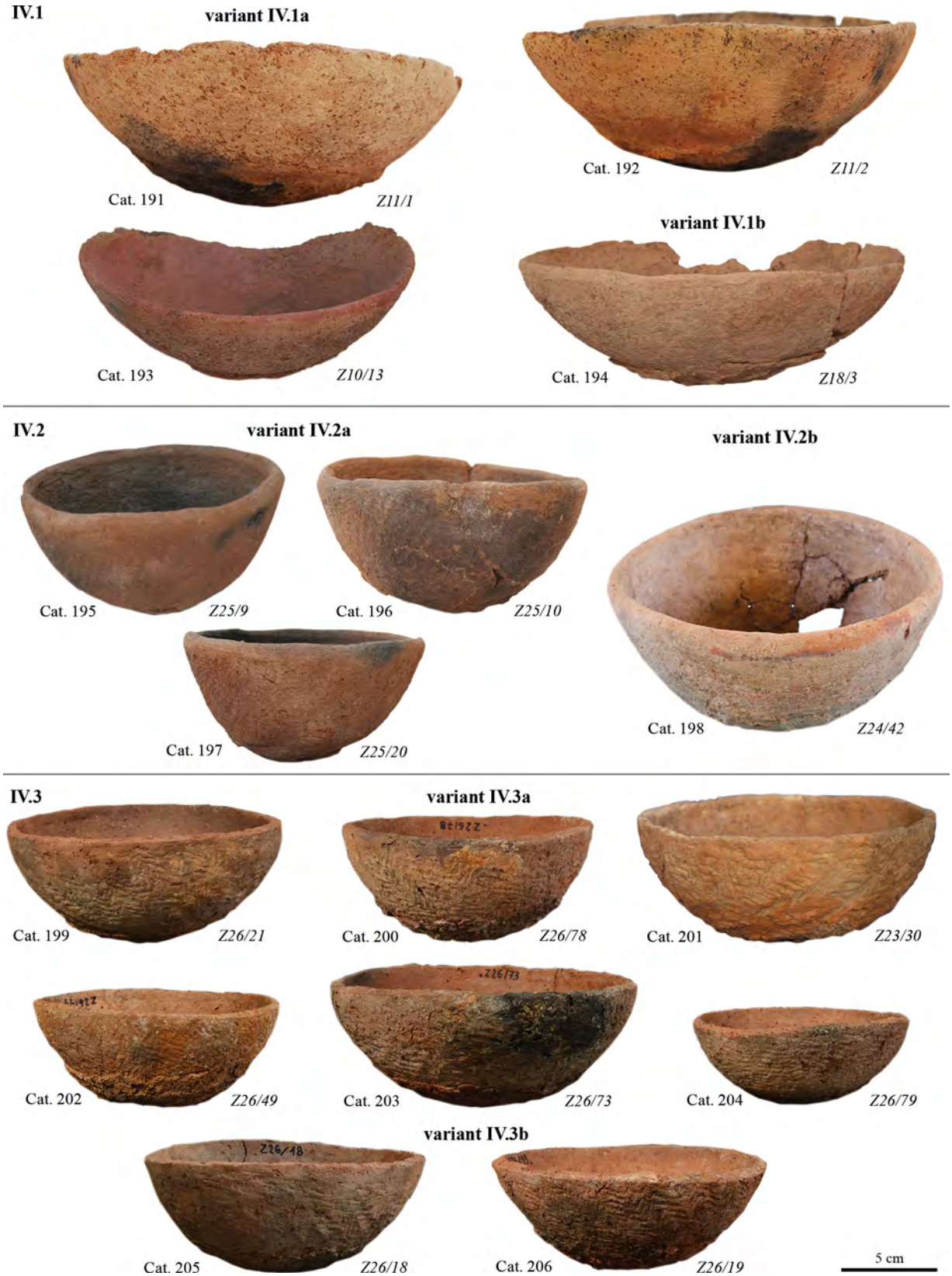

FIGURE 7.107 Bowls of types IV.1, IV.2 and IV.3
Z11/1, Z11/2 PHOTOS BY O. BIAŁOSTOCKA; Z10/13, Z18/3, Z25/9, Z25/10, Z25/20 PHOTOS BY K. KOTLEWSKI; Z24/42 PHOTO BY T. WOJTCZAK; Z26/21, Z26/78 PHOTOS BY A. KAMROWSKI; Z23/30 PHOTO BY K. KOTLEWSKI; Z26/49, Z26/73, Z26/79, Z26/18, Z26/19 PHOTOS BY A. KAMROWSKI

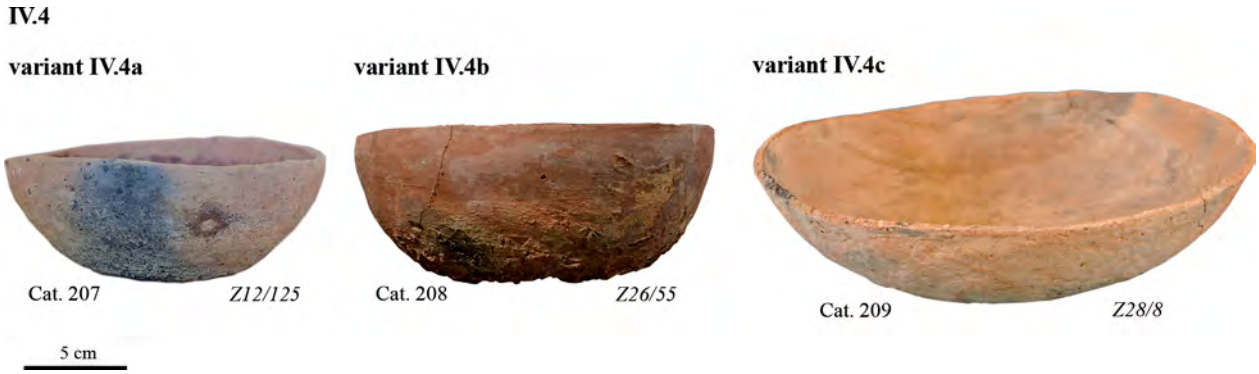

FIGURE 7.108 Bowls of type IV.4
Z12/125 PHOTO BY E. SKOWROŃSKA; Z26/55 PHOTO BY A. KAMROWSKI; Z28/8 PHOTO BY T. WOJTCZAK

FIGURE 7.109 Pots of types V.1, V.2 and V.3
Z18/1 PHOTO BY K. KOTLEWSKI; Z11/3 PHOTO BY O. BIAŁOSTOCKA; Z10/10 PHOTO BY K. KOTLEWSKI; Z11/23 PHOTO BY O. BIAŁOSTOCKA; Z24/17, Z24/21 PHOTOS BY T. WOJTCZAK; Z25/16, Z23/1, Z25/31, Z25/26 PHOTOS BY K. KOTLEWSKI

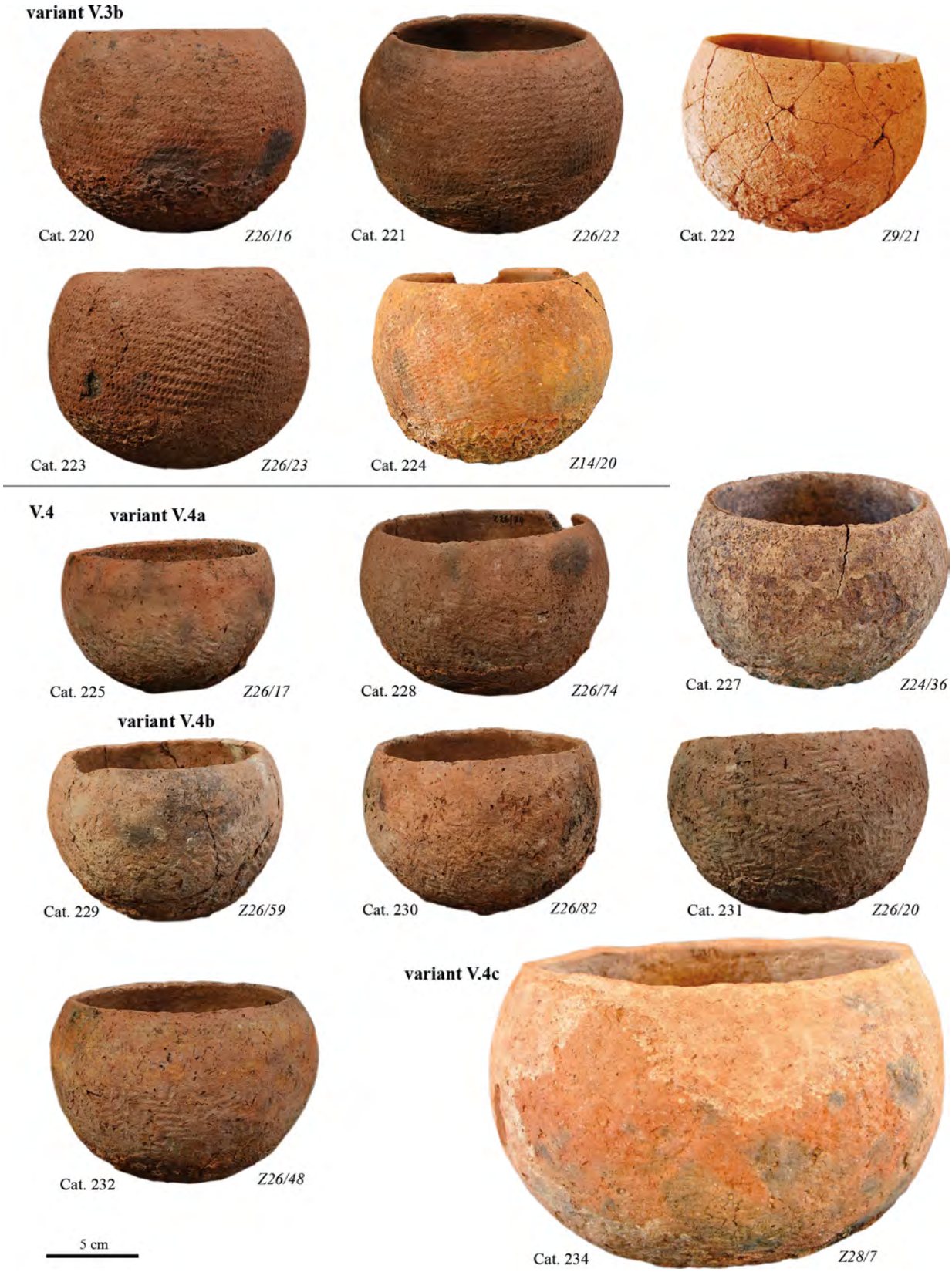

FIGURE 7.110 Pots of types V.3 and V.4
Z26/16, Z26/22 PHOTOS BY A. KAMROWSKI; Z9/21 PHOTO BY E. CZYŻEWSKA-ZALEWSKA; Z26/23 PHOTO BY A. KAMROWSKI; Z14/20 PHOTO BY T. WOJTCZAK; Z26/17 PHOTO BY A. KAMROWSKI; Z24/36 PHOTO BY T. WOJTCZAK; Z26/74, Z26/59, Z26/82, Z26/20, Z26/48 PHOTOS BY A. KAMROWSKI; Z28/7 PHOTO BY T. WOJTCZAK

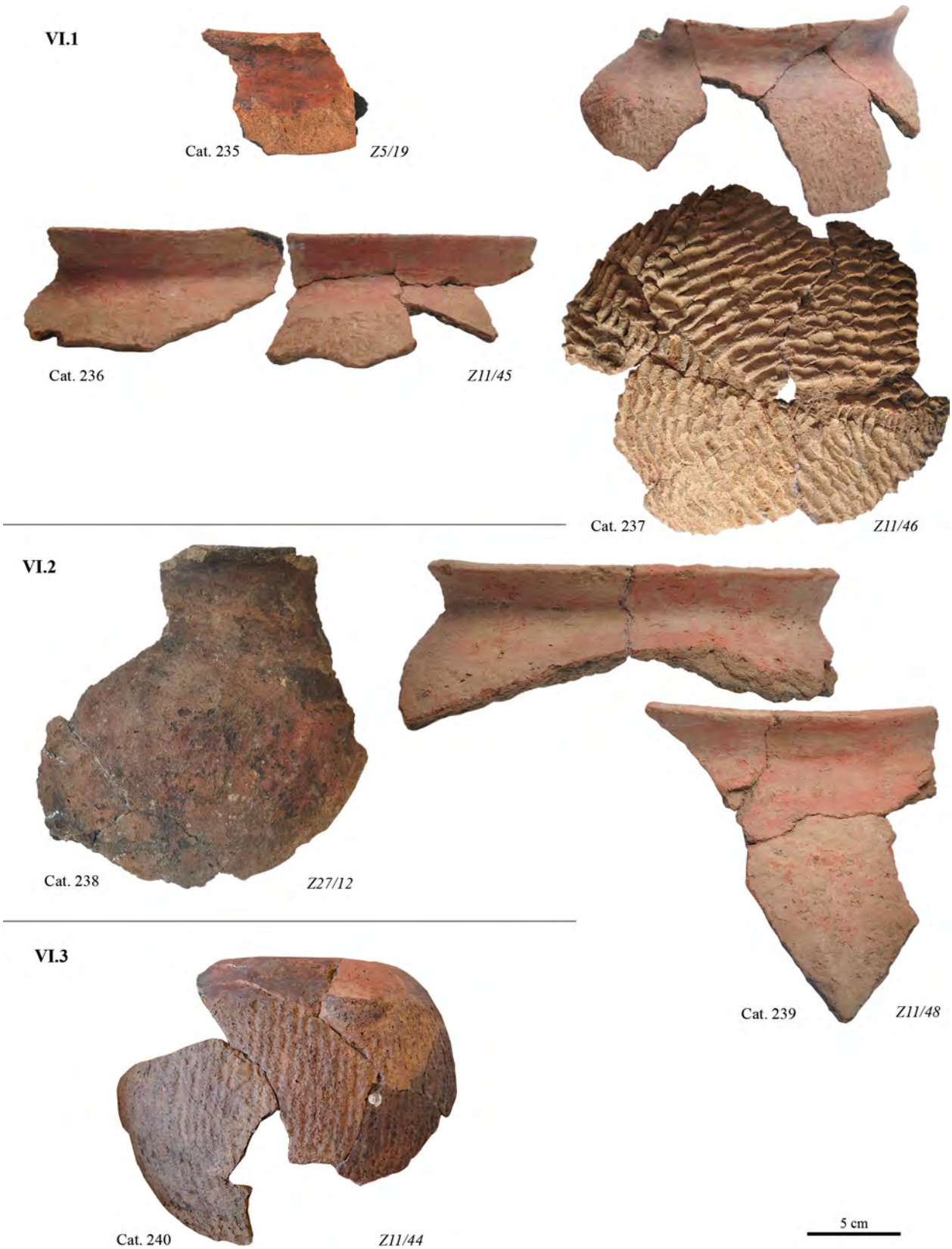

FIGURE 7.111 Pots of type VI
Z5/19 PHOTO BY K. KOLTEWSKI; Z11/45, Z11/46, Z27/12, Z11/48 PHOTOS BY A. KAMROWSKI; Z11/44 PHOTO BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 7.112 Jars of type VII.1
Z18/6 PHOTO BY K. KOTLEWSKI; Z20/5, Z9/3 PHOTOS BY E. CZYŻEWSKA-ZALEWSKA; Z18/8 PHOTO BY K. KOTLEWSKI; Z12/78+Z12/71 PHOTO BY A. KAMROWSKI; Z28/9 PHOTO BY T. WOJTCZAK

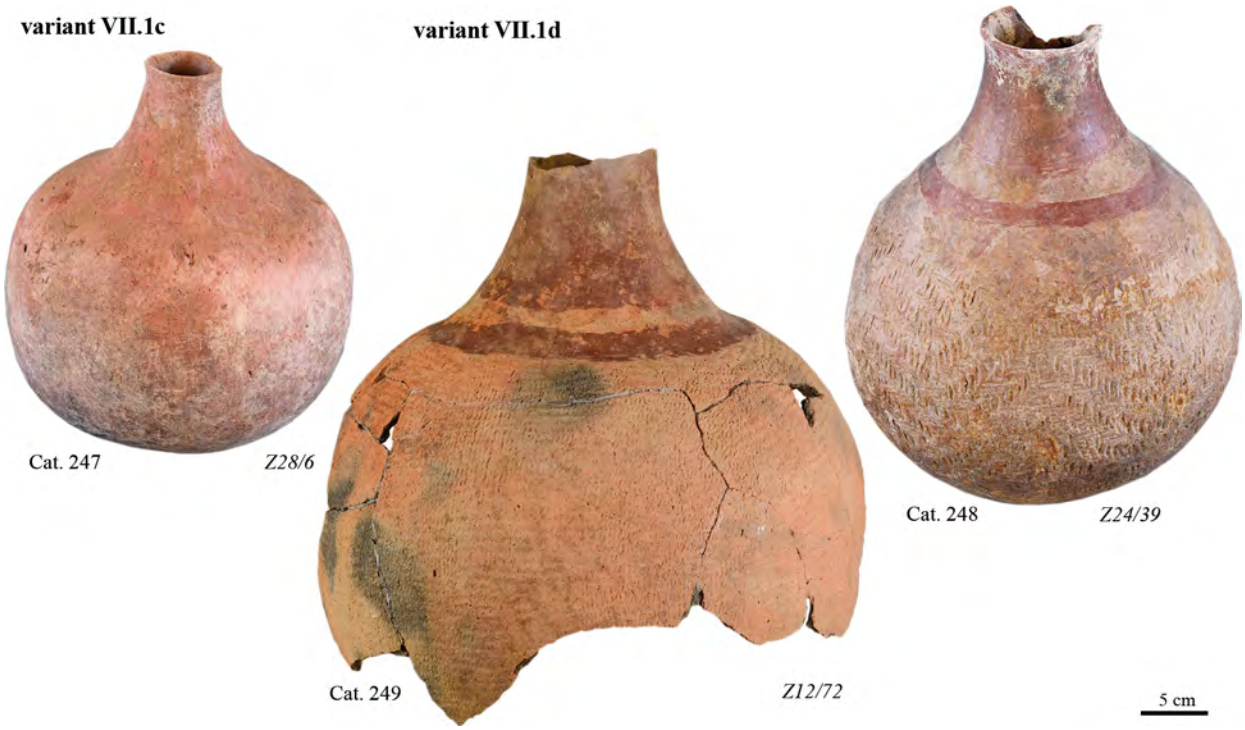

FIGURE 7.113 Jars of type VII.1
Z28/6, Z24/39 PHOTOS BY T. WOJTCZAK; Z12/72 PHOTO BY A. KAMROWSKI

FIGURE 7.114 Jars of type VII.2
Z18/7 PHOTO BY K. KOTLEWSKI; Z13/21 PHOTO BY O. BIAŁOSTOCKA; Z12/135 PHOTO BY A. KAMROWSKI; Z21/9 PHOTO BY R. MAHLER; Z17/2 PHOTO BY O. BIAŁOSTOCKA

FIGURE 7.115 Jars of type VII.2
Z12/134 PHOTO BY A. KAMROWSKI; Z24/40 PHOTO BY T. WOJTCZAK; Z15/52 PHOTO BY E. SKOWROŃSKA; Z2/34 PHOTO BY K. KOTLEWSKI

FIGURE 7.116 Jars of type VII.3
Z12/24.1 PHOTO BY A. KAMROWSKI; Z2/39 PHOTO BY K. KOTLEWSKI, Z14/9 PHOTO BY T. WOJTCZAK

FIGURE 7.117 Bottles of type VII.4
Z2/36, Z2/38 PHOTOS BY K. KOTLEWSKI; Z15/27, Z15/59 PHOTOS BY A. KAMROWSKI

FIGURE 7.118 Bottles of type VII.4
Z2/37 PHOTO BY K. KOTLEWSKI; Z9/4 PHOTO BY E. CZYŻEWSKA-ZALEWSKA; Z13/16 PHOTO BY O. BIAŁOSTOCKA

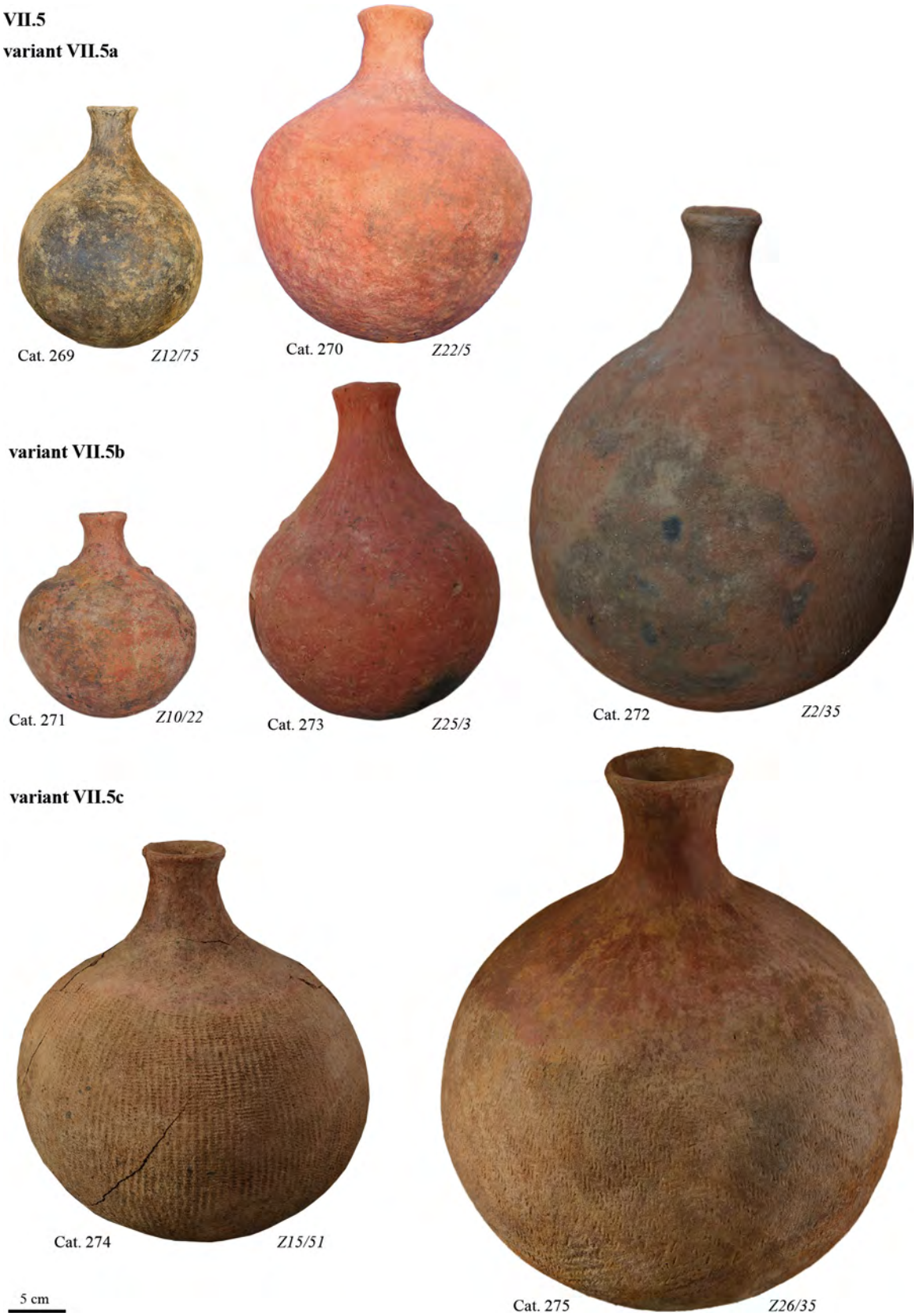

FIGURE 7.119 Bottles of type VII.5
Z12/75 PHOTO BY E. SKOWROŃSKA; Z22/5, Z10/22, Z25/3 PHOTOS BY K. KOTLEWSKI;
Z2/35, Z15/51, Z26/35 PHOTOS BY A. KAMROWSKI

FIGURE 7.120 Bottles of type VII.5
Z14/33 PHOTO BY A. KAMROWSKI

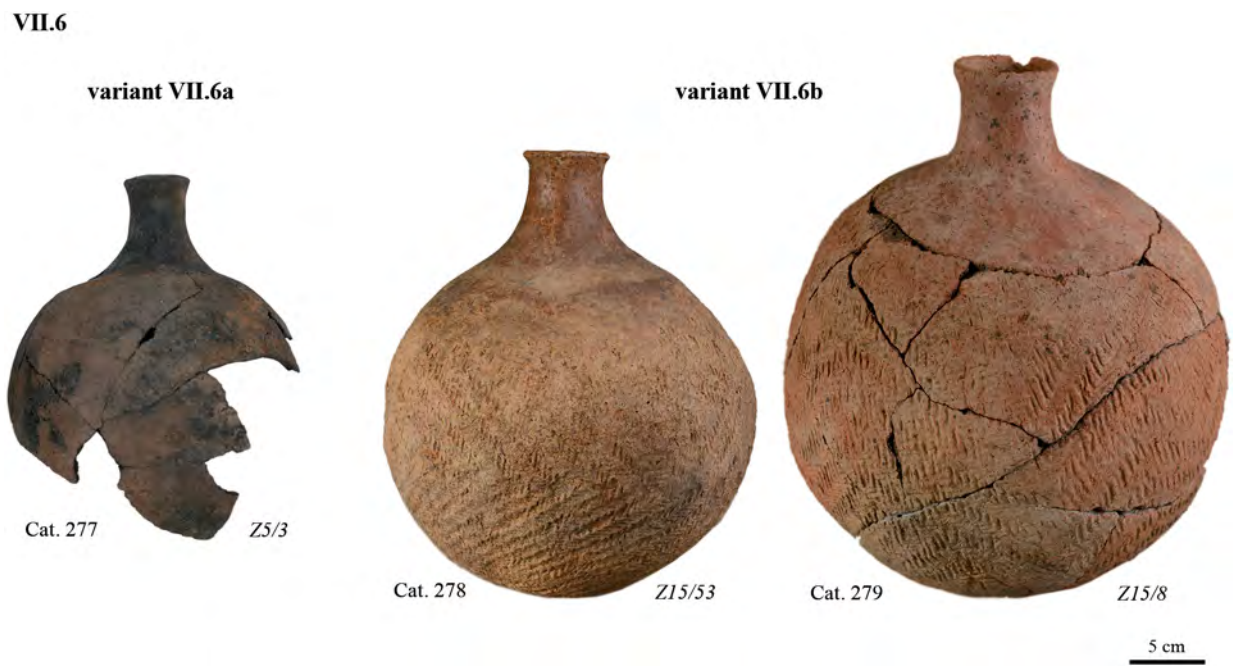

FIGURE 7.121 Bottles of type VII.6
Z5/3 PHOTO BY K. KOTLEWSKI; Z15/53, Z15/8 PHOTOS BY A. KAMROWSKI

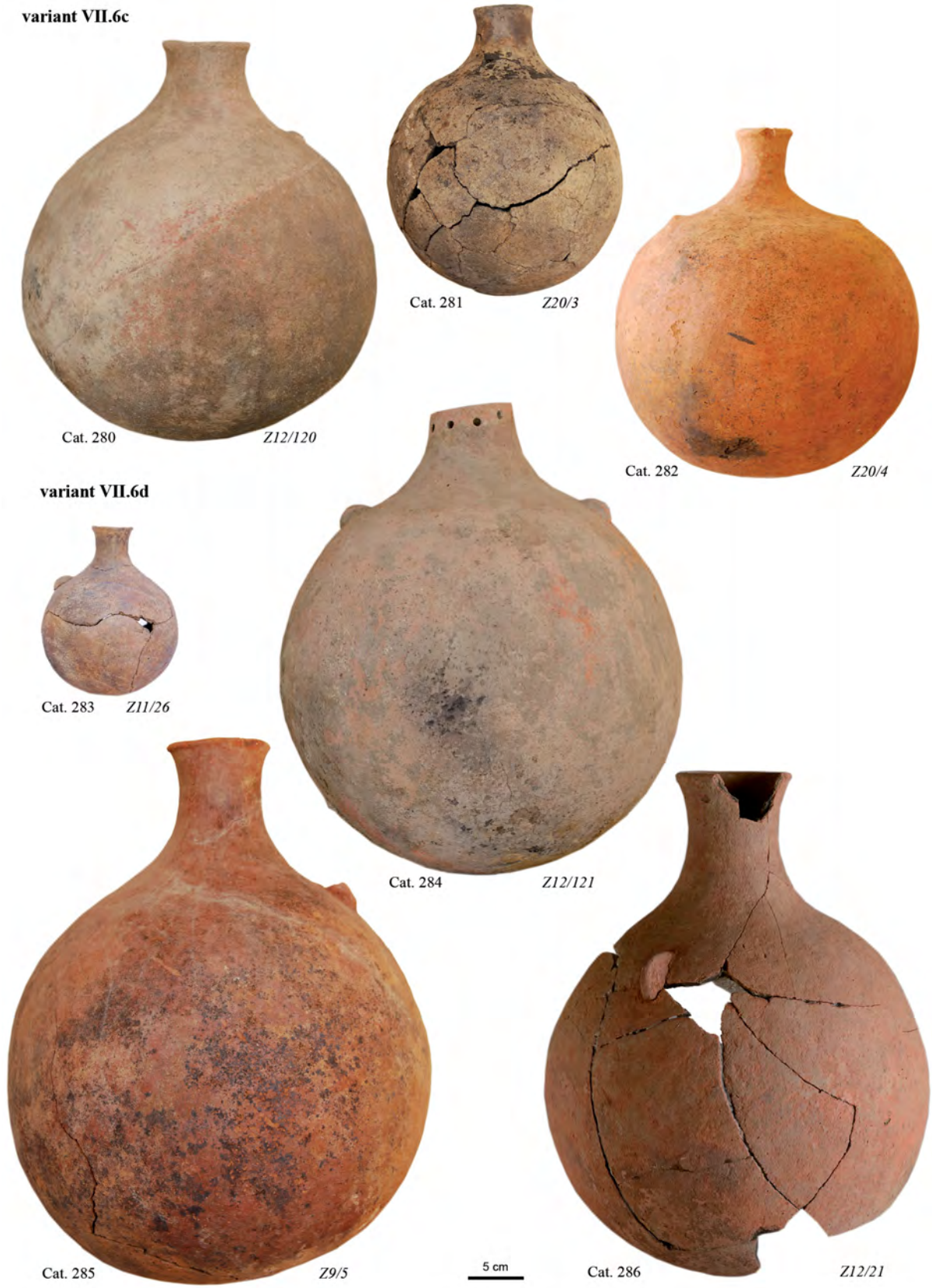

FIGURE 7.122 Bottles of type VII.6
Z12/120 PHOTO BY E. SKOWROŃSKA; Z20/3, Z20/4 PHOTOS BY E. CZYŻEWSKA-ZALEWSKA; Z11/26 PHOTO BY O. BIAŁOSTOCKA; Z12/121 PHOTO BY E. SKOWROŃSKA; Z9/5 PHOTO BY E. CZYŻEWSKA-ZALEWSKA; Z12/21 PHOTO BY A. KAMROWSKI

FIGURE 7.123 Jars of different types
Z12/51 PHOTO BY Z. KOWARSKA; Z25/2 PHOTO BY K. KOTLEWSKI; Z11/42 PHOTO BY O. BIAŁOSTOCKA; Z12/133.1 PHOTO BY A. KAMROWSKI; Z12/52 PHOTO BY Z. KOWARSKA; Z10/25 PHOTO BY K. KOTLEWSKI

FIGURE 7.124
Stands of type IX
Z23/40, Z7/58.1 PHOTOS BY A. KAMROWSKI

FIGURE 7.125
Goblets of types IX.1, IX.2 and IX.3
Z24/20 PHOTO BY T. WOJTCZAK; Z10/7 PHOTO BY K. KOTLEWSKI; Z4/202 PHOTO BY A. KAMROWSKI

FIGURE 7.126 Oil lamps
Z6/21, Z7/49, Z4/61, Z4/10.7, Z4/200 PHOTOS BY A. KAMROWSKI

FIGURE 7.127 *Qawadis* of type XI
Z11/43+Z11/47 PHOTO BY O. BIAŁOSTOCKA; Z6/19.1+Z6/19.2+Z6/38.1; Z26/60.2,3+Z26/62+Z26/63.3+Z26/64+Z26/69+Z26/67; Z26/41+Z26/60.1+Z26/61+Z26/62+Z26/68+Z26/71; Z26/68.2, Z26/65.2, Z26/70.1, Z26/69.3 PHOTOS BY A. KAMROWSKI; Z25/1 PHOTO BY K. KOTLEWSKI

FIGURE 7.128 Amphorae of types XII.1 and XII.2
Z26/32, Z4/14.6 PHOTOS BY A. KAMROWSKI; Z24/29 PHOTO BY T. WOJTCZAK; Z7/25, Z4/31, Z4/225, Z4/226, Z4/224 PHOTOS BY A. KAMROWSKI

FIGURE 7.129 Amphorae of types XII.3, XII.4, XII.5, XII.6 and varia of different shapes Z7/22+Z7/41+Z7/54, Z7/93+Z7/54 PHOTOS BY A. KAMROWSKI; Z2/32 PHOTO BY K. KOTLEWSKI; Z15/5, Z15/56, Z25/6, Z16/1, Z4/2+Z4/10.11, Z3/6.1+Z3/7.1, Z5/43 PHOTOS BY A. KAMROWSKI

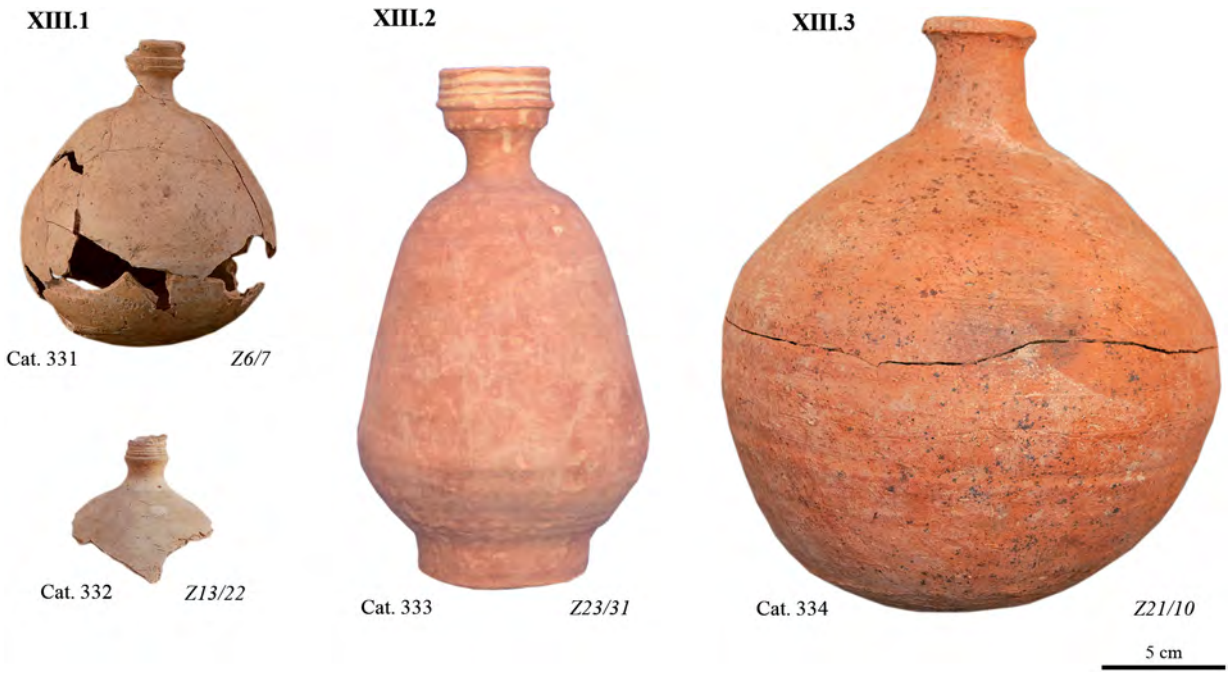

FIGURE 7.130 Bottles of type XIII.1, XIII.2 and XIII.3
Z6/7 PHOTO BY R. MAHLER; Z13/22 PHOTO BY O. BIAŁOSTOCKA; Z23/31 PHOTO BY K. KOTLEWSKI; Z21/10 PHOTO BY R. MAHLER

FIGURE 7.131 Jugs of types XIV.1 and XIV.2
Z15/6, Z15/26 PHOTOS BY A. KAMROWSKI

FIGURE 7.132 Miscellaneous vessels
Z15/4 PHOTO BY R. MAHLER; Z24/2 PHOTO BY T. WOJTCZAK; Z5/22 PHOTO BY A. KAMROWSKI; Z24/8 PHOTO BY E. SKOWROŃSKA; Z15/50 PHOTO BY A. KAMROWSKI

19 Vessel Distribution inside Tumuli

This chapter presents the distribution of all vessels and diagnostic fragments recorded during archaeological work. The main vessel groups presented in the catalogue according to typology are marked on the tomb plans in different colours:

Red	Group I, cups
Green	Group II, types II.1–II.7, small bowls
Dark blue	Group II, types II.8–II.9, large bowls
Black	Group III, spouted bowls
Purple	Group IV, shallow cooking bowls
Light pink	Group V, deep cooking bowls
Pink	Group V, deep cooking bowls
Blue	Group VII, jars/bottles
Grey	Group VIII, pot stands
Dark brown	Group IX, goblets
Yellow	Group X, oil lamps
Violet	Group XI, *qawadis*
Brown	Group XII, amphorae
Light green	Group XIII, bottles
Light blue	Group XIV, jugs

Vessels, mostly complete or almost complete, marked on the plans were found inside the chambers or inside the shafts of the tumuli. Some vessels recorded in pieces or diagnostic fragments, mostly recovered from the shaft fill or the superstructure, are presented in the drawings but not on the plans of the tumuli. There are no grave plans with vessel distribution for type I tombs because in these instances the pottery was found in the form of sherds scattered in the fill of the tunnels. The order in which the tumuli are presented corresponds to the typology set out by Mahmoud El-Tayeb in Volume I (see Volume I, Chapter 3).

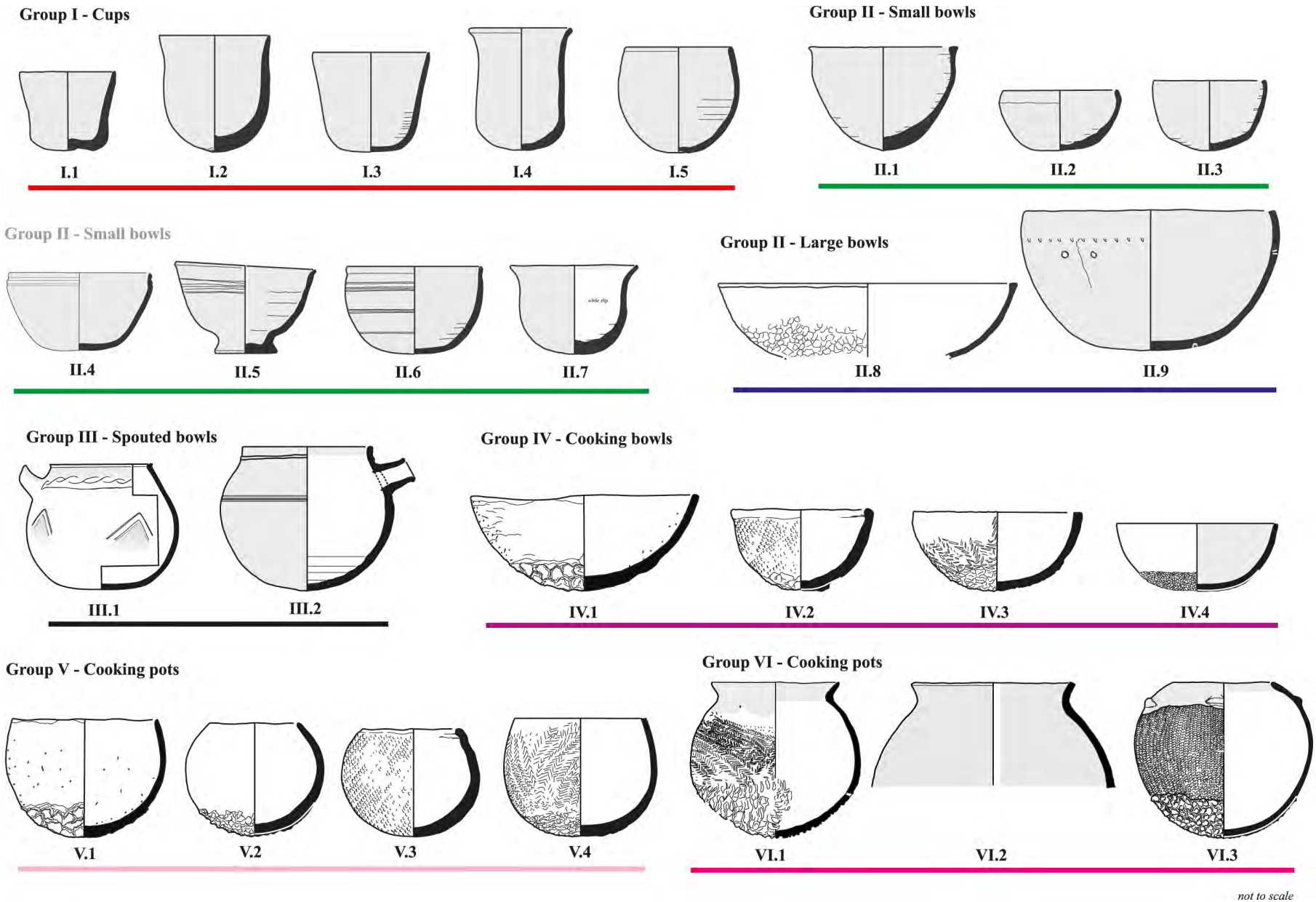

FIGURE 7.133 Legend to the distribution of vessels inside the tumuli

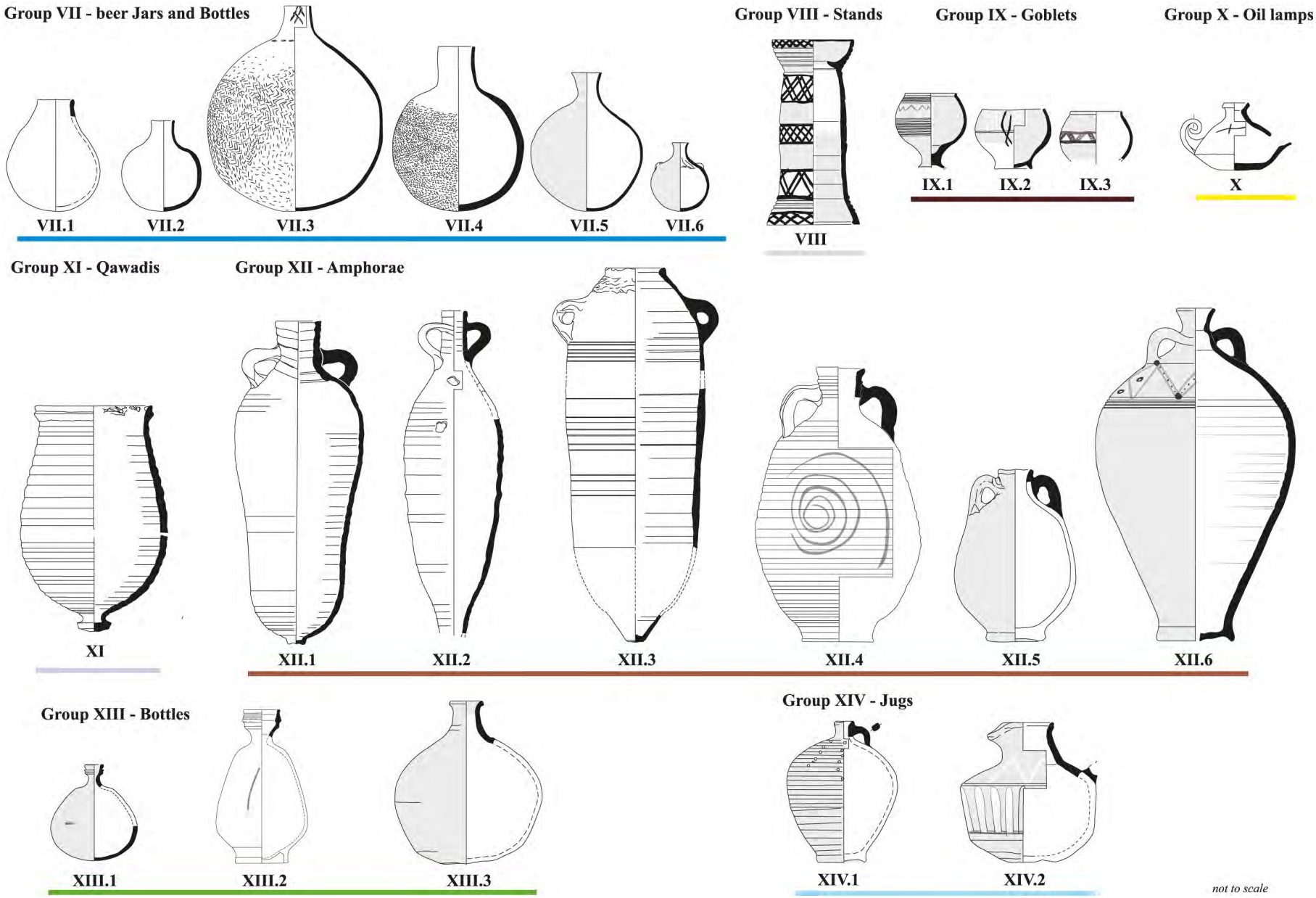

FIGURE 7.134 Legend to the distribution of vessels inside the tumuli

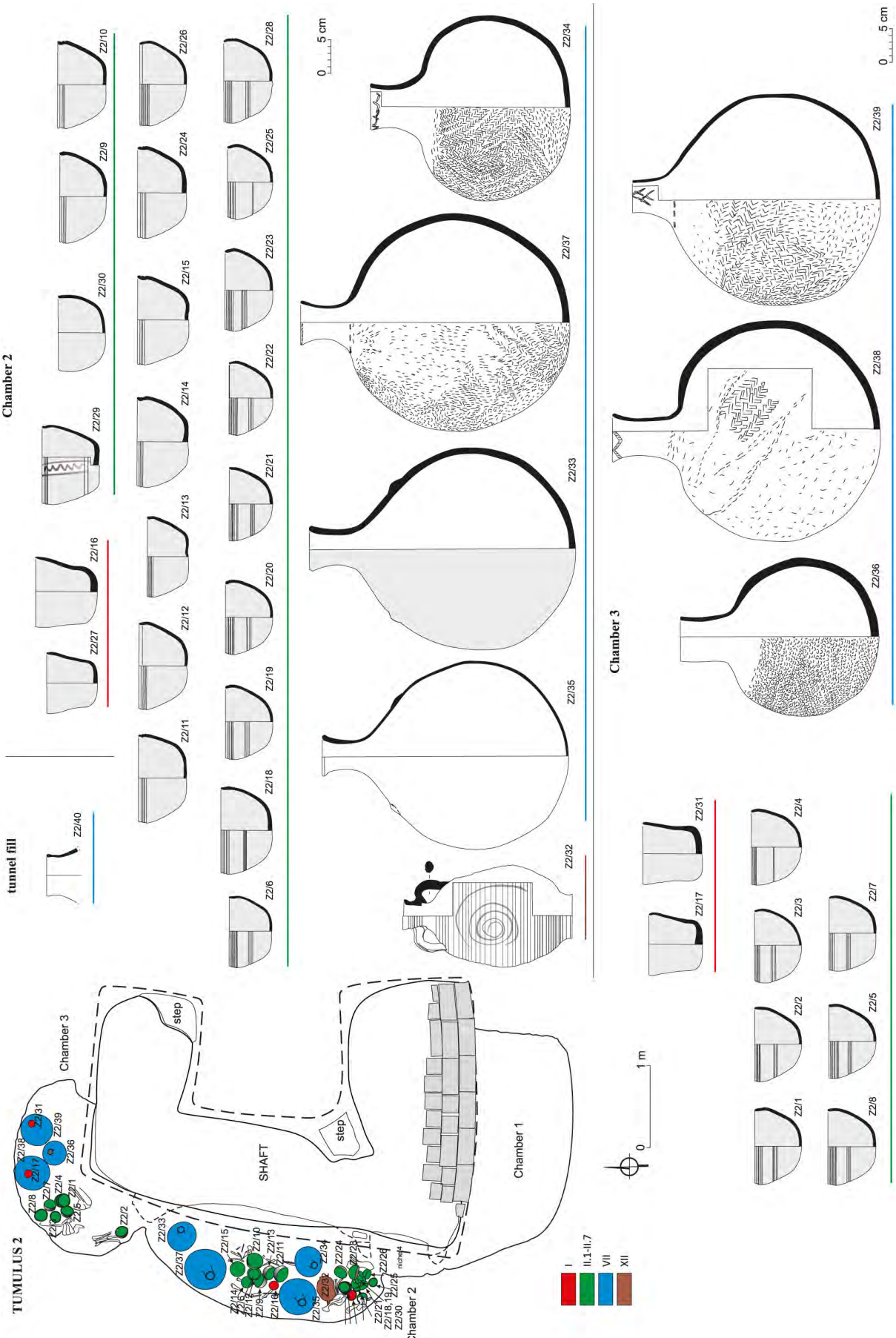

FIGURE 7.135 Tumulus 2, distribution of respective pottery forms by location in the grave

FIGURE 7.136 Tumulus 3, distribution of respective pottery forms by location in the grave

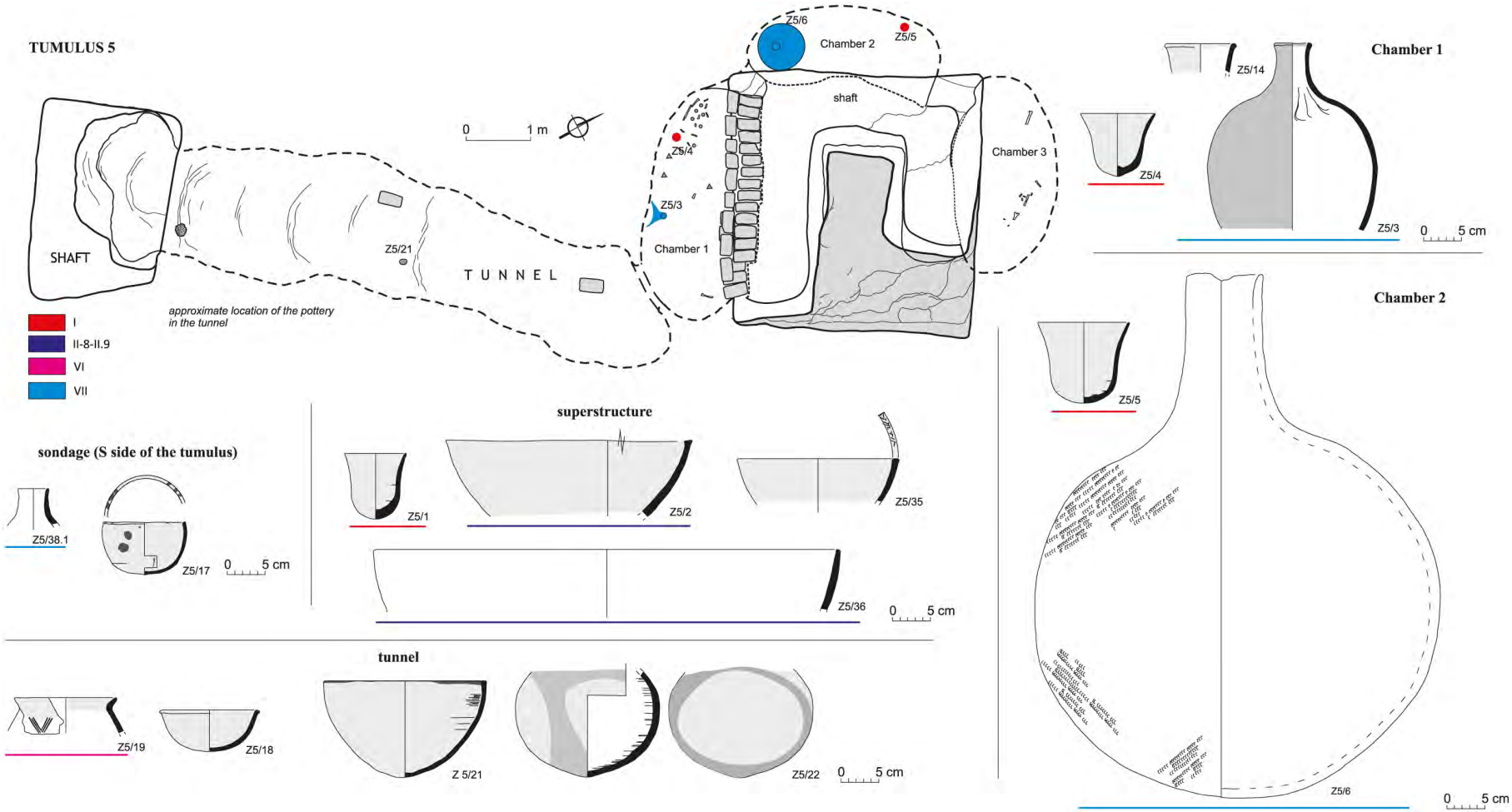

FIGURE 7.137 Tumulus 5, distribution of respective pottery forms by location in the grave

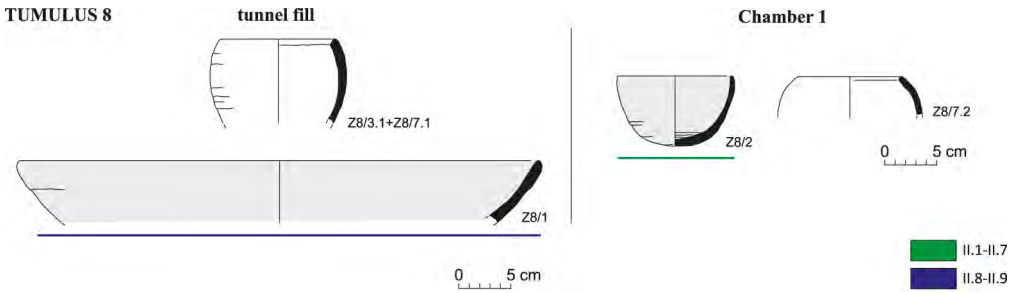

FIGURE 7.138 Tumulus 8, distribution of respective pottery forms by location in the grave

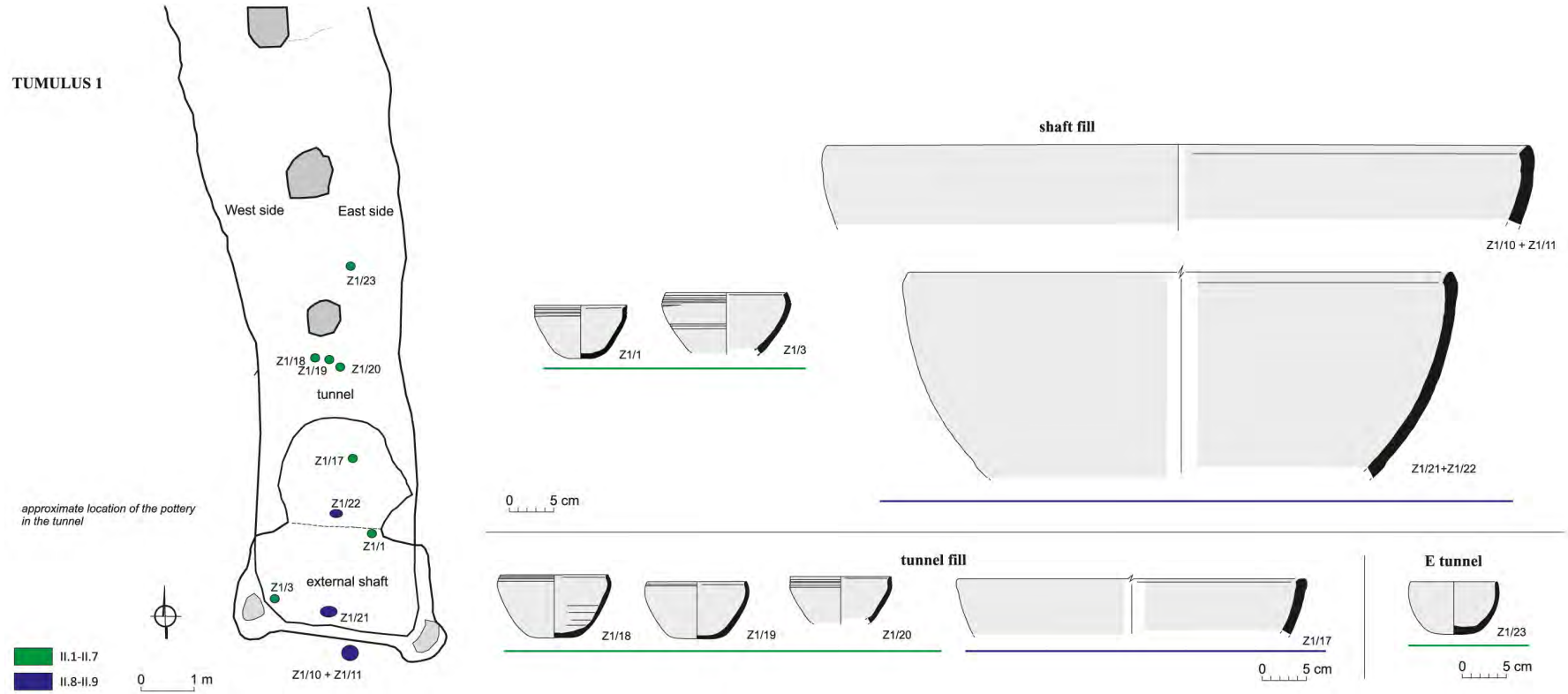

FIGURE 7.139 Tumulus 1, distribution of respective pottery forms by location in the grave

FIGURE 7.140 Tumulus 4, distribution of respective pottery forms by location in the grave

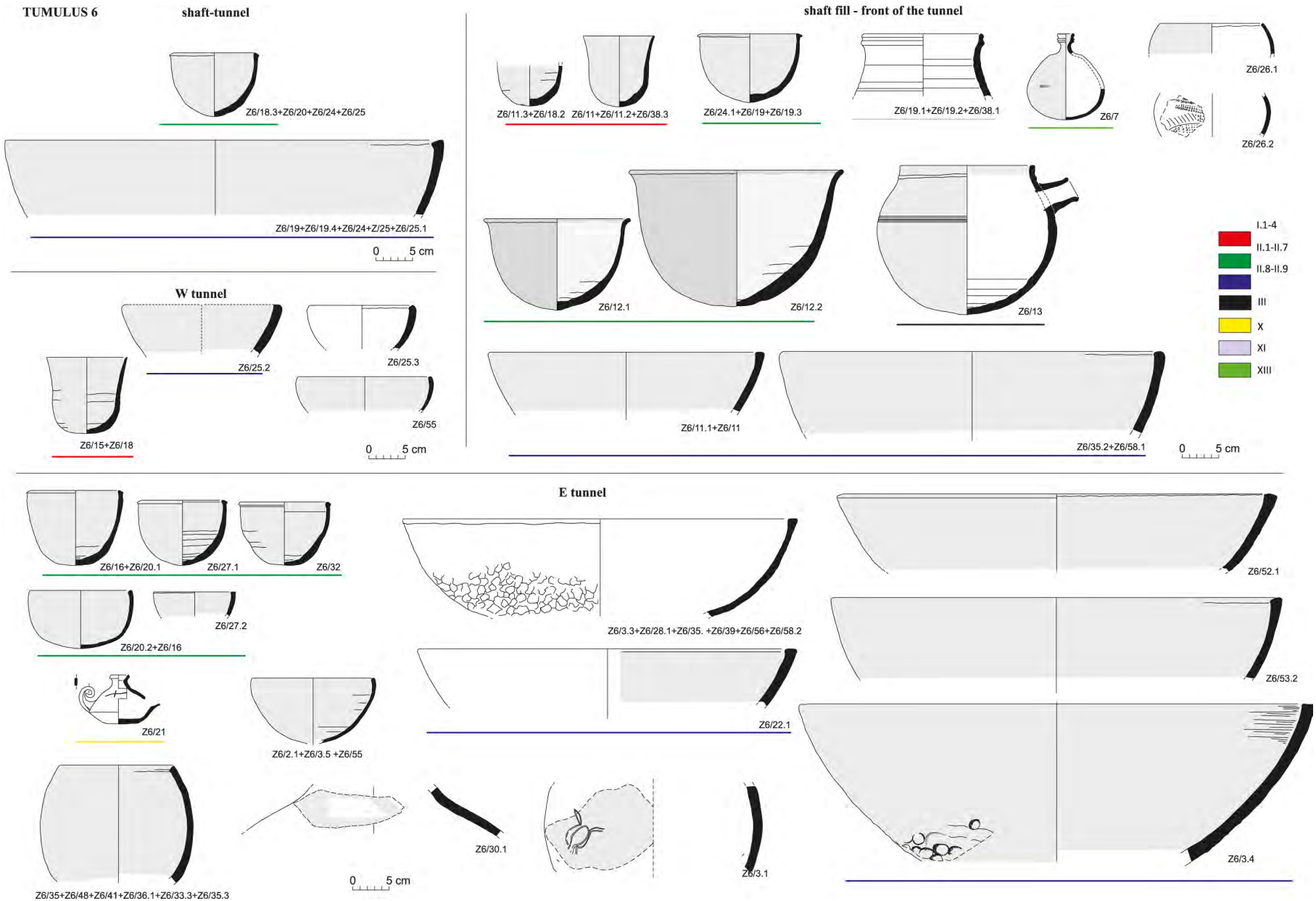

FIGURE 7.141 Tumulus 6, distribution of respective pottery forms by location in the grave

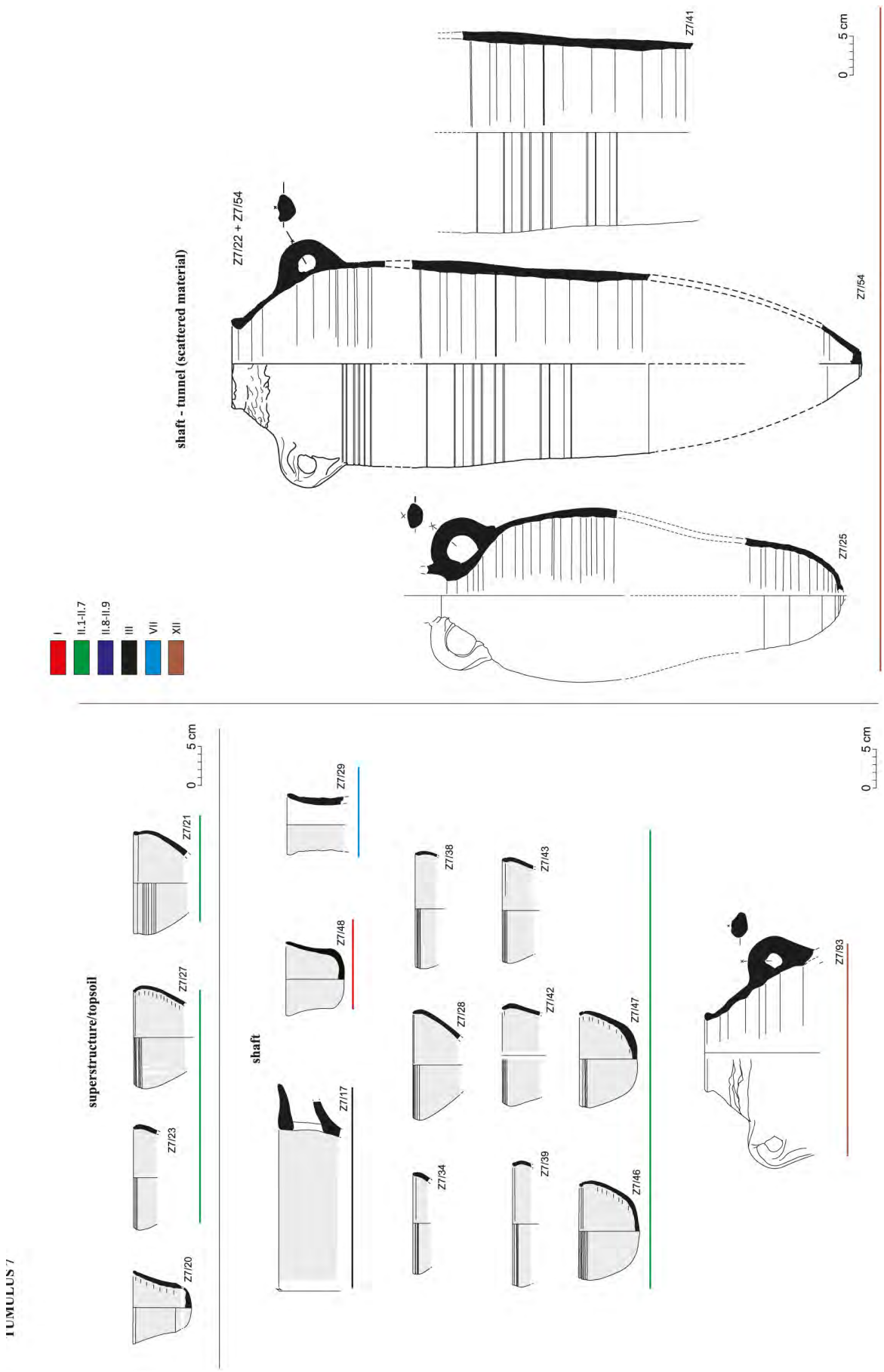

FIGURE 7.142 Tumulus 7, distribution of respective pottery forms by location in the grave

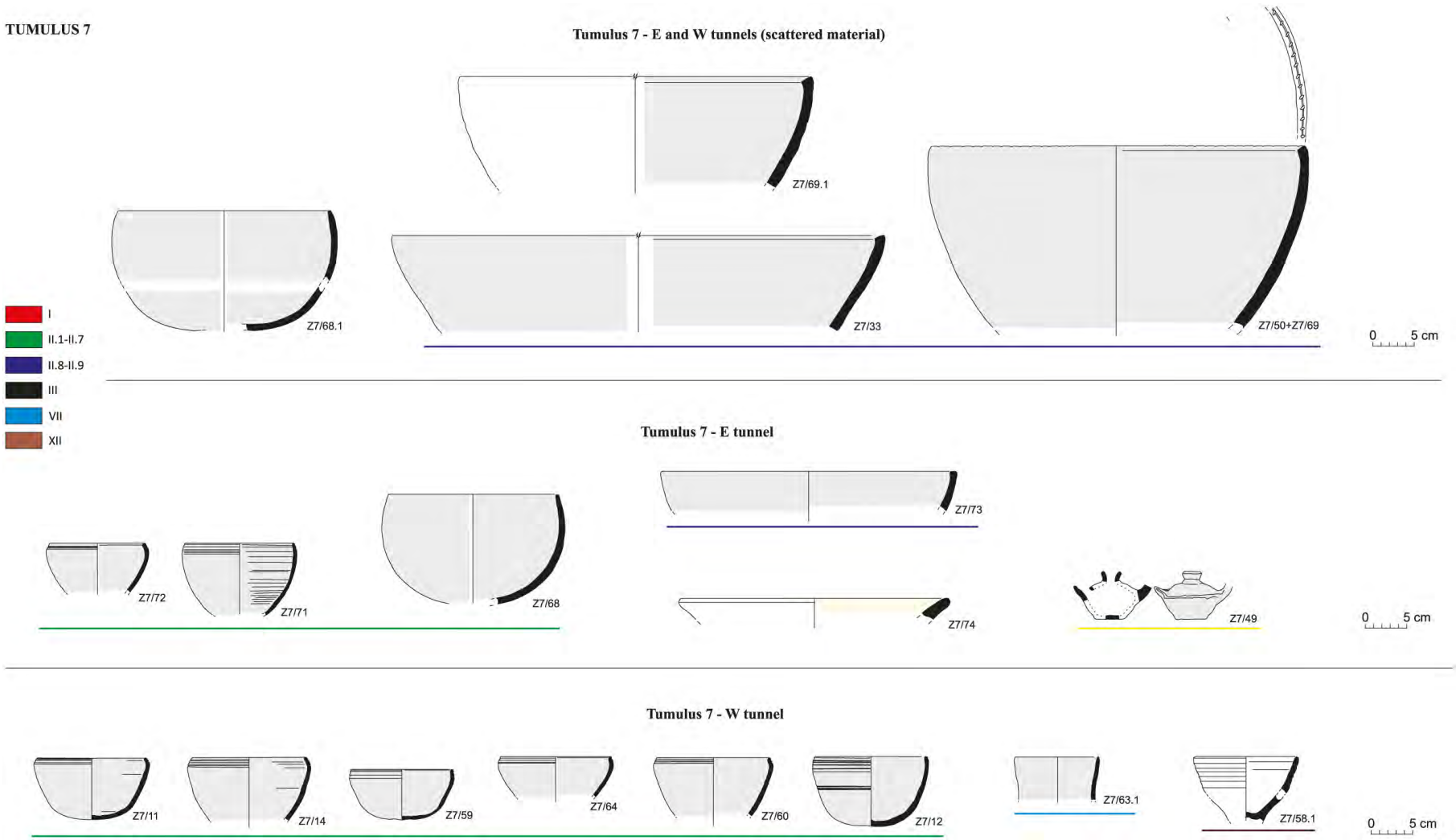

FIGURE 7.143 Tumulus 7, distribution of respective pottery forms by location in the grave (*cont.*)

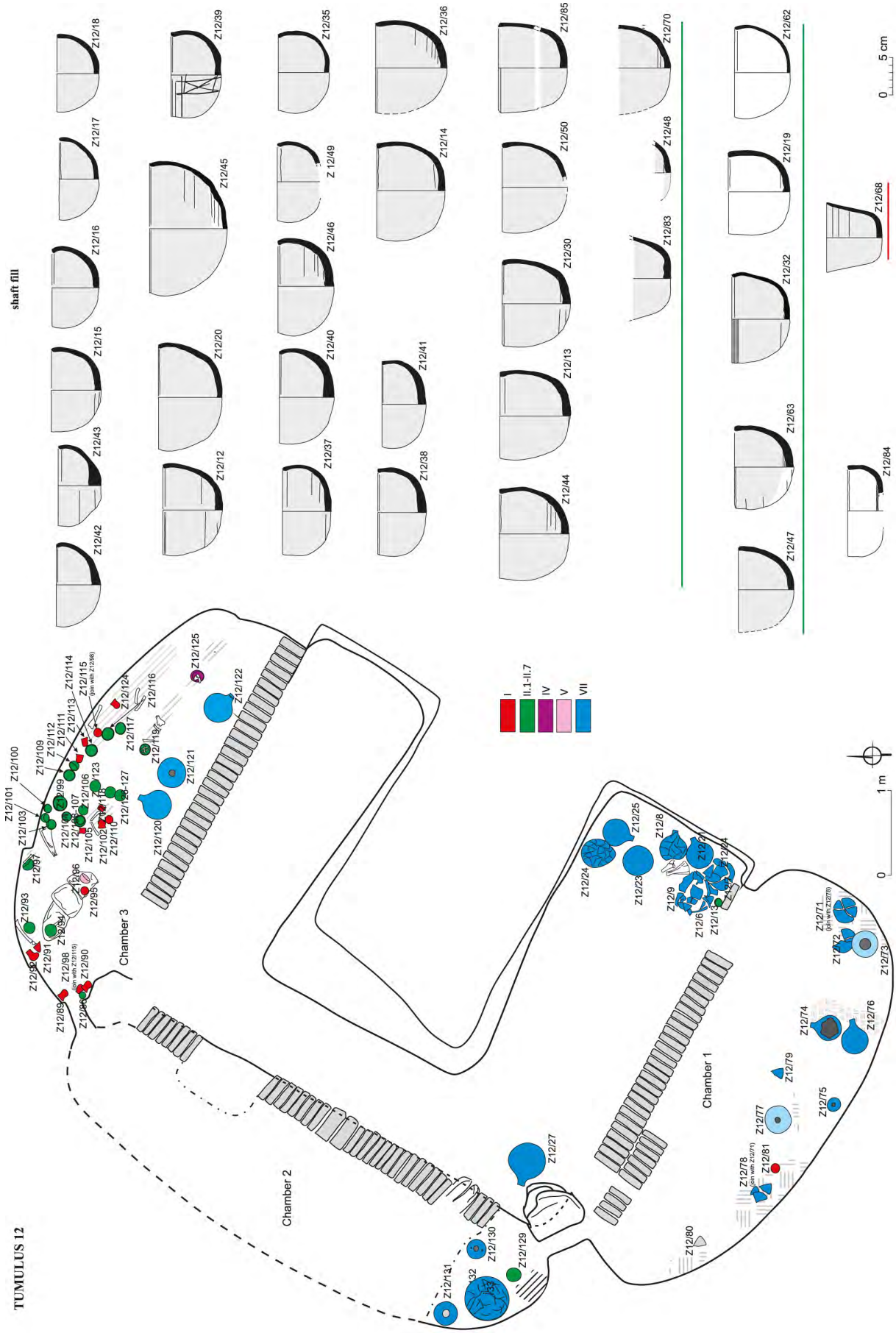

FIGURE 7.144 Tumulus 12, distribution of respective pottery forms by location in the grave

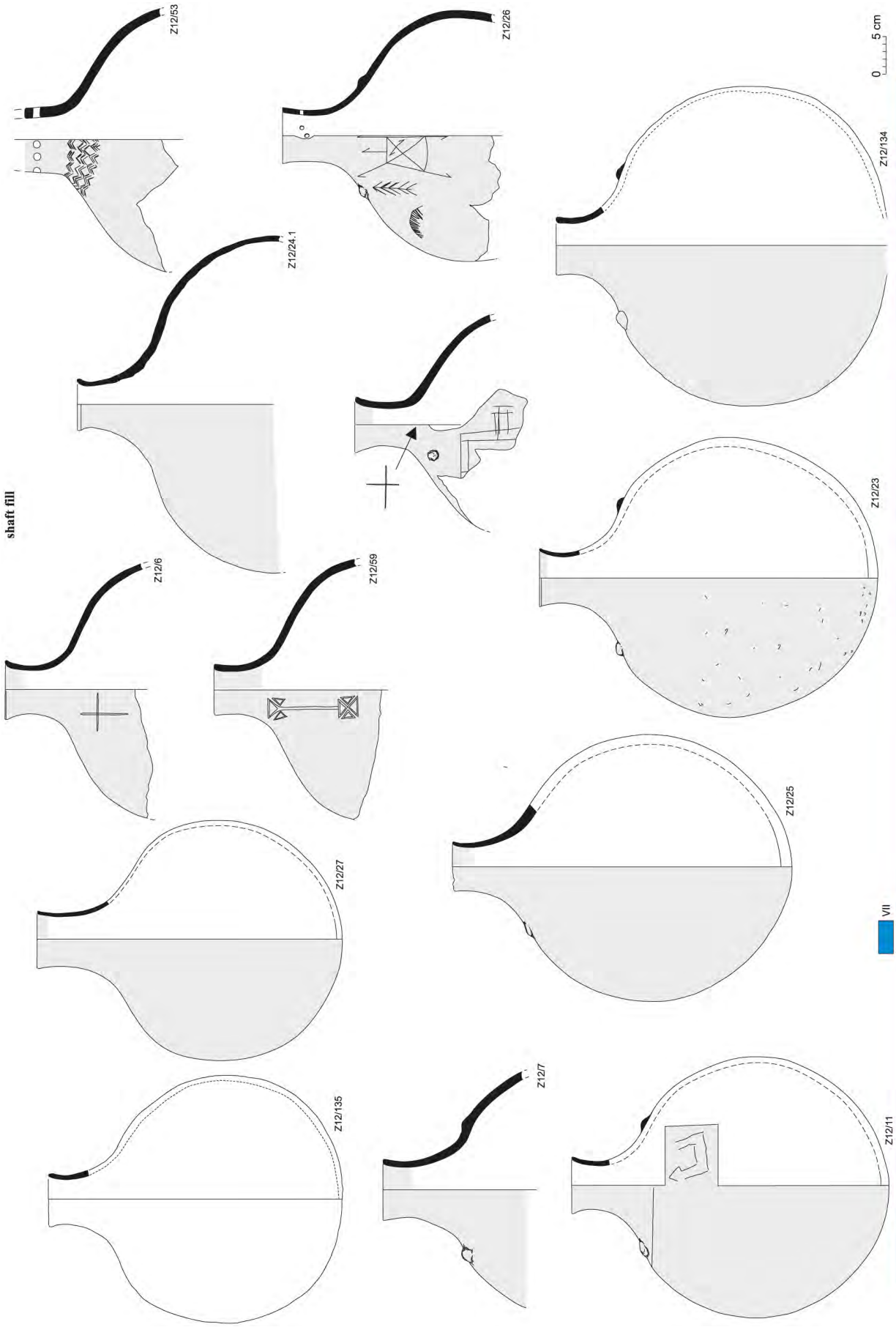

FIGURE 7.145 Tumulus 12, distribution of respective pottery forms by location in the grave (*cont.*)

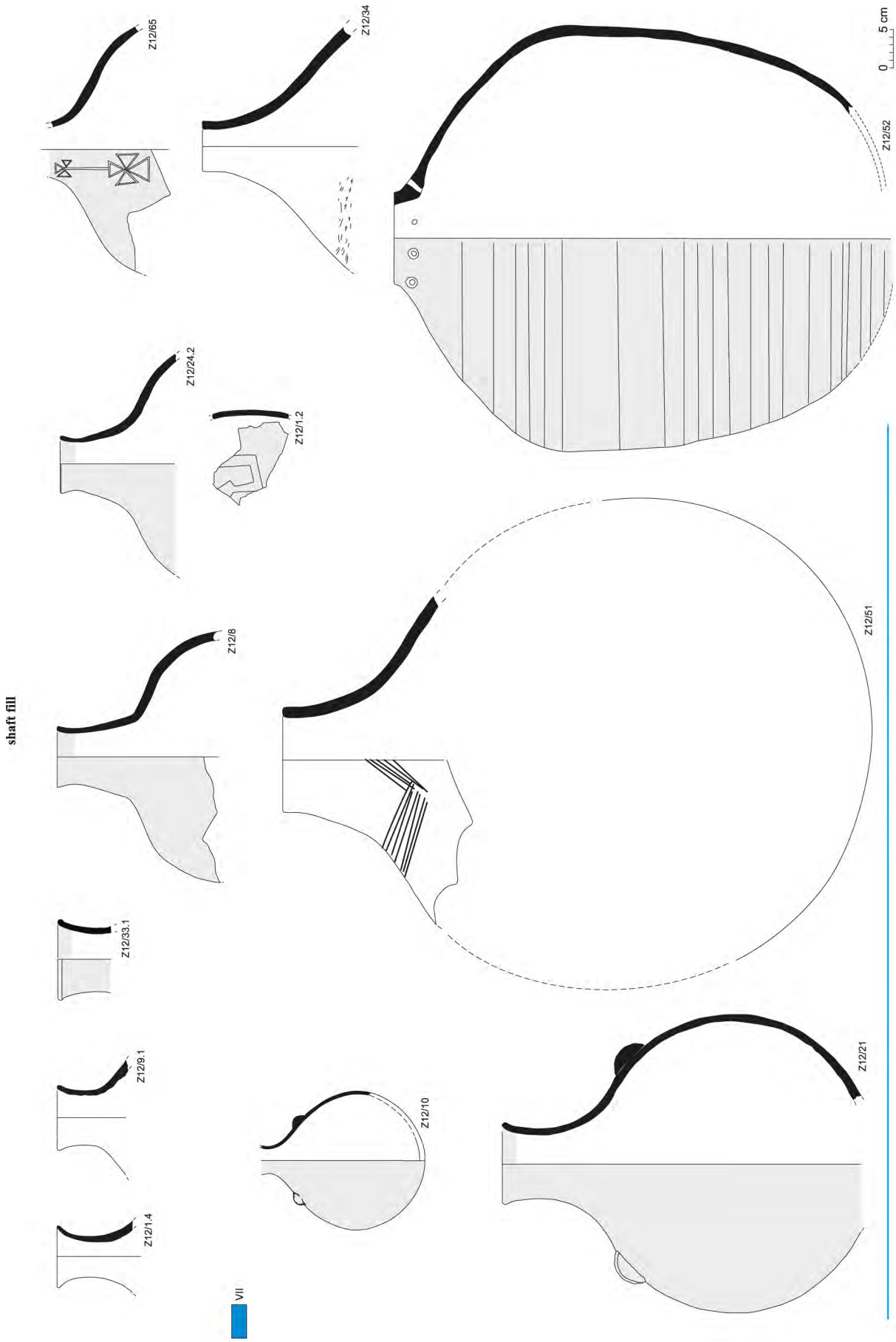

FIGURE 7.146 Tumulus 12, distribution of respective pottery forms by location in the grave (*cont.*)

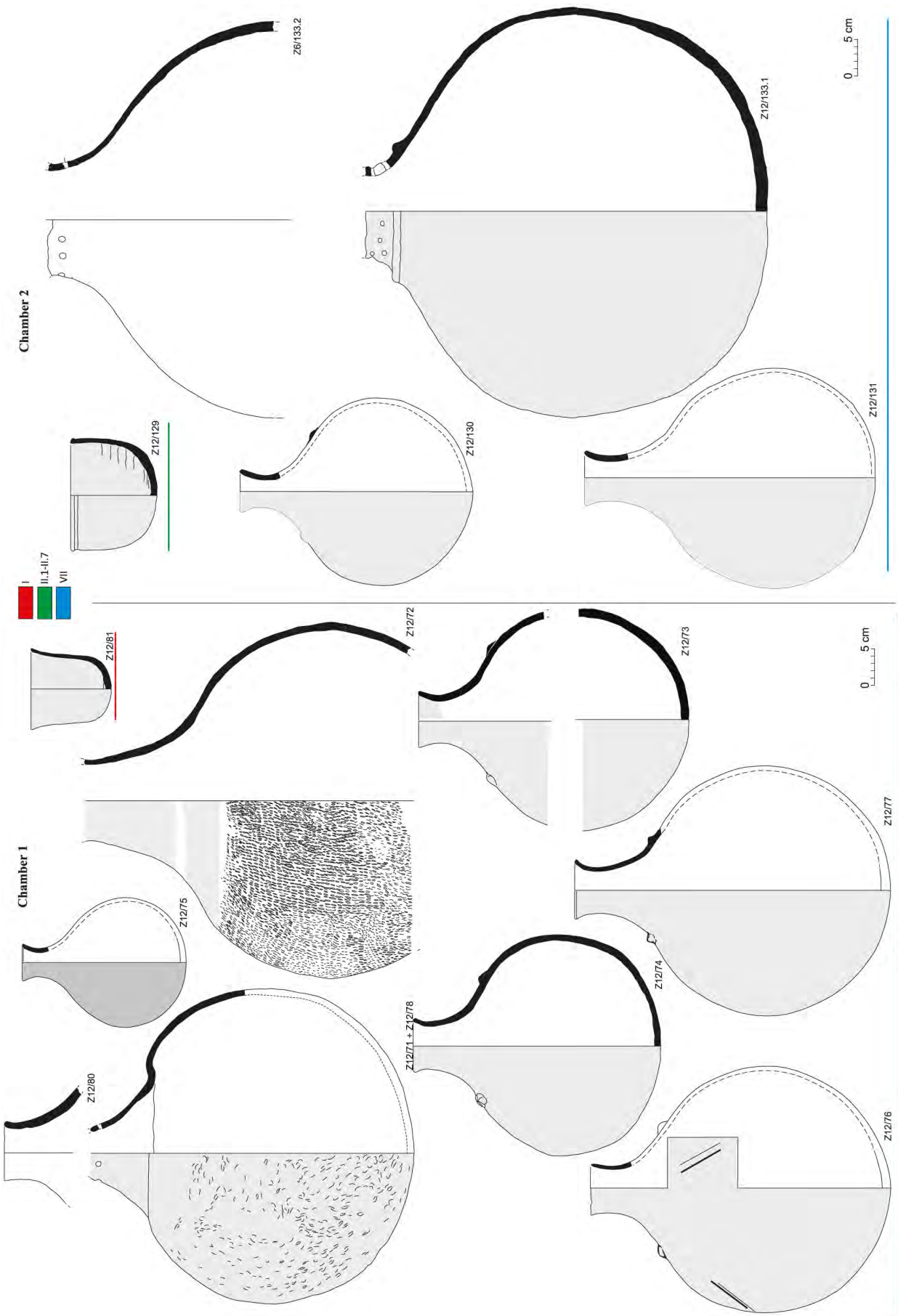

FIGURE 7.147 Tumulus 12, distribution of respective pottery forms by location in the grave (*cont.*)

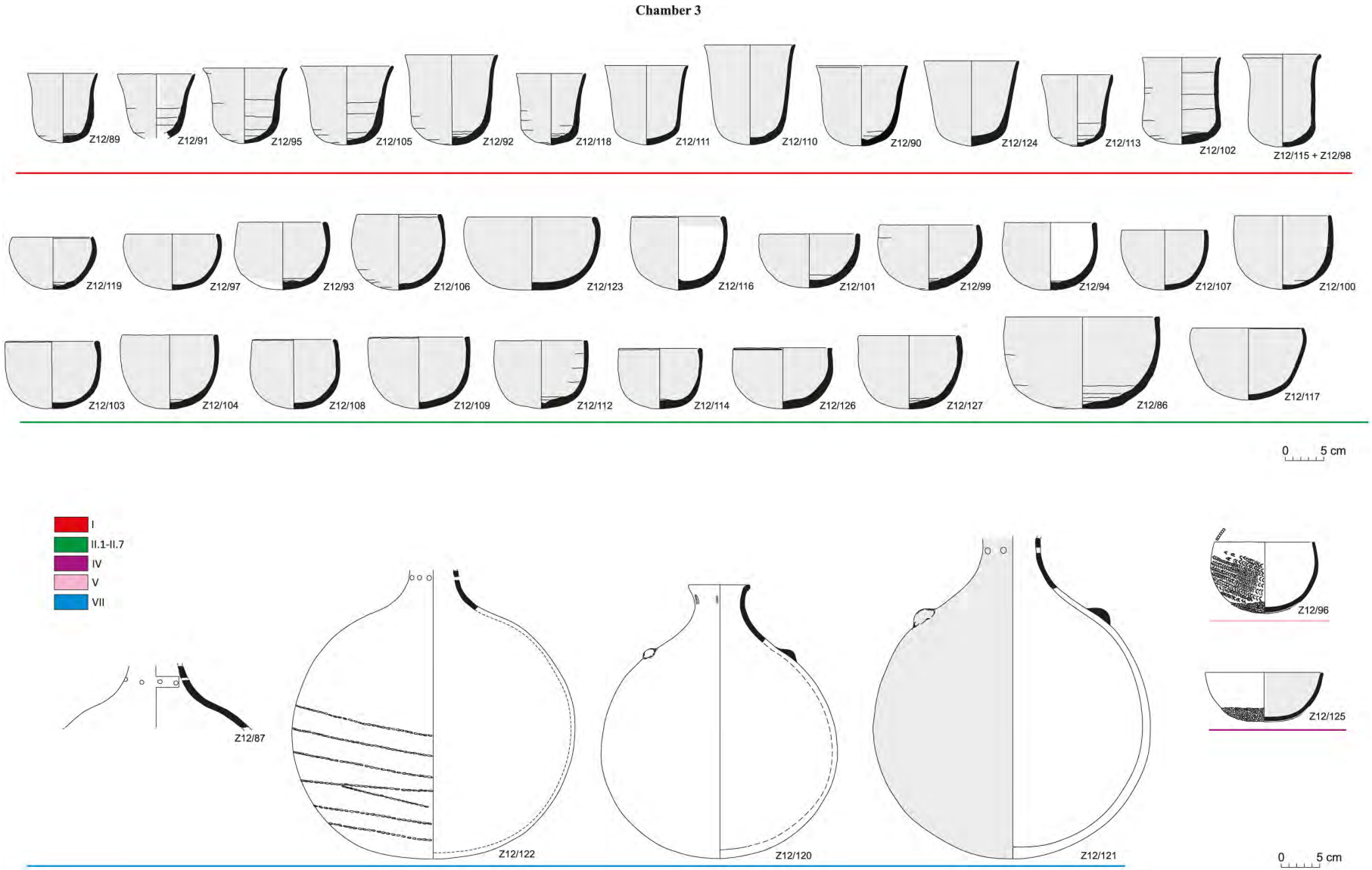

FIGURE 7.148 Tumulus 12, distribution of respective pottery forms by location in the grave (*cont.*)

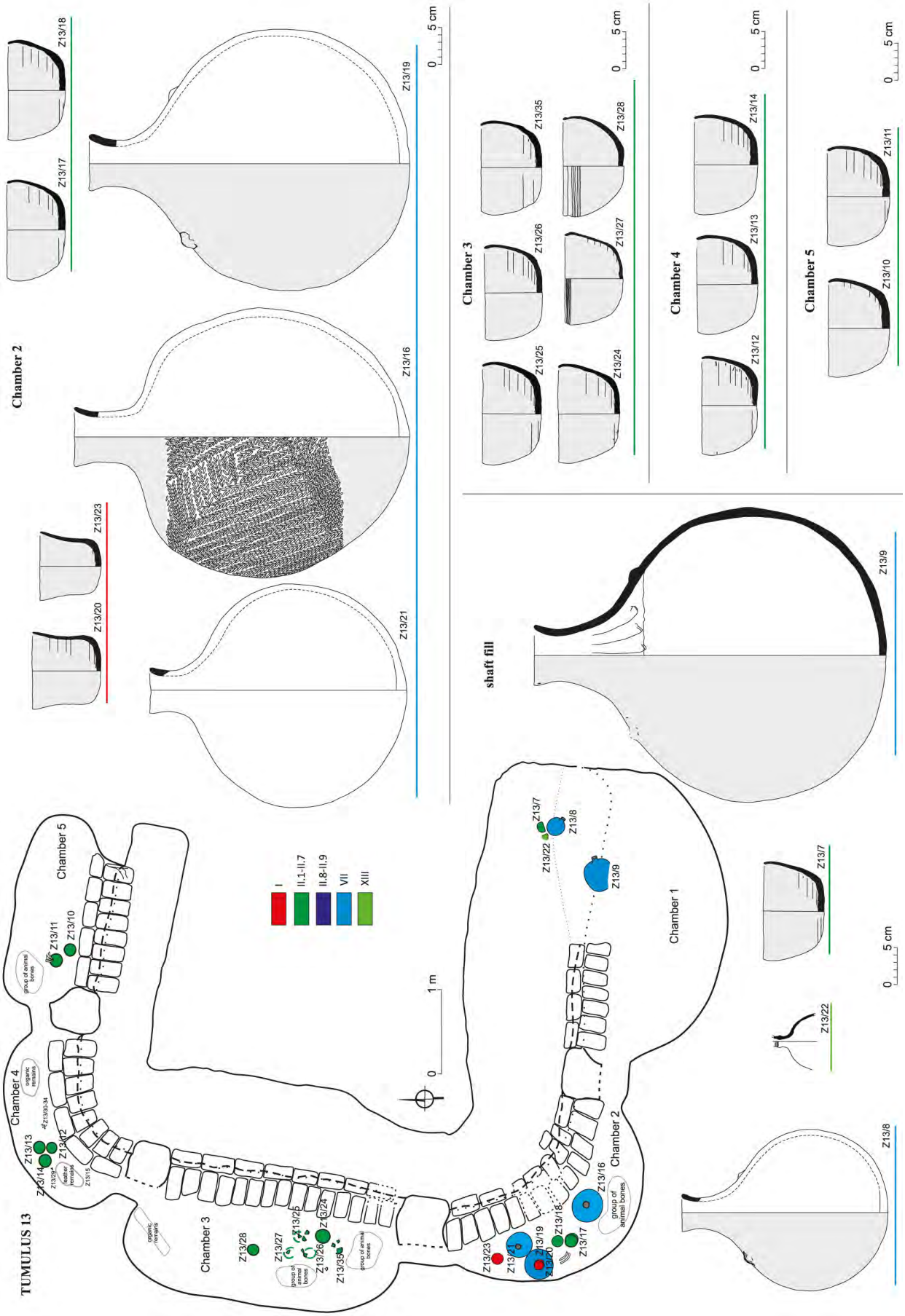

FIGURE 7.149 Tumulus 13, distribution of respective pottery forms by location in the grave

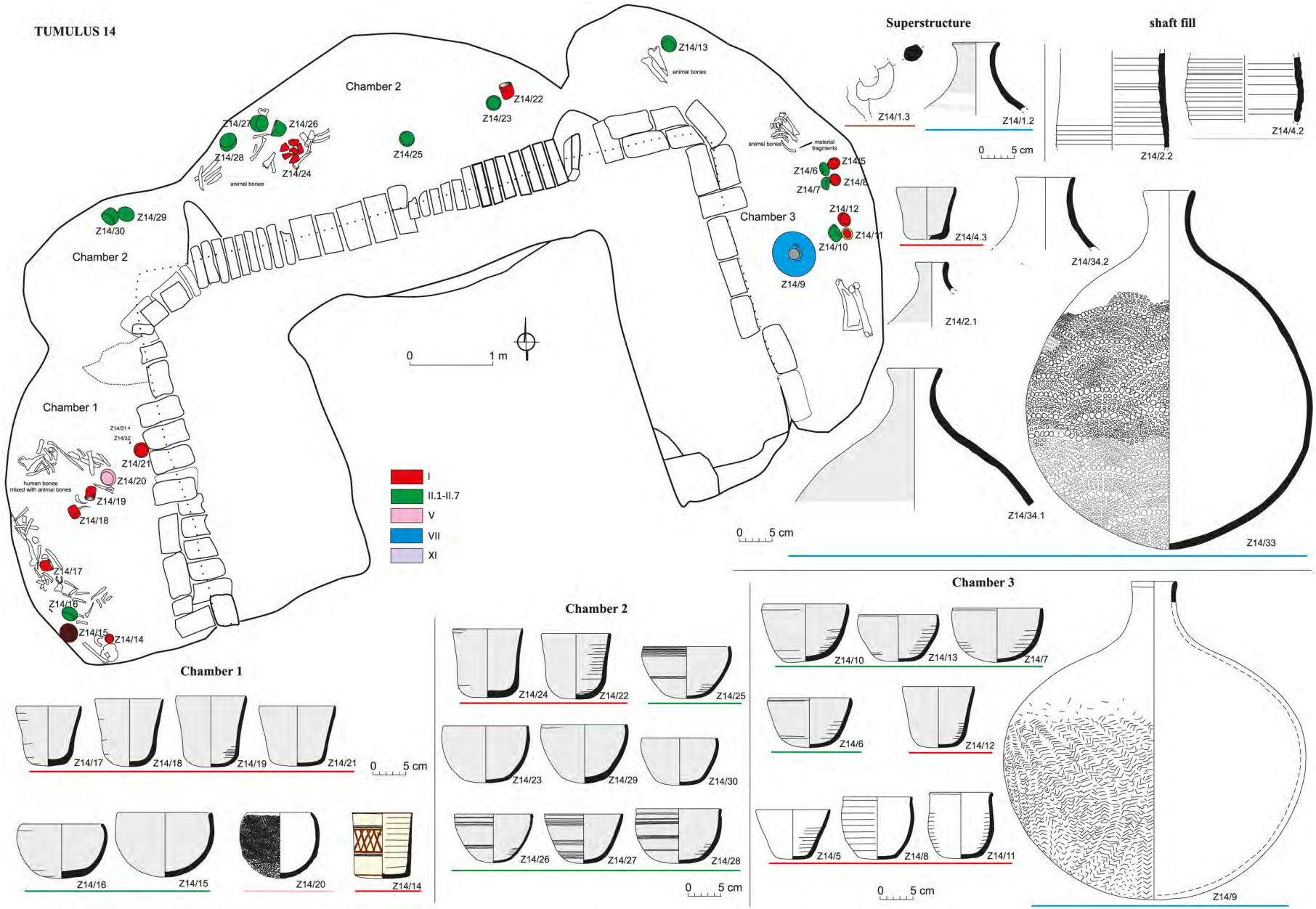

FIGURE 7.150 Tumulus 14, distribution of respective pottery forms by location in the grave

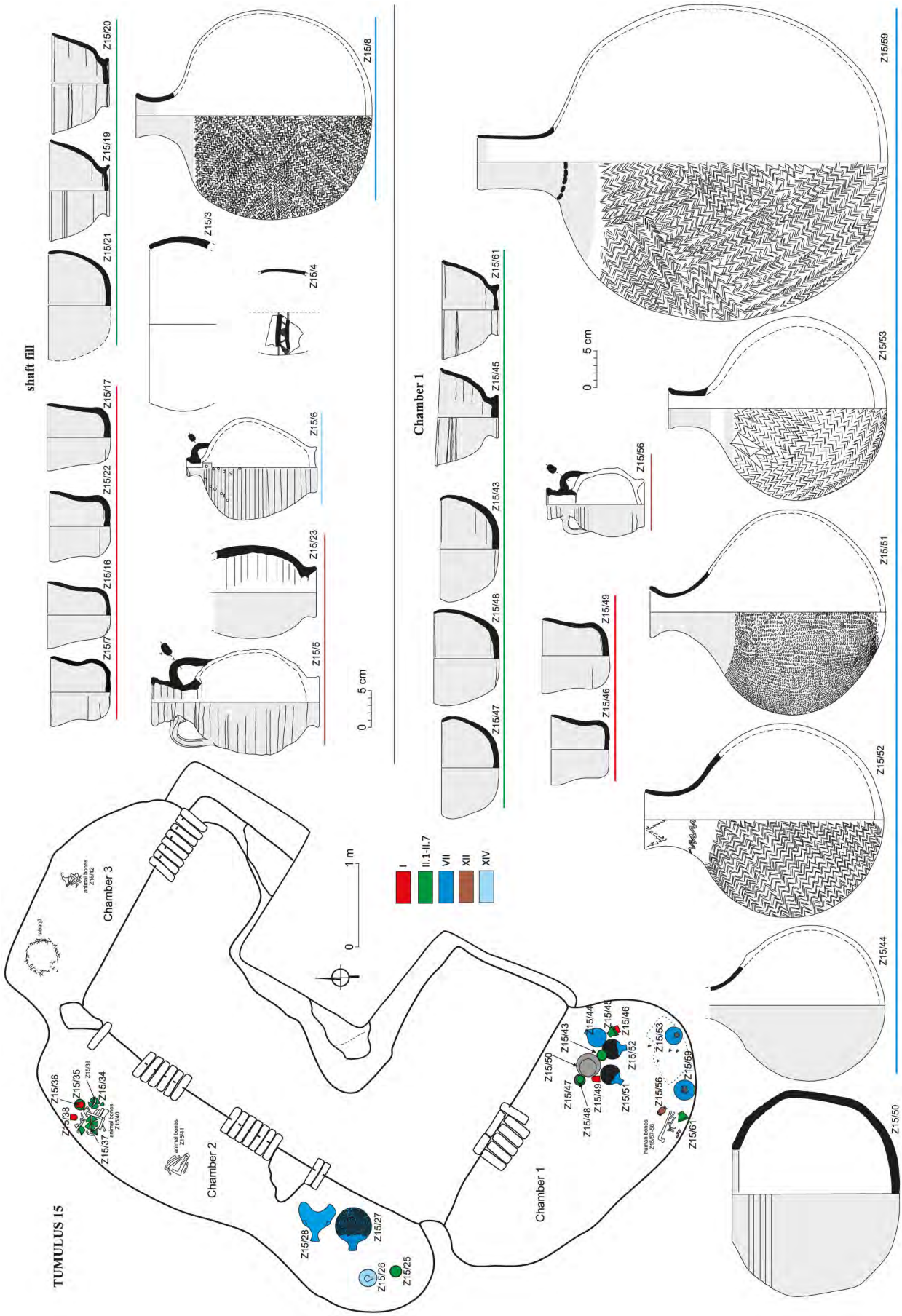

FIGURE 7.151 Tumulus 15, distribution of respective pottery forms by location in the grave

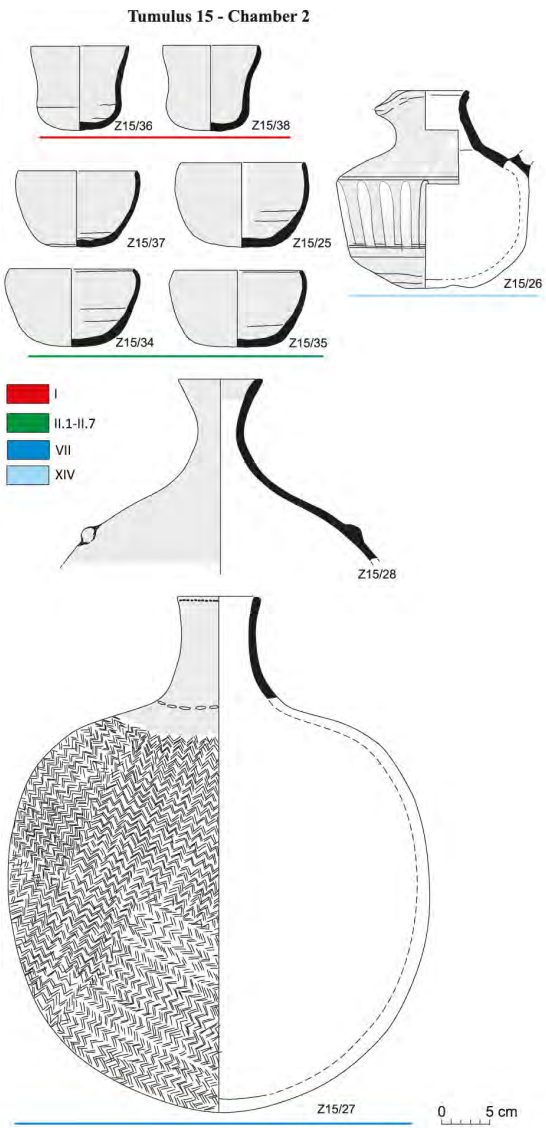

FIGURE 7.152
Tumulus 15, distribution of respective pottery forms by location in the grave (*cont.*)

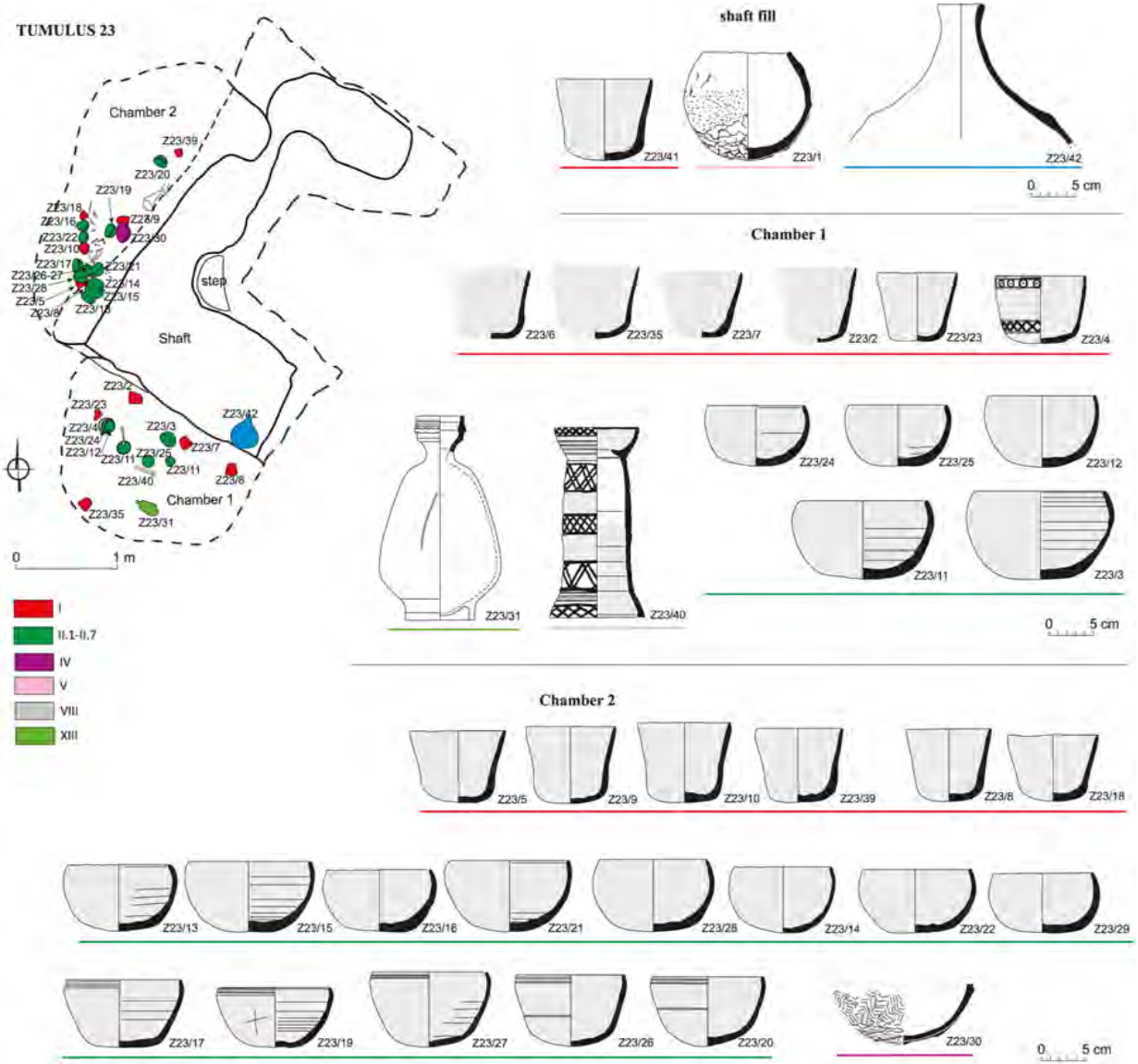

FIGURE 7.153
Tumulus 23, distribution of respective pottery forms by location in the grave

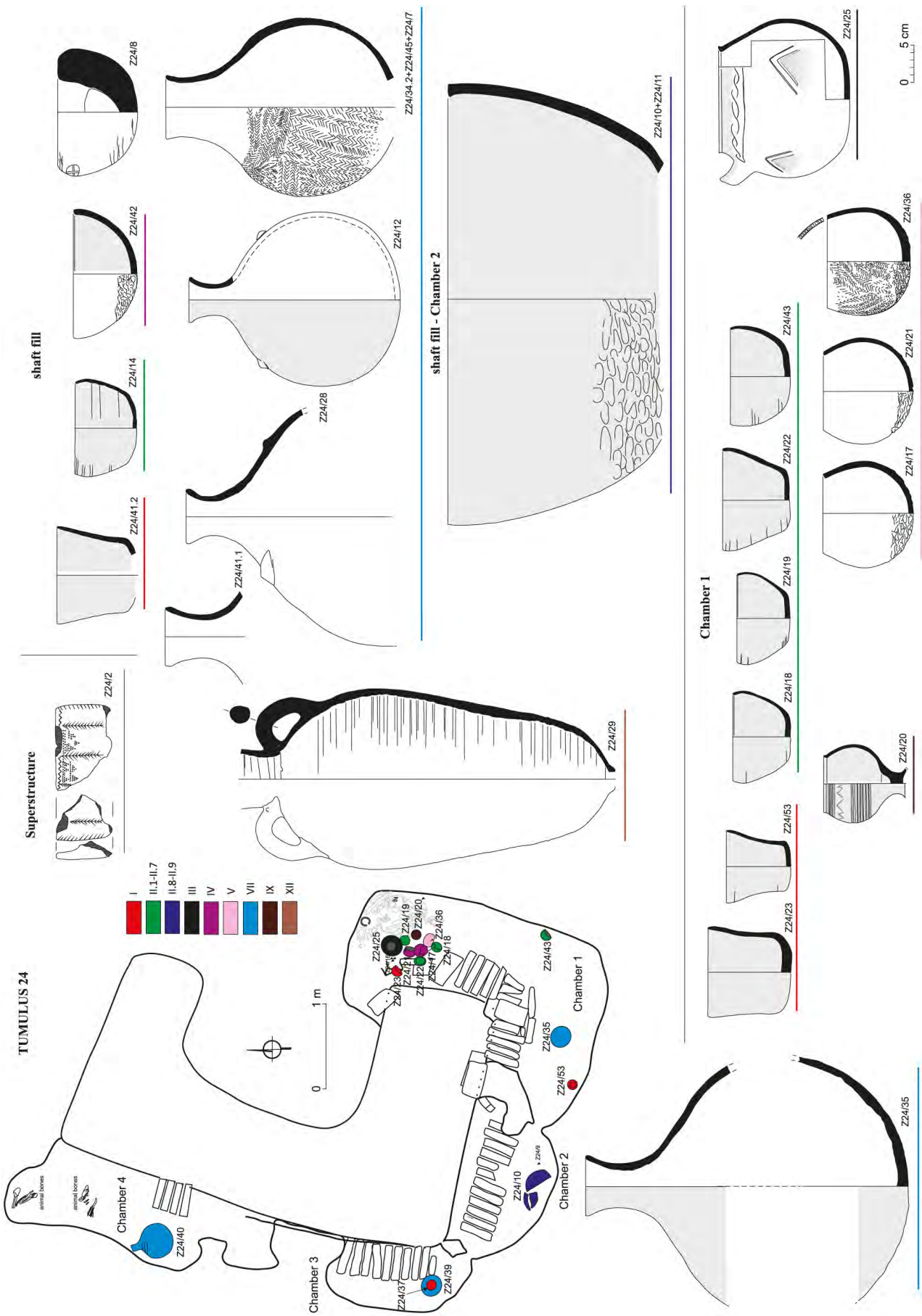

FIGURE 7.154 Tumulus 24, distribution of respective pottery forms by location in the grave

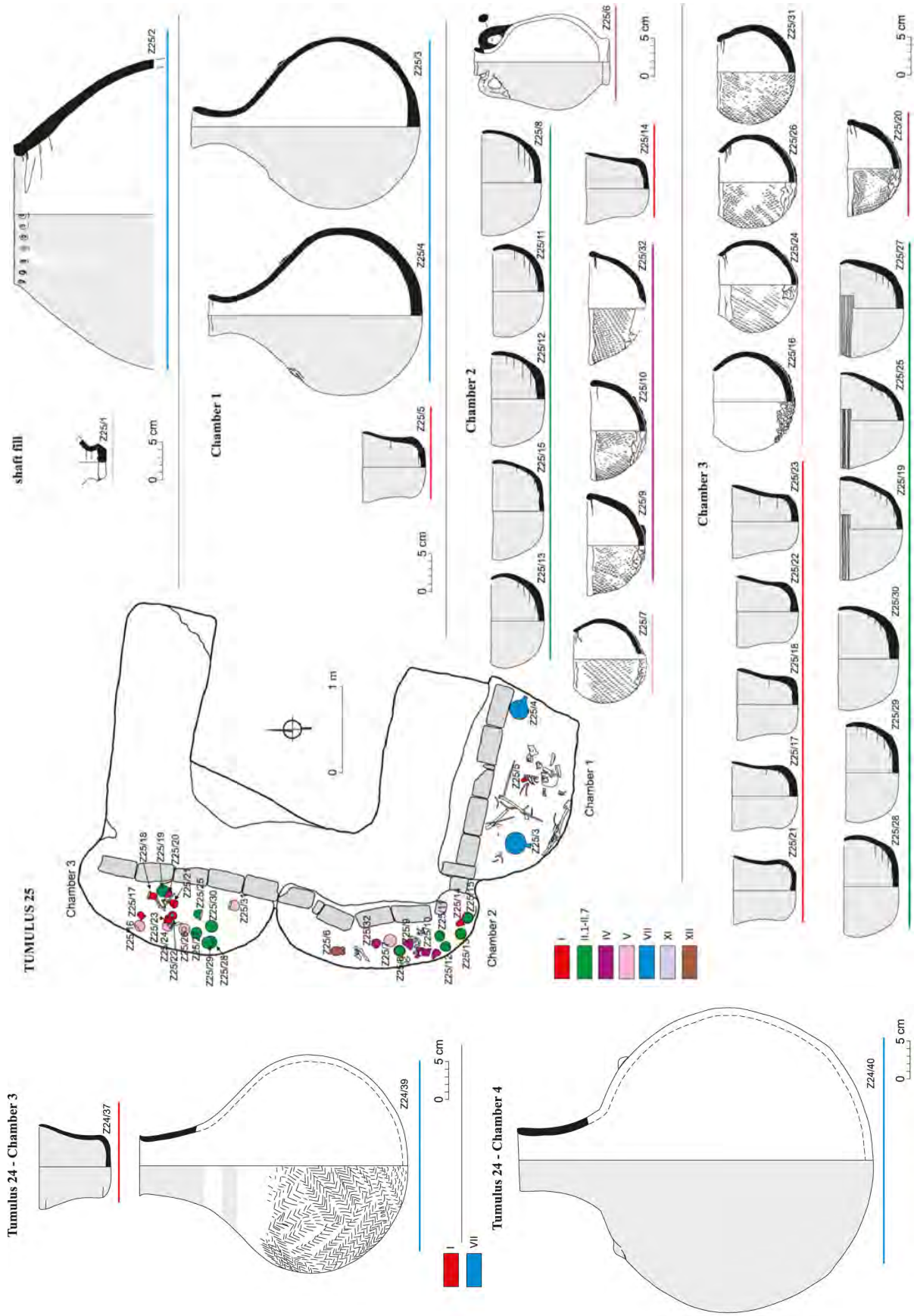

FIGURE 7.155
Tumulus 24, distribution of respective pottery forms by location in the grave (*cont.*)

FIGURE 7.156
Tumulus 25, distribution of respective pottery forms by location in the grave

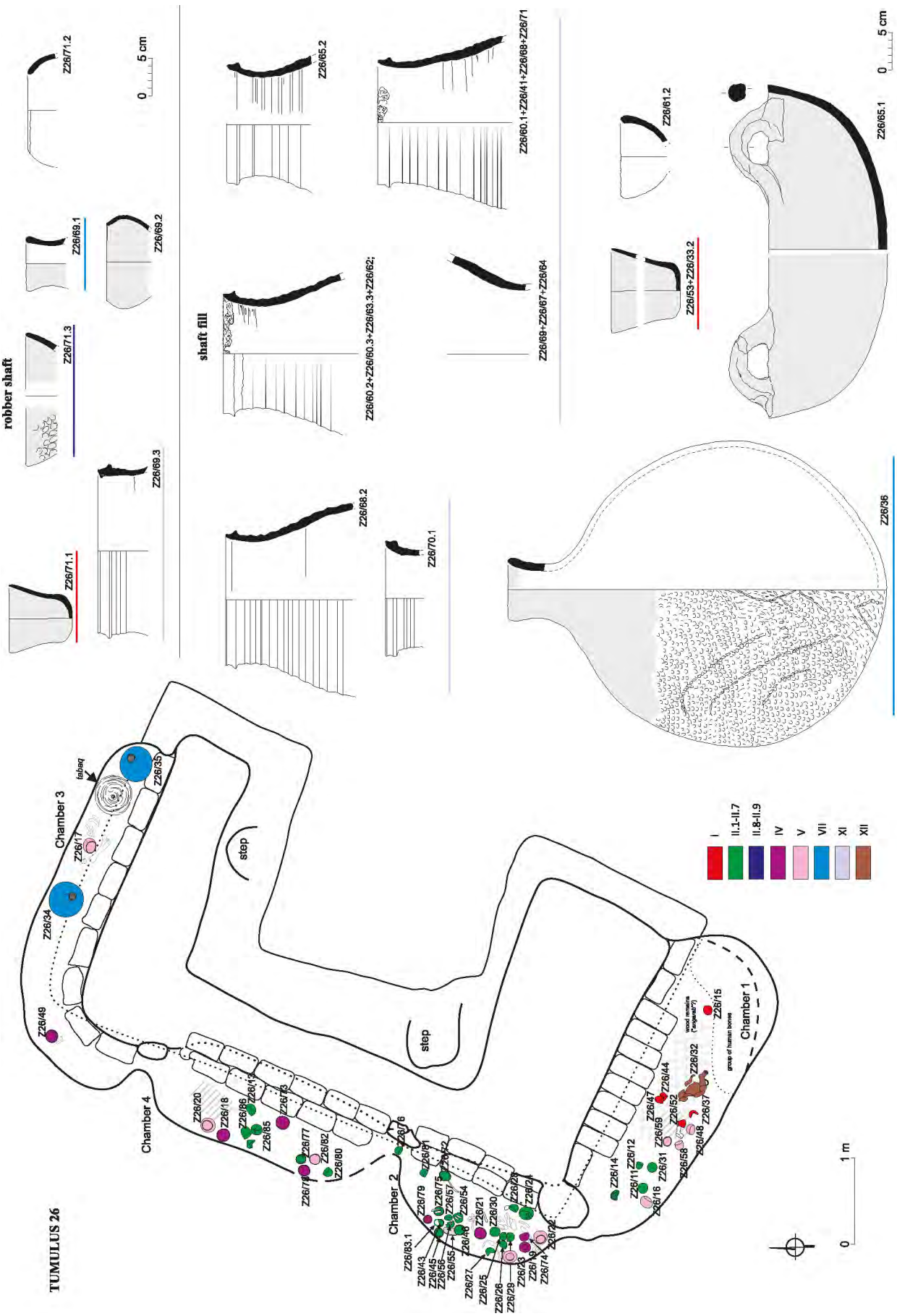

FIGURE 7.157 Tumulus 26, distribution of respective pottery forms by location in the grave

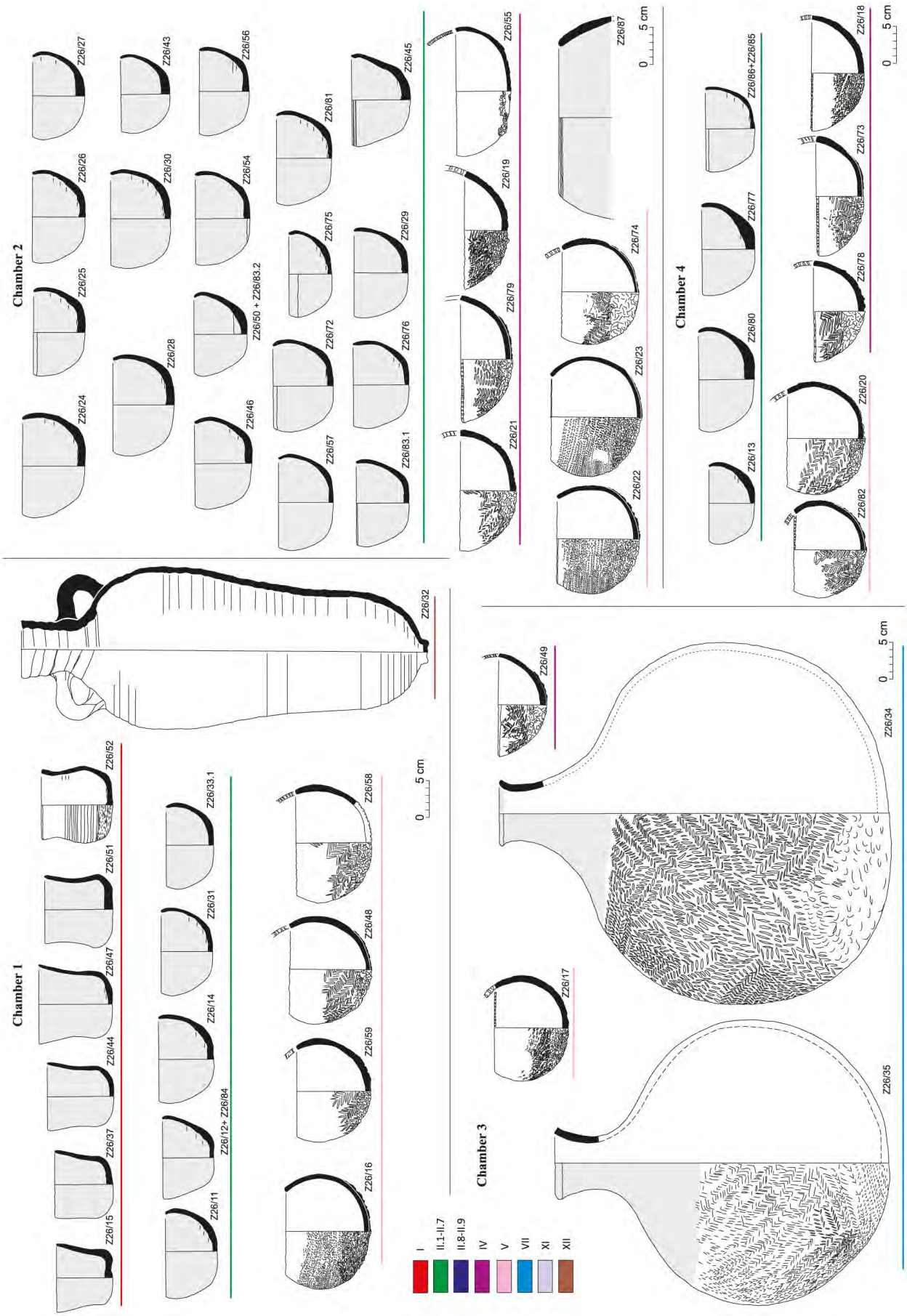

FIGURE 7.158 Tumulus 26, distribution of respective pottery forms by location in the grave (*cont.*)

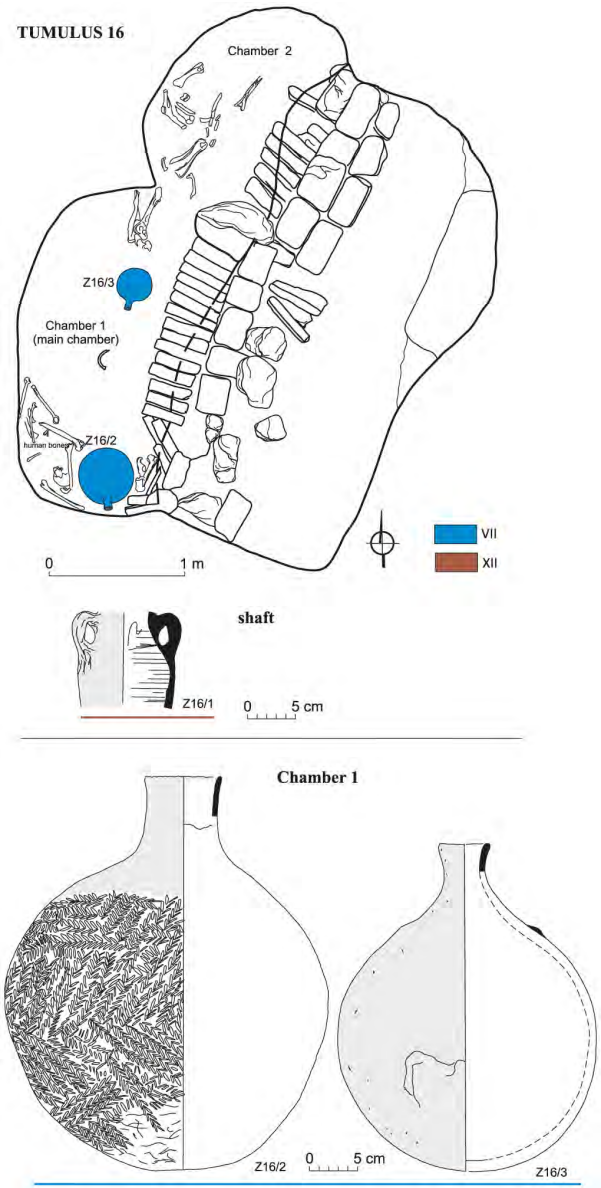

FIGURE 7.159
Tumulus 16, distribution of respective pottery forms by location in the grave

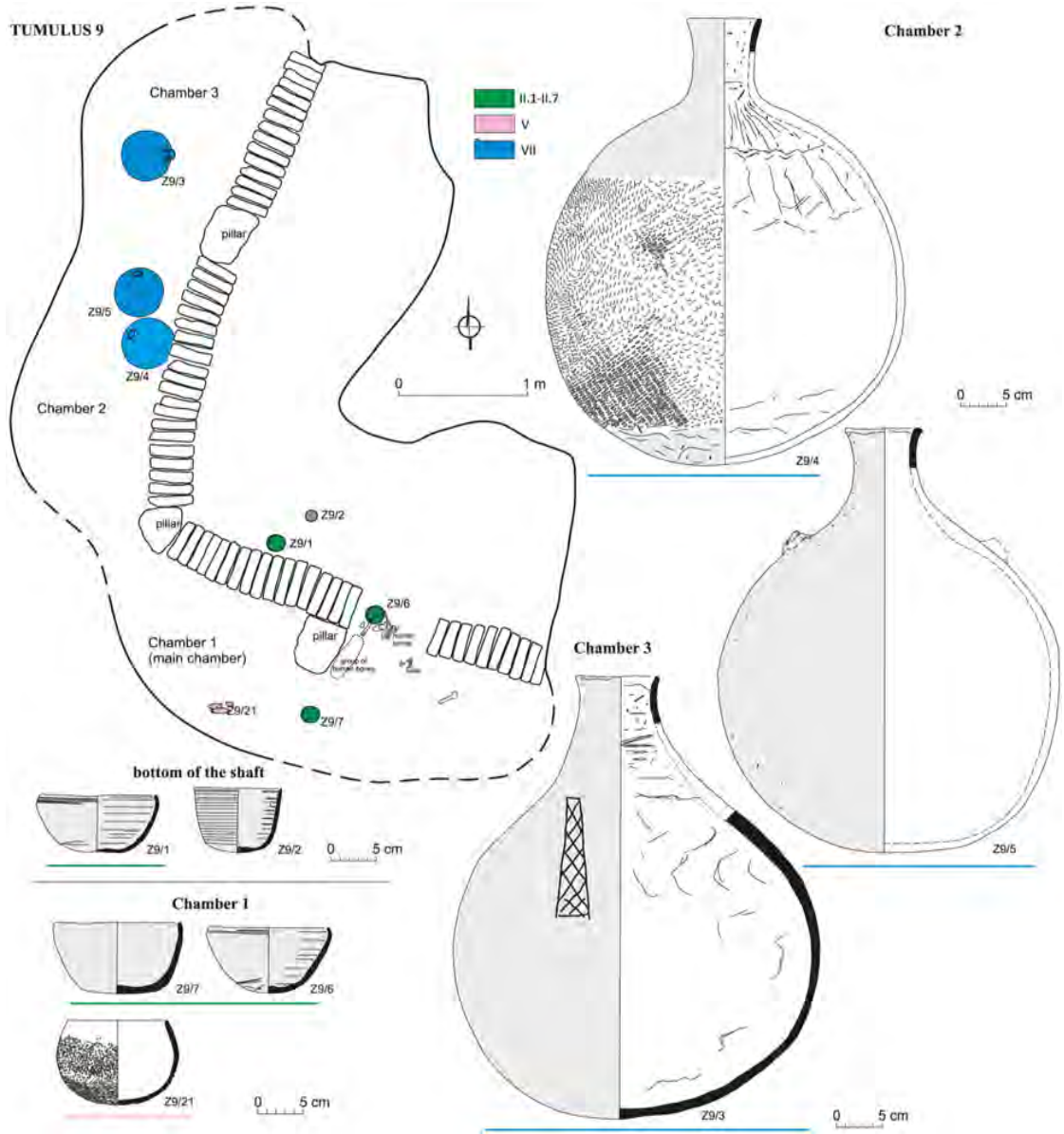

FIGURE 7.160
Tumulus 9, distribution of respective pottery forms by location in the grave

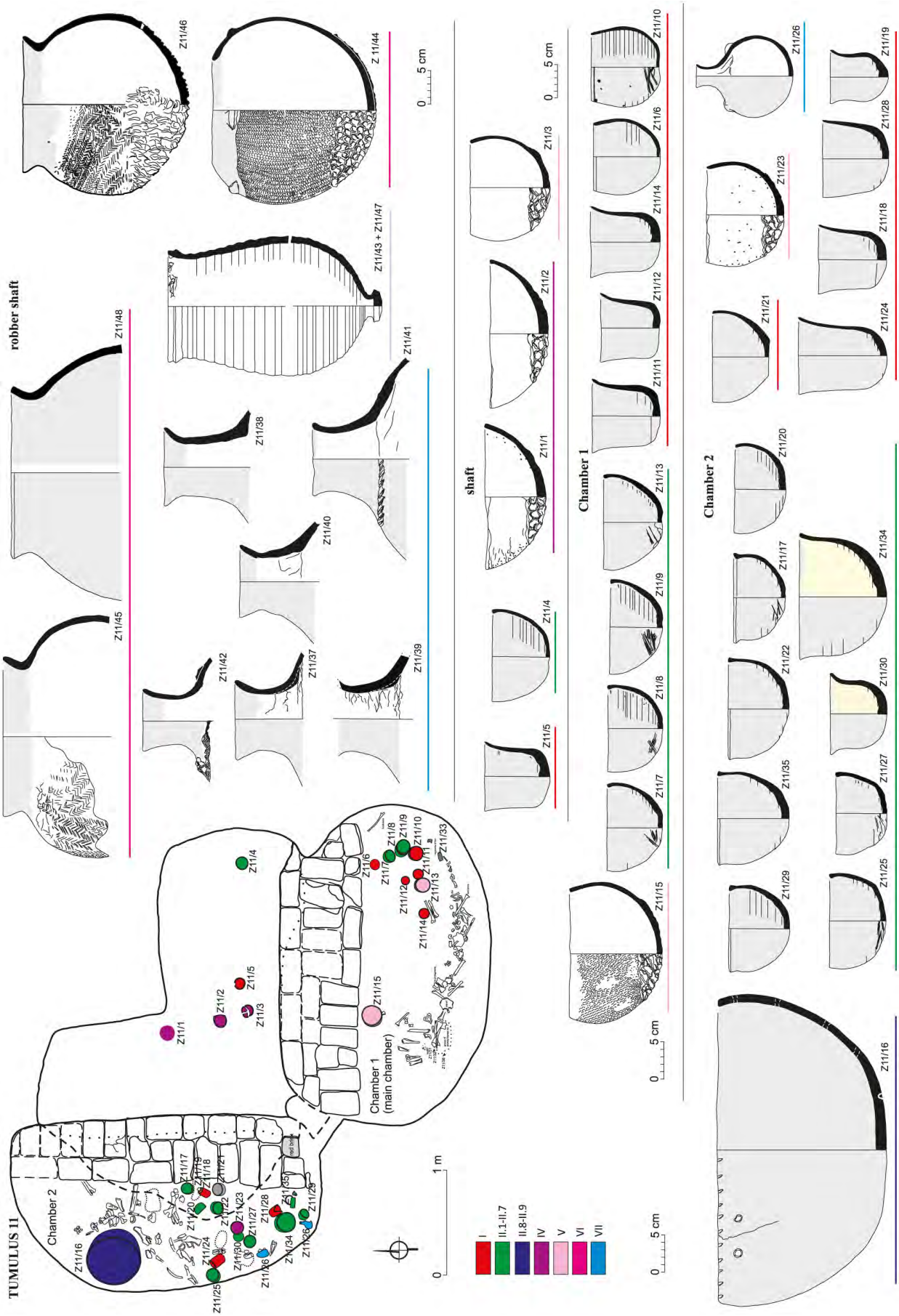

FIGURE 7.161 Tumulus 11, distribution of respective pottery forms by location in the grave

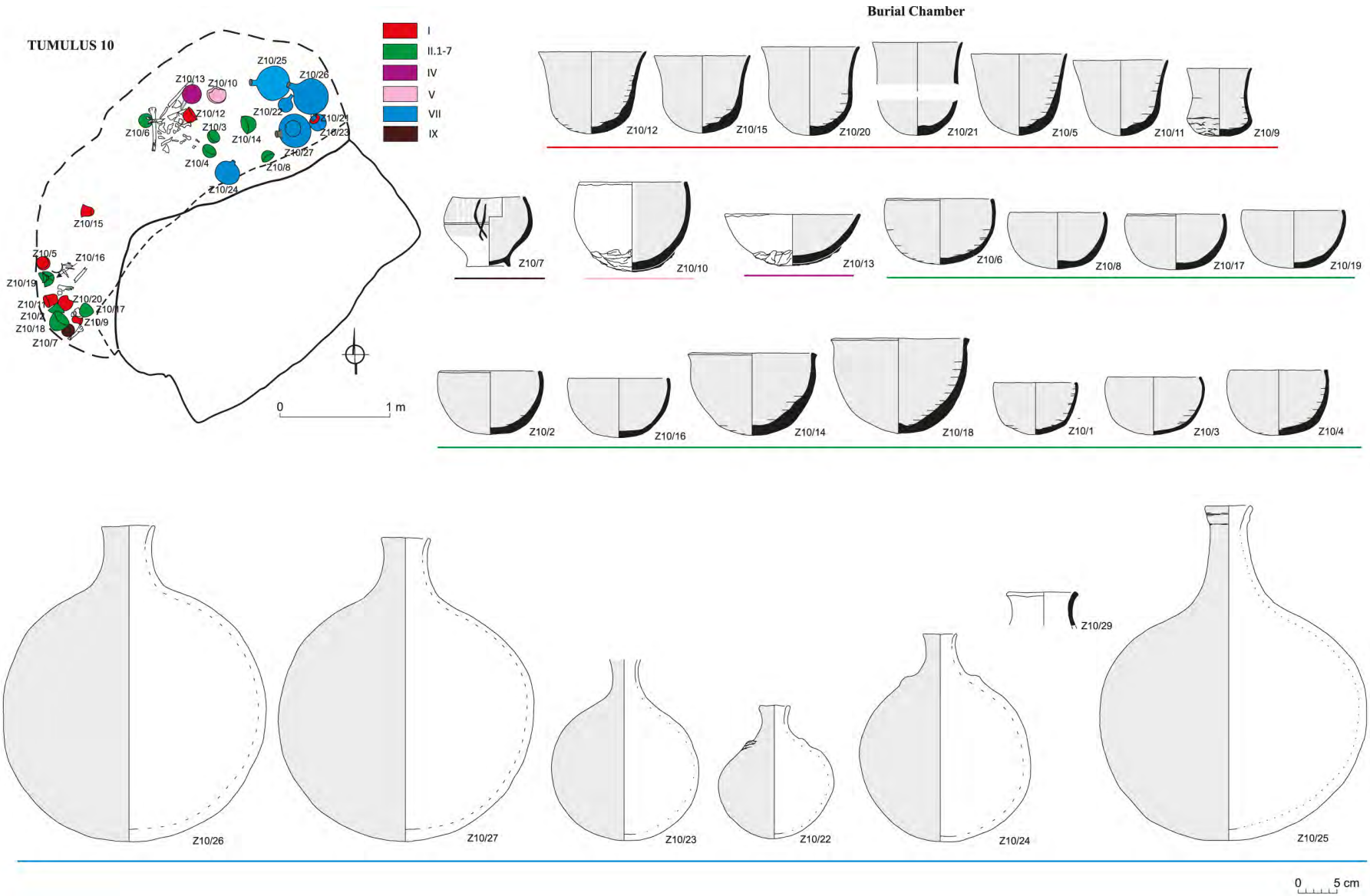

FIGURE 7.162 Tumulus 10, distribution of respective pottery forms by location in the grave

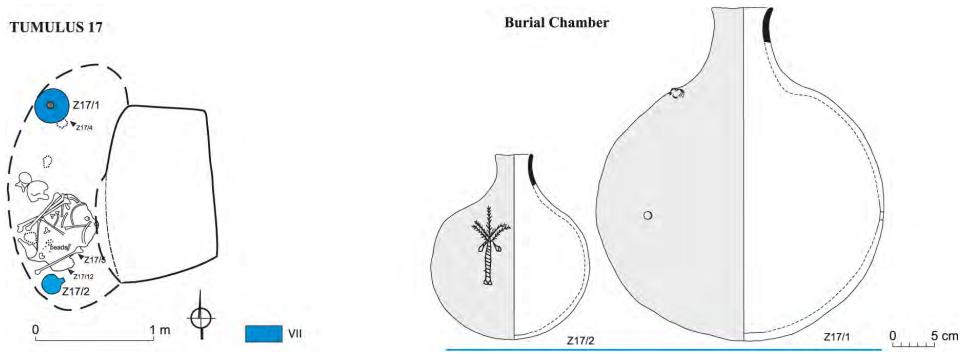

FIGURE 7.163 Tumulus 17, distribution of respective pottery forms by location in the grave

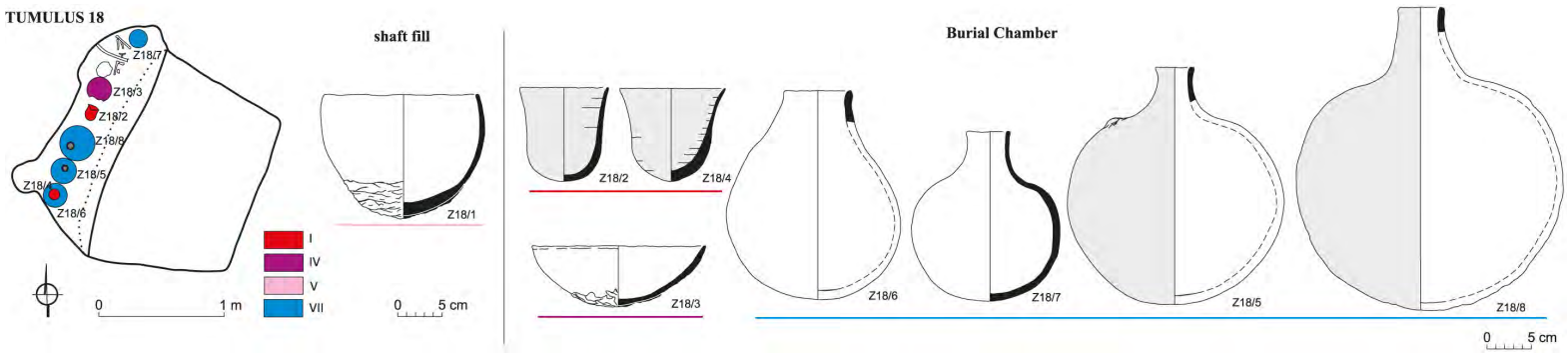

FIGURE 7.164 Tumulus 18, distribution of respective pottery forms by location in the grave

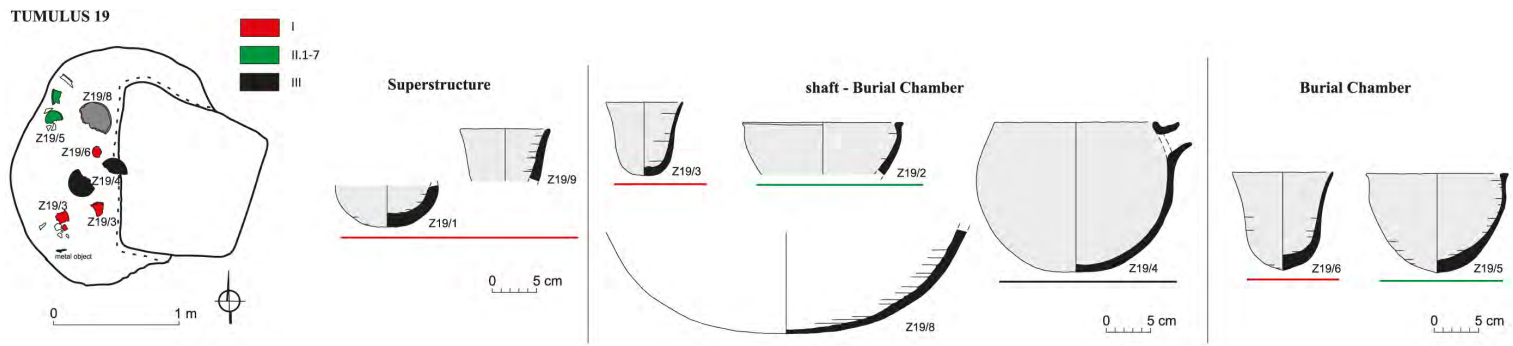

FIGURE 7.165 Tumulus 19, distribution of respective pottery forms by location in the grave

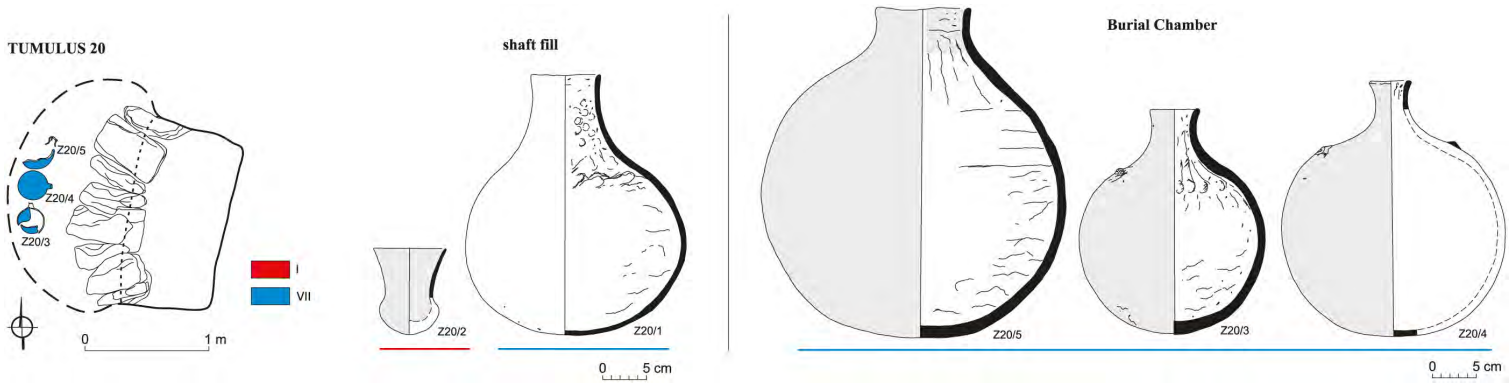

FIGURE 7.166 Tumulus 20, distribution of respective pottery forms by location in the grave

FIGURE 7.167 Tumulus 22, distribution of respective pottery forms by location in the grave

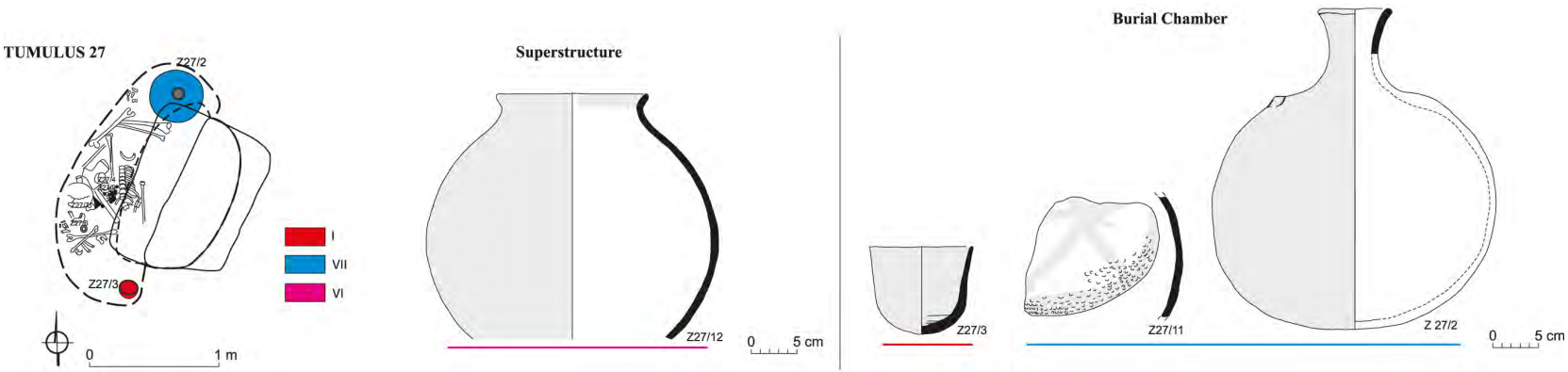

FIGURE 7.168 Tumulus 27, distribution of respective pottery forms by location in the grave

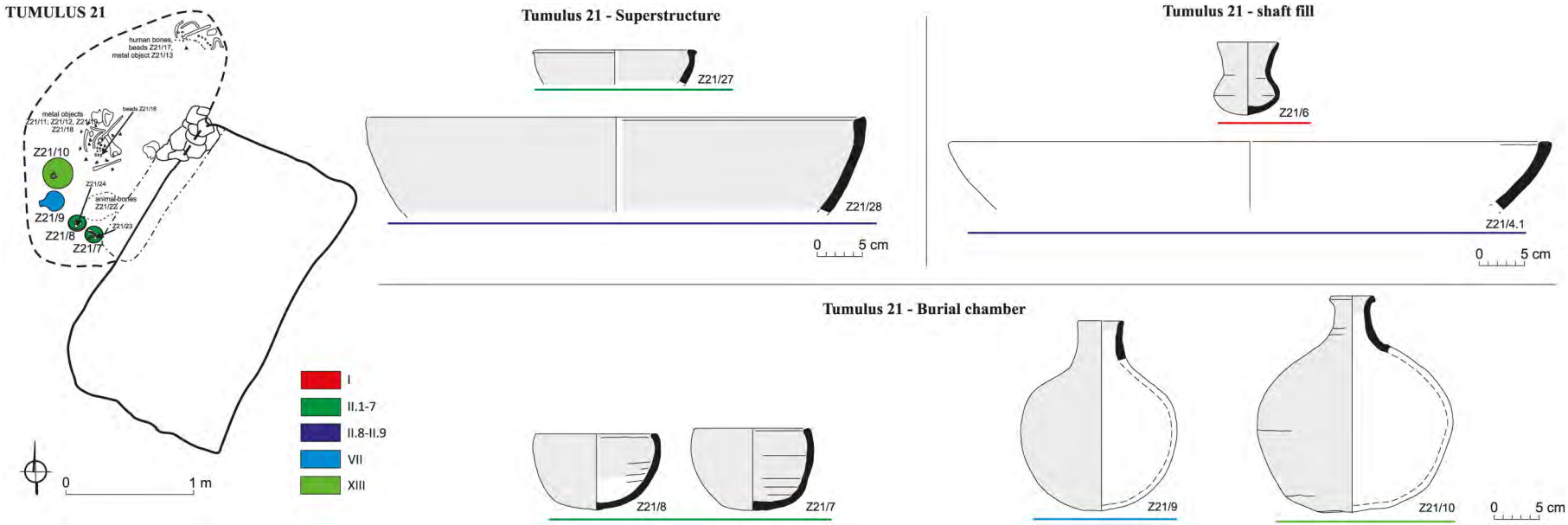

FIGURE 7.169 Tumulus 21, distribution of respective pottery forms by location in the grave

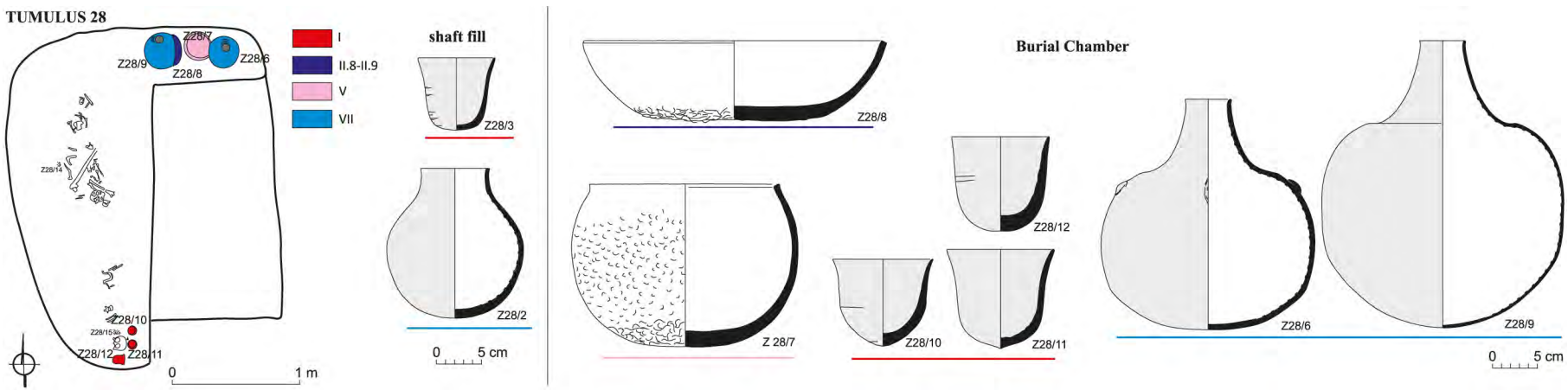

FIGURE 7.170 Tumulus 28, distribution of respective pottery forms by location in the grave

Glossary

(*After Rice 2006, 471–485; Rye 1981, 41, 145–147; Sinopoli 1991, 227–230*)

Anvil a tool with a convex face held against the interior wall of a vessel to oppose the blows of a beater against the exterior.

Beater/Paddle a tool applied with sharp blows over the exterior to shape plastic or leather-hard vessels; used alone or with an anvil on the interior.

Burnishing a method of producing a lustre on an unfired clay surface by rubbing it at the leather-hard stage with a hard, smooth object to align the surface particles.

Coil fracture a smooth-edged breakage characteristic of coiled vessels in which the coils were poorly bonded.

Coiling a method of hand building a clay vessel by the addition of coils of clay.

Core the interior cross-section of a vessel wall, often different in colour to the interior or exterior surface.

Fabric the composition of a fired ceramic, including clay, inclusions, and pores, but excluding surface treatment.

Hardness/scratch hardness the resistance of a material to mechanical deformation, especially scratching, abrasion, or crushing. In this book the hardness of archaeological pottery was assessed using Mohs' scale.

Inclusions particulate matter, usually mineral in nature, present in a clay or fabric either naturally or added by the potter.

Leather-hard the stage of drying when plasticity is minimal but water content is still sufficient to allow some kinds of modification (e.g., the addition of handles or application of slip); the stage between plastic and bone dry.

Mohs' scale a hardness scale based on a series of increasingly hard minerals numbered from 1 (talc) to 10 (diamond). The minerals in this scale are drawn across the test piece to determine which mineral is sufficiently hard to mark the ceramic surface of the piece, thus measuring scratch hardness. From 1 to 5 the test is as follows: 1 (talc)—surface easily scratched by a fingernail; 2 (gypsum)—surface scratched by a fingernail; 3 (calcite)—surface easily scratched by copper wire; 4 (fluorite)—surface easily scratched by a knife; 5 (apatite)—surface hardly scratched by an iron nail.

Munsell charts a series of charts published by the Munsell Color Company for the standardized identification and description of colours.

Non-plastic material in a clay, naturally present or added by the potter, mineral or organic, which by virtue of generally large particle size lacks the property of plasticity and often reduces the plasticity and stickiness of a clay.

Oxidizing atmosphere atmosphere during firing in which the amount of oxygen is more than required to combust the fuel.

Paste fired body; a clay or mixture of clay and added minerals (it differs from fabric and ware because it does not include pores or surface treatment).

Pinching a technique of hand building vessels by squeezing the clay, usually between fingers and thumb.

Polish a glossy lustre on the surface of an unglazed ceramic article, produced by rubbing it while leather-hard with a yielding tool.

Porosity the volume of pores contained within a solid, such as a ceramic object, measured as true or apparent porosity. In most pottery studies open or apparent porosity is measured.

Pottery fired, non-vitrified objects including cooking, serving, and storage vessels.

Primary clay (residual clay) a clay deposit located at its geological site of formation by weathering from a parent rock.

Reducing atmosphere atmosphere during firing in which carbon monoxide is present because insufficient oxygen is available to combust the fuel.

Residual clay a clay weathered in place, remaining in association with its parent rock.

Scraping a finishing technique which involves scraping a leather-hard vessel with a tool held perpendicular to the vessel to thin or shape the vessel.

Secondary clay a clay deposit that has been moved away from the original parent rock from which it weathered and has been redeposited.

Sherd, potsherd a term used to refer to a broken fragment of pottery.

Silt a particle-size grade in which particles are between 00.5 mm and 0.002 mm in diameter; a sediment consisting of 80 % or more silt-sized particles and less than 10 % clay-sized particles.

Slip a fluid suspension of fine clay and water used to coat a body before firing or poured into a mould to cast a piece; a non-vitreous coating on pottery vessels.

Slip casting a method of forming vessels by pouring slip into a plaster mould, allowing a layer adjacent to the mould to dry (forming the vessel), and then pouring off the excess.

Slurry a viscous suspension of clay in water.

Smoothing a finishing technique in which a leather-hard vessel is rubbed with a hard tool (such as a stone or potsherd) to produce a smooth but non-glossy surface.

Temper to mix or modify to a proper consistency; mineral or organic material, usually non-plastic, added to clay to improve its working, drying, or firing properties.

Texture the character of fired pottery/fabric fracture described in terms of particle size (fine, medium fine, coarse), characteristic of density (dense, medium dense, porous)

Throwing forming a vessel on the potter's wheel.

Trimming a finishing technique which involves cutting a vessel with a hard tool held at an acute angle to the vessel to thin its body.

Turning removing excess clay from a leather-hard vessel by shaving with a sharp-edged tool as the vessel revolves on the potter's wheel.

Ware a class of pottery whose members share similar technology, fabric and surface treatment.

Wash a term used to describe a post-firing coating applied to a vessel.

Wiped a surface with the appearance of having had a hand or soft material passed over it while the clay was wet.

Illustrations

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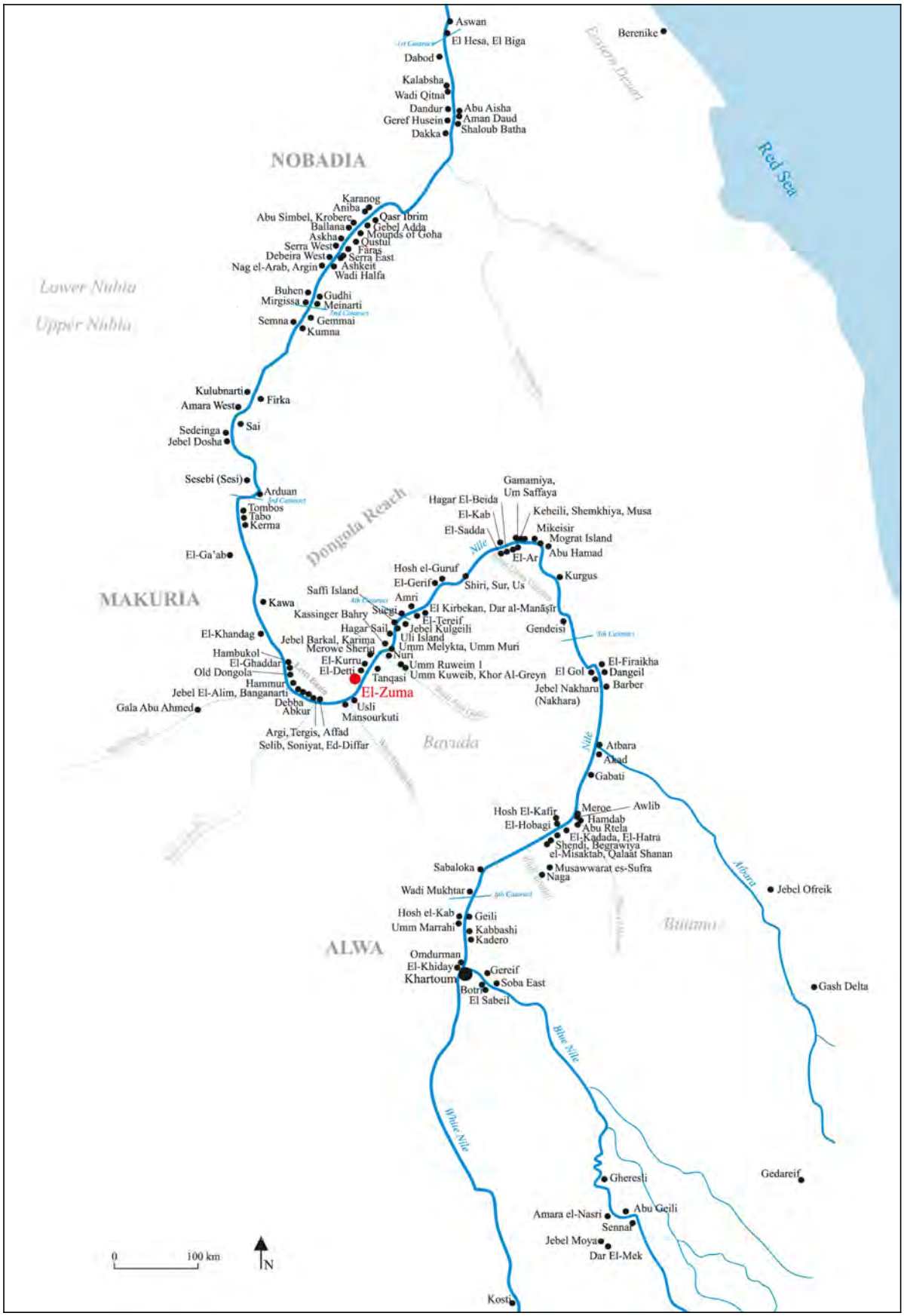

FIGURE 1 Map of the Ancient Nubian archaeological sites mentioned in the publication
DRAWN BY E. CZYŻEWSKA-ZALEWSKA

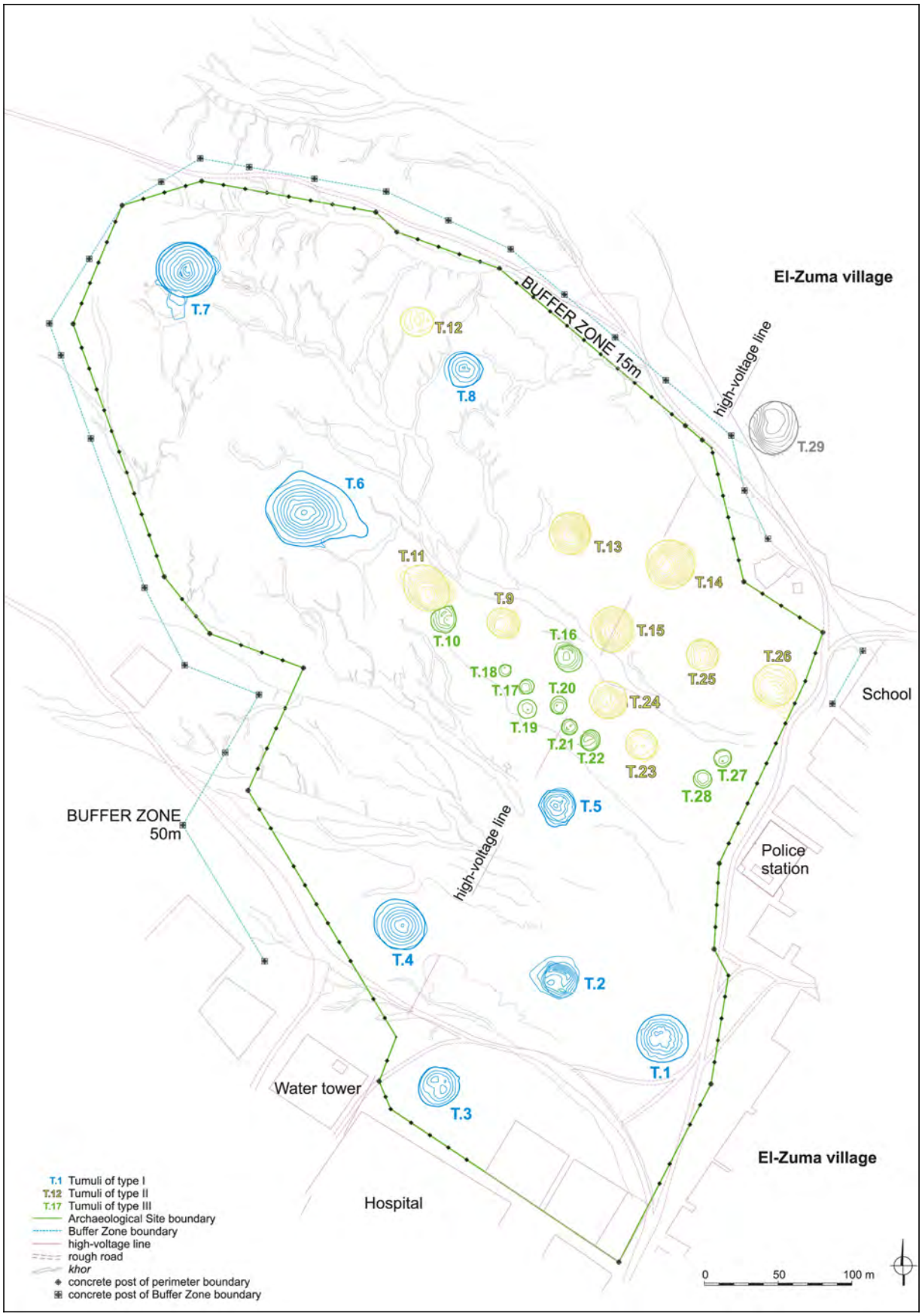

FIGURE 2 Topographic plan of the cemetery in El-Zuma
DRAWN BY J. JUCHNIEWICZ, Z. KOWARSKA, S. LENARCZYK

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Early Makuria Research Project
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Volume 3

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Early Makuria Research Project
El-Zuma Cemetery

Volume 3
Small Finds

By

Joanna Then-Obłuska
Łukasz Zieliński
Ewa Czyżewska-Zalewska

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Cover illustration: Gold-alloy finger-ring with a ribbed hoop and lozenge-shaped bezel set with mosaic glass in a checkerboard pattern (Z4/97). Photo by A. Kamrowski.

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Contents

Analyses of Metal Objects

Łukasz Zieliński

Foreword

The elite tumuli cemetery at the village of El-Zuma in the Dongola Reach, the cradle of ancient Nubian civilization, is at the centre of this three-volume study. The site, which is inscribed on UNESCO's World Heritage List, has been excavated since 2004 by the Polish Centre of Mediterranean Archaeology University of Warsaw in collaboration with the National Corporation of Antiquities and Museums of Sudan.

The investigation of the burials representing different classes of the Nubian elite has brought into the limelight a long understudied period in ancient Nubian history, that is, the centuries preceding the rise of the Christian kingdom of Makuria. Hence the moniker "Early Makuria", which refers to a broader programme of research, as well as to the political and social entity that the elites buried in El-Zuma were part of.

The three-volume monograph ***Early Makuria Research Project. El-Zuma Cemetery*** is a comprehensive presentation of the results of the excavation project. Volume I discusses the excavation of the tombs (Mahmoud El-Tayeb, Ewa Czyżewska-Zalewska and Ewa Skowrońska with a methodological section by Szymon Lenarczyk, Zofia Kowarska and Magdalena Antos) and the bioarchaeological research that was carried out on the skeletal remains, both human and faunal, giving insight into funerary traditions set in a broader historical and economical background of the site and region (Robert Mahler, Iwona Kozieradzka-Ogunmakin, Abagail Breidenstein, Urszula Iwaszczuk). It also draws plans for an archaeological park to be established at the site (Jolanta Juchniewicz, Mahmoud El-Tayeb).

Volumes II and III have been dedicated to studies of the artifacts found in burial contexts. In Volume II, Ewa Czyżewska-Zalewska discusses details of the pottery typology, classification, manufacturing techniques, fabric and ware descriptions with a separate section on oil lamps (contributed by Aneta Cedro). Small finds are the theme of Volume III, opening with a study by Joanna Then-Obłuska of personal adornments and ornaments, such as beads, jewellery and toilet containers. The second part of the volume is a presentation, by Łukasz Zieliński and Ewa Czyżewska-Zalewska, of the metal artifacts as a category, focused on weaponry and personal accessories, as well as miscellaneous burial equipment.

Mahmoud El-Tayeb
Ewa Czyżewska-Zalewska

Figures and Tables

Note to chapters 4–7: Objects illustrated in the figures are identified by their find numbers. Lower case letters indicate different views

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CHAPTER 1

Introduction

Ewa Czyżewska-Zalewska

Despite the abandonment of the royal cemeteries at Meroe many aspects of Meroitic rituals and symbolism survived into the Early Makurian period. Grave goods and furnishings were an essential part of burial customs and religious traditions. Grave goods were provided for the deceased's last journey and for eternity. Jewellery, personal adornments, and other objects found with the deceased were a manifestation of social status during earthly life.

Burying the dead with grave goods was a deeply rooted custom among the ancient Nubian people, from as early as the Mesolithic through conversion to Christianity in the mid-6th century [see chronological table, Fig. 3 at the end of this volume] (Mahmoud El-Tayeb 2012, 80). In the Mesolithic period the deceased were given pottery and stone tools such as mace heads and adzes. In later periods, the A-Group and C-Group cultures reflected contacts with Egypt, and Nubian traditions became mixed with Egyptian influences. A large range of goods was deposited in graves, including jewellery, pottery, food and drink, and numerous Egyptian imports (Haynes 1992, 40; Welsby and Anderson 2004, 277). The tradition of burying the deceased on a bed appeared with the C-Group, and was continued into post-Meroitic times (Welsby and Anderson 2004, 227–228). In the Kerma period metal weapons, such as bronze daggers and knives, appeared for the first time in the grave goods repertoire. Under Egyptian domination local Nubian traditions appear to have given way for the most part to Egyptian traditions and influences, but with the end of Egyptian hegemony there was a revival of Nubian traditions in the Napatan period (Welsby and Anderson 2004, 279–281). However, Egyptian influence remained very strong during the New Kingdom occupation and the Napatan and Meroitic periods, and did not disappear in post-Meroitic and Early Makurian times.

The tumuli yielded a wealth of burial equipment made of various raw materials, in many instances sadly damaged by adverse environmental conditions and displaced by robber activity. These included personal adornments, weaponry, pottery, and other burial equipment such as weaponry or furnishings. The material needs of the deceased were satisfied with large numbers of utensils as well as food. Many objects were made of composite materials (e.g., metal and wood, or metal and bone); of these only the metal parts have been preserved in reasonable condition, the state of the organic materials, such as wood and leather, being largely residual.

Jewellery mainly consisted of necklaces made of ostrich eggshells, red agate, pear-shaped white or black quartz beads, as well as round and tubular beads of green and blue faience. Bronze armlets, pendants, iron and bronze earrings, and bracelets were also found. Pottery, broadly presented in volume II, was a significant component of the goods deposited in graves. Weapons constituted another significant category of grave goods, becoming an essential item in the Early Makurian period, unlike Late Meroitic times. Knives and barbless iron arrowheads were frequently deposited in graves (Mahmoud El-Tayeb 2012, 80–82. The post-Meroitic period witnessed the growing prominence of military materials, often included in burials, ironwork became much more plentiful, and crafts such as basketry also seem to have flourished (Edwards 2004, 207–208).

The third volume in the **Early Makuria Research Project. El-Zuma Cemetery** publication deals with the small finds excavated from the tombs in the El-Zuma tumuli field, both the graves and the tumulus superstructures and robber shafts. The material has been organized into three main categories: ornaments; weaponry and personal accessories; and burial equipment. In each section, chapters provide a presentation of the material, complete with discussion and catalogue. A group of unidentified metal items, stone, glass fragments, leather and organic materials are presented as miscellanea (Chapter 18).

The state of preservation of the metal objects and the analyses methodology are discussed in Chapter 19, along with a presentation of the results of specialist research on selected artefacts.

Ornaments

Joanna Then-Obłuska

∵

CHAPTER 2

Introduction

Nubia is a region in North-East Africa encompassing northern Sudan (the country) and the southern fringes of Egypt. It consists of two parts, the names of which—Lower Nubia in the north and Upper Nubia in the south—correspond to the flow of the Nile. Regions in Nubia are separated by the Nile cataracts, the First Cataract being located south of Aswan and the last one, the Sixth, north of modern-day Khartoum. After the fall of the Kingdom of Meroe, which probably extended as far south as the confluence of the Blue and White Niles and beyond, three entities emerged between the 4th and 6th centuries AD. These were Nobadia in Lower Nubia, Makuria in Upper Nubia, and Alwa (Alodia) in the region upriver from the Fifth Cataract. Single burials in tumuli as well as massive tombs, bronze horse harnesses, and wide-bladed iron spears appeared throughout Sudan. Cemeteries of Nobadian kings, queens and members of the elites were excavated in Qustul and Ballana (Emery and Kirwan 1938; Farid 1963). Royal burials have yet to be identified in the Early Makuria and Alwa regions. Recent finds of ornaments and adornments at El-Zuma have provided evidence of the elite character of at least some of the tombs at this site.

The El-Zuma site is situated between the Third and Fourth Cataracts in the Dongola Reach in Upper Nubia, a region that occupies a strategic position controlling the north–south and east–west desert roads, as well as riverine communication routes (Mahmoud El-Tayeb 2012, 15). The site has been dated to the late post-Meroitic period, otherwise known as Early Makuria Phase II (AD 450–550) (see Volume I, Chapter 1; Mahmoud El-Tayeb 2012, 61–75). The spread of Byzantine-style adornments, Christian symbols, and overseas imports would have followed trade routes of the time, and these goods were also clearly passing through the territory of still- pagan Early Makuria, a region that included El-Zuma.

Between 2004 and 2017 more than 2,000 items of personal adornment (beads, pendants, earrings, chains, and rings), elite jewellery (cabochons and settings), and other decorated objects (sheet metal, ivory intarsia, and gaming pieces) were excavated at El-Zuma from 23 of a total of 25 heavily robbed tumuli. Three categories of tumuli were identified at El-Zuma based on differences in their superstructures and substructures: type I, type II, and type III (see Volume I, Chapter 3). While type I tumuli were the biggest and had the most complex substructures (an underground tunnel of unknown function leading towards the main burial chamber being the most characteristic feature), tumuli of types II and III were usually smaller, did not contain tunnels, and had superstructures in the form of flat-topped mounds. The mound of type III tumuli was also surrounded by a stone ring on the ground surface and the substructure consisted of only a rectangular shaft and one burial chamber, usually cut into the western wall of the shaft. Tumuli 1, 3 to 5, 7, and 8 have been attributed to construction type I. Tumuli 9, 11 to 16, and 24 to 26 are ascribed to type II, while tumuli 10, 17 to 22, 27 and 28 represent type III.

In general, tumuli of types I and II were equipped with the richest inventories in terms of pottery (see Volume II) and animal offerings, suggesting that only the elite were buried in these two types of tombs at El-Zuma (see Volume I, Chapter 8). As shown in the discussion part (see Chapter 8 in this volume), the discovery of imported stone beads, metal bells, and an iron cross in tumuli of types I and II supports this notion. The most elaborate pieces of silver and gold jewellery, as well as an ivory gaming set, were found in tumulus 4 (type I), indicating that it may have been an elite burial.

The author has presented elsewhere an overview of the ornaments found in all of the tumuli excavated at El-Zuma (Then-Obłuska 2016c; 2017). Therefore, this chapter will provide comprehensive descriptions of the materials and techniques used to make these ornaments, as well as indicate their provenance and parallels. It will also provide quantitative analysis and present complete catalogues detailing context and macroscopic observations. Additionally, the chapter will summarize the results of chemical composition analysis of glass beads, which has helped identify the provenance of these finds.

CHAPTER 3

Methods

The remains of personal adornments and other ornaments are fully described in terms of their materials, techniques, and parallels, and are divided into four groups: beads and pendants (Chapter 4); jewellery remains (fly amulet, bell pendants, earrings, chains, rings, cabochons and settings, sheet metal; Chapter 5); a toilet box (Chapter 6), and decorated bone items (ivory dice containers, gaming pieces, and intarsia; Chapter 7). Chapters 4, 5, and 7 are followed by catalogues in tabular form (Tables 4.1, 5.1, 7.1). The majority of objects are illustrated in Figures 4.1 to 7.9. Additionally, the results of chemical composition analyses of selected glass beads are summarized (Chapter 4.2), providing the provenance of these objects. The results of laboratory analysis, state of preservation, and conservation work done on a few items of metal jewellery are described below (see Chapter 19, this volume). The quantitative and qualitative analysis of the objects according to their find context is presented in Chapter 8 and a comprehensive synopsis is given in Table 8.1. All objects are identified by a tumulus number preceded by the prefix Z and followed, after a forward slash, by an inventory number (e.g. Z1/27).

CHAPTER 4

Beads and Pendants

1 Material Analysis

The overview of beads (centrally perforated objects) and pendants (objects with off-centre perforation or with attached loop) presented herein follows a classification by material (marine mollusc shell, coral, stone, faience, glass, metal-in-glass, metal) and by the techniques used to make them. Provenance and parallels are provided accordingly.

1.1 *Marine Mollusc Shells*

Two marine mollusc species of Red Sea origin were found: *Cypraea annulus* sp. and *Marginella* sp. The former was recorded in five of the tumuli, the latter solely in T.7.

Fifteen complete shells and one shell fragment were identified as *Cypraea annulus* sp. (Z1/27, Z1/30, Z4/52.1–2, Z7/1, Z7/8.1.1–4, Z7/9.1, Z7/10.1, Z7/79, Z12/2, Z27/5) [**Fig. 4.1**]. They were perforated by removing the convex part of their bodies, which resulted in a large hole. Similar specimens were discovered in post-Meroitic Tumulus 4 on Uli Island (Godlewski, Obłuski, and Zielińska 2005, Fig. 8). Interestingly, a necklet of cowrie shells came from a camel burial found under a large tumulus in Firka (Kirwan 1939, 3, object A11/5).

Two *Marginella* sp. shells were found in T.7: Z7/8.2, Z7/9.2 [see **Fig. 4.1**]. Their apices had been removed. *Marginella* sp. shells perforated in the same way were found in a late antique trash dump in Berenike (Then-Obłuska 2015b, Fig. 1:6) and in a post-Meroitic Ashkeit grave (Then-Obłuska 2018, Pl. 2.4). *Marginella* sp. specimens known from Meroitic and early Roman bead assemblages tend to have their bodies removed (Then-Obłuska 2015a; 2015b).

1.2 *Ostrich Eggshell*

Ostrich eggshell was an easily available material and yet only 14 beads recorded from El-Zuma were made of it. Two general types were distinguished: large disc and small disc to short cylinder. The large discs were cut from pieces of ostrich eggshell perforated by pecking the centre from one or both ends. The edges were retouched. The surface around the lip of the perforation remained unworked. Large beads measure about 15 mm in diameter [**Figs 4.2**: Z28/15.1, Z28/17.1, **4.6, 4.8**], compared to the 4.5 mm diameter of the smaller type (Z5/29, Z13/33, Z16/22, Z24/49.1) [see **Fig. 4.2**].

1.3 *Coral*

A single coral bead Z25/35, not illustrated here, was recorded (for an earring with coral bead, see Chapter 5.1.5). Short-to-long cylinder beads made of *Corallium* sp. were common in late Roman/early Byzantine Egypt and post-Meroitic Nubia (e.g. Then-Obłuska 2015b, Fig. 2.2; Emery and Kirwan 1938, Pls 43–44). In the Fourth Cataract region, salmon-coloured specimens were found in burial T1.81 at Musa (National Museum in Warsaw, Inv. No. 239056, Then-Obłuska 2018, Pl. 3) and in a grave at Tabo, where they formed part of a belt (Jacquet-Gordon and Bonnet 1971, 81).

1.4 *Stone*

More than 160 stone beads and pendants were recorded. Stone (quartz, agate, carnelian, black steatite, and what is most probably sandstone) beads were produced using one of two techniques: perforation from either one or both ends. Here and in Chapter 5.1.9, carnelian is defined as an orangey or reddish chalcedony with essentially no banding. All remaining varieties of chalcedony, with either banding or other patterns and of various colours, are referred to as agate.

1.4.1 Stone Beads and Pendants Drilled from One End

Most of the beads were drilled from one end and they are characterized by truncated conical perforations. Some of them bear traces of saw marks across the larger hole. Saw marks made it easier to set the drill in place, and they are typical of Egyptian and Nubian stone perforating (Then-Obłuska 2015a; 2015b). Among the small beads there are examples that are **truncated and conical** (Z4/49.1–4, Z4/175, Z16/21), **globular** (Z4/50.1), **long and ellipsoid** (Z4/176, Z4/178, Z16/20a,c) and **pear-shaped** (Z4/48.1–2, Z16/20b) [**Fig. 4.3**].

Small beads of black steatite, and white quartz, and red agate, are the most characteristic types in Early Makurian El-Zuma. They have already been identified in the Fourth Cataract region. They are also known from many Nobadian sites in Lower Nubia (Then-Obłuska 2016a; 2016c and references: Vila 1984, Fig. 219,92; Pellicer Catalán and Llongueras Campañà 1965, Fig. 41,114; Presedo Velo, Blanco y Caro, and Pellicer Catalán 1970, Fig. 215,158; Farid 1963, Fig. 58,11; Kirwan 1939, Pl. XX:14), including the royal cemeteries of Qustul and Ballana (Emery and Kirwan 1938, Pl. 43, Types 53–54 =JE [= Egyptian Museum, Cairo] 80899,

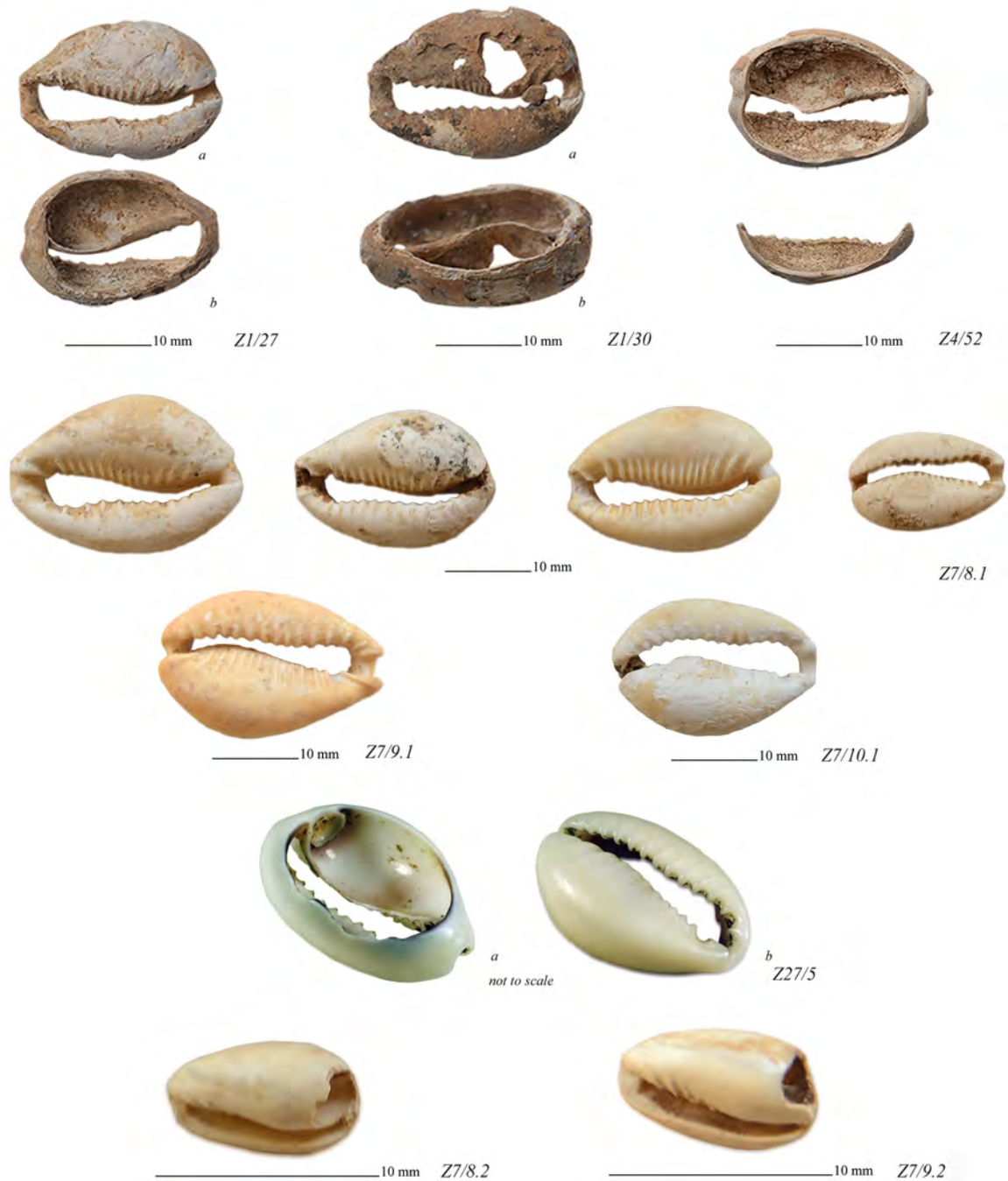

FIGURE 4.1 Marine mollusc shell beads
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

70264, 70275, 70260, personal observation). White, red, and black beads were found strung alternately at the latter site. Furthermore, truncated conical beads made of a variety of stones were found on the neck of a king buried in Tomb 80 at Ballana (Emery and Kirwan 1938, 211, Cat. No. 152, Pl. 46C =JE 70258).

Larger examples are characterized by a truncated conical perforation and a saw mark next to the larger hole. These are **large globular beads** of about 10 mm in diameter, made of red or white quartz (Z28/15), long barrels of white stone (Z17/7), and teardrop pendants with rounded bases (Z17/6, Z17/9, Z20/12) [see **Fig. 4.3**]. These types are commonly recorded in Late Meroitic to transitional Late Meroitic/post-Meroitic graves in the Fourth Cataract region (Then-Obłuska 2014, Pl. 11, Cat. 148, 150, 151, 175 spherical, 173 teardrop, 220, 225 long barrels; Longa 2011, Fig. 4 spherical beads and teardrop pendants) and up to the Sixth Cataract (Pokorná et al. 2014, spherical beads).

FIGURE 4.2 Ostrich-eggshell beads
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1.4.2 Stone Beads Drilled from Both Ends

Some beads were perforated from both ends, resulting in a double parallel perforation. Examples include four **large transparent rock crystal** beads (Z4/48.3) [**Fig. 4.4**], along with similar ones discovered in 4th–7th-century Kharga in the Western Desert, Egypt (MET [= Metropolitan Museum of Art, New York] 25.10.20.96; 31.8.33, personal observation). In Nubia, beads of this kind were found only on the necks of kings from the Ballana burials: Tomb 80 (Emery and Kirwan 1938, 211, object B.80–130, Cat. 155 =JE 70283) and Tomb 95 (Emery and Kirwan 1938, 212, object B.95–68, Cat. 157). The clarity and transparency of this material is said to have been especially valued in religious spheres as a symbol of purity (e.g. Dubin 2009, 77). A few rock crystal beads were discovered in an early Christian context in the Church of the Granite Columns in Dongola (Then-Obłuska 2013, Fig. 3:1).

Two **large lenticular beads of dark agate**, Z7/10.2 and Z7/16, were recovered from a context associated with T.7 [see **Fig. 4.4**]. They measure approximately 23 mm in diameter. A bead of this kind was found in a tomb at El-Detti, a cemetery contemporary with the site at El-Zuma (Then-Obłuska 2016a, Fig. 1F, col. Fig. 3F). Similar large lenticular beads were found on the left arm of a man buried in Ballana Tomb 9, dating from the 4th century AD; this man was apparently a warrior (Emery and Kirwan 1938,

FIGURE 4.3 Stone beads perforated from one end
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FIGURE 4.4 Stone beads perforated from both ends
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

Pl. 38B: B.9–3; Wenig 1978, 309, Cat. 309, personal observation). Tomb B.9 is dated to AD 430/440 (Török 1986, 197). However, another two bracelets were found on the right and left wrists of an adult queen in tomb B.47 (Emery and Kirwan 1938, Pl. 38A: B.47–26, 27), dated to AD 430. Similar beads are exhibited at the Sudan National Museum (SNM 3230); they were registered as coming from the Oxford Excavations at Firka. Indeed, the beads were found as a bracelet on the body marked as E, that of an adult in Tomb A.11 at cemetery A (Kirwan 1939, 6, object A.11/62, Pl. XX: Type 5a, described as carnelian). The Firka site is considered to be of rather late date, that is, AD 490–570 (Williams 1991, 12). Z7/10.3 is a perforated pebble pendant [see **Fig. 4.4**]. Saw marks are visible around the hole.

Long, square to rectangular, biconical carnelian beads Z9/10, Z9/17 and Z24/55 were drilled from both ends, and are characterized by a double parallel perforation [see **Fig. 4.4**]. They measure about 9 mm in thickness and from 12 mm to 20 mm in length. Examples have been recorded from early Byzantine Berenike, Egypt (see Then-Obłuska 2015b, Fig. 3.6–7), Tell al-Sin and Deir el-Zor, Syria (Montero Fenollós and Al-Shbib 2008, Pl. LX:1), Lower Nubian Qustul, dated to AD 370/380–410 (OIM [= Oriental Institute Museum] E20308, E20624M, E21367—personal observation), Fourth Cataract sites dated to the transitional Late Meroitic/post-Meroitic period (Then-Obłuska 2014, Pl. II, Cat. 215, 216) and further up the Nile at Gabati (Edwards 1998, Fig. 10:74). Whether copper drills and abrasive or single- and double-diamond drills were used is not clear. The latter method would indicate their Asian origin (Kenoyer 2003).

The slightly reddish, rectangular truncated biconical bead Z13/31, perforated from both ends, was most probably made of sandstone [see **Fig. 4.4**]. It measures 10 mm in width and 11 mm in length.

1.5 *Glazed Steatite*

The sole scarab bead Z27/4, carved in soapstone, features traces of green glaze in a few places [see **Fig. 4.4**]. It measures 10.2 mm in width and 13 mm in length.

1.6 *Faience*

Faience (also known as glazed composition) beads constitute the overwhelming majority of the assemblage. Almost two thousand faience beads were recorded.

Faience beads are characterized by the porosity of their quartzite bodies, which is probably attributable to the large share of natron used in faience production in the post-Meroitic period in the Fourth Cataract region (Then-Obłuska 2014, 1070). Beads were produced by segmenting hand-folded long tubes into shorter and longer pieces. The fact that whitish parts are visible in the cores of broken beads suggests that they were glazed using the application technique. Blue glaze covers the outer surface of the body and the interior (perforation) surface, indicating they were dipped in liquid glaze. Because of the high core porosity, the glaze went deeply into the bodies and sometimes results in bluish bead sections. Due to their position during glazing, some beads are flattened on the side where they lack the glaze.

1.6.1 Short and Standard Beads

Short and standard beads measure from 3 mm to 6 mm in diameter and from 2 mm to 4 mm in length [see **Figs 4.5, 4.6**].

1.6.2 Long Tubular Beads

Long tubular examples Z22/9, Z28/4, Z28/15 and Z28/17 measure about 3.5–7 mm in diameter and up to 9 mm in length [see **Fig. 4.6**].

In general, faience beads are common finds at Lower Nubian and Fourth Cataract sites (e.g. Then-Obłuska 2014, Pl. 2; 2016a; Longa 2011, Fig. 4) and their distribution extends south to the Sixth Cataract region (Pokorná et al. 2014), to Botri south of Khartoum (Bashir 2007, Pl. 5), and to the west of the White Nile in Al-Khiday (Maritan et al. 2014, Fig. 3).

1.7 *Glass and Metal-in-Glass*

Almost one hundred glass beads and pendants were recorded. Glass beads were made of drawn or wound glass. One pendant was made of rod-pierced glass.

1.7.1 Drawn and Segmented Glass and Metal-in-Glass

Many monochrome beads were made from drawn glass tubes. Such tubes could be segmented on grooved moulds or with a tool that resulted in the beads having constricted ends. They often appear covered with yellowish patina. The smaller specimens measure about 3.3–5 mm in diameter and 2–3.5 mm in length. At El-Zuma they are represented by opaque red glass (Z17/10, Z27/9) and dark blue beads (Z28/15.6) [see **Fig. 4.8**].

Two beads (Z4/50.2, Z4/174) appear to be segments of a tube made of two layers of glass with silver foil in-between [see **Fig. 4.3**: Z4/50.2]. Segmenting glass tubes in open moulds is a well-recognized Egyptian technique used in the manufacture of glass and metal-in-glass beads. Silver-in-glass specimens are one of the most characteristic features of post-Meroitic assemblages in Lower and Upper Nubia (e.g. Then-Obłuska 2014; 2018).

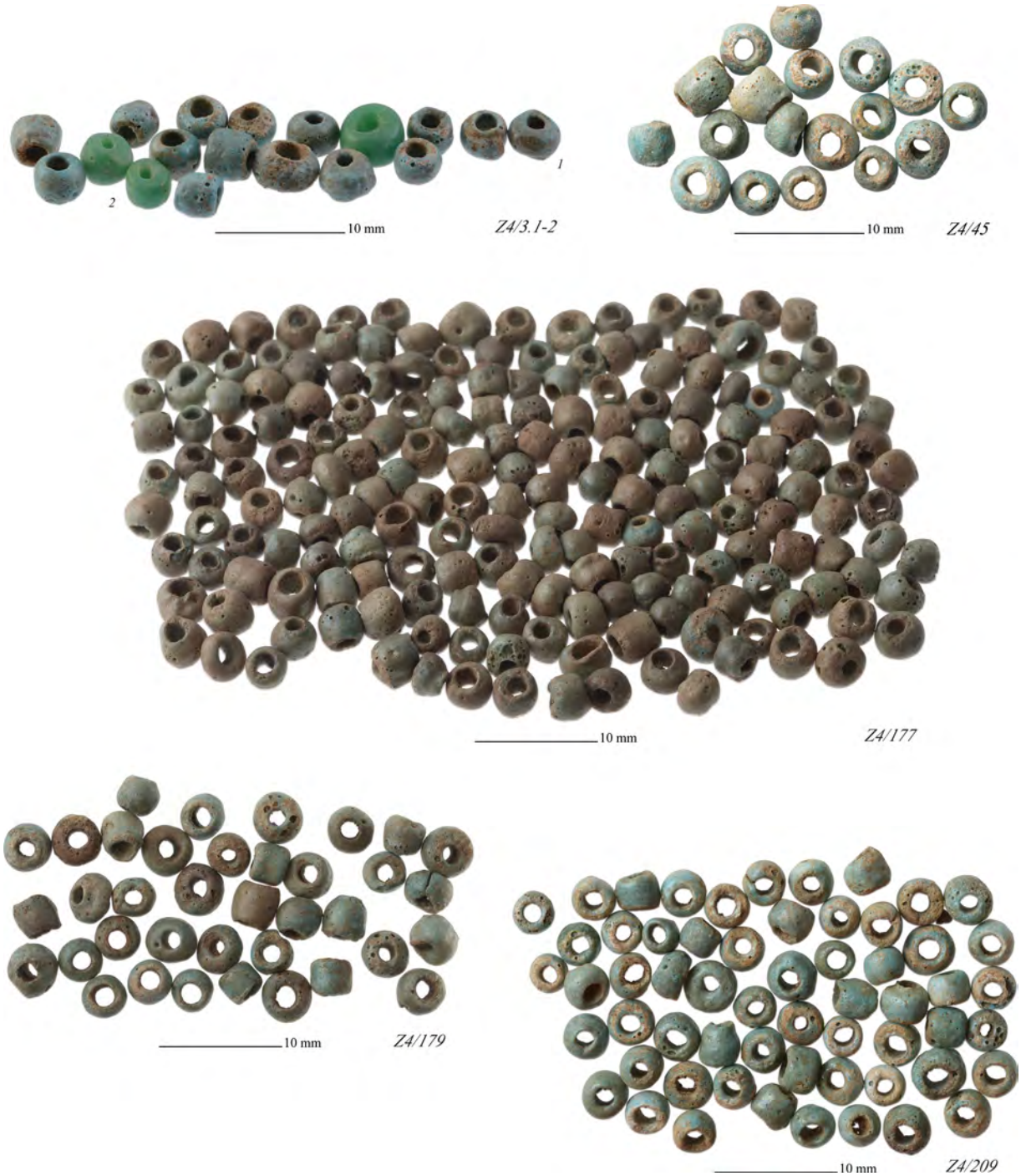

FIGURE 4.5 Faience and some glass beads
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1.7.2 Drawn and Rounded Glass

Drawn glass tubes were cut up and the pieces were roughly rounded. Fifty-one are made of green (Z4/3, Z4/51, Z12/82, Z24/49, Z28/4, Z28/15) [see **Fig. 4.5**: Z4/3.2], two of orange (Z4/51.1), and two of orange-on-red glass (Z4/51.2), two of yellow (Z9/9, Z24/49.4), one of blue (Z24/49.3), and one of blue-green glass (Z28/15.5) [see **Figs 4.7, 4.8**]. Altogether, 59 beads of this type have been recorded at El-Zuma. They make up 63.4% of all glass beads and 2.6% of all beads found at this site.

Drawn and rounded beads have been discovered in many private and royal Nobadian and Early Makurian cemeteries in Lower and Upper Nubia (Then-Obłuska 2018; Then-Obłuska and Wagner 2019). Small monochrome beads with rounded ends come from the late antique Red Sea port sites of Berenike and Marsa Nakari

FIGURE 4.6 Faience and some stone and ostrich-eggshell beads
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FIGURE 4.7 Glass beads
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 4.8 Glass and some ostrich-eggshell, stone and faience beads
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

(e.g. Then-Obłuska 2015b, Fig. 4:33–41; 2019). Those in the form of an opaque orange layer above a translucent red one are rare. Ten such beads were identified from the Serra East 25 site and four from Nag el-Arab. Another two beads were recorded in Berenike (BE95-005-013#72, BE95–005-TS#97). In general, drawn and rounded beads are well known from South Asian, Indian, and Sri Lankan sites, where they were most probably produced (Dussubieux 2001, 105; Hannibal-Deraniyagala 2013, Note 13). Chemical composition analyses of beads from early Roman Quseir/Myos Hormos in Egypt and from Lower Nubian sites have confirmed their South Indian/Sri Lankan origin (Then-Obłuska and Dussubieux 2016; Then-Obłuska and Wagner 2017).

1.7.3 Wound Glass

An outstanding bead of wound glass in translucent green was also found at El-Zuma (Z13/32) [see **Fig. 4.7**].

1.7.4 Rod-Pierced Glass

Large flattened teardrop Z4/210 was perforated by rod-piercing the dark blue glass in its upper part [see **Fig. 4.7**]. A similar example comes from a Coptic burial at Matmar (UC59788, tomb 1101). While blue and blue-green glass teardrop pendants characterize Nobadian assemblages in Lower Nubia (Then-Obłuska 2018), they have so far not been identified in Upper Nubia.

2 Bead Glass Chemistry

Fourteen glass bead samples from the El-Zuma assemblage were selected for laboratory analysis, which was carried out in the Biological and Chemical Research Centre of the University of Warsaw, Poland. The aim was to evaluate the elemental composition of the glass beads by means of a sensitive instrumental method (LA-ICP-MS) (Then-Obłuska and Wagner 2019).

In general, glass beads were manufactured using a soda-rich flux mixed with different types of sand. Three main glass compositional groups were identified based on the content of MgO and Al_2O_3: low-alumina soda-lime glass, high-alumina glass, and plant-ash soda-lime glass.

The results confirmed the presence of East Mediterranean and South Asian glass beads in the El-Zuma assemblage. While drawn and rounded glass beads were made of South Indian/Sri Lankan high-alumina glass, confirming macroscopic identification (compare section 4.1.7), the remaining analysed samples were made of Egyptian glass (Then-Obłuska and Wagner 2019).

3 Catalogue [Table 4.1]

The catalogue, in tabular form, presents beads and pendants according to find number. Object descriptions list (in sequence): figure number, find number (tumulus and object number), object type (B—bead, P—pendant), material, quantity, shape (according to Beck's 1928 nomenclature), technique of manufacture/production, colour and diaphaneity (o—opaque, st—semi-translucent, t—translucent, transparent), measurements (given in millimetres: D—diameter, L—length, W—width, Th.—thickness, H—height, HD—hole diameter), find context, excavation season, references. The scale is 10 mm, unless otherwise stated.

TABLE 4.1 Catalogue of the beads and pendants

Figure no.	Tumulus no.	Find no.	B/P	Material	Quantity	Shape	Technique	Colour(s) and diaphaneity
4.1	T.1	Z1/27	B	Mollusc shell; *Cypraea annulus* sp.	1			
4.1	T.1	Z1/30	B	Mollusc shell; *Cypraea annulus* sp.	1			
	T.3	Z3/8	B	Faience	1			
	T.3	Z3/9	B	Mollusc shell; accidental perforation	1			
4.5	T.4	Z4/3.1	B	Faience	15			
4.5	T.4	Z4/3.2	B	Glass	3		drawn	green
	T.4	Z4/3.3	B	Faience	1	globular		
	T.4	Z4/3.4		Glass	19		drawn	green
4.5	T.4	Z4/45	B	Faience	18			
	T.4	Z4/46	B	Faience	8			
	T.4	Z4/47	B	Faience	222			
4.4	T.4	Z4/48.1	B	Agate	1	ellipsoid		red
4.4	T.4	Z4/48.2	B	Rock crystal	1	ellipsoid		
4.4	T.4	Z4/48.3	B	Rock crystal	4	ellipsoid		
4.3	T.4	Z4/49.1	B	Stone		truncated conical		black
4.3	T.4	Z4/49.2	B	Agate		truncated conical		red
4.3	T.4	Z4/49.3	B	Agate		truncated conical		red
4.3	T.4	Z4/49.4	B	Rock crystal		truncated conical		
4.3	T.4	Z4/50.1	B	Stone	5			red
4.3	T.4	Z4/50.2	B	Metal-in-glass	1			
4.7	T.4	Z4/51.1	B	Glass	2		drawn and rounded	orange
4.7	T.4	Z4/51.2	B	Glass	2		drawn and rounded	orange-on-red
4.7	T.4	Z4/51.3	B	Glass	1		drawn and rounded	green
4.7	T.4	Z4/51.4	B	Glass	1	short cylinder		green
4.1	T.4	Z4/52	B	Mollusc shell; *Cypraea annulus* sp.	2	1 shell and 1 fragment		
	T.4	Z4/137	B	Faience	35			
	T.4	Z4/174	B	Metal-in-glass	1			
4.3	T.4	Z4/175	B	Agate	1	conical		red
4.3	T.4	Z4/176	B	Agate	1	ellipsoidal		dark red
4.5	T.4	Z4/177	B	Faience	191			
4.3	T.4	Z4/178	B	Agate	2	ellipsoidal		red
4.5	T.4	Z4/179	B	Faience	37			
4.5	T.4	Z4/209	B	Faience	58			
4.7	T.4	Z4/210	P	Glass	1	teardrop pendant	rod-pierced	blue
	T.5	Z5/7	B	Glass	1			
	T.5	Z5/8	B	Faience	12			
	T.5	Z5/13	B	Faience	1			
	T.5	Z5/29	B	Ostrich eggshell	1			
	T.7	Z7/1	B	Mollusc shell; *Cypraea annulus* sp.	1			
4.1	T.7	Z7/8.1	B	Mollusc shell; *Cypraea annulus* sp.	4			
4.1	T.7	Z7/8.2	B	Mollusc shell; *Marginella* sp.	1			
	T.7	Z7/8.3	B	Faience	10			
4.1	T.7	Z7/9.1	B	Mollusc shell; *Cypraea annulus* sp.	1			
4.1	T.7	Z7/9.2	B	Mollusc shell; *Marginella* sp.	1			
4.1	T.7	Z7/10.1	B	Mollusc shell; *Cypraea annulus* sp.	1			
4.4	T.7	Z7/10.2	B	Stone, agate	1	lenticular		red
4.4	T.7	Z7/10.3	B	Stone	1	pebble pendant		red
4.4	T.7	Z7/16	B	Stone		lenticular?		
	T.7	Z7/79 (Z7/1-old number)	B	Mollusc shell; *Cypraea annulus* sp.	1	pendant		white (0)
	T.8	Z8/10	B	Faience	1	barrel		blue
	T.9	Z9/8	B	Faience	25 (and a few fragments)	oblate		light green (0)

D	L/Th/W	HD	Context data	Season	References
			Top of tunnel fill (NW part, near entrance to chamber)	2017	Then-Obłuska 2017, Fig. 1
			W part of chamber 1	2017	Then-Obłuska 2017, Fig. 1
			Robber pit	2014	
			Tunnel	2014	
			Tunnel	2013	Then-Obłuska 2016c, Fig. 5
			Tunnel	2013	Then-Obłuska 2016c, Fig. 5
			Tunnel	2013	
			Tunnel	2013	
			Shaft and tunnel secondary deposit (2013 excavation)	2017	
			W tunnel, fill, W part of E side of entrance	2017	
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 3
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 3
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 3
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 3
			W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 1
			W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
			W tunnel, fill, entrance to W room (W chamber?)	2017	
			W tunnel, fill, entrance to W room (W chamber?)	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, entrance to W room (W chamber?)	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, entrance to W room (W chamber?)	2017	
			W tunnel, fill, entrance to W room (W chamber?)	2017	Then-Obłuska 2017, Fig. 2
			W tunnel, fill, entrance to W room (W chamber?)	2017	
			E tunnel, S part, dark layer	2017	Then-Obłuska 2017, Fig. 3
			E tunnel, S part, dark layer	2017	Then-Obłuska 2017, Fig. 3
			Chamber 1	2007	
			Chamber 1, by brick blocking wall at central part	2007	
			Shaft fill, by SE corner	2007	
			Tunnel fill	2007	
	17.55×25.61×6.58	18.5×14.64	Tunnel fill	2011	
			Found close to first pillar	2015	Then-Obłuska 2017, Fig. 1
			Found close to first pillar	2015	Then-Obłuska 2017, Fig. 1
			Found close to first pillar	2015	
			In tunnel entrance	2015	
			In tunnel entrance	2015	Then-Obłuska 2017, Fig. 1
				2015	Then-Obłuska 2017, Fig. 1
				2015	Then-Obłuska 2017, Fig. 2
				2015	Then-Obłuska 2017, Fig. 2
				2015	Then-Obłuska 2017, Fig. 2
17.55×25.61× 6.58		18.5×14.64	Tunnel fill	2011	
			Burial chamber, E part	2014	
4.27	3.3	0.9–1.6	Shaft, S part, near damaged blocking wall (chamber 1)	2011	

TABLE 4.1 Catalogue of the beads and pendants (*cont.*)

Figure no.	Tumulus no.	Find no.	B/P	Material	Quantity	Shape	Technique	Colour(s) and diaphaneity
4.7	T.9	Z9/9	B	Glass	1	short cylinder	drawn	light yellow (o)
4.4	T.9	Z9/10	B	Stone; carnelian	1	long square bicone		red (st)
	T.9	Z9/13	B	Faience	48	barrel		light green (o)
	T.9	Z9/14	B	Faience	1	tubular, long		light green (o)
	T.9	Z9/15	B	Quartz	2	barrel standard	polished; conical perforation	white (o)
	T.9	Z9/16	B	Quartz	1	pear-shaped	polished	white (o)
4.4	T.9	Z9/17	B	Stone; carnelian	1	long square bicone		light to dark red (st)
	T.10	Z10/50	B	Stone?	1	pear-shaped		black
	T.10	Z10/51	B	Quartz	1	globular	saw marks across larger hole	red
4.6	T.10	Z10/52	B	Faience	80	short oblate		light blue
	T.11	Z11/31.1	B	Faience	10 (1 broken)	standard and long tubular	glazed	light blue; green/whitish cores
	T.11	Z11/31.2	B	Faience	7	short tubular	cut and polished	light blue; green
	T.11	Z11/31.3	B	Faience	1	tubular	polished	light blue; green
	T.12	Z12/2	B	Mollusc shell; *Cypraea annulus* sp.	1			
4.7	T.12	Z12/82.1	B	Faience	1			
4.7	T.12	Z12/82.2	B	Glass	21		drawn, rounded ends	green (st)
	T.13	Z13/2.1	B	Faience	220 and 12 fragments	disc and short tubular	glazed	whitish with traces of light blue-green glaze/whitish cores
	T.13	Z13/2.2	B	Stone	1	barrel	burnished	white and black
4.4	T.13	Z13/3	B	Agate?	1	spherical	polished	light yellow; light red; dark red traces
	T.13	Z13/30.1	B	Faience	5	short and standard tubular	glazed	turquoise
	T.13	Z13/30.2	B	Faience	5	disc tubular	glazed	whitish; traces of blue-green
4.4	T.13	Z13/31	B	Stone	5	truncated bicone		dark reddish
4.7	T.13	Z13/32	B	Glass	1	globular	wound	green (t)
4.2	T.13	Z13/33	B	Ostrich eggshell	3 (1 broken)	disc cylinder	burnished	white
4.7	T.13	Z13/34	B	Glass	1 (8 fragments)	oblate		light green (st)
	T.15	Z15/10	B	Faience	1			
	T.15	Z15/13	B	Faience	1			
	T.15	Z15/33	B	Faience	1 half			
	T.16	Z16/5	B	Faience	2			
	T.16	Z16/19	B	Faience	65	short tubular		light green/light blue glaze; white cores
4.3	T.16	Z16/20a	B	Agate	1	ellipsoidal	polished; saw marks across larger hole	light red to dark red
4.3	T.16	Z16/20b	B	Agate	1	conical	polished; saw marks across larger hole	light red to dark red
4.3	T.16	Z16/20c	B	Agate	2	ellipsoidal	polished	light red to dark red
4.3	T.16	Z16/21	B	Stone	1	convex cone	polished	black
4.2	T.16	Z16/22	B	Ostrich eggshell	2	disc cylinder	burnished	whitish
4.3	T.16	Z16/23	B	Quartz	1	ellipsoidal	perforated from one end	white
4.3	T.17	Z17/6	B	Quartz	1	teardrop pendant	saw marks across larger hole	red

D	L/Th/W	HD	Context data	Season	References
5.4×5.16	2.4	1.35	Chamber 1, central part	2011	
9.73×8.93	12.34	1.81	Shaft, S part, near damaged blocking wall of chamber 1	2011	Then-Obłuska 2016c, Fig. 4
4.0	3.3	0.9–1.6	Chamber 1, central part	2011	
5.2	7.1	2.5	Chamber 1, central part	2011	
5.36	5.47	1.85; 1.35	Chamber 1, central part	2011	
3.66	4.67	0.8; 1.35	Chamber 1, central part	2011	
9.45×9.72	20.11	1.84	Chamber 1, central part	2011	Then-Obłuska 2016c, Fig. 4
			Chamber	2007	
			Chamber	2007	
			Chamber	2007	
4.92	4.8–6.46	2.08	Burial chamber 1	2009	
4.28	2.9	1.7	Burial chamber 1	2009	
3.51	3.5	1.3	Burial chamber 1	2009	
			Fill of robber hole	2013	
			Chamber 1, E part	2013	Then-Obłuska 2016c, Fig. 6
			Chamber 1, E part	2013	Then-Obłuska 2016c, Fig. 6
5.9	3.07–4.0	1.3	SE corner of shaft; near burial chamber	2009	
3.83	4.93	1.5	SE corner of shaft; near burial chamber	2009	
8.61	8.21	1.7; 1.93	SE corner of shaft; near burial chamber	2009	Then-Obłuska 2016c, Fig. 4
3.78–4.02	2.94–3.94	1.7	Chamber 4; probably part of decoration of a leather case Z13/15	2009	
4.02	2.1	1.9	Chamber 4	2009	
8.07×9.85	11.02	2.09	Chamber 4, central and E part	2009	Then-Obłuska 2016c, Fig. 4
6.41×6.16	4.98	2.32; 2.2	Chamber 4	2009	Then-Obłuska 2016c, Fig. 6
4.5	1.9	1.0	Chamber 4, central part	2009	
5.76	?	1.0	Chamber 4, central part	2009	Then-Obłuska 2016c, Fig. 6
			Fill of shaft	2013	
			Fill of shaft, S part	2013	
			Fill of shaft, N part	2013	
			Shaft, near chamber 1	2011	
4.0	2.77	1.55	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	
4.28	5.87	1.47; 1.0	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	Then-Obłuska 2016c, Fig. 3
3.08	3.5	0.7; 0.95	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	Then-Obłuska 2016c, Fig. 3
2.88	3.98	1.25; 0.8	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	Then-Obłuska 2016c, Fig. 3
4.4	5.8	1.53; 1.2	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	Then-Obłuska 2016c, Fig. 3
4.36	1.76	1.36	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	
3.27	4.13	1.15; 0.8	Chamber 1 (burial chamber), S part, near skull and skeleton	2011	Then-Obłuska 2016c, Fig. 3
10.0×10.04	12.74	1.9; 2.42	Burial chamber, central part	2009	Then-Obłuska 2016c, Fig. 3

TABLE 4.1 Catalogue of the beads and pendants (*cont.*)

Figure no.	Tumulus no.	Find no.	B/P	Material	Quantity	Shape	Technique	Colour(s) and diaphaneity
4.3	T.17	Z17/7	B	Quartz	3	barrel	saw marks across larger hole	white
	T.17	Z17/8	P	Quartz	4	teardrop pendant	saw marks across larger hole	white
4.3	T.17	Z17/9	P	Quartz	9	teardrop	saw marks across larger hole	whitish
4.8	T.17	Z17/10	B	Glass	7	oblate	single-segment	dark red (0)
	T.17	Z17/11.1	B	Faience	62 (1 broken)	standard tubular	glazed	light blue and green glaze; whitish cores
	T.17	Z17/11.2	B	Glass	1	oblate	drawn	dark red (covered with patina) (0)
4.6	T.18	Z18/9	B	Faience	14			
4.6	T.18	Z18/10	B	Faience	45			
	T.18	Z18/11	P	Quartz	4	teardrop		
	T.18	Z18/12	P	Quartz	1	teardrop		white
	T.20	Z20/6.1	B	Faience	3	standard tubular		light blue
	T.20	Z20/6.2	B	Faience	1	short tubular		light blue
	T.20	Z20/6.3	B	Faience	6	standard tubular		light blue
	T.20	Z20/6.4	B	Faience	9	long barrel		light blue
	T.20	Z20/7.1	B	Faience	1	long tubular		light blue
	T.20	Z20/7.2	B	Faience	5	standard tubular		light blue
	T.20	Z20/7.3	B	Faience	6 (and a half)	standard tubular		light blue
	T.20	Z20/7.4	B	Faience	1 (half)	long tubular		light blue
	T.20	Z20/8.1	B	Faience	24	long tubular		light blue
	T.20	Z20/8.2	B	Faience	6	standard tubular		light blue
	T.20	Z20/8.3	B	Faience	7	standard tubular		light greenish
	T.20	Z20/9.1	B	Faience	11	long tubular		light blue
	T.20	Z20/9.2	B	Faience	6	standard tubular		light blue
	T.20	Z20/9.3	B	Faience	4	short tubular		light blue
	T.20	Z20/10.1	B	Faience	40	long tubular		light blue
	T.20	Z20/10.2	B	Faience	35	standard tubular		light blue
	T.20	Z20/10.3	B	Faience	45	short tubular		light blue
	T.20	Z20/10.4	B	Faience	6	long tubular small		light blue
	T.20	Z20/11	P	Quartz	1	teardrop	saw marks across larger hole	white
4.3	T.20	Z20/12	B	Quartz	1	teardrop	saw marks across larger hole	white
	T.21	Z21/14.1	B	Quartzite	1	globular		white
	T.21	Z21/14.2	B	Faience	1	short oblate		green
	T.21	Z21/15.1	B	Ostrich eggshell	1	disc cylinder		
	T.21	Z21/15.2	B	Faience	1 fragment			
4.6	T.21	Z21/16.1	B	Quartz	1	globular		white
4.6	T.21	Z21/16.2	B	Faience	110	standard tubular		green
	T.21	Z21/17.1a	B	Quartz	1			
	T.21	Z21/17.1b	B	Quartz	16			
	T.21	Z21/17.2	B	Chalcedony	5			
	T.21	Z21/17.3	B	Limestone	67			
	T.21	Z21/17.4	B	Faience	27			

D	L/Th/W	HD	Context data	Season	References
7.95	8.84	2.5	Burial chamber, S part	2009	Then-Obłuska 2016c, Fig. 3
11.67×10.46	15.8	1.38; 2.22	Burial chamber, S part	2009	
10.97×9.96	15.92	2.06	Grave chamber, S part	2009	Then-Obłuska 2016c, Fig. 3
3.36–3.73	2.3–3.37	1.3	Grave chamber, S part	2009	Then-Obłuska 2016c, Fig. 7
3.46–5.8	c. 3.9	2.1	Grave chamber	2009	
3.36	2.38	1.1	Grave chamber	2009	
			Central part of shaft, damaged blocking level	2007	
			Chamber	2007	
			Shaft, damaged blocking level	2007	
			Shaft, damaged blocking level	2007	
5.6	5.75; 6.5	1.98	Robber hole, NW part, near stones from damaged blocking wall	2011	
4.26	3.17	1.5	Robber hole, NW part, near stones from damaged blocking wall	2011	
5.34–3.93	4.64–4.3	1.5	Robber hole, NW part, near stones from damaged blocking wall	2011	
5.5–4.26	7.3–5.26	1.5	Robber hole, NW part, near stones from damaged blocking wall	2011	
4.8	6.83	1.73	Shaft, N part, depth: 0.9 m	2011	
5.63	6.44	2.5	Shaft, N part, depth: 0.9 m	2011	
5.0	4.57–4.12	1.5	Shaft, N part, depth: 0.9 m	2011	
4.42	7.23	1.8	Shaft, N part, depth: 0.9 m	2011	
5.08–4.05	7.56–5.24	1.9–1.0	Shaft, NE part, near skull and stones from damaged blocking wall	2011	
5.93	4.9	2.15	Shaft, NE part, near skull and stones from damaged blocking wall	2011	
3.8	5.65	1.85	Shaft, NE part, near skull and stones from damaged blocking wall	2011	
5.77	8.88–6.5	1.8	Shaft, near bottom	2011	
6.7–4.9	5.56–4.2	1.8	Shaft, near bottom	2011	
3.8	3.67	1.65	Shaft, near bottom	2011	
4.9–5.9	8.8–7.1	2.15	Burial chamber	2011	
4.58–5.96	4.8–6.35	1.7	Burial chamber	2011	
3.31–4.55	2.75–4.04	2.1	Burial chamber	2011	
3.32–4.18	4.96–6.5	1.35	Burial chamber	2011	
11.3×11.22	16.5	3.18×3.08; 1.77×1.8	Burial chamber	2011	
11.02×11.13	14.77	2.88×2.36; 1.57×1.37	Superstructure (surface)	2011	Then-Obłuska 2016c, Fig. 3
			Fill of shaft, S part	2013	
			Fill of shaft, S part	2013	
			Fill of shaft	2013	
			Fill of shaft	2013	
c. 10			Burial chamber, NW part	2013	
			Burial chamber, NW part	2013	
			Burial chamber, N part	2013	
			Burial chamber, N part	2013	
			Burial chamber, N part	2013	
			Burial chamber, N part	2013	
			Burial chamber, N part	2013	

TABLE 4.1 Catalogue of the beads and pendants (*cont.*)

Figure no.	Tumulus no.	Find no.	B/P	Material	Quantity	Shape	Technique	Colour(s) and diaphaneity
4.6	T.22	Z22/9	B	Faience	12			
	T.24	Z24/4.1	B	Quartz	1?			
	T.24	Z24/4.2	B	Faience	1?			
	T.24	Z24/46	B	Faience	9			
	T.24	Z24/48	B	Faience	1			
4.8	T.24	Z24/49.1	B	Ostrich eggshell	1			
4.8	T.24	Z24/49.2	B	Glass	1			green
4.8	T.24	Z24/49.3	B	Glass	many fragments			blue
4.8	T.24	Z24/49.4	B	Glass	1 (in fragments)			yellow
4.4	T.24	Z24/55	B	Carnelian	2	long square bicone		red
	T.25	Z25/34	B	Shell?	1			
	T.25	Z25/35	B	Coral	1			
	T.25	Z25/36	B	Faience	72			
	T.26	Z26/1	B	Faience	1			
	T.26	Z26/6	B	Faience	13			
	T.27	Z27/4.1	B	Faience	100 (2 broken)	standard and long tubular	glazed	light green and blue glazed; whitish cores
4.4	T.27	Z27/4.2	B	Stone; steatite	1	scarab		light grey; traces of turquoise glaze
	T.27	Z27/4.3	B	Glass	1	oblate	drawn	red; covered with yellowish patina
	T.27	Z27/5	B	Mollusc shell; *Cypraea annulus* sp.	3 (1 broken)			white
	T.27	Z27/9	B	Glass	12	oblate	drawn	dark red (covered with patina) (0)
4.6	T.28	Z28/4.1	B	Glass	1	oblate	drawn and rounded	green
4.6	T.28	Z28/4.2	B	Faience	30			
	T.28	Z28/14	B	Faience	30			
4.2, 4.8	T.28	Z28/15.1	B	Ostrich eggshell	3			
4.8	T.28	Z28/15.2	B	Quartz	1	globular	saw marks across one of holes	red
4.8	T.28	Z28/15.3	B	Faience	50			
4.8	T.28	Z28/15.4	B	Glass	5		drawn and rounded	green
4.8	T.28	Z28/15.5	B	Glass	5		drawn and rounded	blue and blue-green; translucent
4.8	T.28	Z28/15.6	B	Glass	2		drawn; segmented	dark blue
4.8	T.28	Z28/15.7	B	Glass	1		drawn; segmented	covered with thick patina
4.2, 4.6	T.28	Z28/17.1	B	Ostrich eggshell	3			
4.6	T.28	Z28/17.2	B	Faience	71			
	?	?	B	Faience	12 (1 half)			

B bead
P pendant

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D	L/Th/W	HD	Context data	Season	References
			Shaft	2005	
			Shaft, central and N part	2012	
			Shaft, central and N part	2012	
			Chamber 1, SE part (E and SE corner)	2012	
			Sedimentary fill of shaft	2012	
			Shaft, N part, depth: 1.6 m	2012	Then-Obłuska 2016c, Fig. 7
			Shaft, N part, depth: 1.6 m	2012	Then-Obłuska 2016c, Fig. 7
			Shaft, N part, depth: 1.6 m	2012	Then-Obłuska 2016c, Fig. 7
			Shaft, N part, depth: 1.6 m	2012	Then-Obłuska 2016c, Fig. 7
			Chamber 1, E part (NE corner), next to skeleton	2012	Then-Obłuska 2016c, Fig. 4
			Chamber 1	2007	
10.5×16.9			Chamber 1	2007	
			Chamber 1	2007	
			Shaft (robber hole), N part	2014	
			Chamber 1, E part, near human bones	2014	
3.43–5.64	2.93–5.87	*c.* 1.7	Burial chamber, central part	2009	
10.24×13.01×5.24		1.8; 1.9	Burial chamber, central part	2009	Then-Obłuska 2016c, Fig. 4
3.52	3.16	1.0	Burial chamber, central part	2009	
15.58×21.87×6.35; 15.23×20.25×6.6; 11.9×17.46×4.82		15.66×11.25; 14.7×11.0; 12.07×9.7	Burial chamber, central part	2009	Then-Obłuska 2016c, Fig. 2
3.1–4.55	2.28–3.23	1.4	Burial chamber, central part	2009	
			Shaft, depth: 1.5–2 m	2012	Then-Obłuska 2016c, Fig. 5
			Shaft, depth: 1.5–2 m	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, central part	2012	
c. 15			Burial chamber, S part, near skull	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, S part, near skull	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, S part, near skull	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, S part, near skull	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, S part, near skull	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, S part, near skull	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, S part, near skull	2012	
			Burial chamber, N part	2012	Then-Obłuska 2016c, Fig. 5
			Burial chamber, N part	2012 2005	Then-Obłuska 2016c, Fig. 5

CHAPTER 5

Jewellery

1 Material Analysis (Materials and Techniques, Provenance and Parallels)

The described jewellery elements also include earrings, chain fragments, cabochons (some with silver settings), rings, and a pin. There is also a shank-bead and bell pendants. The metal finds comprise a rosette stud and pins, a badge with an embossed cross, as well as pieces of embossed sheet metal.

1.1 *Shank-Bead*

One solid-cast silver fly amulet has a body decorated with stippling. On its underside there is a lateral perforation running through a narrow protuberance reminiscent of a button shank, making this a so-called shank-bead (Z4/95.2) [see **Fig. 5.1**]. Amulets in the form of shank-beads made of diverse materials are well known from Meroitic assemblages (Then-Obłuska 2016b; Rose, Then-Obłuska, and Pyke forthcoming). Unlike Egypt where fly amulets were common, they had special significance in Nubia. Made of precious metals, these amulets characterized rich assemblages, starting with a gold fly in the royal A-Group tomb in Qustul (Williams 1986, 306, Pl. 110a, b). Later on, large fly pendants made of ivory and gold were found in elite tombs in Kerma. Many small fly amulets dating from the period of Egyptian domination in New Kingdom times have been recorded in Nubia. Gold specimens are known from the First Archaeological Survey of Nubia (Firth 1927, Pl. 28 b), such as the gold fly pendant found in the tomb of Tanwetamani (Ku. 16) at El-Kurru (MFA [= Museum of Fine Arts, Boston] 21.314). Gold fly pendants with an attached loop or fly beads are deemed to have originated in the Meroitic period. A bracelet consisting of 13 such gold fly beads strung together in their original order, was found in Meroe, in tomb Beg. W 179, on the right wrist of the deceased (Dunham 1963, Fig. 133 =MFA 24.1092). Another 11 gold fly elements were also found in Meroe (MFA 24.538).

Two gold fly pendants were recovered from a tomb (D 16.1) in Wadi Terfowi in the Eastern Desert. Each fly has a suspension loop on its head (Castiglioni and Castiglioni 2004, Cat. 106 =SNM 31347). Last but not least, six silver toe-rings consisting of a ring and an attached fly were found in the Nobadian royal tomb B.47 at Ballana (Emery and Kirwan 1938, Pl. 42, object B.47–48). A similar fly ring was also found in a large tumulus tomb at Firka: A.11/55 (Kirwan 1939, Pl. XXI). Although the fly shank-bead from the El-Zuma tomb has no strict parallel, it is an example of an elite style that was popular for a long time in Nubia.

1.2 *Bell Pendants*

Small metal bells found at El-Zuma were made of silver (Z4/11), copper alloy (Z1/33, Z15/9, Z16/24), and copper alloy with an iron clapper (Z4/82) [see **Figs 5.1**–**5.3**].

A better-preserved silver specimen was cast with a half-elliptical profile and outlined rim. At the top of the bell there was a hole through which both the wire forming the handle and the hook for the clapper were threaded. The clapper is made of wire, with one end wound tightly around the handle (Z4/11) [see **Fig. 5.1**].

Copper alloy bells similar in their construction were found in other El-Zuma tumuli (Z1/33, Z15/9, Z16/24) [see **Figs 5.2, 5.3**]. The El-Zuma examples resemble a specimen known from the Napatan site of Hillat-el-Arab, although they can also be associated with some post-Meroitic artefacts (Vincentelli 2006, A.18:857). They are also reminiscent of two bells from the post-Meroitic graves T1 and T300 in Nag el-Arab (Pellicer Catalán and Llongueras Campañà 1965, 89, 98, 177, Fig. 33:5; MAN [= National Archaeological Museum, Madrid] 1980/95/20bis and 206bis, personal observation). A very similar bronze specimen was found among the beads from grave S56/T2 on Saffi Island in the Fourth Cataract region.

One of the copper alloy bells has an iron clapper (Z4/82) [see **Fig. 5.2**]. The bell is 17 mm in diameter. Its handle consists of a wire bent at one end into a hook from which the clapper was suspended. The clapper itself is not bent, but simply perforated.

Three bronze bells with iron clappers were found on a string around the neck of a camel at Firka (Kirwan 1939, Pl. 16:A.11/6). A chain bracelet with bronze bells featuring iron clappers, similar to the El-Zuma example, was also found with a human body (Kirwan 1939, 6, Pl. 18:A.11/50). The copper alloy bell Z1/33 is larger in terms of its diameter [see **Fig. 5.2**]. Traces of what was most probably an iron handle and clapper can be discerned on top of and inside the bell. Although the bell could have been part of a copper alloy necklace dated to the late Roman period (Petrina 2014, Fig. 8), small metal bells were a feature of various adornments in Nubia during the period under discussion (Then-Obłuska 2016c and references therein). In one case in El-Zuma, bells were found in a burial chamber next to

FIGURE 5.1 Fly amulet and bell pendant
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

a human skull (Then-Obłuska 2016c, object Z16/24). It is not certain that the bells from other tumuli were associated with a necklace worn by a person.

1.3 *Cupola*

A bronze cupola (Z13/29) with the rim bent inwards was most probably a fitting for the leather case next to which it was found [see **Fig. 5.3**].

1.4 *Cross Pendant*

A highly corroded iron cross (Z16/25) [see **Fig. 5.3**] with flared arms. It measures about 50 mm in height. No possible loop fitting could be seen at either end of the longer, vertical arms. A smaller iron cross (32 mm in height, 19 mm in width and 2 mm in thickness) with flared arms and attached cylindrical loop comes from Firka (SNM 24259, excavation number 3-6-15/1/1). A similar but smaller copper pendant was found in a Nobadian grave at Qustul (Williams 1991, 305, Fig. 145c). Large crosses found in conjunc-

FIGURE 5.2 Bell pendants
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 5.3 Bell and cross pendants, and a cupola
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 5.4 Earrings
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

tion with beads are known from contemporary contexts in Egypt (Petrie 1914, 32, Pl. XXIII, 137a bronze) and from a Byzantine grave in Syria (Montero Fenollós and Al-Shbib 2008, Pl. L:3 iron).

1.5 *Earrings*

Two earrings were found in El-Zuma. In both cases they take the form of a pendant attached to a crescent-shaped hoop.

One is a gold alloy earring (Z4/12) which was discovered together with a silver bell pendant in T.4 [**Fig. 5.4**]. The earring measures about 12 mm in width and 22 mm in height. It consists of two parts (a hoop and pendant) soldered to one another with an alloy. The hoop is a crescent-shaped penannular ring with a circular section. One terminal is markedly thinner than the other. Crescent-shaped earrings are known from Nubia (Allason-Jones 1991, Cats 17–18, and references therein) and Aksum (Phillipson 2000, 344, Fig. 299e; Munro-Hay 1989, Fig. 15.189). Similar hoops of diverse metals are known from Nubia from the period under discussion, such as the upper part of pendant earrings, as in the case of this example from El-Zuma (Then-Obłuska 2016c and references therein). The wire pendant attached to the hoop has two spiral terminals with thinned ends. The central portion was beaded using a rolling technique and bent into an open loop onto which a hemispherical sheet-metal boss was soldered. The boss was attached to what was presumably the front of the earring. Loops with spiral ends constitute a very common element of ancient jewellery, including Nubian and pre-Aksumite pieces (Then-Obłuska 2016c and references therein).

The second earring (Z1/32), made of gold or gold alloy, also consists of a hoop and pendant soldered with an alloy [see **Fig. 5.4**]. The hoop is again a crescent-shaped penannular ring with a circular section. The pendant attached to the hoop consists of two conical caps with a faded coral bead in between. The upper cap was made by assembling a ring of beaded wire at the top and bottom, with four looped wires soldered between them. The looped wires have outwardly bent ends. The lower cap was made using the same technique, but the base has a claw setting additionally soldered onto it. Similarly constructed earrings comprising a hoop and a pendant, made of silver and featuring a coral bead, are known from the royal Nobadian cemeteries at Qustul and Ballana (Emery and Kirwan 1938, Pl. 41A:B.47–21, 53, B:Q.14–65, C:Q14–59 =JE 70361a,b, 7035?a,b, 70365a,b). A pair of silver hoop earrings with coral bead was also found in Grave 64 at Cemetery E in Gemmai (Bates and Dunham 1927, 59, Pls 38.2.D, D', 68: Fig. 37 =Peabody Museum 24-24-50/B4037).

1.6 *Rings*

Three rings come from one El-Zuma tumulus. Two are made of copper alloy and one of gold or copper-rich gold.

Two copper alloy rings, Z21/18–19 [see **Fig. 5.5**], were cast as penannular hoops and measure about 20 mm in diameter, 2 mm in thickness and 4 mm in width. Their terminals are not soldered. One of them has rounded terminals (Z21/18). The terminals of toe-ring Z21/19 are slightly flattened. In the latter example, a button protruding from the hoop might have been the bezel for a setting. Both decorated and undecorated rings have been recorded in Nobadian assemblages (e.g. Säve-Söderbergh 1981, 48 and references therein; Williams 1991, Pl. 77).

The gold alloy finger-ring consists of a lozenge-shaped bezel (set with mosaic glass) and a hoop (Z4/97) [see **Fig. 5.5**]. The box setting is made of thin beaten metal and is bordered by beaded wire, while the hoop, round in section, is transversely ribbed. The glass inlay is made from slices of mosaic glass cane in a checkerboard pattern of yellow, red, white, and black. Checkerboard mosaic glass has been identified mainly in Meroitic and post-Meroitic bead assemblages (e.g. Then-Obłuska 2015a). Globular checkerboard beads were found in Nobadian royal tombs (Emery and Kirwan 1938, Pl. 46D, No. 157) and other contexts (Williams 1993, 230; OIM E19841—Serra East). It is uncertain whether these are reused Meroitic items. Checkerboard glass with diverse colour patterns is known to have been in use as of late antiquity (Lankton 2003, Fig. 7.0, 596), and the production of checkerboard mosaic beads continued into the medieval period (e.g. Siegmann 1997, 138, Pls 3, 4—H11/A1). A similar ring, but with a bezel of thin beaten gold set with a beryl, was found in Ballana (Emery and Kirwan 1938, Pl. 42B, object B.2–15). A ring with a similarly executed grooved hoop was found at Gemmai (Bates and Dunham 1927, Pl. LXXVIII: Figs 6, E/R52, 18, Z4/R11). Two bronze finger-rings with beaded hoops and simple silver bezels were found at Kosha (Kirwan 1939, Pl. XIX:K1/23). A silver ring from Soba is said to have had incised grooves (Allason-Jones 1991, 126, Cat. 3).

1.7 *Chains*

Three chains were found in El-Zuma, each representing a different type: single loop-in-loop, double loop-in-loop, and a braid of three double-wires.

1.7.1 Single Loop-in-Loop Chain with Cross-Shaped Elements

The first is made of gold alloy, and takes the form of a basic single loop-in-loop chain (Z4/98) [see **Fig. 5.6**]. It has two cross-shaped elements: a perforated cross with flared arms simply threaded onto the chain, and a decorated cross with wire loops at two ends, which are attached to the chain. One loop wire is bent upward, while the other is bent to one side.

1.7.2 Double Loop-in-Loop Chain

The second is a basic double loop-in-loop chain Z4/113 made of silver [see **Fig. 5.7**]. In contrast to single loop-in-loop chains, in which the link being added is inserted through the last link on the growing chain, double loop-in-loop chains are made by inserting a link through both the next-to-last and the last links (Stark and Smith 1997). This chain type can be observed attached to archer's bracers made of sheet metal, most probably to be hung on a thumb (Emery and Kirwan 1938, Fig. 86C, Pl. 52A, B, objects B.80–49, B.9–28). A much thicker chain of this type was also used for the silver horse equipment bits in Q.3–93 and Q.31–48 (Emery and Kirwan 1938, Pl. 59).

1.7.3 Braided Chain

The third is a basic braid created using three silver double-wires (Z10/46) [see **Fig. 5.7**], which were intertwined, resulting in a flat, solid structure.

1.8 *Dress Pin or Hairpin*

A silver pin consisting of a long thin shaft, circular in section, with a round, tapered end (Z4/212) [see **Fig. 5.7**]. It is 70 mm long, 2.5 mm thick and has a head of 6 mm in diameter. It might have been a hairpin, though in Roman times hairpins were mostly carved in bone and ivory, while dress pins were usually made of metal (Rodziewicz 2007, 28–30).

1.9 *Cabochons and Settings*

Fifty round, oval and rectangular cabochons made of precious stone and glass were found in the tunnel of T.4 at El-Zuma [**Fig. 5.8**]. Some of them (26 in all) were mounted in silver settings.

Additionally, eight beaded settings (Z4/144.1, Z4/146.1–3, Z4/147, Z4/148, Z4/149, Z4/171) and many fragments (Z4/138, Z4/144.2–6, Z4/145, Z4/150, Z4/172.1–8) were collected [**Figs 5.9–5.13**].

Round cabochons outnumber the oval and rectangular ones. In the case of one rectangular cabochon, the exterior part was faceted. Some are lentoid-shaped.

Most of the cabochons were made of carnelian or red agate, while the remaining ones seem to be purple, green or green-and-yellow glass, and differ in size. Among the **round cabochons** those measuring **7 mm to 11 mm** in diameter predominate (Z4/118–125, Z4/27–131, Z4/136, Z4/140, Z4/141, Z4/154–158, Z4/161, Z4/164, Z4/166–168, Z4/170). Smaller ones, **4 mm to 5 mm** in diameter (Z4/126, Z4/151,

FIGURE 5.5 Rings
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FIGURE 5.6 Chain fragments
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 5.7 Chain fragments and a pin
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

Z4/153), or larger specimens measuring **15.5 mm** in diameter (Z4/163) were also found. The largest **oval cabochon** (Z4/159) measures **16 mm in width and 22 mm in length**, and **the smallest ovals are 6 mm by 11 mm** (Z4/152, Z4/173). The **rectangular cabochons** measure **10 mm by 14 mm** (Z4/114, Z4/117).

The bottom and the sides of the **box settings** are made of thin beaten and soldered silver, and are bordered with beaded wire. The settings were filled with white plaster to keep their shape and to facilitate the setting of the cabochon. The metal sheet at the bottom is usually partly extant and retains an irregular layer of plaster. The plain surface of the plaster bears an impression of the cabochon that was once set in it. Most of the round specimens measure from 11 mm to 15 mm in diameter (Z4/118–125, Z4/127–130, Z4/136, Z4/164, Z4/166–168). The smallest are 9 mm in diameter (Z4/126) and the largest is 20 mm in diameter (Z4/163). Oval settings measure 10 mm by 14 mm to 17 mm by 21 mm (Z4/115, Z4/116, Z4/162, Z4/173). The rectangular settings are 14 mm by 17 mm and 14 mm by 19 mm in size (Z4/114, Z4/117).

Silver settings with stone cabochons were found at the Nobadian royal cemetery of Qustul in the following objects: a jewelled collar that was an element of horse

FIGURE 5.8 Cabochons and settings from T.4
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FIGURE 5.9 Cabochons and settings from T.4
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FIGURE 5.10 Cabochons and settings from T.4
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FIGURE 5.11 Cabochons and settings from T.4
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FIGURE 5.12 Cabochons and settings from T.4
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 5.13 Cabochons and settings from T.4
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

equipment (Emery and Kirwan 1938, Pl. 62A, Q.3–93, 94), a child's bracelet (Emery and Kirwan 1938, Q.14–60 Pl. 38F), and rings Q.14–84 (Emery and Kirwan 1938, Pl. 42B,D); however, all of them lacked the beaded wire decoration. Furthermore, two bracelets from Ballana (Emery and Kirwan 1938, Fig. 80, Pl. 40: object B.47–14, and B.47–15 =The Nubian Museum in Aswan) and two from the royal cemetery at Meroe (Dunham 1963, Fig. 126, 127a =MFA 24.1001, 24.1002, W 130 [55–65?]) featured round, oval and rectangular settings. However, unlike the Nobadian crowns and the El-Zuma finds, the bracelets lack the beaded settings around the small cabochons. Approximately 50 round, large and small, oval and rectangular bezels of carnelian, garnet, emerald as well as green glass adorned three of the Nobadian crowns; thus, the 50 cabochons from El-Zuma would definitely have made at least one of the crowns as illustrated in Ballana (Emery and Kirwan 1938; Török 1988).

The Ballana crowns were simple circlets or circlets encrusted with stones. Additionally, some of them have elements attached at the edges, sometimes encrusted with stones. The Nobadian crowns were constructed of silver, iron, plaster and wood, and often encrusted with precious stones. The circlets were fastened at the back with a metal strap and nails. All the circlets were decorated with embossed friezes (Emery and Kirwan 1938, 183–186). Except for B.6–20 and B.4, found in one of the princes' tombs, crowns decorated with stones were found in royal tombs (Emery and Kirwan 1938, B.47–13, Pl. 35A; B.80–48, Pl. 33A; B.95–22, Pl. 32B; B.114–11, Pl. 34A; B.118–29, Pl. 36A) dated to between AD 420 and 490 (Török 1986, 197). Some of them were encrusted solely with round and oval cabochons (B.6–20, B.47–13, B.80–48). Others were decorated with large round, oval and rectangular settings arranged in three rows (B.95–22, B.114–11, B.118–29). Stone settings are found in the upper and lower rows, as well as in the middle row, alternating with embossed kings' busts in B.95–22 and B.114–11, and *udjat* eyes in B.118–29. Additionally, small stones adorn the *nef-nef* crown of embossed kings' bust motifs (B.95–22) and *udjat* eye motifs (B.118–29). Furthermore, the eyes of a ram's head attached to the circlet's edge are set with tiny cabochon settings in B.95–22 and B.114–11, without beaded wire. It should be added that some of the cabochons in B.114–11 and B.118–29 are made of green glass.

The three tombs in which crowns with round, oval and rectangular settings (B.95–22, B.114–11, B.118–29) were found have been dated to a period between AD 470 and 490 (Török 1986, 197).

1.10 *Other Decorated Metal Finds*

Many pieces of embossed sheet metal, beaded wires and cabochon settings, as well as studs, nails and staples were found in T.4, and a few in T.7 [**Fig. 5.14**].

Four fragments of a **flower-embossed silver sheet** (Z4/23.13–16) find exact parallels among certain metal fittings discovered in Ballana. In one case, a pattern was embossed on a scabbard sheet found in royal tomb B.80–36 (Emery and Kirwan 1938, 220, Pl. 49D), dated to about AD 420 (Török 1986, 197, Fig. 81A). The Ballana scabbard consists of two flat pieces of wood held together with a sheet of silver embossed with a variety of patterns (Emery and Kirwan 1938, 219, Fig. 81A–D). The same motif can be observed on the back of a horse saddle fitting (Emery and Kirwan 1938, object Q.36–165, Pl. 63E). Tomb Q.36 was dated to about AD 400 (Török 1986, 197). However, while sword fragments have been found, no horse bones have been identified from T.4 (Urszula Iwaszczuk, personal communication).

There are a few fragments of embossed silver **18-petal rosettes**, about 20 mm in diameter (Z4/23.17–22) [see **Fig. 5.14**]. Some fragments retain staples in certain places. Whereas the same rosette motif can be observed on a saddle fitting from Qustul tomb Q.31–40 (Emery and Kirwan 1938, Pl. 63G), a silver wreath with a series of rosettes from Ballana would be a better fit for the El-Zuma remains (Farid 1963, 101, Fig. 57–1, Pl. 26).

Many fragments of elongated plaques were embossed with **a scarab motif with a *hem-hem* crown and an *ankh* cross between the rear legs** (Z4/23.1–3, 5, 6, 8–12) [see **Fig. 5.14**]. The best-preserved fragment (Z4/23.1) measures approximately 38 mm by 28 mm. Fragments Z4/23.3 and Z4/23.6 appear to be parts of one element. The *hem-hem* crown is set above horizontal ram's horns, and consists of stylized bundles of reeds and a sun disk, flanked on each side by a single ostrich feather and a uraeus. No parallels have been found for these plaques so far; however, the scarab motif is reproduced in repoussé technique on a jewelled horse collar (Emery and Kirwan 1938, Pl. 62A) and embossed on an archer's bracer (Emery and Kirwan 1938, Pl. 86C). It remains a moot point whether the scarab was a motif applied frequently, alongside the rosettes, on Early Makurian crowns.

Three fragments of sheet silver with embossed **plumes** were found together with the fly shank-bead mentioned above and a nail (Z4/95.1–5) [see **Fig. 5.14**]. No parallel for such a motif has been traced so far.

Z4/23.24 [see **Fig. 5.14**] is a **12-petal rosette stud**. Two anklets of red leather decorated with a series of silver discs in the form of rosettes are mentioned as having been found in Burial C of prince's tomb B.6 at Ballana. The leather was

FIGURE 5.14 Decorated metal fittings
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cut into narrow strips and hemstitched, and the discs were attached with wire pins (Emery and Kirwan 1938, 187, Cat. No. 15). The tomb was dated to about AD 420 (Török 1986, 197). Leather elements with lead rosette studs were also found in private grave R 49–5e in Qustul (Williams 1991, Pl. 66c, Fig. 53c,e,f). They have been interpreted as armour studs.

Two rosette plaques are probably made of gold alloy sheets (Z4/213.1–2) [see **Fig. 5.14**]. They measure 18 mm in diameter. The rosettes were punched with a patrix on a mould and consist of 17 petals. They are perforated in the middle. Both examples have a nail driven through the perforation. They might be leather decoration, like the abovementioned examples.

Copper alloy **badge** Z7/7 takes the form of a round shield featuring a punched cross with flared arms and four rivets [see **Fig. 5.14**]. It measures about 40 mm in diameter and might have served as a leather ornament. A similar motif of a cross with flared arms is punched into a bronze pan found in one of the Ballana tombs (Emery and Kirwan 1938, Pl. 76B, B. 118–115).

2 Catalogue [Table 5.1]

The catalogue, in tabular form, presents jewellery remains according to find number. Object descriptions list (in sequence): figure number, find number (tumulus and object number), object type, material, quantity, form, colour, measurements (given in millimetres; D—diameter, L—length, W—width, Th.—thickness, H—height, HD—hole diameter), find context, season, references. The scale is 10 mm, unless otherwise stated.

TABLE 5.1 Catalogue of the jewellery

Figure no.	Tumulus no.	Find no.	Object	Material	Quantity	Form/shape	Colour	D	L/W/Th	Context data	Season	References
5.4	T.1	Z1/32	Earring	Gold and coral	1					Chamber 1, central part	2017	Then-Obłuska 2017, Fig. 5
5.2	T.1	Z1/33	Bell pendant	Metal	1					Chamber 1, central part	2017	Then-Obłuska 2017, Fig. 4
5.1	T.4	Z4/11	Bell pendant	Silver	1 (fragment)			16	wire Th. 0.9	Tunnel	2013	Then-Obłuska 2016c, Fig. 8; 2017, Fig. 4
5.4	T.4	Z4/12	Earring	Gold-alloy	1				W 12, H 22, wire Th. 1	Tunnel	2013	Then-Obłuska 2016c, Fig. 10; 2017, Fig. 5
5.14	T.4	Z4/23	Fitting	Silver	75	decorated fitting fragments + 1 piece of wood with nails				W tunnel, fill, 2.90–3.40 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 9
5.2	T.4	Z4/82	Bell pendant	Copper-alloy bell with iron clapper	1			17		W tunnel, fill, 9.00 m from shaft, dark bottom layer	2017	Then-Obłuska 2017, Fig. 4
	T.4	Z4/84	Ring	Copper-alloy	1			*c.* 32		W tunnel, fill, 8.70 m from shaft, dark bottom layer	2017	
5.1, 5.14	T.4	Z4/95	Fitting and fly bead	Silver	42					W tunnel, fill, 8.70 m from shaft, dark bottom layer	2017	Then-Obłuska 2017, Figs 4, 9
5.5	T.4	Z4/97	Finger ring	Gold-alloy	1	metal ring with checkerboard pattern, glass inlay				W tunnel, fill, near entrance to W room, dark bottom layer	2017	Then-Obłuska 2017, Fig. 6
5.6	T.4	Z4/98	Chain	Gold-alloy	1	chain with two cross-shaped metal elements				W tunnel, fill, near entrance to W room, dark bottom layer	2017	Then-Obłuska 2017, Fig. 7
5.7	T.4	Z4/113	Chain	Silver	1	fragment				W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 7
5.8, 5.9	T.4	Z4/114	Cabochon in setting	Silver, glass	1	rectangular	green-and-yellow		10×14; 14×17	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.9	T.4	Z4/115	Cabochon in setting	Silver, agate	1	oval	red		10×16; 17×21	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.9	T.4	Z4/116	Cabochon in setting	Silver, agate	1	oval	red		12×16; 16×21.5	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.9	T.4	Z4/117	Cabochon in setting	Silver, glass	1	rectangular	green		9.5×14; 14×19	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.9	T.4	Z4/118	Cabochon in setting	Silver, agate	1	round	red	11; 15		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.9	T.4	Z4/119	Cabochon in setting	Silver, agate	1	round	red	10; 13		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	

TABLE 5.1 Catalogue of the jewellery (*cont.*)

Figure no.	Tumulus no.	Find no.	Object	Material	Quantity	Form/shape	Colour	D	L/W/Th	Context data	Season	References
5.8, 5.10	T.4	Z4/120	Cabochon in setting	Silver, glass	1	round	green	8.5; 13		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.10	T.4	Z4/121	Cabochon in setting	Silver, agate	1	round	red	10; 15		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.10	T.4	Z4/122	Cabochon in setting	Silver, agate	1	round	red	9; 12		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.10	T.4	Z4/123	Cabochon in setting	Silver, glass?	1	round	green?	8; 12		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.10	T.4	Z4/124	Cabochon in setting	Silver, glass	1	round	green?	8; 13		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.10	T.4	Z4/125	Cabochon in setting	Silver, glass	1	round	purple	8; 11.5		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.10	T.4	Z4/126	Cabochon in setting	Silver, glass	1	round	dark purple	4.5; 9		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.10	T.4	Z4/127	Cabochon in setting	Silver, agate	1	round	red	8; 13		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.8, 5.11	T.4	Z4/128	Cabochon in setting	Silver, agate	1	round	red	9; 13		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.11	T.4	Z4/129	Cabochon in setting	Silver, agate	1	round	red	8; 11		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.8, 5.11	T.4	Z4/130	Cabochon in setting	Silver, agate	1	round	red	7; 12		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.8, 5.11	T.4	Z4/131	Cabochon in setting	Silver, glass?	1	round	dark purple	8		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.8, 5.11	T.4	Z4/136	Cabochon in setting	Metal, glass?	1	round	dark purple	7; 11		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.11	T.4	Z4/138	Setting	Silver	1	fragment				W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.8, 5.11	T.4	Z4/139	Cabochon	Glass	1	oval	green-and-yellow		8×11	W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	

TABLE 5.1 Catalogue of the jewellery (*cont.*)

Figure no.	Tumulus no.	Find no.	Object	Material	Quantity	Form/shape	Colour	D	L/W/Th	Context data	Season	References
5.8, 5.11	T.4	Z4/140	Cabochon	Glass	1	round	red	8.5		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.8, 5.12	T.4	Z4/141	Cabochon	Glass	1	round	red	7		W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer	2017	
5.12	T.4	Z4/144	Setting	Silver	6	1 round and 5 fragments				W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.12	T.4	Z4/145	Setting	Silver	1	fragment				W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.12	T.4	Z4/146	Setting	Silver	3					W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.12	T.4	Z4/147	Setting	Silver	1	oval				W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.12	T.4	Z4/148	Setting	Silver	1					W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.12	T.4	Z4/149	Setting	Silver	1					W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.12	T.4	Z4/150	Setting	Metal	1	fragment				W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/151	Cabochon	Glass	1	round	red	4		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/152	Cabochon	Glass	1	oval	red		6.5×10.5	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/153	Cabochon	Glass	1	round	red, whitish	5.5		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/154	Cabochon	Agate	2	round	red	7		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/155	Cabochon	Agate	2	round	red	10		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/156	Cabochon	Agate	1	round	red	13		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.12	T.4	Z4/157	Cabochon	Agate	3	round	red	8		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.12	T.4	Z4/158	Cabochon	Glass	3	round	dark purple	8		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.12	T.4	Z4/159	Cabochon	Glass	1	oval	red		10×22	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	

TABLE 5.1 Catalogue of the jewellery (*cont.*)

Figure no.	Tumulus no.	Find no.	Object	Material	Quantity	Form/shape	Colour	D	L/W/Th	Context data	Season	References
5.8, 5.13	T.4	Z4/160	Cabochon	Glass	1	oval; lenticular	green		13×16	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.13	T.4	Z4/161	Cabochon	Glass	1	round	dark purple	7		W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.13	T.4	Z4/162	Cabochon in setting	Silver, glass	1	oval	green		?; 12×16.5	W tunnel, fill, 8.50 m from edge of shaft	2017	
5.8, 5.13	T.4	Z4/163	Cabochon in setting	Silver, glass	1	round	green	15.5; 20		W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.13	T.4	Z4/164	Cabochon in setting	Silver, agate	1	round	red	8; 11		W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.8, 5.13	T.4	Z4/165	Cabochon in setting	Glass	1	oval	red		6×12	W tunnel, fill, 2.40–4.25 m from edge of shaft, layer 5	2017	
5.8, 5.13	T.4	Z4/166	Cabochon in setting	Silver, agate	1	round	red	9.5; 14		W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.8, 5.13	T.4	Z4/167	Cabochon in setting	Silver, agate	1	round	red	9		W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.8, 5.13	T.4	Z4/168	Cabochon in setting	Silver, agate	1	round	red	9; 12		W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	Then-Obłuska 2017, Fig. 8
5.8, 5.13	T.4	Z4/169	Cabochon	Glass	1	oval	green		7×12	W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.8, 5.13	T.4	Z4/170	Cabochon	Agate	2	round	red	7		W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.13	T.4	Z4/171	Setting	Silver	1					W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.13	T.4	Z4/172	Setting	Silver	8	fragments				W tunnel, fill, 8.70–9.60 m from edge of shaft, dark bottom layer	2017	
5.8, 5.13	T.4	Z4/173	Cabochon in setting	Silver, glass	1	oval	green		6×11; ca. 10×14	W tunnel, fill, entrance to W room (W chamber?)	2017	Then-Obłuska 2017, Fig. 8
5.7	T.4	Z4/212	Pin	Silver	1	pin				E tunnel, S part, dark layer	2017	Then-Obłuska 2017, Fig. 7

TABLE 5.1 Catalogue of the jewellery (*cont.*)

Figure no.	Tumulus no.	Find no.	Object	Material	Quantity	Form/shape	Colour	D	L/W/Th	Context data	Season	References
5.14	T.4	Z4/213		Gold-alloy	2	rosette decorated objects of thin plate		18		E tunnel, S part, dark layer	2017	Then-Obłuska 2017, Fig. 9
5.14	T.7	Z7/7	Badge	Copper-alloy	1	badge					2015	Then-Obłuska 2017, Fig. 9
5.7	T.10	Z10/46	Chain	Silver	1 (fragment)	chain fragment				Chamber	2007	
5.3	T.13	Z13/29	Cupola	Bronze		cupola with edges bent inside		15	11	Chamber 4, W part, near fragments of a leather case (Z13/15)	2009	Then-Obłuska 2016c, Fig. 8
5.2	T.15	Z15/9	Bell pendant	Bronze?	1 (fragment)	bell		20	Wire Th. 1	Fill of shaft, E part	2013	Then-Obłuska 2016c, Fig. 8
5.3	T.16	Z16/24.1–2	Bell pendant	Copper-alloy	2	bells				Chamber 1 (burial chamber), S part, near skull	2011	Then-Obłuska 2016c, Fig. 8
5.3	T.16	Z16/25	Cross	Iron	1	cross				Chamber 1 (burial chamber), S part, near skull and skeleton	2011	Then-Obłuska 2016c, Fig. 9
5.5	T.21	Z21/18	Ring	Bronze	1	ring		23	W 4.5–5; Th. 2–4	Burial chamber, central part	2013	Then-Obłuska 2016c, Fig. 11
5.5	T.21	Z21/19	Toe ring	Bronze	1	ring with single central button		21	W 4; 2—thickness of metal sheet	Burial chamber, central part; found on foot phalanx	2013	Then-Obłuska 2016c, Fig. 11

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CHAPTER 6

Toilet Box

1 Material Analysis (Materials and Techniques, Provenance and Parallels)

A gold alloy object (Z4/96) was found in the fill of the west tunnel of T.4, near the entrance to the west room, in the dark bottom layer (Then-Obłuska 2017, Fig. 10). It is a profiled cylinder made of beaten sheet metal [**Fig. 6.1**]. At one end, the edge was bent outward and decorated with bosses. The top of the cylinder is embellished with a beaded ring that serves as the setting for a carnelian bead. The bead is most probably threaded onto a wire that ends in a spherical ball. Its shape and construction are the same as that of the metal knobs known from Ballana, although they differ in the type of metal used. Silver cups with convex lids surmounted by a cylindrical knob are known from Ballana tombs (Emery and Kirwan 1938, Pl. 66C–F). A carnelian bead is set on the top of one of them, B.6–11 (Emery and Kirwan 1938, 275, size 13.4 cm in height). Again, the above-mentioned objects were found in a prince's tomb dated to the period between AD 420 and 440 (Török 1986, 197).

FIGURE 6.1 Lid knob: top, bottom and side views
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

CHAPTER 7

Gaming Set

1 Material Analysis (Materials and Techniques, Provenance and Parallels)

Various ivory fragments were identified as being parts of toilet boxes or dice containers, dice, and gaming pieces. A few fragments of bone intarsia were most probably parts of a game board. It is uncertain if an ivory plaque and wood remnants were parts of a gaming set.

1.1 *Ivory Containers*

All the fragments of ivory containers are small in diameter and they feature external decoration consisting of incised lines and dotted circles. Four ivory fragments form one cylindrical container [**Fig. 7.1**: Z4/8.3, Z4/8.19, Z4/54]. Its rim is rebated to receive a lid, and there is a recess inside to take the base. The cylinder measures 26 mm in diameter. Its interior is smoothly finished, while the exterior surface is decorated with four alternating panels. Two of them consist of rows of four incised parallel lines, with three rows at the top and four at the bottom. These bands alternate with rows of dot-in-circle motifs, three and two respectively. The other two panels are decorated with pairs of semicircles with a cluster of three dotted circles at their ends.

Another fragment (Z4/8.4) [see **Fig. 7.1**] was part of a cylindrical container with rebated edges to receive a lid and base. It measures 25 mm in diameter and about 45 mm in height. The exterior surface is decorated with rows of incised parallel lines alternating with two rows of dot-in-circle motifs. The main panel is decorated with dotted circles which form a swastika meander.

Z4/207 and Z4/221 are most probably fragments of the same object [**Fig. 7.2**]. The diameter of the top is 25 mm. They form a container with a recess on the inside at either end: one for a lid and the other for the base. Tiny traces of blue-green and red paste can be discerned in the incised lines and dotted circles. Bone plaques with coloured geometric patterns have been found in Alexandria (Rodziewicz 2007, 55–56, Cat. Nos 82, 83, 87).

A fragment of a cylindrical container (Z4/211.1) [**Fig. 7.2**] has its exterior surface decorated with linear bands alternating with dotted circles in a row. Except for the widest band, which is decorated with quadruple dot-in-circle motifs arranged in a checkerboard pattern, the other bands consist of dot-in-circle motifs arranged either in simple rows or in the form of a garland.

Another small fragment (Z4/211.2) [see **Fig. 7.2**] originates from a cylindrical container with one edge rebated, probably to receive a lid. The exterior surface is decorated with three incised bands consisting of three and four lines. A row of dotted circles lies between the first and the second linear band. A wide band of dotted circles in triangular arrangements is placed between the second and the third linear band.

One other fragment (Z4/106) [see **Fig. 7.2**] also belongs to a cylindrical container. The exterior surface is decorated with a band of four parallel lines between two bands of dotted circles.

The small diameter of the El-Zuma remains would point to their use as toilet boxes: kohl tubes, ointment containers or pyxides for necklace (Boussac 2019, 179, Cat. 108, 3rd–2nd century BC). The round pyxides may have also served as dice boxes (Rodziewicz 2007). Ivory kohl tubes and a vessel have been identified at Gabati (Edwards 1998, 126–127, Fig. 5.11 = 2004, Cat. 177, Fig. 5.12, object 8309) and at Qasr Ibrim cemetery 123 (Mills 1982, object 123.22.15), but they lack the incised decoration. A few ivory and wood kohl flasks and remains of ivory ointment containers were found at the Qustul cemeteries (Emery and Kirwan 1938, 342–343, Pl. 86; Williams 1991, Fig. 154b). They also lack any decoration in the form of dotted circles or they are figural in shape and do not match the El-Zuma fragments. Bone fragments decorated with incised lines and dotted circles were excavated in Kharga Oasis, where they were dated to the 4th–7th centuries AD (MET X.606.2a–x). Decoration consisting of incised lines and dotted circles can also be observed on an elongated fragment of a wooden vessel found in Wadi Qitna (P 3004) and another unidentified object (P 3005) (Strouhal 1984, 237–238, Fig. 155). An ivory kohl tube, similar in shape and with similar decoration to Z4/207 and Z4/221, is presently on display at the Bibliotheca Alexandrina Antiquities Museum (BAAM Serial 0907; showcase 24; Inv. Coptic Museum 1077). It measures 12.5 cm in height and is dated to the Byzantine period (AD 395–641).

1.2 *Dice*

Part of a bone die showing a "five", marked with dotted double circles, was found in T.4 (Z4/108) [**Fig. 7.3**]. The fragment measures 15.5 mm in length. Various bone fragments, including one with a dotted circle incision (Z4/180) [see **Fig. 7.3**], might also belong to another die. They mea-

FIGURE 7.1 Ivory containers
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 7.2 Ivory containers
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

sure about 15 mm in length. Bone/ivory dice were found throughout the late Roman Mediterranean world (e.g. Rodziewicz 2007, Cat. 558, Alexandria; Davidson 1952, Pl. 100, No. 1745, Corinth). Similar dice of bone and ivory can be traced to Nobadian sites in Lower Nubia, examples having been found in a single mound burial at Faras East (Säve-Söderbergh 1981, 68, object 19/1:13, Pl. 95:3, 12 × 14 × 16 mm, AD 500–600) and at Site 2 in Gamai East (Donner 1998, 282, Pl. 209:3, object 154A:4, 10.6 × 9.6 × 8 mm); they also accompanied the Qustul gaming board and pieces mentioned above (Emery and Kirwan 1938: Pl. 87F).

1.3 *Gaming Pieces*

Half of a large gaming piece made of ivory was found in El-Zuma T.7 (Z7/83) [**Fig. 7.4**]. It measures about 40 mm in diameter and 40 mm in height. It is possible that Z4/53, Z4/190, Z7/82, and Z7/84 are fragments of gaming pieces [see **Figs 7.3, 7.4**].

A leather bag with similar ivory gaming pieces was found beneath the board in the said Qustul tomb Q.3 (Emery and Kirwan 1938, 345, Pls 87B,C,D,F). It contained a set of 15 analogous white ivory gaming pieces together with 15 black wooden pieces, five dice and the remains of a *fritillus* (dice box) (Emery and Kirwan 1938, 345, Pl. 9F, 87C. A:Q.3–96). Furthermore, two ivory gaming pieces were found by the Finnish Expedition together with a bone die in grave 154 at Gamai Site 2. One is sub-cylindrical with the top decorated with concentric circles (22 mm in height and 20–25 mm in diameter) (Donner 1998, 282, Object 2/154A:11). The second item, Object 2/154A:15, is similar in shape and size to the El-Zuma and Qustul pieces and measures 50 × 45 × 45 mm (Donner 1998, 282, Pl. 201:4).

FIGURE 7.3 Gaming pieces
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

1.4 *Intarsia*

Five fragments of ivory intarsia were found in El-Zuma in T.7. They are floral-shaped but without any incised decoration. The fragments, 1.8 mm to 2 mm thick, form a pattern [**Figs 7.5**: Z7/66, **7.6**:B] that to some extent resembles an ivory vegetal motif that was set in the central panel of a wooden gaming board found at Qustul in tomb Q.3 [**Fig. 7.6**:A]. The board was found in the mound above Tomb 3 (Emery 1932, Pl. III, bottom; Emery and Kirwan 1938, 345, Pl. 87A, Q.3–95, Cat. No. 742; currently in the Nubian Museum, Aswan), and it was decorated with three rows of 12 squares of a floral design. Each line is divided by centrepieces, in the form of a circle and two semi-circles with small bolted rings inside, into groups of six. The gaming board measures 77.5 cm by 37 cm, which means that the central panels would be about 8.5 cm in diameter, while the decorative fragments, analogously to the El-Zuma ones, would be about 1 cm wide. Thus, in terms of their size, the El-Zuma remains correspond to the Qustul board decoration.

The Qustul game board was found in a royal tomb dated to about AD 380 (Török 1986, 197). Bell (1979, 28–29) suggested that the board has the same layout as a *duodecim scripta*, for which there was apparently a preference in the early Roman period, replaced later by a variant called a *tabula* (Bell 1979, 31). In Nubia, remains of *duodecim scripta* game boards, gaming pieces and dice were found in two Meroitic graves from the 1st century AD at

FIGURE 7.4 Gaming pieces
PHOTOS BY Z. KOWARSKA, PLATE BY J. THEN-OBŁUSKA

FIGURE 7.5 Intarsia
PHOTOS BY A. KAMROWSKI—Z4/257, Z. KOWARSKA—Z7/66,
PLATE BY J. THEN-OBŁUSKA

Sedeinga (Crist, Dunn-Vaturi, and de Voogt 2016, 136; de Voogt, Francigny, and Baas 2017 and references). However, their inlays lack the sophisticated decoration of the boards found at Qustul. According to László Török (1988, 102), the decorative ivory inlays of the Qustul board imitate *opus interrasile* jewels, suggesting that the game board was made sometime in the last few decades of the 4th century AD. In the history of Roman games, the El-Zuma fragments would constitute the southernmost example of a *duodecim scripta* board found in a grave context, which is dated between the mid-5th and mid-6th century AD. Another fragment of intarsia was found in El-Zuma in T.4 [**Fig. 7.5**: Z4/257].

1.5 *Ivory Plaque*

An ivory plaque, Z13/36 [**Fig. 7.7**], was found in T.13, but its function remains uncertain.

1.6 *Wood Fragments*

Wood fragments Z4/206 [**Fig. 7.8**] might have been remnants of a wooden box. One fragment features a lozenge pattern on one side and a rectangular depression on the other side.

1.7 *Perforated Pottery Disc*

Pottery disc Z5/20 features two holes [**Fig. 7.9**] and measures 33–35 mm in diameter and 6 mm in thickness. It might have been a game token. Similar specimens are known from Abu Geili (Crawford and Addison 1951, 99, Pl. LII B).

2 Catalogue [Table 7.1]

The catalogue, in tabular form, presents the gaming set according to find number. Object descriptions list (in sequence): figure number, find number (tumulus and object number), object type, material, quantity, form, colour, find context, excavation season, references. The scale is 10 mm, unless otherwise stated.

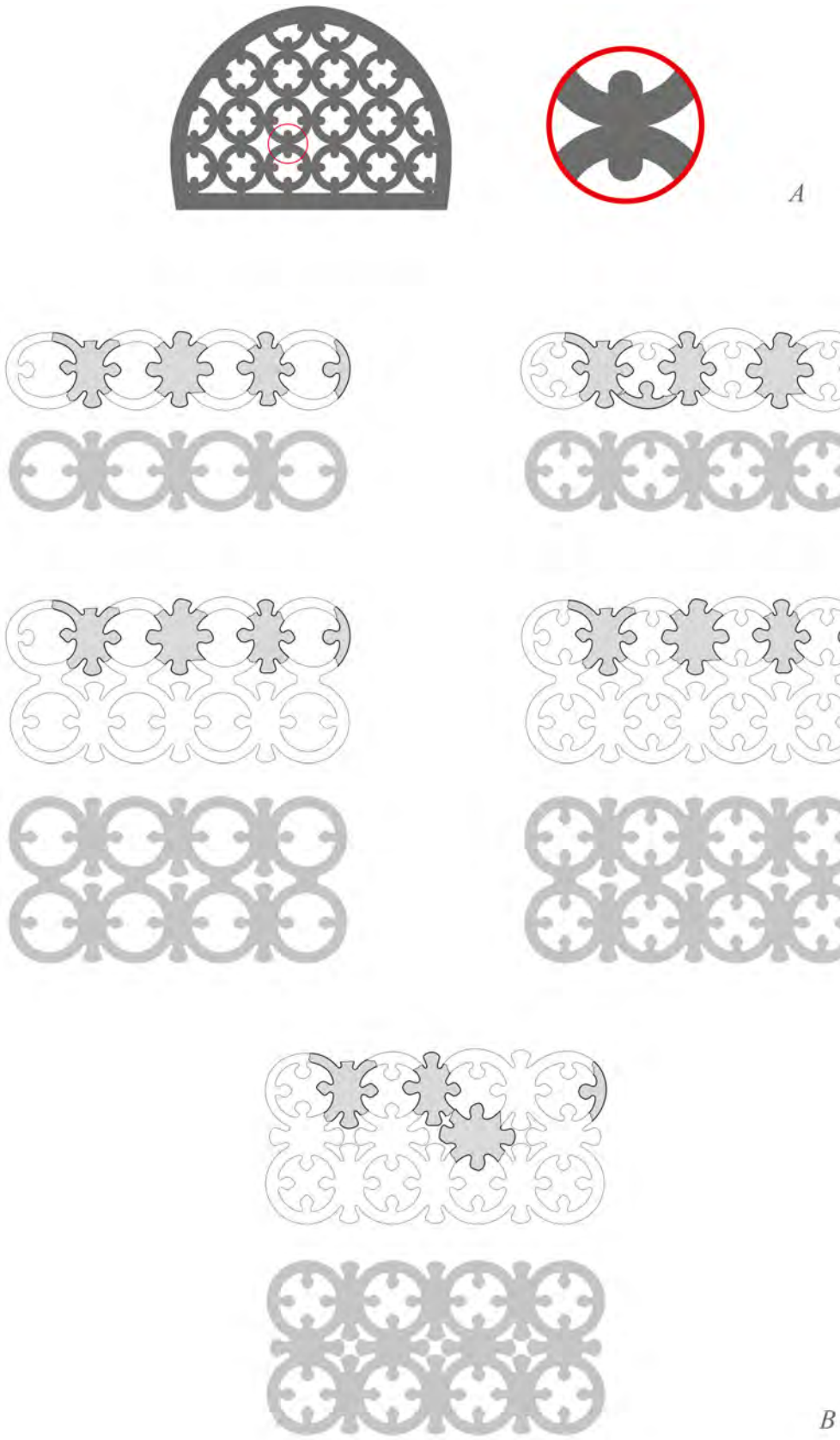

FIGURE 7.6 Intarsia patterns: A—pattern on a gaming board from Qustul, not to scale; B—reconstruction of various intarsia patterns, not to scale
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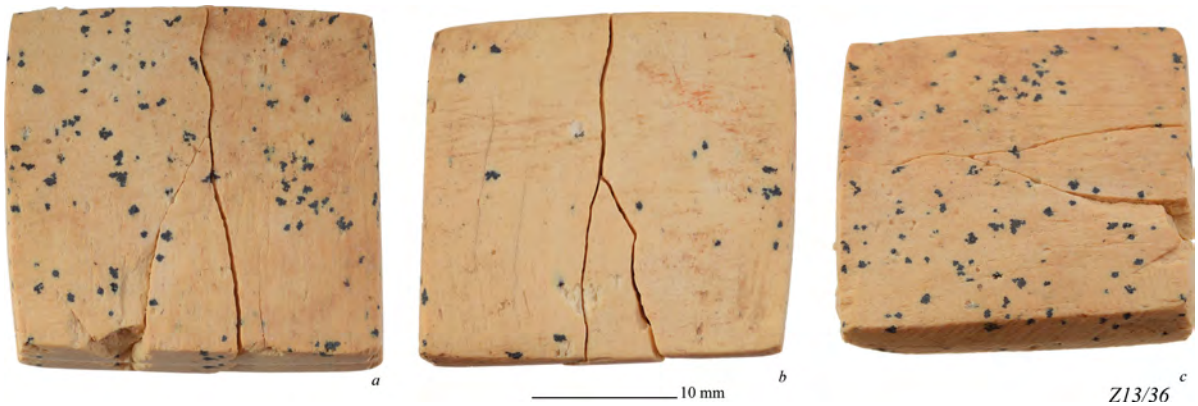

FIGURE 7.7 Ivory plaque
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 7.8 Wood fragments
PHOTOS BY A. KAMROWSKI, PLATE BY J. THEN-OBŁUSKA

FIGURE 7.9
Perforated pottery disc
PHOTO BY K. KOTLEWSKI, PLATE BY J. THEN-OBŁUSKA

TABLE 7.1 Catalogue of the gaming set

Figure no.	Tumulus no.	Find no.	Object	Material	Quantity	Form	Context data	Season	References
7.1	T.4	Z4/8.3	Container	Ivory	1 fragment, fits with Z4/8.19 and Z4/54	decorated fragment	Tunnel		Then-Obłuska 2017, Fig. 11
7.1	T.4	Z4/8.4	Container	Ivory	1 fragment	decorated fragment	Tunnel		Then-Obłuska 2017, Fig. 11
7.1	T.4	Z4/8.19	Container	Ivory	1 fragment, fits with Z4/8.3 and Z4/54	decorated fragment	Tunnel		Then-Obłuska 2017, Fig. 11
7.3	T.4	Z4/53	Gaming pieces	Ivory	1 in fragments		W tunnel, fill, 2.90–4.25 m from edge of shaft, layer 5		
7.1	T.4	Z4/54	Container	Ivory	2 fragments; 1 fits with Z4/8.3 and Z4/8.19	decorated fragment	W tunnel, fill, 2.90–3.40 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 11
7.2	T.4	Z4/106	Container	Ivory	2 fragments, joined together	fragments of decorated object	W tunnel, fill, W side, 8.50 m from edge of shaft	2017	Then-Obłuska 2017, Fig. 12
7.3	T.4	Z4/108	Dice	Bone	1	decorated fragment	W tunnel, fill, W side, 2.90–3.40 m from edge of shaft, layer 5	2017	Then-Obłuska 2017, Fig. 13
7.3	T.4	Z4/180	Dice	Ivory	many fragments	decorated	W tunnel, fill, 2.90–4.25 m from edge of shaft, layer 5		
7.3	T.4	Z4/190	Gaming pieces	Ivory	many fragments		E tunnel, fill, between pillars II and III		
7.8	T.4	Z4/206	Container box?	Wood	a few fragments		E tunnel, 2.50 m from the N end, bottom layer	2017	
7.2	T.4	Z4/207	Container	Ivory	3	decorated bone fragments	E tunnel, S part, bottom layer	2017	Then-Obłuska 2017, Fig. 12
7.2	T.4	Z4/211.1	Container	Ivory		decorated bone fragments	E tunnel, S part, dark layer	2017	Then-Obłuska 2017, Fig. 12
7.2	T.4	Z4/211.2	Container	Ivory		decorated bone fragments	E tunnel, S part, dark layer	2017	Then-Obłuska 2017, Fig. 12
7.2	T.4	Z4/221	Container	Ivory	2	decorated fragments, fits with Z4/54?, probably ivory	E tunnel, S part	2017	Then-Obłuska 2017, Fig. 12
7.5	T.4	Z4/257	Intarsia?	Ivory	1	fragment of decorated object	W tunnel, fill, W side, 2.90–3.40 m from edge of shaft, layer 5	2017	
7.9	T.5	Z5/20	Token?	Pottery	1		Tunnel, fill	2007	
7.5, 7.6	T.7	Z7/66	Intarsia	Ivory	6 fragments		Tunnel; Context 5	2015	Then-Obłuska 2017, Fig. 13
7.4	T.7	Z7/82	Gaming pieces	Ivory	4		Tunnel; Context 5	2015	Then-Obłuska 2017, Fig. 13
7.4	T.7	Z7/83	Gaming piece	Ivory	1		Tunnel; Context 8	2015	Then-Obłuska 2017, Fig. 13
7.4	T.7	Z7/84	Gaming piece?	Ivory	1?		Tunnel; Context 10	2015	
7.7	T.13	Z13/36	Plaque	Ivory	1		"found with animal bones"	2009	

CHAPTER 8

Discussion

Comprehensive quantitative analysis of ornament distribution by context (tumulus, tumulus construction type, find place) and anthropological factors is presented in **Table 8.1.** As mentioned in the introduction, the graves were found heavily robbed and were not completely excavated. Therefore, all observations made on ornaments in the quantitative, construction and anthropological sections below should be seen as tentative and not as characteristic of a given period and region, nor of tumulus type or anthropologically defined group.

1 Quantitative Analysis [Table 8.1]

Two thousand two hundred and forty-six beads, pendants and their fragments have been recorded at El-Zuma. Faience beads (n = 1956) overwhelmingly predominate this assemblage, making up 88.4% of it. Stone beads (n = 162) account for 7.2% and glass beads (n = 93) for 4.1%. The remainder is represented by 18 beads of mollusc shell, 14 ostrich eggshell beads, 1 coral, 1 glazed steatite, and 1 unidentified specimen.

Among jewellery items, 6 bells, 1 cupola, 3 rings (including a toe-ring), 2 earrings, 1 pin, 2 rosettes, 3 crosses, 1 fly shank-bead, and 1 badge were recorded. The remaining jewellery survives mostly in the form of fragmentary pieces and they are included in **Table 8.1.**

The number of ivory containers (n = 6), gaming pieces (n = 8) and dice (n = 2) has been estimated based on preserved fragments. Additionally, six fragments of intarsia are thought to have come from a game board, while one knob made of metal and carnelian was part of a toilet box.

2 Construction Approach (Tumulus Types I, II, III)

No beads were found in T.14 (type II) and T.19 (type III). All bead materials, South Indian/Sri Lankan glass bead imports included, were noted in all three tumulus types. Long square biconical carnelian beads were recorded in two type II tumuli (T.9, T.24).

In general, jewellery was found mainly in type I tumuli, the majority of it (chains and crosses, cabochons, bells, etc.) in T.4. Jewellery was missing from the remaining tumuli or else survived in the form of a few items or rather fragments. Thus, bells (T.13, T.15, T16) and an iron cross (T.16) were recorded in type II tumuli, and the only three rings found at the site (including one toe ring) all came from a type III tumulus (T.21). A fragment of chain was also found in a tumulus of the same type (T.10).

Gaming set remains were recorded in two tumuli ascribed to type I (T.4 and T.7).

3 Contextual Approach

Ornaments were not discovered in one specific place. They were found on the surface, in shafts, tunnels and burial chambers. In six tumuli, ornaments were found solely in the burial chamber (T.8, T.11, T.16, T.17, T.25, T.27). The richest in finds was T.4. Beads were discovered in its shaft and tunnel, the latter also yielding jewellery and gaming set remains; there were no finds in the burial chamber. Likewise, no finds were recorded in the chambers of T.3 and T.22; however, items were found in a tunnel, a robber pit, and a shaft.

Although only a few beads were found close to the first pillar of T.7, beads, jewellery and gaming set remains came to light in the tunnel of this tumulus.

4 Anthropological Approach

The sex of eight individuals from El-Zuma has been conclusively determined (see Volume I, Chapter 6). Females were recorded in T.1, T.25, T.26, and T.28, and males in T.10, T.17, T.21, T.22, T.27. No skeleton was found in T.12. In general, no particular bead material can be attributed to a given sex/age group. South Indian/Sri Lankan glass bead imports were noted in tumuli with both male and female burials. Large ostrich eggshell beads appeared solely in one female grave (Z28/15, Z28/17), and in one case (Z28/15) they were found near the skull. Similar specimens were recorded as a bracelet from grave 11 at site 47 in El-Kassinger Bahry. The grave was that of a mature female (Then-Obłuska 2014, Cat. 213, 214). A mature/senile female in Meroitic grave 7 at site 14 in Hagar Sail also had a bracelet/anklet of large retouched discs (Then-Obłuska 2014, Cat. 138).

A toe-ring was found with a male burial in T.21. A chain fragment was found with a male burial in T.10. Tumulus 4,

in which a gaming set and gold and silver jewellery were found, contained the bones of a probable male.

5 Remnants of Beadwork, Leatherwork and Jewellery

This section provides some remarks on the function of these objects, whose position in relation to body remains was clearly indicated in the fieldwork reports. Discussion on the possible function of the remaining ornaments found in El-Zuma is given above in the sections on material analysis.

Only in three graves were beads found in a place that might indicate what item of beadwork they had been part of. Some beads were found near the skull (Z20/8—faience beads, Z28/15—ostrich eggshell, stone, faience, and glass beads) or near the skull and skeleton (Z16/19–23—ostrich eggshell, stone, and faience beads). They were probably parts of necklaces; however, they may also have been part of a circlet, or even a bracelet if the hands were positioned next to the individual's head. Unfortunately, their state of preservation does not allow for conclusive identification.

In one grave, faience beads (Z13/30) were found close to a leather case (Z13/15) (see Chapter 18.2, Cat. 34, and **Fig. 18.5**, this volume), and it was suggested by the excavators that they may have been part of the case decoration. While leather bags or wraps with beads inside have been recorded in post-Meroitic Nubia (Säve-Söderbergh 1981, 38, object 19/1:15; Pellicer Catalán and Llongueras Campañà 1965, 61–62, Fig. 36:6, 17, Pl. XIX:3), as have beads sewn on to textiles or leather headbands, wristbands, and garments (Williams 1991; Żurawski 2010, Fig. 40; Longa 2011, 503), no leather cases decorated with beads have been reported so far.

A copper alloy cupola Z13/29 with the rim bent inwards was most probably a fitting for the leather case next to which it was found. Leather containers with metal fittings have previously been noted at Nobadian sites (Bates and Dunham 1927, 37–38, Nos 6, 15a–e, Pl. LXVII).

A copper alloy bell was found in the vicinity of the skull and an iron cross was found near the skull and skeleton in T.16. Both items may have been part of a necklace.

One of two bronze rings was found on a foot phalanx of the individual buried in T.21, thus evidencing a toe-ring with a male burial in El-Zuma.

TABLE 8.1 Contextual and quantitative overview of ornament remains according to tumulus construction type and anthropological factors

	Tumulus no.	T.1	T.3	T.4	T.5	T.7	T.8	T.9	T.10
	Tumulus construction type	I	I	I	I	I	I	II	III
	Sex	no data	no data	no data	M(?)	M(?)	F(?)	M(??)	M
	Age				**30–50**	**25–45**	**35–45**	**25–30**	**30–40**
Context	**Chamber**	*^			*		*	*	*^
	Tunnel	*^		*^+	*	*^+			
	Shaft			*	*			*	
	Robber pit		*						
	Surface								
Beads*	**Mollusc shell**	2		2		10			
	Coral								
	Ostrich eggshell				1				
	Stone			20		3		5	2
	Glazed stone								
	Faience		1	585	13	10	1	74	80
	Glass and metal-in-glass			31	1			1	
	Unidentified								
Beads Total		2	1	638	15	23	1	80	82
Jewellery remains^	**Earring**	1		1					
	Ring			1					
	Bells	1		2					
	Cupola								
	Chain			2 fr.					1 fr.
	Pin			1					
	Rosette			2					
	Fly shank-bead			1					
	Fittings			*c.* 120 fr.					
	Cabochons (agate, carnelian, glass)			50					
	Settings			32 and some fr.					
	Badge					1			
	Cross			2					
Gaming set remains+	**Containers**			6 in fr.					
	Pieces			2 in fr.		6 in fr.			
	Dice			2 in fr.					
	Intarsia			1?		6 fr.			
Other	**Plaque**								
	Wood fragments			5 fr.					
	Token?				1				
Toilet box lid knob				1					

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T.11	T.12	T.13	T.15	T.16	T.17	T.18	T.20	T.21	T.22	T.24	T.25	T.26	T.27	T.28	Total
II	II	II	II	II	III	III	III	III	III	II	II	II	III	III	
?	no skeleton	M(?)	F(?)	M(??)	**M**	F(?)	M(??)	**M**	**M**	F(?)	**F**	**F**	**M**	**F**	
16–18		**30–40**	**21–24**	**16–24**	**40–50**	**50+**	**50+**	**35–40**	**35–45**	**15–18**	**24–35**	**45–55+**	**35–45**	**40–55**	
*	*	*^	*	*^	*	*	*	*^		*	*	*	*	*	
		*	^			*	*	*	*	*		*		*	
	*						*								
							*								
	1												3		18
											1				1
		3		2				1		1				6	14
		7		6	17	5	2	91		3			1		162
													1		1
12	1	230	3	67	62	59	217	139	12	11	72	14	100	193	1956
	21	2			8					2			13	14	93
											1				1
12	23	242	3	75	87	64	219	231	12	17	74	14	118	213	2246
															2
								2							3
			1	2											6
		1													1
															3
															1
															2
															1
															c. 120 fr.
															50
															32 and some fr.
															1
				1											3
		1													

CHAPTER 9

Conclusions

After the fall of the Meroitic kingdom, three entities—Nobadia, Early Makuria, and Alwa (Alodia)—emerged in North-East Africa between the 4th and the 6th centuries AD. Richly furnished elite cemeteries with tombs of the Nobadian kings are known from Qustul and Ballana in Lower Nubia (Emery and Kirwan 1938), but until now no Early Makurian royal tombs have been identified. A comparative analysis of some excavated adornments and ornaments from the tumulus cemetery of El-Zuma in Upper Nubia has now enabled the Early Makurian elite tombs (AD 450–550) to be placed there.

Between 2005 and 2017, more than 2,000 items of personal adornment were excavated from 23 heavily robbed tumuli. The objects were found in the fill of chambers, shafts, tunnels, and in robber pits. Although the graves had been heavily looted, the remains of personal adornments provided a broad overview of the materials and techniques used in their production.

While the remains of personal adornments (beads, pendants, earrings, chains, and rings) were recorded in all 23 tumuli, remnants of elite jewellery (cabochons and settings), and other decorated items (metal sheets, ivory intarsia and gaming pieces) predominate the assemblages from three large, partly excavated tumuli of type I: T.1, T.4, and T.7. The provenance of the bead materials and the manufacturing techniques used suggests El-Zuma's involvement in regional and long-distance commercial exchange during the Early Makurian period. Apart from beads made of a variety of materials (Red Sea marine mollusc shell, Mediterranean Sea coral, ostrich eggshell, faience, stone with saw marks facilitating drilling), all of which were probably locally worked or made, the remaining items were faceted carnelian beads of Indian origin and glass bead imports from Egypt and Sri Lanka/South India.

Bells and crosses, as excavated at Early Makurian El-Zuma, are commonly found in early Byzantine graves in the East Mediterranean. Although the cross found in one of the El-Zuma tumuli may have been a personal souvenir that was buried with its owner, items of this sort are seen elsewhere as a result of the spreading influence of Christian ideology. Even if the cross was a looting trophy, some Nobadian elites appear to have been Christians (Welsby 2002, 31). A gold cross pendant came from one of the tombs at the Nobadian royal cemetery of Ballana (Emery and Kirwan 1938, object B. 2–7, Pl. 48F). Taking into consideration the portable character of adornments, it could be that cultural conversion as seen from the evidence of the small finds may have preceded all other archaeological indications of Christianity, also in Early Makuria.

Furthermore, many decorated objects (earring with coral, cabochons and settings, lid knob, metal sheet fragments) and the techniques used to make them find parallels in the elite Nobadian cemeteries of Qustul and Ballana, suggesting the elite character of some of the Early Makurian tomb occupants at El-Zuma. Among the ornaments found in the three largest El-Zuma tumuli (T.1, T.4, and T.7), a few fragments of intarsia may have come from a *duodecim scripta* gaming board, one of the most extraordinary artefacts found in Nubia. Dice fragments, many ivory gaming pieces and probable dice containers found in the tumuli support this interpretation. A decorated metal tube topped with a bead must have been a lid knob. Embossed fragments of sheet silver were once scabbard or saddle fittings. The discovered earrings, bells, chains, ring, and fly shank-bead, as well as the numerous silver cabochon settings are most probably elements of elite jewellery. Altogether, the broad diversity of ornaments and the fact that they have many parallels in the royal burials of Qustul and Ballana, indicate that El-Zuma was the cemetery of Early Makurian elite members of society.

Acknowledgements

I wish to thank Assist. Prof. Mahmoud El-Tayeb, director of the Early Makuria Research Project and the El-Zuma excavation project, and Ewa Czyżewska-Zalewska for making this study possible. Special thanks go to Dr. Alessandra Giumlia-Mair for her valuable comments on metal objects and to Dr. Urszula Iwaszczuk for help in identifying the species of animal bone.

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Metal Artefacts

Łukasz Zieliński and Ewa Czyżewska-Zalewska

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CHAPTER 10

Introduction

As mentioned earlier, the post-Meroitic period witnesses a rise in the prominence of military materials, which are often included in burials, and ironwork becomes much more plentiful (Edwards 2004, 207–208).

A large proportion of the objects presented in this part of the volume are metal artefacts, which are divided into four main groups: weapons and military equipment (blades, arrows, archer's rings); scabbards and belts; nails and fittings; and miscellaneous objects. The most numerous artefacts found at the cemetery are weapons and bed frame elements, such as nails and metal frame fittings. A lot of the metal objects are so fragmentary that it is not possible to determine their function. Many were found scattered across the burial chambers and even in the shafts. Only after initial sorting of the material did it transpire that the amassed fragments represent several different objects. The corroded fittings of bed frames, weapons, and tools were found together on one pile. Recognition of them was possible only upon careful analysis.

Because metal artefacts constitute a large proportion of the burial equipment presented in this section, it is necessary to provide an overview of the methods used to analyse and record these finds (see Chapter 11), as well as a short historical introduction to metal sources in Ancient Nubia (Chapter 12). Many of the objects were corroded and damaged, and required conservation. A short description of the conservation techniques used on the metal artefacts is given below (Chapter 13).

CHAPTER 11

Methods

The metal artefacts presented in this part of the publication (weapons, furniture fittings, tools) were made from different kinds of metal. The analysis of these objects involved the following:

- analysis of individual items to identify technological processes (traces of forging, casting or grinding) and technologies applied in ancient times;
- description of forms and their variations (e.g. arrowheads, edged weapons, pole weapons and archer's thumb rings);
- measurement of each artefact and comparison of the dimensions of objects in the same category (e.g. arrowheads);
- microscopic analysis of the artefacts;
- photographic documentation before and after conservation;
- cleaning and conservation;
- drawing and photographing the artefacts.

In many cases the poor state of preservation of the objects makes it impossible to specify their function. Their surfaces were severely damaged by various post-depositional processes. Most of the metalwork that could not be positively identified takes the form of small splinters or large objects with no original surface remaining. Such artefacts cannot be classified to a specific category.

CHAPTER 12

Metal Alloys, Metal Deposits and Workshop Centres

In a discussion about metal and metallurgy in Ancient Nubia, we cannot ignore Egypt and the influence of Mesopotamian metallurgy in Egypt. Knowledge of Nile Valley metalworking came from the study of smelting scenes from Egyptian tombs. Such a study can assess the techniques, the tools used by bronze-workers, and their evolution. However, this approach has limitations. In the Old and New Kingdoms, paintings and reliefs depicting copper are numerous and allow analysis and comparisons, while Middle Kingdom representations are very basic and only include the melting scenes. Nevertheless, many of the techniques used, especially melting and hammering, could be similar to those associated with copper working, while devices employed like furnaces, crucibles and ventilation methods could be likewise. Iconography, archaeological remains, and artefacts allow us to understand the selection and the exploitation of ores, the reconstitution of the various steps necessary for the manufacture of weapons, and the techniques and instruments required for this production (Drici 2016, 12–13).

Metal artefacts were found at the Neolithic site of Badari in Middle Egypt. Metal processing became common during Nagada I–III. The first items of metalwork were imported from Mesopotamia to Egypt. The Egyptians worked mines in Egypt and Sudan and were responsible for the spread of metalworking across Ancient Nubia (Scheel 1989, 8–10). Nubians and Egyptians made use of the same raw material deposits.

1 Gold

Large parts of the Eastern Desert (in the region around Aswan) belong to the Precambrian basement of the Arabian-Nubian shield, where around 250 sites of gold production have been recorded. Gold artefacts of prehistoric date (*c.* 3500 BC) have been discovered in Egypt. During the Old Kingdom, the Egyptians worked gold mines in Wadi Hammamat, Wadi Abbed, and Wadi Sid in the Eastern Desert. Mines in the area of Gebel Komotit and Gebel el-Nigeim, also in the Eastern Desert, supplied gold to Kerima during the Kerma period. By the Middle Kingdom, deposits in Lower Nubia, Wadi Allaqi and Wadi el Hudi, and deposits between Buhen and Semna, were being mined by the Egyptians. In the New Kingdom, gold production sites further to the south of Nubia, like Sai Island, Shamkhiya, Tanta, and Mograt Island were being worked. Ptolemaic gold mining was concentrated mainly in the central Eastern Desert in the area of Qena-Safaga, Quft-Qoseir, and the Edfu–Berenike Road. During Roman and Byzantine times, gold production decreased. Attacks by the Blemmyes forced the Romans to keep to well-protected fortifications and protected roads in the Eastern Desert (Klemm, Klemm, and Murr 2001, 643, 654–656; Scheel 1989, 11; Castiglioni, Castiglioni, and Bonnet 2010, 267).

2 Copper

Copper was used in Ancient Egypt too. Egyptian copper was hard because of its natural content of arsenic. Copper ores were mined in the Eastern Desert in Beni Suef, Wadi Araba, north-west of Berenike, in Sinai, and in the Red Sea Hills. The Old Kingdom settlement of Buhen, in what is now Sudan, was a centre of copper production. Deposits in Wadi Araba were probably mined during the New Kingdom (Scheel 1989, 14; El Gayar and Jones 1989, 32, 38).

3 Electrum

Electrum, an alloy of gold and silver, was known in Egypt by the Predynastic period, and was mainly imported to Egypt from Nubia and from the Land of Punt (Scheel 1989, 15–16).

4 Silver

The Egyptians had used silver since Predynastic times, importing it from Mesopotamia, Crete and Cyprus (Scheel 1989, 16–17).

5 Iron

The earliest iron objects found in Egypt were made from meteoric iron, but there is no evidence of iron production in early Ancient Egypt. In the New Kingdom, Egyptians imported iron from the Peloponnese, the Near East and Cyprus. Magnetite deposits in the Eastern Desert between

Aswan and Ahellal, and in the Nile Delta at Naucratis, were mined around the 6th century BC. Workshops and deposits excavated at Meroe and Hamdab and dated to the 3rd to mid-6th century AD played a significant role in iron production for Ancient Nubia in Meroitic and post-Meroitic times (Scheel 1989, 17; Humphris and Scheibner 2017, 378, 396). One post-Meroitic ironworking centre, located in Hosh el-Kafir (close to El-Hobagi) and dated to AD 340–564, had a simple smithing workshop, but the iron had been imported to the site (Abdelrahman 2011, 394).

CHAPTER 13

Conservation of Metal Objects

As mentioned above, the state of preservation of most of the artefacts is very poor. The weapons were made of iron, and although their condition is poor, ironically it is quite stable. Weapons were found to consist entirely of corrosion products, and no longer had an iron core, as illustrated by the tomographic analysis of spear fragment Z16/14 (see Chapter 19, Fig. 19.3, this volume). Therefore, conservation was focused mainly on recording the condition of artefacts, minor cleaning, and consolidation.

Most of the metal elements of the bed frames were cleaned by removing loose particles of sand from their surfaces and reassembling fragments into whole objects where possible. The poor condition of nails and frame fittings (mainly made of iron) did not allow the use of chemical cleaning. It could be very risky to use chemical cleaning fluids in field conditions without the proper equipment. In many cases, iron objects were completely corroded, without the core being preserved.

The conservation of tools was also limited to cleaning their surfaces of dust and gluing together broken fragments. The degree of corrosion of the tools precluded further intervention by chemical means.

In the case of copper-based buckles [**Fig. 13.1:** a, b] and other copper objects, conservation was carried out in accordance with the standard procedures for objects made of this metal. After recording the condition of each artefact before conservation, they were tested for the presence of active corrosion. None of the items returned a positive test, regardless of the category. The fight against active corrosion was carried out using the Krefting method (in the case of relatively large objects) or the Rosenberg method (in the case of very delicate or less corroded objects) (Safarzyński and Weker 2010, 17–20). Both methods are based on the electrolytic reduction process and used for active corrosion treatment. In the Krefting method, the object is wholly immersed in an electrolytic bath (often a weak acid, such as acetic acid, being used as an electrolyte). There is no external electricity source. The copper object itself acts as an anode, and, for example, aluminium foil can serve as the cathode. In the case of the Rosenberg method, gel (electrolyte) and aluminium foil are applied only on corrosion spots on the object's surface, so more damaged copper objects can be treated this way.

The object was then subjected to a bath in an aqueous solution of a 5% EDTA (stabilization of corrosion products). Finally, the object was protected with a BTA 2% corrosion inhibitor in a spirit solution and surface-coated with a protective layer of Paraloid B44.

In the case of ferrous objects, such as belt loop Z16/36 (see Chapter 15.2, Cat. 4, this volume), conservation was limited to light surface cleaning from easily removable dust and other fine impurities and gluing the broken parts with a reversible cyanoacrylate adhesive. In 2017 some iron objects from tumulus 1, mainly nails and fittings, were treated in a new way, by boiling in distilled water (desalination, and removal of easily soluble corrosion products). This treatment was carried out three to four times (with changes of water) for 30 minutes. These objects were subsequently drained and degreased in an acetone bath. The effect will be researched by monitoring their condition over the coming years.

The metalwork described in Chapter 18 is not suitable in most cases for any kind of analysis, as its state of preservation is too poor. Metal artefacts (in this case mainly iron) that do not retain their original shape, mass and even quantity cannot be analysed in any rational way. They elude all statistics and categorization, especially since it is often impossible to determine whether all fragments found in a given group represent one or multiple objects.

The gold objects, which were not incrusted with other less resistant materials, did not need any specialist cleaning. Earring Z1/32 (see Chapter 5, Fig. 5.4, this volume) was broken and in the worst state of preservation. Earring Z4/12 and other artefacts discovered in tumulus 4 (Z4/14, Z4/96, Z4/97, Z4/98, Z4/213; see Chapter 5, Figs 5.4, 5.5, 5.6, 5.14, and Chapter 6, Fig. 6.1, this volume) were found in good condition; tarnish was present only in the place where the earring had been brazed with tin [**Fig. 13.1:** c].

Silver objects also survived in good condition. A layer of patina can be present on the surface of good quality silver and prevents the surface from other corrosion. This type of patina was observed on silver bell Z4/11, silver double wires Z10/46, and silver pin Z4/212 [**Fig. 13.2**]. Silver settings of cabochons survived in much worse condition (see Chapter 5, Figs 5.9–5.13, this volume).

Iron objects exhibit the worst state of preservation. Their poor condition sometimes makes it impossible to determine the function of the object. Many, but not all, of the iron artefacts are fully corroded, without any iron core and only corrosion is extant. In such cases, the objects are very friable. The iron blades, arrowheads, spears and javelins in this assemblage have been severely damaged

FIGURE 13.1 Traces of corrosion on copper (a, b) and gold (c) artefacts
PHOTOS OF OBJECTS BY A. KAMROWSKI [LEFT]; MACRO PHOTOS BY Ł. ZIELIŃSKI [RIGHT]

FIGURE 13.2 Traces of patina on the surfaces of silver objects
Z4/11, Z10/46 PHOTOS BY A. KAMROWSKI; Z4/212 PHOTO BY Ł. ZIELIŃSKI

by corrosion, and are often broken. As a result, the individual elements of the weapon are difficult to match and to interpret. Iron elements coated with copper and copper alloys, which in theory should be more resistant to corrosion, are also often severely damaged. It is difficult to attribute them to specific objects because elements such as sleeves were components of both weapons and other items such as tools. Defining the origin of a given element displaced by robber activity proved challenging.

Hardly any elements made of organic raw materials, such as leather and wood, were found in the tumuli at El-Zuma. Sometimes their presence is evidenced only by faint negative impressions in the corrosion surrounding a metal object, or spots of darker soil in which blades or tips appear. Therefore, among the finds from El-Zuma we do not have a complete shaft weapon, arrow or quiver, although we know about their presence thanks to extant projectiles (arrowheads, spearheads, javelin heads) and imprints.

Weaponry and Personal Accessories

Łukasz Zieliński

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CHAPTER 14

Weaponry and Military Equipment

Nubia's long history and links with Egypt and the Mediterranean world were significant to the development of metallurgy in Nubia from the Kerma to the post-Meroitic period (Drici 2016, 9). Nubian lands and mines had been important to Egypt since the Old Kingdom (Lebedev 2018, 277).

As pointed out by Mahmoud El-Tayeb, metal artefacts were not abundant in Early Makurian graves, in contrast to those discovered in the regions south of the Fifth Cataract or downstream of the Second. This could be attributable to looting. Metalwork recovered from excavations is usually in poor condition. Little is known about metallurgical knowledge in the Dongola Reach during this period. Archaeological evidence suggests that the main centre of metalworking was Meroe (Mahmoud El-Tayeb 2012, 81). Weapons discovered in the El-Zuma tumuli (blades, arrowheads, spears, and javelins) were made of iron. When exactly iron appeared still remains unclear. Excavations at Meroe have suggested that iron production may have begun there around the mid-1st millennium BC in the late Napatan period (Tylecote 1982; Rehren 2001). The evidence of iron production at Meroe indicates that this production centre remained active till the post-Meroitic period. We do not know much about the trade and distribution of iron artefacts, or if Meroe played a significant role in the spread of iron production in Nubia (Humphris and Scheibner 2017; Humphris, Charlton et al. 2018). Political changes, pressure from Aksum, and tribal activity during the post-Meroitic period may have led to an increase in weapon production (Humphris and Scheibner 2017, 403; Humphris 2014, 127).

Military power is abundantly represented in post-Meroitic graves. At El-Hobagi dozens of broad-bladed ceremonial spears, axes, swords, at least one bow, and several quivers full of arrows were buried together with the deceased (Lenoble 2018). While weaponry is relatively rare within the royal burials at Meroe, military equipment, if only in the form of bows and arrows, is increasingly common in later Meroitic male burials. In the post-Meroitic period, a military element in male identities seems to have become very widespread, reflected in the ubiquity of arrowheads and archer's looses in graves of this period (Edwards 2004, 191–193). Elements of post-Merotic weaponry have frequently been found in tumulus tombs dating from the 4th to the 6th centuries AD, such as those at El-Hobagi, Ballana, Qustul, and Gabati (Lenoble 2018; Emery and Kirwan 1938; Edwards 1998, see also Figs 1 and 3, at the end of this volume).

1 Description of the Material

The weapons discovered at the El-Zuma cemetery include bladed spearheads, leaf-shaped spearheads, javelins, pieces of an edged weapon, long combat knives, and a few smaller blades probably representing knives and at least one dagger. The author, Łukasz Zieliński, has divided this assemblage into the following categories and types:

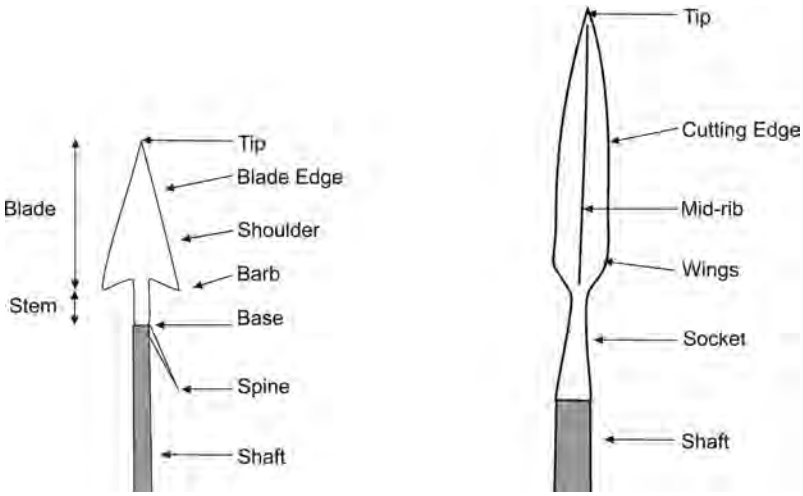
- Pointed weapons/pole arms
  - a) Bladed spears
  - b) Spears
  - c) Javelins
- Edged weapons
- Ranged weapons
  - a) Arrowheads
  - b) Archer's looses/thumb rings

1.1 *Pointed Weapons/Pole Arms* [*Figs 14.2–14.3*]

1.1.1 Bladed Spears

Descriptions of the bladed spears excavated at El-Zuma are based on the typology established by Emery and Kirwan for spears discovered at the royal cemeteries of Ballana and Qustul (Emery and Kirwan 1938, 221–223, Figs 83–85).

Only two bladed spearheads, both made of iron, were found at El-Zuma: one in tumulus 16 and the other in tumulus 4 (Z4/194). Both examples were incomplete and heavily corroded, and there were no preserved spear shafts. Their attribution to types is tentative. The example found in tumulus 16 (Z16/4+Z16/14+Z16/15) [**Cat. 1**] is closest to Emery's type 2, where the spearhead is wide (up to 8 cm) and long (up to 90 cm) with cutting edges that run almost parallel. The one from grave 16 measures approximately 7.5 cm at its widest point, and has an extant length of 53.4 cm, with the longitudinal mid-ribs running roughly symmetrically on both faces of the blade (it may originally have measured up to 80 cm in length). The ribs are 1.1–1.4 cm thick and about 1 cm high. The wings are approximately 0.6–0.7 cm thick around the ribs and measure 3 cm across at the widest point. The angle of the spear tip is not acute enough and amounts to about 70 degrees at



SKETCH 14.1
Arrows and spears terminology
DRAWN BY E. CZYŻEWSKA-ZALEWSKA

the very beginning of the blade's curvature. The spearhead must originally have been very heavy judging from its size, but its original weight could not be estimated. A spear butt or shoe, like those found in Qustul (Emery and Kirwan 1938, 221–223), could have been used to counterbalance the weight of the head, but no such shoes were discovered at El-Zuma, probably because of the poor state of preservation of the spears. The shoe could also be driven into the ground to help support the weight of the weapon.

This spearhead consists of four large fragments and about ten smaller ones, which were identified and glued together (only the smaller ones). The large fragments have not been glued together because they offer an unprecedented opportunity to trace the layers of the spearhead in cross-section at different points along the tip. Thanks to this we have an insight into the technique that the blacksmith used to make the spearhead. Each wing consists of two layers of iron that were welded on the ribs to form a joint. Characteristic wedging of the layers formed in this way is visible in cross-section. This smithing technique was probably used because of the size of the weapon. The iron bloom obtained in a smelting furnace usually had to be subjected to further processing and worked into a relatively small ingot (bar). For an object as large as a bladed spear, at least two such ingots were needed, if not three (taking into account the core of the spear and the tang or socket made from the core). Technically, forging a sword-shaped spearhead could be a problem for an inexpert blacksmith because of the stout rib on either face, which required forging at various angles and good visualization skills. The examples from El-Zuma were made with considerable deviations of the wings and ribs in relation to the axis of symmetry. This suggests that they were made by a blacksmith who must have had some experience of producing this type of weapon, but had not fully mastered the technique.

The bladed spear found in tumulus 16 was probably not very long. The examples found in tombs at Ballana and Qustul measured only 160–170 cm in length (Emery and Kirwan 1938, 222–223). We can assume that the hardest available wood was used for the shafts of pole arms. Meroitic and post-Meroitic spear shafts could have been made from tree species commonly referred to as ironwood, like *Dalbergia* or some of the African acacias, which were common in the Meroitic period and were also used in iron production (Zieliński 2011, 24–45; Gale et al. 2009; Humphris and Eichhorn 2019, 41–43). Tumulus 16 yielded a further three fragments of metalwork, which when pieced together turned out to be an iron sleeve [**Cat. 2**, Z16/37], with characteristic transverse ribs, typical of bladed spears. The glued fragment had an internal diameter of about 2.2–2.6 cm and a wall thickness of 0.2–0.4 cm. Wood impressions (shaft/pole remains) can be seen on the inner surface. This artefact was probably part of the spear described above.

The technical details described by Emery are worth noting. The spearheads that he found were embedded in the shaft with the help of a spike, which was an extension of the central rib. The sleeve or cylinder was made of a separate piece of metal, installed to the spearhead covering the tang inside. This sleeve was often decorated by transverse ribs. The sleeve additionally strengthened the connection with the shaft from the outside, making it very solid (Emery and Kirwan 1938, 222). Unfortunately, there is no extant base section of any of the bladed spearheads found at El-Zuma, only the small fragment of the sleeve mentioned above.

Fragments of another bladed spear [**Cat. 3**, Z4/194] were found in tumulus 4. This object was very corroded

and very poorly preserved, and its original size could not be estimated. It is smaller than the one from tumulus 16, which can be deduced from the rib thickness of 1.4 cm and the wing thickness of around 0.4 cm. The original width can be tentatively estimated at about 2.3–2.5 cm. This would point to a different type of bladed spear, possibly attributable to Emery's type 4 (Emery and Kirwan 1938, 223, Fig. 85:5). This type of spear is narrower than type 2 and has an average length of about 60 cm.

Damaged metal object Z10/36 [**Cat. 11**] is probably a small ferrule from a bladed spear, found in tumulus 10. This item is clearly narrower at one end (maximum diameter 2.8 cm, minimum 2.2 cm). One edge is completely preserved. The side walls are 2 mm thick, and wood imprints are visible on their inner surface. There is also an extant rivet in the side wall. This was probably part of an iron shoe, which was designed to be driven into the ground. Its conical shape meant that if the shaft broke or the spearhead was lost, it could also be used as a spare point. The ferrule was attached to the shaft with a single rivet on one side, as observed among parallel finds from tombs at Qustul (Emery and Kirwan 1938, 222–223). It should be mentioned here that no recognizable fragments of a bladed spearhead were found in tumulus 10. Unfortunately, the tip of the ferrule is missing, but the fact that it measures almost 3 cm in diameter at the preserved end suggests that it was mounted on a fairly thick shaft, as recorded with other bladed spears.

Ribbed decoration similar to the examples presented above can be observed on another bladed spear from tomb 192A.7 at Qasr Ibrim. The blade of this specimen is 51 cm long and has a maximum width of 8.4 cm; the total length of the spear was 2.35 m and it was dated to the Ballana culture, probably to the 3rd century AD (Mills 1982, 36–37, Pl. LXXXVI:6). Spears found in grave A11 at Firka were dated to the beginning of the 5th century AD (Török 1988, 190, Pl. 137). Examples excavated in tomb HBG III/1 at El-Hobagi are 58 cm long with a maximum width of 6.8 cm and are dated to the 4th century AD (Lenoble 2018, 21–22, 120–121, Fig. 65:197). More elaborate forms recorded in tombs at Ballana and Qustul were dated to the 3th–5th centuries AD (Emery and Kirwan 1938, 221–223, Fig. 83:2).

1.1.2 Spears

Leaf-shaped, iron spearheads can be distinguished among the weapons found at the El-Zuma cemetery. These spearheads have a broad, symmetrical blade, without ribs, and were reinforced by the use of a spindle-shaped cross-section. Four examples of leaf-shaped spearheads were found at the cemetery, all of them incomplete and heavily corroded. Three were found in tumulus 16 [**Cat. 4**, Z16/8.2, **Cat. 5**, Z16/8.3, and **Cat. 6**, Z16/8.4] and one came from tumulus 24 [**Cat. 7**, Z24/32]. All four of them represent Emery's type 5 (Emery and Kirwan 1938, 5). Their thickness varies from 0.6 cm to 1.5 cm; however, surface damage and considerable corrosion make it impossible to determine their true dimensions, although we can assume that they were originally about 0.9–1.3 cm thick. One wing of spearhead Z16/8.2 was reconstructed, revealing that it had a maximum width of 7 cm. The base of the blade indicates that these spearheads were finished with a sleeve. Z16/8.2 is the best-preserved example of a leaf-shaped spearhead from El-Zuma, though its maximum length could not be reconstructed. An example of this type found by Emery in one of the Qustul tombs was 32 cm long including the tang (the blade was approximately 25 cm long), but this was a tanged spearhead rather than a socketed one like the specimen from tumulus 16 (Emery and Kirwan 1938, 223). It seems that the examples from El-Zuma are a little smaller. Z16/8.3 appears to be a little longer and narrower than Z16/8.2 (see reconstruction, Cat. 4). Unfortunately, due to its poor state of preservation, the maximum width and length could not be determined, and can only be estimated by analogy to examples of this type found at other sites.

The fragmentary preservation of these objects provides an opportunity to examine them in section and assess the smithing technique used in their production. It seems that the spearheads were made by forge-welding a core sandwiched between two outer layers of metal. Similar examples have been found at other post-Meroitic sites. The spearheads from El-Hobagi are dated to the 4th century AD (Lenoble 2018, 213–220, 242–243, Figs 109–113), while those from Qustul are dated from the 3rd to 5th century AD (Emery and Kirwan 1938, 221–223, Fig. 85:5,6). Another example was found in a post-Meroitic tumulus at el-Misaktab, not far from Shendi and El-Hobagi (Abdelrahman, Sokary, and Bushara 2009, 109–110).

In terms of production technique, we can assume that the spearheads found in El-Zuma were forge-welded using two different types of iron [**Fig. 14.1**]. No specific metallographic studies were carried out on the El-Zuma material, hence we cannot confirm the use of two different types of iron. The only basis for this assumption is that this was the typical method used in forge-welding (evidenced by analogies from around the world). The tang had to be forged from the core layer. Leaf-shaped spearheads with a spindle-shaped cross-section did not require a high degree of skill from the blacksmith, as long as they were tanged rather than socketed. Forging a socket instead of a tang requires specialist tools and a greater level of proficiency. Forge-welding produced a harder blade and a core

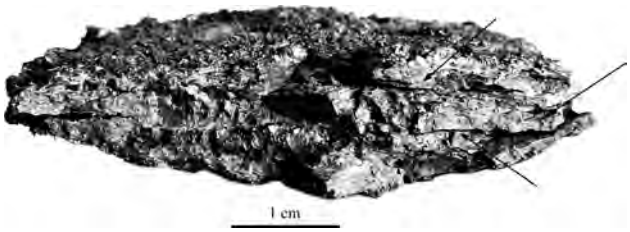


FIGURE 14.1
Layer-forging technique, layers visible in cross-section (Z16/8.3)
PHOTO BY A. KAMROWSKI

that was more resistant to compression and fracture. This also indicates that the person who made the spearheads was an experienced blacksmith.

Several theories about Meroitic and post-Meroitic iron production and smithing have been put forward by Peter L. Shinnie (Haaland and Shinnie 1985, 28–35; Zieliński 2011, 14–19) and Ronald F. Tylecote (1977). Both of them argued that Meroitic iron objects were of very good quality. Tylecote even carried out some metallographic research (microscopic metallographic analysis and the Vickers-Rockwell hardness test), analysing one of the arrowheads from James Smith's collection (Tylecote 1977, 29–30; Zieliński 2011, 18–19). Shinnie suggests that bloomery design was the main reason for the production of good, high-carbon iron comparable to lower quality steel of today. A key factor was the use of as many as six tuyeres (nozzles) positioned very deep in the bloomery shaft, which provided additional oxygen-free heat (Haaland and Shinnie 1985, 28–35; Zieliński 2011, 17). Smithing furnaces were discovered at Meroe, which suggests that iron was not only produced in Meroe, but also worked into objects on-site (Haaland and Shinnie 1985, 28–35), even though no smithing tools were found in the vicinity.

1.1.3 Javelins

Four iron fragments of double-edged blades can be qualified as javelins. One [**Cat. 8**, Z16/6] was found in tumulus 16, two [**Cat. 9**, Z10/35, and **Cat. 11**, Z10/36] came from tumulus 10, and Z11/32 [**Cat. 10**] was discovered in tumulus 11. All of these fragments were found corroded and in a poor state of preservation.

The extant blade of Z11/32 is 9.4 cm long (its tip is missing) and 2 cm wide, with a rounded tang measuring approximately 0.5 cm × 0.4 cm. This object is a double-edged leaf-shaped blade fragment that is spindle-shaped in cross-section. This javelin retains a small part of the tang, which has wood imprints on it (evidence of the shaft). The size of this imprint shows that the shaft was only 0.8 cm in diameter, although it could have been wider further along its length (the shaft may have tapered at one end).

Double-edged blade fragment Z10/35 is 4 cm long and 1.5 cm wide; it was forge-welded (3-layers) and has a spindle-shaped cross-section similar to Z11/32. The two fragments catalogued as Z10/36 are part of a forged iron ferrule, probably from the same artefact as Z10/35. Both were found in the same place in the burial chamber of tumulus 10, but it was not possible to reconstruct the whole artefact.

Javelin Z16/6 has a preserved length of 7.8 cm and measures 2.3 cm in width, with a thickness of approximately 0.4–0.5 cm. Also made of forge-welded iron, with a core and outer layers, this fragment represents an elongated variant of a two-edged, leaf-shaped blade.

The javelins from El-Zuma are very narrow in relation to their length. The angle at the point is very acute, and usually around 23–25 degrees.

Because the javelins are broken it is possible to observe the construction of the blade in cross-section (core and two outer layers). The fact that the forge-welding technique was chosen for such a small blade is not attributable to the insufficient size of the iron ingots. It is more likely that it was used so that high- and low-carbon steel could be combined to produce a stronger blade. It seems that this technique was used for all major blades found at El-Zuma, namely spears, javelins, and knives. Unfortunately, due to their state of preservation (no extant core), it was impossible to confirm this through metallographic analysis. The production of javelin tips requires a smaller amount of force from the blacksmith and slightly higher precision than in the case of spearheads. Forging a tip with a spindle-shaped cross-section is relatively easy for a reasonably experienced blacksmith. Forging a tip with a central rib running symmetrically the length of each face requires additional focus. Perhaps that is why the blacksmith who made the Z16/6 javelin decided to forge a mid-rib on one side only, which makes the task much easier. It is evident that despite some skills in the selection of raw materials and technology, he had not mastered the art of forming mid-ribs symmetrically on both sides.

Z16/6 and Z10/35 have a similar width and thickness of about 0.5 cm. Z11/32 and Z10/35 have a spindle-shaped cross-section, and the Z16/6 javelin is spindle-shaped on one side, while on the other it has a symmetrically formed mid-rib running the entire length of the preserved fragment.

At El-Zuma, each of the javelins was found in a different grave; however, at El-Hobagi one grave chamber sometimes contained multiple javelins (Lenoble 2018, 21–22, 212, Fig. 106:215), and in the Meroitic cemetery at Karanog, dated to the 1st–5th century AD, more than one javelin was also found in tomb G.254 (Woolley and Randall-MacIver 1910, 40–41, Pl. 34). In Qasr Ibrim tomb 101 at cemetery 193, featuring Ballana culture and Christian burials, yielded an item described as a javelin blade that was 7.5 cm long and 2.7 cm wide (Mills 1982, 47, 56, Pl. LXXXVI: 7). Another example was discovered in tumulus 5 in El-Detti, at a site that is dated to the Early Makurian period (Zieliński 2016, 424). The examples found in El-Zuma are very elongated and lanceolate, just like the ones from El-Hobagi (Lenoble 2018, 21–22, 212, Fig. 106:215). The El-Zuma javelins do, however, differ from those found at the royal cemetery in Qustul, which have very fanciful shapes, with constrictions in the middle or additional barbs (Emery and Kirwan 1938, 221–223, Fig. 85).

1.2 *Edged Weapons* [*Fig. 14.4*]

Iron knives and long combat knives were also found in El-Zuma. This assemblage comprises two long combat knives, three other knife fragments and one dagger. Tumulus 10 yielded one long combat knife [**Cat. 13**, Z10/30] and fragments of two other knives [**Cat. 14**, Z10/32+Z10/33+Z10/34, and Z10/31]. The second long combat knife [**Cat. 12**, Z16/8.1] was found in tumulus 16. One knife [**Cat. 15**, Z4/7.1] and fragments of a dagger [**Cat. 16**, Z4/107] were discovered in tumulus 4.

The long combat knives recorded at El-Zuma were found in very poor condition, so their original appearance could only be ascertained by comparison with better-preserved specimens from other archaeological sites.

Long combat knife Z10/30 is represented by two fragments measuring 18.1 cm and 10.8 cm in length respectively. It is a single-edged knife with a blade approximately 1.6 cm thick and at least 4.1 cm wide. It was made of forge-welded iron (core and outer layers). The second of the long combat knives, Z16/8.1, survives in the form of a fragment that is 26 cm long with a maximum width of 3.8 cm. It was also made of forge-welded iron (core and outer layers). The spine has a thickness of about 1.1 cm. Both knives Z10/30 and Z16/8.1 feature wood imprints (probably from a scabbard). Fragment Z10/45 found in tumulus 10, and Z16/36 from tumulus 16, might be parts of such a scabbard (see Chapter 15, Cat. 3, this volume).

Emery referred to these long combat knives as swords (Emery and Kirwan 1938, 219–221), but in the light of other excavations they should be recognized as knives. Knives of this type did not have either a hand guard or a pommel, which makes it even more unfounded to call them swords (Gradowski and Żygulski 1998, 3–4, 19–20, 55, 58; Żygulski 1998, 56–72, 74–144).

Like other weapons, these long combat knives were also forge-welded. At least three layers of iron (a core and two outer layers) were used. Forging a combat knife in such a configuration is much simpler for a blacksmith than forging a spear or a javelin. Blades of such knives do not have any shavings, a fuller or mid-rib, and the side surfaces are flat. The only complication for the blacksmith was the additional forging of the rounded spine. Perhaps this design allowed the blade to be grasped from this side without risk of injury. It is hard to imagine a situation during a fight where this feature would have been needed, but it may have been practical for work in the field. The handle could have been made by another specialist depending on the material used. So in fact not only a blacksmith would have been involved in the production process, but also potentially a tanner, carpenter, horn worker, or even a goldsmith.

The smaller knife from tumulus 10 (Z10/32+Z10/33+Z10/34), reassembled from several fragments, is 14.6 cm long with a thickness of 0.5 cm. The blade is single-edged, forge-welded, and the spine is very thick (2.1 cm wide) and rounded, which could be a useful feature. There are traces of copper patina on the flat tang, which may be the remnants of a structural skeleton that held the scales of the knife handle in place. The tip does not survive, so we cannot determine its shape. Fragment Z4/7.1, found in tumulus 4, could be a small sleeve fragment from a small knife. The sleeve has a diameter of 1.4 cm. A flat piece of metal wedged inside it is part of the tang. Wood impressions from the handle have also been preserved on the inside. Traces of copper patina on the surface show that this sleeve was originally covered with copper. Knives with a hand guard of this form have been noted at other post-Meroitic sites, including an example from Qustul (Emery and Kirwan 1938, 327) most probably dating from the 4th or 5th century AD (Emery and Kirwan 1938, 398–399).

The combat knives from El-Zuma are similar in construction to a knife found in Missimina and dated to the 5th–6th century AD (Török 1988, 188). What could be determined from the fragments found at El-Zuma is that we are dealing with single-edged knives with a blade of triangular cross-section. The knives from both El-Zuma and Missimina have a rounded back. The handles of the examples found in El-Zuma are not preserved, but looking at those discovered in Qustul, and dated to the 4th–5th century AD (Emery and Kirwan 1938, 219–221, 398–399), or Missimina (Török 1988, 188), we can assume that the knives were either whittle tanged (the knife had a nar-

row tang that was inserted into a solid handle) or scale tanged (the tang was broad and flat, and the scales were riveted to it on either side to form a handle). The scales were made of wood or bone. Examples found among the ceremonial arms recorded at the royal cemetery in Qustul (Emery and Kirwan 1938, 219–221) were often decorated with silver plates and precious stones. Utilitarian knives had a bone handle with grooves for all five fingers, similar to that of a Roman gladius (Török 1988, 188). Examples excavated in tomb HBG III/1 at El-Hobagi, and dated to the 4th century AD, are of similar dimensions to those excavated at El-Zuma. One of them (no. 203) survives to a length of 26 cm, with the blade measuring 25.1 cm long and 3.1 cm wide; the second one (204) has an extant length of 26.1 cm, the surviving blade measuring 25.8 cm long and 3.7 cm wide (Lenoble 2018, 21–22, 126, Figs 70, 127).

Dagger Z4/107 is 5.4 cm long, relatively narrow, and only 0.15 cm thick. It has a double-edged blade with a carefully worked bilateral groove hidden in a protruding midrib. Impressions and fragments of leather are preserved in the rust at the edge of the dagger. The greatest width of the preserved fragment is 3.4 cm, while single-edged knives are usually narrower. On the basis of the surviving fragment, little can be said about the original dimensions of the dagger. Nevertheless, the angle of the cutting edge (*c.* 35–40 degrees) indicates that the blade was that of a typical dagger.

The dagger blade is very thin and made from one piece of iron, probably without layering. Although the blade is forged from one piece of iron (not forged-welded or pattern-welded), it was skilfully forged. The mid-ribs and grooves run parallel to each other with very little deviation, and there are no traces of individual hammer strokes. The blade, although it is thin and sharp, is not twisted. It was very carefully made by a highly skilled blacksmith, using smaller tools. Interestingly, despite the fact that the blade is thin, corrosion has almost perfectly preserved its original shape, even though it was in direct contact with leather, which intensifies the effects of corrosion. This indicates that although the blade was not forge-welded, it may have been made of high-carbon iron. It is puzzling that there are few analogies of such daggers from other sites of this period (post-Meroitic). The El-Zuma dagger most closely resembles Berber knives (Burckhardt 1819, 297). Similar double-edged iron knives were also found at Abu Geili (Crawford and Addison 1951, 36–37, Fig. 9) in Funj graves 400/5 and 400/25.

Some very corroded pieces, described as unidentified fragments, such as Z26/91 (see Chapter 18.2, Cat. 22, this volume) and Z26/10 (not presented in the catalogue) may have come from knives, but are too damaged to make an accurate identification. They are large enough and have the right thickness, and are of sub-triangular cross-section. However, the delamination of these fragments, and sometimes the total lack of original surfaces, makes it impossible to assign them to a specific category.

1.3 *Ranged Weapons* [*Figs 14.5–14.9*]

1.3.1 Arrowheads

Arrowheads are the most numerous category of weapons found in the El-Zuma tombs. A typology of arrowheads based on their shape was presented by Łukasz Zieliński in his MA thesis (Zieliński 2011, 119–120) [**Table 14.1**]. Emery formulated typologies for spearheads and javelins, but not for arrowheads (Emery and Kirwan 1938, 221–223, Figs 83, 85). In fact, no typology has previously been devised for arrowheads from Nubia.

Arrowheads were the only items of archery equipment found in such quantities. Only five archer's rings were discovered at this site [**Table 14.2**]. No quivers were found, although groups of arrowheads fused together by corrosion bear leather impressions that could represent the remains of quivers.

Arrowheads came to light in tumuli 4, 10, 13, 16, 17, 19, 21, 22 and 27. Usually, they were found in groups of at least a dozen pieces.

The following arrowhead types are represented in the El-Zuma assemblage:
- type 1 (single-barbed, triangular) [**Cat. 17–36**];
- type 1a (single-barbed, hooked) [**Cat. 37–42**];
- type 1b (single-barbed, leaf-shaped) [**Cat. 43–54**];
- type 6 (barbless, leaf-shaped) [**Cat. 55–56**];
- approximately 68 specimens could not be identified to type [**Cat. 57–69**].

A key feature of the arrowhead is its tip. The tips differ and we can distinguish three variants of tips within each type of arrowhead. The most common variant is represented by arrowheads of 4–5 cm in total length; the second, shorter variant consists of arrowheads with a total length of around 3 cm or less; and the third variant, which is the rarest, comprises elongated arrowheads, usually up to 7 cm in total length. Regardless of the type of tip, the usual width of the blade varies from 1 cm to 1.3 cm. In barbed arrowheads, the barb protrudes a maximum of 0.5 cm (usually less) beyond the outline of the actual blade. The thickness of the blades is much more varied. The tips of types 1 and 1a are usually quite narrow, with a thickness of 0.2–0.3 cm. On the other hand, type 6 and type 1b arrowheads (both leaf-shaped types) are 0.3 cm or sometimes even 0.5 cm thick. This is attributable to the use of a slightly different production technique. Arrowheads that

TABLE 14.1 Arrowhead typology established by Ł. Zieliński

TYPE	Arrowhead type
Type 1	Single-barbed, triangular, asymmetrical, tanged (of various dimensions and with variously angled barb; noted at sites at the Fourth Cataract and Karanog)
Type 1a	Single-barbed, hooked, asymmetrical, tanged (very long barb in the form of a half swallow-tail; noted at Karanog)
Type 1b	Single-barbed, leaf-shaped, asymmetrical, tanged (barb protruding from base of blade, close to tang; noted at Karanog and El-Hobagi); in El-Hobagi arrowheads of this type had a toothed tang
Type 2	Double-barbed, triangular, symmetrical, socketed instead of tanged (noted at Karanog)
Type 2a	Double-barbed, triangular, symmetrical, tanged (noted at El-Hobagi)
Type 3	Double-barbed, with forked point, symmetrical, tanged (very rare; noted at Karanog), probably poisoned
Type 4	Four-barbed, triangular, symmetrical, mid-rib, tanged (noted at Meroe), made of copper alloy
Type 5	Six-barbed, triangular, symmetrical, mid-rib, tanged (noted at Meroe), made of copper alloy
Type 6	Leaf-shaped, barbless, symmetrical, tanged (noted at Karanog and the Fourth Cataract)
Type 7	Open-work, barbless, leaf-shaped, symmetrical, tanged (incendiary—openwork head could be filled with oakum soaked in a flammable substance; noted at Karanog—complex openwork, and El-Hobagi—simple openwork)
Type 8	Needle-shaped with multiple barbs (mid-rib), asymmetrical, tanged (very rare, noted at Karanog)
Type 9	Needle-shaped, rounded in cross-section, tanged (probably anti-armour point; very rare, noted at Karanog)

are 0.3 and 0.2 cm thick were very heavily flattened by strong hammer blows, and required less raw material to manufacture because they were thinner but of the same width as other types. On such a flattened surface it was much easier to use a chisel or punch to create a barb. The arrowheads that are 0.5 cm thick were forged with lighter blows struck at different angles. Perhaps it is because this requires good access from all sides that it was mainly leaf-shaped tips that were forged in this fashion.

Twenty-five (or possibly 35)[1] examples of a single-barbed, triangular arrowhead of type 1 were found in the El-Zuma tumuli [see **Table 14.2**]. Type 1 arrowhead Z16/26.2 [**Cat. 31**] was made using a relatively simple technique. This arrowhead has a slightly triangular shape and a single barb. It is spindle-shaped in cross-section (both faces are symmetrical) and was forged on both sides. Viewed edge-on, the tang and barb are in line with one another. The barb extends slightly at the top and its side surfaces coincide with the surfaces of the tang and the blade. This means that all surfaces were shaped simultaneously with individual hammer blows. The tang itself is rectangular in cross-section. The smithing technique used to produce this projectile point was simple and required little effort. It was the most commonly used technique for making post-Meroitic arrowheads.

Eleven potential examples of single-barbed, hooked arrowheads of type 1a (one of them positively identified) were recovered from the El-Zuma tumuli [see **Table 14.2**]. Normally, type 1a (hooked) arrowheads had asymmetrical, single-barbed tips. The edge of the blade led from the point to the edge of the barb without deviating or differing in thickness. The barb resembled half of a long, narrow and arched swallow's tail, which is why it is referred to as hooked. Most arrowheads of this type are flat or slightly spindle-shaped in cross-section and are 2–3 mm thick. This demonstrates that the tips were forged on both sides on the flat surface of an anvil, without the use of additional tools. A chisel was used to create the barb. The barb can be very long (up to 2 cm) compared to other types of tips, but it does not project very far beyond the main part of the blade. The blade itself is relatively short and terminates in a tang. The blade tip of arrowhead Z16/26.3 [**Cat. 32**] is approximately 1 mm thick and has a flat surface with sharp edges on both sides. The barb was shaped when the blade was hot and malleable. Traces of the blacksmith's work are visible in the form of furrows left by the hammer strokes on the barb surface. Rectangular strike marks from a chisel can also be seen at the base of the barb. On both sides, there are ribs that are slightly asymmetrical in relation to each other, and semi-circular in cross-section (at this point the tip is 4 mm thick). The only logical explanation for this construction is that a small blade (probably made of high-carbon, hardened steel) was

1 Two quantities are given for arrowheads of types 1 and 1a because some of them survive in such a condition that it is difficult to determine which of these two types they represent, although they can conclusively be attributed to one of the two rather than, for example, to type 1b or type 6.

TABLE 14.2 Quantitative list of arrowheads and archer's rings found in the El-Zuma tumuli

Tumulus no.	Type of tumulus	Arrowheads					Archer's rings		
		type 1	type 1a	type 1b	type 6	?	type 2	type 4	type 8
T.1	I	–	–	–	–	–	–	–	–
T.2	I	–	–	–	–	–	–	–	–
T.3	I	–	–	–	–	–	–	–	–
T.4	I	0–3	0–3	3	–	1	–	–	–
T.5	I	–	–	–	–	–	–	–	–
T.6	I	–	–	–	–	–	–	–	–
T.7	I	–	–	–	–	–	1	2	–
T.8	I	–	–	–	–	–	–	–	–
T.9	II	–	–	–	–	–	–	–	–
T.11	II	–	–	–	–	–	–	–	–
T.12	II	–	–	–	–	–	–	–	–
T.13	II	2	–	1	–	20	–	–	–
T.14	II	–	–	–	–	–	–	–	–
T.15	II	–	–	–	–	–	–	–	–
T.16	II	2	1	4	–	14	–	–	–
T.23	II	–	–	–	–	–	–	–	–
T.24	II	–	–	–	–	–	–	–	1
T.25	II	–	–	–	–	–	–	–	–
T.26	II	–	–	–	–	–	–	–	–
T.10	III	0–7	0–7	–	4	9	–	–	–
T.17	III	4	–	–	–	2	–	–	–
T.18	III	–	–	–	–	–	–	–	–
T.19	III	1	–	–	–	–	–	–	–
T.20	III	–	–	–	–	–	–	–	–
T.21	III	10	–	1	1	12	–	–	–
T.22	III	–	–	–	–	4	–	–	–
T.27	III	6	–	4	–	6	–	–	1
T.28	III	–	–	–	–	–	–	–	–
Total		**(25) 35**	**(1) 11**	**13**	**5**	**68**	**1**	**2**	**2**
				(112) 132				**5**	

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actually wedged into a kind of fork formed by ribs that were hot-worked and later not tempered. This is a very unusual technique that is not noted in other finds of the period.

Thirteen examples of single-barbed, leaf-shaped arrowheads of type 1b were found in the graves at El-Zuma. This type was usually made by the same technique as type 1a. It is typically flat or spindle-shaped in cross-section, 0.2–0.5 cm thick, and was forged on both sides on a flat anvil surface. The barb usually measures less than 1 cm. The arrowhead itself can be very long (7 cm with the tang), but most often measures around 5 cm in length.

Z16/26.1 [**Cat. 46**] is an unusual example of this type. The blade is perfectly flat on one side. This flat surface, which was placed on the anvil during the smith's work, was only subjected to grinding. The surface on the other side is slightly slanted, measuring about 1 mm at its thickest point. All protruding elements of this arrowhead, such as the tang and barb, were made on this side. The barb tapers evenly all the way up and has a square cross-section

of approximately 0.2 cm at the base. This arrangement makes the side surfaces of the tip not symmetrical with each other, and the tang is rounded in cross-section, which would have required additional smithing work.

Only five barbless, leaf-shaped arrowheads of type 6 were found. Their tips do not have any barbs, they are symmetrical and usually of a very elongated leaf shape. Arrowheads of this type are less frequent in El-Zuma than barbed arrowheads. In this material catalogue, only five examples are presented: arrowhead Z10/37 [**Cat. 55**], three arrowheads joined together Z10/47 [**Cat. 56**] and artefact Z21/11.10 [**Cat. 28**] comprising an arrowhead of type 6 fused with an arrowhead of type 1. Barbless, leaf-shaped arrowheads have a total length of approximately 5 cm, a width of 1.1–1.2 cm and a thickness of approximately 0.4–0.5 cm. Fragments of around 20 arrowheads were found in tumulus 10, but only four of them were leaf-shaped.

The most varied weapons assemblage, including arrowheads, was found in tumulus 16. The shaft and the main burial chamber (no. 1) yielded a combined total of at least 21 arrowheads. Seven of them are almost complete, and approximately 20 are preserved fragmentarily; the minimum number of arrowheads was estimated at 21 and the maximum number at 29. We can speculate that a quiver of arrows may have been buried in tumulus 16, but no traces of leather were found in this tomb.

The arrowheads recovered from tumulus 16 are examples of types 1, 1a and 1b, and represent three smithing techniques. If there actually was one quiver in tumulus 16, this raises questions about whether the arrowheads came from one manufacturer, and also about their functions and chronology in relation to each other. Arrows break and are lost during usage. This means that at some point the original supply has to be replenished, most often ad hoc with ones acquired from a local blacksmith. Perhaps the arrowheads from tumulus 16 reflect this very scenario.

The arrowheads discovered in the El-Zuma tumuli are typical of those seen at many post-Meroitic sites. The single-barbed arrowhead featured in Meroitic tradition and continued to be used during the post-Meroitic period. A type 1b arrowhead was found in a Meroitic grave at el-Misaktab (Abdelrahman, Sokary, and Bushara 2009, 109–110, Pl. 3). Arrowheads of types 1, 1a, 1b and 6 were found at Karanog and dated to the 1st–5th century AD (Woolley and Randall-MacIver 1910, 66, Pl. 34).

Examples of arrowheads of types 1a, 1b and 6 were found in the Early Makurian tumuli at El-Detti (Zieliński 2016, 422–424). Iron arrowheads of type 1a or 1 were discovered at Mikaisir Fortress and dated to the post-Meroitic period, AD 392–538 (Rees, Lahitte, and Näser 2015, 180–181, Fig. 18). Large numbers of different types of iron arrowheads, either in the form of single specimens or joined in quivers, were found at El-Hobagi III, VI and dated to the 4th century AD (Lenoble 2018, 105–114, 203–208). Iron arrowheads of type 1 or 1a were discovered at the post-Meroitic cemetery of El-Sadda 1 (Osypiński 2007, 360), while arrowheads of types 1b and 6 were discovered in Gebel Adda (Grzymski 2010). A single-barbed arrowhead was found at the Hagar El-Beida 2 cemetery, dated to the Late Meroitic and post-Meroitic period (Longa 2007, 377–378, Fig. 4). Single-barbed iron arrowheads from cemetery 193, containing Ballana and Qustul culture burials, were found at Qasr Ibrim (Mills 1982, 48, Pl. LV: 32.2). Iron arrowheads were found in post-Meroitic tombs at the Gabati cemetery (Edwards 1998, 127, Fig. 5.12). In Akkad, post-Meroitic grave 29 yielded six very corroded iron arrowheads of type 1 or 1a with a maximum length of 0.6 cm (Faroug, Saeed, and Tsakos 2007, 100–101, Pl. XXXIX).

1.3.2 Archer's Looses/Thumb Rings

Five archer's rings were found at El-Zuma [see **Fig. 14.10**]: Z27/6 [**Cat. 73**] was recovered from tumulus 27, Z24/6 [**Cat. 72**] was found in tumulus 24, and three further examples Z7/2 [**Cat. 70**], Z7/3 [**Cat. 69**] and Z7/4 [**Cat. 71**] came from tumulus 7. Ring Z7/3 represents type 2, Z7/2 and Z7/4 represent type 4 and rings Z24/6 and Z27/6 can be ascribed to type 8 of Emery's typology (Emery and Kirwan 1938, 233–234, Fig. 88).

Type 2 rings are the longest (see Catalogue), and the examples from El-Zuma have concave side surfaces and sharp edges (flat top and base). Type 4 rings are smaller than type 2 and have flat side surfaces, but are sharp-edged (flat top and base). Type 8 rings are not very long, with flat side surfaces and a rounded top and base (see Catalogue).

The archer's looses ascribed to type 8 (Z24/6, Z27/6) were made of hard rocks (diorite and granite) and had well-polished surfaces. Straight-sided, similar in shape and dimensions, Z24/6 is 3.1 cm high with a width of 3.9 cm at the top and 5 cm at the base. Z27/6 is 3.27 cm high and measures 3.7 cm at the top and 5.1 cm at the base. The thumb holes of the rings were smoothed and polished, and their usage is indicated by the fact that the internal surface has acquired a characteristic sheen from contact with the hand.

Artefact Z7/3, a type 2 ring with slightly concave sides, and straight-sided Z7/2 and Z7/4, representing type 4, were made of softer and more porous rocks (feldspathic sandstone and probably porphyry). Both types are longer than type 8 rings. The type 2 ring Z7/3 is 4.7 cm high and 5 cm wide at the base. The type 4 rings Z7/2 and Z7/4 are a little smaller, with a height of 4.2–4.4 cm and a width of 4.6–4.8 cm at the base. These three rings feature longitudinal

grooves evidencing sawing inside the thumb hole. Presumably, they were used very little or not at all.

We can surmise that the short rings had been used before they were deposited in the grave, while the long ones had perhaps never been used. Evidence to support this theory was provided by microscopic examination and tests using a wooden replica of a ring with sharp edges (Zieliński 2015, 791–801). During microscopic examination, longitudinal saw marks were noted inside the long rings. The saw marks on the short rings are smaller, and obliterated by further grinding and polishing of the surface. This means that the processing of the long rings was never completed. Consequently, the finger hole was left unfinished and therefore unusable.

Another reason for believing that the long rings were never used is that they may have blocked the thumb joint. A ring could be torn from the finger by a taut bowstring. Experiments with a replica ring with sharp edges also showed that using a sharp-edged ring could result in abrasion and damage to the bowstring. This could lead to accidents that were very dangerous for the archer (including loss of an eye). Hence, it is clear that only the short and smooth-edged rings were fully usable. Detailed information about how these rings were used in Nubian archery was published by Łukasz Zieliński (2015).

Ring Z7/4 was decorated with a cross motif. Similar decoration was noted on the bottles discovered in tumulus 12, which had different forms of crosses scratched on their surface (see Volume II, Chapter 3.3.5). No similar decoration has been recorded on the archer's looses found at other sites.

None of the rings was found on a finger bone (most of them were recovered from the fill of shafts or tunnels). Examples from tumulus 7 were discovered in the tunnel, Z26/6 was found in the shaft and no arrowheads were found with the rings. Only Z27/6 was found in the burial chamber, close to the skull, and was accompanied by at least 16 arrowheads.

A straight-sided thumb ring was recorded in a Meroitic grave in Wadi Muqaddam (Smith 1998, 49, Pl. 3). An example of the granite thumb rings of type IC of Hayes' typology was found in a Meroitic grave at el-Misaktab (Abdelrahman, Sokary, and Buchara 2009, 109–110, Pl. 3). In a Late Meroitic period grave at Botri, a granite archer's loose was found *in situ* on the thumb bone of the left hand of a female (Bashir 2007, 95–96, Pl. 3).

Archer's looses similar to Z24/6 and Z27/6, and of comparable dimensions, discovered at Mikaisir Fortress were dated to the post-Meroitic period, AD 392–538 (Rees, Lahitte, and Näser 2015, 181, 187–189, Figs 14, 22). Examples from Shemkhiya were dated to the Late Meroitic or post-Meroitic period (Żurawski 2010, 373–373, Fig. 4). Thumb rings of all three types were discovered at Gebel Adda and dated to the Meroitic to post-Meroitic period (Grzymski 2010). In Qasr Ibrim, archer's looses made of porphyritic rock were discovered at cemeteries 192A and 193, dated to the Late Meroitic and post-Meroitic periods (Mills 1982, 37, 61, Pls XL:7.4, LXVI:135.1). In post-Meroitic grave 21 at Akkad, four stone archer's rings were found, one of them on a thumb bone (Faroug, Saeed, and Tsakos 2007, 100–101, Pl. XXXIX). A stone ring was found in post-Meroitic cemetery DS2 at Mansourkuti, together with an iron ring and arrows (Bashir 2014, 158–159, Pl. 7). A tall alabaster ring (5 cm high) was found in tomb 201 at Sesebi and dated to the post-Meroitic period (Edwards 1994, 164, 170, Fig. 6:329). In Ballana and Qustul numerous thumb rings of types 2, 4 and 8 were found together with other weapons, such as arrows, inside metal bowls (Emery and Kirwan 1938, 233–248, Pl. 53).

2 Catalogue

2.1 *Legend to the Catalogues*

The catalogue sections of chapters: 14 (weapons), 15 (belt elements), 17 (miscellaneous), and 18 (funerary equipment) present the most interesting artefacts of the metalwork assemblage, highlighting differences in their shapes, sizes, and states of preservation. Most artefacts are preserved fragmentarily. Some inventory numbers cover a group of multiple fragments. Details of the most interesting of these fragments can be found in the description of the object, which also includes information about how many fragments there are in the discussed group. Photographs are provided to give a better idea about the state of preservation of groups of objects recorded under a single inventory number.

Dimensions:
L = length
W = width
Th = thickness
D = diameter
Arrowheads and archer's rings are presented by types.

2.2 *Bladed Spears and Spears*

Cat. 1
Bladed spear reassembled from several smaller fragments (incomplete spearhead)
Inv. no.: **Z16/4+Z16/14+Z16/15**
Context data: Tumulus 16, shaft, near damaged blocking wall of chamber 1

Dimensions: L = 53.4 cm, W = 7.5 cm (wings approximately 3 cm, ribs 1.1–1.3 cm), Th = 0.6–0.7 cm (wings around the ribs), Th = 2.1 cm (rib)
Material and technique: Forge-welded iron on both sides (one wing forged from two lobes of iron welded together on ribs)
Description: Bladed spearhead, with mid-rib slightly off-centre on both faces, heavily corroded and cracked (pieced together from 10 fragments), Emery type 2.
References: Zieliński 2014, 380–382

Cat. 2
Sleeve, pieced together from three smaller fragments
Inv. no.: **Z16/37**
Context data: Tumulus 16, chamber 1, near vessel no. 2
Dimensions: Inner D = *c.* 2.2–2.4 cm, outer D = *c.* 2.6–2.8 cm, wall Th = 0.2 cm
Material and technique: Forged iron
Description: Part of transversely ribbed (corrugated sheet in section) iron sleeve reassembled from three smaller fragments, with more or less consistent cross-section.
Notes: The sleeve was found relatively close to a bladed spearhead. Bladed spear finds from other sites suggest that sleeves decorated with transverse striations were used exclusively on spearheads of this type. Therefore, it seems reasonable to recognize sleeve Z16/37 as a part of a bladed spearhead.
References: Zieliński 2014, 380

Cat. 3
Bladed spear (incomplete spearhead)
Inv. no.: **Z4/194**
Context data: Tumulus 4, E tunnel
Dimensions: W = 2 cm (original W = 2.5 cm), Th = 0.4 cm (wings around the ribs), Th = 1.1 cm (rib)
Material and technique: Forge-welded iron on both sides (one wing forged from two lobes of iron welded together on ribs)
Description: Bladed spearhead, with mid-rib slightly off-centre on both faces, heavily corroded and cracked (pieced together from several fragments), Emery type 5.

Z16/8—group of eight spear fragments
Context data: Tumulus 16, shaft, near damaged blocking wall of chamber 1
Material and technique: Forge-welded iron (core and outer layers)
References: Zieliński 2014, 380–382
(Cat. 4–6, selected fragments)

Cat. 4
Spear, spearhead fragment
Inv. no.: **Z16/8.2**
Dimensions: 6.2 cm × 7 cm, Th = 1.2–1.5 cm on the axis of symmetry of the tip, D = 1.7 cm × 1.5 cm (socket)
Description: Small leaf-shaped spearhead fragment (Emery type 5), heavily corroded with broken point and socket. Wings asymmetrical. Part of one wing glued (originally among fragments catalogued as Z16/17). Blade spindle-shaped in cross-section.

Cat. 5
Spear, spearhead fragment
Inv. no.: **Z16/8.3**
Dimensions: 5.4 cm × 5.5 cm, spearhead Th = 0.9–1.2 cm along midline of blade
Description: Small leaf-shaped spearhead fragment, heavily corroded with point and base missing (only middle part of blade survives with fragmentary cutting edges). Wings asymmetrical. Blade spindle-shaped in cross-section, Emery type 5.

Cat. 6
Spear, spearhead fragment
Inv. no.: **Z16/8.4**
Dimensions: 6 cm × 5.5 cm, spearhead Th = 0.9 cm along midline of blade
Description: Small leaf-shaped spearhead fragment, heavily corroded with point and base missing (only middle part of blade survives without cutting edges). Blade spindle-shaped in cross-section, Emery type 5.

Cat. 7
Spear, spearhead fragment
Inv. no.: **Z24/32**
Context data: Tumulus 24, chamber 1, SE part, next to bones and cluster of metal objects
Dimensions: L = 6.2 cm, W = 3.1 cm, Th = 0.6 cm (original Th = 0.8 cm)
Material and technique: Forge-welded iron (core and outer layers)
Description: Leaf-shaped spearhead fragment (probably elongated variant), heavily corroded with point and base missing (only middle part of blade survives). Blade spindle-shaped in cross-section.

2.3 *Javelins*

Cat. 8
Javelin blade, chipped point fragment
Inv. no.: **Z16/6**
Context data: Tumulus 16, shaft, near damaged blocking wall of chamber 1

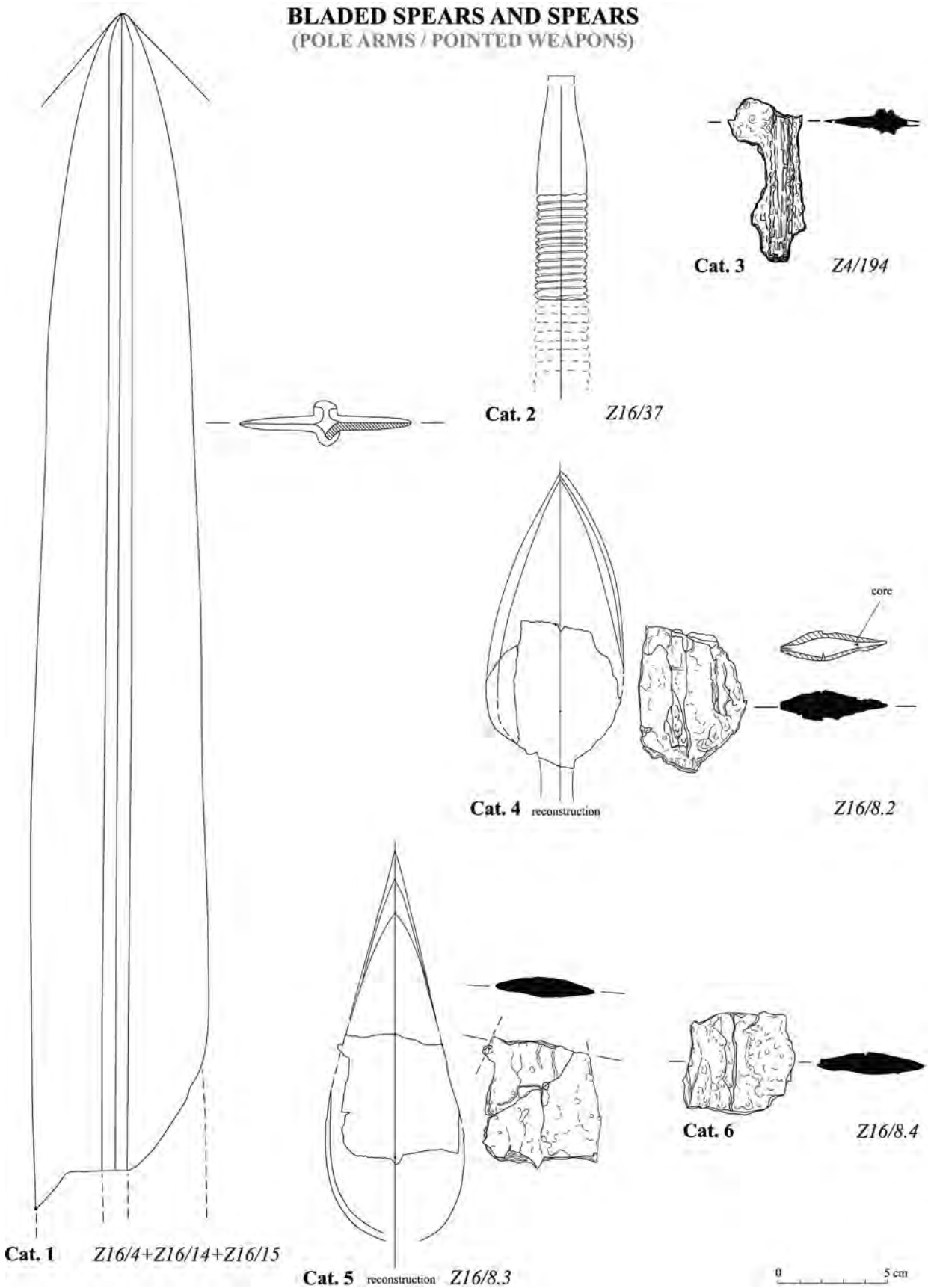

FIGURE 14.2 Pole arms/pointed weapons, bladed spears Z16/4+Z16/7+Z16/14+Z16/15, Z16/37, Z16/8.2, Z16/8.3, Z16/8.4 DRAWN BY Ł. ZIELIŃSKI, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA; Z4/194 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI

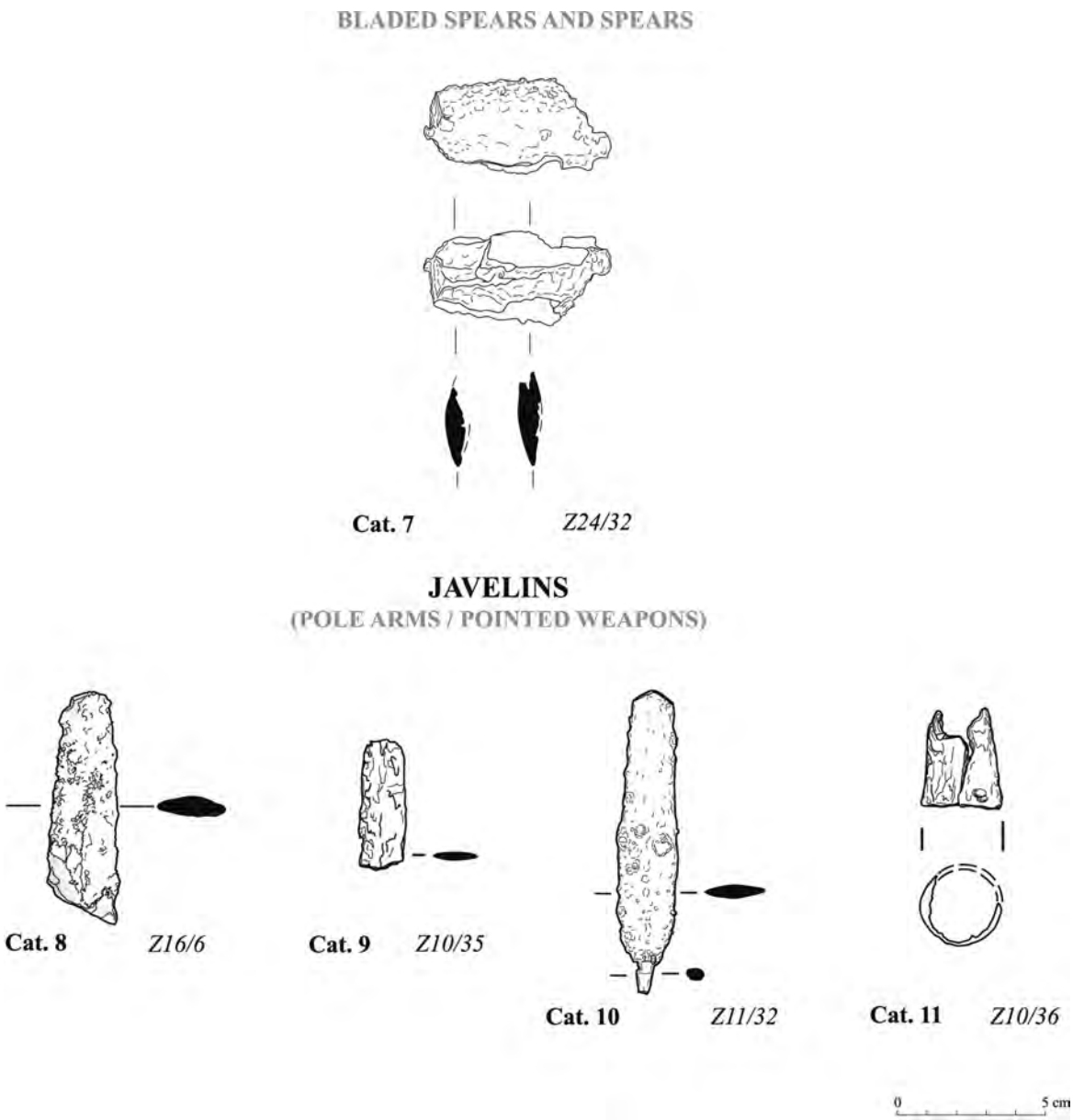

FIGURE 14.3 Pole arms/pointed weapons, bladed spears and javelins
Z24/32 DRAWN BY Ł. ZIELIŃSKI, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA; Z16/6 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK; Z10/35, Z11/32, Z10/36 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI

Dimensions: L = 7.8 cm, max W = 2.3 cm, Th = 0.4–0.5 cm along midline of blade
Material and technique: Forge-welded iron (core and outer layers)
Description: Two-edged, leaf-shaped blade fragment. The mid-rib of rhomboid cross-section and the small dimensions of the blade suggest that this is actually a fragment of javelin head. The rib is still visible on one face, along the midline of the blade. On the other side no rib is visible (perhaps due to the severe corrosion of all surfaces of the blade).
References: Zieliński 2014, 382

Cat. 9
Double-edged blade (probable javelin head)
Inv. no.: **Z10/35**
Context data: Burial chamber
Dimensions: L = 4 cm, W = 1.5 cm, Th = 0.3–0.5 cm, shaft (evidenced by wood grain impression on tang) 0.8 cm × 0.5 cm
Material and technique: Forge-welded iron
Description: Double-edged blade (probable javelin), spindle-shaped cross-section, forge-welded (3 layers).

Cat. 10
Javelin head with broken tang and point
Inv. no.: **Z11/32**
Context data: Tumulus 11, chamber 1, W part
Dimensions: L = 9.4 cm, W = 2 cm, Th = 0.5 cm, tang (rounded) 0.5 cm × 0.4 cm
Material and technique: Forged iron
Description: Heavily corroded javelin head, two-edged, leaf-shaped blade fragment. Spindle-shaped cross-section.

Cat. 11
Iron ferrule fragments (probably the same object as Z10/35)
Inv. no.: **Z10/36**
Context data: Burial chamber
Dimensions: D = 2.8–2.2 cm, Th = 0.2 cm
Material and technique: Forged iron
Description: Two iron ferrule fragments (heavily corroded and broken) with traces of wood inside.

2.4 *Edged Weapons*

Cat. 12
Long combat knife reassembled from several smaller fragments (incomplete blade)
Inv. no.: **Z16/8.1**
Context data: Tumulus 16, shaft, near damaged blocking wall of chamber 1
Dimensions: L = 26 cm (after gluing), max W = 3.8 cm (without original cutting edge), original Th = *c.* 1–1.1 cm
Material and technique: Forge-welded iron (core and outer layers)
Description: Single-edged blade with triangular cross-section and slightly rounded back edge (original rounded back edge survives on small fragment of blade). Original cutting edge does not survive. Blade severely cracked, corroded and in many places delaminated. Wood grain impressions visible on one heavily delaminated and thick fragment of rust coating lateral surface. Similar impressions visible on back edge surface (remains of scabbard).
References: Zieliński 2014, 382

Cat. 13
Long combat knife, reassembled from several smaller fragments (incomplete blade)
Inv. no.: **Z10/30**
Context data: Tumulus 10, burial chamber
Dimensions: Fragment a: L = 18.1 cm, fragment b: L = 10.8 cm (after gluing); max W = 4.1 cm, original Th = *c.* 1.6 cm
Material and technique: Forge-welded iron (core and outer layers)
Description: Single-edged blade with triangular cross-section and slightly rounded back edge (original rounded back edge survives on small fragment of blade). Original cutting edge does not survive. Blade severely cracked, corroded and in many places delaminated. Wood grain impressions visible on badly delaminated and thick fragment of rust coating lateral surface. Similar impressions visible on back edge surface (remains of scabbard).

Cat. 14
Knife, reassembled from several smaller fragments (incomplete blade)
Inv. no.: **Z10/32+Z10/33+Z10/34**
Context data: Tumulus 10, burial chamber
Dimensions: L = 14.6 cm (after gluing), W = 2.1 cm, Th = 0.5 cm
Material and technique: Forge-welded iron
Description: Single-edged blade with triangular cross-section. Traces of copper oxides on tang represent remains of handle (copper strips provided framework that held scales in place).

Cat. 15
Iron sleeve fragment with copper oxides (knife part)
Inv. no.: **Z4/7.1**
Context data: Tumulus 4, tunnel
Dimensions: D = 1.4 cm
Material and technique: Iron with copper coating
Description: Iron sleeve with broken tang wedged inside it. Sleeve covered with copper oxides (remains of copper surface coating). Wood impressions inside.

Cat. 16
Dagger fragment
Inv. no.: **Z4/107**
Context data: Tumulus 4, fill of E tunnel
Dimensions: L = 5.4 cm, W = 3.4 cm, Th = 0.15 cm
Material and technique: Iron
Description: Heavily corroded, broken dagger blade fragment. Double-edged blade, symmetrical with fuller on both sides. Leather impression survives on blade.

2.5 *Arrowheads* (*Ranged Weapons*)

Cat. 17
Arrowhead
Inv. no.: **Z10/38**
Context data: Tumulus 10, burial chamber
Dimensions: L = 6 cm, W = 1.4 cm, cross-section 0.4 cm

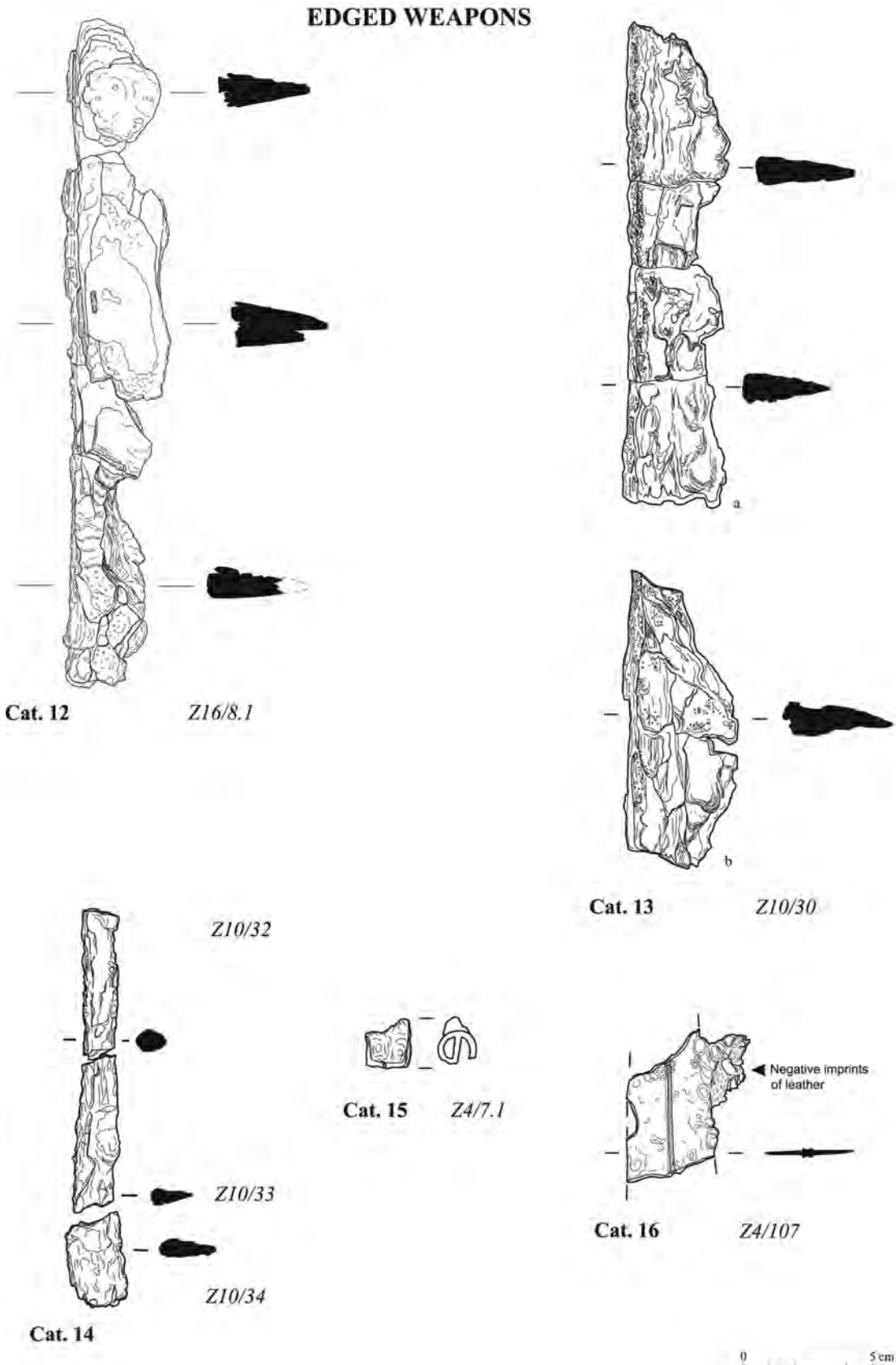

FIGURE 14.4 Edged weapons
Z16/8.1, Z10/30, Z4/7.1, Z4/107 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI;
Z10/32+Z10/33+Z10/34 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI

Material and technique: Forged iron
Description: Arrowhead with broken barb, heavily corroded with traces of wood impressions (shaft), type 1.

Cat. 18
Two arrowheads fused together
Inv. no.: **Z10/39**
Context data: Tumulus 10, burial chamber
Dimensions: a: L = 6 cm, W = 1.2 cm, cross-section 0.3 cm; b: L = 6.4 cm, W = 1.4 cm, cross-section 0.3 cm
Material and technique: Forged iron
Description: Two arrowheads fused together, heavily corroded with traces of wood impressions (shaft), probably type 1.

Z21/11—arrowhead fragments (*c.* 15 tangs and 8 blades)
Context data: Tumulus 21, burial chamber, central part
Dimensions: No more than 2 cm long
Material and technique: Forged iron
Description: Arrowheads represented by about 15 tangs and 8 blades; two specimens with tip of tang rounded in cross-section giving rise to square-sectioned tang body with lateral notching.
(Cat. 19–28, selected fragments)

Cat. 19
Arrowhead
Inv. no.: **Z21/11.2**
Dimensions: L = 4.3 cm, W = 1.1 cm, Th = 0.35 cm
Description: Iron arrowhead with broken barb, type 1.

Cat. 20
Arrowhead fragment
Inv. no.: **Z21/11.9**
Dimensions: Preserved L = 4.6 cm, W = 1.2 cm, Th = 0.3 cm
Description: Fragment of iron arrowhead with broken point, type 1.

Cat. 21
Arrowhead
Inv. no.: **Z21/11.6**
Dimensions: L = 5.6 cm, W = 1.1 cm, Th = 0.3 cm
Description: Complete small iron arrowhead, type 1.

Cat. 22
Arrowhead fragment
Inv. no.: **Z21/11.7**
Dimensions: Preserved L = 3.2 cm, W = 1.2 cm, Th = 0.25 cm
Description: Fragment of small iron arrowhead with broken barb and tang, type 1.

Cat. 23
Inv. no.: **Z21/11.11**
Dimensions: Preserved L = 3.7 cm, W = 1.1 cm, Th = 0.3 cm
Description: Fragment of small iron arrowhead with broken barb and tang, type 1.

Cat. 24
Arrowhead fragment
Inv. no.: **Z21/11.8**
Dimensions: Preserved L = 4.9 cm, W = 1.5 cm, Th = 0.5 cm
Description: Fragment of elongated blade, clearly larger than other arrowheads in this assemblage. The fragment is difficult to interpret, but is probably a type 1 arrowhead.

Cat. 25
Arrowhead
Inv. no.: **Z21/11.12**
Dimensions: Preserved L = 2.3 cm, W = 1.1 cm, Th = 0.3 cm
Description: Fragment of small iron arrowhead with broken barb and tang, type 1.

Cat. 26
Arrowhead
Inv. no.: **Z21/11.13**
Dimensions: Preserved L = 1.8 cm, W = 0.9 cm, Th = 0.3 cm
Description: Fragment of small iron arrowhead with broken barb and tang, type 1.

Cat. 27
Arrowhead fragment
Inv. no.: **Z21/11.4**
Dimensions: Preserved L = 2.1 cm, W = 1.1 cm, Th = 0.3 cm
Description: Fragment of arrowhead with broken barb and tang, type 1.

Cat. 28
Two fused arrowheads
Inv. no.: **Z21/11.10**
Dimensions: a: arrowhead 1: L = 6.3 cm, W = 1.3 cm, Th = 0.5 cm; b: arrowhead 2: L = 4 cm, W = 1.2 cm, Th = 0.5 cm
Description: Two fragments of arrowheads fused by corrosion, a: with broken tang, type 1; b: type 6.

Z13/5—group of 30 fragments of arrowheads
Context data: Tumulus 13, SE part of shaft, near damaged blocking wall
Material and technique: Forged iron
(Cat. 29, selected fragment)

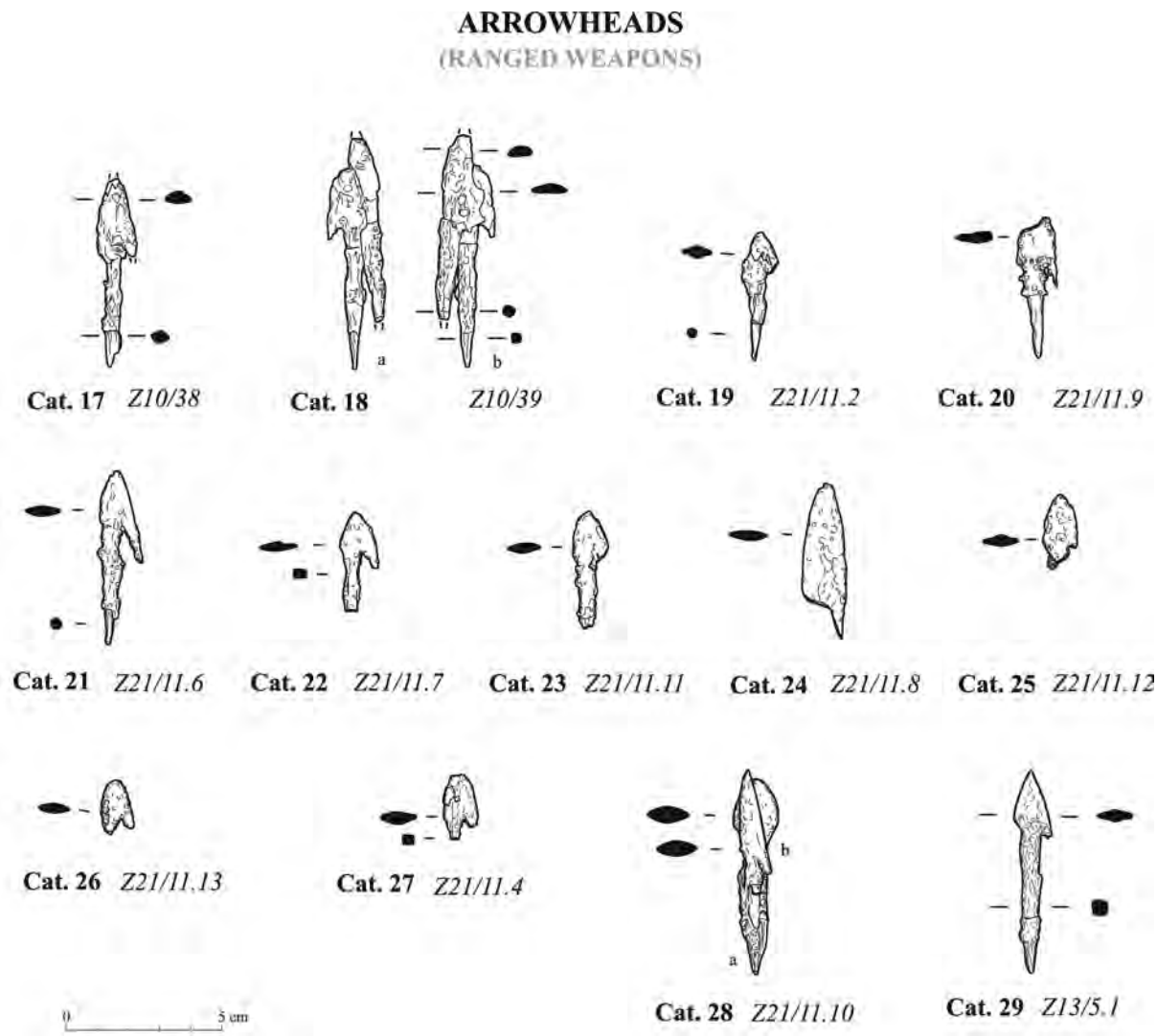

FIGURE 14.5 Ranged weapons: arrowheads
Z10/38, Z10/39, Z13/5.1 drawn by A. Błaszczyk, digitised by Ł. Zieliński; Z21/11.2, Z21/11.9, Z21/11.6, Z21/11.7, Z21/11.11, Z21/11.8, Z21/11.12, Z21/11.13, Z21/11.4, Z21/11.10 drawn and digitised by Ł. Zieliński

Cat. 29
Arrowhead
Inv. no.: **Z13/5.1**
Dimensions: L = 6.4 cm, W = 1.15 cm, Th = 0.3 cm
Description: Single arrowhead with losses; heavily corroded, type 1.

Cat. 30
Arrowhead
Inv. no.: **Z19/7**
Context data: Tumulus 19, burial chamber, S part
Dimensions: W = 1.2 cm, Th = 0.3 cm
Material and technique: Forged iron
Description: Complete single-headed arrowhead, heavily corroded; wood impressions on tang, type 1.

Z16/26—group of 7 fragments of arrowheads
Context data: Tumulus 16, chamber 1, N part near blocking wall
References: Zieliński 2014, 383–384
(Cat. 31–32, selected fragments)

Cat. 31
Two arrowheads (in one lump)
Inv. no.: **Z16/26.2**, after reattachment of one broken piece
Dimensions: L = 6.2 cm, W = 1.1 cm, blade Th = 0.2 cm, rectangular tang 0.4 cm × 0.7 cm
Material and technique: Two sides forged from one piece of iron. Typical and simple smithing technique. Lateral surfaces of blade, barb and tang overlap indicating that they were simultaneously worked by the blacksmith.
Description: Single-barbed, sub-triangular arrowheads;

blade spindle-shaped in cross-section; rectangular-sectioned tang. It was possible to clean some surfaces close to the barb and tang, but, overall, both arrowheads are heavily corroded and cracked, type 1.

Cat. 32
Four arrowheads
Inv. no.: **Z16/26.3** (in one lump), three almost complete and one blade fragment
Dimensions: Arrowhead b: L = 5.8 cm, blade W = 1.1 cm, blade Th = 0.1 cm, Th = 0.4 cm (on ribs); other arrowheads: L = 6–6.1 cm
Material and technique: Iron (forged on both sides; blade probably forged and tempered separately and wedged between the forks of the ribs as a continuation of the tang). Unique smithing technique (standard arrowheads of this type are forged from one piece of iron and the blade is spindle-shaped in cross-section).
Description: b: single-barbed, hooked. The blade is a flat lamina, 1 mm thick, with semicircular ribs on both sides. It was not possible to clean the heavily corroded tang, which is probably rounded in cross-section. The blade was cleaned down to sound metal, revealing traces of smithing under magnification (uncut furrows on the barb and a rectangular chisel mark at the base of the barb, where it joins the tang), type 1a.

Cat. 33
Two fragments, selected from group of five arrowheads
Inv. no.: **Z22/7.1+Z22/7.2**
Context data: Fill of shaft
Dimensions: a: L = 3 cm, b: L = 3 cm, Th = 0.9 cm
Material and technique: Forged iron
Description: Five fragments of arrowheads (4 bodies, 1 blade) fused together by corrosion.

Cat. 34
Arrowhead (from assemblage Z27/1)
Inv. no.: **Z27/1.2**
Context data: Tumulus 27, N part of shaft, near burial chamber
Dimensions: W = 1.3 cm, Th = 0.3 cm
Material and technique: Forged iron
Description: Almost complete arrowhead, heavily corroded and broken, type 1.

Cat. 35
Arrowhead (from assemblage Z27/1)
Inv. no.: **Z27/1.3**
Context data: Tumulus 27, N part of shaft, near burial chamber
Dimensions: W = 1.3 cm, Th = 0.2 cm
Material and technique: Forged iron
Description: Almost complete arrowhead with broken point and barb; heavily corroded and broken, type 1.

Cat. 36
Fifteen arrowhead fragments
Inv. no.: **Z27/7**
Context data: Tumulus 27, burial chamber, central part, near skull
Dimensions: Max arrowhead L = 5 cm
Material and technique: Forged iron
Description: Four relatively complete reassembled arrowheads (one type 1 and one type 1b) and 11 smaller fragments (type 1b—one fragment; type 1—four fragments). Heavily corroded and broken; wood impressions on tangs.

Cat. 37
Broken arrowhead
Inv. no.: **Z4/24**
Context data: Tumulus 4, Layer 5
Dimensions: L = 4.2 cm; rectangular-sectioned tang 0.5 cm × 0.4 cm; head: W = 1.4 cm, Th = 0.4 cm, L = 1.8 cm
Material and technique: Forged iron
Description: Broken single-barbed arrowhead, type 1 or 1a.

Cat. 38
Broken arrowhead
Inv. no.: **Z4/56**
Context data: Tumulus 4, W tunnel
Dimensions: L = 4.8 cm; square-sectioned tang 0.4 cm; head: W = 1.1 cm, Th = 0.1 cm, L = 1.7 cm
Material and technique: Iron
Description: One broken single-barbed arrowhead, type 1 or 1a.

Cat. 39
Arrowhead
Inv. no.: **Z10/44**
Context data: Tumulus 10, burial chamber
Dimensions: L = 6.5 cm, W = 1.3 cm, Th = 0.3 cm, barb L = 1 cm
Material and technique: Forged iron
Description: Complete single-shot arrowhead, heavily corroded; wood impression on tang, type 1a.

Cat. 40
Broken arrowhead
Inv. no.: **Z4/216**
Context data: Tumulus 4, E tunnel

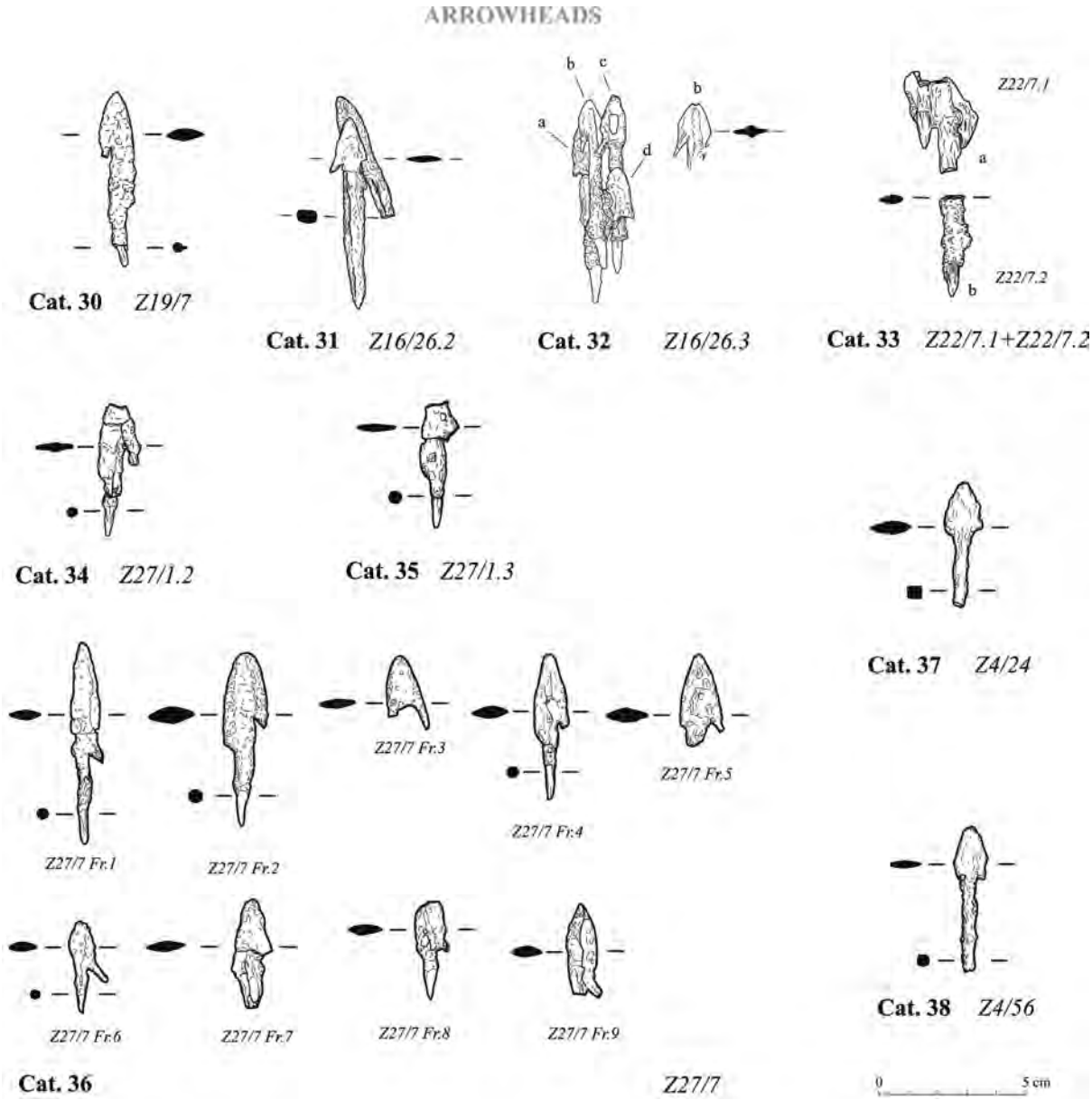

FIGURE 14.6 Ranged weapons: arrowheads Z19/7, Z16/26.2, Z16/26.3, Z22/7.1+Z22/7.2, Z27/1.2–3, Z27/7, Z4/24, Z4/56 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI

Dimensions: Preserved L = 4.4 cm, square-sectioned tang 0.4 cm; blade: W = 1 cm, Th = 0.25 cm; barb: L = 0.85 cm
Material and technique: Iron
Description: One broken single-barbed hooked arrowhead, type 1a.

Cat. 41
Arrowheads fused together (minimum 10 pieces)
Inv. no.: **Z17/5**
Context data: Tumulus 17, burial chamber, S part
Dimensions: W = 1.2 cm, Th = 0.4 cm
Material and technique: Forged iron
Description: Minimum of 10 fragmented arrowheads fused together. At least four pieces attributable to type 1a. Arrow surfaces covered with distinctive heavy corrosion layer (quiver remnants or human remains). Visible wood impressions on tangs; impressions and fragments of raw hide (probably from a quiver).

Cat. 42
Arrowhead, fragment with broken point
Inv. no.: **Z16/12**
Context data: Tumulus 16, shaft, near chamber 1
Dimensions: Blade W = 1.3 cm, Th = 0.3 cm, extant length of blade = 3.8 cm, rectangular-sectioned tang 0.4 cm × 0.7 cm

Material and technique: Forged iron, from one piece (probably simple technique)
Description: Heavily corroded tang fragment with asymmetrical longitudinal blade, broken point and broken barb. Shape and dimensions indicate that this is an elongated variant of a type 1a arrowhead (or less probably type 1).
References: Zieliński 2014, 385

Z13/5—group of 30 fragments of arrowheads
Context data: Tumulus 13, SE part of shaft, near damaged blocking wall
Material and technique: Forged iron
(Cat. 43–44, selected fragments)

Cat. 43
Arrowhead
Inv. no.: **Z13/5.2**
Dimensions: W = 1 cm, Th = 0.4 cm
Description: Single arrowhead with losses; heavily corroded, type 1b.

Cat. 44
Arrowhead
Inv. no.: **Z13/5.3**
Dimensions: W = 1.2 cm, Th = 0.3 cm
Description: Single arrowhead with losses; heavily corroded, type 1b.

Cat. 45
Two arrowheads, two fragments
Inv. no.: **Z16/11**
Context data: Tumulus 16, shaft, central and S part near damaged blocking wall
Dimensions: a: blade L = 1.4 cm, W = 1.1 cm, Th = 0.3 cm; b: blade L = 1.7 cm, W = 1.1 cm, Th = 0.3 cm
Material and technique: Iron forged on both sides, from one piece (simple technique)
Description: Two single-barbed and tanged, leaf-shaped arrowheads, heavily corroded with broken tangs (one completely, one partly). Blade spindle-shaped in cross-section, type 1b.
References: Zieliński 2014, 385

Z16/26—group of 7 arrowhead fragments
Context data: Tumulus 16, chamber 1, N part near blocking wall
References: Zieliński 2014, 383–384
(Cat. 46, selected fragment)

Cat. 46
Arrowhead
Inv. no.: **Z16/26.1**, reassembled (almost complete)
Dimensions: Max W = 1 cm, Th = 0.1 cm, square-sectioned barb 0.2 cm, oval-sectioned tang 0.4 cm × 0.3 cm
Material and technique: Iron forged from one side from one piece, other side flat (uncommon smithing technique)
Description: Leaf-shaped, single-barbed arrowhead with tang; typical post-Meroitic form (type 1b, short variant). One side completely flat; barb and tang on other side. Light surface cleaning revealed sound metal (traces of smithing visible near barb under magnification).

Z21/11—arrowhead fragments (*c.* 15 mandrels/tangs and 8 blades)
Context data: Tumulus 21, burial chamber, central part
Dimensions: No more than 2 cm long
Material and technique: Forged iron
Description: Arrowheads represented by about 15 tangs and 8 blades; two specimens with tip of tang rounded in cross-section giving rise to square-sectioned tang body with lateral notching.
(Cat. 47–49, selected fragments)

Cat. 47
Arrowhead fragment
Inv. no.: **Z21/11.3**
Dimensions: Preserved L = 2.4 cm, W = 1.1 cm, Th = 0.3 cm
Description: Fragment of arrowhead blade with broken tang, type 1b.

Cat. 48
Arrowhead
Inv. no.: **Z21/11.1**
Dimensions: Preserved L = 4 cm, cross-section 0.45 cm
Description: Fragment of arrowhead tang, square in section with characteristic notching (surface of tip very well preserved).

Cat. 49
Arrowhead fragment
Inv. no.: **Z21/11.5**
Dimensions: Preserved L = 2.1 cm, cross-section 0.4 cm × 0.4 cm
Description: Fragment of arrowhead tang, square in section with characteristic notching (surface of tip very well preserved).

Cat. 50
Arrowhead (from assemblage Z27/1)
Inv. no.: **Z27/1.1**

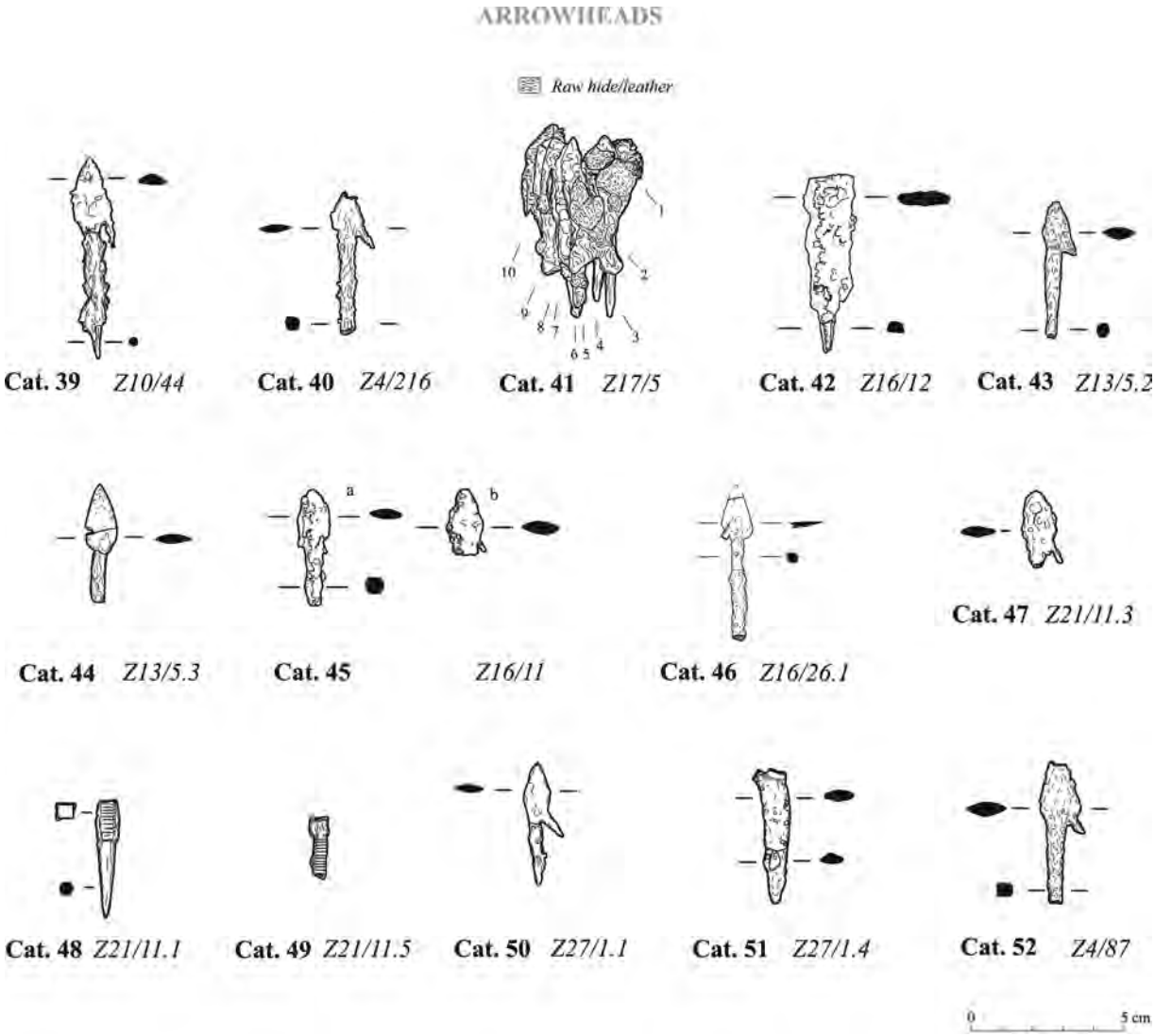

FIGURE 14.7 Ranged weapons: arrowheads
Z10/44, Z13/5.2, Z13/5.3 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI; Z4/216, Z16/26.1, Z21/11.3, Z21/11.1, Z21/11.5, Z27/1.1, Z27/1.4, Z4/87 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z17/5 DRAWN BY K. JUSZCZYK, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA; Z16/11, Z16/12 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK

Context data: Tumulus 27, N part of shaft, near burial chamber
Dimensions: L = 3.7 cm, W = 0.9 cm, Th = 0.25 cm, blade L = 2 cm
Material and technique: Forged iron
Description: Almost complete arrowhead (type 1b); heavily corroded and broken.

Cat. 51
Arrowhead fragment (from assemblage Z27/1)
Inv. no.: **Z27/1.4**
Context data: Tumulus 27, N part of shaft, near burial chamber
Dimensions: W = 0.9 cm, Th = 0.4 cm, blade L = *c.* 4.4 cm
Material and technique: Forged iron
Description: Fragment of arrowhead (reassembled from fragments catalogued under Z27/1), heavily corroded and broken, type 1b, elongated version.

Cat. 52
Broken arrowhead
Inv. no.: **Z4/87**
Context data: Tumulus 4, W tunnel
Dimensions: Preserved L = 4.5 cm; square-sectioned tang: 0.4 cm, blade: L = 2 cm, W = 1.3 cm, Th = 0.5 cm (original Th = 0.2 cm), barb: L = 0.6 cm

Material and technique: Forged iron
Description: Broken single-barbed leaf-shaped arrowhead, type 1b.

Cat. 53
Three fused arrowhead blades (from assemblage Z27/1)
Inv. no.: **Z27/1.5**
Context data: Tumulus 27, N part of shaft, near burial chamber
Dimensions: W = 1.1 cm, Th = 0.35 cm, blade L = *c.* 3 cm
Material and technique: Forged iron
Description: Three fragments of arrowhead fused together by corrosion, heavily corroded and broken, only blades—one attributable to type 1b.

Cat. 54
Two broken arrowheads
Inv. no.: **Z4/88**
Context data: Tumulus 4, W tunnel
Dimensions: a: preserved L = 5.2 cm, rectangular tang 0.4 cm × 0.5 cm, blade: L = 1.8 cm, W = 1.3 cm, Th = 0.4 cm (original Th = 0.2 cm); b: preserved L = 3.2 cm, round-sectioned tang 0.4 cm × 0.4 cm, W = 1.4 cm; broken blade: original Th = 0.2 cm, barb: preserved L = 0.2 cm
Material and technique: Forged iron
Description: Two broken arrowheads fused together by corrosion; single-barbed leaf-shaped; extant hide impression (representing quiver), both type 1b.

Cat. 55
Arrowhead
Inv. no.: **Z10/37**
Context data: Tumulus 10, burial chamber
Dimensions: L = 5 cm, W = 1.1 cm, cross-section 0.5 cm
Material and technique: Forged iron
Description: Heavily corroded with traces of wood impression (shaft), type 6.

Cat. 56
Three arrowheads fused together
Inv. no.: **Z10/47**
Context data: Tumulus 10, burial chamber
Dimensions: L = 5.5 cm, W = 1.2 cm, Th = 0.4 cm
Material and technique: Forged iron
Description: Three arrowheads, fused together by corrosion; heavily corroded; wood impressions on tangs, type 6.

Cat. 57
Arrowhead fragment
Inv. no.: **Z10/41**
Context data: Tumulus 10, burial chamber
Dimensions: Preserved L = 3.8 cm, cross-section 0.5 cm
Material and technique: Forged iron
Description: Arrowhead tang (probably single-barbed), heavily corroded.

Cat. 58
Arrowhead fragment
Inv. no.: **Z10/42**
Context data: Tumulus 10, burial chamber
Dimensions: L = 2.5 cm, cross-section 0.5 cm
Material and technique: Forged iron
Description: Arrowhead tang, heavily corroded.

Cat. 59
Arrowhead fragment
Inv. no.: **Z10/43**
Context data: Tumulus 10, burial chamber
Dimensions: L = 4.8 cm, cross-section 0.5 cm
Material and technique: Forged iron
Description: Asymmetrical arrowhead tang (probably single-barbed).

Cat. 60
Three fused arrowhead fragments
Inv. no.: **Z10/48**
Context data: Tumulus 10, burial chamber
Dimensions: L = 3.5 cm, cross-section 0.5 cm
Material and technique: Forged iron
Description: Three broken arrowheads fused together by corrosion (type unrecognizable).

Cat. 61
Three fused fragments of arrowheads (1 tang, 2 blades)
Inv. no.: **Z10/49**
Context data: Tumulus 10, burial chamber
Dimensions: Cross-section 0.5 cm (tang), Th = 0.3 cm
Material and technique: Forged iron
Description: Three fragments of arrowheads fused together (1 tang, 2 blades); heavily corroded and broken.

Cat. 62
Four fragments of arrowheads fused together
Inv. no.: **Z10/53**
Context data: Tumulus 10, burial chamber
Dimensions: W = 1–1.2 cm, Th = 0.3 cm
Material and technique: Forged iron
Description: Four fragments of arrowheads fused together; heavily corroded and broken.

Cat. 63
Two arrowhead fragments
Inv. no.: **Z17/12**

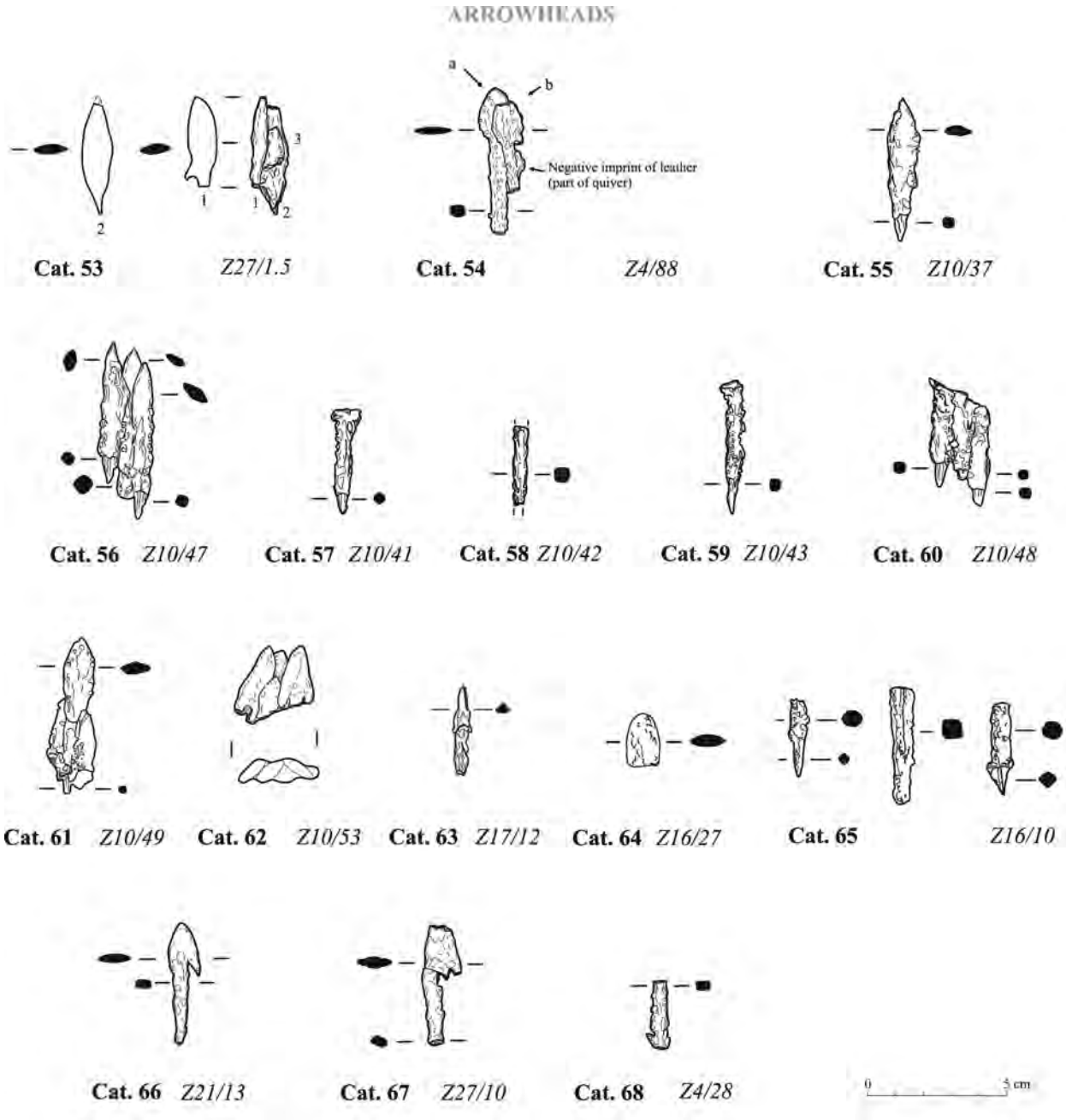

FIGURE 14.8 Ranged weapons: arrowheads
Z27/1.5, Z4/88, Z21/13, Z27/10, Z4/28 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z10/37, Z10/47, Z10/41, Z10/42, Z10/43, Z10/48, Z10/49, Z10/53 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI; Z17/12 DRAWN BY K. JUSZCZYK, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA; Z16/27 DRAWN BY K. JUSZCZYK, DIGITISED BY Ł. ZIELIŃSKI; Z16/10 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK

Context data: Tumulus 17, burial chamber, S part
Dimensions: Cross-section 0.4 cm
Material and technique: Forged iron
Description: Two heavily corroded fragments of arrowhead tang (type unrecognizable).

Cat. 64
Arrowhead, blade fragment
Inv. no.: **Z16/27**
Context data: Tumulus 16, chamber 1, part N, near vessel Z16/3
Dimensions: Blade W = 1.2 cm, Th = 0.3 cm
Material and technique: Forged iron
Description: Broken fragment of arrowhead blade (point only), with spindle-shaped cross-section and heavily corroded surface. Poor diagnostic piece (dimensions and shape suggest a post-Meroitic arrowhead, probably a single-barbed one).
References: Zieliński 2014, 384

Cat. 65
Arrowheads, 14 fragments (11 tang fragments, 3 other fragments)
Inv. no.: **Z16/10**
Context data: Tumulus 16, shaft, central and S part near damaged blocking wall
Dimensions: Tang fragments no longer than 3–3.5 cm
Material and technique: Forged iron
Description: Heavily corroded tangs and other indeterminate iron splinters from arrowheads.
References: Zieliński 2014, 385

Cat. 66
Arrowhead
Inv. no.: **Z21/13**
Context data: Tumulus 21, burial chamber, N part, near beads
Dimensions: L = 4.3 cm, W = 1.1 cm, Th = 0.25 cm
Material and technique: Forged iron
Description: Small iron arrowhead reassembled from two fragments (asymmetrical, single-barbed).

Cat. 67
Group of nine arrowhead fragments
Inv. no.: **Z27/10**
Context data: Tumulus 27, N part of shaft, near burial chamber
Dimensions: Largest fragment L = 4.7 cm
Material and technique: Forged iron
Description: Eleven different fragments: three definite fragments of arrowheads (two blade fragments, one broken barb), one long fragment, bent and broken at the end (L = 4.7 cm), seven other fragments (two possible fragments of arrowheads). Heavily corroded and broken.

Cat. 68
Arrowhead tang fragment
Inv. no.: **Z4/28**
Context data: Tumulus 4, Layer 5
Dimensions: Preserved L = 2.4 cm, rounded cross-section 0.4 cm × 0.4 cm
Material and technique: Forged iron
Description: One arrowhead tang fragment.

2.6 *Thumb Rings* (*Ranged Weapons*)

Cat. 69
Thumb ring (archer's loose)
Inv. no.: **Z7/3**
Context data: Tumulus 7, context 5
Dimensions: Inside D = 2 cm, constriction in middle 1.85 cm; outside D = 3 cm (top), 5 cm (bottom), H = 4.7 cm
Material and technique: Stone—porphyry
Description: Outer surface bleached and smooth; longitudinal scratches evidencing processing (sawing) visible on inner surface. Very nicely worked (almost straight edges and even surfaces), Emery type 2.

Cat. 70
Thumb ring (archer's loose)
Inv. no.: **Z7/2**
Context data: Tumulus 7, context 5
Dimensions: Inside D = 2.1 cm; outside D = 2.8 cm (top), 4.6 cm (bottom); H = 4.4 cm
Material and technique: Stone—feldspathic sandstone
Description: Nicely worked (almost straight edges and even surfaces); quite porous surfaces (no polishing). Longitudinal scratches evidencing processing (sawing) visible on inner surface. Broken ring (approximately half-extant) with crack at base, Emery type 4.

Cat. 71
Thumb ring (archer's loose)
Inv. no.: **Z7/4**
Context data: Tumulus 7, context 5
Dimensions: Inside D = 2.15 cm; outside D = 2.9 cm (top), 4.8 cm (bottom), H = 4.2 cm
Material and technique: Stone—feldspathic sandstone (ferriferous)
Description: Nicely worked (almost straight edges and even surfaces), quite porous surfaces (no polishing). Longitudinal scratches evidencing processing (sawing) visible on inner surface. Lateral surface features roughly

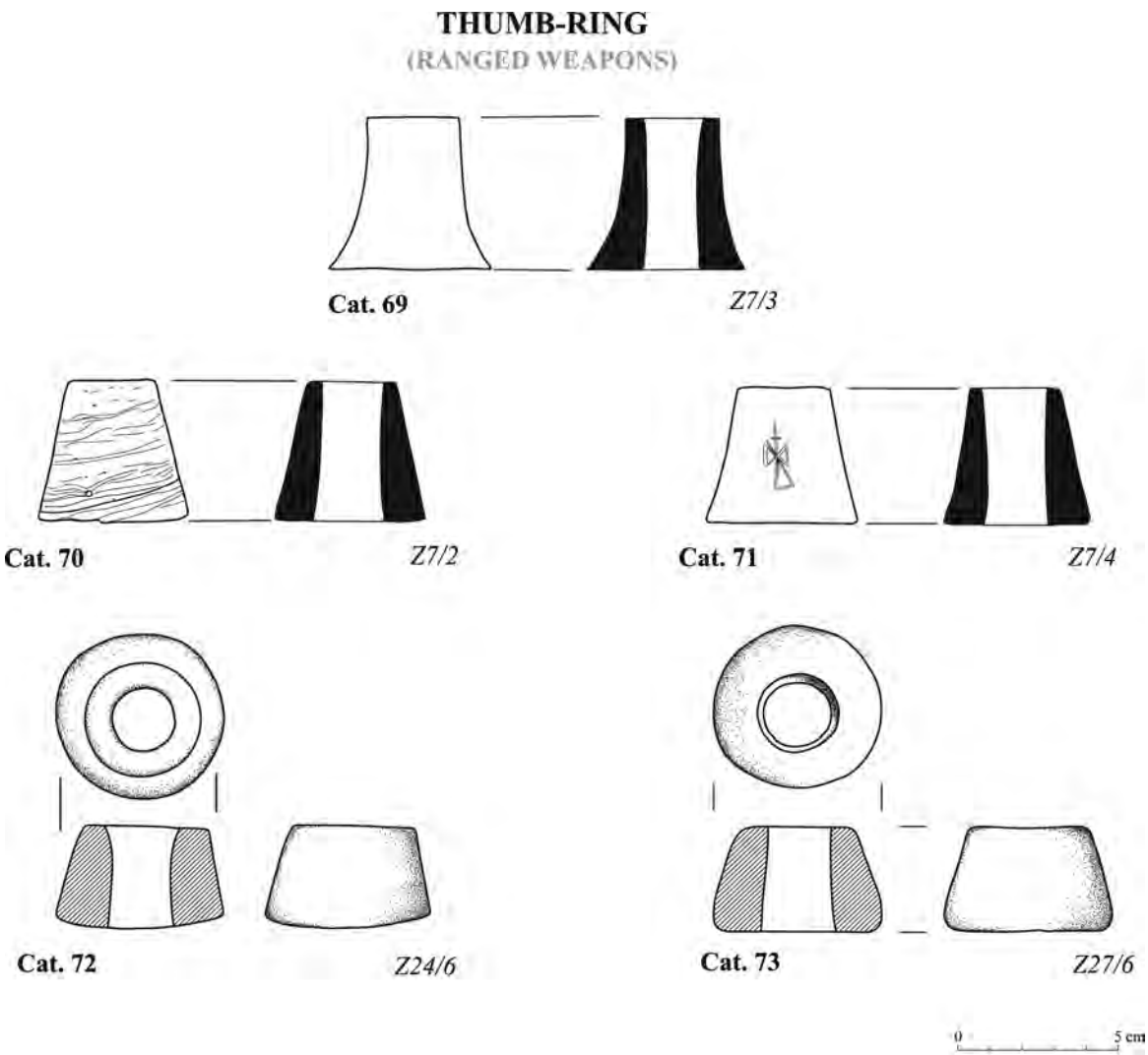

FIGURE 14.9 Archer's looses/thumb rings
Z7/3, Z7/2, Z7/4, Z24/6, Z27/6 DRAWN BY Ł. ZIELIŃSKI, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

FIGURE 14.10 Archer's looses discovered in El-Zuma tumuli
PHOTOS BY A. KAMROWSKI

scratched cross with flared arms (top arm least carefully executed), Emery type 4.

Cat. 72
Thumb ring (archer's loose)
Inv. no.: **Z24/6**
Context data: Tumulus 24, SE part of shaft, fill
Dimensions: Inside D = 2.2 cm, constriction in middle 1.75 cm; outside D = 3.9 cm (top), 5 cm (bottom); H = 3.1 cm (weight: 119–120 g)
Material and technique: Stone—diorite
Description: Outer surface smooth but scratched; inner surface smooth from use. Two splinters on upper edge; bottom surface uneven with one loss and edges more rounded than those of top surface, Emery type 8.

Cat. 73
Thumb ring (archer's loose)
Inv. no.: **Z27/6**
Context data: Tumulus 27, burial chamber, central part, near skull
Dimensions: Inside D = 2.2 cm, constriction in middle 1.9 cm; outside D = 3.7 cm (top), 5.1 cm (bottom), H = 3.27 cm (weight: 120–121 g)
Material and technique: Stone—granite
Description: Outer surface smooth but scratched; inner surface smooth and shiny from use. Very nicely worked (almost straight edges and even surfaces), slightly uneven base with faint scratches. Longitudinal scratch on lateral surface. One small loss to top edge, Emery type 8.

CHAPTER 15

Scabbards and Belt Fittings

The buckles and various carrying rings constitute a small group of artefacts found at the El-Zuma cemetery [**Fig. 15.1**]. Items identified as belt elements were discovered only in three tumuli. In all three cases they were found alongside edged weapons.

1 Scabbards and Belt Elements

Two copper-based buckles Z4/20 [**Cat. 1**] and Z4/81 [**Cat. 2**] were found in T.4. Buckle Z4/20 was made of brass, as confirmed by XRF tests (see Chapter 19, this volume). This object is of relatively simple construction. It was made of D-shaped brass wire as a two-part model (frame and pin). The construction technique used for the second buckle (Z4/81) was much more complicated. Apart from the frame and pin, it consisted of an attachment plate wrapped around the bar. The front of this triangular plate was embossed (slightly convex), and had a rivet in each of its three corners to fix it to the belt. The attachment to the belt was reinforced with a rectangular backplate.

This construction was a typical solution for military belts, which must have additional reinforcements and fittings on top due to the possibility of being cut in combat, as well as the additional weight they have to bear when a weapon is suspended from them. These buckles could be parts of two belts used to attach a weapon, but we cannot state this with certainty because all objects from T.4 came from the tunnel.

A broken and contorted forged iron loop Z16/36, [**Cat. 4**] was found in T.16. Its longer side measures 2.6 cm on the inside, which means that this was the maximum width of the belt. The shorter side measures 1.4 cm in the middle (the widest point). Unfortunately, no evidence of a pin was found. However, due to its very poor condition, it cannot be ruled out that this object originally had such a pin.

Object Z10/45 [**Cat. 3**], found in T.10, is a fragment of two thick, longitudinal iron strips terminating in a sleeve with an iron ring. The object was broken in half, so the other end does not survive. Originally, it would have consisted of three strips and a second iron ring at the opposite end. The middle strip is semi-circular in cross-section. The whole object was probably a scabbard locket with a carrying ring still extant at one end.

Buckle finds in Nubian assemblages are very rare. One example was found at the West Cemetery in Meroe in grave W114 (Dunham 1963, 227, Fig. 158), associated with ox bones and dated to AD 60–70. Other specimens were recorded in the private cemeteries at Ballana and Qustul and dated to the 4th–5th century AD (Williams 1991, 127–128, Pl. 73e). Both the buckle from Meroe and the examples from El-Zuma are identical to Roman buckles of the 4th to 5th century AD (Soupault 2003; Forum Ancient Coins 2019; Roman Coins n.d.), which were used only by the Roman army. Mountings for horse and camel equipment found in Ballana and Qustul do not feature any buckles (Emery and Kirwan 1938, 251–262). Many big combat knives with scabbards (described as swords) were found in Ballana and Qustul, but no buckles are mentioned by Emery (Emery and Kirwan 1938, 219–221). However, the custom of wearing edged weapons by using two belts is known from Meroitic iconography. Examples include a relief depicting warriors on the lower podium of temple M250 in Meroe (Török, Hofmann, and Nagy 1997, Pl. 72) and the iconography of a Meroitic king (Shinnie 1967, Pl. 33; Zieliński 2011, Figs 52, 54). The characteristic use of rings for mounting sword scabbards can be seen in both cases, and could provide an analogy for artefact Z10/45 from El-Zuma.

Roman influences in the post-Meroitic period can be seen in different categories of burial equipment: for example, in the horse equipment from Ballana (Emery and Kirwan 1938, 251–253), but also in the buckles discovered in El-Zuma. The custom of hanging an edged weapon from two belts is very practical and, as detailed above, has been noted in Meroitic as well as Roman contexts. Since Nubia was a direct neighbour of Roman Egypt, it is quite possible that Roman-style objects were imported and used in the same way as they were by the Romans (in this instance, for carrying weapons).

Fragmentarily preserved long combat knives were found in T.16 and T.10, and a regular knife in T.10. In addition, fragments of a large dagger were found in T.4, as well as the sleeve (handguard) of a second smaller knife. A large number of indeterminate fragments also found in T.4 may be the remains of another combat knife judging by their dimensions.

The Z4/81 belt loop had meticulously made fittings typical of belts, in particular ones designed to carry weapons. The Z10/45 fragment is very corroded and heavily damaged, but some characteristic traits of a scabbard mounting can still be distinguished. One of them is a small ring

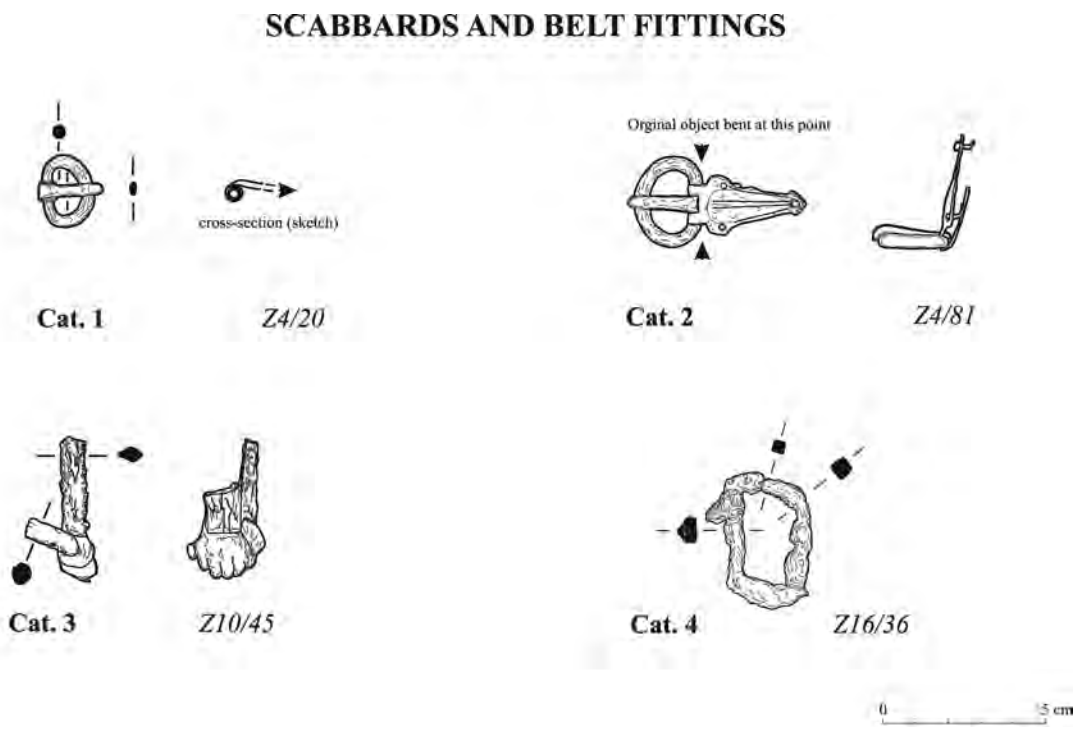

FIGURE 15.1 Scabbards and belt fittings
Z4/20, Z4/81, Z16/36 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z10/45 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI

for fixing the scabbard to a belt. Another is the reinforced plate of the scabbard neck. In examples from the royal cemeteries of Ballana and Qustul dated to the 5th–6th century AD (Emery and Kirwan 1938, 219–221), the whole scabbard was decorated with silver sheets, but Z10/45 from El-Zuma is a more utilitarian version made of iron.

In the case of T.4, all metal finds were found mixed up in the tunnel, having been disturbed by robber activity. This was not the case with T.10, where all of the finds came from the burial chamber. On the other hand, in the case of T.16, loop Z16/36 was found in the immediate vicinity of the skeleton, while the weapons (long combat knife included) were found mainly in the shaft, but still close to the disturbed blocking wall of the burial chamber.

2 Catalogue

Cat. 1
Brass buckle
Inv. no.: **Z4/20**
Context data: Tumulus 4, Layer 5
Dimensions: Frame: 2.2 × 1.6 cm, D = 0.4 cm; pin: L = 2 cm, W = 0.4 cm, Th = 0.2 cm
Material and technique: Brass
Description: Brass buckle (in good shape).

Cat. 2
Buckle
Inv. no.: **Z4/81**
Context data: Tumulus 4, W tunnel
Dimensions: Frame: 2.8 × 2.1 cm, D = 0.4 cm; pin: L = 2.4 cm, max W = 0.55 cm; plate: L = 3.7 cm, max W = 1.9 cm, Th = 0.3 cm
Material and technique: Copper alloy
Description: Buckle with triangular plate featuring three rivets.

Cat. 3
Scabbard fitting fragment
Inv. no.: **Z10/45**
Context data: Tumulus 10, burial chamber
Dimensions: D = 0.6 cm, side rod cross-section 0.6 cm × 0.8 cm, middle rod diameter 1.1 cm (rounded)
Material and technique: Iron
Description: One heavily corroded and broken iron fragment of scabbard fitting.

Cat. 4
Rectangular loop, reassembled from two fragments
Inv. no.: **Z16/36**
Context data: Tumulus 16, chamber 1, part S, near skeleton
Dimensions: 3.7 cm × 2.4 cm (inside 2.6 cm × 1.4 cm),

cross-section varies (square 0.4 cm cross-section on shorter side, rectangular 0.4 cm × 0.5 cm on longer side)

Material and technique: Forged iron (from one piece)

Description: Loop which, under the weight of surrounding soil, deformed into a rhombus (but originally must have been rectangular). The object is heavily corroded on the surface and has a cracked core; pieced together from two fragments.

References: Zieliński 2014, 387

CHAPTER 16

Discussion and Conclusions

Weapons were found in all three types of tumuli at El-Zuma, but not in all graves. Twelve tumuli of the 28 excavated yielded weapon finds [**Table 16.1**]. Ten of them were male burials, one was of undetermined sex and only one was probably female. Two tumuli of type I, four of type II and six of type III contained weapons. We do not have much information about the burial chambers of the largest, type I, tumuli (T.1–T.8) because in most cases only their external shafts and tunnels were excavated. Some weapon fragments were found in the tunnels of T.4 and T.7, but the graves themselves were not explored, and it is not certain that these objects came from the burial chambers. Only two type I tumuli (T.2 and T.5) were fully excavated and no weapons were found there.

It is also significant that relatively young individuals were buried in only three of the graves: a probable female aged 15–18 in T.24, an individual of undetermined sex aged 16–18 in T.11, and a probable male aged 16–24 in T.16. The other tumuli contained the remains of adults aged 30–45 years, and only one grave (T.17) was that of an older adult aged 40–50 years. Only one tumulus contained a probable female. Female graves containing weapons are known from the Meroitic period. A Late Meroitic female burial associated with iron weaponry was discovered in Botri (Bashir 2007, 96). Strabo records that the Meroites were famous as archers and that they even armed their women (Eide et al. 1998, 816).

In terms of discovery context [**Table 16.2**], we can observe that weapons were found in the main chamber together with the deceased. Some artefacts were found in the shaft near the damaged blocking wall of the chamber, but this was a result of robber activity. No weapon elements were found in any of the subsidiary chambers, which suggests that weapons were items of personal equipment and not grave goods such as pottery, which was mostly deposited in additional chambers. Of course, we cannot be sure about this because a large group of objects recovered from the side chambers could not be identified (see Chapter 17, this volume).

It is difficult to determine the exact function of the weapons deposited in the burials, and their presence raises the following questions: Did the weapons have a symbolic meaning, and were they used only for ceremonial purposes? Were they connected with the activities of the deceased, who would have used them as weapons of war or for hunting?

Almost all of the weapons found in El-Zuma were made of iron; even the handles and sockets were iron with a copper coating rather than made entirely of copper. Only one knife from tumulus 10 (Z10/32–34) has traces of copper on the tang.

Weapons with metal blades, arrowheads and spearheads usually had components made of other materials. The handles of combat knives were made of wood or bone, while the shafts of spears, javelins, and arrows were made of wood. No complete shafts were found in the graves at El-Zuma, but evidence in the form of imprints and wood replaced by corrosion products survives on some of the metal parts [see **Fig. 17.7**]. Small fragments of wood were recorded in the graves, but the effects of decay, animal activity and looting make it impossible to interpret these wooden fragments. In tumuli 10 and 16, which were the richest in weapons of various types, there was no extant piece of wood or bone that could be identified as part of a weapon. No fragments of organic materials survived on any of the blades or weapon tips found at El-Zuma, other than in the form of imprints. Likewise, no poles or shafts were preserved. We can only draw inferences about these components based on analogies from other sites of the period, such as Ballana, Qustul (Emery and Kirwan 1938, 221–232) and El-Hobagi (Lenoble 1997; 2018, 200–226, 244–245; Lenoble et al. 1994). Some spearheads from Ballana and Qustul had extant shafts that were 160 cm to 195 cm long (Emery and Kirwan 1938, 221–232), while Lenoble (2018, 200–226, 244–245) mentions spearheads with shafts of similar lengths found at El-Hobagi.

Other metals, like silver, were not used and no decoration is present, which may indicate that all of the weapons from El-Zuma were utilitarian. In contrast, swords and spearheads from the royal cemeteries at Qustul and Ballana (Emery and Kirwan 1938, 219–232) were covered with silver and decorated with different patterns. Even the archer's bracers were silver instead of leather, which makes them impossible to use (Emery and Kirwan 1938, 232–233). Of course, the weapons from El-Zuma, all of which were fully usable, could also have served ceremonial purposes, like any other weapons.

The archer's rings can be divided into usable and non-usable ones (see Chapter 14, this volume; Zieliński 2015, 791–801). Three non-usable rings from T.7 are so long that they block the thumb joint. They also have sharp edges that could have damaged the bowstring. Another two

TABLE 16.1 Anthropological context of weapons found in El-Zuma tumuli

Tum. no.	Type of tumulus	Sex*	Age*	Pointed weapons			Edged weapons		Ranged weapons	
				Bladed spears	Spears	Javelins	Knives	Daggers	Arrowheads	Archer's rings
T.1	I	–	–	–	–	–	–	–	–	–
T.2	I	–	–	–	–	–	–	–	–	–
T.3	I	–	–	–	–	–	–	–	–	–
T.4	I	–		1	–	–	1	1	7	–
T.5	I	M(?)	30–50	–	–	–	–	–	–	–
T.6	I	–	–	–	–	–	–	–	–	–
T.7	I	M(?)	25–45	–	–	–	–	–	–	3
T.8	I	F(?)	35–45	–	–	–	–	–	–	–
T.9	II	M(??)	25–30	–	–	–	–	–	–	–
T.11	II	?	16–18	–	–	1	–	–	–	–
T.12	II	–	–	–	–	–	–	–	–	–
T.13	II	M(?)	30–40	–	–	–	–	–	23	–
T.14	II	F(?)	20–30	–	–	–	–	–	–	–
T.15	II	F(?)	21–24	–	–	–	–	–	–	–
T.16	II	M(??)	16–24	1	3	1	1	–	21	–
T.23	II	–	–	–	–	–	–	–	–	–
T.24	II	F(?)	15–18	–	1	–	–	–	–	1
T.25	II	F	24–35	–	–	–	–	–	–	–
T.26	II	F	45–55+	–	–	–	–	–	–	–
T.10	III	M	30–40	1?		2	4		20	–
T.17	III	M	40–50	–	–	–	–	–	6	–
T.18	III	F(?)	50+	–	–	–	–	–	–	–
T.19	III	M(?)	35–45	–	–	–	–	–	1	–
T.20	III	M(??)	50+	–	–	–	–	–	–	–
T.21	III	M	35–40	–	–	–	–	–	24	–
T.22	III	M	35–45	–	–	–	–	–	4	–
T.27	III	M	35–45	–	–	–	–	–	16	1
T.28	III	F	40–55	–	–	–	–	–	–	–

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* sex and age based on anthropological data (see Volume I, Chapter 6)

examples found at El-Zuma were made of soft stone with a rough and porous surface that would not have allowed the string to slip off the ring and would also have been prone to damage. The thumb hole was unfinished and shows no signs of use. Two rings from T.24 and T.27 respectively were probably usable. These rings are short, so they do not impede the thumb joint. They have smooth edges and were made of harder, smooth stone. The thumb hole was finished and its polished surface evidences repeated use.

Interestingly, no special arrowheads were found at El-Zuma, such as openwork (incendiary) tips, bodkin points (anti-armour) and multi-barbed (probably poisoned) arrowheads that sometimes appear at other post-Meroitic sites, like Meroe (Dunham 1963, 202–206), Karanog (Woolley and Randall-MacIver 1910, 66, Pl. 34) or El-Hobagi (Lenoble 1997; 2018, 200–226, 244–245; Lenoble et al. 1994) (see also Fig. 1, at the end of this volume). The arrowheads from El-Zuma are multipurpose single-barbed types 1, 1a and 1b, and leaf-shaped type 6. These types are very common at other sites (see Chapter 14.1.3, this volume), because they were easy to produce. All arrowheads are essentially either leaf-shaped or triangular with barbs, the barb being made by a single cut with a chisel when the blade is almost formed. This means that the initial stages

TABLE 16.2 Archaeological context of weapon finds

Tumulus no.	Type of tumulus	Shaft	Tunnel	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5
T.1	I	–	–	?	?	?	?	?
T.2	I	–	–	–	–	–		
T.3	I	–	–	?	?	?	?	?
T.4	I	– – – –	7 arrowheads, 1 knife, 1 dagger, 1 bladed spearhead	?	?	?	?	?
T.5	I	–	–	–	–	–		
T.6	I	–	–	?	?	?	?	?
T.7	I	–	3 archer's rings	?	?	?	?	?
T.8	I	–	–	?	?	?	?	?
T.9	II	–		–	–	–		
T.11	II	–		1 javelin				
T.12	II	–		–	–	–		
T.13	II	23 arrowheads		–	–	–	–	–
T.14	II	–		–	–	–		
T.15	II	–		–	–	–		
T.16	II	1 bladed spearhead, 3 spearheads, 1 javelin, 1 long combat knife		21 arrowheads, 1 bladed spearhead (same as in shaft)	–			
T.23	II	–		–	–			
T.24	II	1 archer's ring		1 spearhead	–	–	–	
T.25	II	–		–	–	–		
T.26	II	–		–	–	–	–	
T.10	III	– – – –		1 long combat knife, 1 knife, 1 javelin, 2 arrowheads				
T.17	III	–		6 arrowheads				
T.18	III	–						

TABLE 16.2 Archaeological context of weapon finds (*cont.*)

Tumulus no.	Type of tumulus	Shaft	Tunnel	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5
T.19	III	–		1 arrowhead				
T.20	III	–						
T.21	III	–		24 arrowheads				
T.22	III	4 arrowheads						
T.27	III	10 arrowheads		6 arrowheads, 1 archer's ring				
T.28	III	–						

	not applicable
?	area not excavated

of arrowhead production are exactly the same for most arrowheads of these types, and the blacksmith decides whether to leave the arrowhead in the form of a leaf or to create a barb towards the end of the process. The production of the El-Zuma arrowheads would have been further simplified by the fact that they are all tanged rather than socketed. Thus, even a blacksmith of moderate skill could have made them, given a set of appropriate tools. There are, however, some arrowheads in the El-Zuma assemblage that were made using an unusual technique for the type they represent (see Chapter 14.1.3, this volume).

Weapons found in graves of the post-Meroitic period almost always have iron blades, with a few exceptions, like the bronze arrowheads noted at El-Hobagi (Lenoble 2018, 103). This reflects the transition of iron production from the Meroitic to post-Meroitic period mentioned by Bruce G. Trigger (1969, 36–49), when iron objects became more popular. It was only after the decline of Meroe that iron became essential to the post-Meroitic economy (Trigger 1969, 36–49).

The different types of weapons found at El-Zuma have many analogies from other post-Meroitic tumulus sites (see pole weapons, edged weapons and arrowheads, Chapter 14, this volume), but the closest comparisons were recorded at El-Hobagi (Lenoble 2018, 103–124, 212–246). Both sites featured long bladed spearheads of the same type, leaf-shaped spearheads, javelins and long combat knives, as well as arrowheads of common types such as 1b. The weapons from El-Hobagi also had iron blades with no decoration or applied details in precious metals like those from Ballana and Qustul (Emery and Kirwan 1938, 219–232). However, some differences are visible. No bronze arrowheads were discovered at El-Zuma (all of them were made of iron), and there were no specialized arrowheads, such as the incendiary openwork ones found at El-Hobagi (Lenoble 2018, 115–116). Similarly, no axes or maces were discovered in the El-Zuma tumuli, but they were recorded at El-Hobagi (Lenoble 2018, 125–127, 220–222).

Scabbards and belt fittings were found at El-Zuma in three male burials (T.4, T.10 and T.16), which also contained edged weapons. The individuals in T.4 and T.10 were aged 30–45 years, while the T.16 burial was of a younger individual aged 16–24 (see Volume 1, Chapter 6). No buckle or similar element was found in graves identified as female. Belts with buckles appear only with male burials, and not in the context of clothing but in association with weapons.

A rectangular loop (Z16/36) was found in tumulus 16 near the skeleton. Such belt loops could be used to suspend a scabbard from various types of straps. It is reasonable to surmise that these sorts of belt fittings and scabbards were connected with weaponry.

All of the weapons found at El-Zuma were in common use during the period in question, but because of their state of preservation it is hard to tell whether these particular weapons were ever used. However, the example of arrowheads from tumulus 16 (Zieliński 2014, 377) could show that in fact they were used, and arrows were supplemented ad hoc.

We should remember that the tomb was the final resting place for the deceased and at the same time marked the beginning of a new journey to a better life, and so we should also take into consideration two key aspects:

religious traditions and customs, and the symbolic meaning of weaponry as a social indicator and manifestation of the wealth and status of the deceased. The quantity and quality of the objects are a vital clue. Iron arrowheads are found in graves at many post-Meroitic cemeteries (see Chapter 14.1.3, this volume), though seldom in the large numbers recorded at El-Zuma. As for combat knives and bladed spearheads, these appear only at more important sites (see Chapters 14.1.1 and 14.1.2, this volume). The economic cost and skill required to produce a large iron weapon like a bladed spearhead or combat knife was considerable. These are weapons that not anyone could have owned, and only those of high status could have been buried with as many different types of weapons as noted in tumulus 16 at El-Zuma. We also know that archer's thumb rings like the ones found at El-Zuma had symbolic meaning in the Meroitic period (Shinnie 1967, 110–111). Rulers and even gods were depicted with archer's rings in Meroitic iconography, as seen in a relief from the temple of Apedemak in Musawwarat es-Sufra (Shinnie 1967, 110–111). In tumulus 7 we have three thumb rings, not all of which were usable types (see Chapter 14.1.3, this volume), hence their purpose may have been to show the high status of the deceased. Conversely, the archer's rings from tumuli 24 and 27 were usable types (see Chapter 14.1.3, this volume) and showed traces of wear, so the grave occupants may have used them in life.

There are some examples showing that weapons were used for fighting during the post-Meriotic period. One of them is a human skull with an arrowhead fragment inside the eye socket, which was found by our mission at the El-Detti cemetery, in tumulus 4 (Robert Mahler and Magdalena Srienc, personal communication). The arrowhead was probably of the asymmetrical, single-barbed type (1 or 1a). The buried individual may have been a warrior since some arrowheads were found in the chamber (Zieliński 2016). And in Karanog two skeletons were found with arrowheads stuck in the thoracic vertebrae (Zieliński 2011, 133–136; O'Connor 1993, 158). These were type 6 (leaf-shaped) arrowheads. These weapons were most probably also used for hunting. When describing the type 5 spears from Ballana and Qustul (Emery and Kirwan 1938, 221–223), Emery noted their resemblance to Masai spears, which are used for hunting to this day.

During the Meroitic period, weapons featured sporadically in graves and were associated mainly with male burials; however, at El-Zuma they are relatively numerous both in male and female burials. Women of the Ancient Nubian world were not unaccustomed to owning weapons. Amanitore (Nubian Kandake), Nubian queen regnant of the Kushite Kingdom of Meroe together with king Natekamani, is depicted in the temple at Meroe bludgeoning her enemies' heads with a club. Female rulers are depicted as archers on the pylons of the pyramids at Meroe. Strabo, writing about the punitive expedition of Petronius to Meroe during the reign of Octavian, noted that the Meroites armed their women and that their army was led by a Kandake queen (Eide et al. 1998, 3:815, 882–884). Kandake was a Meroitic term for the sister of the King of Kush, who, due to the matrilineal succession, would bear the next heir, making her a queen mother. She had her own court and probably acted as a landholder (Lohwasser 1991, 131).

The post-Meroitic and Early Makurian periods (see Fig. 3, at the end of this volme) are not sufficiently well recognized in the archaeological record to determine the chronological variability of weapons during this time. The looting of graves in antiquity and the poor state of preservation of metalwork make it difficult to identify this material and also hinder research into the development of weapons. The Early Makurian metalwork assemblages from El-Zuma demonstrate a continuation of Meroitic traditions and show that weapons were far more commonplace in burial contexts.

Miscellaneous Grave Goods

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CHAPTER 17

Elements of Burial Equipment

The El-Zuma tumuli yielded a wealth of burial equipment made of various raw materials. Unfortunately, many of these items had been badly damaged by environmental conditions and displaced by robber activity (see Volume 1, Chapters 3 and 5). Among the numerous objects made of composite materials (e.g. metal and wood, or metal and bone), only the metal parts were preserved in reasonable condition. Most organic materials, such as wood and leather, survived solely in residual form. As was mentioned earlier, a large proportion of the objects preserved at El-Zuma are metal artefacts, among them items of burial equipment represented by nails and fittings, and miscellaneous objects. A lot of the metal finds are so fragmentary that it is not possible to determine their function.

The term "elements of burial equipment" is used in this publication to describe artefacts such as bier parts and different kinds of boxes found in graves at various sites of the post-Meroitic period (Emery and Kirwan 1938, 278–282; Edwards 1998, 112–123; 1994, 172–174, Pl. XXIX.1). Such finds usually accompanied the privileged class, and not only in the post-Meroitic period, but at least since Napatan times, or even earlier, as evidenced by the Tombos cemetery (Smith 2008, 103–109) (see also Figs 1 and 3, at the end of this volume). After the fall of Meroe, the royal graves at the cemeteries in Ballana and Qustul were the most important archaeological sites where elements of fine-quality burial equipment, such as beds, large and small chests, tables, and chairs, were discovered (Emery and Kirwan 1938, 123–124, 278–282, 383–384, Figs 95–98, Pl. 109). Boxes also appeared in burials at the Karanog cemetery (Woolley and Randall-MacIver 1910, 32–33, 44, Pls 21–22, 24), while funeral beds were found in elite graves at El-Hobagi (Lenoble 2018, 195–197, Fig. 78) and Qasr Ibrim (Emery and Kirwan 1938, Fig. 1). The El-Zuma cemetery is also thought to have been an elite burial ground featuring equipment of this type.

Two main categories of funeral equipment were recorded in the El-Zuma tumuli: biers on which the body was placed, and containers in the form of chests or boxes of unspecified sizes. No complete biers or boxes were excavated at the site; only their metal parts, such as nails and fittings, have survived.

1 Elements of Burial Equipment: Description of the Material

1.1 *State of Preservation*

The biers and boxes posed a number of problems. Their poor state of preservation (they were represented mainly by nails and metal fittings) meant that there was a lack of information about the shape and size of these artefacts, and their identification was only possible through analogies. The wooden components of these burial furnishings survived in fragmentary form [see **Fig. 18.6**]. Sometimes only traces of different soil colours recorded in the graves could be regarded as evidence of organic materials used in these constructions. However, this evidence can often be misleading and relate to completely different objects (pole arms, leatherwork, fabrics, and even the soft tissues of the body), or attest to the activity of pests that got inside the grave after burial. At El-Zuma it was only the remains of metal fittings and nails that indicated that a bed or box had been present, although most of these items were not found in their original contexts. It was only in a few cases, when bier remains were found in undisturbed contexts, that they could be positively identified (tumulus 6, see **Table 17.1**).

Another problem is the preservation of the metal elements. Artefacts made of iron are very susceptible to corrosion. Therefore, most of the fittings and nails from the bier survive in poor condition, usually preventing their complete reconstruction. The state of these items was further exacerbated by the destructive effects of robber activity. In targeting the body to remove the jewellery that adorned it (see Chapters 4–6, this volume), the robbers also damaged the funeral bed. Boxes and chests that may have contained valuable items could also have been destroyed during looting. No chests or boxes were found in any of the graves at El-Zuma.

1.2 *Nails*

Nails from El-Zuma come in very different sizes. The largest nails, such as Z24/54.1 [**Cat. 37**], are about 1.3 cm in cross-section with a head that is more than twice as large, measuring about 2.6 cm in cross-section. The longest preserved fragments of nails with a cross-section of 1.3 cm, among them Z24/52 [**Cat. 30**, Fr. 3], are approximately 9 cm long. The most common variety are small nails with diameters of 0.6–0.9 cm. The smallest nails were found

TABLE 17.1 Distribution of bed-frame fittings and nails in tombs at El-Zuma

Tumulus no.	Type of tumulus	Sex	Bed frame fittings and nail fragments	Context
T.1	I	–	17	Chamber 1
T.2	I	–	–	–
T.3	I	–	–	–
T.4	I	–	89	Tunnel
T.5	I	M(?)	6	Chamber 1 and tunnel
T.6	I	–	left in chamber, not examined	Chamber 1
T.7	I	M(?)	left in chamber, not examined	Chamber 1
T.8	I	F(?)	3	Chamber 1 and shaft (near blocking wall)
T.9	II	M(??)	14	Chamber 1 and shaft (near blocking wall)
T.11	II	?	5	Chamber 1
T.12	II	–	–	–
T.13	II	M(?)	14	Shaft (near blocking wall)
T.14	II	F(?)	3	Chamber 1
T.15	II	F(?)	24	Chamber 1 and shaft (near blocking wall)
T.16	II	M(??)	31	Chamber 1
T.23	II	–	–	–
T.24	II	F(?)	58	Chamber 1
T.25	II	F	2	Chamber 1
T.26	II	F	8	Chamber 1
T.10	III	M	–	–
T.17	III	M	–	–
T.18	III	F(?)	–	–
T.19	III	M(?)	–	–
T.20	III	M(??)	–	–
T.21	III	M	–	–
T.22	III	M	–	–
T.27	III	M	–	–
T.28	III	F	–	–
Total			**274**	–

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in tumulus 4 together with elements of decorated silver fittings featuring scarab and palm motifs (see Chapter 5, Fig. 5.15, Z4/95, this volume). These nails are also made of silver; they are 1.2 cm long with a diameter of 0.2 cm, and they resemble shoe nails (like the silver nail from group Z4/93). Other finds in this category include copper clamps, about 1 cm long (reminiscent of modern staples), which were used instead of nails in conjunction with thin copper fittings, as illustrated by fragment Z7/5 [**Cat. 54**]. In many cases, small pieces of wood that were in direct contact with nails (and also several staples, such as Z7/5) have been preserved due to the action of oxides. Almost all nails, with the exception of clamps and nails used with copper fittings, were made of iron. All of them, even the silver ones, have a characteristic square cross-section, gradually tapering towards the tip, and a head which is convex in the middle and has sharp edges. This is due to the fact that they were forged, which makes them very easy to distinguish from modern nails, which are round in cross-section. A distinctive feature of nails that were used to attach bed frame fittings is that they are thicker and shorter than the nails present in the bed frame by themselves. The nails in the copper fittings, e.g. Z7/19.2 [**Cat. 50**], were probably similar in size to the preserved silver nails, which is easy to judge from the extant fragments and nail holes. Nails from other sites are mostly not described at all, but the elements of a bed frame from El-Hobagi were made of iron (Lenoble 2018, 195–197, Fig. 78). Many containers

(boxes) and beds were found at the royal cemeteries in Ballana and Qustul (Emery and Kirwan 1938, 123–124, 278–282, 383–384, Figs 95–98, Pl. 109), but no detailed information is given about nails. The same applies to finds from Karanog (Woolley and Randall-MacIver 1910, 32–33, 44, Pls 21–22, 24) and Tombos (Smith 2008, 103–109). We have no detailed description of nails or fittings of any kind from these sites. Anthony J. Mills provides some drawings and gives the lengths of two nails from Qasr Ibrim (Mills 1982, 48, 59, Pls LV 32.1, LXI 121.12). These nails were made of iron and measure 6.1 cm and 10.6 cm long respectively. They are of similar shape to the nails found at the El-Zuma cemetery (Mills 1982, Pls LV 32.1, Pl. LXI 121.12).

1.3 *Bed Parts and Fittings*

The fittings can be divided into two groups: iron ones, which were in the overwhelming majority, and those made of other metals, such as copper or silver. Some copper and silver fittings were decorated in repoussé with different patterns (for pattern descriptions see below). Most of the iron fittings came from funeral beds, and they are relatively easy to recognize thanks to their characteristic features. Bed fittings were usually made of a longitudinal iron strip widening at the ends through which nails were driven. These fittings are usually bent at an angle of about 90 degrees because they were attached to the corners of the bed from the outside. Fitting Z11/33 [**Cat. 41**] suggests that similar fittings were also used on the inner corners of the beds, but this is the only inner fitting found at El-Zuma.

The bed fittings were usually 2.5 cm to 3 cm wide, varying in thickness from 0.2 cm to 0.4 cm. Typical bed fittings include Z16/33 [**Cat. 46**], Z24/54.1 [**Cat. 37**] and Z26/8 [**Cat. 47**]. Width and thickness are diagnostic features of bed frame fittings from El-Zuma. These dimensions are far more telling than length, which is often difficult to assess because the fittings are so fragmented. Another very characteristic feature seen on the external face of fittings are textile fragments preserved by oxides in the linen weave that originally covered the bed; one such example is Z24/54.1. Wood impressions are always noted on the inner face. These impressions can provide some clues about the wooden bed frame. In several cases they reveal that there was a 0.2 cm gap between the boards that made up the frame, which may indicate the use of expansion joints [see **Fig. 17.7**]. Gaps of this size are also evident on some nails found in isolation. The ends of some nails that had been driven through a board were bent at 90 degrees, like Z24/9 [**Cat. 28**, Fr. 3]. The impressions sometimes indicate the thickness of the boards used, which in several cases was about 2 cm. Unfortunately, their width is not so easy to determine. However, based on the better-preserved outlines of the beds, as well as analogies with traditional beds used in Sudan to this day, we can identify a few important features. The El-Zuma beds were frame-built, rectangular constructions, long and wide enough for a man to lie on (Lenoble 2018, 195–197, Fig. 78; Emery and Kirwan 1938, 123–124, 146, 152). Each corner of the frame was connected on top, so at least four fittings were used on each bed. Sometimes as many as eight may have been used, given the discovery of inner corner fittings, like the aforementioned Z11/33. The fact that in several instances mud bricks were found at the corners of the frame suggests that, unlike ordinary beds, those from El-Zuma had no legs, as demonstrated by the remains of the bed in tumulus 7 (Mahmoud El-Tayeb, Skowrońska, and Czyżewska 2016, 123–125, Pl. 33) and tumulus 6. However, this cannot be stated with one hundred percent certainty in all cases due to the state of preservation of the evidence.

The presence of biers in graves of this period is not a very common occurrence, although similar objects have been recorded at other contemporaneous sites, like Qasr Ibrim (Emery and Kirwan 1938, Fig. 1), El-Hobagi (Lenoble 2018, 195–197) and Ballana (Emery and Kirwan 1938, 123–124, 146, 152). Some bed remains were also found at Tombos (Smith 2008, 103–109), but in tombs dated to the Napatan period, the Third Intermediate Period, and the Eighteenth Dynasty. The presence of a bed is a distinctive feature of Nubian burial practice (Smith 2008, 105) and has a long tradition. In El-Zuma alone, the remains of funerary beds were found in 15 of the 28 examined graves [see **Table 17.1**].

1.4 *Boxes*

Fragments of other distinctive metalwork were also found in some tumuli. These were mainly fittings made of copper and silver, some of them decorated, but also small nails and iron fittings. A large accumulation of elements of this type occurred in tumuli 4 and 7. Mysterious small fragments of sheet copper, rods and some unidentified iron elements were also found in tumulus 5. A small piece of sheet copper also came to light in tumulus 26.

In tumulus 7 there were a number of elements, not only metal ones, suggesting that this tumulus had been equipped with a wooden chest or box. The state of preservation of iron bolt Z7/6 [**Cat. 56**] indicates that it was damaged due to the actions of robbers (broken ring, side lever and main shank). This tumulus also yielded a set of iron fittings and nails, of non-standard dimensions and very different features from those of the bed frame fittings, among them Z7/1 [**Cat. 27**], Z7/19.1 [**Cat. 32**] and Z7/19.2 [**Cat. 50**]. These fittings were short and thin, with no textile impressions. One of them, Z7/1, bore an impression of several 4-mm-thick and 4-mm-deep notches made in wood for

the corner joint of an item of furniture, probably a box. In addition to the iron fittings found in tumulus 7, there was also a pair of badly damaged copper fittings, Z7/19.2, featuring small nail holes of 2 mm in diameter. These fittings probably came from the same box. A piece of sheet copper decorated with a cross executed in repoussé (Z7/7) is also part of this box (see Chapter 5, Fig. 5.14, this volume). Longitudinal rods of almost 10 cm long connected with small copper clamps Z7/5, and bone elements with traces of drilling and rust from nails, as well as pieces of inlays probably made of shell (Urszula Iwaszczuk, personal communication) could also have been part of this box. All of these elements were badly preserved, often broken and with bits missing, and none of them were found in their original contexts (they were recovered from the tunnel of tumulus 7). It is not possible to reconstruct the appearance of the original chest.

The same applies to the object or objects found in the tunnel of tumulus 4. The delicately decorated fittings and nails found there (groups Z4/95 and Z4/23) were made of copper alloy and silver and decorated with various motifs executed in repoussé. Most of the preserved fragments of these fittings do not exceed 1 cm and are very fragile. All silver fittings from tumulus 4 were very delicate with a thickness of 0.04–0.05 cm (groups Z4/95 and Z4/23). They were also almost completely corroded, just like the copper ones, which means that they crumble under the lightest pressure. Only the hexagonal fittings with scarab motifs largely retained their original shape and dimensions (for more detail see Chapter 5, this volume). In addition to the fittings in these groups, there were staples and nails, and even small pieces of wood with staples, which were preserved thanks to corrosion oxides. The silver nails and iron clamps that were found with these fittings are described above (see Chapter 17.1.2, this volume).

In addition to decorated fittings, a single crescent-shaped fitting, Z4/19 [**Cat. 1**], with a nail in it was found in the tunnel of tumulus 4. This crescent-shaped fitting is well-preserved and measures 11.4 cm long, so the object from which it came was at least that size. The fitting could have been part of a box, although among the examples from other sites there is no analogy for the shape of this fitting. This artefact could belong to the same group as the Z4/23 decorated fittings. It was examined by XRF spectrometric analysis in Poland (see Chapter 19, this volume).

2 Discussion and Conclusions

Numerous artefacts found at El-Zuma indicate that a bier had been present in at least some of the graves at this site. Most often, this was evidenced by the framework of a bed for the body of the deceased. The remains of a bed were found in over half (15) of the 28 excavated tombs. In El-Zuma the remains of a burial bier were present in tumuli of types I and II, but they did not appear in small graves of type III [see **Table 17.1**]. In most cases, the remains of bed frame fittings and nails appeared in the main chamber or in the shaft, close to the damaged blocking wall. Tumulus 4 was the only one in which a bed frame fitting was found in the tunnel only. It seems that the sex of the deceased individual did not dictate whether or not they were buried on a bed.

The number of fitting and nail fragments that came from any one grave is often irrelevant because not a single example of a completely preserved object from either of these categories was found at El-Zuma [see **Table 17.1**]. The state of preservation of these finds often precludes their reconstruction. The same applies to smaller fittings from chests and boxes [**Table 17.2**]. Fittings and nails are often heavily damaged and fragmented, probably as a result of robber activity. Sometimes the only thing left of a nail or fitting is a rusty residue. For example, the 14 fragments of nails and bed frame fittings from tumulus 9 [see **Table 17.1**] tell us nothing about the original number of nails and fittings in the burial bed. Each bed required at least four fittings, one in each corner, sometimes eight if the corner was reinforced from the inside. There should have been at least twice as many nails, in addition to the solitary nails found without fittings.

Grave robbers may have tackled boxes in one of two ways. In the case of smaller boxes and chests, it was easiest to take them out of the grave and view their contents in a safe hideout. Where larger objects were concerned, or if there was a danger of being caught red-handed, the crates could also be examined on the spot. In this case, the container, which was of no value in itself to the looters and could even serve as evidence of the theft, was mercilessly destroyed. This is evidenced by the pieces of bent and broken fittings, such as Z7/19.2 [**Cat. 50**], and nails and other broken elements that could have been parts of a lock or hinges (fragment Z7/6) [**Cat. 56**]. It is worth highlighting that some boxes may additionally have been covered with thin sheets of precious metal and inlaid with expensive stones, like those discovered in Ballana (Emery and Kirwan 1938, 278–282, 383–384, Figs 95–98, Pl. 109). In these instances, the fittings and jewels could be prised off, leaving only the wooden and base metal elements.

Fragments of flat, copper plaques found in the El-Zuma graves clearly indicate the presence of furniture other than beds (probably chests or boxes). Additional evidence

TABLE 17.2 Distribution of smaller fittings (copper and silver) and small nails

Tumulus no.	Type of tumulus	Sex	Smaller fittings and nail fragments	Context
T.1	I	–	–	–
T.2	I	–	–	–
T.3	I	–	–	–
T.4	I	–	117	Tunnel
T.5	I	M(?)	2	Tunnel
T.6	I	–	–	–
T.7	I	M(?)	9	Tunnel
T.8	I	F(?)	–	–
T.9	II	M(??)	–	–
T.11	II	?	–	–
T.12	II	–	–	–
T.13	II	M(?)	–	–
T.14	II	F(?)	–	–
T.15	II	F(?)	–	–
T.16	II	M(??)	–	–
T.23	II	–	–	–
T.24	II	F(?)	–	–
T.25	II	F	–	–
T.26	II	F	1	Shaft (near damaged blocking wall)
T.10	III	M	–	–
T.17	III	M	–	–
T.18	III	F(?)	–	–
T.19	III	M(?)	–	–
T.20	III	M(??)	–	–
T.21	III	M	–	–
T.22	III	M	–	–
T.27	III	M	–	–
T.28	III	F	–	–
Total			**129**	

PRODUCED BY Ł. ZIELIŃSKI

comes in the form of various, mostly iron, rods of circular cross-section, measuring no more than 1.5 cm in diameter and often significantly exceeding 5 cm in length. These pieces of long, narrow rods do not have the characteristics of weapon components, and may have come from the hinge of a box lid. Lids of all kinds were mounted on such hinges. Rods were also components of lock mechanisms, the best example being the iron rod from tumulus 7, fragment Z7/6 [**Cat. 56**]. Small fragments of copper plates and rods may also indicate the presence of boxes in tumuli 5 and 26.

At least two graves (tumuli 4 and 7) certainly contained a box. The construction of the one in tumulus 7 may have been comparable to that of chest Cat. No. 881 from Qustul Tomb 14–77 (Emery and Kirwan 1938, 383–384, Fig. 118, Pl. 109). Similarities include the use of ivory inlays, copper alloy fittings, and hinges and a bolt featuring iron elements. Inlaid boxes and caskets were also found in graves at Karanog (Woolley and Randall-MacIver 1910, 32–33, 44, Pls 21–22, 24) dated from the 1st to 5th century AD. The chests from Qustul and Karanog were mostly made of wood, and probably so was the chest from tumulus 7 in El-Zuma. The wooden elements connected with copper clamps Z7/5 [**Cat. 54**] found in tumulus 7 suggest this kind of technology may have been used to build the chest. Casket 7517 found in grave 445 at Karanog (Woolley and Randall-MacIver 1910, Pl. 22) was reinforced with bronze fittings on the lower corners. The same reinforce-

ment technique could have been used in the chest from tumulus 7 at El-Zuma (with fitting sets Z7/19.2 and Z7/1).

The box or boxes from tumulus 4 may have been of similar construction to that of the Gemmai box (see Chapter 7, this volume; Scholz 2009) and casket Cat. No. 427 from grave B4–9 in Ballana (Emery and Kirwan 1938, 280, Fig. 98). These kinds of wooden boxes were completely covered with decorative metal fittings, but no inlays. The fittings recovered from tumulus 4 in El-Zuma were made of silver and copper. The box from Gemmai was embellished with silver fittings, while casket 427 from Ballana was clad with bronze fittings. However, the particulars of their construction were not discussed in detail by the excavators. In the case of casket 427, Emery (Emery and Kirwan 1938, 280, Fig. 98) describes the fittings as having been soldered together, but there was no evidence of soldering on the fittings recovered from tumulus 4 in El-Zuma, though this may be attributable to their poor state of preservation.

Compared to other sites of the period, El-Zuma falls somewhere between El-Hobagi and Qustul and Ballana. Beds and boxes were found at the royal cemeteries of Ballana and Qustul as well as in El-Zuma (see Discussion above). The difference is that the royal objects were much grander (they were made using many precious materials and were richly decorated) in comparison to those from El-Zuma. Another key difference is that the objects from Ballana and Qustul survived in good condition. In El-Zuma mostly only metal fragments survived. Beds were also found at El-Hobagi (Lenoble 2018, 195–197), but no boxes were mentioned. At smaller cemeteries like Shemkhiya 5 or Shemkhiya 10 in the Fourth Nile Cataract region (Żurawski 2008, 433–436, 441), the deceased were buried without a bed or boxes. In some cases the body was placed on a mat, so a bed was unnecessary (Żurawski 2008, 433–436). At the El-Detti cemetery, which is close to El-Zuma, a padlock was found in tumulus 4 (Zieliński 2016), but there were no bed fragments in any of the excavated graves.

The grave assemblages from El-Zuma demonstrate that Nubian culture was still rooted in Egyptian influences and traditions. Placing the body on a bed for burial (see Volume I, Chapter 3; Volume II, Chapter 2) harks back to C-Group traditions in Lower Nubia, where the first evidence of bed burials appears towards the end of the C-Group period. Egyptian rule and cultural influences led to increased numbers and varieties of grave goods and equipment. Nubian pottery and Egyptian imports as well as jewellery, beds, and chests became prominent among the items with which the dead were provided for the afterlife. Differences in wealth are also very clearly evident in the burial assemblages at El-Zuma. Chests were generally found in the largest tumuli, whilst bed fittings were mainly recovered from tumuli of types I and II. The smallest tumuli (type III) were the most sparsely furnished, even in terms of their pottery assemblages. Bodies were probably buried without a bed in these tombs. Other post-Meroitic sites, such as Shemkhiya 5, show that the vast majority of the population were buried with neither beds nor chests, as evidenced by the more modest type II tumuli at El-Zuma.

3 Catalogue

Cat. 1
Crescent-shaped fitting
Inv. no.: **Z4/19**
Context data: Tumulus 4, layer 4
Dimensions: L = 11.4 cm, max W = 3.5 cm, Th = 0.07 cm; nail D = 0.1 cm
Material: Copper
Description: Crescent-shaped copper fitting with one extant copper nail and some small nail holes.

Cat. 2
Nail
Inv. no.: **Z1/35**
Context data: Tumulus 1, chamber 1, central part
Dimensions: L = 6.2 cm (reconstructed), cross-section = 0.47 cm × 0.56 cm, head = 1.43 cm × 1 cm
Material: Iron
Description: Heavily corroded and bent nail.

Cat. 3
Nail
Inv. no.: **Z1/36**
Context data: Tumulus 1, chamber 1, central part
Dimensions: L = 4.88 cm, cross-section = 1.05 cm × 0.95 cm
Material: Iron
Description: Heavily corroded nail.
Notes: One nail selected from group of nail and fitting fragments.

Cat. 4
Nail
Inv. no.: **Z1/38**
Context data: Tumulus 1, chamber 1, central part
Dimensions: L = 3.14 cm, cross-section = 0.8 cm × 0.84 cm, head = 1.99 cm
Material: Iron
Description: Heavily corroded nail.

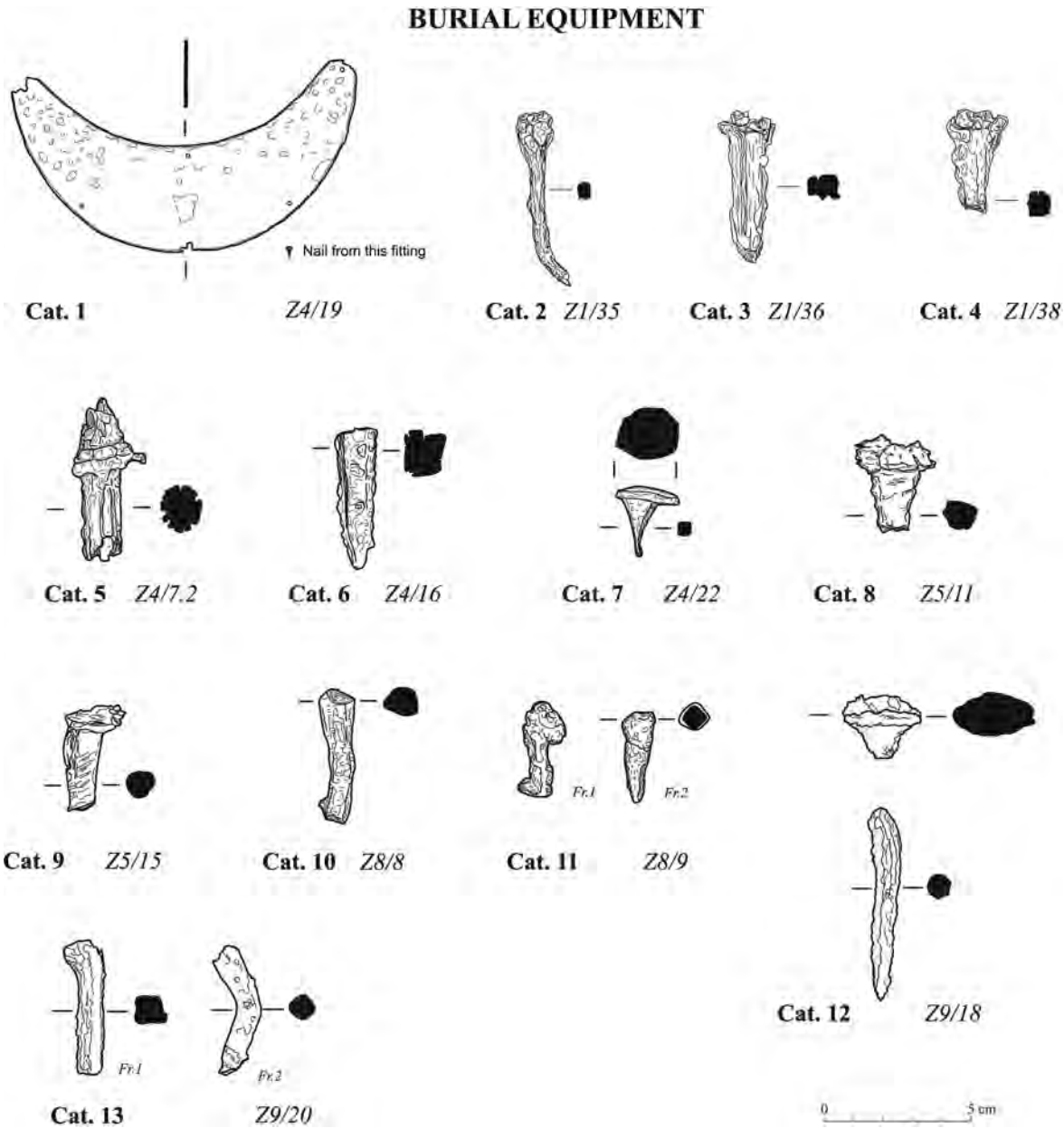

FIGURE 17.1 Crescent-shaped fitting and nails
Z4/19, Z1/35, Z1/36, Z1/38, Z4/7.2, Z4/16, Z4/22, Z5/15, Z8/8, Z8/9 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z5/11 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI; Z9/18, Z9/20 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK

Cat. 5
Nail fragment
Inv. no.: **Z4/7.2**
Context data: Tumulus 4, tunnel
Dimensions: L = 5.5 cm, rounded cross-section = 1.5 cm
Material: Iron
Description: Heavily corroded nail (shank fragment).

Cat. 6
Nail
Inv. no.: **Z4/16**
Context data: Tumulus 4, layer 5
Dimensions: L = 4.8 cm, square cross-section = 1.4 cm × 1.5 cm
Material: Iron
Description: Heavily corroded and broken nail fragments.
Notes: One nail selected from group of nail and fitting fragments.

Cat. 7
Nail
Inv. no.: **Z4/22**

Context data: Tumulus 4, layer 5
Dimensions: L = 2.4 cm; square cross-section = 1.1 cm × 1.1 cm
Material: Iron
Description: Heavily corroded fragment.
Notes: One nail selected from group of nine nail fragments and one mandrel fragment.

Cat. 8
Nail
Inv. no.: **Z5/11**
Context data: Tumulus 5, chamber 1, E part
Dimensions: L = 3.2 cm, head = 2.6 cm, cross-section = 1.2 cm × 1.2 cm
Material: Iron
Description: Heavily corroded and broken nail fragment.
Notes: One nail selected from group of two nail fragments.

Cat. 9
Nail fragment
Inv. no.: **Z5/15**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 3.5 cm, cross-section = 0.8–0.9 cm
Material: Iron
Description: Heavily corroded and broken nail fragment.

Cat. 10
Nail fragment
Inv. no.: **Z8/8**
Context data: Tumulus 8, burial chamber, E part
Dimensions: L = 4.4 cm, square cross-section = 0.9 cm × 0.9 cm
Material: Iron
Description: Heavily corroded and broken nail.

Cat. 11
Two nail fragments
Inv. no.: **Z8/9**
Context data: Tumulus 8, robber hole (bottom of shaft)
Dimensions: Fr. 1: L = 3.2 cm, square cross-section = 0.8 cm × 0.8 cm
Fr. 2: L = 3 cm, square cross-section = 0.7 cm × 0.7 cm
Material: Iron
Description: Heavily corroded and broken nails.

Cat. 12
Head and shank of nail, from group of four nail fragments
Inv. no.: **Z9/18**
Context data: Tumulus 9, chamber 1, central part
Dimensions: Fr. 1: L = 2.1 cm, head = 1.4 cm × 2.6 cm
Fr. 2: L = 6.2 cm; square cross-section = 0.7 cm × 0.7 cm
Material: Iron
Description: Heavily corroded and broken nail fragments.

Cat. 13
Two nail fragments
Inv. no.: **Z9/20**
Context data: Tumulus 9, chamber 1, E part, near the human bones
Dimensions: Fr. 1: L = 5.2 cm, rectangular cross-section = 10.4 cm × 9.2 cm
Fr. 2: L = 4.3 cm, square cross-section = 0.6 cm × 0.6 cm
Material: Iron
Description: Heavily corroded and broken nail fragment.

Cat. 14
Two nails from group of 10 nail fragments
Inv. no.: **Z13/4**
Context data: Tumulus 13, shaft, SE part, near damaged blocking wall
Dimensions: Fr. 1: L = 2.5 cm, square cross-sections from 1.1 cm × 1.1 cm
Fr. 2: L = 3.5 cm, square cross-section = 0.9 cm × 0.9 cm
Material: Iron
Description: Heavily corroded and broken nails.

Cat. 15
Three nail fragments
Inv. nos.: **Z14/31.4, Z14/31.3, Z14/31.6**
Context data: Tumulus 14, chamber 1, E part
Dimensions: Z14/31.4: L = 5.3 cm, head = 1.7 cm, square cross-section = 0.8 cm × 0.8 cm
Z14/31.3: L = 6.4 cm, square cross-section = 1.1 cm × 1 cm
Z14/31.6: L = 4.6 cm, rectangular cross-section = 0.8 cm × 1 cm
Material: Iron
Description: Heavily corroded and broken nails.
Notes: Three nail fragments selected from group of 10 nail fragments.

Cat. 16
Two nail fragments
Inv. no.: **Z14/32**
Context data: Tumulus 14, chamber 1, next to W wall
Dimensions: Fr. 1: L = 5.8 cm, rectangular cross-section = 0.9 cm × 0.75 cm
Fr. 2: L = 3.2 cm, rectangular cross-section = 0.8 cm × 0.6 cm
Material: Iron
Description: Two heavily corroded and broken nails.

Cat. 17
Three nail fragments
Inv. no.: **Z15/55**
Context data: Tumulus 15, main burial chamber, E part
Dimensions: Fr. 2: L = 4.5 cm, square cross-section = 0.8 cm × 0.8 cm
Fr. 3: L = 3.7 cm, oval cross-section = 0.6 cm × 1 cm
Fr. 4: L = 3.7 cm, rectangular cross-section = 0.8 cm × 1 cm
Material: Iron
Description: Heavily corroded and broken nails
Notes: Three nail fragments selected from a group of 14 fragments.

Cat. 18
Nail with sheet metal from *anghareb* fitting (selected from Z15/55)
Inv. no.: **Z15/55.1**
Dimensions: L = 6.5 cm, rectangular cross-section = 0.7 cm × 1.3 cm
Material: Iron
Description: Heavily corroded and broken nail.

Cat. 19
Nail with sheet metal from *anghareb* fitting (selected from Z15/55)
Inv. no.: **Z15/55.2**
Dimensions: L = 6.7 cm, rectangular cross-section = 0.7 cm × 1.1 cm
Material: Iron
Description: Heavily corroded and broken nail.

Cat. 20
Four nail fragments
Inv. no.: **Z24/31**
Context data: Tumulus 24, chamber 1, E part (next to wall of shaft)
Dimensions: Fr. 1 with sheet metal fitting: L = 4.5 cm, rectangular cross-section = 0.8 cm × 0.7 cm
Fr. 2: L = 6.8 cm, head = 1.9 cm × 0.9 cm, rectangular cross-section = 0.7 cm × 1.3 cm
Fr. 3 with sheet metal fitting: L = 5.7 cm, rectangular cross-section = 0.5 cm × 0.9 cm
Fr. 4: L = 6 cm, head = 2 cm × 1.5 cm, rectangular cross-section = 0.6 cm × 1.2 cm
Material: Iron
Description: Heavily corroded and broken nail fragments.
Notes: Four nail fragments selected from group of 10 nail fragments.

Cat. 21
Sheet metal fitting of *anghareb*
Inv. no.: **Z24/31.10** (selected from Z24/31)
Dimensions: L = 5 cm, W = 4.7 cm, Th = 0.4–0.5 cm
Material: Iron
Description: Heavily corroded sheet metal featuring textile impression.

Cat. 22
One nail fragment
Inv. no.: **Z26/3**
Context data: Tumulus 26, chamber 1, near damaged blocking wall
Dimensions: L = 3.5 cm, square cross-section = 0.9 cm × 0.9 cm
Material: Iron
Description: Heavily corroded and broken nail fragment.

Cat. 23
Three nail fragments
Inv. no.: **Z26/7**
Context data: Tumulus 26, chamber 1, E part, near human bones
Dimensions: Fr. 1: L = 5.2 cm, square cross-section = 0.8 cm × 0.8 cm
Fr. 2: L = 4.4 cm, square cross-section = 0.7 cm × 0.8 cm
Fr. 3: L = 4 cm, circular cross-section = 0.7 cm × 0.8 cm
Material: Iron
Description: Heavily corroded and broken nail fragments.

Cat. 24
One fragment of fitting
Inv. no.: **Z4/143**
Context data: Tumulus 4, W tunnel, entrance to burial chamber
Dimensions: L = 7 cm, W = 3.3 cm, Th = 0.4 cm
Material: Iron
Description: Heavily corroded fitting fragment.
Notes: One fragment of fitting selected from group of 16 nails and fitting fragments.

Cat. 25
Fitting
Inv. no.: **Z4/189**
Context data: Tumulus 4, E tunnel, N part
Dimensions: L = 3.5 cm, W = 1.1 cm, Th = 0.4 cm
Material: Iron
Description: Heavily corroded fitting.
Notes: One fitting selected from group of seven nails and eight fitting fragments.

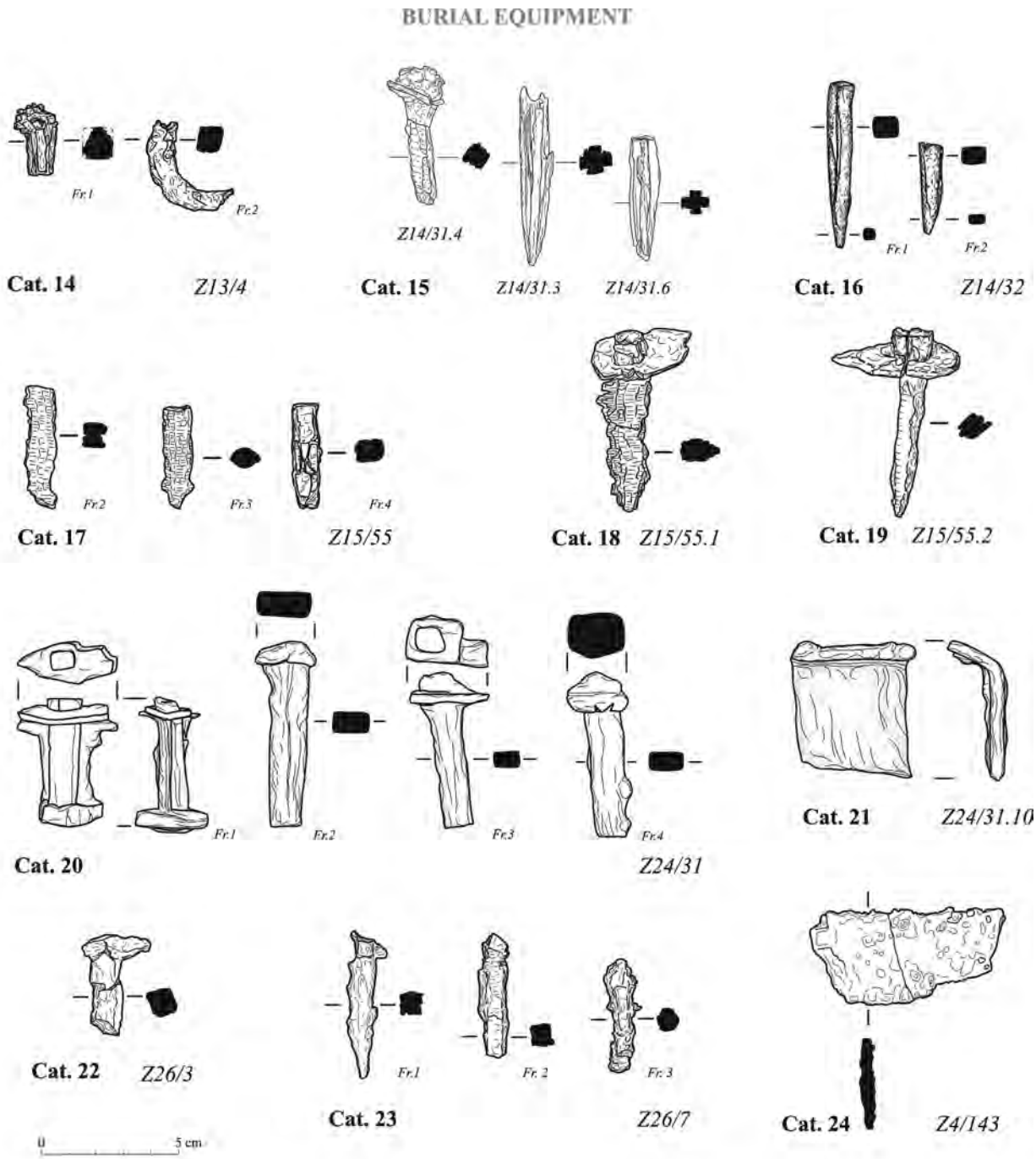

FIGURE 17.2 Nails and fitting elements
Z13/4, Z15/55, Z15/55.1, Z15/55.2, Z26/3, Z26/7, Z4/143 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z14/31.4, Z14/31.3, Z14/31.6, Z14/32, Z24/31, Z24/31.10 DRAWN BY R. HAJDUGA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

Cat. 26
Nail
Inv. no.: **Z5/12**
Context data: Tumulus 5, chamber 1, part E
Dimensions: L = 4.8 cm, sub-circular cross-section = 0.9–1 cm
Material: Iron
Description: Heavily corroded and broken fragment.
Notes: One nail selected from group of two fragments: a nail and an n-shaped plate fragment (fitting).

Cat. 27
Fitting fragment
Inv. no.: **Z7/1**
Context data: Tumulus 7, layer 5
Dimensions: L = 3.6 cm, W = 3 cm, Th = 0.3 cm
Material: Iron
Description: Heavily corroded and broken fitting.
Notes: One fitting fragment selected from group of three nail fragments and two fitting fragments.

Cat. 28
Three nails
Inv. no.: **Z24/9**
Context data: Tumulus 24, chamber 2, W part
Dimensions: Fr. 1, nail with sheet metal fitting: L = 4.8 cm, rectangular cross-section = 0.6 cm × 0.6 cm; sheet metal fitting Th = 0.2 cm
Fr. 2, nail: L = 4.2 cm, rectangular cross-section = 0.9 cm × 1 cm
Fr. 3, bent nail: L = 6.1 cm, circular cross-section = 0.9 cm × 0.9 cm
Material: Iron
Description: Heavily corroded and broken nails.
Notes: Three nails selected from group of seven nail fragments with sheet metal fitting.

Cat. 29
Seven fragments of nails and bed frame fittings
Inv. no.: **Z24/16**
Context data: Tumulus 24, chamber 1, near blocking wall, NE corner
Dimensions: Fr. 1, nail: L = 3.7 cm, square cross-section = 1 cm × 1.1 cm
Fr. 2, nail: L = 1.7 cm, square cross-section = 1 cm × 1 cm
Fr. 3, nail: L = 3 cm, oval cross-section = 0.7 cm × 1 cm
Fr. 4, fitting: L = 5.5 cm, W = 3.2 cm, Th = 0.6 cm × 0.7 cm
Fr. 5, fitting: L = 3 cm, W = 2 cm, Th = 0.5 cm
Fr. 6, fitting: L = 2.5 cm, W = 1.5 cm, Th = 0.3 cm
Fr. 7, fitting: L = 3 cm, W = 5.2 cm, Th = 0.5 cm × 0.7 cm
Material: Iron
Description: Heavily corroded and broken nails and bed frame fittings (from same item of furniture as Z24/52).

Cat. 30
Six nails
Inv. no.: **Z24/52**
Context data: Tumulus 24, chamber 1, part E
Dimensions: Fr. 1, nail: L = 7.7 cm, head = 2.5 cm × 1.5 cm, rectangular cross-section = 0.8 cm × 1.3 cm
Fr. 2, nail: L = 6.5 cm, head = 1.6 cm × 1 cm, rectangular cross-section = 0.7 cm × 1.1 cm
Fr. 3, nail: L = 9 cm, rectangular cross-section = 0.7 cm × 1.3 cm
Fr. 4, nail: L = 3.6 cm, head = 2.36 cm × 1 cm, rectangular cross-section = 0.6 cm × 1 cm
Fr. 5, nail: L = 5.5 cm, rectangular cross-section = 0.6 cm × 1.2 cm
Fr. 6, nail with sheet metal fitting: L = 4 cm, rectangular cross-section = 0.5 cm × 1 cm; sheet metal fitting Th = 0.5 cm
Description: Heavily corroded and broken nails and bed frame fitting (from same item of furniture as Z24/54).
Notes: Six nails selected from group of 10 nails and bed frame fittings.

Cat. 31
One nail and one bed frame fitting fragment
Inv. no.: **Z25/33**
Context data: Tumulus 25, chamber 1, E part, on blocking bricks
Dimensions: Fr. 1, sheet metal fitting with nail fragment: L = 3.2 cm, rectangular cross-section = 0.3 cm × 0.4 cm, Th = 0.3 cm
Fr. 2, nail: L = 2.7 cm, square cross-section = 0.9 cm × 0.9 cm
Material: Iron
Description: Heavily corroded and broken nail and bed frame fitting.

Cat. 32
Two fitting fragments
Inv. no.: **Z7/19.1**
Context data: Tumulus 7, layer 5
Dimensions: Fr. 1, fitting: L = 9.8 cm, W = 1.2 cm, Th = 0.3 cm
Fr. 2, fitting: L = 5.7 cm, W = 1.3 cm, Th = 0.3 cm
Material: Iron
Description: Two fitting fragments (from a chest).

Cat. 33
Nail fragment
Inv. no.: **Z9/11**

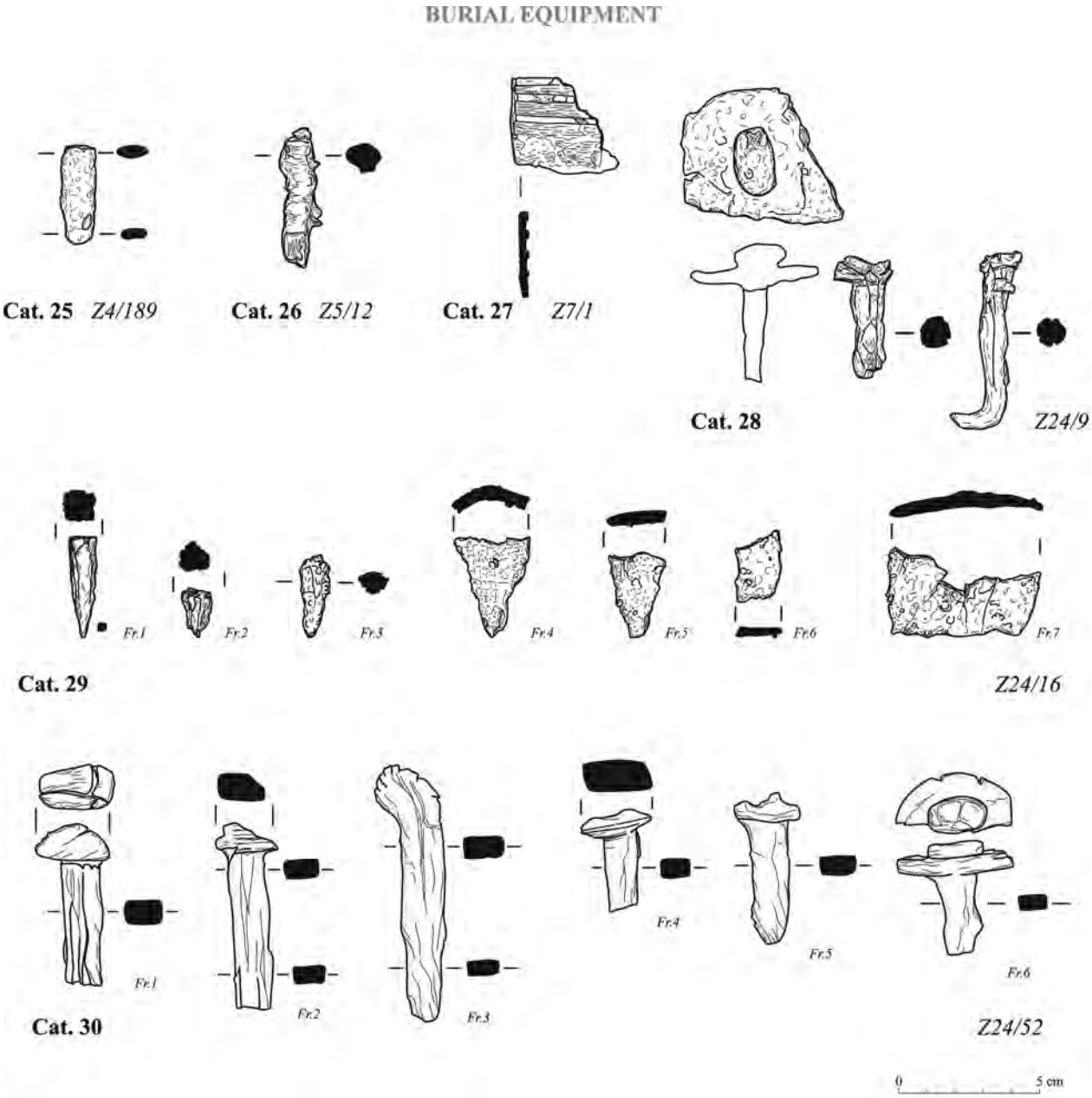

FIGURE 17.3 Nails and fitting elements
Z4/189, Z7/1, Z24/9, Z24/16 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z5/12 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI; Z24/52 DRAWN BY R. HAJDUGA, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

Context data: Tumulus 9, shaft, S part, near damaged blocking wall of chamber 1
Dimensions: L = 5 cm, square cross-section = 0.4 cm × 0.4 cm
Material: Iron
Description: Heavily corroded and broken nail.

Cat. 34
Fitting
Inv. no. **Z4/17**

Context data: Tumulus 4, layer 5
Dimensions: L = 4.2 cm, W = 2.9 cm, Th = 0.2 cm
Material: Iron
Description: Heavily corroded fitting fragment.
Notes: One fitting selected from group of three fitting fragments.

Cat. 35
Fitting fragment
Inv. no.: **Z4/72**

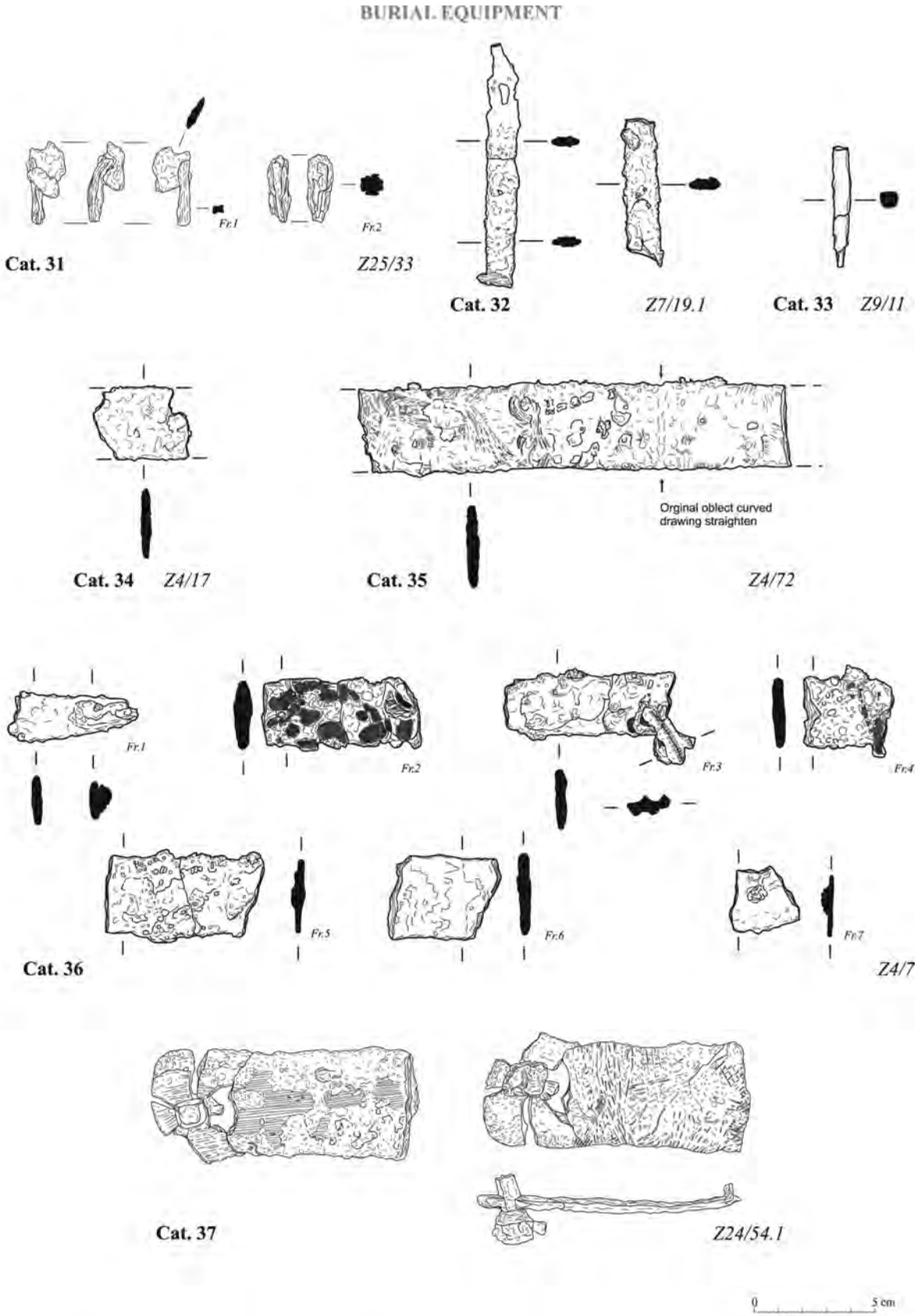

FIGURE 17.4 Fitting elements with nails
Z25/33 DRAWN BY Ł. ZIELIŃSKI, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA; Z7/19.1, Z4/17, Z4/72, Z4/7, Z24/54.1 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z9/11 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK

Context data: Tumulus 4, tunnel, E side
Dimensions: L = 14.6 cm, W = 3.5 cm, Th = 0.3 cm
Material: Iron
Description: Fitting fragment with textile impression.

Cat. 36
Seven bed frame fitting fragments
Inv. no.: **Z4/7**
Context data: Tumulus 4, tunnel
Dimensions: Fr. 1: L = 5.2 cm, W = 2.1 cm, Th = 0.4 cm
Fr. 2, fitting with textile imprint: L = 6.5 cm, W = 2.9 cm, Th = 0.7 cm
Fr. 3, fitting with textile imprint: L = 7 cm, W = 2.7 cm, Th = 0.4 cm
Fr. 4, fitting with textile imprint: L = 3.7 cm, W = 3.6 cm, Th = 0.5 cm
Fr. 5: L = 6.5 cm, W = 3.5 cm, Th = 0.5 cm
Fr. 6: L = 4.5 cm, W = 3.4 cm, Th = 0.5 cm
Fr. 7: L = 2.8 cm, W = 2.7 cm, Th = 0.3 cm
Material: Iron
Description: Heavily corroded bed frame fitting fragments with traces of textiles.

Cat. 37
Fragment of bed frame fitting selected from group of six nails Z24/54
Inv. no.: **Z24/54.1**
Context data: Tumulus 24, chamber 1, E part, NE corner
Dimensions: L = 10.7 cm, W = 4.4 cm, Th = 0.5–0.6 cm
Material: Iron
Description: Heavily corroded bed frame fitting.

Cat. 38
Bed frame fitting fragment
Inv. no.: **Z5/23**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 4.1 cm, W = 1.9 cm, Th. = 0.4 cm
Material: Iron
Description: Heavily corroded and broken bed frame fitting fragment.

Cat. 39
Bed frame fitting fragment
Inv. no.: **Z9/12**
Context data: Tumulus 9, shaft, S part, near damaged blocking wall of chamber 1
Dimensions: L = 6.1 cm, W = 2.8 cm, Th = 0.4 cm
Material: Iron
Description: Heavily corroded and broken bed frame fitting (with wood and textile impressions).

Cat. 40
Nail with sheet metal fitting
Inv. no.: **Z9/19**
Context data: Tumulus 9, chamber 1, central part
Dimensions: L = 5 cm, head = 2.1 cm, square cross-section = 0.7 cm × 0.7 cm; sheet metal Th = 0.5 cm
Material: Iron
Description: Heavily corroded and broken bed frame fitting with preserved nail (featuring wood and textile impressions).

Cat. 41
Three fitting fragments from a bed frame
Inv. no.: **Z11/33**
Context data: Tumulus 11, chamber 1, near human bones
Dimensions: Fr. 1: L = 10.2 cm, W = 3 cm, Th = 0.2 cm
Fr. 2: L = 4.6 cm, W = 3 cm, Th = 0.2 cm
Fr. 3: L = 3.7 cm, W = 2.4 cm, Th = 0.2 cm
Material: Iron
Description: Three bed frame fitting fragments, with two nail holes in fragments 1 and 2.

Cat. 42
Two fitting fragments from a group of five bed frame fittings
Inv. no.: **Z13/1**
Context data: Tumulus 13, shaft, SE part
Dimensions: Fr. 1: L = 3.5 cm, W = 2.1 cm, Th = 0.25 cm
Fr. 2: L = 10.3 cm, W = 2.2–3 cm, Th = 0.6 cm
Material: Iron
Description: Heavily corroded and broken bed frame fittings.

Cat. 43
Nail with sheet metal fitting
Inv. no.: **Z15/29**
Context data: Tumulus 15, SE corner of shaft, near blocking wall of main burial chamber
Dimensions: L = 6.4 cm, square cross-section = 0.5 cm × 0.5 cm, sheet metal Th = 0.5 cm
Material: Iron
Description: Heavily corroded and broken bed frame fitting with preserved nail.

Cat. 44
One bed frame fitting fragment
Inv. no.: **Z16/29+Z16/33**
Context data: Tumulus 16, chamber 1, N part, near vessel no. 2
Dimensions: L = 12 cm, W = 3 cm, Th = 0.3 cm
nail: square cross-section = 0.4 cm × 0.4 cm

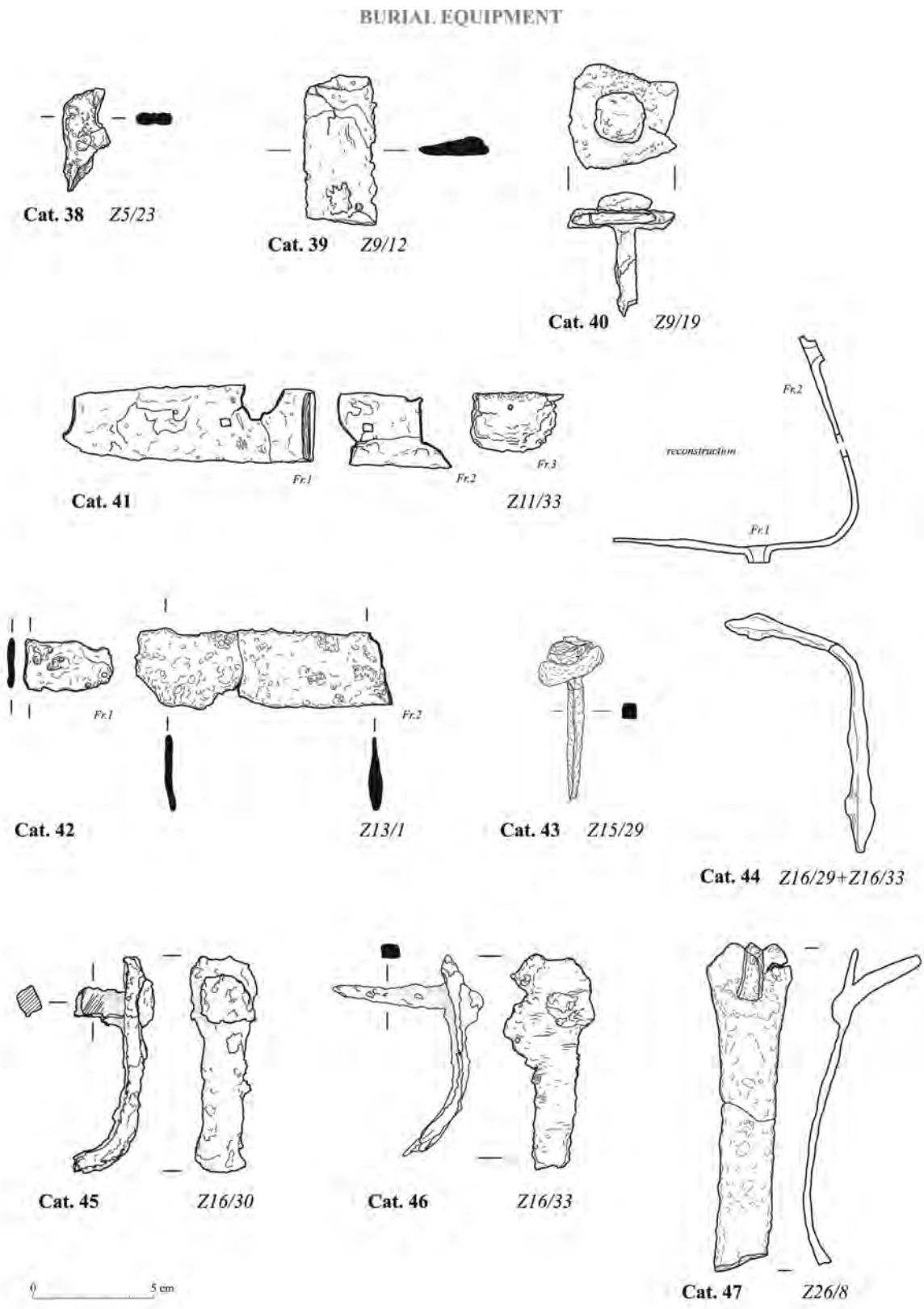

FIGURE 17.5 Fitting elements with nails
Z5/23, Z11/33, Z13/1, Z16/29+Z16/33, Z/8 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI;
Z9/12, Z9/19, Z16/30, Z16/33 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK;
Z15/29 DRAWN BY Ł. ZIELIŃSKI, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

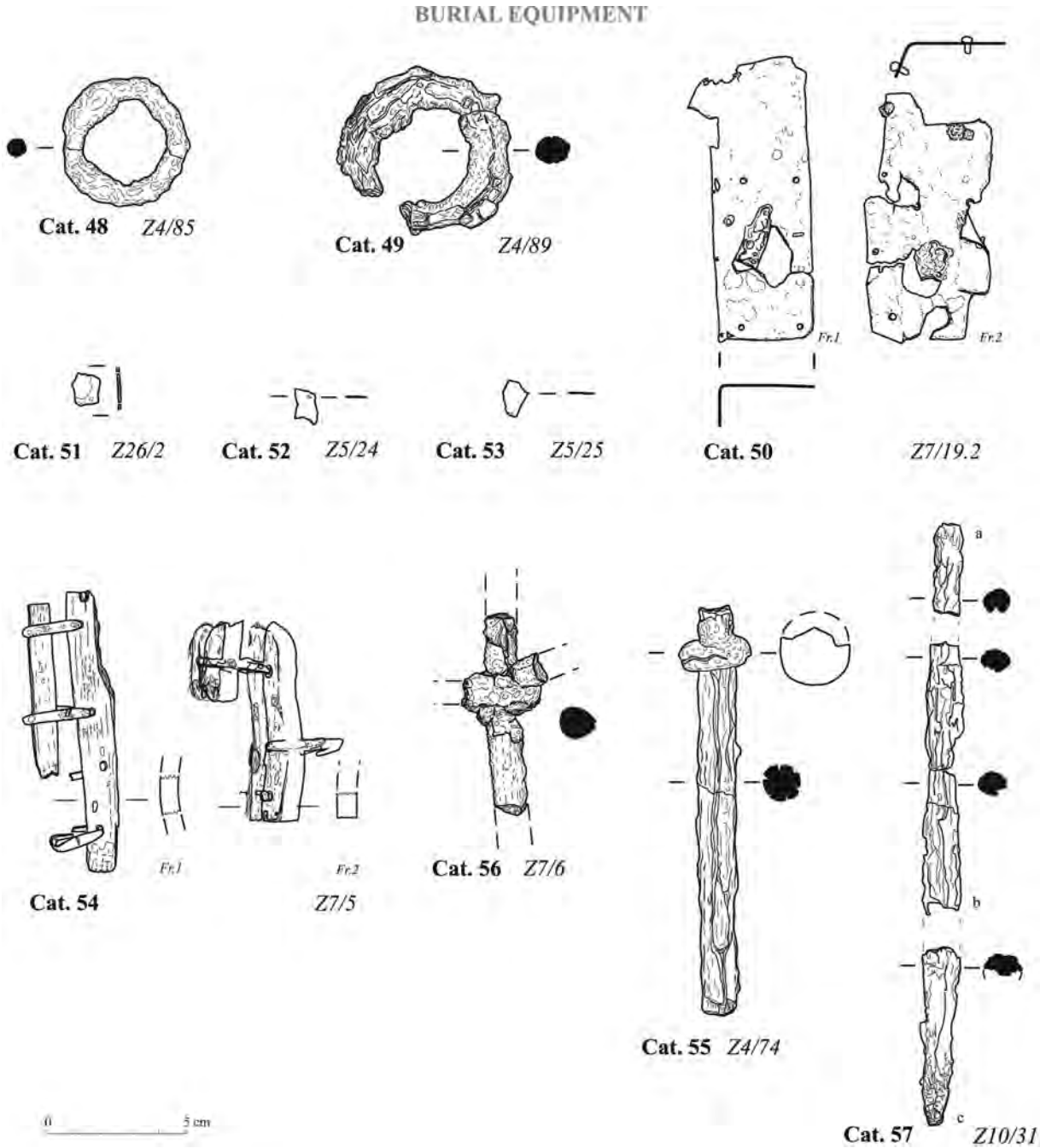

FIGURE 17.6 Fitting elements and rods
Z4/85, Z4/89, Z7/19.2, Z26/2, Z5/24, Z5/25, Z7/5, Z4/74, Z7/6, Z10/31 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI

Material: Iron
Description: One heavily corroded and broken bed frame fitting.

Cat. 45
One bed frame fitting fragment with nail fragment
Inv. no.: **Z16/30**
Context data: Tumulus 16, chamber 1, N part, near vessel no. 2
Dimensions: fitting: L = 8.5 cm, W = 2 cm, Th = 0.8–0.9 cm
nail: L = 3 cm, head = 1.8 cm, square cross-section = 0.8 cm × 1 cm
Material: Iron
Description: One heavily corroded and broken bed frame fitting with preserved nail fragment.

Cat. 46
Bed frame fitting with nail fragment selected from group of 14 fittings
Inv. no.: **Z16/33**
Context data: Tumulus 16, chamber 1, S part, near skeleton
Dimensions: fitting: L = 8 cm, W = 2 cm, Th = 0.5 cm
nail: L = 6 cm, rectangular cross-section = 0.7 cm × 0.5 cm
Material: Iron
Description: Heavily corroded and broken bed frame fitting fragment with preserved nail.

Cat. 47
One bed frame fitting fragment with nail fragment
Inv. no.: **Z26/8**
Context data: Tumulus 26, chamber 1, E part, near human bones
Dimensions: fitting: L = 12.8 cm, W = 2.3 cm, Th = 0.5 cm
nail: L = 4 cm, square cross-section = 0.7 cm × 0.7 cm
Material: Iron
Description: Heavily corroded and broken bed frame fitting fragment.

Cat. 48
Hoop
Inv. no.: **Z4/85**
Context data: Tumulus 4, W tunnel
Dimensions: Outside D = 4.5 cm, inside D = 2.8 cm, cross-section = 0.7 cm
Material: Iron
Description: Heavily corroded iron hoop with preserved imprints of unknown objects.

Cat. 49
Hoop
Inv. no.: **Z4/89**
Context data: Tumulus 4, W tunnel
Dimensions: Outside D = 6.3 cm, inside D = 3.5 cm, cross-section = 1.5 cm
Material: Iron
Description: Heavily corroded iron hoop with preserved imprints of unknown objects.

Cat. 50
Two fitting fragments with pins
Inv. no.: **Z7/19.2**
Context data: Tumulus 7, layer 5
Dimensions: Fr. 1: L = 10 cm, W = 3.4 cm, Th = 0.05 cm
Fr. 2: L = 8.7 cm, W = 3.2 cm, Th = 0.05 cm
pin D = 0.2 cm
Material: Copper
Description: Two copper fitting fragments with pins and pin holes (from a chest).

Cat. 51
One fitting fragment
Inv. no.: **Z26/2**
Context data: Tumulus 26, shaft, near damaged blocking wall of chamber 1
Dimensions: L = 1.1 cm, W = 0.9 cm, Th = 0.8 cm
Material: Copper
Description: Small copper fitting fragment.

Cat. 52
Plate fragment (fitting)
Inv. no.: **Z5/24**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 1.2 cm, W = 0.8 cm, Th = 0.07 cm
Material: Copper
Description: Copper plate fragment (fitting), probably from the same object as Z5/25.

Cat. 53
Plate fragment (fitting)
Inv. no.: **Z5/25**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 1.1 cm, W = 0.8 cm, Th = 0.07 cm
Material: Copper
Description: Copper plate fragment (fitting), probably from the same object as Z5/24.

Cat. 54
Two wood pieces with clamps
Inv. no.: **Z7/5**
Context data: Tumulus 7, layer 5, entrance to tunnel
Dimensions: Fr. 1: clamps: L = 2 cm, W = 0.4 cm, Th = 0.05 cm; wood: L = 9.9 cm (long fr.) and 6.6 cm (short fr.), Th = 0.7 cm

FIGURE 17.7 Wooden imprints in the metal fittings
PHOTOS BY A. KAMROWSKI

Fr. 2: clamps: L = 2 cm, W = 0.4 cm, Th = 0.05 cm; wood: L = 7 cm (long fr.) and 3 cm (short fr.), Th = 0.7 cm
Material: Copper and wood
Description: Two wood pieces with copper clamps.

Cat. 55
One rod fragment
Inv. no.: **Z4/74**
Context data: Tumulus 4, tunnel, E side
Dimensions: L = 14.2 cm, D = 1.3 cm, 2.4 cm, ring Th = 0.9 cm
Material: Iron
Description: Heavily corroded iron rod fragments (with hoop attached at one end).

Cat. 56
Rod fragment with clamp and broken arm (probable bolt)
Inv. no.: **Z7/6**
Context data: Tumulus 7, layer 5, close to pillar 1
Dimensions: top D = 1.1 cm, base D = 1.2 cm, square cross-section of arm = 0.8 cm × 0.8 cm, clamp Th = 0.9 cm
Material: Iron
Description: Rod fragment with clamp and broken arm, probably part of the locking mechanism of a chest.

Cat. 57
Knife, reassembled from several smaller fragments (incomplete blade)
Inv. no.: **Z10/31**
Context data: Tumulus 10, burial chamber
Dimensions: a: L = 3.3 cm, W = 1 cm, Th = 1 cm; b: L = 9.5 cm (after gluing), W = 1.3 cm, Th = 1–1.2 cm; c: L = 6.3 cm, W = 1–1.3 cm, Th = 1.2 cm
Material and technique: Forge-welded iron
Description: Four iron rod fragments; four fragments of flared rod (1.2–1.4 cm in cross-section).

CHAPTER 18

Miscellaneous Objects

Pottery, jewellery, weapons, and furniture are the most common items found in burial contexts. Tools were also sometimes deposited in graves, stone tools having been found in Neolithic burials (Arkell 1949). Clothing would have been another significant item associated with the burial and the body itself. From early times, cloth has enjoyed considerable importance in Sudanic contexts (Edwards 2004, 169–170). Nubians in the time of the A-Group and C-Group wore leather and linen loincloths, belts, and sandals. The Kerma graves included items of leather, linen, and wool. Leather seems to have been the most popular material for clothing. Linen in fine and coarse weaves was found in most of the Kerma graves. In the Meroitic period, Nubians also adorned themselves in finely embroidered woven garments made from high-quality cotton and silk imported from China (Haynes 1992, 44–52) (see also Figs 1 and 3, at the end of this volume). Organic materials, clothes, and accessories were also deposited in post-Meroitic graves (Edwards and Rose 1998; Lenoble 2018). Traces of leather and textiles survived in the graves at El-Zuma, but only in vestigial form, making it impossible to conclude what items they represented. The dead were not buried naked but covered, as seen in type I tumuli, in which the body was wrapped in a shroud and placed on a bed (see Volume I, Chapter 3). Fragments of wood, which are difficult to interpret, may also have come from burial equipment. This chapter presents a variety of grave furnishings that are hard to identify.

The first group of finds [**Cat. 1–4**] presented here are stone artefacts whose function is difficult to determine. The second group [**Cat. 5–33**] consists of metal objects: a handle, part of a pair of shears, chisel fragments, and a group of unidentified items of metalwork. The last group [**Cat. 34–40**] comprises organic material, including leather, *tabaq* remains, wooden artefacts, and fragments of glass. Most of the artefacts presented below were found not *in situ* but in the fill of shafts or tunnels, displaced by robber activity and in a poor state of preservation, especially in the case of the metal objects, which makes it impossible to identify them. This chapter presents various objects of different functions. A discussion of each category is provided immediately after the description of the artefacts.

1 Miscellaneous Objects: Description of the Material

1.1 *Stone Artefacts*

1.1.1 Material

Z16/13 [**Cat. 1**] is a stone ring recovered from a robber hole in tumulus 16. The ring measures approximately 10–11.2 cm in diameter and 2.9–3.6 cm in thickness; a hole of around 2.5 cm in diameter was pierced in the middle of the stone. The ring is made of sandstone containing a large quantity of coarse quartz, and its surface is uneven and weathered. This artefact was published in a previous archaeological report as a sandstone ring without any post-Meroitic parallels. Because it was found in a robber hole at the top of the superstructure, it is very possible that stone ring Z16/13 did not come from tumulus 16 (Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 366). It probably found its way into the grave by accident as a result of robber activity, and it is difficult to ascribe an exact date to this artefact because of the lack of context. Interesting examples, very similar in shape and size to Z16/13, were found during excavation at the Mesolithic site at Khartoum Hospital, where the excavator suggested that the hole in these stone rings could have been used for shaping bone or wooden shafts, and that some of the rings may have been made from grinders. Most of them were found broken (Arkell 1949, 63, Pls 34; 35:2,3; 36:8). A stone ring was also found at the settlement at Saggai, located 40 km from Khartoum and dated to the same period as Early Khartoum (Caneva and Zarattini 1984, 302, 305, Fig. 4). Such examples are also known from the Late Neolithic sites of Rabob (Fernández et al. 2003, 238–239, Fig. 41:1,2) and Qalaat Shanan (Nassr Hmad 2015, 162–163, Fig. 4). Stone rings dating from later periods include examples found in Lower Nubia (at Agordat) and attributed to the C-Group Culture (Arkell 1954, 36, 39, 62, Fig. 4:1). Similar finds dating from the Meroitic period were found at Jebel Moya (Addison 1949, 163–164, Pl. LXXIIIa).

Z3/13 [**Cat. 2**, see also **Fig. 18.5**] could be some form of tool. A similar polished stone was found at the Mesolithic Early Khartoum site and described as an axe (Arkell 1949, 112). Various types of tools were placed in graves from the Neolithic period onwards.

Z6/4 and Z6/5 [**Cat. 3** and **Cat. 4**, see also **Fig. 18.5**] are difficult to identify, though they appear to be decorative items. They were found in the W tunnel of tumulus 6, close

to the pillars running along the centre of the tunnel. The two objects are made of the same material as the rock into which the tunnels were cut. These were the only two artefacts of this type discovered at the site. There are no parallels from other tumuli at El-Zuma or any other archaeological sites. No trace of any such object was found in the other tumuli provided with tunnels (type I). The closest analogy from post-Meroitic graves, dated to AD 450–550, was found in Gabati, where an oval sandstone item with incised motif was used as a blocking slab (Edwards 1998, 115, 122, Fig. 5.5 T5/54S).

1.1.2 Discussion and Conclusions

The objects described above were not found *in situ*. Stone ring Z16/13 was found in a robber hole in a type II tumulus, while sandstone items Z6/4 and Z6/5 were found in the tunnel of a type I tumulus, and the possible tool Z3/13 was found in the W chamber of a type I tumulus. Stone ring Z16/13 was probably deposited in the grave by accident when the burial was looted, and its exact date cannot be determined because of the lack of context.

Artefact Z3/13, described here as a tool, could be an axe or another kind of tool.

1.2 *Metal Artefacts*

1.2.1 Material

Among the identified metal artefacts is a copper handle (Z5/9) from a metal bowl, an iron chisel (Z11/36) and part of a pair of shears (Z4/25).

Copper handle Z5/9 [**Cat. 5**, see also **Fig. 18.5**] came from a metal vessel and is the only example of its type found at El-Zuma. Metal bowls with handles of different forms and shapes are known from other Meroitic and post-Meroitic sites. Bronze bowls with handles were discovered at El-Hobagi III and IV and dated to the 4th century AD (Lenoble 2018, 84–85, nos. 101, 164, Figs 40, 84–85).

Z4/71 and Z4/86 [**Cat. 7** and **Cat. 8**] are two decorated hoops of identical size and shape. They have an inside diameter of 4 cm, which is too small for a bracelet (Robert Mahler, personal communication). The closest analogies to hoops of this type were found at Qasr Ibrim in house X-17, dated to the X-Group period. They were of similar dimensions to the examples from El-Zuma and served as the handles of a heavy bronze basin (Plumley, Adams, and Crowfoot 1977, 43, Pl. 5:1,2).

An interesting artefact is copper alloy strip Z24/44 [**Cat. 6**, see also **Fig. 18.5**]. This grooved strip brings to mind metal bowls with grooved decoration below the rim; however, the walls of these vessels are 3–4 mm thick, while the strip is only 0.5 mm thick and its upper edge is inverted, suggesting that it may have been attached to another object. There are no known examples of metal bowls with components reminiscent of this strip, but we do have examples of stone jars with applied metal features, although none of them bear a resemblance to this item of metalwork, so we cannot say with any certainty what this object was.

Iron chisel fragment Z11/36 [**Cat. 10**] has a preserved length of 5.8 cm. The original length is hard to estimate, but it was probably not less than 9–10 cm, meaning that it would have fitted in the palm of the hand. The preserved diameter is relatively small and amounts to 1.3 cm. The cutting edge of the chisel is only 0.7 cm and the angle of the blade is 75 degrees. The blade angle suggests a tool for working in harder materials such as very hard wood, medium-hard stone, or soft metal.

Z4/25 comprises two fragments from a pair of shears [**Cat. 9**] found in the W tunnel in tumulus 4. One fragment is an almost complete, single-edged blade with a triangular cross-section, a sharp cutting edge and a thick, hefty spine measuring 0.9 cm. In addition to the blade itself, a very slightly curved bow survives, which was identified and glued to the blade. The bow is a characteristic feature of shears. The whole artefact, including the bow, has a length of 9.6 cm, and it seems that the original blade was not much longer, and quite narrow (3.2 cm at its widest point). The blade is triangular, and its spine creates a straight line with the bow. This is another feature that testifies to the fact that we are dealing with scissors and not a typical knife. Only a small fragment of the middle section, broken off at both ends, survives of the second blade.

Among the numerous metal items discovered at the El-Zuma cemetery there is a large group of unidentified objects that cannot be classified, but is interesting and therefore worth presenting. Most of the unidentified material described in this chapter cannot be meaningfully analysed. The state of preservation is the main stumbling block. Heavily corroded metal artefacts, such as those made of iron, do not retain their original shape or mass. This makes them difficult to analyse. It is often impossible to determine whether all fragments found in a given group belong to one or many objects. Yet the presentation of this material is still important. It shows that the graves were not empty, and even where no significant objects were found, there was some burial equipment made of iron inside the grave. Even when the object itself is unidentified, sometimes, the dimensions of preserved fragments can tell us whether it was small or large.

In at least a few cases, these unidentified fragments are larger than, for example, nails or fittings [e.g. **Cat. 28**, Z4/94; **Cat. 17**, Z4/142; **Cat. 18**, Z7/18]. Although we cannot say what these items were, we can rule out certain

categories. We can also make some suggestions based on analogies from other graves at El-Zuma, and even other Early Makurian cemeteries. Small fragments of less than 1 cm are virtually unidentifiable. Sometimes, if they appear in a grave together with other iron objects that are damaged but recognizable, we can assume that we are dealing with their fragments, though not always. In contrast, the largest fragments, with at least two dimensions exceeding 2 cm [e.g. **Cat. 22**, Z26/91], are open to a greater number of interpretations.

1.2.2 Discussion and Conclusions

Iron chisel Z11/36 from T.11, although found in chamber 1 of this tumulus, was not necessarily part of the original burial equipment, and may have been left there by grave robbers. The chisel was found badly damaged and incomplete. Even though nearly every item of ironwork recorded at El-Zuma was found in a similar condition due to corrosion and robber activity, it cannot be ruled out that this chisel was discarded in the grave when already damaged. It may have been used by the looters during the robbery, like the 11 ceramic scrapers they left in this tumulus (see Volume II, Chapters 4 and 5). A tool of this type could be used to perform various tasks, such as making the overlapping corner joints of a chest. Its size suggests that it would have been suitable for shaping the thumb hole of an archer's ring, although these were usually fashioned using drill bits and files rather than chisels. The chisel could also have been used to incise a pattern on the surface of an object made of a softer metal, for example, a copper alloy, or for engraving letters in soft stone. Finding this fragment in T.11 is a mystery, all the more so given that there was no sign of a hammer which would have been used in conjunction with the chisel. Several chisels were found at the cemetery in Ballana (Emery and Kirwan 1938, 327–339, Fig. 110) and dated to the 4th–5th century AD. Iron chisels were also recorded at Musawwarat es-Sufra (Rehren 1996, 22, Fig. 2), where they were dated to between the 3rd century BC and 4th century AD. Some chisel-like objects were also found at Abu Geili in Funj grave 400/25 and dated to AD 1500–1700 (Crawford and Addison 1951, 25).

The Z4/25 shears from T.4 were heavily damaged. However, the extant fragment of a slightly curved hoop at the end of the blade allowed this item to be identified as part of a pair of shears. Shears of this type were discovered in one of the graves at the cemetery in Qustul (Emery and Kirwan 1938, 327–339). A similar object was found in Karanog and dated to the 1st–5th century AD (Woolley and Randall-MacIver 1910, 66, Pls 35–36). A fragment of iron shears was also found in Meroe in grave W5 (Dunham 1963, 118, Fig. 91 J). The solid proportions of the blade indicate that we are dealing with an industrial tool (for cutting large sheets of material or shearing animals) rather than a pair of scissors for personal hygiene.

At first glance, it seems that there is only one example of a tool that may have been deliberately deposited as a grave good, namely the shears. The chisel deposited without a hammer or mallet would not have been usable on its own. Unfortunately, the only metal objects other than the chisel found in T.11 were a javelin fragment and bed-frame fittings with nails.

The unidentified metal objects most likely represent weapons, which were very popular items of burial equipment and were predominantly made of iron. The most common large weapons are spears, long combat knives and axes. Artefacts attributable to the first two categories were recorded at El-Zuma (see Chapter 14, this volume; Zieliński 2014); however, no axes were found at this cemetery, although they have been noted at other sites of the period, among them El-Hobagi (Lenoble 2018, 220, 244). This example is particularly important because, despite being far away from El-Zuma, in many aspects (and above all in its metalwork assemblage) El-Hobagi is extremely similar to El-Zuma. Some fragments, like Z26/91 [**Cat. 22**] or Z4/142 [**Cat. 17**], are even large enough to have been axe heads, but are too badly decayed for identification. Another possible explanation for the large fragments found at El-Zuma, among others in tumuli 3, 4, 5, 7, 12, 21 and 26, is that they came from tools.

Tools such as hoes, hammers, adzes, and axes were discovered at sites dated to the end of the Meroitic period (Emery and Kirwan 1938, 327–339; Woolley and Randall-MacIver 1910, 66, Pls 35–36; Zieliński 2016). However, they are much rarer finds than weapons, and only solitary examples were found at El-Zuma itself. Large tools were also made of iron and structurally similar to certain large weapons, which makes identification difficult when the object is heavily corroded and in pieces.

Large and small iron fragments were found in different tumuli of all three types (T.3, T.4, T.5, T.7, T.10, T.12, T.13, T.21, T.26 and T.28) [see **Table 18.1**].

Most of the fragments came from T.4, which was rich in metal artefacts. In this case, many (but not all) of the fragments could have been parts of damaged but identified objects. Some bigger fragments, like Z4/142 [**Cat. 17**], could have been parts of some larger items that did not survive. In the case of T.28, the unidentified iron fragments Z28/16 [**Cat. 33**] were the only metal artefacts found in that tumulus.

Larger iron fragments were found in tumuli 3, 4, 5, 7, 12, 21 and 26. These large fragments are too big to have been

TABLE 18.1 Distribution of unidentified iron fragments in tombs at El-Zuma

Tumulus no.	Type of tumulus	Sex	Shaft	Tunnel	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5
T.1	I	–	–	–	–	–	–	–	–
T.2	I	–	–	–	–	–	–	–	–
T.3	I	–	–	–	–	–	–	–	–
T.4	I	–	–	604	–	–	–	–	–
T.5	I	M(?)	–	3	–	–	–	–	–
T.6	I	–	–	–	–	–	–	–	–
T.7	I	M(?)	–	1	–	–	–	–	–
T.8	I	F(?)	–	–	–	–	–	–	–
T.9	II	M(??)	–		–	–	–		
T.11	II	?	–		–	–			
T.12	II	–	8		–	–	–		
T.13	II	M(?)	1		–	–	–	–	–
T.14	II	F(?)	–		–	–	–		
T.15	II	F(?)	–		–	–	–		
T.16	II	M(??)	–		–	–			
T.23	II	–	–		–	–			
T.24	II	F(?)	–		–	–	–	–	
T.25	II	F	–		–	–	–		
T.26	II	F	–		–	–	–	–	
T.10	III	M	–		–				
T.17	III	M	–		–				
T.18	III	F(?)	–		–				
T.19	III	M(?)	–		–				
T.20	III	M(??)	–		–				

TABLE 18.1 Distribution of unidentified iron fragments in tombs at El-Zuma (*cont.*)

Tumulus no.	Type of tumulus	Sex	Shaft	Tunnel	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5
T.21	III	M	–		–				
T.22	III	M	–		–				
T.27	III	M	–		–				
T.28	III	F	–		–				
Total	**617**								

* sex and age information based on anthropological data (see Volume I, Chapter 6)
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not applicable

bed-frame fittings or nails, or parts of weapons (arrowheads, javelins and knives) or small tools. They might be remnants of larger weapons and tools, although their state of preservation makes it difficult to verify this theory.

Before the post-Meroitic period, iron tools were small and very seldom appeared in graves. The modest size and quantity of iron tools was linked to the fact that iron was not readily available and to the technological difficulties experienced during the Napatan and early Meroitic periods, when ironworking was in its infancy in Nubia. By the post-Meroitic period, iron was a much better understood raw material and far more widely available, which meant that larger tools could be produced in greater numbers (as observed by Trigger [1969]). However, with the change in burial rite during the Christian period, the tradition of depositing tools in graves disappears, and tool finds in graves become extremely rare.

1.3 *Organic Artefacts*

1.3.1 Material

This category is represented by eight pieces of leather [Z13/15, **Cat. 34**, see also **Fig. 18.5**], fragments of baskets [**Cat. 35–37**, see also **Fig. 18.7**], various pieces of wood [**Cat. 39**, see also **Fig. 18.6**], and a rope fragment [**Cat. 40**, see also **Fig. 18.6**].

The leather remains discovered at El-Zuma are described elsewhere in this volume by Joanna Then-Obłuska, who suggests that they are possibly the remnants of a bag for beads (see Chapter 8.5, this volume).

Basket remains found at El-Zuma are represented by fragments Z26/4 and Z26/5 and basket imprint Z1/14 [**Cat. 35**, see also **Fig. 18.7**]. Z1/14 is only an impression in soil and was not discovered *in situ*. Two baskets were recorded in chamber 3 of T.26. Similar examples are known from other sites. Basket remains, some of them covered with leather, were discovered at Gabati in late post-Meroitic burials T.27 and T.28 (Edwards 1998, 124–125, 133, Fig. 5.9).

Different kinds of wood fragments [**Cat. 39**, see also **Fig. 18.6**] were found in almost all tumuli of type I. Wood fragments were noted in the tunnels of T.1, T.4, T.6, T.7 and T.8. In T.5 pieces of wood were found in chamber 1, and in T.3 fragments were found in the S chamber. Tumulus 2 was the only one which did not yield any finds of this sort. T.26 was the only type II tumulus in which remnants of wood were recorded (in chamber 1). Wooden bed fragments were discovered in the post-Meroitic burials at Gabati and dated to AD 450–550 (Edwards 1998, 112, 118, Fig. 5.1).

1.3.2 Discussion

Most of the wood fragments were not discovered *in situ*. They included some kind of thin sticks (not presented here), which can probably be linked to robber activity or animal activity. Some of the wooden remnants may have come from burial equipment. Looking at the objects recorded in the main burial chambers, we should discuss other possibilities. Some of the wood and rope fragments [Z4/214, **Cat. 40**, see also **Fig. 18.6**] may have come from the frame of the burial bed. All of these artefacts were

discovered inside main burial chambers together with the deceased.

The basket remains in tumulus 26 were found along with pottery in chamber 3. The remains of seeds visible on the basket [see **Fig. 18.7**] suggest that some kind of food had been deposited in the grave.

1.4 *Glass*

The only glass fragments [**Cat. 38**] recorded at El-Zuma were found inside the tunnel of tumulus 7, in context 5 [see **Fig. 18.7**]. The state of the glass is too fragmentary to determine the function of the object it represents.

2 Catalogue

Cat. 1
Stone ring
Inv. no.: **Z16/13**
Context data: Tumulus 16, robber hole, NW part
Dimensions: D = 11–11.2 cm, hole = 2.5 cm, Th = 3.6–2.9 cm
Material: Sandstone
Description: Ring made of hard yellowish sandstone, pierced in the middle.
References: Mahmoud El-Tayeb, Juszczyk-Futkowska, and Czyżewska 2014, 366

Cat. 2
Tool, possible axe
Inv. no.: **Z3/13**
Context data: Tumulus 3, W chamber, S part
Dimensions: L = 5 cm, H = 1.3–2 cm, Th = 1.3–1.5 cm
Material: Stone
Description: Polished stone.
Notes: See **Fig. 18.5.**

Cat. 3
Incised stone
Inv. no.: **Z6/4**
Context data: Tumulus 6, W tunnel, top layer of fill, close to pillar III
Dimensions: L = 13.5 cm, H = 9 cm
Material: Sandstone
Description: Fragment of rock with incised lines as decoration.

Cat. 4
Incised stone
Inv. no.: **Z6/5**
Context data: Tumulus 6, W tunnel, top layer of fill, close to pillar III
Dimensions: D = 19.8–17 cm
Material: Sandstone
Description: Fragment of rock with crossed lines as decoration.
Notes: See **Fig. 18.5.**

Cat. 5
Copper alloy vessel handle
Inv. no.: **Z5/9**
Context data: Tumulus 5, white fill
Dimensions: D = 3.8 cm, base: L = 4.2 cm, W = 3 cm
Material and technique: Copper alloy
Description: Copper-based vessel handle in form of double-wired loop on tear-shaped base; traces of tin solder on base.
Notes: See **Fig. 18.5.**
References: Mahmoud El-Tayeb 2010, 211, 213, Fig. 11:5

Cat. 6
Copper alloy strip
Inv. no.: **Z24/44**
Context data: Tumulus 24
Dimensions: D = 10 cm, Th = 0.05 cm
Material and technique: Copper alloy
Description: Corroded and severely fragmented (reassembled) copper strip (possible vessel rim fitting) with horizontal grooves.
Notes: See **Fig. 18.5.**

Cat. 7
Decorated hoop
Inv. no.: **Z4/71**
Context data: Tumulus 4, tunnel, E side
Dimensions: Outside D = 6–5.9 cm, inside D = 4.2–4.3 cm, Th = 0.7 cm × 0.85 cm
Material: Copper
Description: Hoop decorated with running zigzag and dots on both faces, and two grooves with central crimp on the edge.

Cat. 8
Decorated hoop
Inv. no.: **Z4/86**
Context data: Tumulus 4, W tunnel
Dimensions: Outside D = 6–5.8 cm, inside D = 4.2–4.3 cm, Th = 0.7 cm × 0.9 cm
Material: Copper
Description: Hoop decorated with running zigzag and dots on both faces, and two grooves with central crimp on the edge.

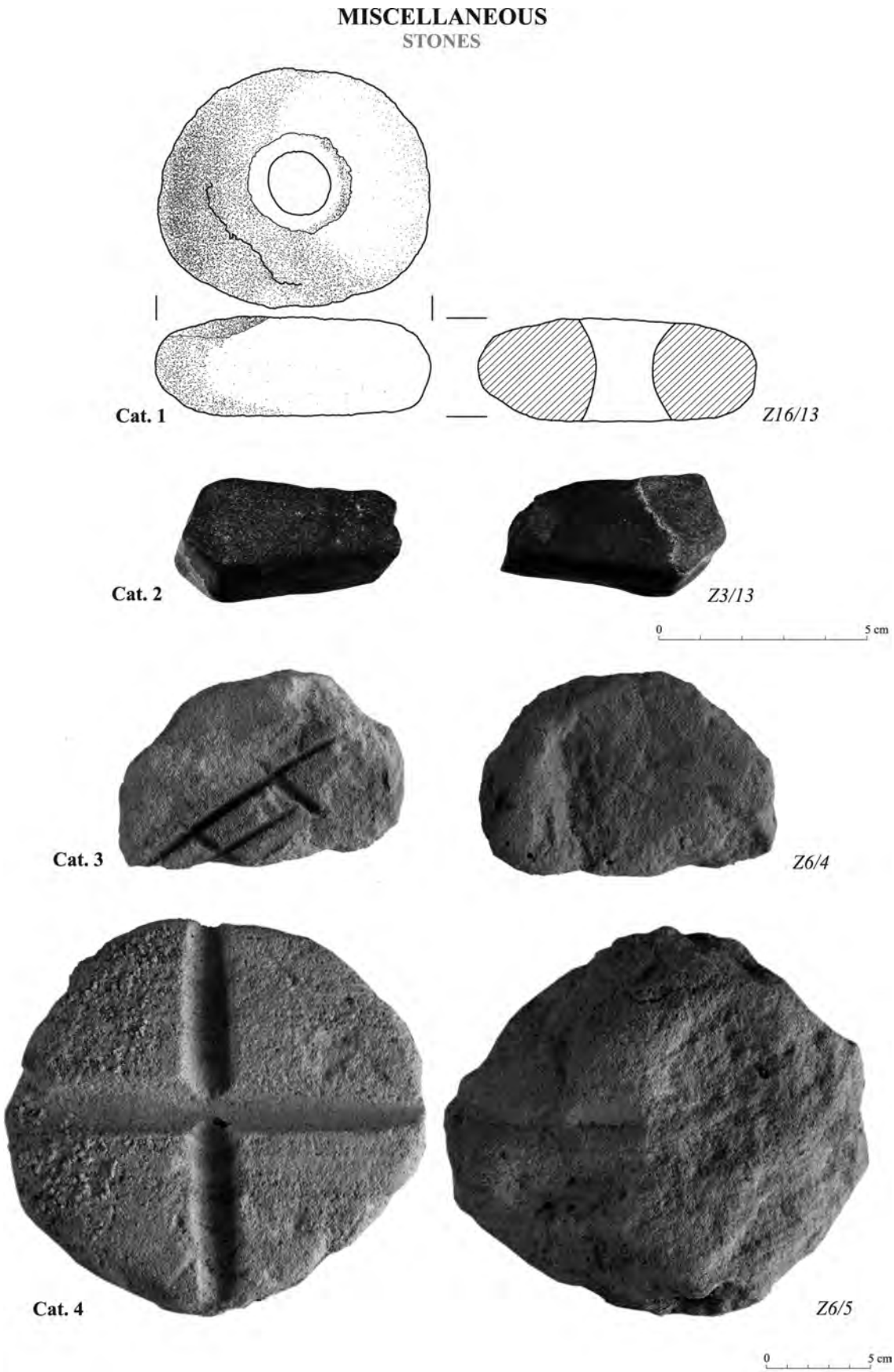

FIGURE 18.1 Stone artefacts
Z16/13 DRAWN BY K. JUSZCZYK, DIGITISED BY U. IWASZCZUK; Z3/13, Z6/4, Z6/5 PHOTOS BY A. KAMROWSKI

Cat. 9
Shears
Inv. no.: **Z4/25**
Context data: Tumulus 4, W tunnel
Dimensions: Fragment a: L = 9.6 cm, W = 3.2 cm, Th = 0.9 cm
Fragment b: L = 3.5 cm, W = 2.8 cm, Th = 0.5 cm
Material and technique: Forged iron
Description: Two fragments of heavily corroded shears, triangular in cross-section (single-edged blade); one tip fragment extant.

Cat. 10
Chisel fragment
Inv. no.: **Z11/36**
Context data: Tumulus 11, chamber 1, W part
Dimensions: L = 5.8 cm, cross-section 1.3 cm (rounded), cutting edge 0.7 cm
Material and technique: Forged iron
Description: Heavily corroded and broken chisel fragment featuring flattened point with 0.7 cm cutting edge at an angle of 75 degrees.

Cat. 11
One of a group of four unidentified fragments (probable sleeve)
Inv. no.: **Z12/54**
Context data: Tumulus 12, fill of shaft, S part
Dimensions: D = 3.4 cm, H = 3.4 cm
Material: Iron + copper
Description: Two heavily corroded and broken iron sleeve fragments (traces of copper oxides).

Cat. 12
One unidentified fragment (probable iron ring)
Inv. no.: **Z17/4**
Context data: Tumulus 17, burial chamber, N part (near beer jar Z17/1)
Dimensions: D = 2.2 cm, Th = 0.3 cm
Material: Iron + copper
Description: One heavily corroded and broken iron openwork ring with traces of copper oxides.

Cat. 13
One unidentified fragment (probable iron ring)
Inv. no.: **Z21/12.1**
Context data: Tumulus 21, burial chamber, central part
Dimensions: D = 5 cm, cross-section *c.* 1 cm
Material: Iron
Description: One heavily corroded and broken iron ring fragment.

One unidentified fragment (probable iron ring)
Inv. no.: **Z21/12.2**
Context data: Tumulus 21, burial chamber, central part
Dimensions: D = 6.5 cm, cross-section *c.* 1.1 cm
Material: Iron
Description: One heavily corroded and broken iron ring fragment.

Cat. 14
One of a group of four unidentified fragments; probable roundel in sleeve (ring over strip of metal suspended from it)
Inv. no.: **Z12/55**
Context data: Tumulus 12, fill of shaft, S part
Dimensions: Roundel: D = 2.5 cm, Th = 3.5 cm; band: W = 0.8 cm, Th = 0.3 cm
Material: Iron
Description: Three heavily corroded and broken rod fragments, and one ring over a strip of metal suspended from it.
Notes: See **Fig. 18.5.**

Cat. 15
One unidentified fragment
Inv. no.: **Z4/7.3**
Context data: Tumulus 4, tunnel
Dimensions: L = 4.4 cm, W = 1.9 cm
Material: Iron
Description: One fragment of heavily corroded, delaminated and broken iron object (sickle-shaped with no original surfaces).

Cat. 16
One small iron handle (unidentified)
Inv. no.: **Z4/83**
Context data: Tumulus 4, W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer
Dimensions: Inner D = 0.4 cm, Th = 0.6 cm × 0.6 cm, shaft cross-section 1 cm × 0.4 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (handle).

Cat. 17
One fragment from a group of 29 unidentified fragments
Inv. no.: **Z4/142**
Context data: Tumulus 4, W tunnel, fill, entrance to W tunnel
Dimensions (*max*): 9 cm × 2.6 cm × 1.3 cm
Material: Iron
Description: Twenty-nine heavily corroded, delaminated and broken iron fragments.

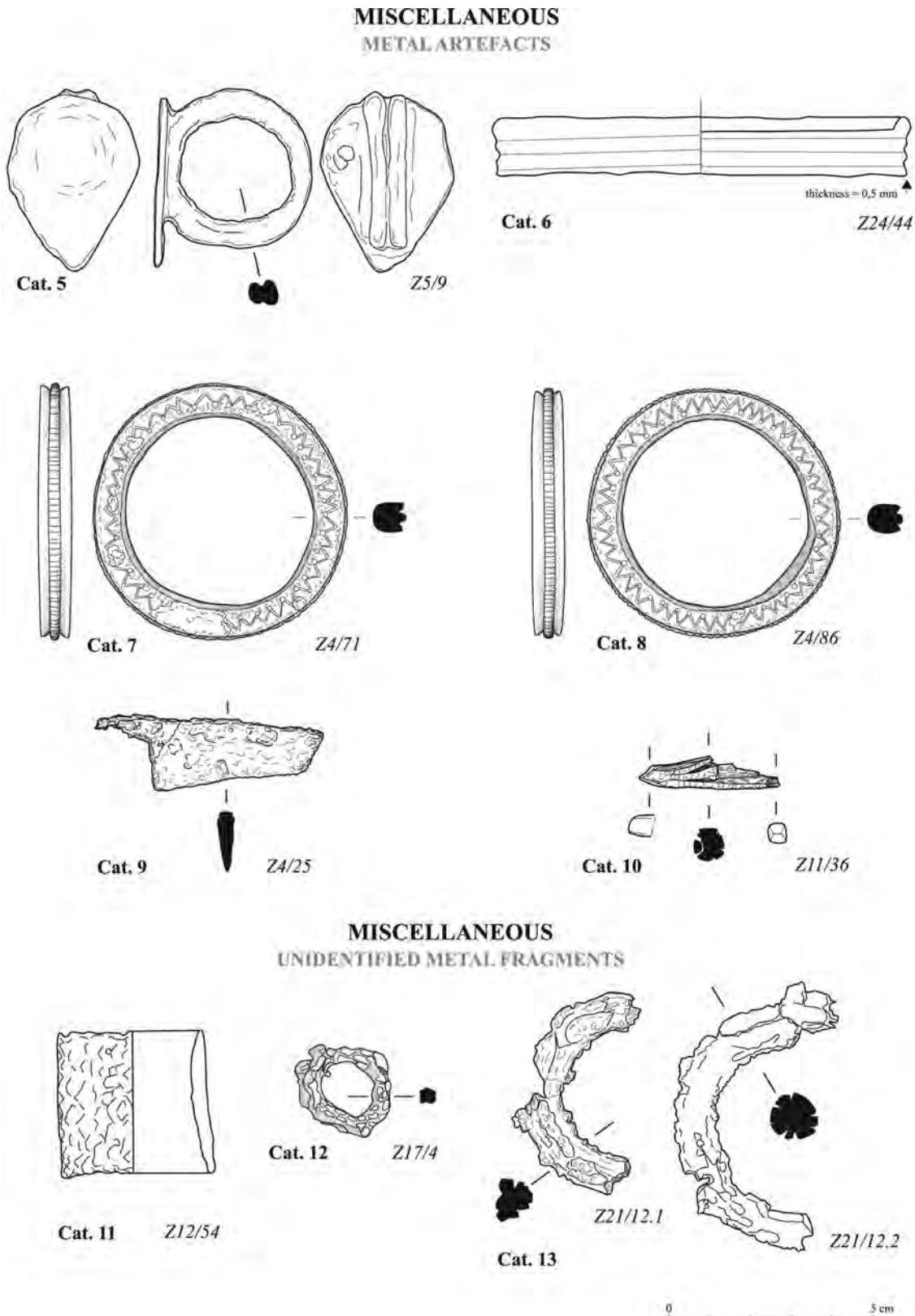

FIGURE 18.2 Metal vessel elements, fragments from shears, a chisel and unidentified metal artefacts Z5/9 DRAWN BY A. BŁASZCZYK, DIGITISED BY Ł. ZIELIŃSKI; Z24/44 DRAWN BY Ł. ZIELIŃSKI, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA; Z4/71, Z4/86 DRAWN BY J. GÓRECKA, DIGITISED BY M. MOMOT; Z4/25, Z11/36, Z12/54, Z21/12.1, Z21/12.2 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z17/4 DRAWN BY K. JUSZCZYK, DIGITISED BY E. CZYŻEWSKA-ZALEWSKA

Cat. 18
One unidentified fragment
Inv. no.: **Z7/18**
Context data: Tumulus 7, context 5, found close to pillar 11
Dimensions: L = 8.6 cm, W = 4 cm, Th = 1.1 cm
Material: Iron
Description: One heavily corroded, delaminated and broken iron fragment.

Cat. 19
Ten unidentified fragments
Inv. no.: **Z4/215**
Context data: Tumulus 4, E tunnel, S part, dark layer
Dimensions: L = 6.2 cm, W = 1.7 cm
Material: Iron
Description: Ten heavily corroded, delaminated and broken iron fragments.

Cat. 20
Two fragments from a group of 23 unidentified fragments
Inv. no.: **Z4/73**
Context data: Tumulus 4, W tunnel, fill, 8.00–8.50 m from edge of shaft, dark bottom layer
Dimensions: L = 8.3 cm, W = 1.3–1.4 cm
Material: Iron
Description: Twenty-three heavily corroded and broken iron fragments (the biggest, possibly some kind of rod).

Inv. no.: **Z4/73.1**
Context data: Tumulus 4, W tunnel, fill, 8.00–8.50 m from edge of shaft, dark bottom layer
Dimensions: L = 3.1 cm, inside D = 1.5 cm, Th = 0.5 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (sleeve fragment, possibly the same object as rod Z4/73).

Cat. 21
One unidentified fragment
Inv. no.: **Z5/27**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 5 cm, D = 2 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (amorphous).

Cat. 22
Two unidentified fragments
Inv. no.: **Z26/91**
Context data: Tumulus 26, chamber 1, E part, among human bones
Dimensions: L = 6.5 cm, W = 3.1 cm, Th = 0.6 cm
Material: Iron
Description: Two heavily corroded, delaminated and broken iron fragments.

Cat. 23
One unidentified fragment (same as Z3/17)
Inv. no.: **Z3/11**
Context data: Tumulus 3, W chamber, S part of lower fill deposit (white rubble)
Dimensions: L = 2.7 cm, W = 1.5–1.65 cm
Material: Iron
Description: One fragment of heavily corroded and broken object (probably rounded, tapering towards one end).

Cat. 24
One unidentified fragment (same as Z3/11)
Inv. no.: **Z3/17**
Context data: Tumulus 3, S chamber, near blocking wall
Dimensions: L = 3.1 cm, W = 1.2–1.4 cm
Material: Iron
Description: One fragment of heavily corroded and broken iron object (probably rounded, tapering towards one end).

Cat. 25
One unidentified object
Inv. no.: **Z5/28**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 5.5 cm, W = 2.4 cm, Th = 1.9 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (amorphous).

Cat. 26
One unidentified fragment (probable rod)
Inv. no.: **Z10/40**
Context data: Tumulus 10, burial chamber
Dimensions: L = 4.7 cm, cross-section *c.* 0.5 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (rod).

Cat. 27
One unidentified fragment (probable rod)
Inv. no.: **Z5/26**
Context data: Tumulus 5, tunnel fill
Dimensions: L = 2.5 cm, rectangular cross-section 1 cm × 1.5 cm
Material: Iron

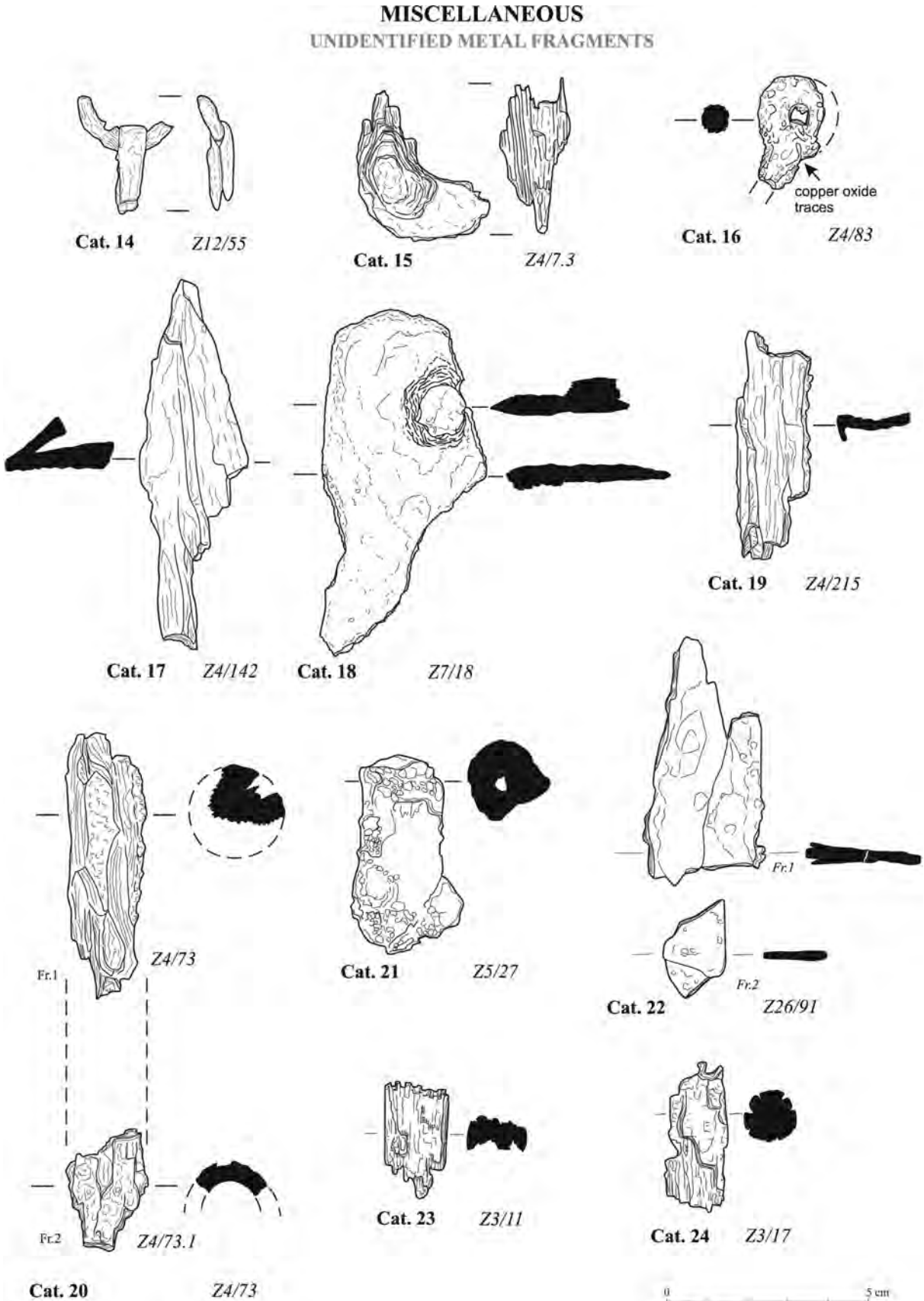

FIGURE 18.3 Unidentified metal artefacts
Z12/55, Z4/7.3, Z4/83, Z4/142, Z7/18, Z4/215, Z4/73, Z5/27, Z26/91, Z3/11, Z3/17
DRAWN AND DIGITISED BY Ł. ZIELIŃSKI

Description: One heavily corroded and broken iron fragment (rod with rectangular cross-section).

Cat. 28
One fragment from a group of 300 unidentified fragments
Inv. no.: **Z4/94**
Context data: Tumulus 4, W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer
Dimensions: L = 8 cm, D = 1.9 cm
Material: Iron
Description: Three hundred heavily corroded, delaminated and broken iron fragments.

Cat. 29
One unidentified fragment
Inv. no.: **Z4/27**
Context data: Tumulus 4, W tunnel, fill, 2.40–2.90 m from edge of shaft
Dimensions: L = 4.1 cm, W = 0.9 cm, Th = 0.3 cm
Material: Iron
Description: One fragment of heavily corroded and broken iron object.

Cat. 30
One unidentified fragment (rod)
Inv. no.: **Z4/93**
Context data: Tumulus 4, W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer
Dimensions: L = 6.7 cm, D = 1.6 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (rod).

Cat. 31
One unidentified fragment
Inv. no.: **Z4/90**
Context data: Tumulus 4, W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer
Dimensions: L = 9.4 cm, W = 1.7 cm, Th = 0.7 cm
Material: Iron
Description: One heavily corroded and broken iron fragment.

Cat. 32
One unidentified fragment
Inv. no.: **Z4/91**
Context data: Tumulus 4, W tunnel, fill, 9.00 m from edge of shaft, dark bottom layer
Dimensions: L = 9.8 cm, W = 2.3 cm, Th = 0.9 cm
Material: Iron
Description: One heavily corroded and broken iron fragment (tang at one end).

Cat. 33
Three unidentified fragments
Inv. no.: **Z28/16**
Context data: Tumulus 28, chamber 2, S part, near skull and vessels
Dimensions (*largest fragment*): L = 3.5 cm, W = 1 cm, Th = 0.4 cm
Material: Iron
Description: Three heavily corroded, delaminated and broken iron fragments.

Cat. 34
Leather remains
Inv. no.: **Z13/15**
Context data: Tumulus 13, chamber 4, W part, near vessels Z13/12, Z13/13, Z13/14
Material: Leather
Description: Eight fragments of perforated leather.
Notes: See **Fig. 18.5**.

Cat. 35
Basket imprint
Inv. no.: **Z1/14**
Context data: Tumulus 1, SE corner of trench 1
Material: Soil mixed with sandstone
Notes: See **Fig. 18.7**.

Cat. 36
Tabaq
Inv. no.: **Z26/4**
Context data: Tumulus 26, chamber 3, W part, near vessel Z26/16
Material: Organic material
Notes: See **Fig. 18.7**.

Cat. 37
Tabaq
Inv. no.: **Z26/5**
Context data: Tumulus 26, chamber 3, central part
Material: Organic material
Notes: See **Fig. 18.7**.

Cat. 38
Twenty glass fragments
Inv. no.: **Z7/15**
Context data: Tumulus 7, context 5
Material: Glass
Notes: See **Fig. 18.7**.

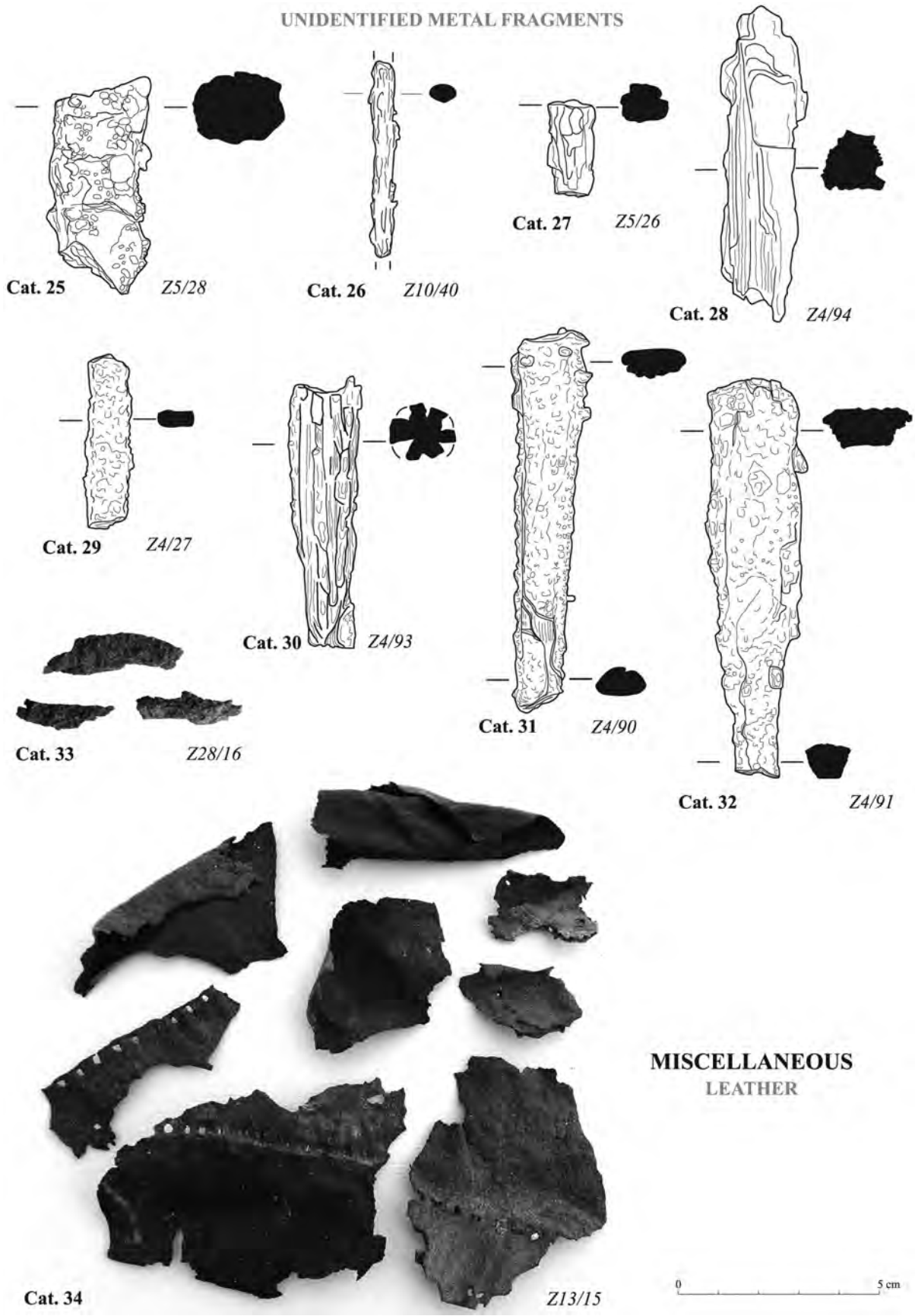

FIGURE 18.4 Unidentified metal artefacts and leather fragments
Z5/28, Z10/40, Z5/26, Z4/94, Z4/27, Z4/93, Z4/90, Z4/91 DRAWN AND DIGITISED BY Ł. ZIELIŃSKI; Z28/16 PHOTO BY A. KAMROWSKI, Z13/15 PHOTO BY O. BIAŁOSTOCKA

FIGURE 18.5 Various objects discovered in El-Zuma tumuli
PHOTOS BY A. KAMROWSKI

Cat. 39
Wood fragments from various tumuli
Inv. no.: **Z3/12**
Context data: Tumulus 3, S chamber, near entrance to W chamber
Material: Wood
Notes: See **Fig. 18.6.**

Inv. no.: **Z4/101**
Context data: Tumulus 4, fill of W tunnel, 8.70–9.60 m from shaft edge, dark bottom layer
Material: Wood
Notes: See **Fig. 18.6.**

Inv. no.: **Z4/192**
Context data: Tumulus 4, fill of E tunnel, between pillars II and III

FIGURE 18.6 Various objects discovered in El-Zuma tumuli
PHOTOS BY A. KAMROWSKI

FIGURE 18.7 Basket imprints (top), basket fragments (middle) and glass fragments (bottom), discovered in El-Zuma tumuli
PHOTOS BY A. KAMROWSKI

Material: Wood
Notes: See **Fig. 18.6**.

Inv. no.: **Z7/78**
Context data: Tumulus 7, context 8
Material: Wood

Inv. no.: **Z7/76**
Context data: Tumulus 7, context 5, close to pillar 11
Material: Wood
Notes: See **Fig. 18.6**.

Inv. no.: **Z7/45**
Context data: Tumulus 7, context 5
Material: Wood
Notes: See **Fig. 18.6**.

Inv. no.: **Z26/92**
Context data: Tumulus 26, chamber 1, E part
Material: Wood
Notes: See **Fig. 18.6**.

Cat. 40
Bed fragment?
Inv. no.: **Z4/214**
Context data: Tumulus 4, E tunnel, S part
Material: Seeds, leather, mat fragment, rope
Notes: See **Fig. 18.6**.

Analyses of Metal Objects

Łukasz Zieliński

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CHAPTER 19

Metalwork: Methods and Analysis

A number of metal artefacts discovered during the excavations required various conservation treatments. Their state of preservation varied depending on their particular depositional environment and on the metal from which the object or element was made. The objects found in El-Zuma were executed in iron, copper, copper alloys, silver, and gold.

In 2014, 2016, and 2017 the following artefacts were sent to Poland for analysis:

Z16/25	iron cross,
Z5/9	metal vessel handle,
Z21/19	ring,
Z16/14	spear,
Z4/12	earring,
Z4/19	crescent-shaped fitting,
Z4/20	buckle,
Z4/71 and Z4/89	decorated hoop,
Z4/96	cylindrical lid knob.

Thanks to the support and help of Władysław Weker, Chief Conservator at the State Archaeological Museum in Warsaw, iron cross Z16/25 was examined at the museum using a metallographic microscope and X-ray apparatus [**Fig. 19.1**].

The aim of this analysis was to see whether, as suspected, the cross had some form of decoration hidden under a layer of corrosion, and to determine the state of preservation of the artefact. It turned out that there was no decoration. The microscope image showed a poor state of preservation: the object was already devoid of an iron core and, in fact, was only a lump of consolidated rust. After this examination, the cross was returned to Sudan.

In 2016 a new and expanded programme of research was carried out in cooperation with the State Archaeological Museum in Warsaw and the National Centre for Nuclear Research in Świerk. Four selected objects were brought to Poland for analysis:

Z16/14	fragment of a bladed spearhead,
Z21/19	ring,
Z4/12	earring,
Z5/9	vessel handle.

Spear fragment Z16/14 was examined using computed tomography (for a description of the method see below, analysis by Tymoteusz Kosiński). It was chosen for examination because of its dense structure, size, and (as we thought at the time) good state of preservation. A particularly good state of preservation was an important factor for further planned research using XRF (X-Ray Fluorescence) spectrometry and the Vickers-Rockwell test for hardness. However, tomography showed that the spear had no surviving iron core, which was a prerequisite for further research. In fact all of the iron objects from El-Zuma proved to be in the same condition, thus ruling out any further research. The tomographic image also revealed the product of an atypical (in European terms) corrosion process that affected all iron objects in El-Zuma (see Chapter 13, in this volume). In addition to microscopic analysis, ring Z21/19 was also examined by means of tomography, but, in contrast to the spear, 3D imaging was used for better visualization of the obtained results (for a description of the method see below, analysis by Tymoteusz Kosiński). Analysis results revealed that ring Z21/19 has no decoration. Nevertheless, the tomographic image showed a very interesting effect of post-depositional processes. Ring Z21/19 was found on a foot phalanx, meaning that it had been in direct contact with the body of the deceased, which intensified the physico-chemical processes taking place within the ring. The ring was originally made of brass (copper and zinc alloy), but the chemical composition was changed. The zinc appears point-wise, in irregular patches and mainly on the outer surface of the ring (as if it was moving as far as possible from the corrosion centre, i.e. the deceased's toe). Migration may, therefore, have taken place on the principle of electrophoresis, although we cannot say exactly how it happened. After the analysis, the object was mechanically cleaned and re-examined under the microscope (with zinc already visible on the surface) before undergoing conservation treatment.

Earring Z4/12 was examined under a metallographic microscope, and analysed using XRF spectrometry to determine its chemical composition (for a description of the method see below, analysis by Aneta Gójska). We were particularly interested in this spectrometric study because the earring was the only gold object discovered by the mission at the time of this analysis. The spectrometric study determined that the object was in fact about 91.49 % gold, circa 7.30 % silver and circa 1.21 % copper [**Table 19.1**]. Hence the earring was not pure gold, but an alloy. Unfortunately, without a reference base in the form of XRF analysis results for samples from specific mines, it is impossible to determine where the raw material came from. We are not even sure whether the alloy was of natural origin or

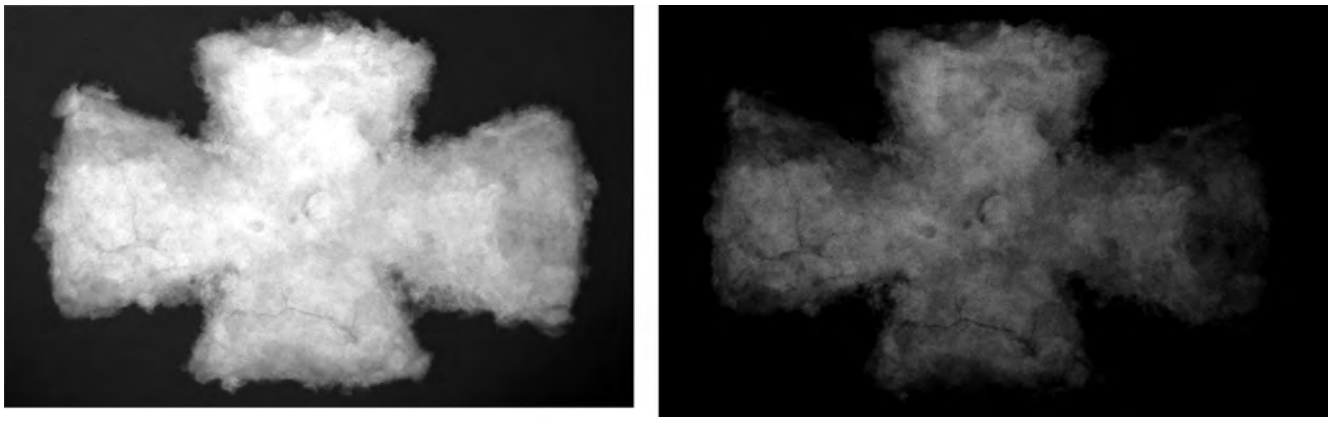

FIGURE 19.1 X-ray photo of cross Z16/25
LOWER CONTRAST AND HIGHER CONTRAST; PHOTO BY W. WEKER

artificially obtained, by the goldsmith adding 7.30% silver as an alloying additive. It is known that there are natural deposits of even higher silver content in Nubia and Egypt (e.g. Helmy et al. 2004, 504; Abdelnasser 2016, Tables 1, 2). The author of this chapter personally visited two of the small gold mines in the Abu Hammad Reach while working on the Merowe Dam Archaeological Salvage Project. Thus, it is possible that the raw material is Nubian, especially since the very form of the earring is local (similar earrings were found in Qustul: Emery and Kirwan 1938). While the spectrometric study was aimed at determining the earring's chemical composition, the microscopic examination was aimed at confirming observations as to the manner in which it was made. The individual elements of the earring were carefully trimmed. The middle bump (executed in repoussé) had its edges filed smooth on the reverse and its front face was fairly well polished (for the technical capabilities of the time). At both ends of the crescent, there are small flat areas from a single impact at an angle of almost 90 degrees, but otherwise the surface itself has no visible post-production traces other than minor scratches from grinding and polishing. In turn, the tip of the spirally wound wire is wrapped and hammered. The centre of the wire, wrapped in a loop around the nodule, is carefully incised. The incisions are made at fairly even intervals and their depth is similar around the perimeter. While the execution of the individual elements is careful, their soldering is more sloppy. The tin solder spilled out across large surfaces. The crescent was soldered to the wire unsymmetrically. So if the artisan was suitably qualified in cold work, then soldering was either not his/her strong point, or he/she did not have sufficiently precise tools.

Vessel handle Z5/9 was analysed under a metallographic microscope. Microscopic analysis showed clear traces of tin solder present on the base of the handle. The object did not have any visible holes or protruding pins, which means that it was attached to the vessel only by soldering. The handle was cast in one piece, but we cannot say anything about the mould type. No visible seams were found. However, the loop is clearly cut off from one side at an angle. This may indicate that the sprues were removed incompetently, by filing them together with the part of the ring arch (the straight part of the loop).

Research in 2017 was of a different nature. All objects brought to Poland that year were examined by microscope in the State Archaeological Museum in Warsaw, and then spectrometrically (XRF) in the Laboratory of Theoretical Basics of Analytical Chemistry of the University of Warsaw (for a description of the method see below, analysis by Łukasz Zieliński). Among the analysed objects were a cylindrical lid knob (Z4/96), a buckle (Z4/20), a crescent-shaped fitting (Z4/19), and two decorated hoops (Z4/71 and Z4/86). Almost all of them have been cleaned and conserved.

The base of cylindrical knob Z4/96 was cleaned using a micromotor and brushes. The base was chosen and prepared for XRF analysis for two reasons. Firstly, because it was suspected that the handle might be gilded rather than made of solid gold, and the base was the best place for testing the depth of the gold layer. It was also the most hidden part of the object, meaning that any change in its appearance resulting from the cleaning process would not be visible. Because the cylinder was in almost perfect condition, further cleaning was limited to simple removal of dust using distilled water with soap and acetone. The preliminary phase before the spectrometry also included examination of artefacts under a metallographic microscope.

Spectrometry established the chemical composition of the cylindrical lid knob [**Fig. 19.9**]. The material was mostly gold (circa 88%), with circa 8% silver, circa 2.5% copper and circa 1.7% nickel (see below, analysis by

Łukasz Zieliński). So the cylinders that made up lid knob Z4/96 are made of gold from a native deposit, although with an exceptionally high silver content, which is also characteristic of Nubian and Egyptian deposits. As can be seen, the percentage of other metals is also higher than in the case of earring Z4/12.

Microscopic examination of the cylindrical knob focused on production techniques. The basic raw materials from which the knob was made were: 0.05-cm-thick gold sheet, 0.2 cm threaded gold wire, a round, perforated carnelian of 0.6 cm diameter, and a gold rivet with a head diameter of 0.4 cm. The sheet was rolled up and soldered to make two cylinders of different sizes. The smaller cylinder was decorated with incised wire which was tin-soldered onto the perimeter. The carnelian was mounted into this part. It was additionally secured against falling out by a gold rivet, the spindle of which was soldered to the base of the cylinder. One end of the second cylinder was bent outwards to form a base that was decorated with repoussé dots, which may have been of technical significance because this embossing reinforced the base, which was made of thin gold plate, and the base itself provided a larger contact area when it was glued to the lid with an adhesive. From the top, the cylinder was also rolled up creating a large circle to which an oval plate was tin-soldered to create a dish. It was to this dish, that the smaller cylinder with a carnelian was added from above (also by tin soldering). The whole structure was therefore quite complicated and carefully designed.

The manner in which individual elements were executed is interesting. Longitudinal scratches survive on the underside, inside the cylinder. This shows that the knob had an inner core, probably wooden, onto which the cylinder was studded from above (unfortunately the wooden core does not survive).

Pieces of old rags were used in some places to fill the gap between the wood and the cylinder, which was not a perfect fit. This technique was used in Sudan for the production of swords with cylindrical, silver handles. The sheet from which the lower section of the cylinder was made was profiled in the middle. The artisan joined the plate to the cylinder not with the edges but with overburden (surplus), and a lot of solder was used to mask the contact surface. The overall effect, however, does not reflect well on the craftsman's skill, because in some places the solder is simply missing and the sheet sticks out. However, the solder used as an alloy did not differ in colour from the object itself (tin with something added to make it golden), and the soldering space was partially filled. The very edges of the base are wavy due to ribbing, but filed without burrs. In contrast, the length of the soldered wire on the perimeter of the upper cylinder is poorly matched, because the ends do not meet and there is a large gap. The craftsman did not try to mask his mistake by filling the gap with solder, as was done, for example, in the case of the ring with glass mosaic (Z4/97) from the same grave. The very neat soldering on that object may indicate that although it was found together with the knob in tumulus 4, the two objects were made by different individuals.

The Z4/20 buckle was also examined spectrometrically (XRF) [**Fig. 19.6**]. It turned out to be typical brass. Analysis results revealed that copper content ranged from 73.5% to 81.5% and zinc from 13.1% to 19.4%, with traces of iron (about 0.5%), nickel (about 0.3%) and lead (about 0.3%) (see below, analysis by Łukasz Zieliński). Microscopic examination did not bring any new findings regarding production techniques. The buckle consisted of two parts. The frame was made of a 0.4-cm-thick wire bent into the shape of the letter D. The pin was made of a smaller diameter flat wire (0.2 cm wide after hammering). The surface of the object was too badly corroded to find post-production traces on the surface. However, both ends of the D-shaped frame bear traces of cutting with a chisel.

The other object examined by XRF spectrometry was crescent-shaped fitting Z4/19 [**Fig. 19.5**]. It has a copper content of about 83–86%, with a high content of zinc (about 3.3–6.5%), lead (about 3.3%), and tin (about 1.5%). Thus the crescent could be considered as being made of brass, although the zinc content in normal brass is in most cases above 10%.

Both decorated hoops Z4/71 [**Fig. 19.7**] and Z4/86 [**Fig. 19.8**] were also examined by XRF. Both proved to be made of copper with about 6.1–6.5% lead content. In both cases there are also similar levels of arsenic (about 0.9%) and nickel (about 0.5–0.8%). This could indicate that both hoops were made from the same material. Because the hoops were also examined microscopically, we can tell that they may even have been made by the same individual. The decorative pattern on both hoops is identical in close-up. The zig-zag with dot motifs that appear on the faces of both hoops have the same traits of imperfection. The hand that made the pattern was imprecise, thus many dots feature in the spaces between the zig-zags, while others are exactly on their apexes. Also, the tools used for both hoops were the same: a chisel with a blade 2.7 mm long and 0.2 mm thick for the zig-zags, and a puncturing tool of 0.8 mm for the dots.

Spectrometric analysis was executed to determine the chemical composition of metal objects. The artefacts excavated from the El-Zuma tumuli were made of pure copper and alloys. The buckles and simple fittings like Z4/19 were probably made from brass, while the deco-

rated hoops were probably made of natural copper; the earring Z4/12 was made of gold with a high content of silver (about 7.3%) and low content of copper (1.2%); and the cylindrical knob Z4/96 was made from gold with a high content of silver (about 8.8%). The higher contents of copper (2.5–3.5%) and nickel (1.7–2.4%) suggest that earring Z4/12 may have been of a different origin. Microscopic analysis of the earring and cylindrical knob revealed similarities in production techniques. Both objects were tin-soldered, and incised wire was used as a part of the decoration. The tin soldering on the knob was less precisely executed, suggesting that the soldering may have been carried out by a different craftsman.

Ancient sources of ore are very difficult to establish. Not enough is known about the chemical composition of gold and copper from Ancient Nubia. We can assume that the metals used for the artefacts discovered at El-Zuma could have been of Nubian or Egyptian origin, such as gold (e.g. Helmy et al. 2004, 504; Abdelnasser 2016, Tables 1, 2) and copper (Young 1996, 482–483). The high levels of arsenic and lead in decorated hoops Z4/71 and Z4/86 are similar (but not exactly the same) to those noted in swords excavated at Kerma (Young 1996, 482–483). The Buhen sources of copper ore had a different gold content to that of the metalwork discovered at El-Zuma and Buhen probably could not have been a source of ancient ore (El-Gayar and Jones 1989).

Appendix: Analyses of Objects

Tymoteusz Kosiński, Aneta Gójska, Władysław Weker and Łukasz Zieliński

1 Ring Z21/19: X-ray Tomography Scan – *Analysis by Tymoteusz Kosiński*

The tomography scan was done using Nikon's XT H 225ST Computed Tomography (CT) system (courtesy of ImagineRT sp. z o.o.). The X-ray images are taken with a Perkin Elmer 1620 detector (2000×2000 pixels). The scanner is equipped with VGStudio MAX 2.2 software which enables analysis of the tomographic scan [**Fig. 19.2**].

A CT scan requires multiple X-ray images of an object to be taken while it rotates through 360 degrees. The acquired images are then reconstructed to produce a three-dimensional model. The result can be presented, for example, as slices in any plane of the object. The greyscale corresponds to different material densities—the lighter the part of an image is, the higher the density.

During the CT scan of the ring the following parameters where used:
– X-ray tube voltage: 210 kV;
– X-ray tube current: 170 μA;
– exposure time of a single image: 354 ms;
– number of exposures: 3141.

The results of the scan are presented below. **Fig. 19.2a** shows a slice in the plane marked on **Fig. 19.2b**. It can be observed that most of the object is made of quite homogenous material with some lighter parts on its surface. This suggests that it was covered with a thin layer of high-density metal (e.g. silver) during the manufacturing process. **Figs 19.2c** and **19.2d** show another slice through the ring. On the left side of the image it can be seen that there is no outer layer, and on the right side there are some remains of it. The shadows outside of the object's contours are artefacts—distortions caused by the physical limitations of this method. **Fig. 19.2e** shows a slice through the ring with a well-preserved part of the outer layer. A high level of shadow artefact is also visible. **Fig. 19.2f** is a three-dimensional visualisation of the surface of the object. The parameters of that visualisation were set to feature the outer layer's remains. Many cavities in the layer are visible.

2 Spear Z16/14: X-ray Image of Part of the Spear – *Analysis by Tymoteusz Kosiński*

The X-ray was taken using Nikon's XT H 225ST CT (courtesy of ImagineRT sp. z o.o.) system with the following parameters:
– X-ray tube voltage: 225 kV;
– X-ray tube current: 360 μA;
– exposure time of a single image: 354 ms;
– the image was averaged from 8 exposures (images).

The image shows the core of the object (darker part) [**Fig. 19.3**] probably relatively well-preserved, and side parts, probably mostly corroded. Best seen are the cracks on the right side of the image.

3 Earring Z4/12: XRF Spectrometric Analysis – *Analysis by Aneta Gójska*

The analyses were performed using ED-XRF (energy dispersive X-ray fluorescence). For the ED-XRF measurements an X-ray generator designed and built at the National Centre for Nuclear Research in Świerk was used. The compact X-ray generator was constructed using a transmission X-ray tube (Gójska and Miśta-Jakubowska 2018). The device makes use of a focused electron beam which bombards a silver (Ag) anode target, thus generating X-ray radiation. The XRF spectrum of the studied earring was recorded by exposing its whole surface to X-ray photons. Then, the average value of the elemental composition was obtained. The X-ray generator was operated with anode voltage and current equal to 40 kV and 30 μA respectively. The fluorescence spectra of the earring were registered with an Amptek SDD spectrometer, offering an energy resolution of 149 eV at 5.9 keV photon energy. The distances between the X-ray source and the measured earring (SC) and between the earring and the detector (CD) were set to 90 mm and 115 mm respectively [**Fig. 19.4a**]. The beam incident angle was 90 degrees and XRF spectra were registered at 45 degrees. The energy spectra (measured XRF spectra of object) [**Fig. 19.4b**] were analysed by an Amptek ADMCA multi-channel analyser. Before the measurements with the X-ray tube, the detector was energy-calibrated using radioisotope sources: ^{55}Fe: 5.9 keV (Mn-Kα) and 6.5 keV (Mn-Kβ); ^{109}Cd: 22.1 keV (Ag-Kα) and 24.9 keV (Ag-Kβ); ^{137}Cs: 32 keV (Ba-Kα). A good linearity in

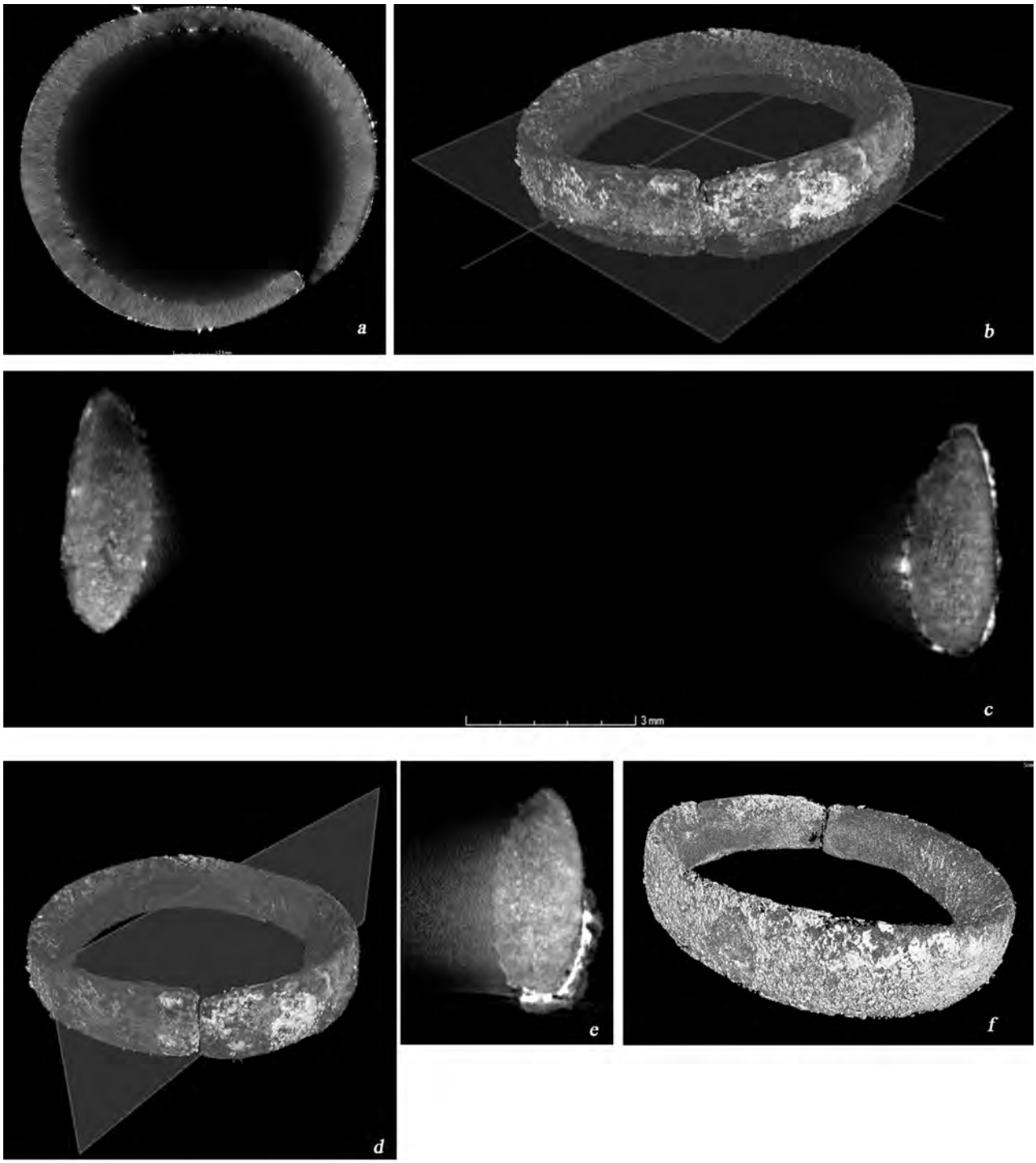

FIGURE 19.2 a—slice through the object in the plane marked on image b; b—3D image of the scanned object with marked plane shown on a; c—slice through the ring in the plane marked on d; d—marked plane shown on c; e—slice through the ring; f—3D image of the object's surface

PHOTOS BY T. KOSIŃSKI

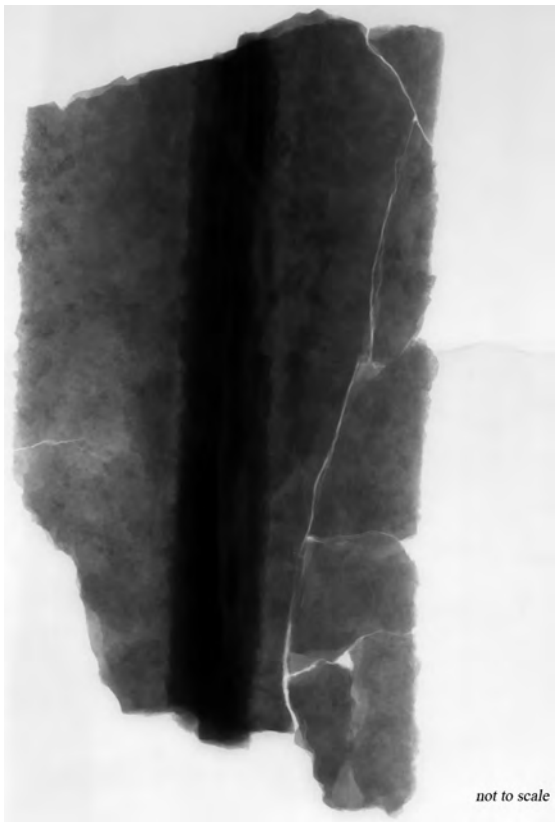

FIGURE 19.3
X-ray image of part of the spear
PHOTO BY T. KOSIŃSKI

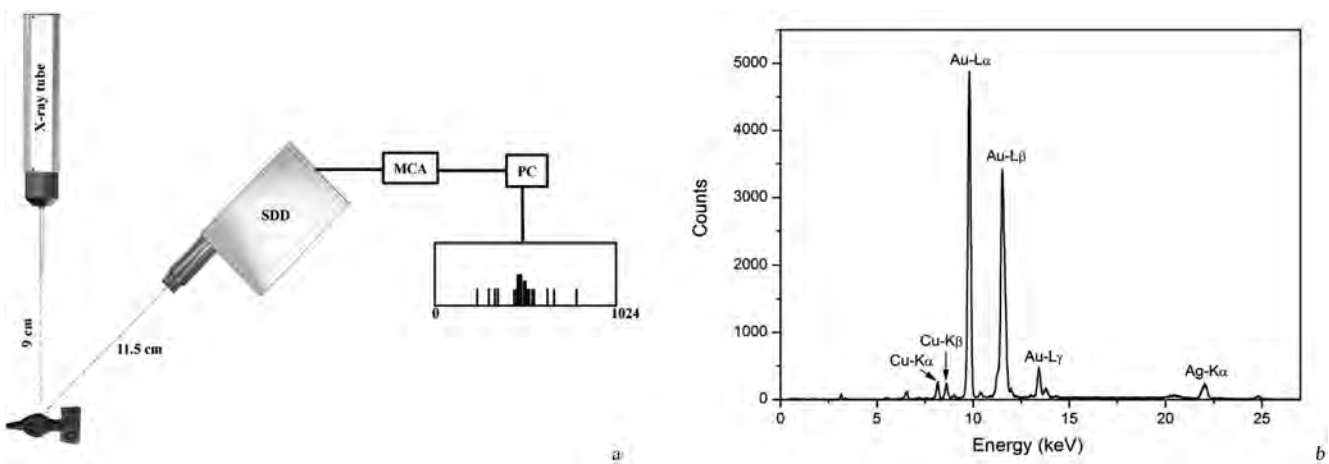

FIGURE 19.4 Experimental setup of the XRF system
DRAWN BY A. GÓJSKA

TABLE 19.1 Experimental system performances

X-ray tube type	transmission
Anode of X-ray tube	Ag
HV	40 kV
Anode current	30 μA
Detector	SDD 25 mm^2
Source-object distance (SO)	9 cm
Object-detector distance (OD)	11.5 cm
Incident angle	90°
Detector angle	45°
Irradiated area	2.1 cm^2

PRODUCED BY A. GÓJSKA

TABLE 19.2 Elemental concentrations determined using XRF-FP software

Element	Intensity	Concentration
Ag	6731.48	7.30%
Au	99114.54	91.49%
Cu	3483.92	1.21%

WITH EXPERIMENTAL ERROR 10%; PRODUCED BY A. GÓJSKA

energy calibration was achieved in the whole X-ray energy range which was needed for our studies (8–25 keV). The linear fit of energy calibration was obtained with χ^2 = 0.999. The summary of the experimental system is shown in **Table 19.1**.

The X-ray radiation from the X-ray tube can lead to the ionization of K-shell of electrons in the artefact. As a result of electron transition from higher shell fills to the hole of the K-shell the characteristic Kα and Kα lines can be observed in X-ray spectra. Each element has its own specific transition energy. Thus, the characteristic lines in spectra constitute the signature of the specific element in the studied object. Composition analysis consists of the conversion of peak intensities to concentrations of elements. Since the incident X-ray beam irradiated the whole surface of the earring, an average composition of the studied earring was obtained. The elemental concentrations were determined using XRS-FP software (X-ray Fluorescence—Energy Dispersive Spectrometry—Fundamental Parameter program). The results are shown in **Table 19.2**.

4 Spectrometric Analysis
– Analysis by Łukasz Zieliński, Władysław Weker

In 2017 artefacts were analysed using a Bruker Tracer 5 XRF spectrometer. This model has a Si-PIN detector and a voltage of 40 kV. Bruker AXS software was used to process the results. Two to four measurements were made for each object. These measurements were taken on different areas of the object, depending on which of its surfaces was subjected to X-ray examination. Therefore, the results for individual tests differ depending on the degree of corrosion of the object (the corrosion of some alloy components) and the heterogeneity of the material from which the object was made. It is also worth noting that although the results are given as a percentage, they never add up to 100%. This is due to the fact that the report does not contain data on trace elements, the concentration of which is lower than 0.01%. It also does not contain data on numerous oxides that are a product of corrosion and other impurities, such as silicon compounds from soil.

Percentages indicate what metal we are dealing with. For example, a zinc content of more than 6–7% in a copper structure (about 80% copper) indicates that we are dealing with a brass object. Lower contents of zinc and tin indicate natural copper. Brass can also contain small amounts of tin (from 1% to 7%). Small amounts of lead, nickel, or arsenic are typical admixtures found in natural copper deposits (and their content varies depending on the deposit). On the other hand, in the case of gold, a silver content in excess of 25% suggests that we are dealing with an alloy. Usually, electrum (gold and silver alloy) may already contain 20% silver to about 80% gold with other small additions, such as copper and nickel. However, some natural gold deposits around the world have a silver content of around 25%. Gold with a silver concentration of less than 20% is likely to be natural gold (without alloying additives).

5 Crescent-Shaped Fitting Z4/19

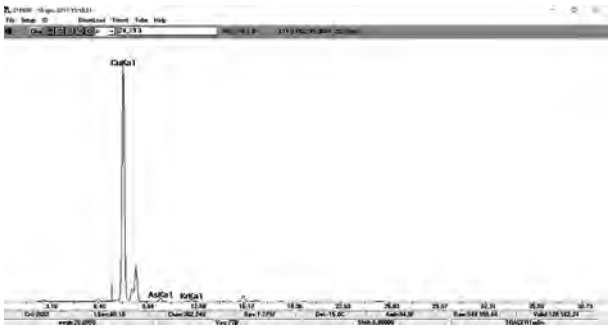

FIGURE 19.5 Spectrometric analysis of crescent-shaped fitting Z4/19
BY W. WEKER

Z4_19 1 fitting	12-18-2017 14:26:30	Concentration (CU1)
MnKa1	0.1707451418	
FeKa1	0.7436883702	
CoKa1	0.0762349497	
CuKa1	84.0294045750	

Z4_19 2	12-18-2017 14:35:12	Concentration (CU1)
FeKa1	0.8863478260	
CoKa1	0.0825110824	
NiKa1	0.4012828462	
CuKa1	86.1566274085	
ZnKa1	3.3360126660	
AsKa1	0.6239310602	

Z4_19 3	12-18-2017 14:36:37	Concentration (CU1)
MnKa1	0.1557083202	
FeKa1	0.7093627646	
CoKa1	0.0831721691	
NiKa1	0.3210139722	
CuKa1	83.4020015832	
ZnKa1	6.5936394458	

Z4_19 4	11-28-2017 23:33:35	Concentration (CU1)
MnKa1	0.1707451418	
FeKa1	0.8863478260	
NiKa1	0.4012828462	
CuKa1	6.1566274085	
ZnKa1	3.3360126660	
AsKa1	0.6239310602	
PbLb1	3.3819630032	
BiLb1	0.1357728936	
NbKa1	0.1487354252	
SnKa1	1.4934627016	

6 Buckle Z4/20

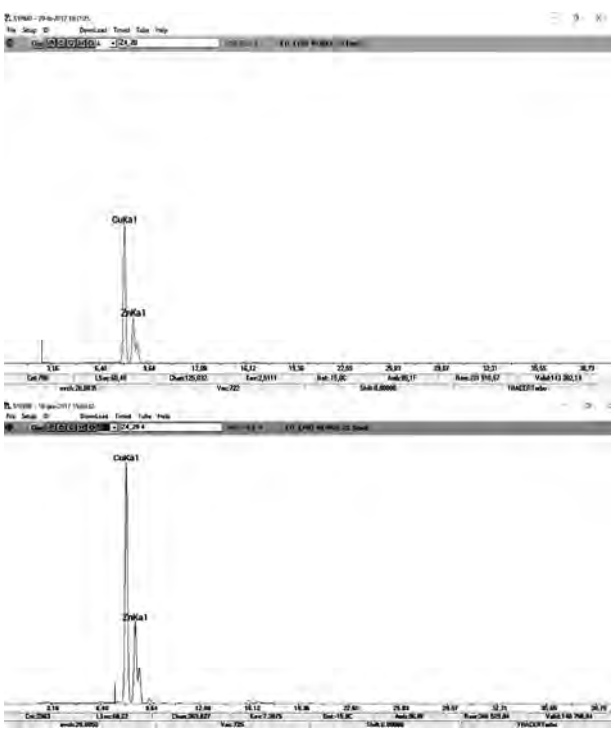

FIGURE 19.6 Spectrometric analysis of buckle Z4/20
BY W. WEKER

Z4_20	11-29-2017 18:01:34	Concentration (CU1)
MnKa1	0.1635866855	
FeKa1	0.5076029560	
CoKa1	0.1281143087	
NiKa1	0.3138465854	
CuKa1	73.5604601208	
ZnKa1	19.4310707874	
AsKa1	0.1421578568	
PbLb1	0.3320291883	
NbKa1	0.2897291536	

Z4_20–2.buckle	11-29-2017 17:56:11	Concentration (CU1)
MnKa1	0.1891787901	
FeKa1	0.5644873755	
CoKa1	0.1129601704	
NiKa1	0.3799700526	
CuKa1	81.5727630748	
ZnKa1	13.1096268387	

AsKa1	0.0840566114
PbLb1	0.3434645271
BiLb1	0.1502902368
NbKa1	0.1326348771

Z4_20–3	**11-29-2017 00:21:02**	**Concentration (CU1)**
MnKa1	0.1677449451	
FeKa1	0.5122013499	
CoKa1	0.1191771445	
NiKa1	0.3128423083	
CuKa1	78.8144812793	
ZnKa1	15.1603900265	
PbLb1	0.2204980328	
BiLb1	0.1275866167	
NbKa1	0.2019537614	

Z4_20–4	**11-29-2017 00:17:47**	**Concentration (CU1)**
MnKa1	0.1444981965	
FeKa1	0.5268045668	
CoKa1	0.1080655154	
NiKa1	0.3072699933	
CuKa1	72.6203716495	
ZnKa1	19.9700042986	

Z4_20–5	**11-29-2017 17:59:00**	**Concentration (CU1)**
MnKa1	0.1480336024	
FeKa1	0.5288866090	
CoKa1	0.1100844745	
NiKa1	0.3082526896	
CuKa1	71.8143864487	
ZnKa1	20.6464492362	
AsKa1	0.1230421003	
PbLb1	0.2227709206	
BiLb1	0.1040311472	
ZrKa1	0.0304668797	
NbKa1	0.3553196283	

Z4_20–6	**11-29-2017 18:00:15**	**Concentration (CU1)**
MnKa1	0.1304512726	
FeKa1	0.5276040447	
CoKa1	0.1023806131	
NiKa1	0.2880920023	
CuKa1	70.1539220354	
ZnKa1	21.3277345061	
NbKa1	0.4526161813	

7 Decorated Hoop Z4/71

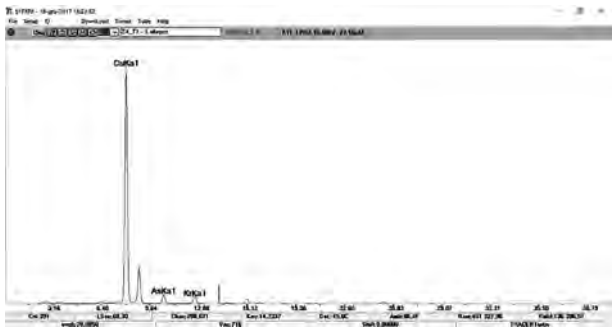

FIGURE 19.7 Spectrometric analysis of decorated hoop Z4/71 BY W. WEKER

Z4_71—1.hoop	**12-18-2017 14:40:11**	**Concentration (CU1)**
MnKa1	0.1973159771	
FeKa1	0.5762068655	
CoKa1	0.0889341694	
NiKa1	0.5612918098	
CuKa1	82.6262536389	
ZnKa1	0.4198454404	

Z4_71—2	**12-18-2017 14:41:38**	**Concentration (CU1)**
MnKa1	0.1895641715	
FeKa1	0.4721392706	
CoKa1	0.0947511480	
NiKa1	0.5423438768	
CuKa1	84.1391635272	
ZnKa1	0.4565902997	
AsKa1	0.9867467442	
PbLb1	6.1187592553	

Z4_71—3	**12-18-2017 15:06:40**	**Concentration (CU1)**
MnKa1	0.1940735444	
FeKa1	0.5401382839	
CoKa1	0.0858671374	
NiKa1	0.5537900209	
CuKa1	84.5500222327	
ZnKa1	0.4652371673	
AsKa1	0.9517432658	

Z4_71—4	**11-28-2017 23:27:13**	**Concentration (CU1)**
MnKa1	0.1973159771	
FeKa1	0.5762068655	
NiKa1	0.5612918098	
CuKa1	82.6262536389	

ZnKa1	0.4198454404
AsKa1	1.1041780989
PbLb1	6.1496960182
BiLb1	0.1759998570
SnKa1	4.498823418

8 Decorated Hoop Z4/86

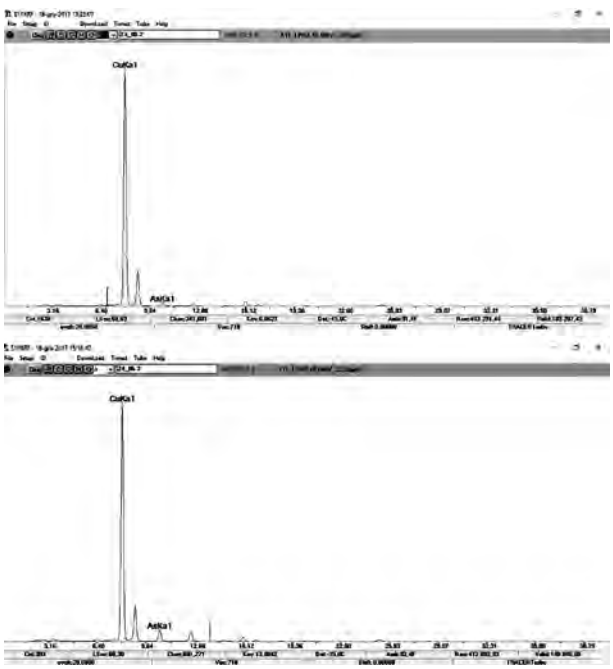

FIGURE 19.8 Spectrometric analysis of decorated hoop Z4/86 BY W. WEKER

Z4_86 1.hoop	**12-18-2017 15:08:27**	**Concentration (CU1)**
MnKa1	0.1990990841	
FeKa1	0.5285327669	
CoKa1	0.0936198873	
NiKa1	0.6855151129	
CuKa1	81.4999434184	
ZnKa1	0.4709750875	
AsKa1	0.9907552904	
PbLb1	6.5122983573	

Z4_86 2	**12-18-2017 15:10:13**	**Concentration (CU1)**
MnKa1	0.1768964050	
FeKa1	0.4812477446	
CoKa1	0.0754432587	
NiKa1	0.6681879017	
CuKa1	88.4572755190	
ZnKa1	0.5158392406	
AsKa1	0.5282539789	
PbLb1	4.3997387139	

Z4_86 3	**12-18-2017 15:11:10**	**Concentration (CU1)**
MnKa1	0.1948940650	
FeKa1	0.6038605197	
CoKa1	0.0897159781	
NiKa1	0.8411570675	
CuKa1	78.7110219743	
ZnKa1	0.5750410622	
AsKa1	1.2495569065	
PbLb1	6.1281921629	

9 Cylindrical Knob Z4/96

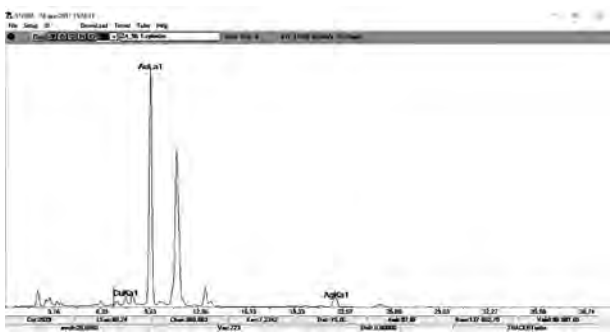

FIGURE 19.9 Spectrometric analysis of cylindrical knob Z4/96 BY W. WEKER

Z4_96 1	**11-29-2017 00:10:42**	**Concentration (AU1)**
NiKa1	1.7281150087	
CuKa1	2.5993204238	
ZnKa1	0.3020635998	
AuLa1	88.5542955273	
AgKa1	8.0768141433	

Z4_96 2	**11-29-2017 00:07:11**	**Concentration (AU1)**
CuKa1	2.7568535288	
ZnKa1	0.4989263709	
AuLa1	87.5573922696	
AgKa1	8.8530200428	
InKa1	0.0572824592	

Z4_96 3	11-29-2017 00:08:49	Concentration (AU1)
NiKa1	2.4621128066	
CuKa1	3.5525737780	
ZnKa1	0.4091805527	
AuLa1	84.1725642540	
AgKa1	8.8613562650	

Illustrations

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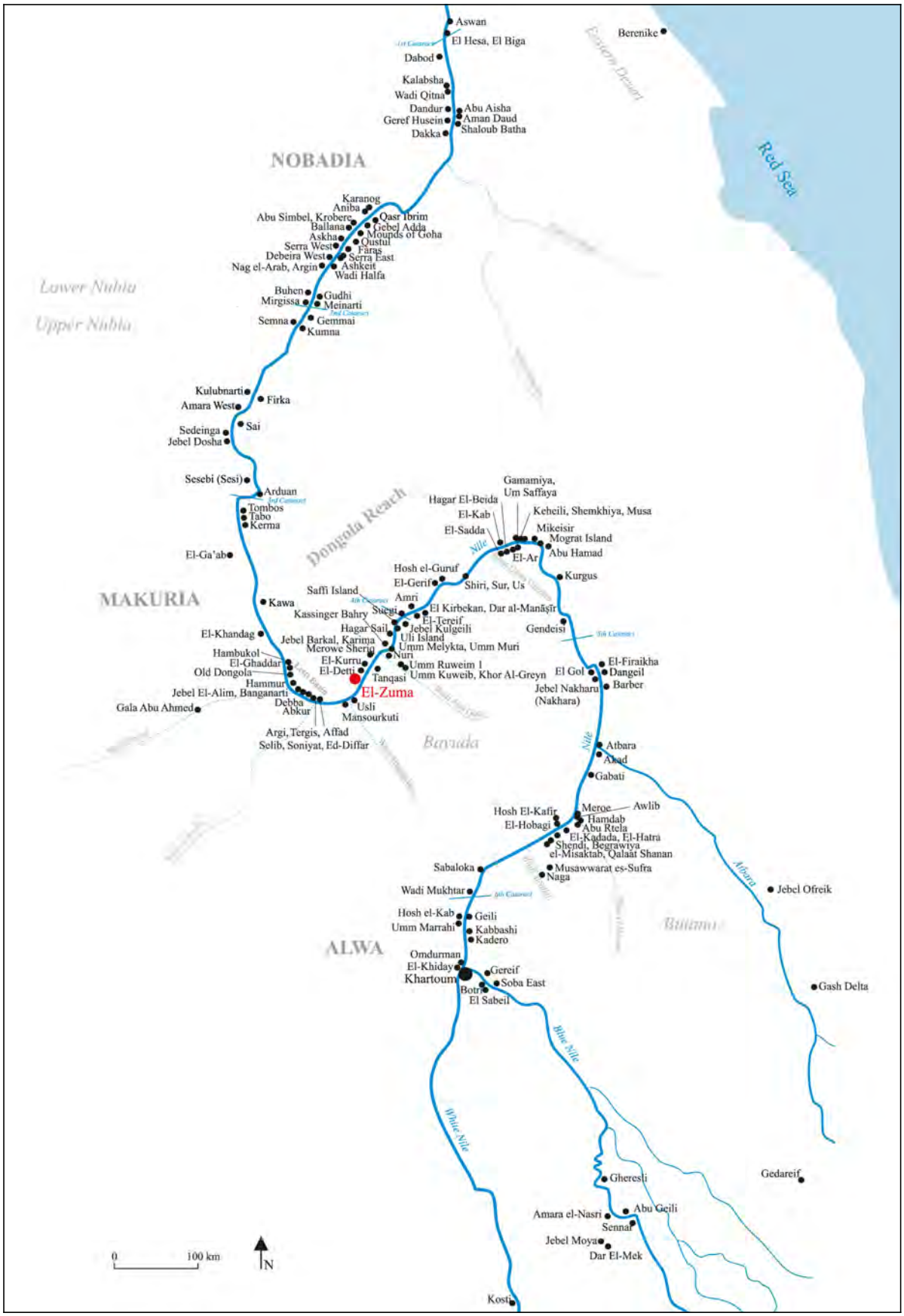

FIGURE 1 Map of the Ancient Nubian archaeological sites mentioned in this publication
DRAWN BY E. CZYŻEWSKA-ZALEWSKA

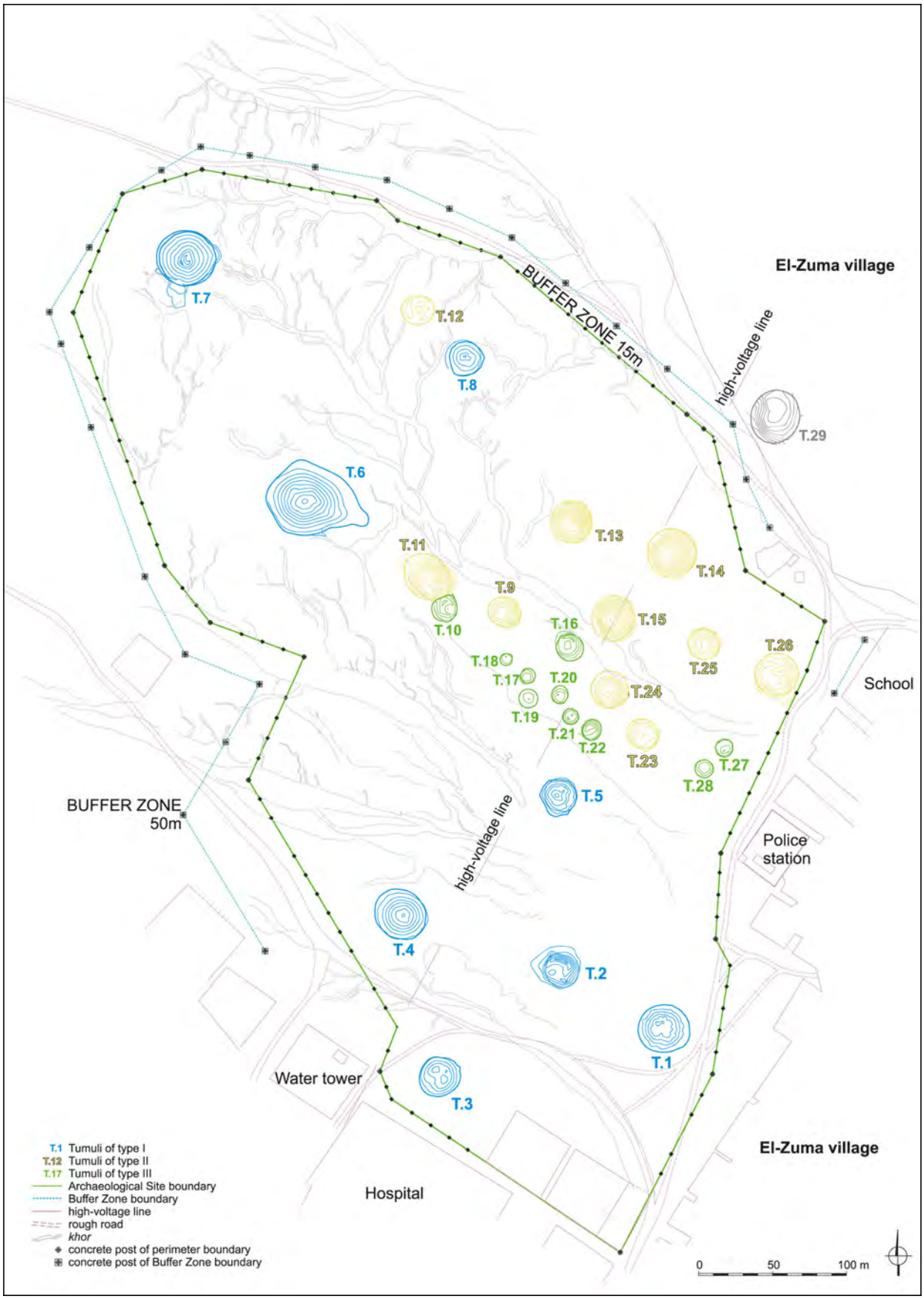

FIGURE 2 Topographic plan of the cemetery at El-Zuma
DRAWN BY J. JUCHNIEWICZ, Z. KOWARSKA, S. LENARCZYK

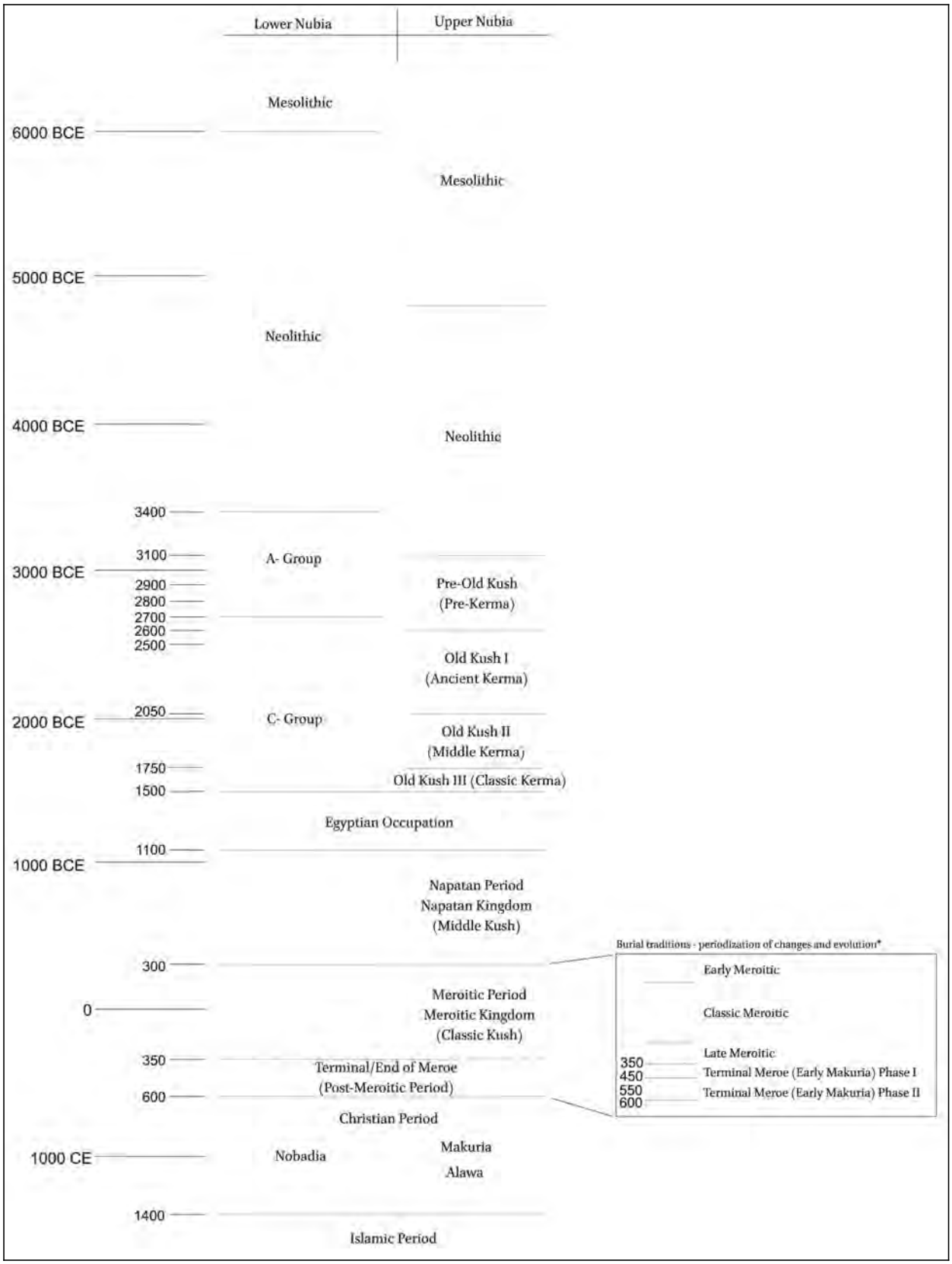

FIGURE 3 General chronological table based on the chronology of Mesolithic and Neolithic Sudan (David and Salvatori 2019, Fig. 2) and the timeline of Kush and Christian Nubia (Emberling and Davis 2019, x–xi; Obłuski 2014, 9). * The inset with the periodization of changes in the burial tradition according to Mahmoud El-Tayeb's (2012, 41–75) periodization
DRAWN BY E. CZYŻEWSKA-ZALEWSKA

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