Volume 4

Peshdar Plain Project Publications

The Dinka Settlement Complex 2018

Continuing the excavations at Qalat-i Dinka and the Lower Town

edited by

Karen Radner, F. Janoscha Kreppner and Andrea Squitieri

PeWe-Verlag

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Umschlagabbildung: Trench QID1 on Qalat-i Dinka at the end of excavations (3 May 2018). Photo by Andrea Squitieri, taken with a DJI Phantom 4 Pro drone.

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Preface

Karen Radner, F. Janoscha Kreppner & Andrea Squitieri

To Stephan Kroll, in gratitude

Just in time for the beginning of the 2019 autumn campaign at the Dinka Settlement Complex, this volume presents the results of the 2018 activities of the Peshdar Plain Project (PPP).

The publication of this fourth volume of the series Peshdar Plain Project Publications (4P4) was yet again made possible by the wonderful support granted by the authorities of the Autonomous Kurdistan Region of Iraq: the General Directorate of Antiquities, the Sulaymaniyah Directorate of Antiquities and the Raparin Directorate of Antiquities and their individual members, named in Chapter A; the sponsorship of the institutions who provided generous funding: the Alexander von Humboldt Foundation, Ludwig-Maximilians-Universität München (LMU Munich) and the Gerda Henkel Foundation; and the great dedication and the enormous and enormously varied expertise of our international and interdisciplinary team of specialists, named with their respective areas of responsibility during fieldwork in 2018 in Chapter A of this book.

In 2018, we welcomed Cajetan Geiger (Ruhr-Universität Bochum) to the field team who presents the first results of his assessment of the geology of the Bora Plain in Chapter B1. The 2018 autumn campaign was a landmark in the Peshdar Plain Project's history as Sophie Pietsch (Freie Universität Berlin) was the first undergraduate student to ever join us in the field, and with great success. Further undergraduates from Janoscha Kreppner's new academic home at the Westfälische Wilhelms-Universität Münster will join the team in the upcoming 2019 autumn campaign in order to practice and further their archaeological skill sets in the field after studying the Dinka Settlement Complex in class.

We are very pleased to present reports on the petrographic and archaeometric analyses conducted by Silvia Amicone, Christoph Berthold and Jörg Fischer at the Competence Center Archaeometry Baden-Wuerttemberg (CCA-BW) of Eberhard-Karls-Universität Tübingen, our cooperation partner since 2017. We are equally pleased to present the results of Patrick Arneitz and Roman Leonhardt (Zentralanstalt für Meteorologie und Geodynamik, Vienna) from their analysis of an archaeomagnetic sample taken from a kiln at Gird-i Bazar in 2015; our collaboration continues.

Beyond the many many individuals mentioned in Chapter A, we are indebted to many colleagues and friends working in the Kurdish Autonomous Region of Iraq for sharing information and expertise, foremost among them our cooperation partner Jessica Giraud, head of the Mission archéologique française du Gouvernorat de Soulaimaniah (MAFGS). In Baghdad, we thank Qais Hussein Rasheed who, as its director, graciously issued the formal permit of the State Board of Antiquities and Heritage of Iraq for the work of the Peshdar Plain Project on 10 October 2018. At LMU Munich, we are very grateful to Denise Bolton who found time to language-edit Chapters B to F despite many other commitments and to Nikola Wenner who assisted Andrea Squitieri in the preparation of some of the figures. In Gladbeck, our thanks go to our publisher Peter Werner for his care and attention in producing this handsome volume.

As with the first three volumes of the series Peshdar Plain Project Publications (4P1 = *Exploring the Neo-Assyrian Frontier with Western Iran: The 2015 Season at Gird-i Bazar and Qalat-i Dinka*, edited by Karen Radner, F. Janoscha Kreppner and Andrea Squitieri, Gladbeck 2016; Open Access download: https://epub.ub.uni-muenchen.de/29236/; 4P2 = *Unearthing the Dinka Settlement Complex: the 2016 Seasons at Gird-i Bazar and Qalat-i Dinka*, edited by Karen Radner, F. Janoscha Kreppner and Andrea Squitieri, Gladbeck 2017; Open Access download: https://epub.ub.uni-muenchen.de/40252/; and 4P3 = *The Dinka Settlement Complex 2017: The Final Season at Gird-i Bazar and First Work in the Lower Town*, edited by Karen Radner, F. Janoscha Kreppner and Andrea Squitieri, Gladbeck 2018; Open Access download: https://epub.ub.uni-muenchen.de/57255/), this book is meant to share the results of our

fieldwork in a detailed and timely manner. It is deliberately a "work in progress" that represents the current state of our knowledge and interpretation of the Dinka Settlement Complex, and future work and analyses are likely to change some of our views. Yet again, we have succeeded in completing the stratigraphic analysis for all areas excavated in 2018 and are able to present every single stratigraphic unit of the 2018 excavations at Qalat-i Dinka and in the new excavation area in the Lower Town of the Dinka Settlement Complex, dubbed DLT3.

We dedicate this volume in gratitude and admiration to Prof. Dr. Stephan Kroll (LMU Munich) who supported the Peshdar Plain Project from its earliest days and freely shared his enormous knowledge on Iron Age ceramics and western Iran with us, drawing on his many years of fieldwork experience in the highland regions of the Middle East. Thank you, Stephan, for your curiosity, your generosity and all those sherds!

Munich, Münster and Penjwin, July 2019

A. The Peshdar Plain Project in its fourth year: the 2018 work programme

Karen Radner

The Peshdar Plain Plain (PPP) was initiated by Karen Radner in 2015 in order to conduct multi-disciplinary fieldwork with a focus on the early first millennium BC in the district of Peshdar (also Pishdar or Pizhder) in the province of Sulaymaniyah (Kurdish Autonomous Region of Iraq), with the objective to recover data that would allow us to better reconstruct the history of this understudied region on the border with Iran (**Fig. A1**). PPP brings together international experts in history, archaeology, bioarchaeology, landscape archaeology, geography, geophysics, material science studies, physical anthropology, GIS, photogrammetry and 3D modelling. In 2018, we expanded our work programme to also include geology and were joined for this purpose by Cajetan Geiger (Ruhr-Universität Bochum, Germany; **§B1**).

From the second half of the 9th century BC onwards, the Assyrian Empire controlled the Peshdar Plain, which was situated on its eastern frontier (**Fig. A2**) and formed part of the defensive Border March of the Palace Herald[1]. Little is presently known about the transformation processes that the annexation triggered in the mountain lands on the upper reaches of the Lower Zab and our fieldwork seeks to address this question.

Our activities focus on the Bora Plain, a sub-unit of the Peshdar Plain that stretches along the northern bank of the Lower Zab, very close to the Zagros main ridge that today constitutes the border between Iran and the Kurdish Autonomous Region of Iraq. Here, geophysical and surface prospection led to the discovery of the Dinka Settlement Complex (DSC), some of whose structures have been uncovered by our excavations in Gird-i Bazar, Qalat-i Dinka and the areas in between. "Dinka Settlement Complex" is our provisional designation for the extended urbanised settlement of ca. 60 ha, which incorporates the sites of Gird-i Bazar (UTM 38S 512696 E; 3999290 N) and Qalat-i Dinka (UTM 38S 511928 E; 3999154 N) and whose existence was conclusively proven by the results of the 2016 magnetometer survey[2] and the excavations in its lower town undertaken since 2017[3]. The ancient name of the Dinka Settlement Complex is still unknown.

On the other hand, nearby Qaladze (also Qaladize), the district capital of Peshdar, where a sizable settlement mound is located[4], can be identified with the city of Anisu(s) that appears in Neo-Assyrian sources of the 8th and 7th century BC[5]. So far, only very limited survey work[6] has been undertaken on the tell of Qaladze whose upper layers are very badly disturbed by modern interventions, including its use as a military fortification during the Saddam period. PPP's dig house is based in Qaladze while our excavations take place in the surroundings of the village of Nureddin. As in previous years, we are very grateful to the people of Qaladze and Nureddin for their hospitality, interest and practical help.

PPP is headed by Karen Radner and, since his appointment to the professorship in Ancient Near Eastern Archaeology at Westfälische Wilhelms-Universität in October 2018, also F. Janoscha Kreppner, hitherto PPP's field director. Our work is conducted under the auspices of the Directorate of Antiquities of Sulaymaniyah, headed by Kamal Rasheed Raheem, enjoying also the support of the General Directorate of Antiquities of the Kurdish Autonomous Region of Iraq, currently directed by Kaifi Mustafa Ali, and of the Raparin Directorate of Antiquities headed by Barzan Baiz Ismail. Staff from Sulaymaniyah, Erbil and Raniyah have greatly supported the project along the years, in all logistical and administrative matters, with several colleagues joining the project during many excavation seasons as representatives, excavation and pottery experts. We are also very grateful to work with the kind permission of the State Board of Antiquities and Heritage

1 Radner 2015; 2016.

2 Fassbinder *et al.* 2017.

3 Kreppner *et al.* 2018.

4 Radner 2016a, 13 Fig. A1.3.

5 Radner 2016, 17-21.

6 D'Agostino *et al.* 2016.

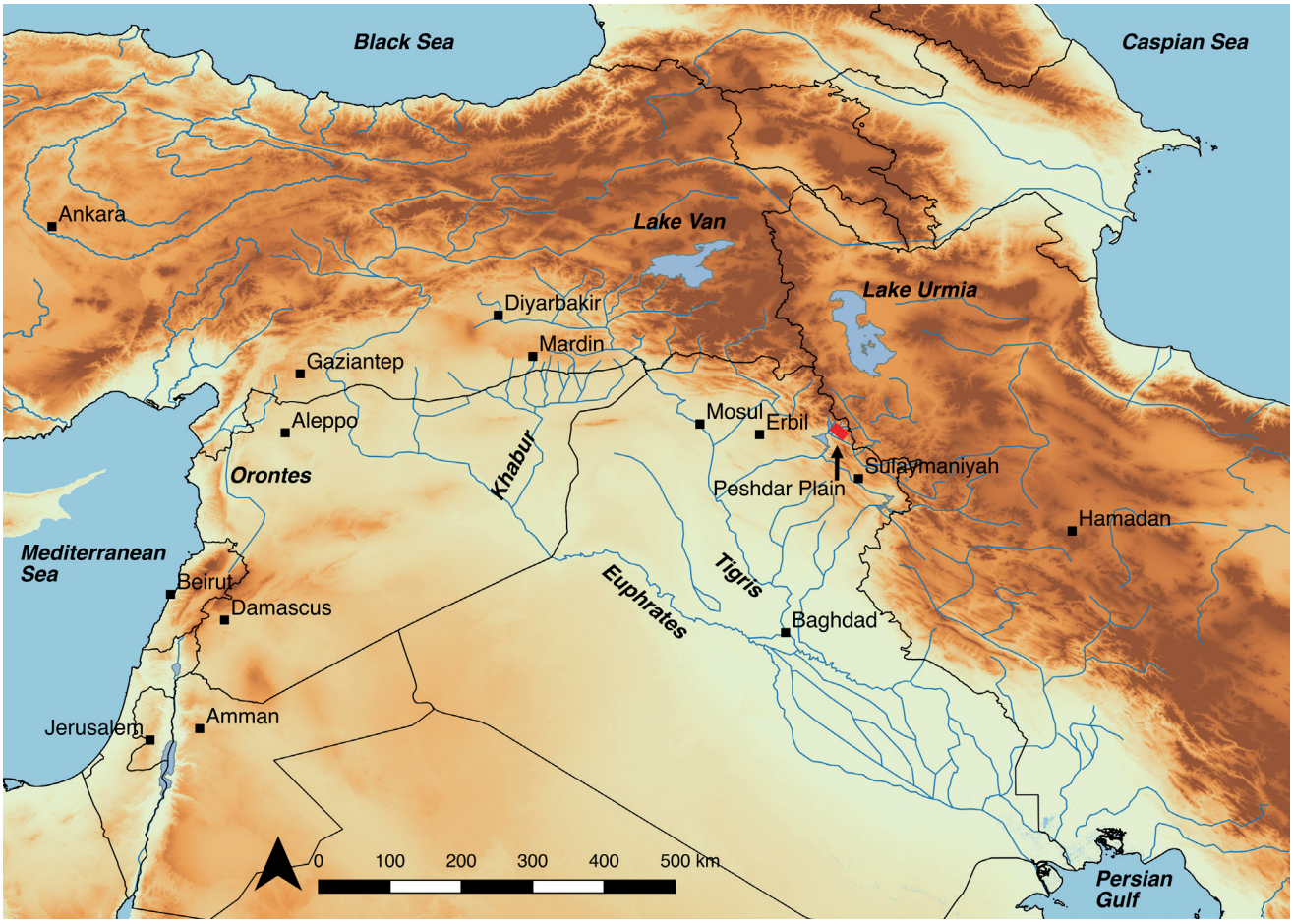

Fig. A1: The position of the Peshdar Plain in the modern Middle East, on the border of the Kurdish Autonomous Region of Iraq with Iran. Prepared by Andrea Squitieri.

of Iraq, directed by Qais Hussein Rasheed who issued the formal permit on 10 October 2018.

Between 2015 and 2018, PPP has carried out seven excavation campaigns: three in Gird-i Bazar (GiB), two on the western slope of Qalat-i Dinka (QiD, including one in spring 2018) and one each in two separate operations in the so-called Lower Town (DLT2; DLT3 in autumn 2018) in the plain between Gird-i Bazar and Qalat-i Dinka. So far, a total of over 1400 m² have been unearthed. As excavating is expensive, we are very grateful to our institutional sponsors for providing funding. The Alexander von Humboldt Foundation and LMU Munich continue to be our main sponsors through the creation of Karen Radner's Alexander von Humboldt Chair for the Ancient History of the Near and Middle East at LMU in 2015. The Gerda Henkel Stiftung kindly continued to support Christoph Forster's development and refinement of PPP's digital documentation system. LMU provided further support through an award of the LMUexcellent Junior Researcher Fund to Andrea Squitieri to help finance the 2018 excavations undertaken on Qalat-i Dinka and through a month-long fellowship awarded by the Center for Advanced Studies (CAS^{LMU}) to Mark Altaweel in November 2018 as part of the CAS Research Focus "Settlements between diversity and homogeneity" (CAS-Schwerpunkt "Siedlungen zwischen Diversität und Gleichförmigkeit") headed by Karen Radner, which facilitated writing his and Eileen Eckmeier's joint chapter (**§B2**). We are greatly indebted to all these institutions for their invaluable support.

A1. The 2018 activities of the Peshdar Plain Project

Exploring the Dinka Settlement Complex in its local environment within the framework of a wider study of the eastern frontier region of the Neo-Assyrian Empire is the main goal of the Peshdar Plain Project. **Fig. A3** shows the extent of the excavations and the latest results of the ongoing magnetometer survey (**§C**) as well as the three new geoarchaeological trenches dug in the Lower Town (**§B2**). These trenches were dug with a backhoe in autumn 2018

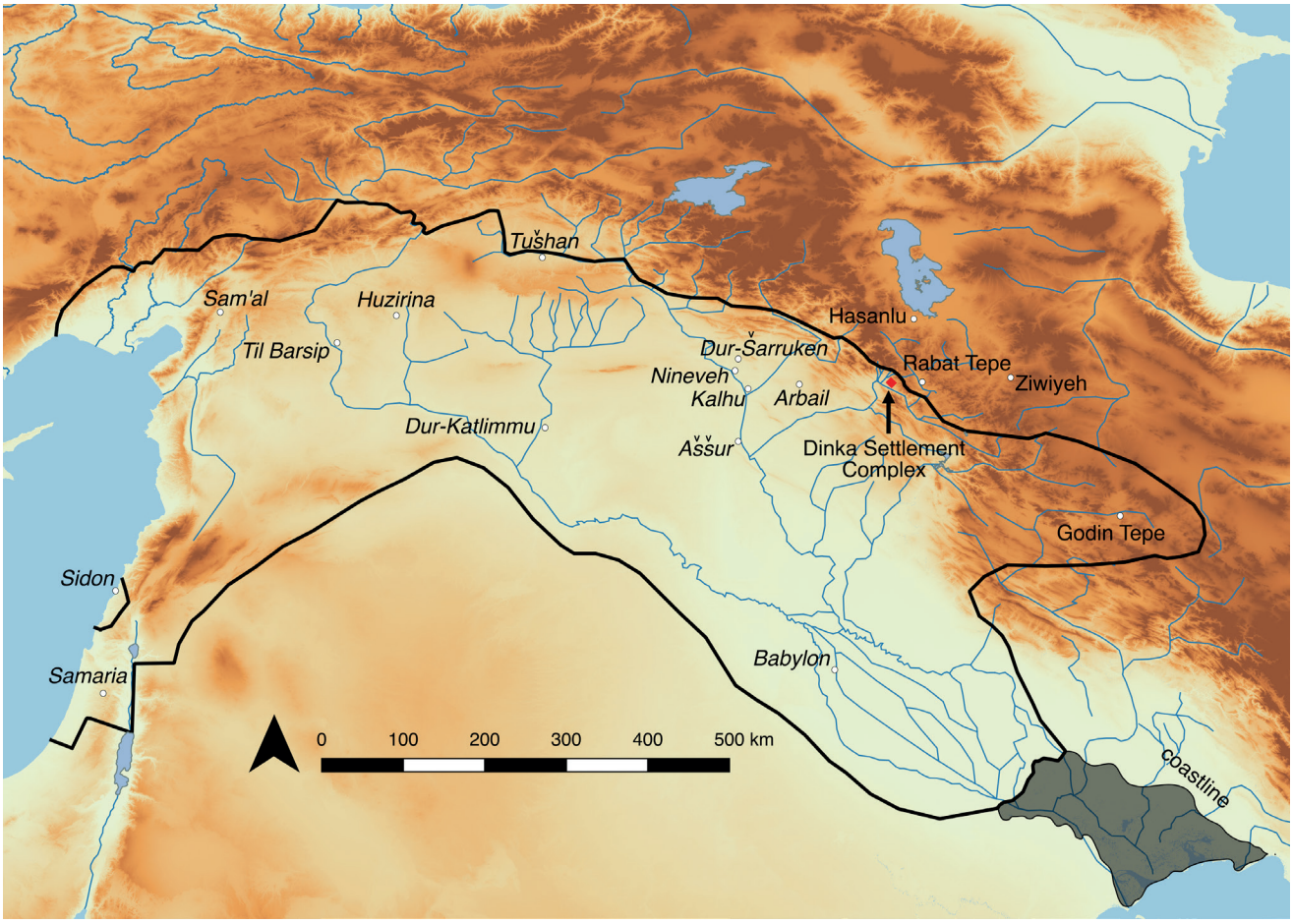

Fig. A2: The position of the Dinka Settlement Complex at the end of the 8th century BC, on the eastern frontier of the Neo-Assyrian Empire. Ancient place names in italics. Prepared by Andrea Squitieri.

in order to further the programme of sediment coring with a gasoline powered percussion drilling set and soil sampler (Cobra TT Percussion Hammer) begun in 2017 and continued in 2018 and in order to substantiate the data of the 2016 geophysical survey[7], which showed a gap in the settlement in the area of these trenches (cf. **Fig. A3**).

In our excavation, particular care is given to the recovery of charcoal and carbonised seeds from floors and other key contexts in order to procure material for ^{14}C analysis, in addition to suitable human and animal teeth and bones. While we are currently waiting for Melissa Rosenzweig (now Northwestern University, Evanston) to identify suitable samples among the plant remains from DLT3 we are very grateful to Kathleen Downey for selecting appropriate material from the human remains during fieldwork in 2018. **Fig. A4** shows the position and the calibrated date ranges (calBC) with the highest probability of these and previous ^{14}C samples from the Iron Age layers of the Dinka Settlement Complex. Our newest radiocarbon date ranges come from the Qalat-i Dinka excavations and are discussed in **§D2.1**[8].

2018 was another productive and successful year for PPP with two fieldwork campaigns on site and a range of analyses conducted in various laboratories. The following gives a brief overview over the work undertaken in the Kurdish Autonomous Region of Iraq and lists the team members. It is a great honour and pleasure that the project continues to attract experienced archaeologists and specialists, from Iraq and elsewhere, whose hard work, far-ranging expertise, good humour and stellar professionalism we gratefully acknowledge once again.

7 Fassbinder *et al.* 2017.

8 For the previously obtained ^{14}C results see Altaweel/Marsh 2016, 27-28 (from the geoarchaeological sounding GA42 = now DLT3); Greenfield 2017, 173-174 (from a burial of the Sasanian-period cemetery in Gird-i Bazar); Kreppner/Radner 2018 (from various contexts in Gird-i Bazar); and Radner 2018 (from DLT2).

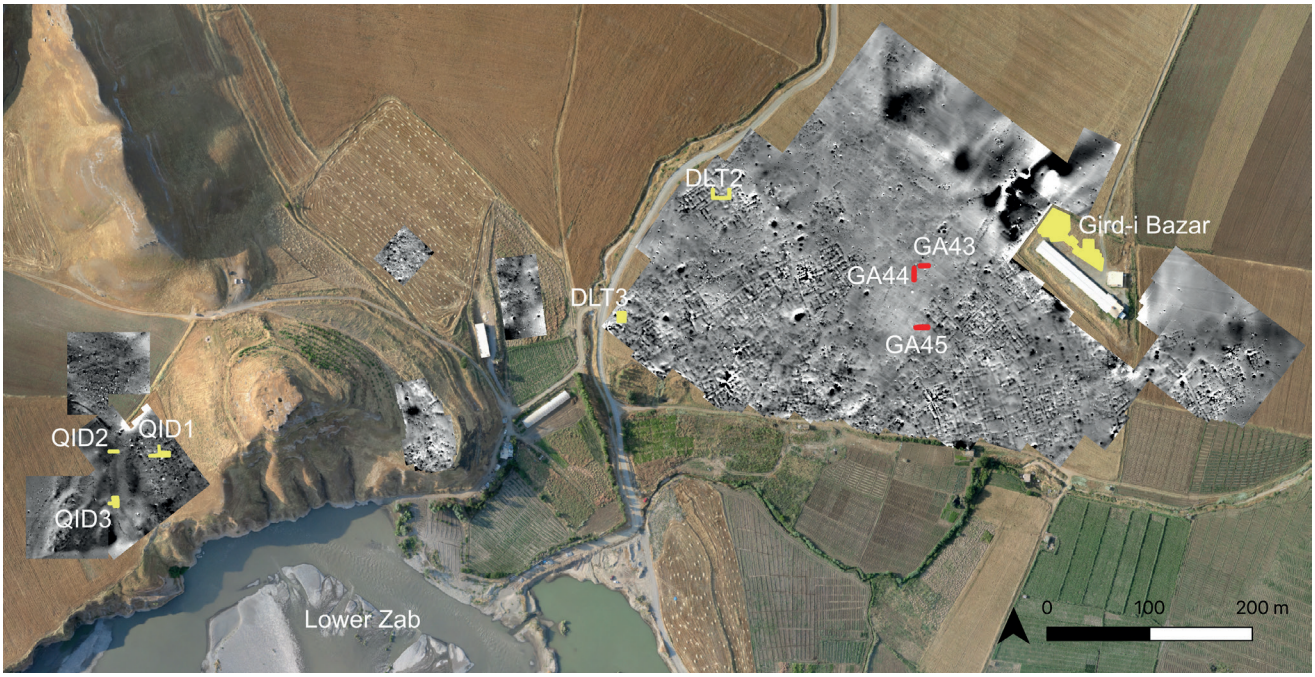

Fig. A3: The results of the magnetometer survey 2015-2018, and, in yellow, the locations of the excavations conducted so far at the Dinka Settlement Complex. From west to east, the three operations on the western slope of Qalat-i Dinka (QID1, QID2 and QID3; spring 2016 and 2018), the excavation areas "Dinka Lower Town 3" (DLT3; autumn 2018) and "Dinka Lower Town 2" (DLT2; spring 2017), the area within the enclosure of the chicken farm of Gird-i Bazar (retrospectively dubbed "Dinka Lower Town 1"; autumn 2015, 2016, 2017 and 2018 (well of Building I only)). In red, the new geoarchaeological trenches (GA43, GA44 and GA45) excavated in autumn 2018. Drone image created by ICONEM (Paris; http://iconem.com), courtesy of Un Film à la Patte (Strasbourg; http://www.unfilmalapatte.fr) and Jessica Giraud. Prepared by Andrea Squitieri.

A1.1 The second excavation campaign on Qalat-i Dinka in spring 2108

After a promising first test excavation on the western slope of Qalat-i Dinka in spring 2016[9], the second campaign took place in this same area from 3 April to 14 May 2018. Its results are presented in **§D**.

Team members (Fig. A5):
Representative of the Sulaymaniyah Directorate of Antiquities:
- Hero Salih Ahmed, also field team and pottery processing.

Representative of the Raparin Directorate of Antiquities:
- Abubakr Qasim, also field team and pottery drawing.

Logistics:
- Aziz Sharif, Sulaymaniyah Directorate of Antiquities, driver,
- Ibrahim Manla Issa, Erbil, cook,
- Baiaz Ibrahim Manla, Erbil, assistant cook and pottery team support.

Field team:
- F. Janoscha Kreppner, LMU Munich & FU Berlin, field director,
- Andrea Squitieri, LMU Munich, deputy field director, digital documentation and small finds,
- Christoph Forster, Fa. Datalino, Berlin, digital documentation and database,
- Zahra Hashemi, ÉPHÉ Paris, Paris, trench supervisor and field photography,
- Felix Wolter, FU Berlin, trench supervisor and field photography,
- 11 workmen mainly from Qaladze and Nureddin.

Pottery team:
- Jean-Jacques Herr, ÉPHÉ Paris & LMU Munich, lead ceramicist and pottery processing,
- Abdullah Bakr Othman, ELTE Budapest & Salahaddin University Erbil, pottery registration and photography,
- Awas Jihad, Sulaymaniyah Directorate of Antiquities, pottery drawing.

9 The 2016 results are presented in Kreppner/Squitieri 2017a.

Fig. A4: The positions of the Iron Age ^{14}C samples from the Dinka Settlement Complex and the probable calibrated date ranges (calBC). White dots: charcoal samples; blue dots: carbonized seeds; red dots: human bones or teeth; green dot: donkey tooth. Detail of a drone image created by ICONEM (Paris; http://iconem.com), courtesy of Un Film à la Patte (Strasbourg; http://www.unfilmalapatte.fr) and Jessica Giraud. Prepared by Andrea Squitieri.

Fig. A5: The 2018 Qalat-i Dinka field team around the trench QID1 at the end of excavations (3 May 2018). Photo by Jean-Jacques Herr (by automatic shutter release).

Fig. A6: Most of the 2018 Dinka Lower Town team inside the trench DLT3 at the end of excavations (25 September 2018). Photo by Andrea Squitieri, taken with a DJI Phantom 4 Pro drone.

Specialists:
- Kathleen Downey, Ohio State University, human bones,
- Fatemeh Ghaheri, University of Texas at Austin, phytoliths.

A1.2 A further excavation campaign in the Lower Town of the Dinka Settlement Complex in autumn 2018

What remained of the ancient occupation layers of Gird-i Bazar (retrospectively understood to be "Dinka Lower Town Operation 1"; DLT1) in the aftermath of the construction of a chicken farm in 2014 was excavated in three campaigns from 2015-2017[10]. After already having explored another area in the Lower Town in spring 2017 ("Dinka Lower Town Operation 2"; DLT2)[11], the first excavations in a new area in the Lower Town called "Dinka Lower Town Operation 3" (DLT3) took place from 1-30 September 2018. The results are presented in **§E**. This work was followed by a programme of environmental and geoarchaeological investigations conducted across the Bora Plain from 1-15 October 2018, some of whose results are presented in **§B**, as well as further excavations in the well in Building I in Gird-i Bazar (**§F**). A further instalment of the magnetometer survey that has been ongoing since 2015 took place from 29-30 September 2018 (**§C**).

Team members (Figs. A6-A7)
- Karen Radner, LMU Munich, project co-director,
- F. Janoscha Kreppner, LMU Munich (until 30 September 2019) / WWU Münster, project co-director.

Representative of the Sulaymaniyah Directorate of Antiquities:
- Hero Salih Ahmed, also field team and pottery processing.

Representative of the Raparin Directorate of Antiquities:
- Abubakr Qasim, also field team and pottery drawing.

Logistics:
- Aziz Sharif, Sulaymaniyah Directorate of Antiquities, driver,
- Ibrahim Manla Issa, Erbil, cook,
- Eimo Mustafa Manla, Erbil, assistant cook and pottery team support.

Field team:
- Andrea Squitieri, LMU Munich, field director, digital documentation and small finds,

10 Radner/Kreppner/Squitieri 2016; 2017; 2018.

11 The results from DLT2 are presented in Kreppner *et al.* 2018.

- Alessio Palmisano, University College London, trench supervisor and field photography,
- Sophie Pietsch, FU Berlin, assistant trench supervisor,
- Jens Rohde, LMU Munich, trench supervisor, field photography and 3D stratigraphy,
- 6 workmen from Qaladze and Nureddin.

Pottery team:

- Jean-Jacques Herr, ÉPHÉ Paris & LMU Munich, lead ceramicist and pottery processing,
- Abdullah Bakr Othman, ELTE Budapest & Salahaddin University Erbil, pottery registration and photography,
- Jamal Jamil Assad, General Directorate of Antiquities Erbil, pottery drawing.

Specialists:

- Mark Altaweel, University College London, geoarchaeology and landscape archaeology,
- Kathleen Downey, Ohio State University, human bones,
- Eileen Eckmeier, LMU Munich, geography and landscape ecology,
- Cajetan Geiger, Ruhr-Universität Bochum, geology and mining archaeology,
- Fatemeh Ghaheri, University of Texas at Austin, phytoliths,
- Marion Scheiblecker, LMU Munich, magnetometer survey.

Fig. A7: Most of the 2018 environmental and geoarchaeological team in front of the excavation house in Qaladze in October 2018. Photo by Jean-Jacques Herr (by automatic shutter release).

A2. The scope of this volume

As the three earlier volumes of the series *Peshdar Plain Project Publications* (4P) have done for 2015[12], 2016[13] and 2017[14], the present work again offers a comprehensive report of the Peshdar Plain Project's fieldwork activities in 2018 and details some of their results.

Section B is devoted to the environmental studies conducted at the Dinka Settlement Complex and the surrounding Bora Plain in 2018. In Chapter B1, Cajetan Geiger presents a preliminary assessment of the Bora Plain's geology based on first fieldwork in October 2018 while Mark Altaweel and Eileen Eckmeier continued the programme of sediment sampling from the surface, by coring and from dedicated geoarchaeological trenches and discuss new results. Their work in the Lower Town confirms the presence of a wadi that cuts through the settlement and that seems to have served a role in wastewater drainage for the Iron Age settlement.

Section C presents an update by Marion Scheiblecker and Jörg Fassbinder on the magnetometer survey that the team have been conducting at the Dinka Settlement Complex since 2015, adding new data from prospecting further areas in the Lower Town and on Qalat-i Dinka.

In Section D, Kathleen Downey, Zahra Hashemi, Jean-Jacques Herr, F. Janoscha Kreppner, Karen Radner, Andrea Squitieri and Felix Wolter detail the results of the 2018 excavations undertaken on the western slope of Qalat-i Dinka, continuing work started in spring 2016 at the monumental Building P and opening up two new trenches to explore the line of fortifications protecting the settlement on the Upper Town. While we have not been able to locate the position of the gate leading into this area we can now describe the fortification system as a high wooden palisade erected above a stone-earth structure with a stone glacis supporting the defensive line along sensitive stretches. The results of the radiocarbon analyses of two samples confirms that Building P and the defensive structures date to DSC's Iron Age Main Occupation Period.

Section E is dedicated to the presentation of the results of the first excavations in a new area in the Lower Town, known as "Dinka Lower Town 3" (DLT3), as discussed by Kathleen Downey, F. Janoscha Kreppner, Alessio Palmisano, Karen Radner, Jens Rohde and Andrea Squitieri. In addition to evidence for two distinct building phases during DSC's Iron Age Main Occupation Period, this excavation

12 Radner/Kreppner/Squitieri 2016.
13 Radner/Kreppner/Squitieri 2017.
14 Radner/Kreppner/Squitieri 2018.

area yielded good contexts dating to the Late Chalcolithic period (c. 4800-3100 BC), including a pottery kiln.

In Section F, Jens Rohde and Kathleen Downey detail the results of the ongoing excavation of Grave 71, i.e. the accumulation of human skeletons found in the well of Room 49 in Building I at Gird-i Bazar. This difficult and slow work had started in 2017 and was continued in October 2018 with the unearthing of the remains of another three individuals, presumably deposited (or dumped) in the well towards the end of the Iron Age occupation of DSC, as suggested by the radiocarbon date derived from one of the skeletons excavated in 2017.

Section G is devoted to pottery. In Chapter G1, Jean-Jacques Herr, Abdullah Bakr Othman and Hero Salih Ahmed present the data of the pottery unearthed at Qalat-i Dinka in 2016 and 2018 and in DLT3 in 2018. For the Iron Age levels, the new pottery assemblages share the characteristics of the material recovered in the other excavation areas of DSC's Lower Town, thus establishing a common and contemporaneous occupation horizon: the Main Occupation Period. The chapter also assesses materials dating to other periods, most importantly the Late Chalcolithic pottery from DLT3; glazed Middle Islamic Period pottery from secondary contexts on Qalat-i Dinka; and the Sasanian-period pottery retrieved from the 2018 geoarchaeological trench GA44. The Iron Age pottery with animal-head appliqués from DSC is discussed in an excursus in the context of similar finds from the wider region. Chapter G2 presents the results of Silvia Amicone's petrographic analyses on selected pottery samples from Qalat-i Dinka while Christoph Berthold, Jörg Fischer and Silvia Amicone offer the results of the archaeometric analysis of a sintered quartz ceramic sample from Qalat-i Dinka in Chapter G3, having identified the material as Egyptian faience covered in the synthetic pigment Naples Yellow.

In Section H, Andrea Squitieri presents the 2018 small finds from Qalat-i Dinka and DLT3. Thanks to the rich finds from Building P on Qalat-i Dinka, these include ivory fittings, beads of carnelian and Egyptian Blue and other jewellery as well as nine identical iron arrowheads whereas the finds from DLT3 represent the more mundane inventory of mostly simple stone tools known from elsewhere in the Lower Town.

The most exciting find from DLT3 is arguably the fragmentary fired brick with a Neo-Assyrian cuneiform inscription. Karen Radner discusses this piece and its historical implications in Section I, and after having surveyed all brick inscriptions known from elsewhere in the Assyrian Empire, she can make a plausible case for attributing the brick to Shalmaneser III (r. 859-824 BC), the founder of the Border March of the Palace Herald, to which the DSC would have belonged.

In Section J, Tina Greenfield presents results of the identification and quantitative analyses of the animal bones recovered from Gird-i Bazar in 2015 and 2016 as a first step towards determining diet and species preference as well as distribution, consumption and disposal practices for animals and their by-products across the site.

In Section K, Patrick Arneitz and Roman Leonhardt present the results of the archaeomagnetic study of a kiln first identified at Gird-i Bazar in 2015, which seems to be associated with the "Levantine Iron Age Anomaly". There are contradictions between the archaeomagnetic dating and dates resulting from radiocarbon analysis and historical sources, and the authors explore possible explanations. The Peshdar Plain Project will continue to supply the team at Zentralanstalt für Meteorologie und Geodynamik at Vienna with further archaeomagnetic samples to increase the available data sets from the Near East.

The book closes with Section L and Karen Radner's and F. Janoscha Kreppner's conclusions regarding the Iron Age occupation of the Dinka Settlement Complex, based on the work conducted there since 2015.

None of the studies presented in this volume would have been possible without the unflagging support and enthusiasm of our local colleagues. In 2018, we are enormously grateful to archaeologists from Sulaymaniyah, Qaladze and Erbil who have greatly contributed to the success of all fieldwork and who have taken on the main burden of processing and analysing the pottery: Abubakr Qasim, Awad Jihad, Jamal Jamil Assad and especially Abdullah Bakr Othman and Hero Ahmed Salih who continued and completed the pottery processing off-season in Sulaymaniyah. Zor spas!

B. 2018 environmental studies in the Bora Plain

B1. A first geological survey of the Bora Plain

Cajetan Geiger

In October 2018, a first geological survey around the Dinka Settlement Complex was carried out. The aim was to obtain more detailed information on the lithology of the Bora Plain and its geological situation than currently available from existing geological maps. This would help to set the geological information on a scale suitable for archaeology, in order to contextualise the archaeological findings within their natural environment. On the one hand, the objective was to analyse the environment of the Dinka Settlement Complex and the availability of resources (clay, building materials, etc) in its surroundings, and on the other hand, to reconstruct the landscape during the time of the settlement (in combination with the ongoing geoarchaeological investigations). The initial work carried out in 2018 consisted in the main of conducting an extensive field survey in order to differentiate and describe lithological units with the objective to create a geological map (**Figs. B1.1** and **B1.3**).

B1.1 The tectonic setting

Iraqi Kurdistan sits at the western flank of the Zagros mountains, comprising parts of the Zagros fold and thrust belt – a zone of highly deformed and metamorphosed

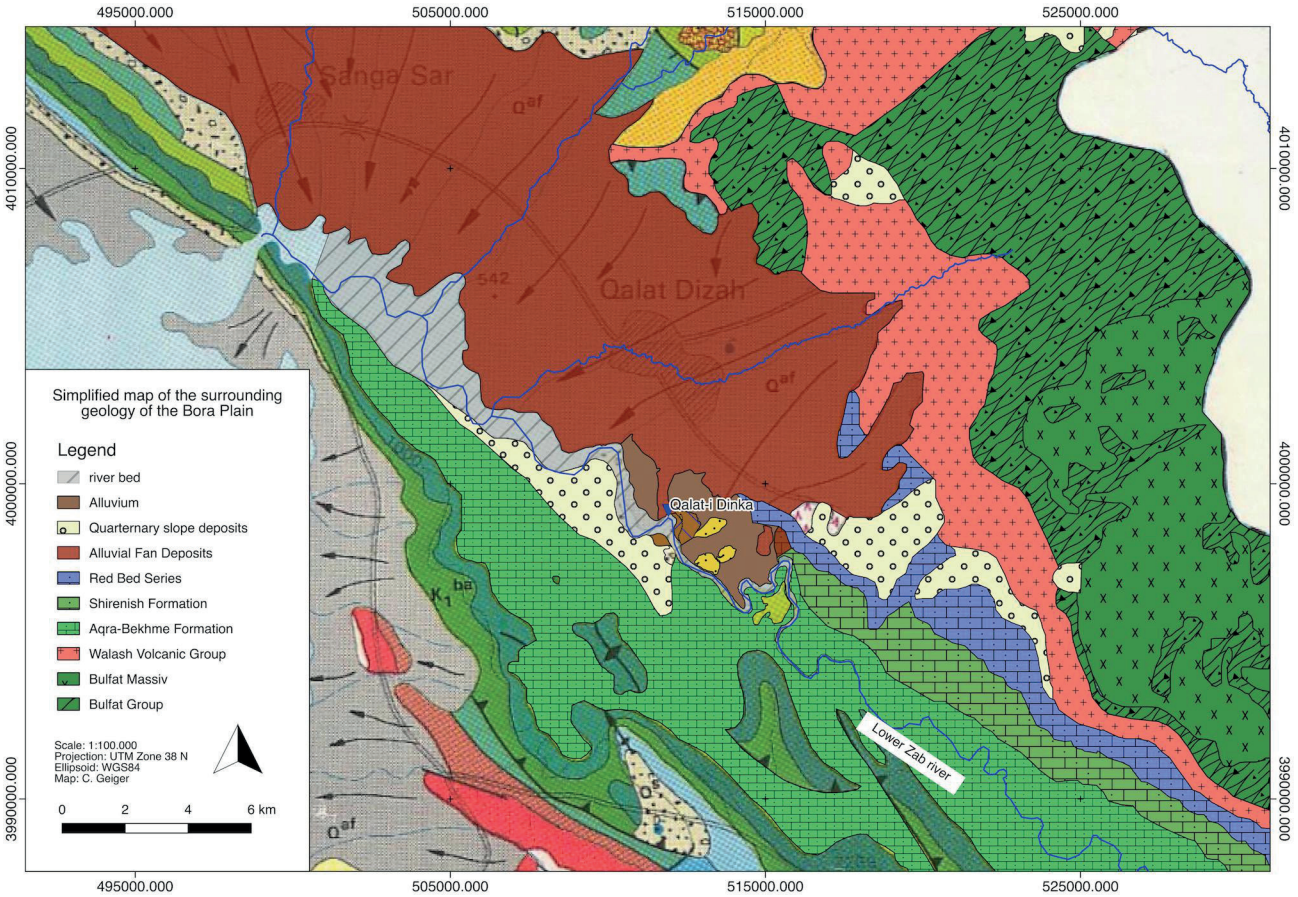

Fig. B1.1: Simplified geological map (scale 1 : 100.000) showing the location of detailed field mapping around Qalat-i Dinka and the Bora Plain in a broader geological context. Note the alluvial fan deposits covering all low-elevation areas. Most of the metamorphic clasts of the alluvial fan deposits and the conglomerate observable at Qalat-i Dinka originate from the Walash Volcanic Group and the Bulfat Formation. The latter is part of the ophiolite complex cropping out in the Penjwin Walash Zone. The Walash Volcanic Group consists of volcanic rocks and mainly meta-sedimentary limestones and marks the border between the ophiolites and the bedded sedimentary formations. Map created by Cajetan Geiger on the basis of information from Sissakian 1997 and Sissakian/Saeed 2012 and observations made in the field by Cajetan Geiger in 2018.

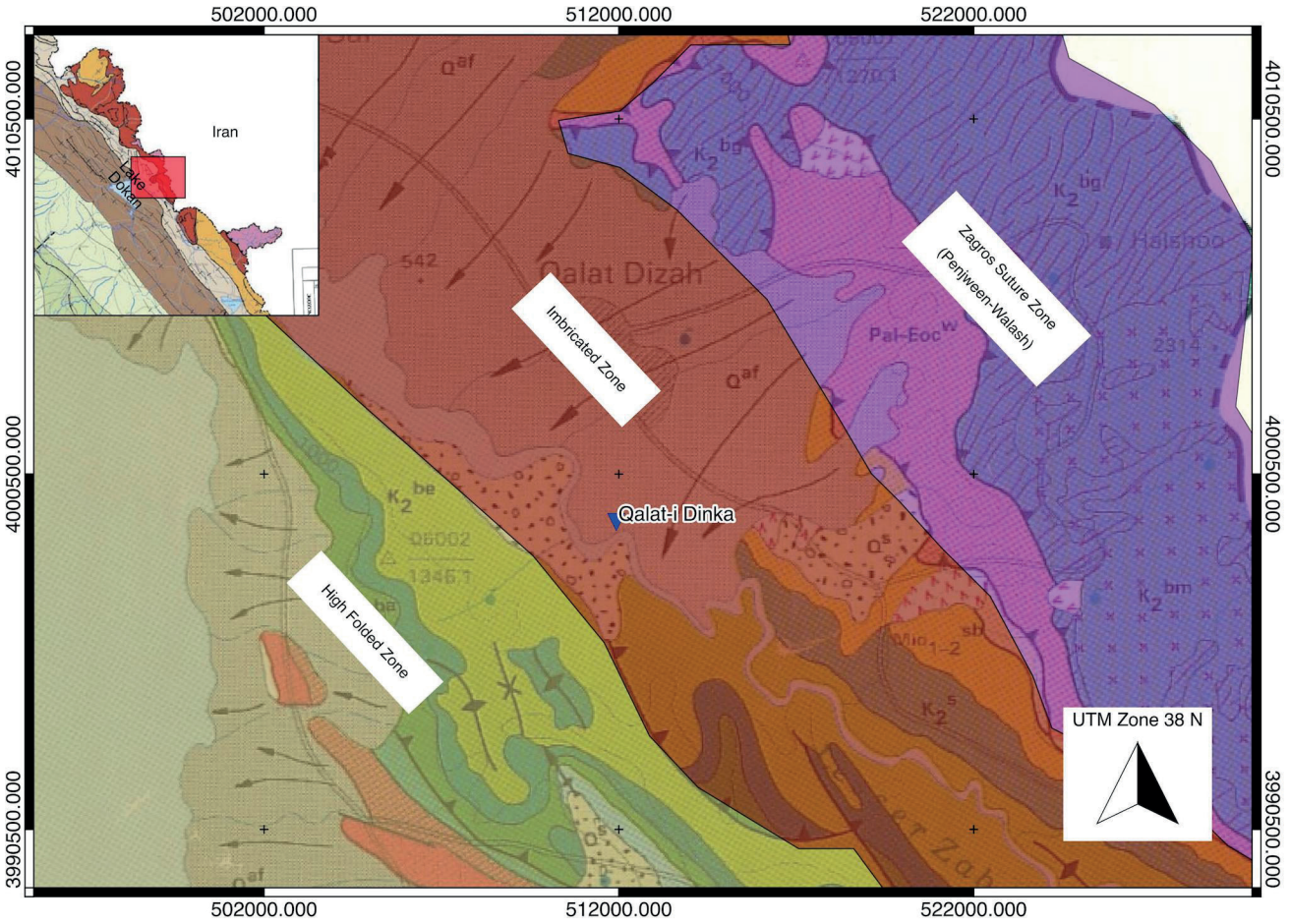

Fig. B1.2: Tectonic setting of the Bora Plain. Qaladze and the entire Peshdar Plain lie in a small border zone between geological formations of extreme difference. Map created on the basis of information from Fouad 2015 and Sissakian 1997 by Cajetan Geiger.

crustal rocks resulting from the collision of the Arabian and Eurasian continental plates that caused the Zagros mountains to fold upwards[15].

The Bora Plain, on which the Dinka Settlement Complex is located, is part of the larger Peshdar Plain. It lies in the Imbricated Tectonic Zone between the High Folded Zone and the Zagros Suture Zone[16] (**Fig. B1.2**). The Imbricated Tectonic Zone consists mainly of Cretaceous limestones and their derivates from the mountain-folding processes. The High Folded Zone is composed of a variety of formations from Palaeozoic to Tertiary sediments. Of these, the Cretaceous limestones are the most adjacent to, and the most relevant for, the Bora Plain. The Zagros Suture Zone is comprised of former oceanic crustal rocks of the Neo-Tethys ocean. The Bora Plain sits close to a subzone of the Zagros Suture Zone, called the Penjween-Walash Zone. It is characterised by diverse ophiolites, volcanics, intrusive magmatic rocks and metasediments from the last 150 million years with Tertiary volcanism[17].

B1.2 A preliminary assessment of the geology of the Bora Plain

A ridge of smooth hills with steep slopes at their highest points marks the landscape which surrounds the Bora Plain on the east, north, and west. These hills are formed by alluvial deposits of a thickness of more than 200 m, which also created the massive terraces northeast of the Bora Plain where the city of Qaladze is located (**Fig. B1.4**). They can only have been the result of heavy fluviatile activity or several greater flow events during the Pleistocene.

After their deposition, the landscape that we know today was carved out by the course of the Lesser Zab and

15 McQuarrie 2004.

16 Jassim/Goff 2006, 75-83.

17 Jassim/Goff 2006, 82.

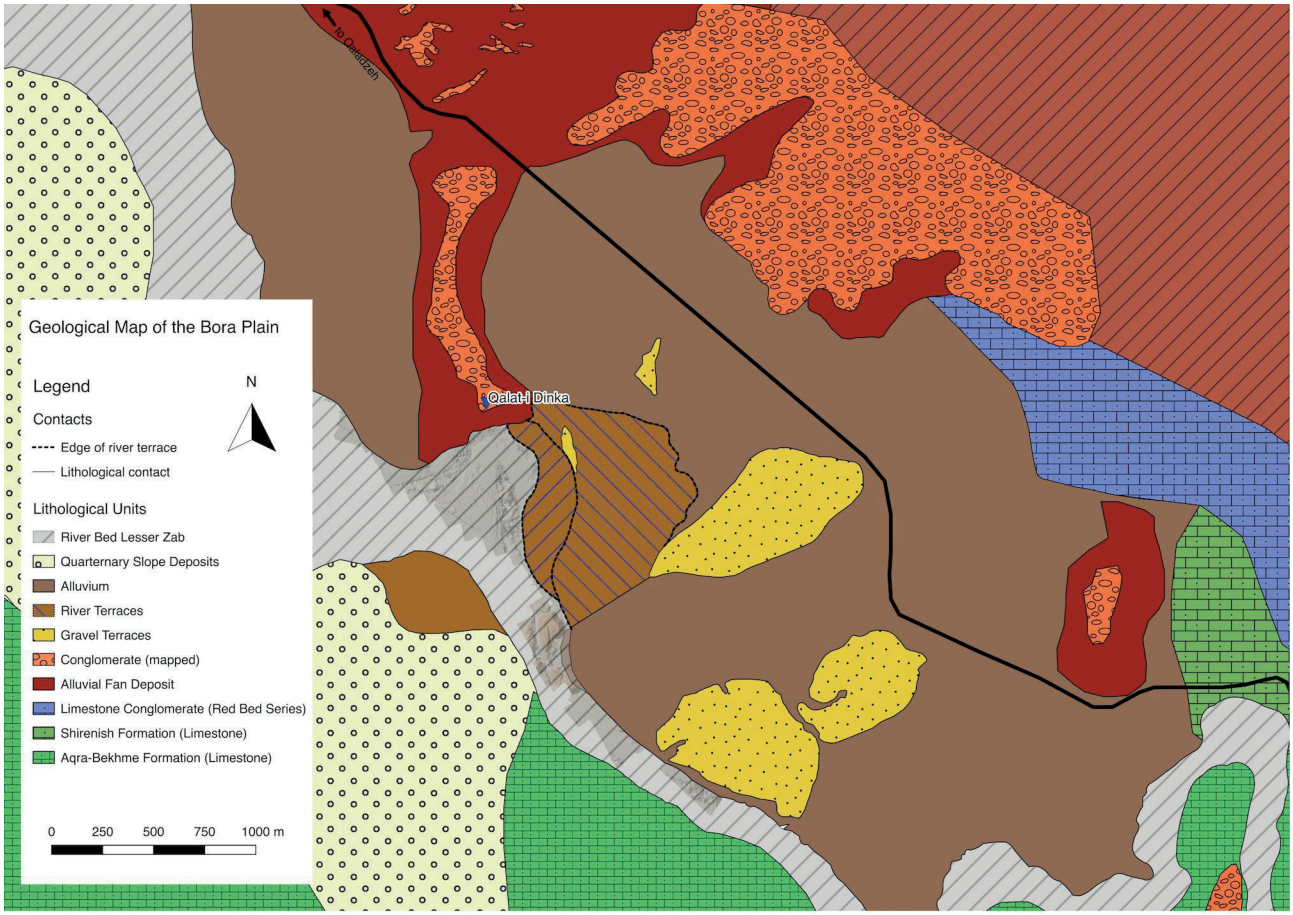

Fig. B1.3: Geological map of the Bora Plain (scale 1 : 15.000). Map created by Cajetan Geiger.

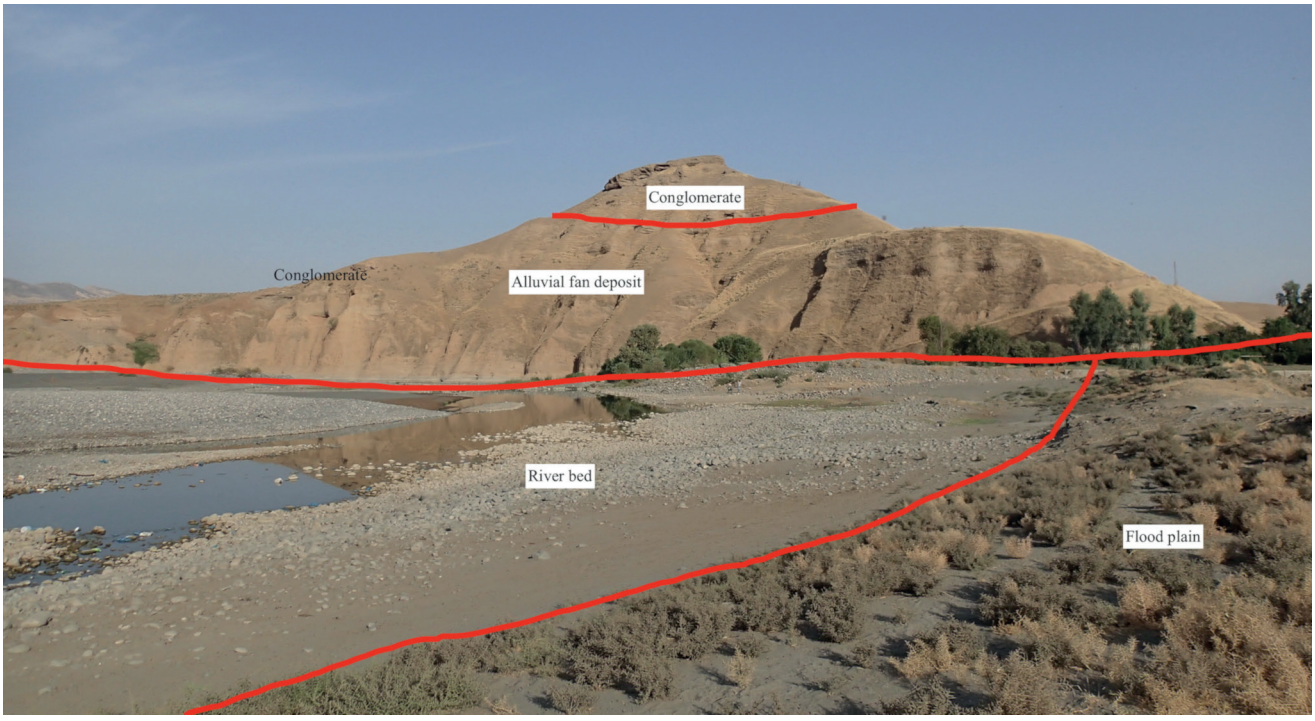

Fig. B1.4: Photo showing the S-flank of Qalat-i Dinka with different geological areas marked. Clearly visible is the massive deposition layer of the alluvial fan deposit. The conglomerate sits on top of this as well as on weather-exposed locations. In the front, the Lower Zab with its river bed deposits and the adjacent flood plain. The hill elevation is about 70 m. Photo by Cajetan Geiger (October 2018).

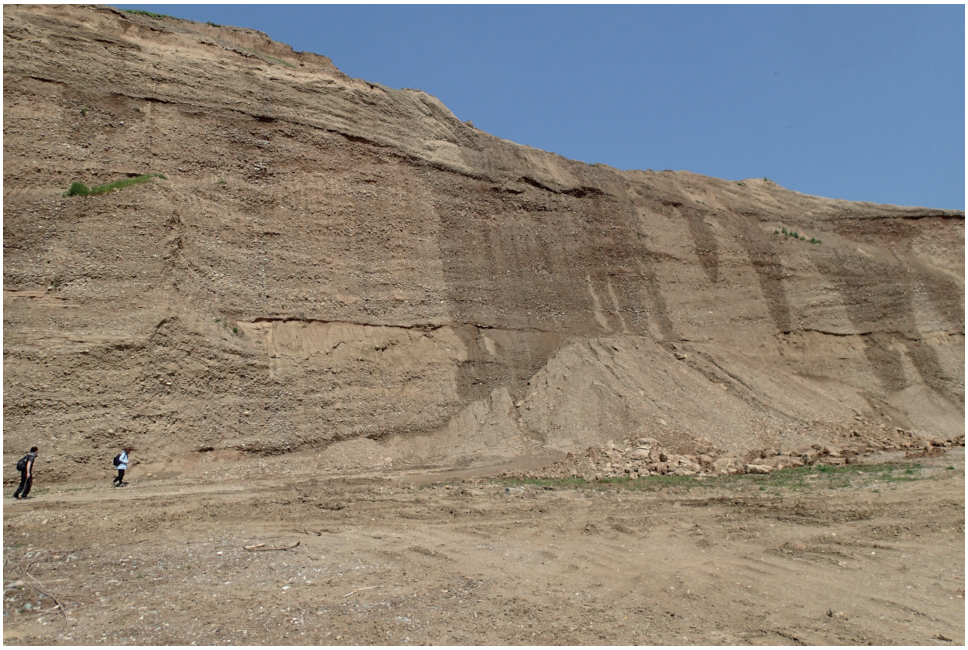

Fig. B1.5: A quarry wall on the road from Qaladze to the Bora Plain. Note how water is leaking from the water-bearing layers in the alluvial fan deposits. This is the reason for consolidated and calcinated steps of conglomerate in the surrounding loose sediment. Photo by Cajetan Geiger (April 2019).

its feeder channels, which originate in the Zagros mountains. These large scale alluvial deposits are composed primarily of metamorphic and partially-sedimentary clasts of various grain-sizes surrounded by a highly calcareous clay-mud matrix and covered by a thin layer of soil and vegetation.

There are no traces of diagenesis in these deposits, so the clasts are held together mainly with dried earth and muddy material. The only exceptions to this are in locations where the deposits have been exposed to water-related weathering: either on top of the ridge or close to water-bearing layers inside the alluvial fan deposits (which are most active in winter and spring; cf. **Fig. B1.5**), or in locations where other kinds of erosion prevent the formation of a protective covering.

In these places, a relatively hard conglomerate forms, held together by an extremely calcite-rich (but relatively coarse) matrix that predominantly consists of sand fraction. This conglomerate is diagenetically formed and hardened and, like the alluvial fan deposits, consists of metamorphic and metasedimentary clasts. As the surrounding geology and the sediments themselves have an extremely high calcium content, it seems probable that calcium-enriched waters washed out the finer fractions of the clay-mud matrix and the remaining coarser particles bound together, forming this new calcareous rock. The calcination is not well-developed and stops a few centimetres below the surface, gradually converting to the original sediment. This conglomerate forms the top layers of most of the heights surrounding the Bora Plain (**Fig. B1.4**) and also forms hardened layers in the slopes that are more resistant to erosion.

In the north, east and southwest of the Bora Plain, different formations of limestones can be found. The main formations are the Shiranish Formation, the Aqra-Bekhme Formation and the Red Bed Series[18]. The Red Bed Series in particular has outcroppings very close to the village of Nureddin at the eastern edge of the Bora Plain. These outcrops show a massive limestone breccia with clasts of sandstone, cherts and radiolarites. To the south, the plain opens towards the Lower Zab river, which cut terraces in different steps and left its traces in the form of (palaeo-)floodplains (cf. **§B2**).

On the Bora Plain itself, there are some gravel terraces, which may have been deposited after the formation of the plain. In composition and structure, they differ substantially from the much larger alluvial fan deposits. They are formed of gravel aggregations with some mud matrix. Once dried, the calcium-rich mud binds and builds a relatively resistant body of rock that does not easily erode. Nevertheless, the matrix never achieves the level of density found in the conglomerate. The gravel concentration is much higher than in the alluvial fan deposits and the matrix concentration much lower. This type of formation was most likely created within a fluvial environment, or in an area that maintained a consistent quantity of shallow water, such as a riverbed. Following the depositional phase, these alluvial deposits were partially eroded by (seasonal) channels that made their way down the mountains. A relatively thin layer of earth and humus overlying mainly colluvium formed from gravel and silt covers the plain itself. In the riverbed, there are huge quantities of cobbles,

18 For detailed descriptions of these formations and their exact lithological compositions see Jassim/Goff 2006, 149 (Aqra-Bekhme Formations), 150 (Siranish Formation), 199 (Suwais Red Bed Group).

mainly of metamorphic origin, which will be studied in further detail in future analyses.

Future research will also include continuing the survey in order to cover a wider area around the Dinka Settlement Complex and the petrographic analysis of selected rock samples in order to obtain further insights into the lithology of the area.

B2. Geoarchaeological work at the Dinka Settlement Complex, 2018

Mark Altaweel & Eileen Eckmeier

The geoarchaeological work conducted during the autumn season of 2018 focused on clarifying the gaps in the built-up settlement, as observed in the magnetogram of the Dinka Settlement Complex[19]; on identifying alluvial terraces and their evolution in relation to the site; on determining the relationship of the Lower Zab in antiquity to the site; and on gaining a better understanding of soils and land use in and around the settlement.

To these ends, we excavated three geoarchaeological trenches (GA43-GA45), took eleven sediment cores (C10-20), and collected five topsoil samples (F1-F2; O1-O3) in 2018. Overall, we were able to answer our questions at least partially during fieldwork while further laboratory analysis at LMU Munich, supervised by Eileen Eckmeier, shed significant light on the identified issues. **Fig. B2.1** indicates the location of the 2018 cores, geological trenches and other samples. The figure also shows a channel flow modelled between Gird-i Bazar and Qalat-i Dinka as well as identified terraces.

The locations of the available cores and profiles can be divided into five spatial groups:

(1) the northwestern part (in the excavation areas DLT2 and DLT3);
(2) the northeastern part outside the settlement areas (core C10; topsoil samples F1-F2, O3);
(3) the central transect along the ancient wadi (geoarchaeological trenches GA43-GA45, cores C11-C14);
(4) the lower terrace in the south (cores C15-C20); and
(5) the off-site wadi profiles in the north (topsoil samples O1-O2).

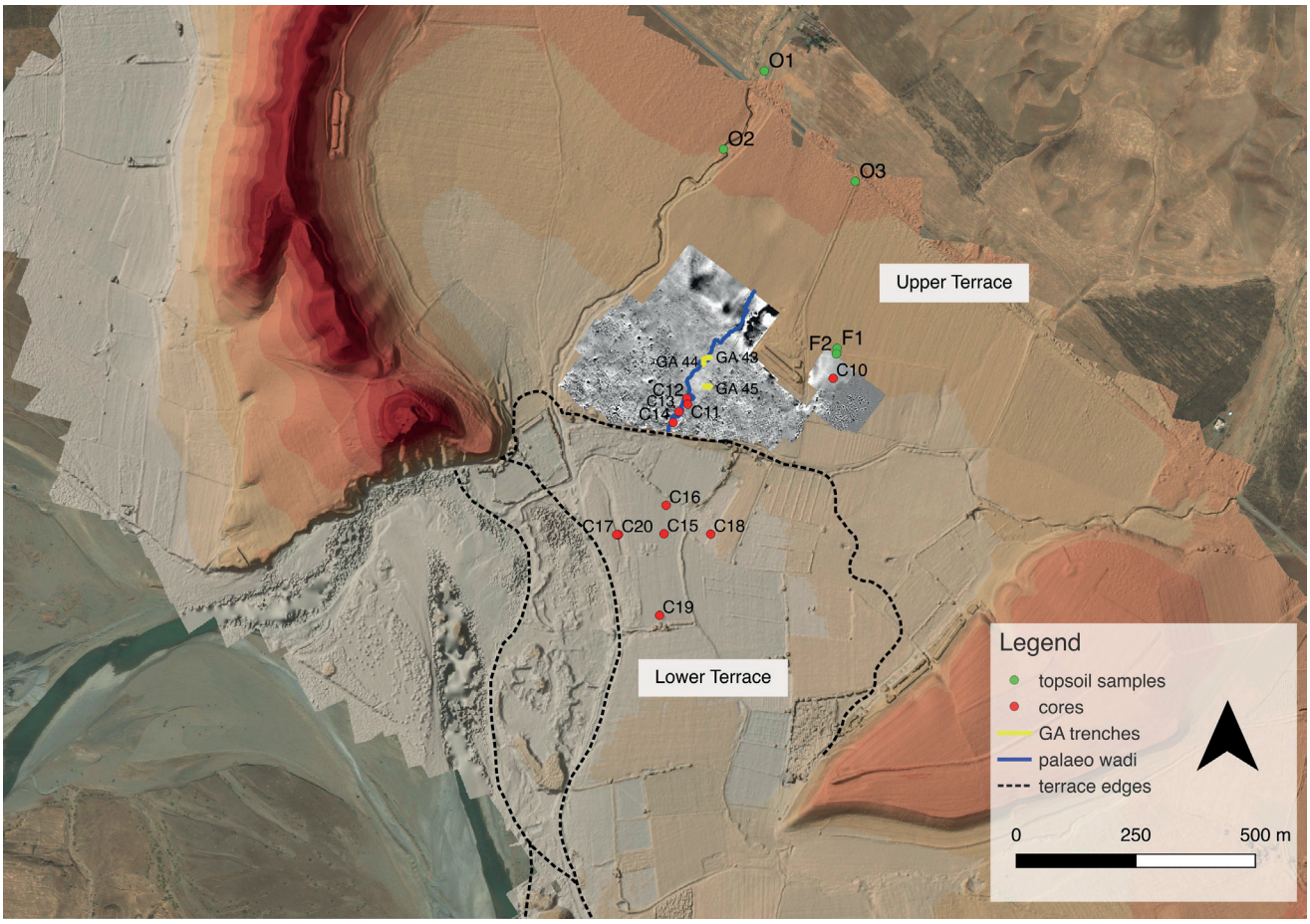

Fig. B2.1: Geoarchaeological areas studied in the 2018 autumn field season. Prepared by Cajetan Geiger.

19 Fassbinder *et al.* 2017; Fassbinder *et al.* 2018.

B2.1 A wadi cutting through the Dinka Settlement Complex

(*with contributions by Cajetan Geiger*)

In the geophysical surveys that began in 2015 and continued through 2018, gaps were noticed in the architectural occupation of the Dinka Settlement Complex, as identifiable in the magnetogram. The cores C11-C14 sampled in the area around Gird-i Bazar were taken to help explain the gap in the built-up settlement and to clarify whether and how erosion may have affected the settlement. Additionally, three geoarchaeological trenches (GA43-GA45) were excavated with a backhoe excavator. The trenches were placed in areas were no intact architecture was evident from the magnetogram and the surface in order to test the accuracy of the magnetogram. The precise positions of these trenches were selected based on the results of a hydrologic flow model created on the basis of the digital elevation model constructed from the 2016 drone flight[20], which suggested the probable existence of a channel or wadi; the three trenches were positioned so that they would intersect this possible channel.

The 2018 trenches and cores suggest that the Dinka Settlement Complex has experienced erosion since the site's abandonment. Cores C11-C14 confirmed the presence of silty-clayey material, sometimes interlayered with gravel; the depths of the cores ranged between 1-3 m. This demonstrates the existence of alluvial deposits within an erosional landscape affected by overbank/floodplain channel deposits, suggesting seasonal low-to-medium intensity flooding. In the cores, artefacts were present only up to a depth of 50-60 cm, and in mainly fine sediment.

During the occupation of the Dinka Settlement Complex in the Iron Age, a wadi eroded the site in this area. It may have been a source of fresh water and was likely used to drain waste water from the site. In fact, given the size and width of the wadi's gravel deposits, it may have been the main channel cutting through the site during the Iron Age. Drains running from the houses of Gird-i Bazar's Iron Age occupation into alleyways were exposed in the excavations, suggesting that the wadi was used to drain water from the site, as the observed drains are oriented towards this wadi[21].

Both cores and trenches revealed an absence of large stones for architectural structures, except when they were found as parts of eroded structures. Gravel or stones were present only at greater depths, and often in layers. This was clearly visible in the trenches, where well-sorted layers of fine sediment material, gravel, and stones alternated. There was no evidence for the accumulation of materials as would be typical of a large flood event. Any earlier material could have been removed, and gullying (or a channel) might have formed due to an event or re-occurrence of flooding, with the area later refilled with sediment in subsequent events. The presence of angular stones in GA43-GA45 at depths of 50-100 cm shows that the deposited sediments had not been transported over a long distance.

In GA43 (**Figs. B2.2a-b**), the soil reaches down to a depth of about 0.5 m. Below this, a homogenous, silty-clayey sediment mixed with pebbles was found. A depression about 1 m in diameter can be seen approximately in the middle of the trench, with its lowest edge approximately 1 m deep. At the bottom of the trench, a slight accumulation of pebbles could be observed. These observations fit with what might be expected from channel/wadi deposits as well as what was suggested by the hydrologic flow model. Beyond some irregularly distributed cobbles and some smaller pebble concentrations, nothing else was observed in the section.

In GA44, however, some features were clearly visible (**Fig. B2.3a-b**). The soil reaches down to a depth of 0.35-0.95 m. Within this homogeneous soil material were a few large Sasanian pottery sherds (**§G1**). In the middle part of the eastern section, an accumulation of fine rounded pebbles was observed at a depth of around 1-1.5 m, corresponding to the presumed bed of the wadi. The surrounding sediment is homogeneous and consists of silty-to-clayey material, mixed with pebbles and larger cobbles. In the southern section, some larger cobbles and aggregations of pebbles were observed, largely resembling the general composition of the Bora Plain's underlying bedrock.

In GA45, several intriguing features were observed (**Fig. B2.4a-b**). On the top of this trench, there is a fine-earth sediment layer, around 0.8-2.2 m thick. In the eastern half of the northern section, some large cobbles crop out, possibly parts of archaeological structures. In the silty-clayey sediment below, three banks of fine pebbles, occasionally disturbed by larger cobbles, could be clearly distinguished. They appear in three layers, with the deeper ones further to the west (left). Probably all of the levels, and certainly the two lower ones, are connected to the wadi bed previously observed in trenches GA43 and GA44. In the lower eastern part of the northern section, some large accumulations of pottery were embedded in the sediment below the uppermost pebble bank. It is likely that GA45 is situated close to an intact building, as suggested by the magnetogram. Continuing to the narrow eastern section, some burned mud bricks (or very thick reddish pottery

20 Radner/Kreppner/Squitieri 2017, Fig. H2.

21 Kreppner *et al.* 2017.

Fig. B2.2a: Orthophoto of the northern section of the trench GA43. Created by Andrea Squitieri.

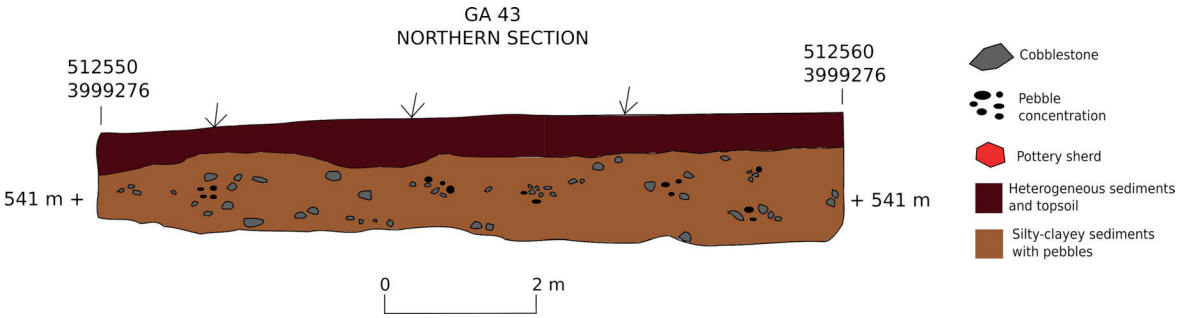

Fig. B2.2b: Section drawing of trench GA43. Field drawing by Cajetan Geiger; digitisation by Andrea Squitieri.

fragments) were documented; perhaps these belonged to a kiln or some other installation. These were also situated below a broader bank of pebbles. These remains reflect eroded materials that had come into the area of the ancient wadi. This shows clearly that some kind of stronger sedimentation process took place simultaneously with and following the occupation of this site. In the southern section, three different layers of a stronger fluvial-sedimentation regime could be differentiated, sometimes forming clay lenses within the pebble banks that may have been the remains of palaeo-channels, indicating changes in the wadi's course. Coarse and badly rounded cobbles were found in two of the upper layers. Pottery sherds were found throughout the layers.

The results from the geoarchaeological trenches GA43-GA45 indicate that a long-lived wadi existed just west of the Gird-i Bazar area with the modern chicken farm and that this wadi ran through the Dinka Settlement Complex towards the Lower Zab, from the northeast to the southwest (**Fig. B2.1**). This is evidenced by the pebbles in the silty/clay sediments of the trenches.

The evidence from the trenches further indicates that the wadi pre-existed any signs of occupation. It is therefore likely that this wadi existed prior to the Iron Age Dinka Settlement Complex and continued to exist for some time after this settlement had been abandoned. A few large Sasanian pottery sherds that were found in trench GA44 may indicate the presence of a nearby settlement during this period, or they may be connected to the use of the Sasanian-period cemetery at Gird-i Bazar. These sherds were found either above the wadi, or within its topmost layer, and either below, or within, the plough zone. This might indicate that while the wadi was active during the time of the Iron Age settlement, it had dried out around the Sasanian period (or later). However, on balance it is more likely that seasonal flooding led to the gradual erosion of architectural structures near the wadi, and that the tumbled remains, including some of the larger stones, are a reflection of this eroded architecture.

B2.2 Investigating the Lower Terrace

Gird-i Bazar and its environs are located on an ancient terrace near the Lower Zab, which we call the "Upper Terrace" (**Fig. B2.1**). Just below this main terrace on which the site lies are other, more recent Holocene terraces, with a larger terrace (dubbed the "Lower Terrace") south of Gird-i Bazar.

Six cores, ranging in depth from 1.5-5 meters (C15-C20), were placed just south of Gird-i Bazar. The area has some of the richest soils attested in the Bora Plain, demonstrated by current agricultural activity and recent irrigation. Very few artefacts were found in this area. The cores demonstrated the existence of overbank and alluvial fill deposits, alternating between clay, silt and some sandy sediments. The sediments are mostly devoid of rocks until bedrock is reached. According to the core samples,

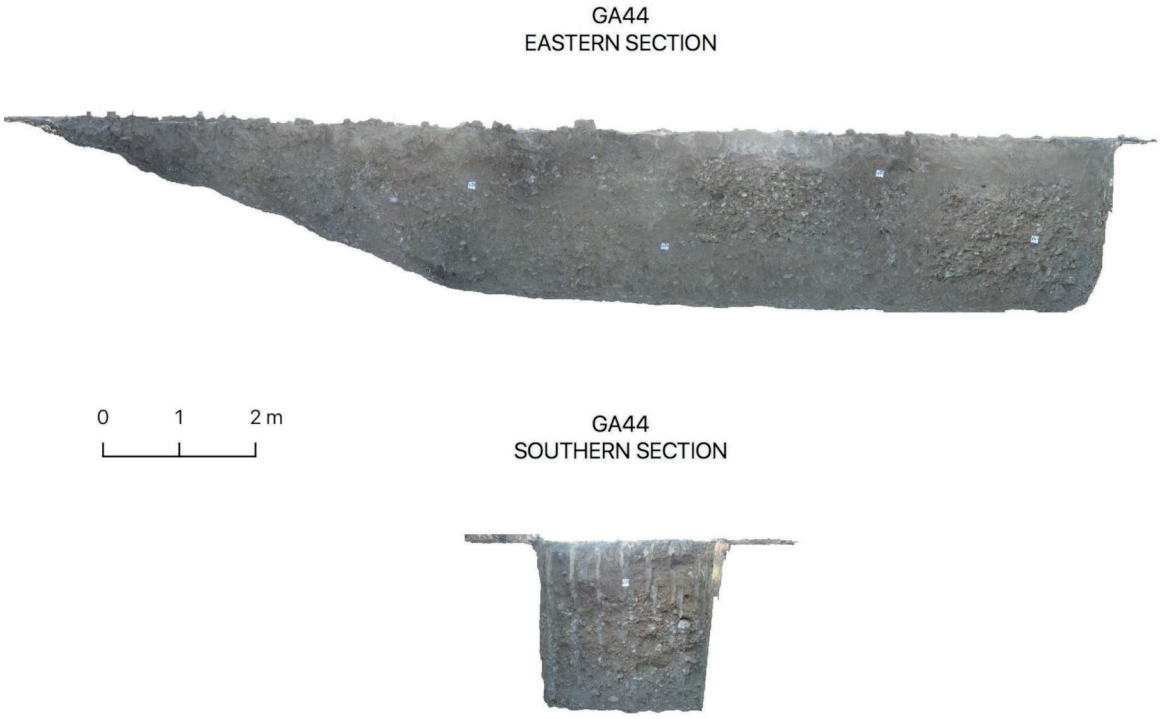

Fig. B2.3a: Orthophotos of the eastern and southern sections of the trench GA44. Created by Andrea Squitieri.

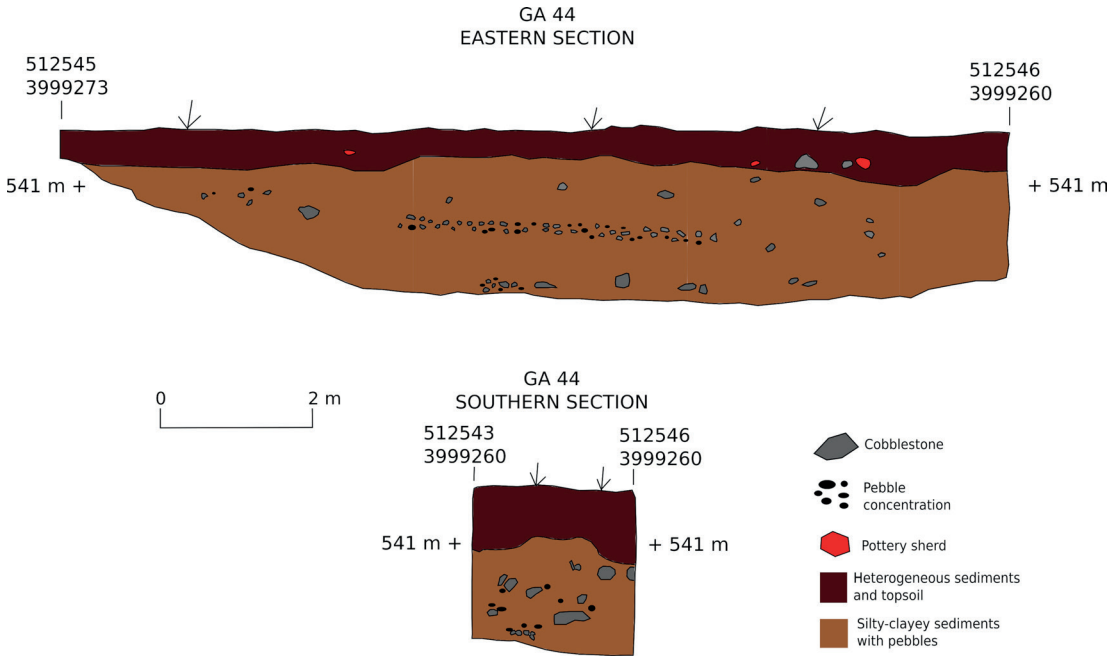

Fig. B2.3b: Section drawings of trench GA44. Field drawing by Cajetan Geiger; digitisation by Andrea Squitieri.

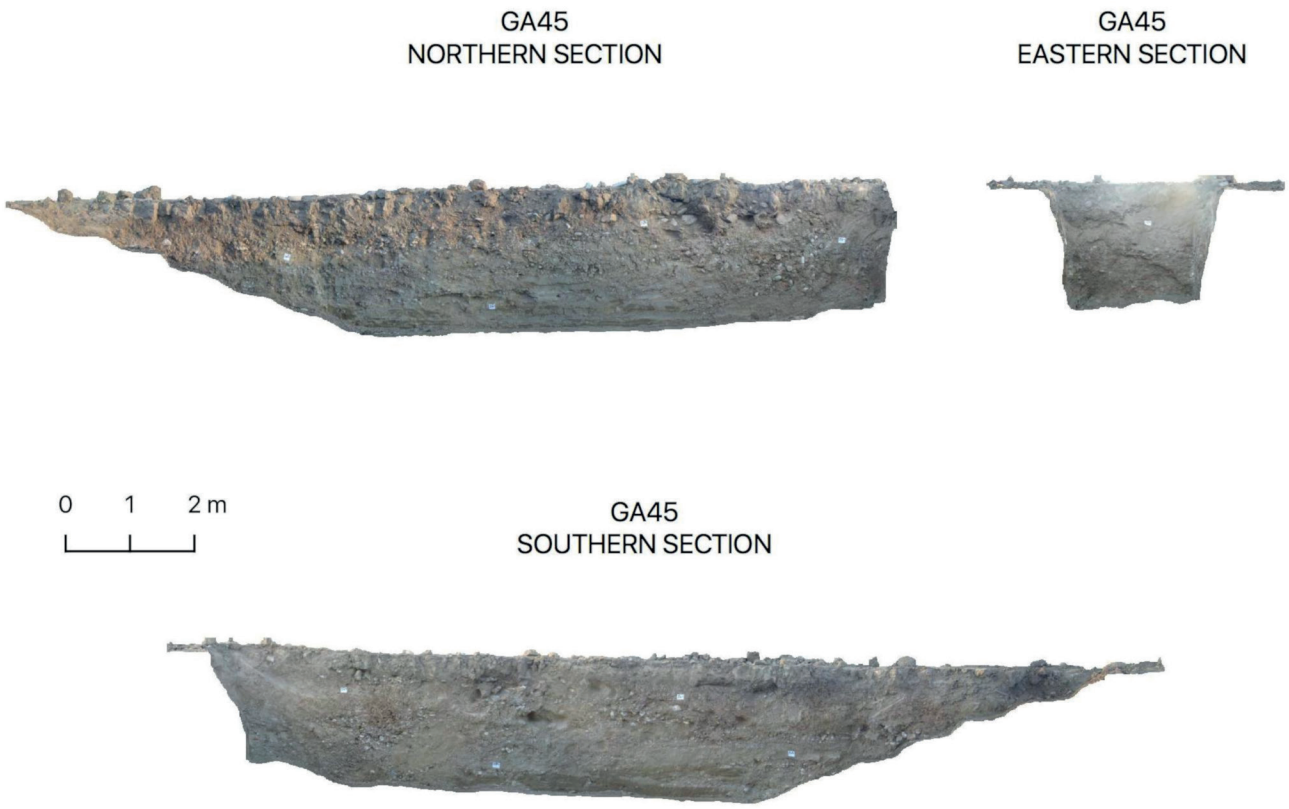

Fig. B2.4a: Orthophotos of the northern, southern and eastern sections of the trench GA45. Created by Andrea Squitieri.

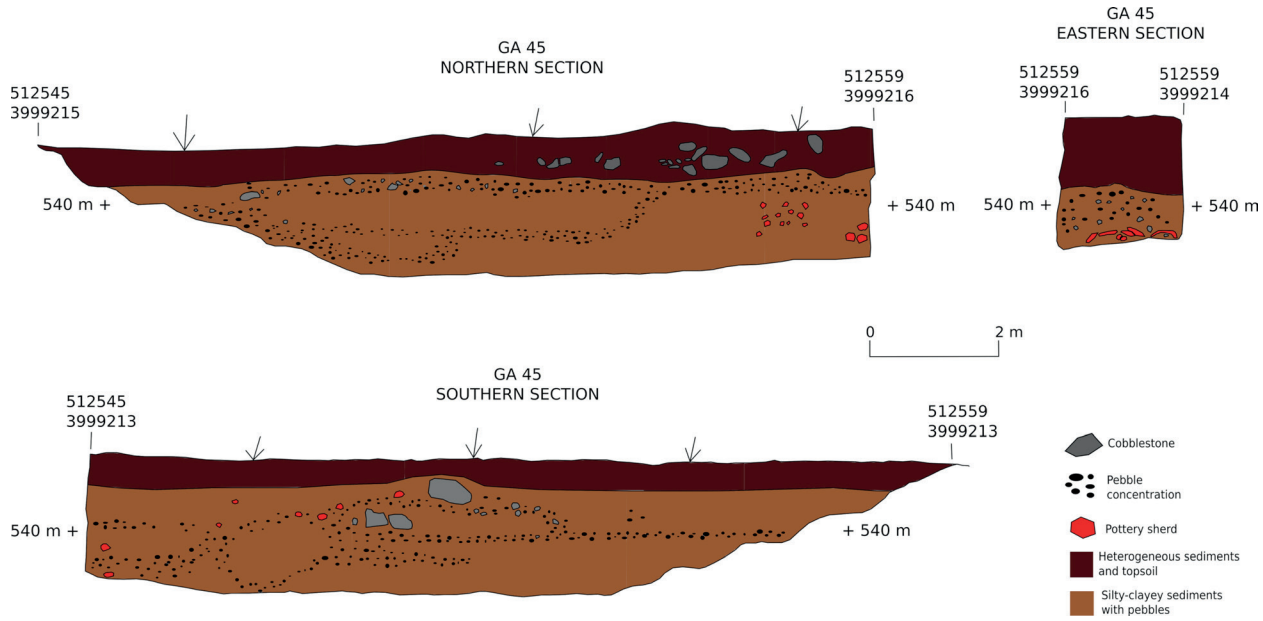

Fig. B2.4b: Section drawings of trench GA45. Field drawing by Cajetan Geiger; digitisation by Andrea Squitieri.

this bedrock is situated between 3.5-5 meters below the modern surface. The bedrock consists of small gravel.

The sand evidence is unknown at the level of the Upper Terrace where Gird-i Bazar is located, and this indicates that different fluvial deposits occurred in the Lower Terrace. Possibly, the core C17 could indicate a relict, more sandy formation that has largely been eroded but is still higher than other parts of the Lower Terrace. The sediments suggest not only more energetic fluvial activity than in the other areas of the Lower Terrace but also the presence of the Lower Zab in this area at some point in the past. The Lower Terrace, where Cores C15-C20 are located, may have been affected by more periodic flooding and was likely also submerged by the Lower Zab at different points in time.

The lack of archaeological materials suggests that the area may have been vulnerable to flooding, and that past inhabitants either avoided living in the area, or that any evidence of past occupation was eroded by the Lower Zab. Local informants reported that just west of the core C19, and in the direction of the river, the terrace was frequently flooded during the last fifty years and was even occasionally submerged by the Lower Zab. While it cannot be excluded that the Lower Terrace, from where Cores C15-C20 were taken, was partially settled as part of the Dinka Settlement Complex and that the evidence for this settlement was subsequently subject to erosion, the area may have been, even in the Iron Age, prone to flooding, and thus not subject to heavy occupation.

Dating the Lower Terraces might help further resolve the relationship between the settlement and the Lower Zab river. One core, C20, was taken specifically to be evaluated for OSL dating potential. This core was located on a relic alluvial channel, where channel scarring was evident on the available satellite imagery. If OSL dating is feasible, it may be possible to date the evolution of the Lower Terrace and better pinpoint the Lower Zab's relationship to the Dinka Settlement Complex.

It is possible that the Lower Terrace south of the Dinka Settlement Complex and closer to the Lower Zab was a relatively protected area, as the surrounding hills may have offered some protection from the river's fast flowing waters. This area could have served as a small harbour for shipping. Field-walking along the lowest terraces from the southwest to the southeast of the Dinka Settlement Complex and along the Lower Zab suggested that the ancient Lower Zab once cut through this area, which today contains river gravels and boulders.

B2.3 Spatial heterogeneity as indicated by the results of topsoil analysis

We analysed topsoil samples from the Dinka Settlement Complex to gain insight into the sedimentological differences, which can also reveal potential land-use patterns. We measured particle-size distribution, carbonate, carbon and nitrogen content, and the amount of phosphate within the soils and sediments. The results indicate some differences between the areas that might be related to sedimentation, but may also demonstrate differences in land-use (**Figs. B2.5-7**)[22].

The percentage of clay (< 2 µm) is particularly high in the soils of the north-western area, very low in the off-site sediments in the north, and rather low on the Lower Terrace in the south. The amount of sand is less variable, with pronounced peaks in the wadi sediments of the off-site area in the north and near the Lower Zab river on the elevated ridge on the Lower Terrace (C17). The latter might be a relic channel bar formed by sedimentation closer to the main river channel. The quantity of silt is higher at the edges of the Lower Terrace, near the channels or wadis (C16, C19) where flooding might occasionally occur; it is rather low in the central part where the ancient wadi (see above; **§B2.1**) was situated.

The distribution of particle sizes seems to be related mainly to the sedimentation history, and not to land-use. Also, carbonate contents show variations that are especially extreme in the soils of the Lower Terrace and the off-site samples, presumably due to the effect of precipitation of water from the wadis which is also used to irrigate the fields on the terraces. The high level of carbonates in the topsoil of C18 correlates to the carbonate contents in the excavated sediments of Gird-i-Bazar[23], but their source needs further investigation.

The levels of organic carbon (C_{org}) are highest in the north-eastern topsoils, which could be the result of land-use, as this could represent e.g. the residue of cropped plants. Phosphate levels often mirror the amount of organic carbon because organic matter can be a source of C_{org}. However, this is the case only with the topsoils of the excavation area DLT3; all other areas contain lower levels of phosphate. Some bone material was detected in core C13, which explains its high level of phosphate. The elevated levels of phosphates in DLT3, and partly also in the excavation area DLT2, are most likely related to materials connected to settlement activity. In the future, such

22 Core 8, taken in 2017 in our area (2), is included for reference. For this core see Eckmeier *et al.* 2018, 110 Fig. E3, 118.

23 Eckmeier *et al.* 2018.

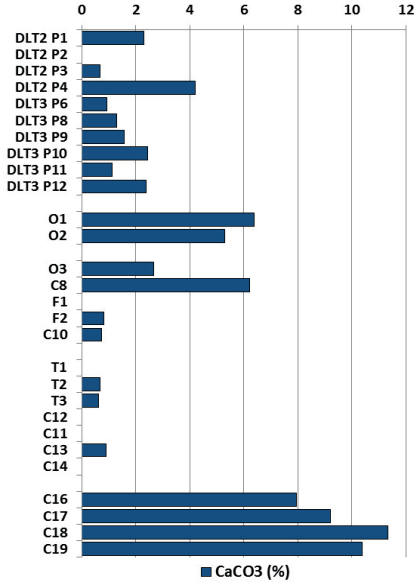

Fig. B2.5: Concentration of calcium carbonate from sampled areas in the Dinka Settlement Complex. Prepared by Eileen Eckmeier.

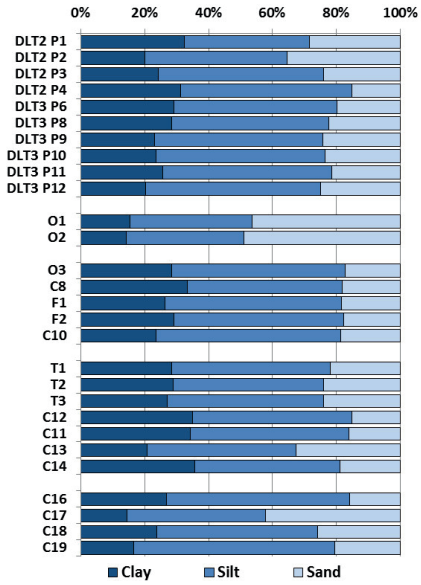

Fig. B2.6: Clay-silt-sand concentrations from sample areas in the Dinka Settlement Complex. Prepared by Eileen Eckmeier.

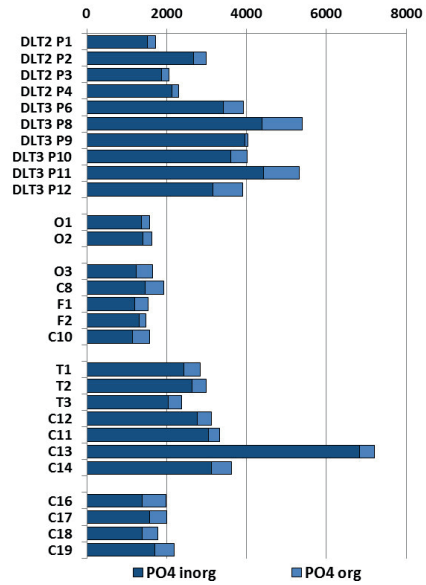

Fig. B2.7: Organic and inorganic phosphates. Prepared by Eileen Eckmeier.

phosphates could then be a good proxy for detecting the presence of settlement remains in other areas.

B2.4 General summary

In 2018, we were able to confirm that a large wadi/channel once ran through the Dinka Settlement Complex, cutting through the area just west of Gird-i Bazar. It likely existed before the Iron Age occupation of the Bora Plain and may have remained in place until the Sasanian or even later periods. This wadi would have been important to the Iron Age settlement as it provided a means for draining waste water away from the site and possibly also provided fresh water to the site. All drainage observed in the excavations at Gird-i Bazar points in the direction of the wadi, further supporting its usefulness for this purpose.

This wadi also affected the post-Iron Age site through erosion that potentially damaged structural remains between Gird-i Bazar and Qalat-i Dinka. To the south of the Dinka Settlement Complex and near the Lower Zab, a younger terrace is evident that was recently formed by alluvial activity, which may well have caused the erosion of part of the Dinka Settlement Complex. However, another possibility is that this Lower Terrace could have been part of the bed of the Lower Zab during the Iron Age occupation of the Dinka Settlement Complex, but confirmation of this awaits dating (using either OSL or radiocarbon methods). The area to the south of Gird-i Bazar, along the more recent Lower Terrace, would have been an ideal place for a small harbour during the Iron Age.

C. The 2018 magnetometer survey of the Dinka Settlement Complex

Marion Scheiblecker & Jörg Fassbinder

Between 29-30 September 2018, a magnetometer prospection was undertaken in two areas: in the Lower Town of the Dinka Settlement Complex, east of the chicken farm of Gird-i Bazar, and on the western slope of Qalat-i Dinka (**Fig. C1**). The aim was to extend the magnetometer prospections previously undertaken in these areas, chiefly in order to clarify the extent of the site.

C.1 The Lower Town

While the northern limit of the Lower Town had already been determined in 2016, thanks to magnetometer investigations conducted in that year[24], the western and eastern limits are still unknown.

To this aim, the area east of Gird-i Bazar was surveyed as far as accessible: because of deep ploughing, prospection of the southeastern part was not possible. Following the field boundaries and the established grid system, we were able to enlarge the area surveyed in 2016 by 80 m to the east and by almost 120 m from north to south. The centre of the surveyed area is slightly elevated and covered with a high concentration of scattered stones, a phenomenon that usually indicates the presence of architecture below[25]. As first trialed at Gird-i Bazar in 2017, we again used the handheld total field magnetometer Geometrics G-858 in duo-sensor configuration[26].

The 2018 magnetometer survey revealed a further extension of the built-up area of the Dinka Settlement Complex, which appears to taper off in the northern section of the magnetogram (**Figs. C2-C3**) as well as in the east. Kilns or ovens appear frequently within the architectural remains, and an additional street was identified that runs from southeast to northwest and apparently ends in front of a building. In the area of the stone accumulation in the central part of the surveyed area, the walls appear to be less well preserved than to the south and west. This seems to be the result of ploughing, which damaged the walls and pulled the stones to the surface, thus creating the stone accumulation.

C.2 The western slope of Qalat-i Dinka

The first magnetometer survey on Qalat-i Dinka was conducted in 2015[27] and covered parts of the western and eastern slopes. In 2018, we added two areas northwest and southwest of the previously investigated area on the western slope in order to gain additional information regarding the organisation and extension of the built-up area in the direction of the Lesser Zab.

The magnetogram of the northern survey area (**Figs. C4-C5, top**) is characterised in its northern part by geological features due to the slope running northeast to southwest: streambeds are visible that follow this slope. To the south, the modern field boundary can be traced. The magnetogram revealed positive magnetic anomalies, which probably represent buildings of that orientation along the slope, although it is impossible to reconstruct the complete layout of any building with confidence. As the positive anomalies are partly accompanied by white shadows, these buildings may have been constructed with baked bricks and also with highly magnetisable stones, whose remnant magnetisations are oriented in different directions[28]. Positive anomalies of various irregular shapes indicate features like pits; during the excavations at Qalat-i Dinka, several looting pits were excavated that had similar shapes (**§D3.3**). The surface in the survey area was covered with fragments of baked bricks, possibly also because of looting activity.

On the magnetogram of the southern survey area (**Figs. C4-C5, bottom**), the western and southern sides appear as relatively homogenous, while the remaining

24 Fassbinder *et al.* 2018, 23.

25 Cf. Altaweel/Squitieri 2019.

26 For the methodology see Fassbinder *et al.* 2018, 20-21.

27 Fassbinder/Ašandulesei 2016, 40-42.

28 Fassbinder 2017, 505.

Fig. C1: Overview of the 2015-2018 magnetometer surveys conducted at the Dinka Settlement Complex, including Qalat-i Dinka and the Lower Town. Red squares indicate the areas surveyed in autumn 2018. Prepared by Marion Scheiblecker.

area shows big differences in the magnetic values, both positive and negative. This could be interpreted as the border between the built-up area of Qalat-i Dinka and the rest of the slope towards the river, but this should be confirmed by excavation. The features in the magnetogram appear relatively regular, suggesting that diamagnetic rocks (e.g., quartz), limestone or mudbrick cause negative anomalies[29], while magnetised rocks (e.g., gabbro, serpentine), baked bricks, or burnt features may be responsible for the positive anomalies in the magnetogram.

29 Fassbinder 2017, 505-507.

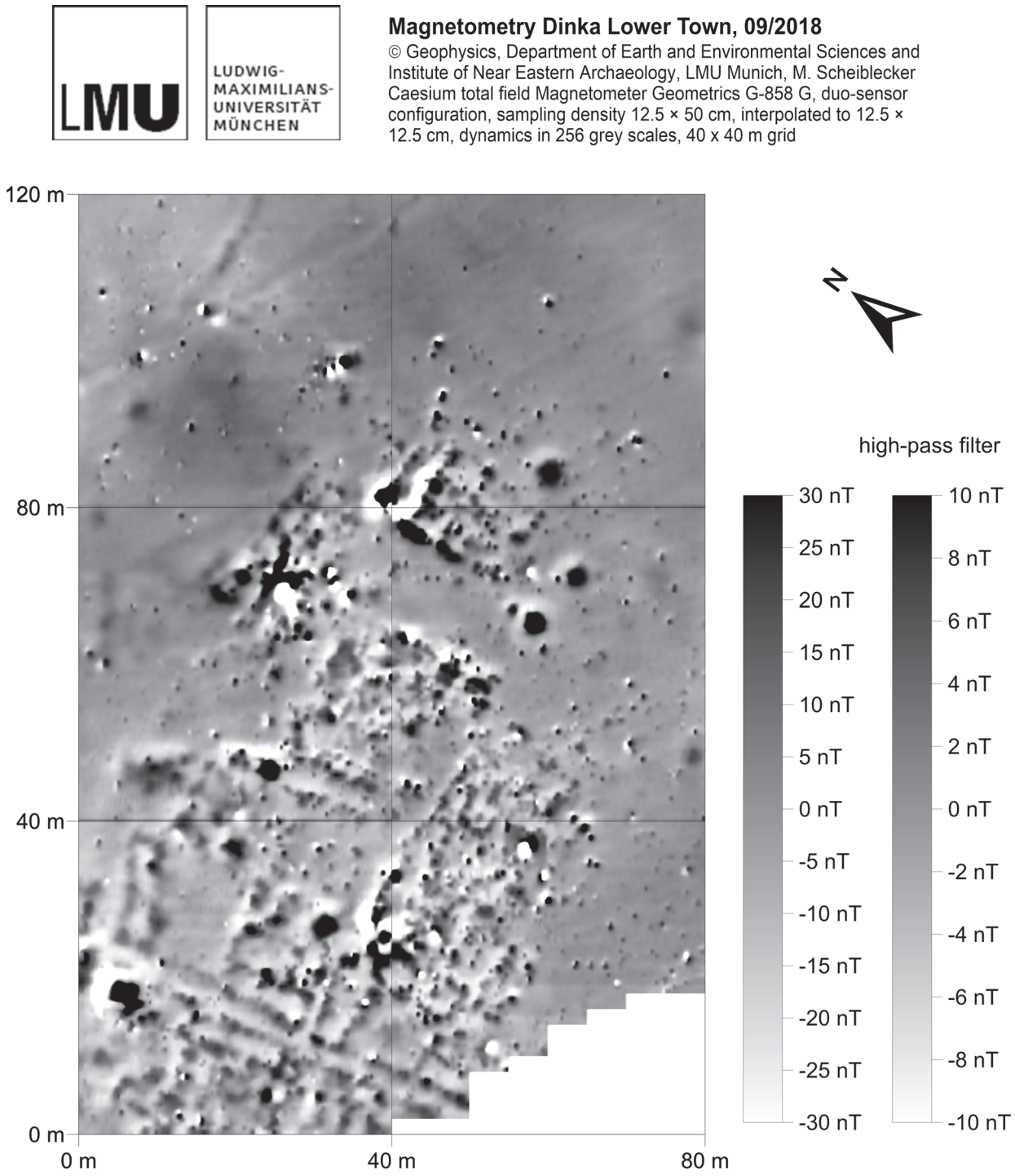

Fig. C2: Magnetogram with the 2018 results of the prospection area east of Gird-i Bazar. Magnetometer survey conducted with a Geometrics G858 total field magnetometer in duo-sensor configuration. 40×40 m grid, sampling density 10×50 cm, interpolated to 12.5×12.5 cm, dynamics +/- 30 nT in 256 greyscales. Intensity of the Earth's magnetic field: 47.760 nT +/- 30 nT (September 2018). Prepared by Marion Scheiblecker.

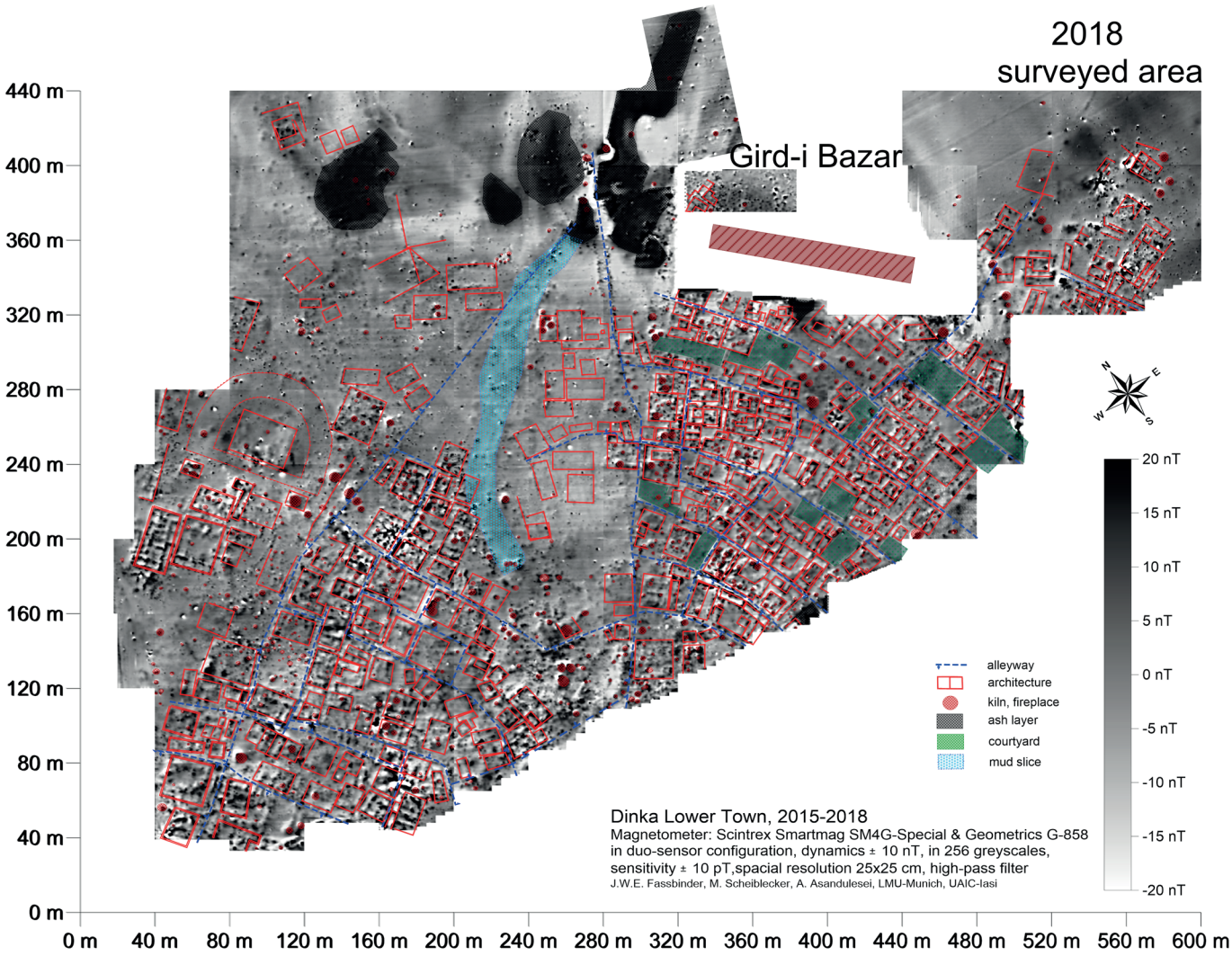

Fig. C3: Magnetogram with the 2015-2018 results of all areas surveyed in the Lower Town of the Dinka Settlement Complex, with interpretation. Magnetometer survey conducted with a Scintrex Smartmag SM4G-Special and Geometrics G858 total field magnetometer in duo-sensor configuration. 40×40 m grid, sampling density 10×50 cm, interpolated to 25×25 cm, dynamics +/- 24 nT in 256 greyscales. Prepared by Jörg Fassbinder and Marion Scheiblecker.

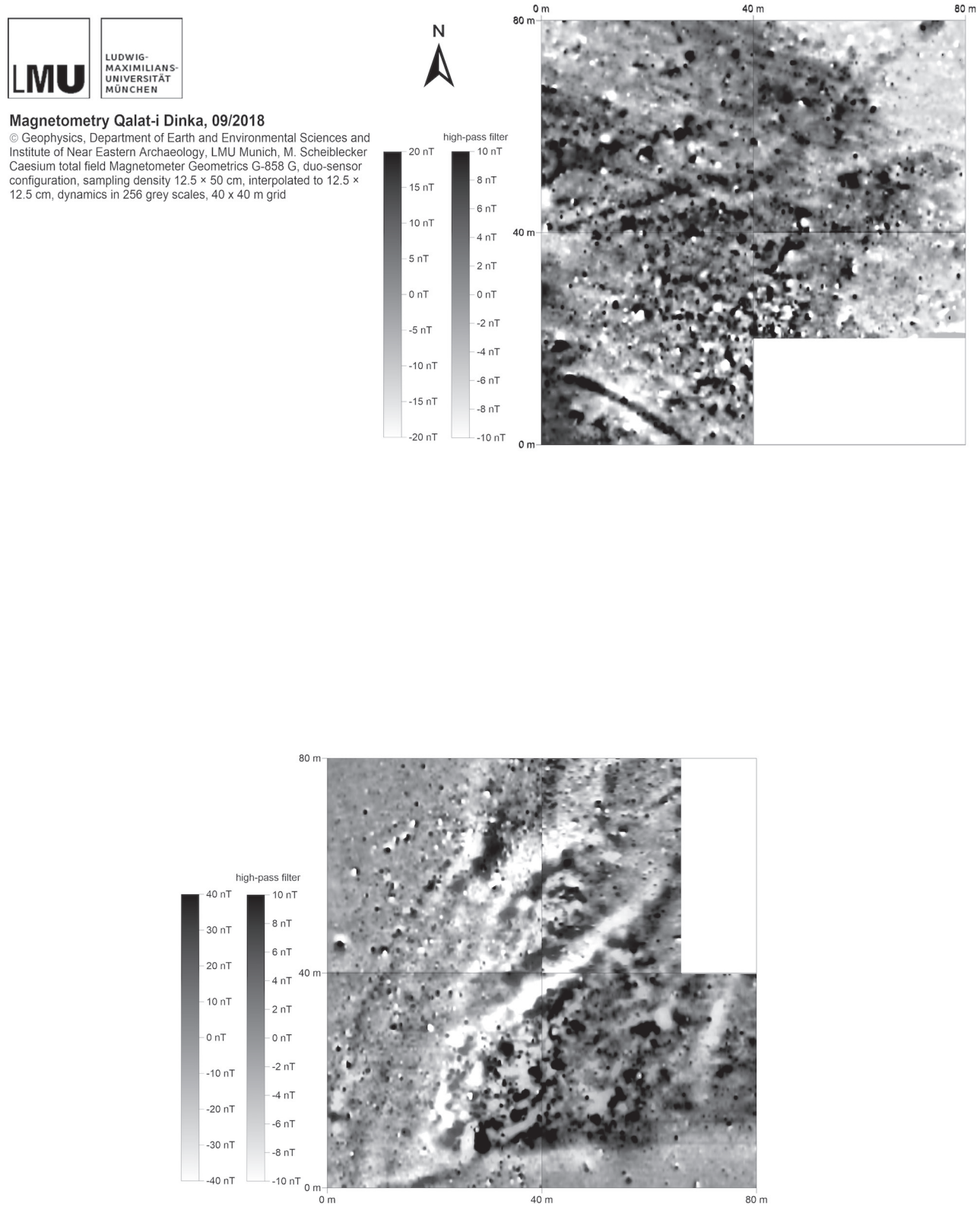

Fig. C4: Magnetogram with the 2018 results of the two survey areas on the western slope of Qalat-i Dinka; top: northern area, bottom: southern area. Magnetometer survey conducted with a Geometrics G858 total field magnetometer in duo-sensor configuration. 40×40 m grid, sampling density 10×50 cm, interpolated to 25×25 cm, dynamics +/- 24 nT in 256 greyscales. Intensity of the Earth's magnetic field: 47.760 nT +/- 30 nT (September 2018). Prepared by Marion Scheiblecker.

Fig. C5: Interpretation of the 2018 results of the two survey areas on the western slope of Qalat-i Dinka; top: northern area, bottom: southern area. Prepared by Marion Scheiblecker.

D. Excavating the Upper Town: the 2018 excavation season at Qalat-i Dinka

This chapter presents the results of the excavations that took place on the western slope of Qalat-i Dinka between 3 April and 14 May 2018 (**Fig. D1**), with funding from the LMUexcellent Junior Researcher Fund awarded to Andrea Squitieri for this specific purpose supported by additional funding from LMU Munich and the Alexander von Humboldt Foundation (Alexander von Humboldt Professorship 2015 for Karen Radner).

D1. The excavation, its grid and the registration system

Andrea Squitieri

Because a Neo-Assyrian clay tablet dated to 725 BC had been found on the western slope of Qalat-i Dinka in 2013[30], a geophysical survey led by Jörg Fassbinder was undertaken in 2015 on this side of the mound. This survey highlighted that several structures are concentrated in the upper part of the slope and that downwards on the slope, these structures are bordered by a linear magnetic anomaly of about 80 m length and roughly north-southern orientation[31]. On the basis of the magnetogram, this anomaly was initially interpreted as a possible fortification wall (indicated by red arrows in **Fig. D2**). During work conducted on the same slope in February 2013 and October 2015, a surface survey team directed by Jessica Giraud noted a high concentration of Iron Age pottery[32]. This pottery matched the ceramics found at Gird-i Bazar during both the initial surface survey and the excavations which began in August 2015[33]. This evidence, combined with the geographic and topographic characteristics of Qalat-i Dinka, led to the hypothesis that looming over the extended Lower Town, there was a fortress or a fortified citadel on the mound that served to watch and guard the mountain passage along the Lower Zab river that today connects Iraq and Iran.

In the spring of 2016, first test excavations were conducted on the western slope of the mound. To gain insight into the nature of the occupation, and to establish whether this occupation was contemporary with that of Gird-i Bazar in the Lower Town, we opened a T-shaped trench of a size of ca. 40 m². The 2016 test excavations achieved both objectives: the recovery of pottery of the same type as observed in Gird-i Bazar indicated contemporaneity, while the hypothesis of the presence of an Iron Age fortified citadel was strengthened by the discovery of a sizable building with thick stone walls and paved floors (dubbed "Building P"); fragmentary ivory items strongly suggested that the resources available to its occupants were much richer than at Gird-i Bazar[34] (**Fig. D3**).

In 2018, we continued work on the T-shaped trench of 2016 and extended it to form "Operation QID1" (with QID standing for Qalat-i Dinka) in order to unearth more of the remains of the monumental Building P. Two more trenches called QID2 and QID3 were opened further down the slope in order to investigate the linear feature identified by the 2015 geophysical survey (**Fig. D2**). As will be shown in this chapter, all trenches yielded evidence for an Iron Age occupation contemporaneous with the Main Occupation Period of Gird-i Bazar and the DLT2 and DLT3 operations.

For the excavations on Qalat-i Dinka, a grid system was employed according to the principles that the Peshdar Plain Project (PPP) has been using since 2015: a UTM-based, northward-oriented grid, containing squares named after the eastern and northern coordinates of the SW vertices of each square. The operation QID1 is located in the squares 181908 and 181909; the operation QID2 in the square 176909; and the operation QID3 in the squares 176904, 176905 and 177905 (**Fig. D4**).

According to PPP principles, we use a locus system for registration. The loci (pl. for locus) represent the stratigraphic units (either installations, e.g. walls, floors or benches; or deposits, e.g. fills) and receive a progressive identification number added to the name of the square in which the locus is found. To give an example, Locus:181909:002 corresponds to the topsoil in square

30 Radner 2016.

31 Fassbinder/Ašandulesei 2016.

32 Giraud 2016.

33 Herr 2016.

34 Kreppner/Squitieri 2017a.

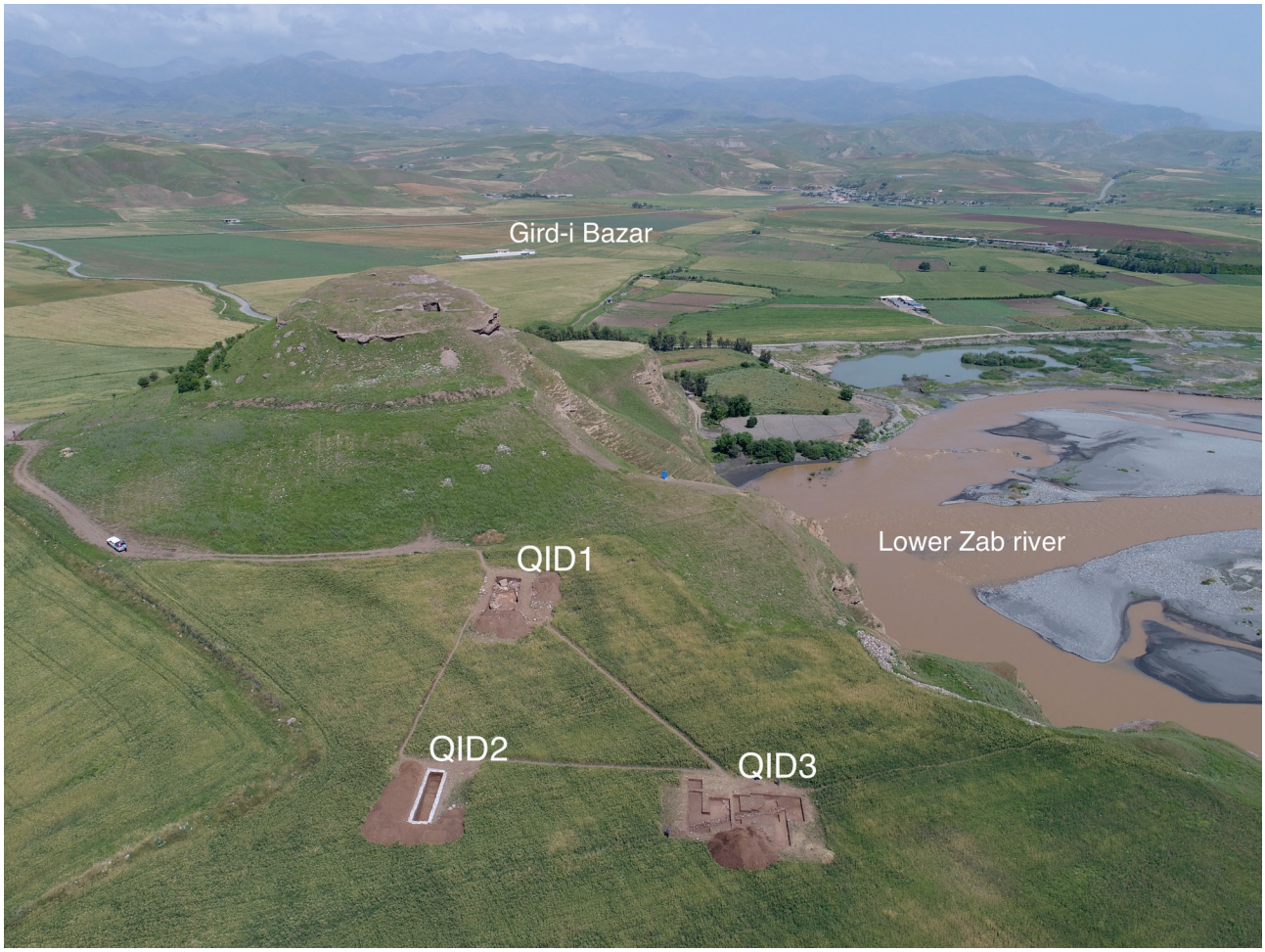

Fig. D1: The western slope of Qalat-i Dinka with the three trenches QID1, QID2 and QID3 opened in spring 2018. In the background, the chicken farm of Gird-i Bazar is visible. Photo taken by Andrea Squitieri with a DJI Phantom 4 Pro drone.

181909. Whenever a stratigraphic unit expands across two (or more) squares, it is assigned separate locus numbers in each square, which are then grouped together in so-called Locus Groups (abbreviated as LGR). For example, LGR:0324 is the paved brick floor encountered in QID1 that extends across the squares 181908 and 181909 and that was therefore excavated as two separate loci: Locus:181908:019 and Locus:181909:039. A correspondence table (**Table D1**) lists the locus groups in QID1, QID2 and QID3 with their constituent loci.

Also when two (or more) loci are later revealed to be part of the same stratigraphic unit, they are grouped into a Locus Group, even when they occur within the same square. The latter case was particularly relevant in QID1 because this trench continued the excavation of the archaeological features partially unearthed in 2016. In spring 2016, the PPP grid system could not be used because no dGPS was available to the team at the time; hence, we created a local grid system with a fictitious square called 100000[35]. In this system, each locus received a progressive number following the label 100000 of the square. Only later, we were able to establish the UTM coordinates of the fix points used in 2016 and to fit the 2016 features into the UTM-based grid system. Most of the features uncovered in 2016 are situated in square 181909. When their excavation continued in 2018 we assigned new locus numbers to them, which were eventually grouped into Locus Groups with the previous 2016 numbers. The stratigraphic table (**Table E2**) shows the current interpretation of the stratigraphy of QID1, merging both the 2016 and 2018 results.

Finally, the material collected from the loci, such as pottery and animal bones, receives a collection number, which is formed by a consecutive number following the locus name, preceded by PPP (for "Peshdar Plain Project"). To give an example, PPP 181909:002:001 represents

35 Kreppner/Squitieri 2017a.

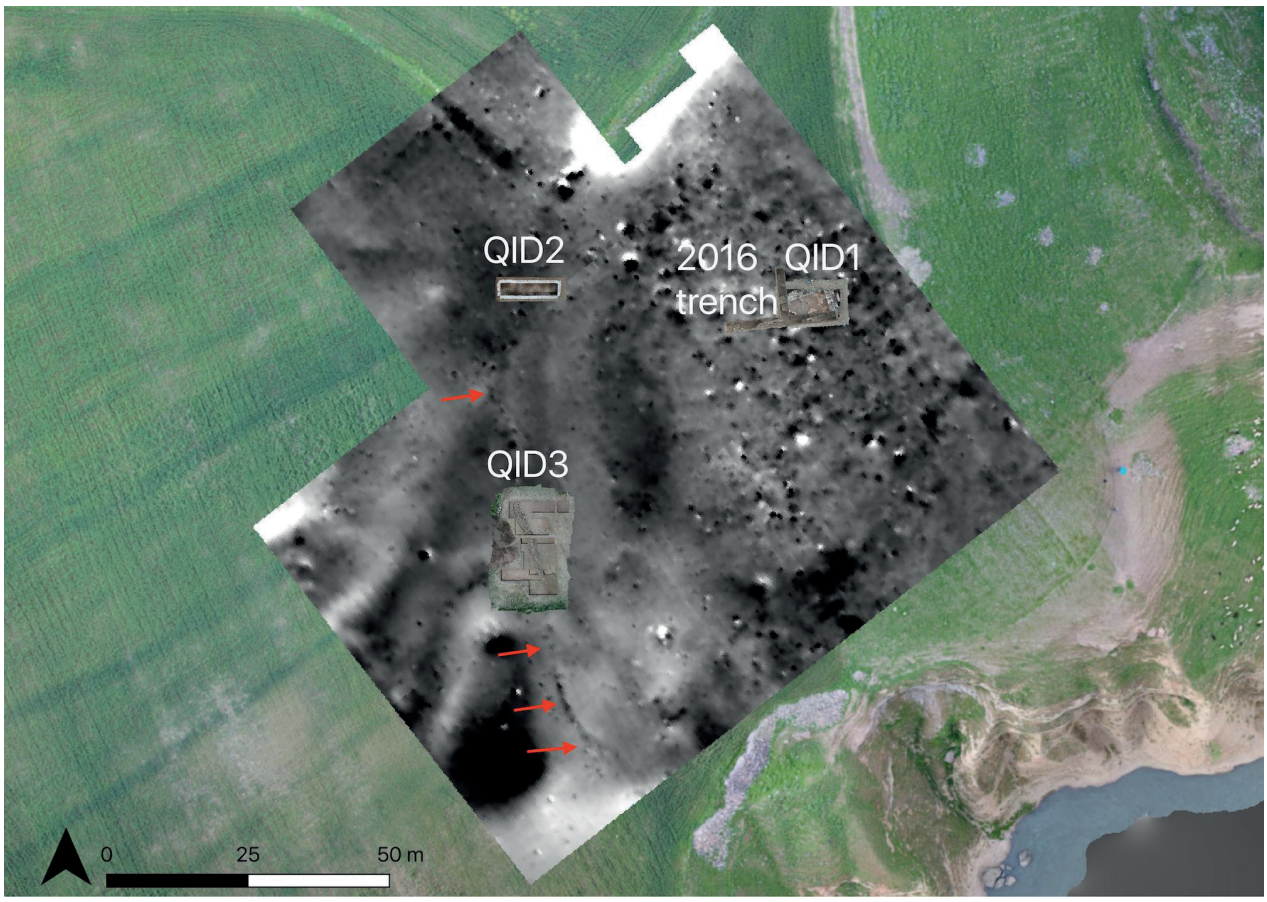

Fig. D2: The 2015 magnetogram of the western slope of Qalat-i Dinka, overlaid on an orthophoto. The 2016 trench and the three 2018 trenches QID1, QID2 and QID3 are also visible. The red arrows indicate the semi-circular magnetic feature intercepted by QID2 and QID3. Magnetogram by Jörg Fassbinder and Andrei Ašandulesei (see Fassbinder/Ašandulesei 2016), orthophoto by Felix Wolter and Andrea Squitieri; annotated by Andrea Squitieri.

Fig. D3: The 2016 T-trench superimposed on the 2018 QID1 trench, showing the northern and southern walls of Room 58, first unearthed in 2016 and then further excavated in 2018. Prepared by Andrea Squitieri.

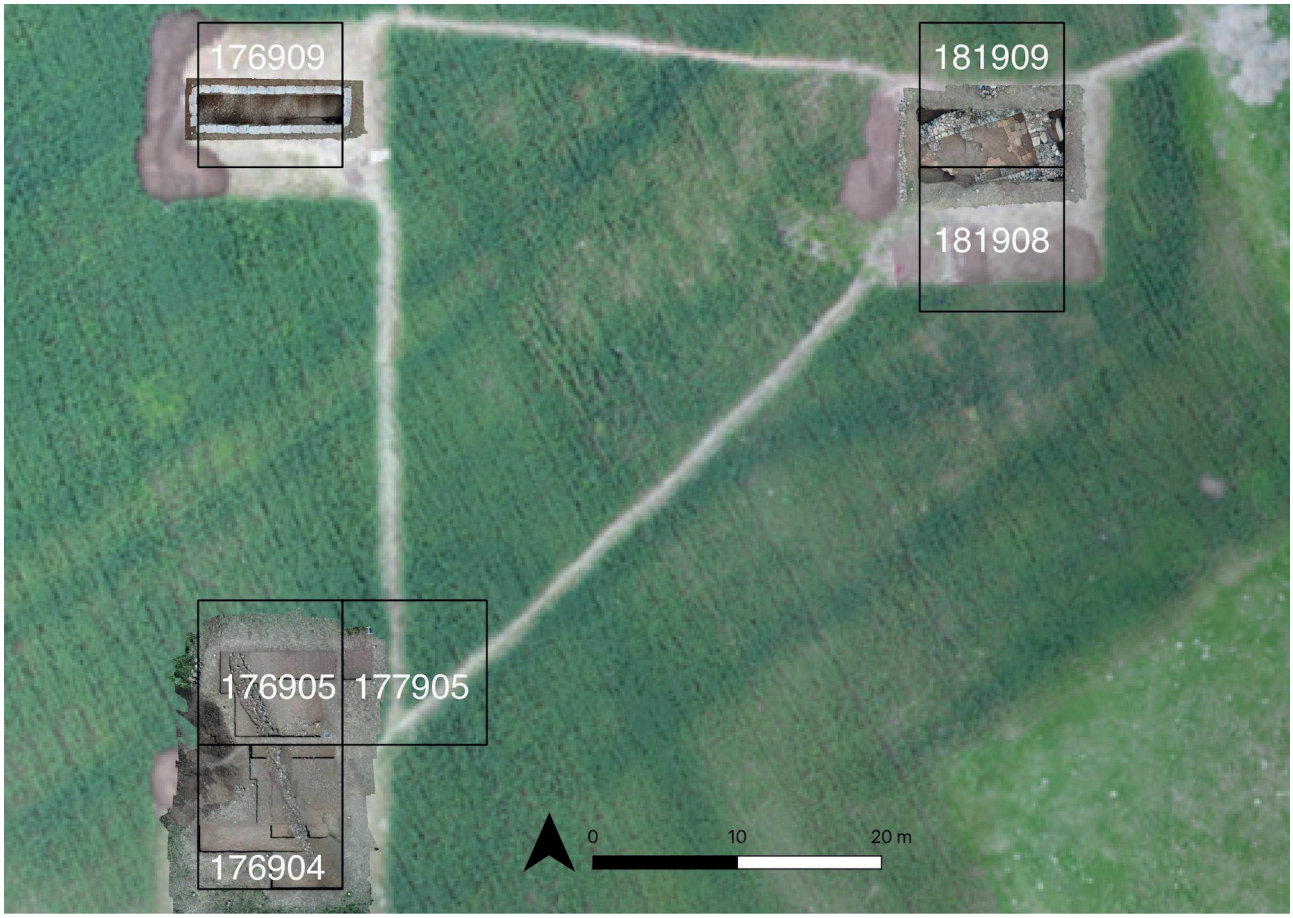

Fig. D4: The three 2018 trenches on the western slope of Qalat-i Dinka, with the excavation grid. Prepared by Andrea Squitieri.

the pottery collection from the topsoil of square 181909. Labels for samples (e.g., charcoal, phytoliths) and small finds (e.g., a stone tool) are created in the same way.

D2. Absolute chronology and relative stratigraphy

D2.1 The first ^{14}C dates

Karen Radner & Andrea Squitieri

The results of the radiocarbon analysis of two charcoal samples collected during the 2018 excavations constitute the first step towards establishing the absolute chronology of the occupation on Qalat-i Dinka. The first sample (PPP 181909:038:049) was collected from directly above the paved floor of Building P's Room 58 in the excavation area QID1 and yielded a probable date range of 1001-891 calBC (85.9% probability; **Fig. D5a**). The second sample (PPP 176905:031:005) was collected from a floor that is interpreted as an open area in the operation QID3 and yielded a probable date range of 1043-893 calBC (91.8 % probability; **Fig. D5b**).

These dates from QID1 and QID3 broadly fall into the same range of dates hitherto obtained from radiocarbon analysis of samples from the Lower Town, specifically from Gird-i Bazar and DLT2, where charcoal and seed samples taken from floor deposits yielded high probability date ranges spanning the time from 1215 to 816 calBC[36]. The new ^{14}C evidence therefore supports the view that the occupation on Qalat-i Dinka and the Lower Town during the Iron Age was contemporaneous. In terms of the relative stratigraphy, we refer to this period as the Main Occupation Period. Once the ongoing analysis of short-lived samples (i.e., carbonised seeds) has been completed suitable specimens will be selected for ^{14}C analysis.

While the operation QID2 did not yield any suitable ^{14}C samples during the 2018 excavations the pottery collected from there matches in shapes and techniques the pottery unearthed in the Main Occupation Period levels in all

36 Radner 2018; Kreppner/Radner 2018.

Locus Group (LGR)	Square	Locus
290	181909	5
290	181909	6
290	181908	5
290	181908	6
290	181909	17
290	181909	18
290	181909	19
290	181909	20
290	181909	24
290	181909	36
291	181909	4
291	181908	4
292	100000	20
292	181909	11
292	181908	8
293	176904	5
293	176904	6
293	176904	8
293	176904	14
293	176904	25
293	176904	26
293	176904	27
293	176904	28
293	176904	33
293	176904	37
293	176905	4
293	176905	29
294	176904	2
294	176904	22
294	176904	24
294	176904	31
294	176904	35
294	176905	2
294	176905	8
294	176905	14
294	176905	16
294	177905	2
294	176905	23
295	176904	9

Locus Group (LGR)	Square	Locus
295	176904	18
295	176904	23
295	176904	32
295	176905	5
295	176905	19
297	100000	14
297	181909	15
297	181908	9
298	176904	17
298	176904	30
299	100000	15
299	181908	10
300	176904	15
300	176904	21
300	176904	40
300	176905	11
300	176905	39
301	176904	36
301	176904	38
303	100000	3
303	100000	4
303	100000	5
303	181909	8
303	181909	9
303	181909	10
303	181909	13
304	176904	3
304	176905	3
305	181909	12
305	181909	16
305	181909	29
305	181908	12
306	176909	3
306	176909	6
306	176909	8
306	176909	20
306	176909	22
306	176909	24
306	176909	26

Locus Group (LGR)	Square	Locus
306	176909	27
307	176909	4
307	176909	23
307	176909	29
307	176909	30
309	176909	7
309	176909	25
310	176909	5
310	176909	10
310	176909	11
310	176909	33
312	176909	9
312	176909	14
312	176909	16
312	176909	34
312	176909	37
312	176909	38
312	176909	39
312	176909	40
312	176909	41
312	176909	42
312	176909	43
313	176909	13
313	176909	35
314	176909	12
314	176909	28
314	176909	32
314	176909	36
315	176909	10
315	176909	26
315	176909	33
316	176904	10
316	176904	19
316	176904	34
316	176904	41
316	176905	6
316	176905	7
316	176905	10
316	176905	12

Locus Group (LGR)	Square	Locus
316	176905	13
316	176905	21
316	176905	22
316	176905	26
316	176905	37
317	100000	33
317	181908	16
318	100000	8
318	100000	9
318	100000	10
318	100000	11
318	100000	34
319	100000	6
319	181909	7
320	181908	15
320	181909	47
321	181909	23
321	181908	21
322	181909	33
322	181908	11
323	181909	38
323	181908	14
324	181909	39
324	181908	19
325	181909	34
325	181908	17
326	100000	21
327	181909	31
328	181908	18
329	100000	16
329	181908	7
330	176904	13
330	176904	20
330	176905	30
330	176904	45
363	100000	26
363	181909	27

Table D1: Correspondence list between locus groups and loci of QID1-3. Prepared by Andrea Squitieri.

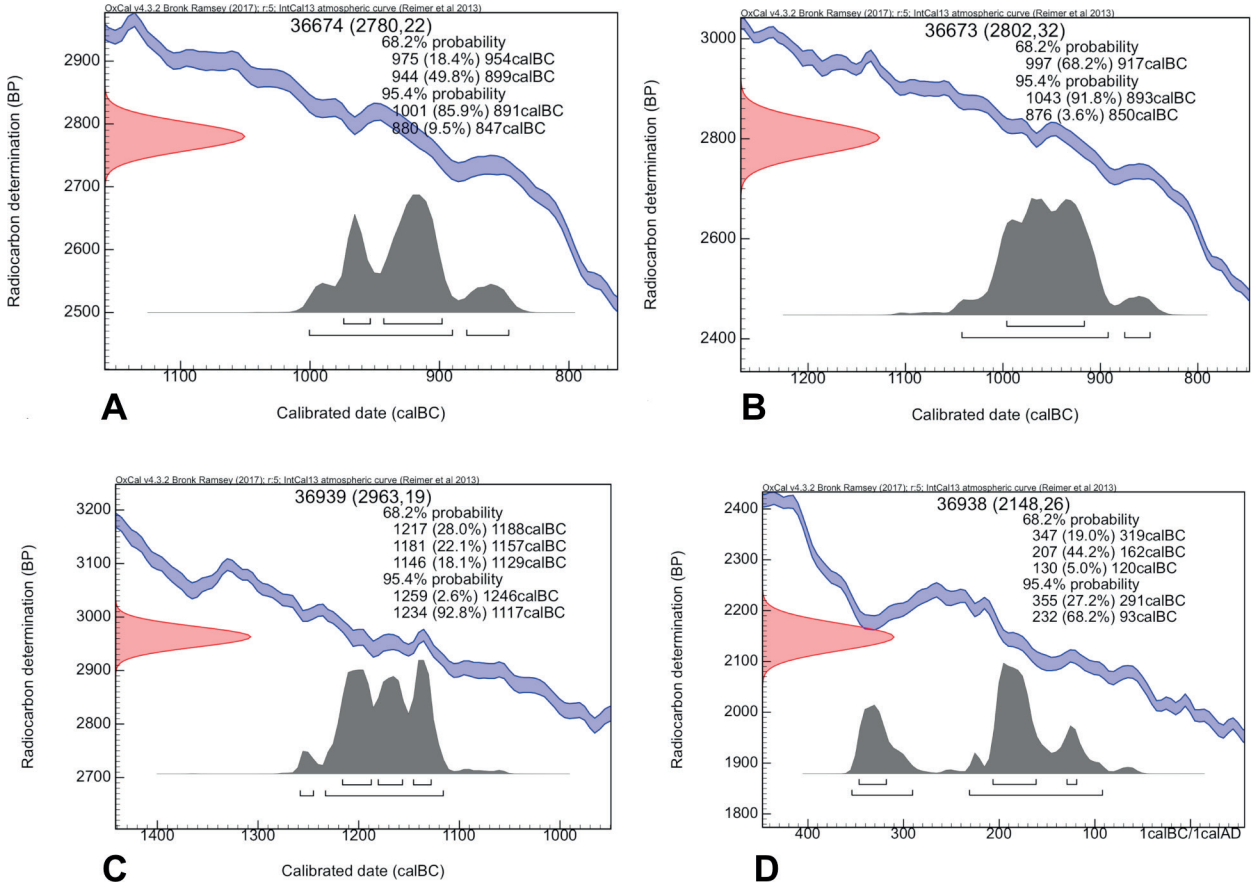

Fig. D5: Calibrated radiocarbon dates for the samples: (a) PPP 181909:038:049 (charcoal); (b) PPP 176905:031:005 (charcoal); (c) PPP 181908:018:016 (tooth from Grave 99); (d) PPP 181909:031:002 (bone from Grave 98). Calibration software OxCal 4.3.2. Prepared by Andrea Squitieri.

other excavation areas, thus indicating that the structures found in QID2 also date to the Iron Age horizon (**§G1**).

Two more radiocarbon dates are available from QID1. One derives from a human skeleton unearthed on virgin soil next to the floor of Building P's Room 58 from in between two pilasters. The stratigraphic position of this skeleton ("Grave 99": **§D3.2.2**) is not clear as the heavy looting that had occurred in QID1 in recent times (**§D3.5**) did not allow identification of the grave cut. A tooth (PPP 181908:018:016) from this skeleton was radiocarbon dated to a probable date range of 1234-1117 calBC (92.8% probability; **Fig. D5c**), broadly matching other date ranges obtained from Qalat-i Dinka and the Lower Town.

The final radiocarbon date was obtained from one of the human bones (PPP 1818909:031:002) that were excavated above the stone wall of Room 58, where they were sticking out of the northern section of QID1 ("Grave 98": **§D3.2.1**). The stratigraphic position of these bones already indicated a dating to a period later than the Iron Age, and the ^{14}C analysis indeed resulted in a probable date range of 355-93 calBC (95.4% probability, with 355-291 calBC at 27.1% and 232-93 calBC at 68.2%; **Fig. D5d**). This suggests the existence of a late cemetery in the area of QID1, active at some point in time during the late Achaemenid, Seleucid or Parthian periods. Other human remains that were unearthed already in 2016 in the heavily disturbed upper fills of Room 58 (**§D3.2.3**) may also belong to this cemetery, along with some of the small finds retrieved (**§H**).

D2.2 Relative stratigraphy and the stratigraphic table

F. Janoscha Kreppner

The relative stratigraphy of the three operations QID1, QID2 and QID3 is presented in a stratigraphic table (**Table D2**) that also integrates the results of the 2016 excavations, as published in the second volume of the Peshdar

Plain Project Publication series[37]. The following remarks provide a guide to reading this table:

- The table rows follow the timeline, from the oldest occupation periods on the bottom to the youngest at the top.
- The columns indicate the spaces, such as rooms of buildings, courtyards and open areas, arranged from east to west. Consequently, roughly contemporary depositional processes and occupation periods that span various areas of the site can be identified on the table by reading it horizontally.
- The cells of the table contain either a grave number (e.g., G98) or a locus number (e.g., Locus:181909:039) or a locus group number (e.g., LGR:0290), followed by a brief description of the locus or locus group. The background colours of the cells indicate the temporal extent of the occupation as well as non-occupational or post-occupational periods. Hence, different pink shades are used for topsoil, modern occupation, graves and virgin soil; brown is used for post-occupation periods; yellow indicates occupation periods. The same colour coding is used in the section drawings so that the stratigraphic table and the section drawings can be read in parallel.

Each occupation period is defined by a floor. When a new floor is detected that overlies an earlier one, a new occupation period is defined. In our system, the term "floor" refers to the actual purpose-built floor or hardened surface created by human use, which is assigned a specific locus number. Deposits found immediately above floors are given their own locus numbers. This allows us to isolate material found on a floor and, at the same time, gain a better understanding of the formation processes of the deposits above the floor.

Reading **Table D2** from the bottom up, the following phases can be identified:

- Virgin soil
- A period predating the Main Occupation Phase
- The first Construction Phase, when the foundations of the buildings were laid down and the walls were created.
- The Main Occupation Period, when these buildings were used. This is divided into three sub-phases, from oldest to youngest: the construction phase of the floor, comprising the construction of the floor and the installations created before the floor was used; the occupation phase of the floor, resulting in deposits and installations from the period when the floor was in use; and the end phase of occupation, resulting in deposits that indicate the destruction or abandonment of the floor, covering the finds collected directly on the floor.
- A Post-Occupation Period follows each occupation period, representing a period of non-occupation during which erosion phenomena were the main causes for the formation of archaeological deposits. These processes may be repeated cyclically, which is why yellow and brown rows alternate in the table.
- A period characterised by the construction of graves which are clearly in a higher stratigraphic position than the features of the Main Occupation Period.
- A Modern Occupation Period, which in the current excavation trenches is mainly represented by several recent looting pits that damaged the graves, the older structures and the fills.
- The topsoil and the modern site surface with traces of continuing agricultural activities.

The following sections presents the results of the excavations in QID1, QID 2 and QID3 following the stratigraphic sequence from the oldest to the youngest layers, as in the stratigraphic table (**Table D2**).

D3. The excavations in QID1

D3.1 Building P

Jean-Jacques Herr

The 2016 T-trench was enlarged towards the east, which resulted in a trench measuring 10 × 5 m (**Figs. D3**, **D6-D7**). Further remains of the large monumental building, dubbed Building P, were unearthed, but its overall layout is still unclear. For the time being, Building P is composed of a large room, named Room 58 (located in the middle of the trench QID1,) and two more rooms to the northwest and northeast of this room: Room 59 and Room 60, which have been only partially excavated so far.

When compared to the structures found in the Lower Town (Gird-i Bazar, DLT2 and DLT3), Building P's walls are massive with their width of 1.4-1.5 m and a preserved height of about 90 cm. The monumental doorway, the paved floor, and the pilasters in Room 58 clearly distinguish this building in terms of its monumentality from all the other architecture that has so far been excavated in the Lower Town.

Building P's fill was also very rich in items not previously encountered in the Dinka Settlement Complex, par-

37 Kreppner/Squitieri 2017a.

QALAT-I DINKA STRATIGRAPHY	QiD-1			
	100000 (2016 western trench)		Building P	
	Room (?) 61	Room (?) 60	Room 58	Room (?) 59
PRESENT SQUARE SURFACE	Locus:100000:001		Locus:181909:001, Locus:181908:001	
TOPSOIL	Locus:100000:002		Locus:181909:002, Locus:181908:002	
MODERN OCCUPATION	LGR:0319 looting pit 2016 western trench (Locus:100000:008 stone accumulation, Locus:100000:009 brown loamy soil, Locus:100000:010 stone accumulation, Locus:100000:011, Locus:100000:034 accumulation of large stones)	LGR:0303 looting pit northwest (Locus:181909:013 stone accumulation, Locus:181909:009 row of stones, Locus 181909:010 dark brown silty clay; Locus:181909:008 looting pit cut, Locus:100000:003 and Locus:100000:005 stone accumulations in looting pit fill Locus:100000:004)	LGR:0291 reddish soil (Locus:181908:004, Locus:181909:004), LGR:0290 looting pit central (fill: Locus:181908:006, Locus:181909:006, Locus:100000:007, Locus:100000:012, Locus:100000:013, Locus:100000:027, Locus:100000:031, Locus:100000:032, Locus:181909:018, Locus 181909:020 Locus:181909:024; cut: Locus:100000:017, Locus:181908:005, Locus:181909:005, Locus:181909:014, Locus:181909:036); LGR:0297 stone accumulation (Locus:100000:014, Locus:181908:009, Locus:181909:015), LGR:0299 stone accumulation (Locus:100000:015, Locus:181908:010), Locus 181909:035 accumulation of stone slabs and cobblestones, stones layed down in a row: Locus:181909:017, Locus:181909:019, Locus:181909:021	LGR:0305 looting pit northeast (Locus:181909:012 accumulation of stones, Locus:181909:016 dark brown clayey-silty soil with some pottery and some pebbles, Locus:181909:029 looting pit cut, Locus:181909:026 moved stone slab with hole, looting pit east Locus:181908:012 pit cut)
GRAVES			Grave 97: Locus:100000:021 disturbed skeleton, Grave 98: Locus:181909:031 remains of articulated feet bones and tibia fibula with C14 355-93 cal BC	
POST MAIN OCCUPATION PERIOD				
END MAIN OCCUPATION PERIOD			remnatns of deposit on brick floor unfortunatly disturbed: LGR:0323 (Locus:181908:014, Locus 181909:038 C14 1001-847 calBC), Locus:100000:019 dark brown clayey-silty soil; Locus 181909:044 and Locus 181909:045 burned mud plaster	
MAIN OCCUPATION PERIOD			?Grave 99: Locus:181908:018 remains of skeleton with C14 1259-1117 calBC?	
CONSTRUCTION FOR MAIN OCCUPATION PERIOD		Locus:100000:025 beaten mud floor	LGR:0292 (Locus:181908:008, Locus:181909:011, Locus:100000:020) and LGR:0324 (181908:019, 181909:039) pavement made of baked bricks, Locus:100000:030 beaten mud floor, LGR:0317 (Locus:100000:033, Locus:181908:016), LGR:0320 (Locus:181908:015, Locus:181909:047), Locus 181909:028 and Locus:181909:037, Locus:181909:040 pilaster bases (?)	
FIRST CONSTRUCTION PHASE FOR MAIN OCCUPATION PERIOD	Locus:100000:028, Locus:100000:029 walls	LGR:0319 (Locus:181909:007, Locus:100000:006) wall, Locus:100000:023 wall with threshold Locus:100000:024, LGR:0363 (Locus:100000:026 and Locus:181909:027) light brown clayey soil with pebbles substructure	LGR:0319 (Locus:181909:007, Locus:100000:006) northern wall, LGR:0321 (Locus:181908:021, Locus 181909:023) eastern wall with Locus:181909:022 threshold; LGR:0329 (Locus:100000:016, Locus:181908:007) southern wall, Locus:100000:029 western wall; LGR:0325 (Locus:181909:034, Locus:181908:017), Locus:181908:020, Locus:181909:041, Locus:181909:042 and Locus:181909:043 pebble foundations; Locus:181909:046 burned clay	LGR:0321 (Locus 181909:023, Locus:181908:021) wall with Locus:181909:022 threshold, Locus:181909:030 and Locus:181909:032 walls
older				
VIRGIN	Locus:100000:022		LGR:0322 (Locus:181908:011, Locus 181909:033)	Locus:181909:025

Table D2: Stratigraphic table of QID. Prepared by F. Janoscha Kreppner.

QiD-2	QiD-3	
176909	176904, 176905	
	west	east
Locus:176909:001	Locus:176904:001, Locus:176905:001, Locus:177905:001	
Locus:176909:002	LGR:0294 (Locus:176904:002, Locus:176904:022, Locus:176904:024, Locus:176904:031, Locus:176904:035, Locus:176905:002, Locus:176905:008, Locus:176905:014, Locus:176905:016, Locus:176905:023, Locus:177905:002)	
	Locus:176904:004 sounding	Locus:176904:011, Locus 176904:029, Locus:177905:005 soundings
LGR:0306 dark brown soil (Locus:176909:003, Locus:176909:006, Locus:176909:008, Locus:176909:020, Locus:176909:022, Locus:176909:024, Locus:176909:026, Locus 176909:027, LGR:0309 embedded stones (Locus 176909:007, Locus:176909:025) LGR:0307 light brown soil (Locus:176909:004, Locus:176909:023, Locus:176909:029, Locus:176909:030)	LGR:0293 brownish-greyish clayey soil (Locus:176904:005, Locus:176904:006, Locus:176904:008, Locus:176904:014, Locus:176904:025, Locus:176904:026, Locus:176904:027, Locus:176904:028, Locus:176904:033, Locus:176904:037, Locus:176905:004, Locus:176905:029), Locus:176905:009 dark brown soil, Locus:176905:029 dark brown soil, Locus 177905:003 disturbed pebble stone layer, Locus:176904:042 stone collapse	
LGR:0310 reddish-brown soil (Locus:176909:005, Locus:176909:010, Locus:176909:011, Locus:176909:033) LGR:0313 reddish brown soil (Locus:176909:013, Locus:176909:035), Locus:176909:021 soft dark grey soil		
Locus 176909:031 brown clayey soil with pebbles	LGR:0295 brown clayey soil with medium amount of small pebbles and some pottery (Locus:176904:009, Locus:176904:018, Locus:176904:023, Locus:176904:032, Locus:176905:005, Locus 176905:019) greyish brown soil, pottery and small pebbles	LGR:0301 greyish brown soil with high amount of pebbles, pottery and very few spots of burned material (Locus:176904:036, Locus:176904:038)
LGR:0314 surface of glacis (Locus:176909:012, Locus:176909:028, Locus:176909:032, Locus:176909:036) LGR:0312 package of floors of mud and pebbles (Locus:176909:009, Locus:176909:014, Locus:176909:016, Locus:176909:034, Locus:176909:037, Locus:176909:038, Locus:176909:039, Locus:176909:040, Locus:176909:041, Locus:176909:042, Locus:176909:043) Locus:176909:017 brown soil with small pebbles, Locus:176909:015 grey clayey soil with pottery		youngest floors: Locus 176904:039, Locus:176905:036, Locus:177905:004 mud and pebble floors, floor packages: Locus:176904:043 floor package, Locus:176904:046 silty reddish soil, Locus:176904:047 reddish soil with pebbles, Locus:176905:025 stone stepping, Locus:176905:015, Locus:176905:017, Locus:176905:018, Locus 176905:020, Locus:176905:024, Locus:176905:027, Locus:176905:028, Locus:176905:032 floor packages, Locus:176905:031 C14 1043-850 calBC
Locus:176909:018 floor with somes stones, Locus:176909:044 beaten mud floor	LGR:0300 pebble floor (Locus:176904:015, Locus:176904:021, Locus:176904:040, Locus:176905:011, Locus:176905:039)	oldest floors: Locus:176904:048, Locus:176905:033 mud and pebble floors
	Locus:176904:044 (west of wall) and LGR:0330 (east of wall) red soil as floor substructure (Locus:176904:013, Locus:176904:020, Locus:176904:045, Locus:176905:030), LGR:0316 dark brown clay covering wall (Locus:176904:010, Locus:176904:019, Locus:176904:034, Locus:176904:041, Locus:176905:006, Locus:176905:007, Locus:176905:010, Locus:176905:012, Locus:176905:013, Locus 176905:021, Locus:176905:022, Locus:176905:026, Locus:176905:037), LGR:0304 wall (Locus:176904:003, Locus:176905:003), LGR:0298 brown soil fill of foundation pit (Locus:176904:017, Locus:176904:030), Locus:176904:016 cut of foundation pit	
Locus:176909:019 light brown soil		
	Locus:176904:007	Locus:176905:035

Table D2 (continued): Stratigraphic table of QID. Prepared by F. Janoscha Kreppner.

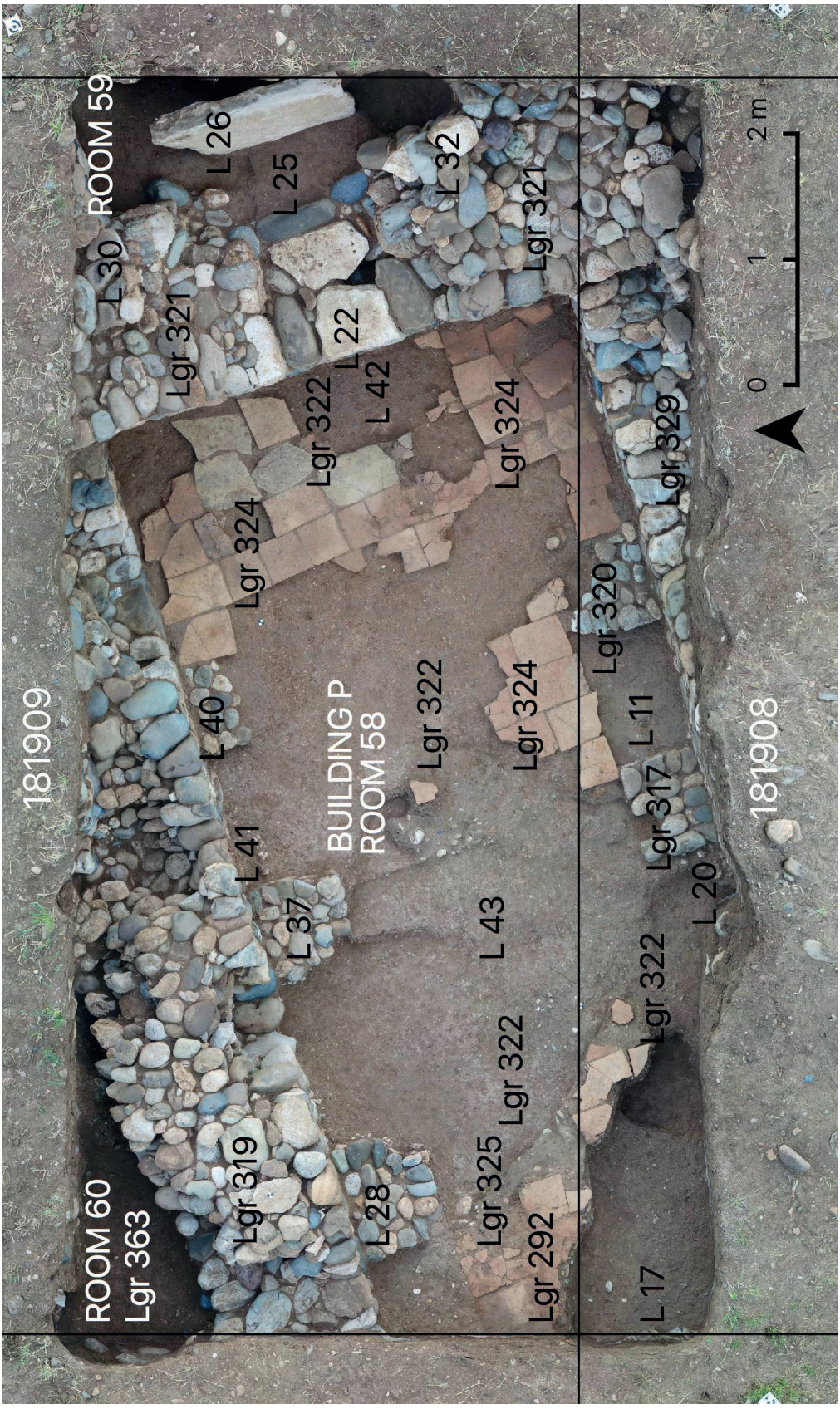

Fig. D6: Orthophoto of the trench QID1. Prepared by Andrea Squitieri.

Fig. D7: Plan combining the results of the 2016 and 2018 excavations, showing the Main Occupation Period architecture. Prepared by Jens Rohde.

ticularly fragmentary ivory objects and metal arrowheads (**§1.1.4**; **§H**). Unfortunately, the entire area of QID1 was severely damaged in recent years by looting and several pits have been dug down all the way to virgin soil, causing damage to the walls of Building P and mixing up modern and ancient material within the fills.

D3.1.1 Room 58

Room 58 is a large space of about 4 × 8 m (**Figs. D6-D8**). When excavating the 2016 trench, parts of the room's northern and southern walls were uncovered, plus a portion of the room's paved floor. The 2018 excavation reached both the room's eastern wall and the monumental entrance that connects this room to Room 59 on the east. As already observed in 2016, the entire area had been heavily looted in recent times (the looting pits are discussed below, **§D3.3**).

The stratigraphic sequence of Room 58 starts with the virgin soil LGR:0322 (Locus:181908:011, Locus:181909:033), which we reached in several spots underneath the room. It is a reddish, clayey soil with some pebbles, matching what had been identified as the virgin soil in 2016 (Locus:100000:022). Right above the virgin soil, we reached in several places a layer of about 40 cm, labelled LGR:0325 (Locus:181909:034, Locus:181908:017), Locus:181909:041, Locus:181909:042, Locus:181909:043, and Locus:181908:020. This consists of a greyish, clayey soil, mixed with pebbles and sherds (**Fig. D9**). We interpret this as a levelling layer laid down before the construction of the walls and the floor, in order to create a level construction surface. A similar levelling layer (LGR:0363) had been found under Room 60 in 2016.

Fig. D8: View of Room 58, as seen from the west. Photo by Jean-Jacques Herr.

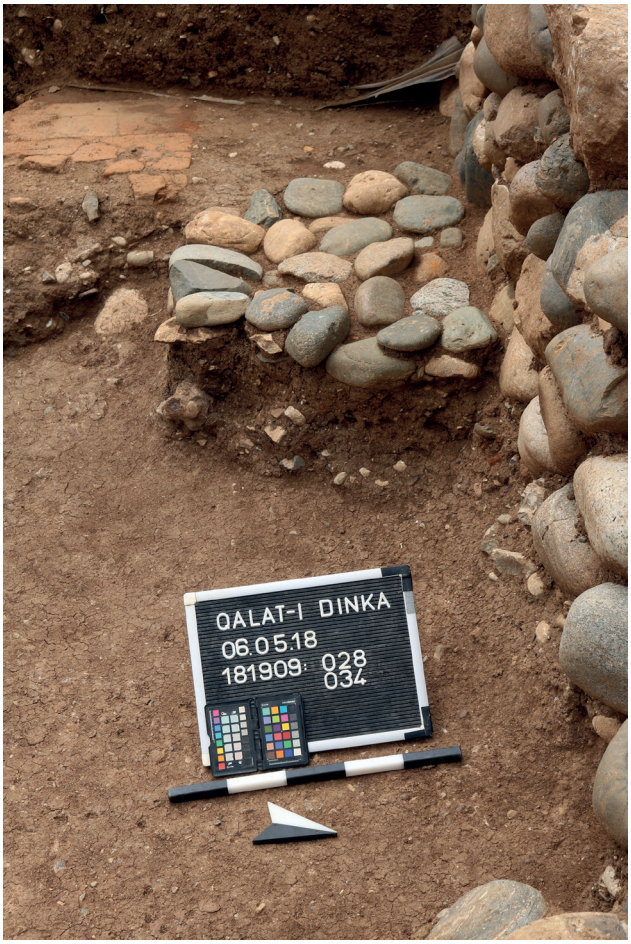

Fig. D9: LGR:0325, a substructure layer with pebbles under one of the pilasters of Room 58. Photo by Jean-Jacques Herr.

D3.1.1.1 The walls and the monumental doorway

The northern wall of Room 58, LGR:0319 (Locus:181909:007, Locus:100000:006; **Fig. D10**), is about 1.40 m wide. On its western end, it was constructed over the already discussed levelling layer (LGR:0325) while on its eastern side, it was built directly on virgin soil.

The best-preserved section of the wall is about 90 cm high, with 5-6 courses of cobblestones. This is assumed

to be the original height of the wall because there is no evidence for any additional courses. There survives no evidence for any kind of suprastructure made of mud bricks, pisé, or baked bricks. On the east, wall LGR:0319 connects with wall LGR:0321 (Locus:181908:021, Locus:181909:023; **Fig. D11**), whose stone structure is higher by about 34 cm. Both walls are made with 30-45 cm long cobblestones that are set perpendicularly to the wall alignment and encase a core of smaller stones with a diameter of about 10-25 cm. No mortar was observed between the stones during excavation. The top courses of both walls were composed of larger, flat stones, a technique that would have facilitated the building up of the wall suprastructure. The southern face of wall LGR:0319 was apparently plastered with mud, because some remains of burned clay (Locus:181909:044) adhered to the wall face when it was excavated (**Fig. D12**).

The southern wall of Room 58 (LGR:0329: Locus:181908:007, Locus:100000:016; **Fig. D13**) is made with the same technique as the northern wall. Its southern face, located under the southern baulk, has not been uncovered, but it can be assumed that the wall's total width is around 1.40-1.50 m. Similar to the northern wall, its preserved elevation is 90 cm. On the east, it connects to wall LGR:0321, which is again higher by about 40 cm.

Due to their differences in elevation, the three walls of Room 58 form a sort of stepped structure with the preserved top of the northern and southern walls being significantly lower than the eastern wall. We cannot say whether the walls' superstructure mirrored this difference in height or whether they all reached the same height. But it is entirely possible that the roof of Room 58 was

Fig. D10: LGR:0319, the northern wall of Room 58. Photo by Jean-Jacques Herr.

Fig. D11: The northern wall (LGR:0319) of Room 58 connecting with the eastern wall (LGR:0321). Note the difference in height between the two walls. Photo by Jean-Jacques Herr.

Fig. D12: Locus:181909:044, the burnt clay feature attached to the northern wall of Room 58. Photo by Jean-Jacques Herr.

Fig. D13: LGR:0329, the southern wall of Room 58. Photo by Jean-Jacques Herr.

Fig. D14: LGR:0321, the eastern wall of Room 58 with the threshold (Locus:181909:022) in the centre. As seen from the north. Photo by Jean-Jacques Herr.

lower than the roof of Room 59 to its east, thus creating a stepped building structure to manage the slope of the hill.

The eastern wall of Room 58, LGR:0321 (Locus:181908:021; Locus:181909:023), shares the same building technique as the other two walls (Figs. **D14-D15**). It is preserved to a height of about 1.33 m, corresponding to nine courses of stones. It is built in part directly on the virgin

Fig. D15: LGR:0321, the eastern wall of Room 58 with the threshold (Locus:181909:022) in the centre. As seen from the west. Note the square hole within the wall, just to the right of the threshold stone. Photo by Jean-Jacques Herr.

Fig. D16: Detail of LGR:0321, the eastern wall of Room 58, with the square hole next to the threshold stone, and the paved brick floor. Photo by Jean-Jacques Herr.

soil (LGR:0322), and in part on a pebble foundation (Locus:181909:042). It is 1.60 m wide, which makes it the widest wall hitherto unearthed in this excavation area.

A large doorway (1.20 wide, 1.15 m long, and 90 cm deep) sits in the middle of this wall, just above the floor level of Room 58. The threshold is formed by two elongated cobblestones, about 65 cm long, that are placed longitudinally along both the edges of the passage. These stones enclose two flat stone slabs of about 60 × 57 × 20 cm that appear to be quarried blocks of white limestone as they are very different from the naturally shaped cobblestones. To the east, these two slabs are bordered by a third elongated cobblestone.

Because the threshold is 90 cm higher than the floor level, a flight of stairs would have been required to access Room 58. Right below the cobblestone bordering the threshold to the south, there is an empty space accessible through a square hole of 20 × 11 cm, located on the western face of the wall (**Fig. D16**). This may possibly be the

socket for a now lost, horizontally placed wooden beam that supported a now lost wooden staircase providing access to the doorway. On the floor (cf. **§3.1.1.3**), about 1.22 cm west of the doorway, there is a brick with a very regular circular hole with a diameter of about 30 cm, and this may be a second socket that once supported a vertical pole. This pole and the horizontal beam would have formed the frame of the staircase.

D3.1.1.2 The pilasters

The walls of Room 58 feature at regular intervals five square pilasters (**Figs. D6**, **D10**, **D17**), which were partially damaged by looting. Three of these pilasters project from the northern wall and two from the southern wall. Starting in the northwest and going clockwise, these pilasters are labelled Locus:181909:028, Locus:181909:037, Locus:181909:040, LGR:0320 and LGR:0317.

As the northern and southern walls have not yet been excavated along their entire length, it is possible that more such pilasters exist towards the west. Despite the looting damages, the original dimensions of the pilasters are known as with the exception of Locus:181909:040, all pilasters have at least one undamaged corner. The pilasters extended about 70 cm away from the wall and are about 90 cm wide. They rest on a pebble foundation and are made of 2-3 courses of flat stones of a length of approximately 10-20 cm. No indication is available in regard to their suprastructure. If this existed at all, it may have been made of wood or beaten earth as no evidence for baked bricks has been found. Alternatively, the pilasters may have served as the support for some wooden structure, e.g. a bench or shelving that connected them.

Fig. D17: Two pilaster bases projecting from the northern wall of Room 58. Photo by Jean-Jacques Herr.

Fig. D18: Detail photo of the floor LGR:0324 of Room 58. Photo by Jean-Jacques Herr.

D3.1.1.3 The floor

The floor of Room 58, labelled LGR:0292 (Locus:181908:008, Locus:181909:011, Locus:100000:020) and LGR:0324 (Locus:181908:019, Locus:181909:039), was paved with bricks, set either on a pebble foundation or directly on the virgin soil (**Figs. D8**, **D18**). Their size is 55-60 × 33-35 × 3.5-4 cm. In the northeastern corner of the room, the bricks are interspersed with stone slabs of the same size and shape as the bricks. In several spots, the floor was found either intact or only partially damaged by looting activity. But in many other places, the bricks had been completely destroyed and dislocated by looters. For this reason, we recovered very many brick fragments, totaling more than 100 kg, within the room's fill. In total, 6 m² of paved floor were uncovered from the total exposed room surface of 27 m². Therefore, only about 20 % of the original floor have been preserved. The shape and size of the bricks match those found in Gird-i Bazar where they were used to partially pave Courtyard 18[38].

In the eastern part of the room, where the floor was better preserved, a thin layer made of dark brown silty-clayey soil, LGR:0323 (Locus:181908:014, Locus:181909:038), was excavated right above the floor (**Fig. D19**). This layer is interpreted as marking the end of occupation of the floor, even though it was heavily contaminated by looting activity. Nevertheless, some finds were collected within this layer, namely several fragmentary ivory objects (some with decorative motifs), earrings, and beads (**§H**). Only a few pottery sherds have been recovered, but no complete vessels. These sherds share the same forms and techniques as the pottery from Gird-i Bazar and DLT2, which allows us to assign the floor to the same chronological horizon as the occupation found in these two operations (**§G1**). A charcoal sample was collected from right above

38 Bartl 2018, Fig. D43.

Fig. D19: The layer LGR:0323, situated just above the easternmost portion of the paved floor of Room 58. In the centre of the photo, note the looting pits damaging the room's fill and floor. Photo by Jean-Jacques Herr.

Fig. D20: The fill of Room 58, with several looting pits and stone accumulations left behind by looters. Photo by Jean-Jacques Herr.

the floor, and radiocarbon analysis produced a date range of 1001-891 calBC (85.9 % probability; **Fig. D5a**). This date range fits the date ranges obtained from ^{14}C samples recovered from the Lower Town at Gird-i Bazar and DLT2, thus indicating that the use of Building P falls into the same chronological horizon as that of the structures unearthed in the Lower Town.

D3.1.1.4 The fill

The fill of Room 58 was damaged by several looting pits dug in recent times. In between the pit cuts, some parts of the room's fill, consisting of a reddish, silty soil, could be distinguished from the pits' fills, which are darker. The room's fill, however, showed signs of heavy contamination from the looting activities, as it yielded a mix of modern and ancient material. The first included fragments of plastic, aluminum and metal, left behind by the looters. The ancient material included pottery (of the same type as Gird-i Bazar: **§G1**), fragmentary ivory objects, earrings and beads (**§H**) as well as a large quantity of fragmented bricks that originate from the destruction of the paved floor of the room.

Another peculiarity of this fill is that it yielded a large quantity of loose and fragmentary human and animal bones. The exact origin of the human bones cannot be established with certainty because of the destructive looting activity, which destroyed any evidence of burials. The stones that were frequently encountered in the room's fill may well have come from the architecture of these burials (**Fig. D20**). While we have not sampled any of these human remains for ^{14}C analysis, Grave 99, which was found in the northern section of the trench (**§D3.2.2**), was radiocarbon dated to the late Achaemenid to early Parthian period with a date range of 355-93 calBC (95.4 % probability, with 355-291 calBC at 27.1 % and 232-93 calBC at 68.2 %; **§D2.1**). All this suggests the presence of a late cemetery in this area, to which the loose bones found in the room's fill once belonged. The skeletons of Locus:100000:021 (**§D3.2.3**) likely also belong to this late period cemetery.

D3.1.2 Room 59

Room 59 is located in the eastern portion of the trench, east of wall LGR:0321. It is connected to Room 58 via the large and monumental doorway Locus:181909:022 (**§D.3.1.1.1**; **Figs. D6-D7**, **D21**). Only a portion of this room has been excavated so far.

The walls of Room 59 rest on the virgin soil (Locus: 181909:025). To the north, the room is limited by wall Locus:181909:030, and in the south by wall Locus:181909:032. Both walls have not yet been completely excavated. The building technique used is the same as that used in Room 58. The northern wall Locus:181909:030 is made of 4-5 courses preserved to a height of about 80 cm. It is higher than wall LGR:0321, to which it connects at its lower part. The southern wall Locus:181909:032 has a preserved height of 70 cm and is heavily damaged, either from ploughing or looting. On its lower part, it, too, connects to the lower, western wall LGR:0321.

Both the northern and southern walls of Room 59 are higher than the stone wall LGR:0321, which in turn is higher than the walls of Room 58 to the west (**§D.3.1.1.1**). This may indicate that Building P had a stepped architectural design, which may have been required to manage the slope of Qalat-i Dinka.

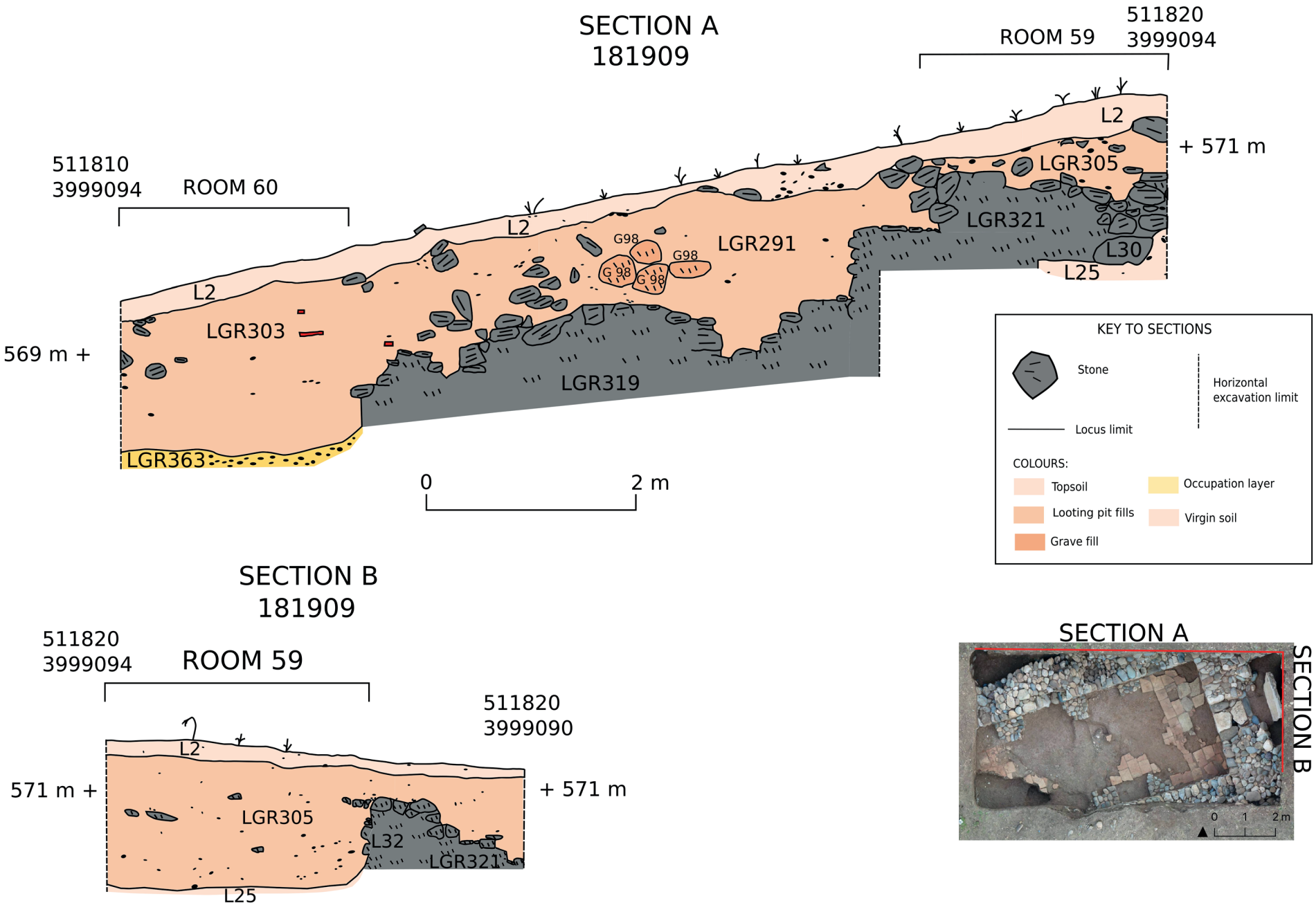

Fig. D21: The northern section (Section A) and the eastern section (Section B) of QID1. Prepared by Andrea Squitieri and Nikola Wenner, based on field drawings by Jean-Jacques Herr.

In Room 59, we found a large, quarried slab of limestone (Locus:181909:026) that measures 1.55 × 1.27 × 0.14 m and is of almost rectangular shape (**Figs. D22-D23**); it was not found in situ but leaned against the monumental threshold Locus:181909:022 (as shown in **Fig. D22**). Looters had clearly lifted the slab from its original position. For safety reasons, we lifted and placed it against the eastern baulk of the trench (as shown in **Figs. D6** and **D23**). The eastern-facing side of the stone slab was relatively carelessly finished, and its rough surface shows several tool marks. On this side, roughly in the middle of the northern edge of the stone slab, there is a semicircular perforation of a width of ca. 19 cm. The opposite side of the stone slab is smoother, perhaps because it was meant to be visible. On this side, towards one corner, there is a well shaped circular cavity that may have served for holding the pivot of a door. Because of its size, it is unlikely that this large stone slab belonged to the threshold Locus:181909:022 connecting Room 58 and Room 59. We rather think that it constituted part of another doorway of Room 59, located most probably to the east.

Fig. D22: The stone slab Locus:181909:026, found in secondary position in Room 59. Photo by Jean-Jacques Herr.

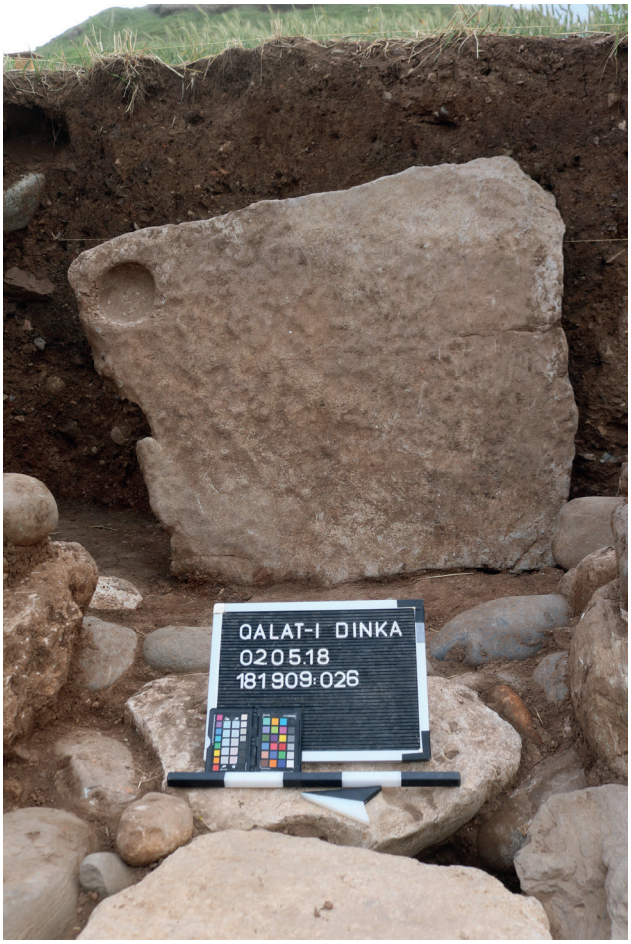

Fig. D23: The stone slab Locus:181909:026, after it had been moved to lean against the eastern section. Note the circular cavity likely used as a socket. Photo by Jean-Jacques Herr.

D3.1.3 Room 60

Room 60 is a space located in the northwestern part of the trench, only partially uncovered in 2016 and 2018 (**Figs. D6-D7**, **D21**). The lowest layer reached during excavation is a pebble substructure which was laid down as a foundation layer for the wall, labelled LGR:0363 (Locus:100000:026, Locus:181909:027). The room is bordered by wall LGR:0319 (Locus:181909:007, Locus:100000:006) to the south. The other limits of the room are still unknown, although another wall, called Locus:100000:023, was uncovered to the north in the 2016 trench. This wall may well represent part of the northern limit of Room 60, but this will have to be confirmed. The room fill has been heavily compromised by the looting pits (labelled LGR:0303).

D3.2 The burials

Kathleen Downey

D3.2.1 Grave 98: part of a late first millennium BC cemetery

Above the Iron Age structures of QID1, the stratigraphic sequence of the trench continues with some human remains found sticking out of the northern section of the trench. Grave 98 was indicated by a concentration of bones about 50-60 cm under the topsoil, and above wall LGR:0319 (**Figs. D21**, **D24**). Initial cleaning revealed at least one articulated human foot present below and to the west of the stone, as well as some human long bones. Once the stone was removed, it was possible to see that there were two sets of the lower leg with the left tibia and

Fig. D24: Grave 98, with some stones above human remains that stick out from the northern section of QID1, above the wall of Room 58. Photo by Jean-Jacques Herr.

Fig. D25: The remains of the skeleton of Grave 99, found in between two pilaster bases projecting from the southern wall of Room 58. Photo by Jean-Jacques Herr.

Fig. D26: Detail of Grave 99, with the remains of the cranium in foreground. Photo by Jean-Jacques Herr.

fibula on top articulated with the talus – the bone that creates the ankle joint with the tibia. Based on the legs and feet, the individual was most likely laid on their right side with their head in the southeast, facing east, and the feet placed to the northwest. The right distal tibia and fibula were slightly pushed out of articulation with the talus. They appear to have moved together from articulation with the ankle; it is possible that the stone on top caused this shift while the body was still fairly fresh although this is not certain. The fractures to both bones of the right lower leg appear to have occurred post-mortem, after the body had skeletonized and the bone had dried out, losing collagen. The excavation of Grave 98 was not continued because the human remains extended under the northern baulk. Consequently, it is not possible to say what type of burial this grave was, and whether there was any grave architecture.

All of the long bones were heavily fractured. Despite this, a large fragment of the left fibular shaft was selected for sampling and radiocarbon dated to a date range of 355-93 calBC (95.4 % probability, with 355-291 calBC at 27.1 % and 232-93 calBC at 68.2 %; **Fig. D5d**). This date range covers a time span ranging from the very end of the Achaemenid era to the early Parthian period. The date is relevant because it is the first evidence for an occupation of Qalat-i Dinka at some time between the late Achaemenid to early Parthian period. It is tempting to assign at least some of the many loose human bones found in the fill of Room 58 **(§D3.1.1.4)**, which derived from graves irremediably damaged by looting, to the same chronological horizon as Grave 98. If we also add the undated skeletons of Locus:100000:021 (**§D3.2.3**), then we could tentatively postulate that this area of Qalat-i Dinka may have hosted a cemetery in the late first millennium BC. A metal bracelet found in 2016[39] in a looting pit in Room 58 can be stylistically attributed to the Achaemenid period, and therefore provides further evidence for the presence of a late first millennium BC cemetery in QID1, above the Iron Age structures of Building P. Further investigations in this area are needed to confirm this hypothesis.

D3.2.2 Grave 99: an Iron Age burial

Between the two pilasters projecting from the southern wall of Room 58 (LGR:0317 and LGR:0320), a human cranium was identified under two stones, and some assorted bones were visible to the west of the cranium (**Figs. D25-D26**). Most of these human remains laid directly on the virgin soil in the space where no floor brick was present. Some of the bones, however, extended onto part of the brick close to the pilaster LGR:0317. These remains

39 Kreppner/Squitieri 2017a, 54-55 with Fig. C24 (PPP 1000000:005:003).

were registered as Grave 99. To the southeast of the cranium there were fragments (PPP 181908:018:008) of what was identified through archaeometric analyses as Egyptian Faience (sintered-quartz ceramic), painted with a synthetic pigment known as "Naples Yellow" (**§G3**). Also a few sherds of a Gird-i Bazar-type ceramic pot (TechP 6a) were retrieved (**§G1**).

The cranium was resting on the basicranium, or base, with the face pointing northwest, away from the rest of the human remains. After some cleaning of the cranium in situ, radiating ante- or peri-mortem fractures became visible. The angle of the crushing and the movement of the fractures would be consistent with having been caused by the stone that was found resting above the cranium (**Fig. D27**), but this is not certain. Regardless, that type of

Fig. D27: Detail of the cranium found under a stone of Grave 99. Photo by Kathleen Downey.

fracture must have occurred while the body was still fairly fresh, and a large portion of collagen remained in the bones of the cranial vault. Photographs of the fractures were taken before the stones were removed, as a precaution in case that their removal would cause the cranium to collapse.

Once the stones were removed we continued to excavate the dark brown clay surrounding the bones. The grave matrix came out or peeled off in chunks, especially due to the wet weather during excavation, and was clearly distinguishable from the more orange coloured virgin soil. The darker soil of the grave matrix followed a gentle slope downward to the west. Under the second stone to the south of the cranium more sherds were found that belonged to the already mentioned pot. The sherd farthest to the west was pressed directly on the lateral portion of the distal end of a left humerus, which ran directly west. The pressure of the pot, or the weight of the matrix above the pottery sherd, caused a circular crushing fracture to the distal bone below. Like the fractures to the cranium, this type of fracture is consistent with an injury that occurred ante- or peri-mortem when the bone was still relatively fresh and contained a significant proportion of its original collagen.

Along the western edge, against the northern extent of the pilaster base, a radius and ulna lay on top of each other in what appeared to be an articulated arrangement. They were rotated so that they crossed each other, with the proximal end to the south and the distal end to the north. If the carpals, or wrist, had been present they would have been resting on the baked brick surface rather than on the brown grave matrix. Fragments of two scapula were found directly west of the cranium, in the centre part of the burial. One first metatarsal was also found directly to the north of the cranium.

To the south of the burial along the wall, the remains of the right hand were unearthed, clutching a conical pottery fragment (PPP 181908:018:010; **§G1**). The metacarpals and phalanges were directly on the ceramic in articulation with the fingers curled around to the west and going under the object (**Fig. D28**). It is not possible that this section of the grave was disturbed after deposition. The

Fig. D28: The conical-shaped pottery fragment PPP 181908:018:010, enclosed in the hand of the skeleton of Grave 99. Photo by Kathleen Downey.

remnants of both feet were found underneath and slightly to the west of the left phalanges with three metatarsals in articulation. Some other bones of the foot were present and quite close, which is consistent with movement of skeletal extremities after decomposition in undisturbed burials.

In the centre of the burial there was a dark brown organic material that at first appeared to be burned clay. This organic material also cut through a lower level that contained a white loose substance, which appeared to be degraded stone. It then extended deeper into the virgin soil in a conical shape, indicating that it was probably the remains of a root. A bronze earring (PPP 181908:018:005; **§H**, no. 7) was found directly next to the left temporal bone (north of the cranium), positioned exactly where the soft tissue of the ear would have been. Two red beads (PPP 181908:018:006; PPP 181908:018:015) and one tiny blue bead (PPP 181908:018:013) were found in the northwestern area of the burial (**§H**, nos. 13-15). A small, disc-shaped, white bead (PPP 181908:018:007; **§H**, no. 4) was found south of the cranium.

The individual is judged to be female based on its vertical forehead, relatively small mastoid process, and sharp orbital margins. Four molar teeth with wear were the only features preserved to assist in aging the individual more specifically than "adult". Based on the occlusal wear, the individual is estimated to have been 30+ years of age. An in situ measurement of the left humerus was the only data that could be collected to estimate stature, and based on this one measurement the individual was relatively tall at 168.85 cm ± 4.45 cm. The right maxilla with the first and third molars were selected for sampling.

One of the molars was radiocarbon dated to the date range of 1234-1117 calBC (92.8 % probability; **Fig. D5c**). This means that these human remains belong to the Iron Age, the same chronological horizon as the Main Occupation Period of the Dinka Settlement Complex. On the other hand, their stratigraphic relationship to the floor of Room 58 is difficult to ascertain, because the entire area was heavily looted in modern times, and the entire room's fill was heavily disturbed. Hence, it is not entirely clear whether these remains were still in situ, thus constituting a proper burial, or whether they were somehow moved during the looting process. The same applies to the finds collected close to the skeleton. Were they part of the grave furniture? Did they originate from the disturbed room's fill? Or, were they a combination of both? Although the analysis of the bone fractures points at a partial in situ preservation of at least some of the bones, caution is needed in the interpretation of the stratigraphy of these remains and their relation to the floor.

D3.2.3 Update to the 2016 excavations: skeletons from Room 58

In 2016, a concentration of human bones encountered above the paved floor in the westernmost part of Room 58 was collected as Locus:100000:021. Some of the bones appeared articulated, but overall the deposit was heavily damaged and desturbed by modern looting activity. Analysis of this human material was conducted in spring 2018 and determined that the collection had an MNI (minimum number of individuals) of three people.

Based on the examination of the dentition, there were three distinct individuals. An older juvenile/young adult individual, aged 16-20 years, is represented by unworn molars with roots that are not fully developed. A young adult, roughly between 20-30 years of age, is represented by both mandibular and maxillary molars that are relatively unworn. The third individual was identified by more heavily worn maxillary molars and is roughly estimated to have been 30+ years of age at the time of death. An assignation to a more specific age group of either middle adult (30-40 years) or old adult (40+ years) is impossible because only a few teeth were available for analysis. Both adults had maxillary second molars present with substantial differences in wear. This is another indication that the teeth belonged to two separate individuals, although they were from different sides of the mouth. Autopsy of photographs taken during excavation in 2016 of a pair of semi-articulated legs indicate that the individual in question was an adult.

One tooth from each of the adult individuals was selected for radiocarbon dating; however, neither contained enough collagene to allow dating. We are therefore not able to determine the period to which these skeletons date although the assumption that they are contemporaneous with Grave 98 is likely (**§D3.2.1**).

D3.3 The looting pits and the topsoil

Jean-Jacques Herr

During the excavation of Room 58's fill LGR:0291 (**Fig. D20**) (Locus:181908:004, Locus:181909:004), several pit cuts were identified, as well as stones accumulated during looting. In 2016, a biscuit package with a manufacturing date of 1999 and an expiry date of 2000 was found in one of these looting pits (Locus:10000:004)[40], which suggested a date of at least one looting event in the years 1999-

40 Kreppner/Squitieri 2017a, 48.

2000. The looting pits and stone accumulations found across QID1 were registered as LGR:0290[41], LGR:0297 (Locus:100000:014, Locus:181908:009, Locus:181909:015), LGR:0299 (Locus: 100000:015, Locus:181908:010), Locus 181909:035, Locus:181909:017, Locus: 181909:019, and Locus: 181909:021.

North of the wall LGR:0319, we found another pit cut Locus: 181909:008, which destroyed the wall and the wall's pebble foundation (LGR:0317). The fills of the looting pits damaging Room 58 contained a brown-dark soil, with some ash, as opposed to the room's fill, which tended to be reddish in colour. Nevertheless, the room fill too displayed as many signs of considerable modern contamination as the pit fills; therefore the material found in the room fill cannot be considered reliable for stratigraphic analysis. The modern contamination included several plastic, aluminum and other metal remains which were intermixed with clearly ancient materials such as pottery of the same type as of the Iron Age occupation of Gird-i Bazar (**§G1**), fragmentary ivory items, beads and earrings (**§H1.1**). Overall, the contaminated fills of Room 58 were very rich in small finds from antiquity.

The fill from Room 59 was also disturbed by looting pits. Pit LGR:0305 (Locus:181909:012, Locus:181909:016, Locus:181909:029 cut, Locus:181908:012 pit cut) was dug through to the virgin soil, causing the removal of the large stone slab (Locus:181909:026; **§D3.1.2**; cf. **Fig. D21**). Modern materials, mixed with Iron Age pottery, were recovered from within this pit.

Finally, all of the QID1 structures were covered by topsoil (Locus:181908:002 and Locus:181909:002) with indications of recent ploughing. Some objects that were found in the topsoil can be attributed to the Iron Age period (**§H1.1**).

Fig. D29: Orthophoto of the trench QID2. Prepared by Andrea Squitieri.

Fig. D30: The trench QID2, as seen from the west, with the large sloping stone structure. Photo by Zahra Hashemi.

D4. The excavations in QID2

Zahra Hashemi

The QID2 operation was opened as a 10 × 2 m trench in square 176909, down the slope and about 50 m west of QID1 (**Figs. D4**, **D29-D31**). This particular spot was chosen in order to intercept a feature highlighted in the magnetogram of 2015 (**Fig. D2**) that showed a long, curved line running roughly north to south, which had been interpreted as a possible defensive wall or palisade[42]. The excavation of this trench was quite challenging because of the accumulation of several thick layers of deposit that sloped down from east to west, yielding only a few pottery

41 Fills: Locus:181908:006, Locus:181909:006, Locus:100000:007, Locus:100000:012, Locus:100000:013, Locus:100000:027, Locus: 100000:031, Locus:100000:032, Locus:181909:018, Locus:181909:020 Locus:181909:024. Cuts: Locus:100000:017, Locus:181908:005, Locus:181909:005, Locus:181909:014, Locus:181909:036.

42 Fassbinder/Ašandulesei 2016, Fig. B4.6.

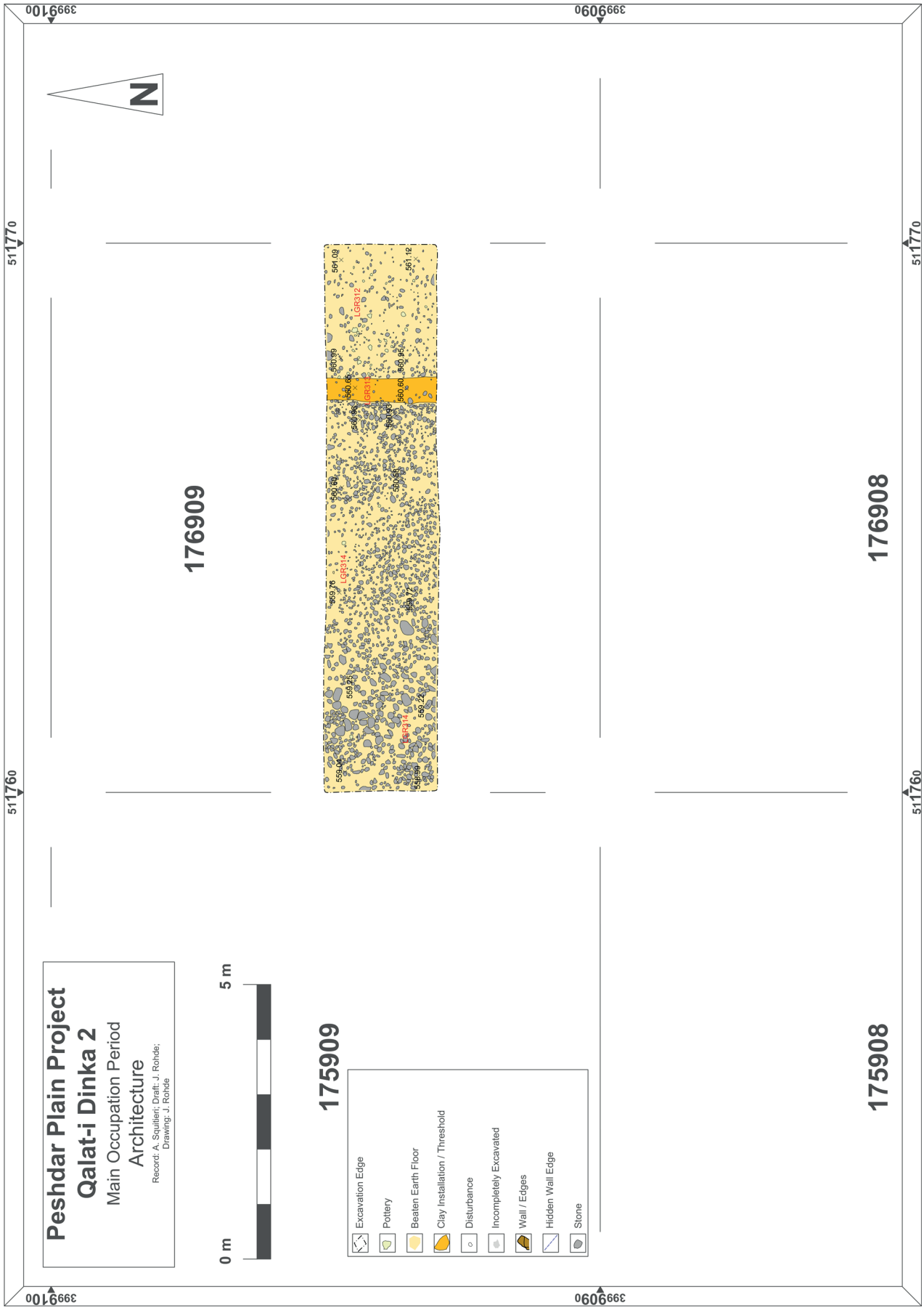

Fig. D31: Plan showing the remains of the Main Occupation Period in trench QID2. Prepared by Jens Rohde.

sherds and no other finds. Therefore, to accelerate the excavation process, it was decided to open two longitudinal soundings, one inside the other, of 10 × 1 m and 10 × 0.5 m respectively, in the southern portion of the trench QID2. Once the relevant archaeological features described below were reached, the soundings were expanded to reach the northern limit of QID2.

The virgin soil was not reached in any part of the trench. The oldest feature uncovered was a massive, 7 m long stone structure extending from the western part of the trench to the east, labelled LGR:0314 (**Figs. D29-D32**). It was not excavated in its entirety as it extends beyond the trench limits to the west, north and south. From the uppermost point of this structure to the lowermost point, the difference in elevation is about 2 m, corresponding to a slope of about 30 %. The absolute elevations above sea level are 560.95 m for the top point and 558.98 m for the low point. The structure is made of small-to-medium sized stones; in the lower part to the west, the stones tended to be 15-25 cm wide while in the middle and upper part they tended to be smaller with a width of about 8 cm (**Figs. D33-D34**).

We interpret this as a glacis, a sloping stone structure with a defensive purpose as commonly found in ancient fortification systems. In the lower part of LGR:0314, the larger stones may have been intentionally placed to support the glacis, or they may have fallen down due to erosion; they could also belong to an older phase of the glacis. As we did not remove the smaller stones in the upper part of the glacis to see if there are bigger stones underneath, the presence of an older phase of the glacis could not be proven.

About 7 m east of the trench's westermost limit, the glacis, after reaching its highest point, gently slopes down eastwards (as can also be seen in the southern section), to ultimately form a flat surface of small stones and pebbles (Locus:176909:018; **Fig. D35**). This surface, excavated only in the southern portion of the trench, may be one of the oldest floors constructed in the east of the glacis. This floor continues to the east as a mud floor (Locus:176909:044). It is light brown-yellowish in colour and most likely the remains of a trodden surface (i.e., a surface formed by people regularly walking over it rather than a properly built floor). The main evidence for the existence of this surface came from a large broken pottery vessel found lying flat on top of it (PPP 176909:015:001; **Fig. D36**).

Underneath the trodden surface (Locus:176909:044), we opened a deep sounding of 1.10 × 0.5 m and a depth of 0.65 m in the southeastern corner of the trench, aiming to reach the virgin soil. A fill (Locus:176909:019) was found in this sounding. No artefact was found in this fill, which could suggest that this was virgin soil. However, while this is possible it is not certain as the soil is clayey and of yellowish colour, which is very different from the reddish virgin soil encountered in the excavation trenches QID1 and QID3.

Right above the glacis and across its entire length, we isolated a thin layer composed of moist, silty soil with some pebbles (Locus:176909:031; **Fig. D32**) that contained animal bones and Gird-i Bazar-type pottery sherds (**§G1**). East of the glacis, and right above the stone floor (Locus:176909:018), we identified another thin layer of yellowish soil with no pottery (Locus:176909:017; **Fig. D32**). Further to the east, above the trodden surface (Locus:176909:044), we identified another thin layer composed of a greyish soil (Locus:176909:015) that contained fragments of the already mentioned large pottery vessel (PPP 176909:015:001). In the east of the glacis, the layers Locus:176909:017 and Locus:176909:015 were covered by an accumulation of trodden surfaces which due to their nature could not be properly separated during the excavation. Characterised by superimposed sequences of flat-lying pottery sherds, this floor accumulation is called LGR:0312 (Locus:176909:016, Locus:176909:014, Locus:176909:043; **Figs. D32**). Apart from pottery, the only find from this accumulation is a basalt whetstone (PPP 176909:042:005, **§H1.2**, no. 14).

To the west, the accumulation of trodden surfaces (LGR:0312) abuts a concave depression with a width of 45 cm and a depth of 30 cm, which is situated right next to the glacis (**Figs. D33**, **D35**). This depression was filled with a light brown, clayey soil with small white particles (LGR:0313: Locus:176909:013, Locus:176909:035). This material most likely filled the depression during the post-occupation phase. Two explanations can be proposed for the cavity itself. It either may have been formed by rainwater running down from the east; or else it was intentionally dug to accommodate the foundations of a now-gone structure. We consider the second option more likely and assume that this depression once accommodated the foundations of a wooden palisade that rose above the glacis.

Above the accumulation of trodden surfaces (LGR:0312) and the concave depression (LGR:0313), a brown-reddish layer rich in pebbles (LGR:0310) slopes down from east to west across the entire trench (**Fig. D32**). Above this fill, there is another layer of light brown soil that extends across the trench and contains small stones (LGR:0307: Locus:176909:023, Locus:176909:004). This is in turn covered by a brown soil rich in small stones (LGR:0306), with a concentration of larger stones in its western part (LGR:0309: Locus:176909:007, Locus:176909:025). This as well as the layers LGR:0310, LGR:0313 and LGR:0307 represent the thick accumulations of alluvial materials mentioned above, which formed during the post-occupation phase.

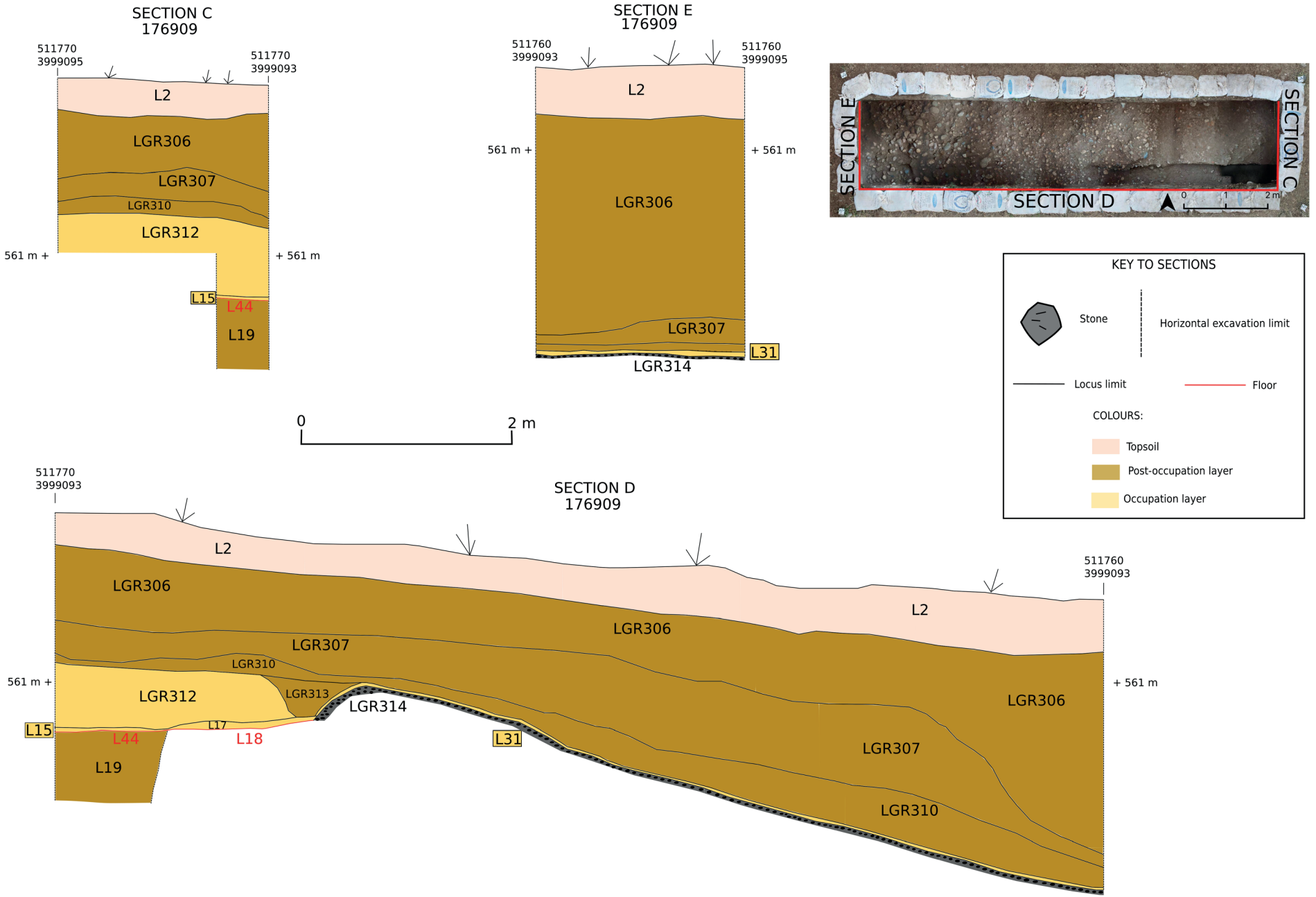

Fig. D32: Sections of QID1: east (section C), south (section D), west (section E). Prepared by Andrea Squitieri and Nikola Wenner, based on field drawings by Zahra Hashemi.

Fig. D33: The concave depression located east of the upper part of the "glacis", and the floor extending east. Photo by Zahra Hashemi.

Fig. D35: Detail of the concave depression and the top of the "glacis". Photo by Zahra Hashemi.

Fig. D34: Detail of the "glacis" LGR:0314 in QID2. Photo by Zahra Hashemi.

Fig. D36: Remains of a large pottery vessel PPP 176909:015: 001, lying flat on the floor. Photo by Zahra Hashemi.

Above all of this lies the topsoil (Locus:176909:002), which formed in more recent times and shows signs of recent ploughing. In contrast to QID1, no evidence of modern contamination such as looting pits or modern materials has been identified in QID2.

D5. The excavations in QID3

Felix Wolter

The trench QID3 was opened 50 m west of QID1 and 50 m south of QID2. Similarly to QID2, it was initially intended to be a 10 × 2 m trench running east-west, designed to intercept the same linear feature visible in the 2015 magnetogram (see above; **Fig. D2**). Therefore, both trenches QID3 and QID2 initially had a similar purpose. However, soon after the excavation of QID3 began, the archaeological features that were being unearthed appeared so different from those in QID2 that it became necessary to expand the trench to the north. Ultimately, QID3 wound up expanding across three squares, namely 176904, 176905, and 177905 (**Figs. D4**, **D37**).

The stratigraphic sequence of QID3 begins at the bottom with the virgin soil, which was reached in two spots: southwest of the "wall" LGR:0304, where it was labelled Locus:176904:007; and to the northeast as Locus:

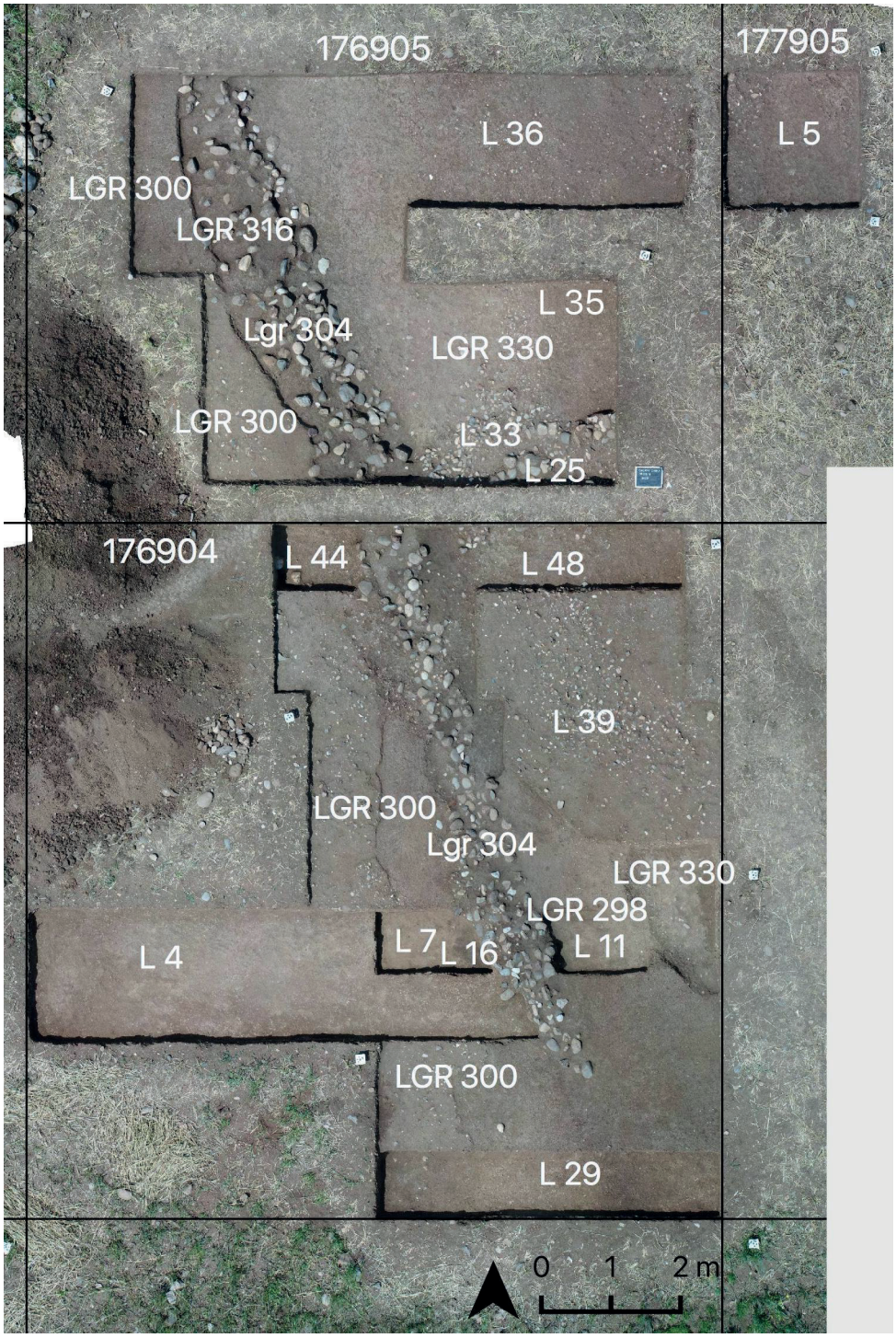

Fig. D37: Orthophoto of the trench QID3. Prepared by Andrea Squitieri.

176905:035 (**Fig. D37**). This soil is of silty consistency, reddish in colour and contains small pebbles and some gravel. The foundation pit (Locus:176904:016) was cut into the virgin soil and filled with a brown clayey soil (LGR:0298), identified in the southern portion of the "wall" LGR:0304. It served as a foundation for the construction of this wall.

The "wall" LGR:0304 runs in NW-SE direction for 15.5 m and represents the main archaeological feature uncovered in QID3 (**Figs. D37-D38**). We extended the trench in order to follow its course northwards. While we were able to identify the structure's southern edge it continues to the north beyond the limit of the excavated area. Its

Fig. D38: The wall LGR:0304 crossing trench QID3, as seen from the north. Photo by Felix Wolter.

preserved width is 40 cm in the southern part of QID3 while its width expands to about 140 cm in the northern part.

LGR:0304 is made of medium-sized stones that are very loosely set and not arranged in courses and rows but held together by a dark, clayey soil that yielded a few small fragments of baked bricks. This type of stone-earth construction is very different from any of the other walls unearthed so far at the Dinka Settlement Complex. This suggests that also the function of LGR:0304 was very different. Its location suggests that this stone-earth structure had a role to play within the overall defensive system of Qalat-i Dinka. The most likely interpretation is that LGR:0304 served to support the base of a now-gone wooden superstructure of protective function, such as a palisade of some considerable height. Also because of LGR:0304's close proximity to the modern surface, no traces that would offer further clues about the assumed superstructure could be observed during excavation.

The alluvium accumulation in this part of the slope was very different from QID2. The top of the stone-earth structure LGR:0304 was unearthed just c. 15 cm below the site surface, whereas in QID2 the first architecture only emerged underneath a metre of alluvial deposit (cf. **§D4**). The erosion phenomena in these two trenches, that are situated just 50 m apart from one another, must have been very different, most likely due to the topography of the terrain which would affect the flow of the rain water.

Right above the "wall" LGR:0304, a thick fill of dark-brown clayey soil was identified and excavated in several loci grouped together as LGR:0316 (**Fig. D39**). This layer may have been connected with the construction phase of LGR:0304, rather than being a post-occupation deposit. This fill may have been intended to cover the stones of LGR:0304 entirely, thus creating a solid base for the erection of the superstructure. As excavated, this layer rises up to about 30 cm higher than the oldest floor level (see below), but it may have been even higher originally.

Before we turn to the floors connected to LGR:0304, we have to mention the floor preparation layer that was identified in two spots: firstly, to the west of the wall: Locus:176904:44; and secondly, to the east of the wall: LGR:0330 (**Fig. D37**). In both cases, the preparation layer for the floor consists of a reddish soil containing some pottery sherds and pebbles.

West of the wall, and along its entire length, floor levels were intercepted in several spots; although these are not connected to each other we assume them with confi-

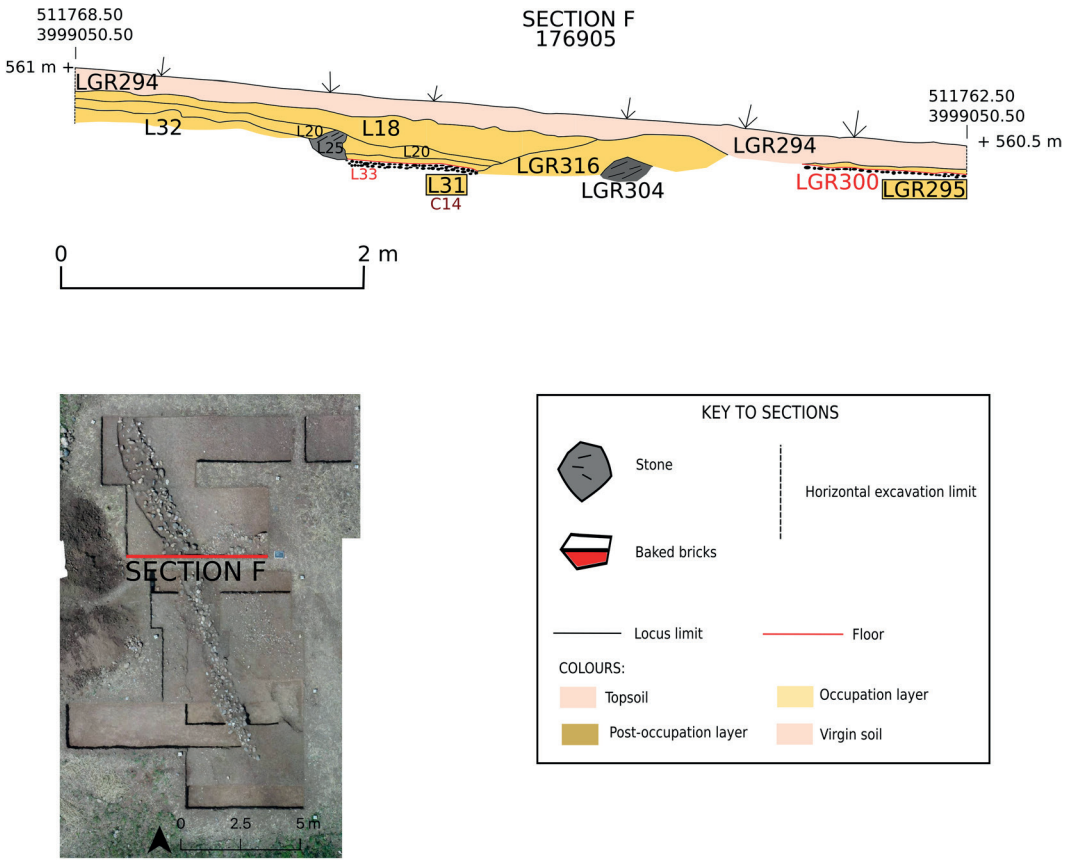

Fig. D39: Section of QID3, showing the main structures found in this trench and the layer from which the charcoal sample (PPP 17695:031:002) was collected for radiocarbon dating. Prepared by Andrea Squitieri and Nikola Wenner, based on field drawings by Felix Wolter.

dence to represent the same floor (LGR:0300). This was a trodden floor formed by small-medium pebbles on which some pottery sherds were found, lying flat (**Fig. D40**). Right above this floor, a clayey deposit with some pottery was identified that represents the end of the Main Occupation Period (LGR:0295: **Fig. D39**).

Corresponding to the pebble floor LGR:0300, two other pebble floors were unearthed to the east of the wall: Locus:176904:048 and 176905:033. These floors were covered by a succession of floor levels characterised by pebbles and mostly flat-laying pottery sherds, to which different locus numbers were assigned[43]. Apart from pottery, the only find coming from this accumulation of walking surfaces is a broken perforated stone tool (PPP 176905:032:004; **§H**, no. 15), of a type known from the Iron Age occupation of Gird-i Bazar. A charcoal sample from Locus:176905:031 was radiocarbon dated to the date range of 1043-893 calBC (91.8 % probability; **Fig. D5b**), a result which fits the chronological horizon of the Main Occupation Period in QID1 as well as of the various excavation areas in the Lower Town of the Dinka Settlement Complex. This allows us to attribute this floor accumulation and the "wall" LGR:0304 to Qalat-i Dinka's Iron Age occupation.

During the excavation of this accumulation of walking surfaces a structure made of medium-sized stones (Locus:176905:025) was identified close to the southeastern corner of square 176905, near the border of the excavated area (**Fig. D41**). The structure's limits could not be clearly defined so its function is not clear, but it may have been part of another building feature that was connected to the "wall" LGR:0304.

The floor accumulations east of the wall were covered by a greyish-brown soil (LGR:0301), likely formed at the end of the Main Occupation Period.

Across the entire trench, and therefore also covering the "wall" LGR:0304, there were several layers of deposits (LGR:0293) formed in the Post-Occupation Phase

43 Locus:176904:039, Locus:176905:036, Locus:177905:004, Locus:176904: 043, Locus:176904:046, Locus:176904:047, Locus:176905:015, Locus:176905:017, Locus:176905:018, Locus:176905:020, Locus:176905:024, Locus:176905:027, Locus:176905:028, Locus:176905:032 and Locus:176905:031.

Fig. D40: Trodden floor with pebbles, west of the wall LGR:0304. Photo by Felix Wolter.

Fig. D41: Locus:176905:025, the stepped stone structure. Photo by Felix Wolter.

(**Fig. D39**). Layer LGR:0293 was covered by the topsoil (LGR:0294), which formed in more recent years and bears traces of ploughing. A metal earring (PPP 176904:002:005) and a perforated stone tool (PPP 176904:002:004) were retrieved from the topsoil and are likely of Iron Age date (**§H1.2**, nos. 16-17). Just like in QID2 and unlike in QID1, no substantial signs of modern contamination (e.g., looting pits, modern materials) were found in QID3.

D6. Preliminary conclusions

Karen Radner

The 2016 and 2018 results of the excavations on Qalat-i Dinka suggest that we are dealing with a well defended citadel where an elite segment of the population of the Dinka Settlement Complex resided. The fill within the monumental Building P yielded fragments of ivory objects (including some decorated with a guilloche motif), iron arrowheads of an Iron Age type well-attested in Northern Mesopotamia and Western Iran, and Egyptian Blue beads. There are no counterparts for any of these items among the finds so far uncovered in the various excavation areas in the Lower Town. The available radiocarbon dates place the building in an Iron Age horizon but do not allow us to pinpoint when Building P was constructed. The charcoal samples analysed so far only provide *post quem* dates that in theory would allow for an Assyrian foundation. The skull from Grave 99 provides an earlier date but unfortunately comes from a disturbed context.

While the finds and the monumentality of Building P suggest that high status individuals lived on Qalat-i Dinka, the palisade foundations and the glacis unearthed in the excavation areas QID2 and QID3 highlight that they would have been very well protected. Already during the 2015 magnetometer survey, we noted two large river pebbles with a diameter of about 1 m that once served as door sockets[44]. Like a great many other stones that are found to obstruct modern ploughing activity the two door sockets had been moved by the farmers working this land to the modern metal fence that the Sulaymaniyah Directorate of Antiquities and Heritage had erected to protect the site of Qalat-i Dinka. From their relative position on the slope, it is beyond doubt that they originally belong to the fortification line. We can therefore state with confidence that the presumed palisade had a very sizable gateway with two doors. The large size of the door sockets suggests that the door leaves and therefore the palisade reached a substantial height, certainly above 2 m. Radiocarbon dating of a charcoal sample from a floor level associated with the palisade (Locus:176905:031) produced a the date range of 1043-893 calBC (91.8 % probability; **Fig. D5b**), attributing this structure to the Iron Age.

Further work is needed to clarify whether the structures on Qalat-i Dinka were founded before the arrival of the Assyrians, like those in the Lower Town, or whether they are an expression of the Assyrian take-over of the Peshdar Plain. In any case, the building ensemble unearthed on Qalat-i Dinka can certainly be interpreted as a fortress that served to guard the Lower Zab route and passage across the Zagros Mountains.

44 Fassbinder/Ašandulesei 20016, 41-42 Fig. B4.7a-b.

E. Continuing the excavation of the Lower Town: the Dinka Lower Town Operation 3 (DLT3)

This chapter presents the results of the excavations in the Dinka Lower Town Operation 3, dubbed DLT3, which were undertaken from September 1 to September 30, 2018.

E1. Selecting the excavation area DLT3

Karen Radner

A magnetometer survey conducted in autumn 2016 and annually continued in subsequent years revealed a large lower town that extends between Gird-i Bazar and Qalat-i Dinka, with buildings and roads clearly discernible (**Fig. E1**). The excavation area DLT3 was opened in the southwestern corner of the area covered by the 2016 magnetometer survey. It is situated about 400 m west of Gird-i Bazar and 150 m southwest of the excavation area DLT2.

This particular spot was chosen because of the results yielded by the geoarchaeological trench GA42, which had been excavated there with a digger in August 2015, alongside two more such trenches (GA40-GA41; for their position see **Fig. E1**)[45]. The locations of these trenches were chosen by Mark Altaweel and Karen Radner at regular intervals between Gird-i Bazar and Qalat-i Dinka with the goal to collect environmental samples throughout the Holocene sequence down to the Pleistocene plateau in order to reconstruct the palaeoenvironment of the Bora Plain.

The 2015 geoarchaeological trench GA42 measured 3 × 8 m and was excavated to a depth of about 5 m. At the time of their excavation, the magnetometer survey between Gird-i Bazar and Qalat-i Dinka had not yet been carried out, and the two sites were still thought to be separate, with the position of these trenches therefore assumed to be off-site. While GA40 and GA41 yielded only scanty or no archaeological remains at all, GA42, on the other hand, produced evidence of tumbled walls and a kiln, visible in the sections of this trench[46]. These structures were part of the remains of ancient buildings, which GA42 cut; they later showed up in the magnetogram produced by the 2016 geophysical survey, which was undertaken because of the discoveries in GA42.

In 2018, the research design for the excavation area DLT3 operation focused on re-excavating and extending the geoarchaeological trench GA42. The main reason for the decision to investigate this area more closely was provided by the results of the ^{14}C analysis of a charcoal sample collected in 2015 from the southeastern section of GA42, around 1 m under the surface and close to a tumbled wall. The probable date range of 830-789 calBC (95.4 % probability)[47] of this sample represented the first ^{14}C date from the Lower Town[48] to unequivocally fall into the time span when the Peshdar Plain (in which the Bora Plain and the Dinka Settlement Complex are situated) was part of the provincial system of the Neo-Assyrian Empire[49]. With this date range in mind, we planned the 2018 investigations in DLT3 with the primary objective of obtaining data on the occupation of the Lower Town during the Neo-Assyrian period.

E2. The grid, the registration system and the new 3D documentation

Andrea Squitieri & Jens Rohde

The DLT3 operation was designed as an 8 × 10 m trench that included the area of the geoarchaeological trench GA42, aligned (unlike GA42) to the usual north-oriented and UTM-based grid used by the Peshdar Plain Project (**Fig. E2**). Following the same method as in the previous excavation campaigns, the squares of this grid were named using the final three digits of the eastern coordinates and the final three of the northern coordinates of their southwestern corner. DLT3 extends across the squares 225922 and 226922, with the north-south border between the two squares passing through GA42.

45 Altaweel/Marsh 2016.
46 Altaweel/Marsh 2016, 27-28.
47 Altaweel/Marsh 2016, Fig. B2.7.
48 Radner 2018, 30-33; Kreppner/Radner 2018, 56-58.
49 Radner 2016, 17-22.

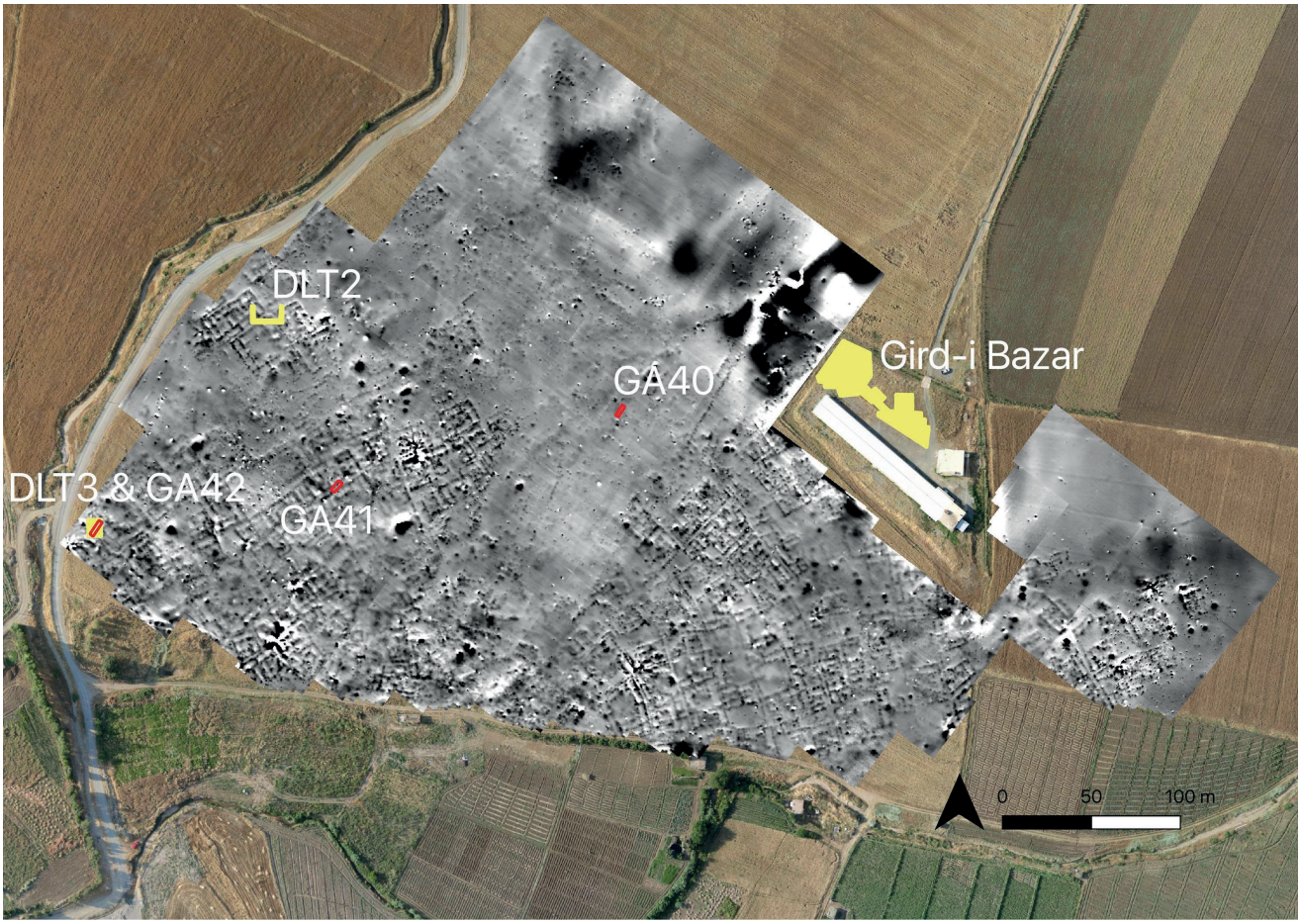

Fig. E1: The excavated areas (in yellow) overlaying the 2016 magnetogram showing architectural features in the lower town between Gird-i Bazar and Qalat-i Dinka. In red, the three geoarchaeological trenches (GA40, GA41 and GA42) opened in 2015. GA42 is positioned within the 2018 excavation area DLT3. Prepared by Andrea Squitieri.

The registration system follows the same protocol as in previous campaigns[50], which is here summarised for the reader's convenience. The stratigraphic units (be they deposits or installations) are named loci (pl. for locus). The loci of DLT3 are labelled with a progressive number following either 225922 or 226922, depending on which square they are in (e.g., Locus:225922:002 is the topsoil, Locus 2, in the square 225922). When more loci extend across the two squares, they are grouped into a locus group, abbreviated LGR, and identified by a progressive number (e.g., LGR:0346 is a wall extending across the two squares, made up of Locus:225922:039 and Locus:226922:033). Moreover, when additional loci are recognised as being part of the same stratigraphic unit despite having been separately excavated, they are grouped into the same locus group, even if they were in the same square. **Table E1** shows the correspondence between locus groups and the relative loci which are part of them. The materials collected from within each locus (e.g., pottery and animal bones) are grouped into collections which are identified by their locus number followed by an additional progressive number. In this case the label is preceded by PPP (for "Peshdar Plain Project"). Therefore, the pottery collection from Locus 2 in square 225922 is labelled PPP 225922:002:001. This registration system is also used for samples and small finds.

During the 2018 excavations at DLT3, we successfully trialled a new documentation method designed to create a three-dimensional presentation of our core stratigraphic units, the loci. In the course of the excavation, the top and bottom outlines of any deposit, such as e.g. a fill, are measured and recorded using a Leica GS18 global navigation satellite system (GNSS) with a Leica CS20 controller, and then exported into Autodesk AutoCAD 2018 in DXF file format. In this computer-aided design (CAD) software toolkit, the deposit's two outlines are connected to each other so that they form a three-dimensional closed body.

50 Kreppner/Squitieri 2017b, 57-60.

The 3D closed bodies representing individual deposits are then visualised together with the 3D model of the architecture (i.e., walls and installations) by using the Agisoft PhotoScan photogrammetry software[51]. This provides us with an efficient way to control and understand the relative and absolute positions of the deposits in relation to each other and to the architecture (**Fig. E3**).

The 3D visualisation of deposits makes it possible to assess the entire stratigraphic sequence from different perspectives, not only in the form of 2D vertical sections or 2D horizontal views, as is the classic way to present this data in publications (e.g., **Figs. E10**, **E19**). With 3D visualisation, the deposits can be grouped and displayed based on their deposition location, on the time of deposition or on the cause of deposition. In this way, the excavation process can be tracked back from the end to the beginning. At the same time and even more importantly, the formation processes of these deposits, from the oldest to the youngest, can be displayed.

Moreover, we can create virtual sections that cut through the deposits wherever we want. This allows for 3D distribution analyses of objects through the display of the exact positions of the objects collected from within a deposit and therefore goes far beyond the possibilities of the more common 2D distribution analysis.

The 3D documentation also makes it possible to easily calculate the density of finds, e.g. pottery sherds, in relation to the volumes of the deposits. Therefore, we are in a position to compare deposits on the basis of e.g. the number or weight of sherds per cubic metre ("pottery density"), which in turn provides further data in order to reconstruct the processes behind the formation of the deposits. Analyses of the material from DLT3 and future operations in the DSC will be able to fully draw on the possibilities opened up by the 3D documentation method.

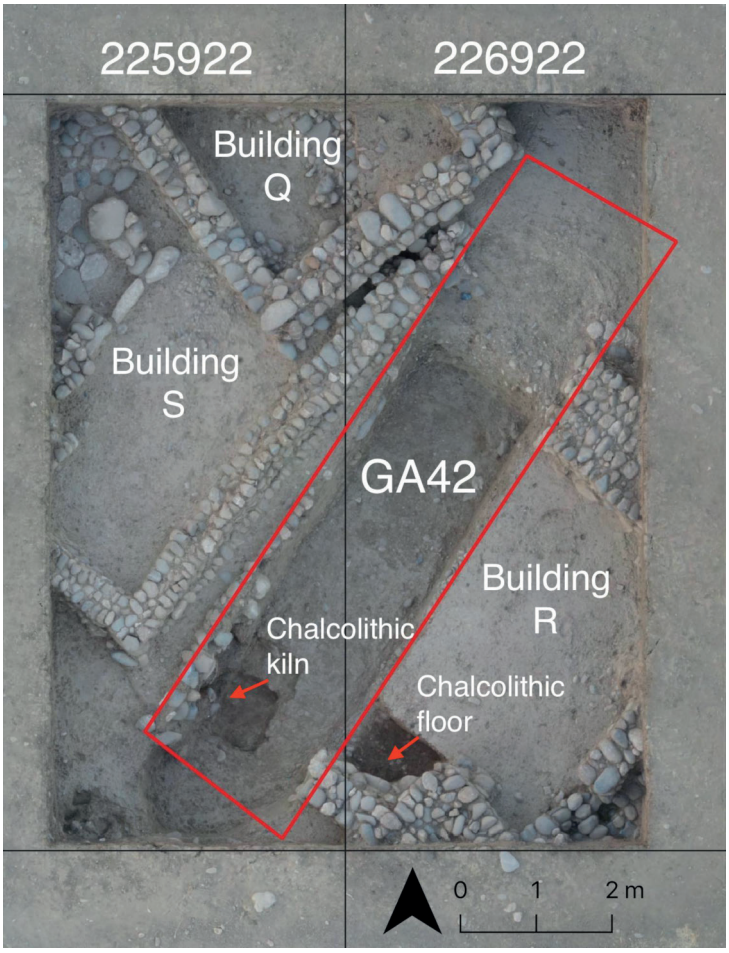

Fig. E2: Orthophoto of DLT3, indicating in red the original 2015 cut of GA42, partially re-excavated during the 2018 campaign. Prepared by Andrea Squitieri.

E3. The relative chronology and the stratigraphic table

F. Janoscha Kreppner

The relative stratigraphy of DLT3 is offered in **Table E2**. It follows the same principles as the stratigraphic tables published in the previous volumes of the Peshdar Plain Project excavations. The information needed to read this table is summarised below:

- The rows of the table follow the timeline spanning from the oldest (bottom) to the most recent (top) periods.
- The columns of the table reflect individual spaces, such as rooms, courtyards and outdoor areas. Consequently, roughly contemporary depositional processes and occupation periods that span across various areas of the site can be read horizontally across the table.
- Each cell contains a locus number (e.g., Locus:225922:035), a Locus Group number (e.g., LGR:0336) followed by a brief description; or a grave number (e.g., G100).
- The background colours of the cells indicate their interpretation and duration. Hence, different shades of pink are used for topsoil, modern occupation, graves, and virgin soil; brown indicates post-occupation periods (non-use/erosion processes), and yellow is used for occupation periods.
- The table follows the principle of the occupation phases. Occupation phases are defined by floors. The occu-

51 Kreppner/Squitieri 2017b, 57-59.

Locus Group (LGR)	Square	Locus
331	225922	1
331	226922	1
331	226922	4
331	225922	9
332	226922	2
332	225922	2
332	225922	4
332	225922	5
332	226922	5
332	225922	10
333	226922	3
333	225922	7
333	226922	6
333	225922	14
333	225922	43
334	225922	6
334	226922	7
335	225922	3
335	226922	10
336	226922	14
336	225922	16

Locus Group (LGR)	Square	Locus
337	226922	8
337	225922	17
338	225922	8
338	226922	12
338	226922	13
339	226922	19
339	226922	25
340	225922	27
340	226922	27
341	225922	29
341	226922	28
341	226922	38
342	225922	31
342	226922	29
343	225922	34
343	226922	30
344	225922	33
344	226922	32
345	225922	23
345	226922	31
346	226922	33

Locus Group (LGR)	Square	Locus
346	225922	39
347	226922	36
347	225922	40
348	225922	42
348	225922	45
348	225922	47
349	225922	30
349	226922	43
350	226922	45
350	226922	46
351	226922	50
351	226922	51
351	226922	52
352	226922	54
352	226922	58
353	226922	11
353	226922	26
353	226922	39
354	226922	61
354	225922	67
355	226922	21

Locus Group (LGR)	Square	Locus
355	226922	37
355	225922	64
356	225922	44
356	225922	58
356	225922	62
357	225922	60
357	226922	66
358	225922	38
358	225922	48
358	225922	54
359	225922	59
359	225922	61
360	225922	35
360	225922	36
361	225922	28
361	225922	55
362	225922	66
362	226922	65

Table E1: Correspondence list between locus groups and loci of DLT3. Prepared by Andrea Squitieri.

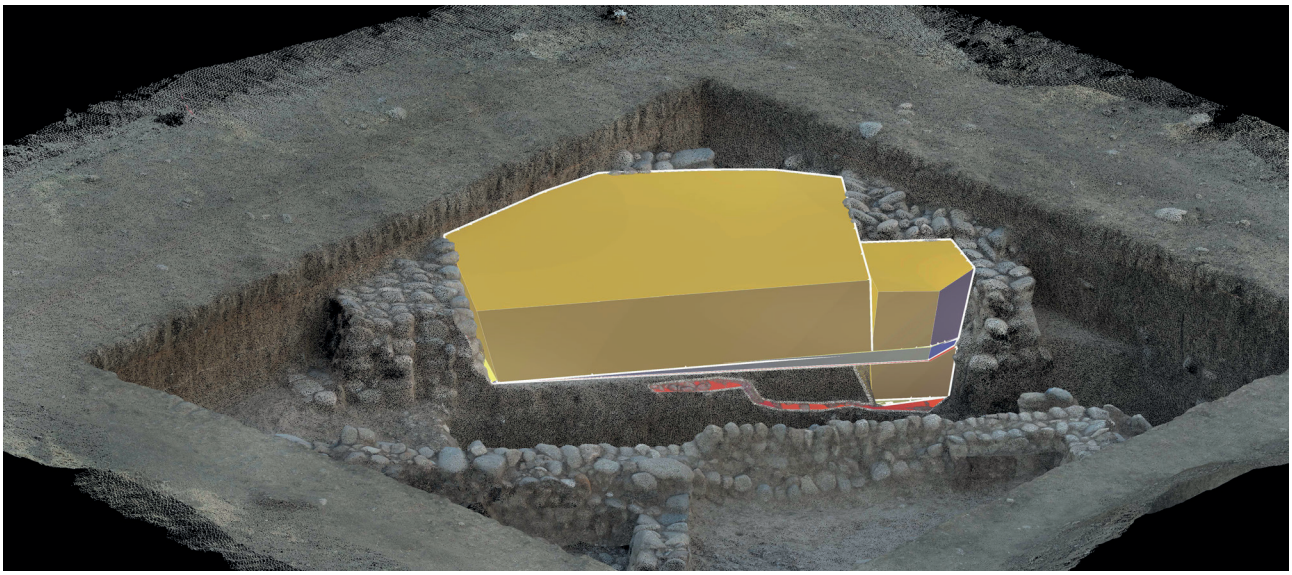

Fig. E3: Isometric view of deposits inside and below Room 64 of Building R. The colours correspond to the occupation period: red for floor, grey for end of occupation, and yellow-brown for post-occupation period. Prepared by Jens Rohde.

DLT3 STRATIGRAPHY	Outdoor Area (?) 65	Alley 68	Outdoor Area / Courtyard (?) 67	Building S Room (?) 66
PRESENT SITE SURFACE	LGR:0331 (Locus:225922:001, Locus:225922:009, Locus:226922:001, Locus:226922:004)			
TOPSOIL	LGR:0332 (Locus:225922:002, Locus:225922:004, Locus:225922:005, Locus:225922:010, Locus:226922:002, Locus:226922:005)			
MODERN OCCUPATION	LGR:0336: cut of trench GA42 (Locus:225922:016, Locus 226922:014), LGR:0333 moist friable, loamy, poorly sorted soil (backfill GA 42 trench) few gravel, cobbles and pebbles and some chunks of charcoal (Locus:225922:007, Locus:225922:014, Locus225922:043, Locus:226922:003, Locus:226922:006)			
SPORATIC OCCUPATION	Pit (Locus:225922:020 fill, Locus:225922:021 cut), Locus:225922:068 pit cut			Locus:225922:013 remans of wall
POST MAIN OCCUPATION 2 PERIOD	LGR:0338 dark brown moist loose, loamy, moderately sorted soil with a few pebbles and some sherds (Locus:225922:008, Locus:226922:012, Locus:226922:013)	LGR:0335 dark brown moist firm clayey soil, moderately sorted, with several pebbles, common potsherds (Locus:225922:003, Locus:226922:010)		
	LGR:0360 dark brown moist friable, silty soil moderately sorted, with some pottery, some burnt clay, ashes (Locus:225922:035 , Locus:225922:036) LGR:0361 dark greyish brown moist firm, clayey soil moderately sorted with some pottery (Locus:225922:028, Locus:225922:055)	LGR:0340 dark brown, moist friable. silty soil moderately sorted, few pottery, some pebbles (Locus:225922:027, Locus:226922:027)	Locus:225922:025 dark brown moist friable silty clay, moderately sorted with some pebbles, some pottery, and red patches	Locus:225922:026 dark brown moist friable, silty soil moderately sorted with some pottery, some burnt clay, ashes
END MAIN OCCUPATION PERIOD 2		LGR:0342 dark brown moist friable, moderately sorted silty soil, ashes and few charcoal, pottery and burnt material (Locus:225922:031, Locus:226922:029)		
MAIN OCCUPATION PERIOD 2				
CONSTRUCTION FOR MAIN OCCUPATION PERIOD 2				
POST MAIN OCCUPATION 1 PERIOD				Locus:225922:037 wall collapse, LGR:0341 silty soil, some pebbles and some sherds (Locus 225922:029, Locus:226922:028, Locus:226922:038)
END MAIN OCCUPATION PERIOD 1			Locus:225922:046 brown moist friable, clayey soil, moderately sorted, some pebbles, flat medium-sized stones, pottery, some ashes	LGR:0358 brown moist friable silty soil moderately sorted with pebbles, pottery and white inclusions (Locus:225922:038, Locus:225922:054 ---------->
MAIN OCCUPATION PERIOD 1				
CONSTRUCTION FOR MAIN OCCUPATION PERIOD 1	LGR:0359 (Locus 225922:061, Locus:225922:059) beaten mud floor	LGR:0357 beaten mud floor (Locus 225922:060, Locus:226922:066),LGR:0344 row of upright placed stones in front of western wall (Locus:225922:033, Locus226922:032), Locus:225922:032 row of upright placed stones in front of eastern wall	Locus 225922:051 stone pavement, Locus:225922:052 threshold, Locus 225922:053 wall / pilaster / pillar base?	LGR:0356 beaten mud and pebble floor (Locus:225922:044, Locus:225922:058 Locus:225922:052 threshold, Locus:225922:041 door socket ---------->
FIRST CONSTRUCTION PHASE FOR MAIN OCCUPATION PERIOD	Locus:225922:022, LGR:0347 (Locus:225922:040, Locus:226922:036) walls	LGR:0345 (Locus:225922:023, Locus:226922:031), LGR:0346 (Locus:225922:039, Locus 226922:033) walls	Locus:225922:024 wall	Locus:225922:022, LGR:0345 (Locus:225922:023, Locus:226922:031), LGR:0362 remnants of the northern boundary wall (Locus:225922:066, Locus:226922:065), Locus:225922:024, Locus 225922:050 walls
POST OLDER OCCUPATION PERIOD	Locus:225922:063 dark-brown yellowish soil with some small pebbles and very few traces of ashes			
END OLDER OCCUPATION PERIOD				
OLDER OCCUPATION PERIOD				
CONSTRUCTION FOR OLDER OCCUPATION PERIOD				
VIRGIN				

Table E2: DLT3 stratigraphy 2018. Prepared by F: Janoscha Kreppner.

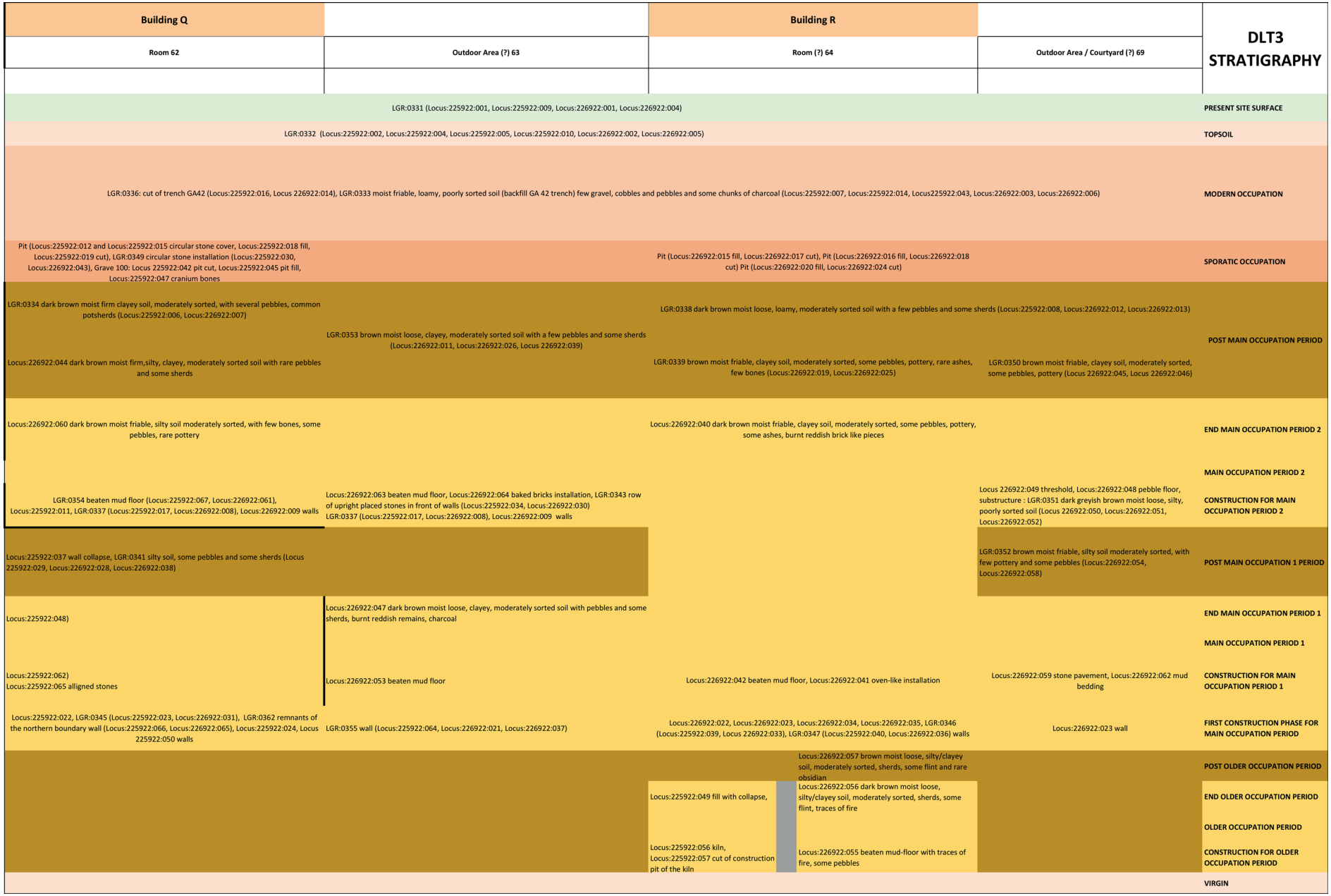

Table E2 (continued): DLT3 stratigraphy 2018. Prepared by F. Janoscha Kreppner.

pation phases can be divided into four sub-phases, to which stratigraphic units of the archaeological record such as earth deposits, walls, or installations can be assigned: firstly, the construction phase preceding the use, including the construction of the walls, floors, and any installations. Secondly, deposits and installations from the time when the floor was in use. Thirdly, the end of occupation, including deposits that indicate the destruction or abandonment of the floor, thus covering finds collected directly from the surface of the floor. Fourthly, the Post-Occupation Period (cell colour: brown) follows each occupation period, representing a period of non-occupation during which erosion phenomena are the main causes for the formation of any archaeological deposits.

- These four phases may repeat cyclically when new floors were constructed, which is why yellow and brown rows alternate in the table. However, not all of these sub phases are necessarily represented in the archaeological record.
- If a new floor overlying an earlier one is detected, then a new occupation period is defined. It is noteworthy that the term "floor" refers to the purpose-built surface or the trodden surface created through use, which is assigned a specific locus number. On the other hand, deposits found directly on the floor are given their own locus numbers. This allows us to isolate material found on a floor and, at the same time, to gain a better understanding of the formation processes of the deposits associated with the use of the floor.

Reading the table from the bottom up, it is possible to identify the following phases at DLT3:

- The virgin soil.
- A so-called "Older Occupation Phase" so far only represented by a floor and a kiln below and therefore older than the Iron Age structures.
- The Main Occupation Period, indicating when the buildings were in use. The Main Occupation Period 1 represents the period when the buildings were founded and when the oldest floors were laid down. Over time, as the buildings in DLT3 were inhabited, structural changes were made during the main period of use, including a new building (e.g., Building Q) or new floors (e.g., Outdoor Area 69). However, since in some outdoor areas and rooms only a single floor was used from throughout the entire occupation period, we deal with one Main Occupation Period, within which changes are differentiated by the sub-phases Main Occupation Period 1 and 2. In terms of absolute chronology, the ^{14}C date from GA42 as well as the material culture show that the Main Occupation Periods 1 and 2 in DLT3 belong to the Iron Age chronological horizon.
- After a chronological hiatus, some pits, a wall, an installation and possibly a grave (G100) are evidence for the so-called Sporadic Occupation Phase in this area, possibly dating to the Sasanian era.
- The geoarchaeological trench GA42, excavated in 2015, and its refill are assigned to the Modern Occupation Period.
- The topsoil represents the ploughing zone formed in more recent years.
- The most recent site surface covering the topsoil.

In the following sections, we present the results of the excavations in DLT3 in stratigraphic order, from the oldest Late Chalcolithic phases through the youngest phases up to the topsoil, in parallel to the stratigraphic table (**Table E2**).

E4. The Late Chalcolithic occupation of DLT3

E4.1 The Late Chalcolithic floor under Building R

Jens Rohde

A portion of a Late Chalcolithic floor was intercepted in a sounding opened below the Iron Age floor of Building R Room 64 (**Figs. E2**, **E4-5**), in the southwestern corner of the room. That there was a floor older than the Iron Age occupation was clear from the observation of a natural accumulation of pebbles in the eastern section of GA42 on which some pottery sherds dated to the Late Chalcolithic period (c. 4800-3100 BC[52]) were noted (**Fig. E6**).

This Late Chalcolithic floor (Locus:226922:055) showed as a dark brown trodden surface with some pebbles on it (**Fig. E7**). This floor represents the oldest feature excavated in DLT3 (**Table E2**). The floor slopes slightly towards the southwest. Several Late Chalcolithic-period pottery sherds were found lying horizontally, embedded in the dark brown soil (Locus:226922:056) that also contained traces of burning and some flints.

This floor layer was covered by a moist, loose, brown silty-clayey soil (Locus:226922:057), with sherds, flints and a few obsidian remains in it. This was part of an accumulation that formed after the occupation period of the floor. This accumulation layer was in turn sealed by the Iron Age floor (Locus:226922:042) of Room 64, which belongs to Main Occupation Period 1.

52 Stein/Alizadeh 2014, Table 1.

It is possible that the Late Chalcolithic floor (Locus: 226922:055) is directly connected to the kiln (Locus: 225922:056; **§E5**) that was found in the southwestern part of DLT3, although no physical relationship could be proven because of the deeper 2015 geoarchaeological trench, which cuts through the area. The floor In the northeastern section of DLT3 (**Fig. E6**) seems to cut the naturally accumulated layer of pebbles, and this could indicate a relationship between the floor and the kiln because the bottom part of the kiln also cuts a layer of pebble, as observed in the southwestern section of DLT3, at the other side of GA42 (**Fig. E8**).

E4.2 The Late Chalcolithic kiln

Alessio Palmisano

The Late Chalcolithic kiln (Locus:225922:056) is located in the southwestern corner of DLT3 (**Figs. E2**, **E5**, **E8**). In 2015, remains of this kiln were visible in the western section of GA42 as a red burnt area[53]. The excavations conducted in autumn 2018 confirmed that this structure was indeed a kiln, and approximately half of it was excavated.

The upper part of the kiln was destroyed by the Iron Age wall LGR:0346 (**Figs. E4**, **E8**). The kiln lining is visible on both sides of the structure and made of burnt clay, 3-4 cm thick (**Fig. E9**). The kiln's fill (Locus:225922:049) is composed of a soil characterised by discolorations ranging from black to red, the result of contact with fire. The fill also yielded two types of fragmentary architectural elements: one of plano-convex shape, light reddish on the outside and black on the inside; and the other of cylindrical, slightly curved shape, red in colour, showing wide grooves on the surface in a kind of „tortile" pattern. A few bones, some of which look burnt, and a small number of pottery sherds dated to the Late Chalcolithic period were also collected from the fill, which became richer in ash towards the bottom. From the section, it is possible to see that the bottom part of the kiln cuts a layer of pebbles which likely formed naturally and is paralleled by the pebble layer described above (**§E4.1**) that was excavated in the northeastern part of DLT3, on the opposite side of the geoarchaeological trench GA42 (**Fig. E9**).

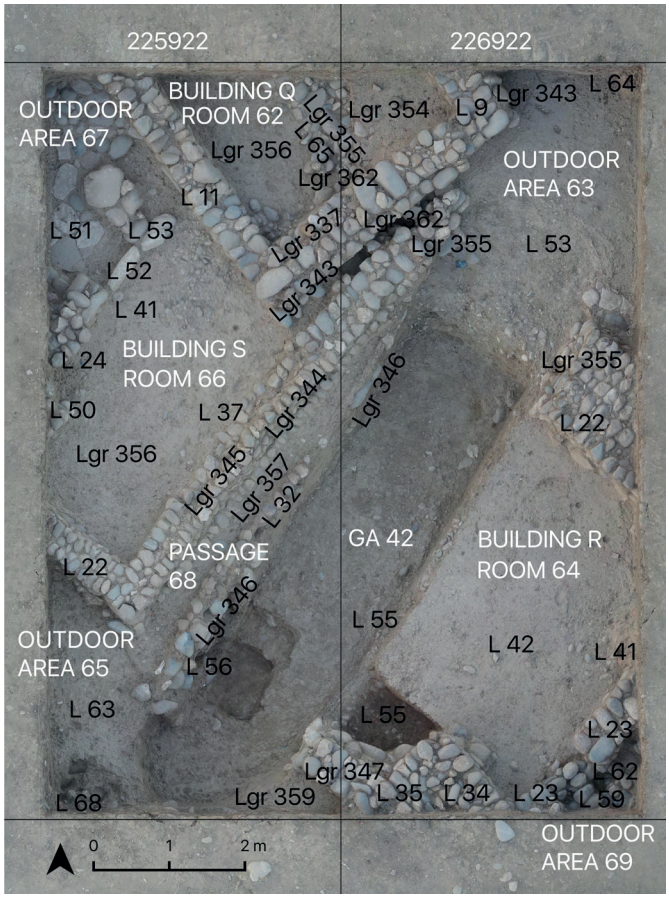

Fig. E4: Orthophoto of the excavation area DLT3. Prepared by Andrea Squitieri.

While removing the kiln fill, a vertical cylindrical structure was found still in situ in the centre of the kiln, made of brownish-greenish clay, 3-4 cm thick, with a diameter of 30 cm (**Fig. E9**). This structure continues westwards into the section underneath the Iron Age wall, and down towards the bottom of the kiln. It is interpreted as the central column that supported the kiln floor, a feature typically found on many Late Chalcolithic round kilns[54].

In April 2019, the excavation of the kiln was continued and completed (cf. **§E8**).

53 Altaweel/Marsh 2016, Fig. B2.6.

54 E.g. at Tell Abada: Hansen Streily 2000, 77-78, Figs. 13 and 15.

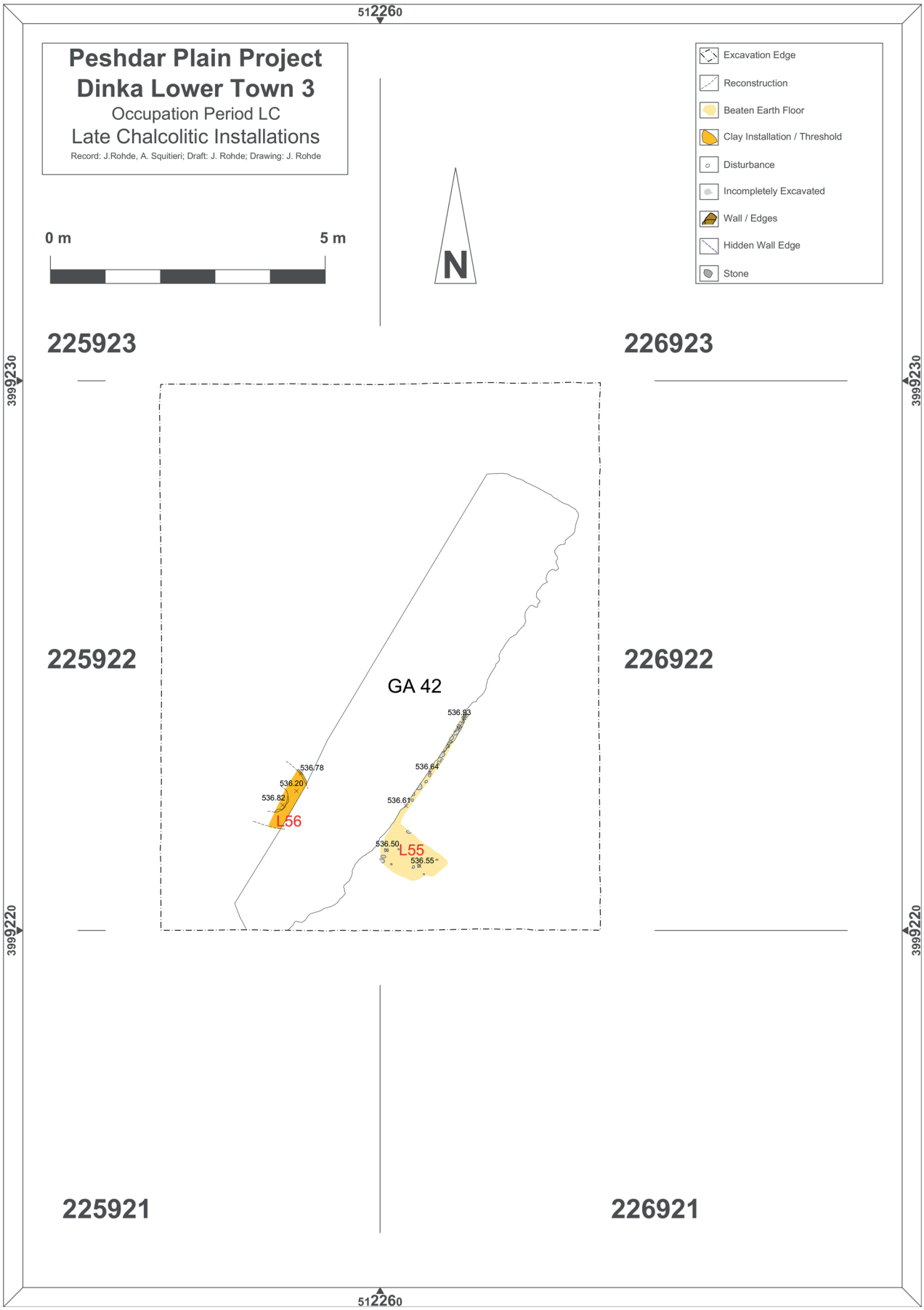

Fig. E5: Plan of the Late Chalcolithic levels found in DLT3. Prepared by Jens Rohde.

Fig. E6: Orthophoto of the eastern section of GA42, as re-excavated in 2018. Note the Late Chalcolithic floor on the right continuing in the section towards the left, below Locus:225922:042. Prepared by Andrea Squitieri.

Fig. E7: The Late Chalcolithic floor Locus:226922:055, intercepted within a sounding under the Iron Age floor of Room 64. Photo by Jens Rohde.

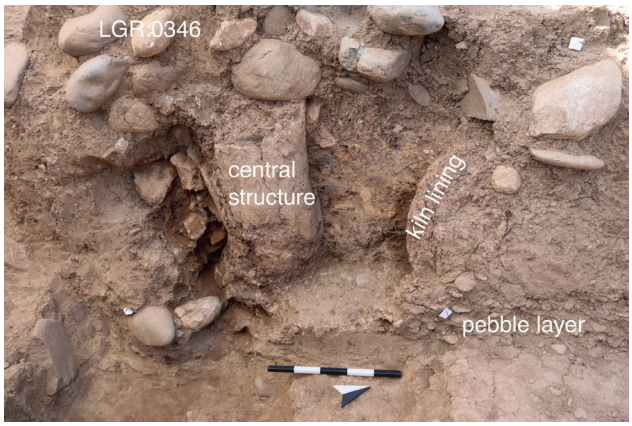

Fig. E9: The Late Chalcolithic kiln at the end of the 2018 excavations. Note the remains of the Iron Age wall LGR:0346 above the kiln structure. Photo by Andrea Squitieri.

Fig. E8: Orthophoto of the western section of GA42, as re-excavated in 2018. Note the Late Chalcolithic kiln feature on the left. Prepared by Andrea Squitieri.

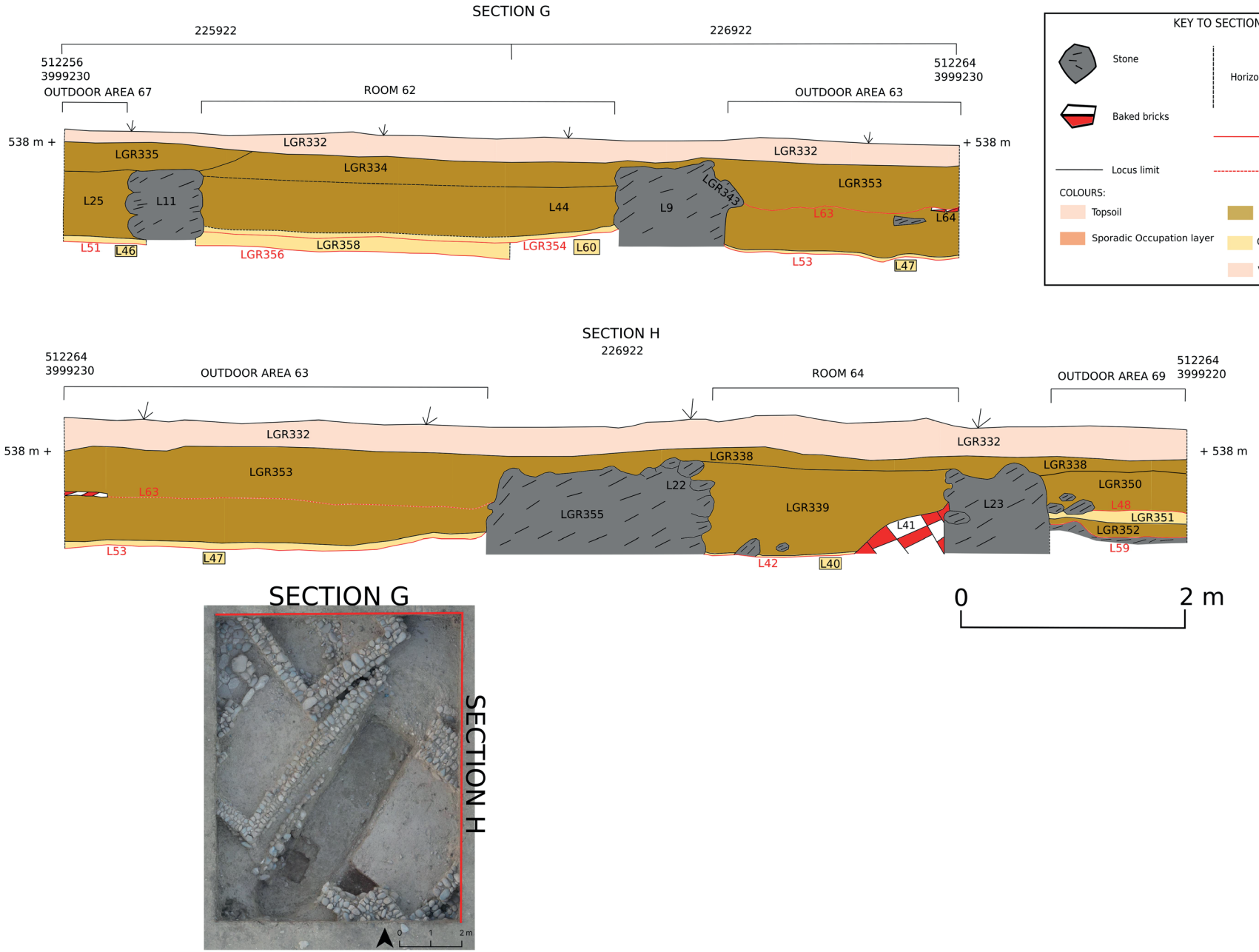

Fig. E10: DLT3's northern section (= section G) and eastern section (= section H). Prepared by Andrea Squitieri and Nikola Wenner, based on field drawings by Jens Rohde and Sophie Pietsch.

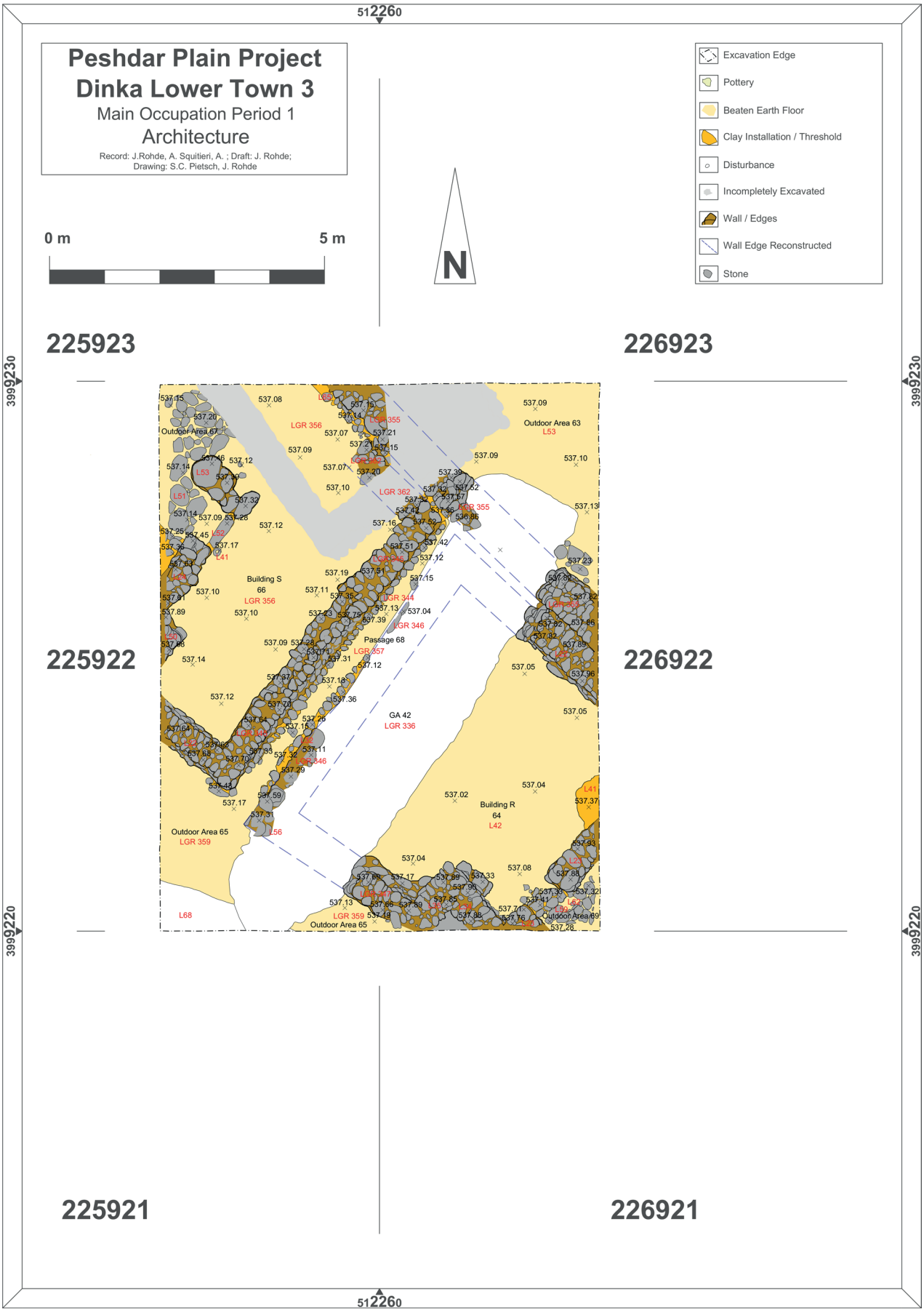

Fig. E11: Plan of the Main Occupation Period 1 levels in DLT3. Prepared by Jens Rohde.

E5. The Iron Age Main Occupation Period of DLT3

Following the stratigraphic sequence of DLT3 shown in **Table E2**, the contributions to this section describe the architectural units and features dating to the Iron Age.

E5.1 Outdoor Area 69

Jens Rohde

Outdoor Area 69 is located at the southeastern corner of DLT3 (**Figs. E4**, **E10**: section H, **Fig. E11**). Most of it runs under the western and southern baulks. On the northwest, Outdoor Area 69 is limited by wall Locus:226922:023, while its other limits are not known.

Some flattish cobbles formed a paved floor (Locus:226922:059; **Fig. E12**). These cobbles, about 25 × 25 cm in size, are set in rows aligned with the wall Locus:226922:023. Within this floor, there is an area without cobbles, where a moist, friable, silty soil, with some bones and sherds, was found (Locus:226922:062). This material is interpreted as the preparation layer for setting the cobbles. Both this layer and the floor belong to the First Construction Phase of Main Occupation Period 1.

Fig. E12: Flat cobbles forming the oldest floor (Locus:226922:059) of Outdoor Area 69. Photo by Jens Rohde.

Directly above the floor is LGR:0352 (**Fig. E10**: section H), a brown, moist, friable and silty soil, containing a few sherds and some pebbles, that formed after the Main Occupation Period 1. Above this layer, the Construction Phase for the Main Occupation Period 2 was identified based on the presence of a threshold (Locus:226922:049) set into wall Locus:226922:023. A pebble floor (Locus:226922:048, younger than floor Locus:226922:059; **Fig. E10**: section H) was found connected to this threshold. This floor had a substructure (LGR:0351), understood to be a preparation layer, made of a greyish-brown, moist, loose, silty soil that contained only a few bones.

The younger floor (Locus:226922:048) seems to be connected via the threshold (Locus:226922:049, **Fig. E13**) to the only floor (Locus:226922:042) found in Room 64 of Building R.

Fig. E13: The younger floor (Locus:226922:048) and the threshold (Locus:226922:049) of Outdoor Area 69. Photo by Jens Rohde.

A post-occupation layer made of moist, friable, clayey and moderately sorted soil with some pebbles and pottery (LGR:0350; **Fig. E10**: section H) covers the floor Locus:226922:048 and the threshold Locus:226922:049. It formed as a result of erosion processes after the Main Occupation Period 2. This was then covered by a brown, moist soil, containing some pottery and bones (LGR:0338: Locus:225922:008, Locus:226922:012 and Locus:226922:013), which covers the wall Locus:226922:023 and the walls of Building R (**§E5.2**). Above it lay the topsoil LGR:0332.

E5.2 Building R and Room 64

Jens Rohde

Building R is located in the eastern part of the excavated area of DLT3, to the east of the geoarchaeological trench GA42 (**Figs. E4**, **E11**, **E14**). Its complete layout is not known, because it has only been partially excavated and because it is partially cut by GA42, which obliterated the northwestern portion of this building. Of Building R, only Room 64 is hitherto known.

The walls of Building R are Locus:226922:022 on the northeast, Locus:226922:023 on the southeast, the walls Locus:226922:034, Locus:226922:035 and LGR:0347 (Locus:226922:036, Locus:225922:040) in a zigzag shape on the southwest, and LGR:0346 (Locus:226922:033, Locus:225922:039) on the northwest. The latter wall is badly pre-

Fig. E14: Room 64 / Building R, view from the northwest. Photo by Jens Rohde, annotated by Andrea Squitieri.

served because it was cut by GA42 and is only partially visible in its northwestern section (**Figs. E8**, **E11**).

West of the wall Locus:226922:023, Room 64 is located, connected to Outdoor Area 69 through a doorway in wall Locus:226922:023. Outdoor Area 63 is located to the north and separated by wall LGR:0355 (Locus:226922:021 and Locus:226922:037), but not accessible from Room 64 within the excavated area. To the northwest, wall LGR:0346 (Locus:226922:033, Locus:225922:039) separates Room 64 and Building R from Passage 68, northwest of which lies Building S (**Fig. E4**). Thanks to the presence of Passage 68, Buildings S and R can be securely attributed to the same usage phase, namely Main Occupation Period 1. Southwest of Building R is Outdoor Area 65.

The limits of Room 64 coincide with the known limits of Building R (**Figs. E4**, **E10**: section H, **Figs. E11**, **E14**). On the northwestern limit, that is wall LGR:0346, only a few remains are preserved, whereas the inner wall's face is not preserved at all. The lowest course of the wall is visible in the section of GA42 and it is set at an elevation of about 536.90 m above sea level, that is a few centimetres below the other known walls of Room 64, including LGR:0347 (536.97 m) and Locus:226922:022 (537 m).

This lowest course of wall LGR:0346 is made of longish cobbles, measuring 30-45 cm in length, oriented according to the wall alignment. On the outer face of this wall, towards Passage 68, a row of longish cobbles is set vertically (Locus:225922:032). The height of the stone base of wall LGR:0346 is unknown, but an original elevation of about the same height as walls LGR:0347 and Locus:226922:022 is most likely.

Room 64's northern wall Locus:226922:022 was also cut by the geoarchaeological trench GA42, and the corner with wall LGR:0346 is therefore not preserved. Wall Locus:226922:022 consists of two rows of medium-sized cobbles of c. 20 × 20 cm, with smaller ones in between. The cobbles are perpendicular to the wall, except in the lower area where the cobbles follow the wall's alignment. The wall is about 60 cm wide, with a well-constructed façade facing towards Room 64. The stone base of the wall is leaning against wall LGR:0355, but in the lower part there is a gap between the two walls. Six courses of the wall Locus:226922:022 are visible in the northeastern section of GA42 (**Figs. E5**, **E14**). It is likely that the wall's currently preserved height is its original height, firstly because it is similar to wall LGR:0355, and secondly because the wall's top surface is quite flat.

The northeast corner of Room 64 is underneath the baulk and most likely formed by walls Locus:226922:022 and LGR:0355. The southeastern limit of wall Locus:226922:023 in this room has two stratigraphic phases: an older one belonging to the construction phase of the Main Occupation Period 1, and a younger one with a new upper part of the stone base added during Main Occupation Period 2.

Little is known about the wall's older construction phase, although it is safe to assume that the width of the wall was almost the same as that of the younger phase,

that is approximately 60 cm. At least two courses of this phase are partially visible from Room 64. From the other side of the wall, from the Outdoor Area 69, and below the younger doorway connecting this area with Room 64, the older phase of the wall could not be found, possibly because it lies too close to the baulk or under it.

The wall of the younger construction phase is made of cobbles of two basic sizes (30 × 40 cm and 25 × 20 cm), with smaller ones in between. They are mostly set perpendicularly to the alignment of the wall, except at the corner of the doorway. To the southwest, the younger phase of wall Locus:226922:023 seems to connect with wall Locus:226922:034. Because the upper part of wall Locus:226922:023 is disturbed by a later pit (Locus:226922:016), there is no clear limit recognisable between these two walls. Wall Locus:226922:034 has a younger phase connected to wall Locus:226922:023, which was built on soil. An older phase of this wall could not be identified. Therefore, further investigation of the walls Locus:226922:023 and Locus:226922:034 is needed to better understand their relation and construction phases.

Wall Locus:226922:034 is about 55-60 cm wide, and has two rows and four courses of longish cobbles of a size of about 30 × 20 cm with smaller cobbles set in between the larger ones. The cobbles are oriented at right angles to the alignment of the wall. The construction of the faces of walls Locus:226922:034 and Locus:226922:023 seems quite rough.

Connecting with wall Locus:226922:034, wall Locus:226922:035 is about 70 cm wide with an irregular surface and consists of 5-6 courses of cobbles. The longish cobbles of the wall reach a size of up to 30 × 20 cm, while the rounded cobbles are a little smaller. The stones are placed perpendicularly to the alignment of the wall.

Wall LGR:0347, which connects with wall Locus:226922:035, leads towards the northwest, where it should meet wall LGR:0346 in the southwest but the connection was disturbed by the geoarchaeological trench GA42. The stone base of wall LGR:0347 is six courses high and constructed of two or three rows forming two faces with a rather flat top surface. The cobbles used have irregular shapes and include longish ovoids of 30 × 20 cm or rounder stones of a diameter of approximately 25 cm, with some smaller cobbles in between.

Room 64 has a greyish-brown, beaten mud floor (Locus:226922:042; **Fig. E15**), characterised by a few pebbles, sherds, reddish remains and traces of ashes. The floor abuts the walls, with the exception of walls Locus:226922:023 and Locus:226922:034 where the older phase of these walls was only partially excavated. Embedded in this floor, stones from older structures are partially visible, especially close to wall Locus:226922:023.

Fig. E15: Floor of Room 64. Photo by Jens Rohde.

Above the floor, a dark brown, moist, friable, clayey soil (Locus:226922:040) is present, with some pebbles, pottery, ashes and burnt reddish brick fragments, which marks the end of the Main Occupation Period 2. Some items were collected from this layer, in particular a polisher (PPP 226922:040:050, **§H**, no. 25), a perforated stone (PPP 226922:040:053, **§H**, no. 26) and a pottery stand (PPP 226922:040:052, **§G1**). There was much pottery lying on the floor, including a carinated bowl PPP 226922:040:006 (**§G1**).

An installation (Locus:226922:041) with several red traces of burnt clay was found. It was only partially excavated because it extends underneath the baulk. Due to its incomplete excavation, the shape of the installation is not clear, and its interpretation as an oven or possibly a kiln is therefore preliminary. It is abutted by the floor Locus:226922:042 and represents remains of the usage phase of the floor (**Fig. E10**: section H).

Above the layer Locus:226922:040 that covers the floor Locus:226922:042 lies as the room's fill a brown, moist, friable, clayey soil (LGR:0339: Locus:226922:019 and Locus:226922:025), in which some pebbles, pottery, ashes, and a few bones had accumulated. This fill was formed by erosion processes after the end of the Main Occupation Period 2. Above it is LGR:0338, which covers the walls of the room.

Three pits were found inside LGR:0338. The first pit cut (Locus:226922:017) was almost in the centre of Room 64 and was filled with a very dark, greyish-brown, moist, friable and silty soil with much charcoal, ash and a few pebbles and sherds (Locus:226922:015). To the south, partly within the baulk, the second pit cut (Locus:226922:018) was found. It was entirely filled with a moist, friable, very dark greyish-brown, silty soil with many shells, ashes, charcoal remains and sherds (Locus:226922:016). The third pit cut (Locus:226922:024) was filled with a moist, friable, silty/loamy, dark greyish-brown soil, with some bones and spots of ashes and a few pebbles and sherds

(Locus:226922:020). This third pit cuts precisely the corner of the walls LGR:0347 and Locus:226922:035, so that one can assume that the remains of the walls were still visible at the time the pit was dug. These pits are stratigraphically younger than the Iron Age structures and have been assigned to the Sporadic Occupation Phase (**§E6**).

E5.3 Outdoor Area 63

Jens Rohde

Outdoor Area 63 extends north of Building R (**Figs. E4**, **E10**: section H, **Fig. E11**). The complete layout of this space is unknown due to the limitations of the excavation and because its southern portion was damaged by the geoarchaeological trench GA42. The only known limit of this space is wall LGR:0355 on the south, whereas the other boundaries should be found under the eastern and the northern baulk. Whether a doorway or any other connection to the south existed is unknown.

The eastern part of wall LGR:0355 has a height of 6-7 courses of stones. The wall's top surface is quite flat although the edges are slightly higher. The wall was erected by placing three medium-sized cobbles of 20 × 20 cm next to each other in order to form a width of about 70 cm wide, with smaller cobbles set in between. The wall was built prior to the construction of wall Locus:226922:022, although the two were used at the same time.

The western part of LGR:0355 is separated from the eastern part by the 2015 geoarchaeological trench GA42. In its western part, the wall is preserved up to 5 courses high and is about 70 cm wide. The cobbles are either flattish and roundish with 20-30 cm in diameter, or they have an ovoid shape of 20-30 × 10-20 cm.

An extension to wall LGR:0355 continues in northwestern direction beneath the younger Room 62 (**§E13**) as Locus:225922:064 (also part of LGR:0355). The physical connection with Locus:225922:064 has been lost because of the construction of the younger room, but both the extension's alignment and characteristics suggest that it was part of LGR:0355.

In the eastern section of Outdoor Area 63, the floor Locus:226922:053 (**Fig. E16**) abuts wall LGR:0355. This is a beaten mud floor, with pebbles, reddish spots and pottery lying flat on it, which runs underneath the younger walls LGR:0337 and Locus:226922:009 of Room 62. This floor also continues to the east and north underneath the baulk. In the southeastern corner, in front of wall LGR:0355, some flat cobbles are set as part of the floor.

Right above the floor Locus:226922:053, a brown/dark-brown, moist, loose, clayey soil with pebbles, some sherds,

Fig. E16: Floor of Outdoor Area 63. Photo by Jens Rohde.

charcoal and burnt reddish remains was excavated (Locus:226922:047). This layer contained an iron object (PPP 226922:047:023; **§H**, no. 24) and an assemblage of pottery typical of the Main Occupation Period (**§G1**), plus some intrusive Late Chalcolithic pottery dispersed from the older layers below (**§E4**).

During Outdoor Area 67's second phase, the walls belonging to the younger Room 62 LGR:0337 (Locus:225922:017, Locus:226922:008) were built, and this partially destroyed Wall LGR:0355. Based on the construction of Room 62's walls and of the protective installation LGR:0343 (formed by Locus:225922:034 and Locus:226922:030, a series of cobbles set vertically against the wall; discussed below, **§E5.4**), there is no doubt that there should have been a younger floor in Outdoor Area 63, abutting the bottom of the protective installation LGR:0343, which has not been preserved in the centre of the area. This floor is clearly recognisable in the northern section of the trench (Locus:226922:063; **Fig. E10**: sections G-H). In this section, it appears as a beaten mud floor which abuts the protective installation LGR:0343 at the lower part of wall Locus:226922:009 and, in our reconstruction, must have also abutted wall LGR:0355. Because this floor has not been preserved in the centre of the area, the fill above this floor, LGR:0353, was excavated down to Locus:226922:047, that is the layer directly above the older floor (Locus:226922:053).

Right in the northeastern corner of the trench, an installation made of baked bricks (Locus:226922:064) was found. It was connected to the younger floor of Outdoor Area 63, but it could not be completely excavated as it runs underneath the baulks.

Above the younger floor Locus:226922:063 was fill LGR:0353 (Locus:226922:011, Locus:226922:026 and Locus:226922:

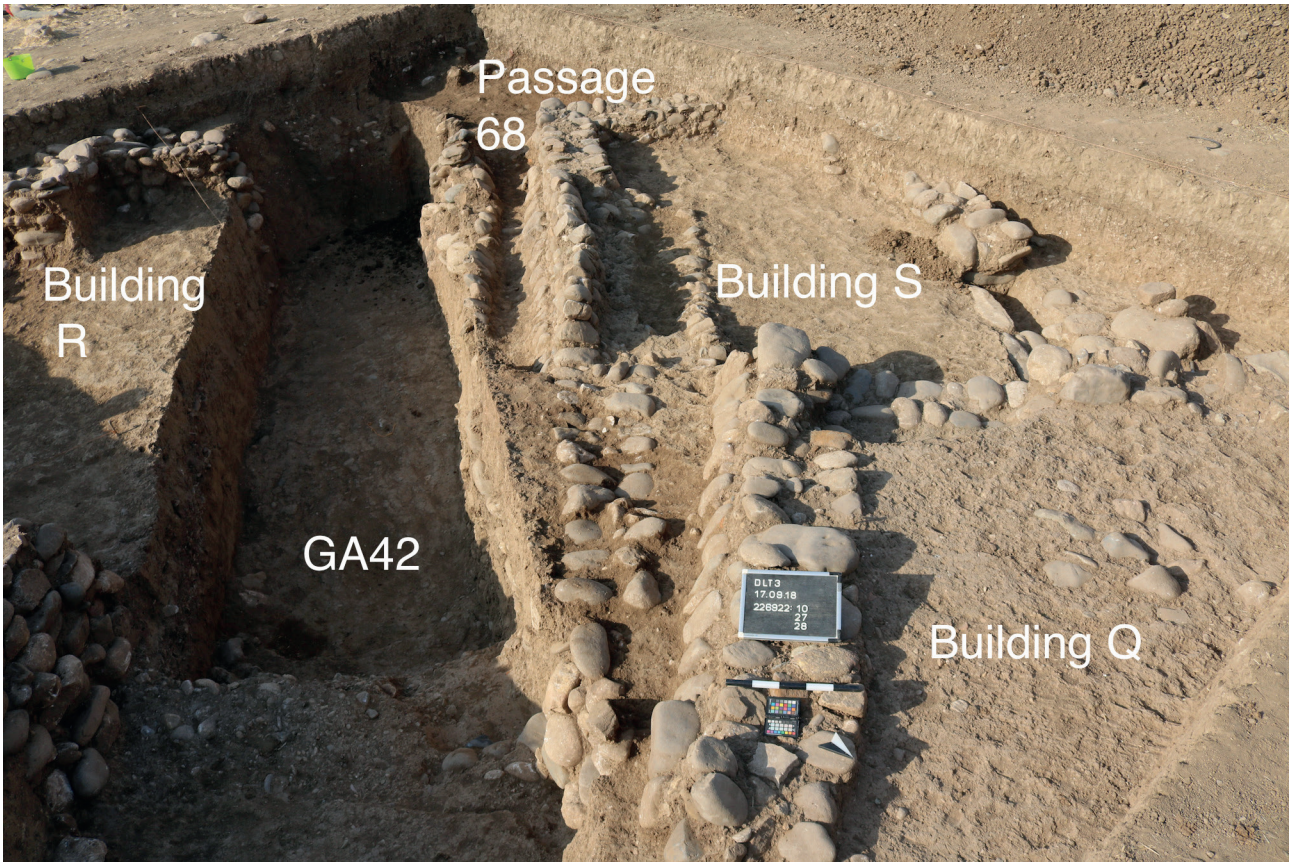

Fig. E17: Passage 68 (in the centre), bordered by Buildings R and S, as seen from the northeast. Building R is cut by the 2015 geoarchaeological trench GA42. Photo by Jens Rohde.

039), made of a brown/dark brown, moist, loose, clayey soil, containing a few pebbles and some sherds. LGR:0353 formed during the Post-Main Occupation Period 2 and is in turn covered by the topsoil (LGR:0332).

E5.4 Passage 68

Jens Rohde & Alessio Palmisano

Passage 68 (**Figs. E4**, **E11**, **E17**) is a narrow passage, c. 20 to 30 cm wide, between Building R on the southeast and Building S on the northwest. It is called a "passage" rather than an "alley" because of its narrowness, which would not allow a person to walk easily through it. It is clearly different from the several alleys set between buildings that have been previously excavated at Gird-i Bazar[55].

Passage 68 is bordered on the northwest by wall LGR:0345 (Locus:225922:023, Locus:226922:031). Of this wall, three courses of cobbles are preserved. It is also equipped with a protective installation (LGR:0344, composed of Locus:225922:033 and Locus:226922:032) formed by a row of medium-sized cobbles set vertically against the wall (**Fig. E18**).

Wall LGR:0345 is about 55-60 cm wide, with its cobbles up to 30 × 20 cm in size. It leans slightly towards the northwest. To the northeast, it joins wall LGR:0362 and forms a corner, which was obliterated by the construction of the younger wall LGR:0337 of Room 62 (**§E5.8**). This wall LGR:0362 forms a double wall with wall LGR:0355, which also runs underneath Room 62.

To the southeast, Passage 68 is limited by wall LGR:0346 (Locus:225922:039, Locus:226922:033), equipped with a protective installation (Locus:225922:032) that is very similar to the above-described LGR:0344. Some of the stones of this wall visibly jut out of the northwestern section of GA42. To the southwest, the passage gives access to Outdoor Area 65.

Passage 68 has a beaten mud floor (LGR:0357: Locus:225922:060 and Locus:226922:066) (**Fig. E18**), which abuts the two protective installations LGR:0344 and Locus:225922:032 on both sides of the passage. A dark brown, moist, friable, silty soil, with ashes, a few charcoal

55 Radner *et al.* 2018, 53-101.

Fig. E18: Passage 68, with vertically-set cobbles leaning against both sides of the passage. Photo by Alessio Palmisano.

remains and burnt material and some pottery (LGR:0342: Locus:225922:031 and Locus:226922:029) covers the floor and marks the end of the occupation.

Above it, there is a dark brown, moist, friable, clayey-silty soil, with pottery and some pebbles (LGR:0340: Locus:225922:027 and Locus:226922:027), which is interpreted as a Post Main Occupation Period deposit. Above it, the layer LGR:0335 (Locus:225922:003, Locus:226922:010) was excavated, in which a fragment of a fired brick with the remains of a cuneiform inscription was found (PPP 226922:010:004; **§I**). The soil of LGR:0335, which covers walls LGR:0345 and LGR:0355 completely, is dark brown, moist, loose and silty and contains a few pebbles and some sherds. The topsoil (LGR:0332) covers LGR:0335.

E5.5 Outdoor Area 65

Alessio Palmisano & Jens Rohde

Outdoor Area 65 extends to the south of Room 66 (**Fig. E4**, **E11**, **E19**: sections I-J), in the southwestern corner of the excavated area. It is bordered on the northwest by wall Locus:225922:022 and to the northwest by wall LGR:0347 (Locus:225922:040 and Locus:226922:036), the latter being only partially preserved because of the excavation of the geoarchaeological trench GA42. To the north, Outdoor Area 65 is connected to Passage 68 although no threshold or socket door marks the entrance.

The oldest deposit excavated in Outdoor Area 65 is Locus:226922:063, a dark yellowish-brown soil containing some small pebbles and some scant traces of ash. It lies below the floor (LGR:0359), which consists of a beaten mud surface extending across both sides of GA42 that represents the southern continuation of Passage 68's Floor LGR:0357. This floor was laid down during Main Occupation Period 1 and used until the end of Main Occupation Period 2.

Since it had not been properly preserved in the plan, the western part of floor LGR:0359 was reconstructed based on the southwestern section of square 225922 (**Fig. E19**: section J). From this section, it was possible to see that the floor abuts wall Locus:225922:022. Floor LGR:0359 is preserved east of GA42 where it abuts wall LGR:0347 (**Fig. E19**: section I). Above the floor, a dark, greyish-brown, moist, firm and clayey soil containing some pottery (LGR:0361: Locus:225922:028 and Locus:225922:055) was excavated; this is considered to be a Post Occupation deposit. Because floor LGR:0359 was only reconstructed, but not observed in the western corner of the excavated area, we were only able to excavate a mixed deposit (LGR:0360: Locus:225922:035 and Locus:225922:036) in the middle of the space, which combines material from both above and below this floor, including some material from the fill of the large pit (Cut Locus:225922:068) located in the southern portion of the trench (**Fig. E19**: sections I-J).

Above the fills of Outdoor Area 65 (LGR:0360 and LGR:0361) are LGR:0338 (located east of pit cut Locus: 225922:068) and LGR:0335 (west of that pit cut). Another pit was excavated (cut: Locus:225922:021, fill: Locus: 229522:20), located south of wall Locus:225922:022 (**Fig. E19**: section I). These pits surely post-date the Main Occupation Period features and likely belonged to the Sporadic Occupation Period, as did the other pits found in Room 64 (**§E6**). Finally, all of these deposits and the pits were covered by the topsoil (LGR:0332).

E5.6 Building S and Room 66

Alessio Palmisano

Building S may be composed only of Room 66 (**Figs. E4**, **E11**, **E19**: section J), which seems to be enclosed on all four sides. However, it is presently not possible to reconstruct

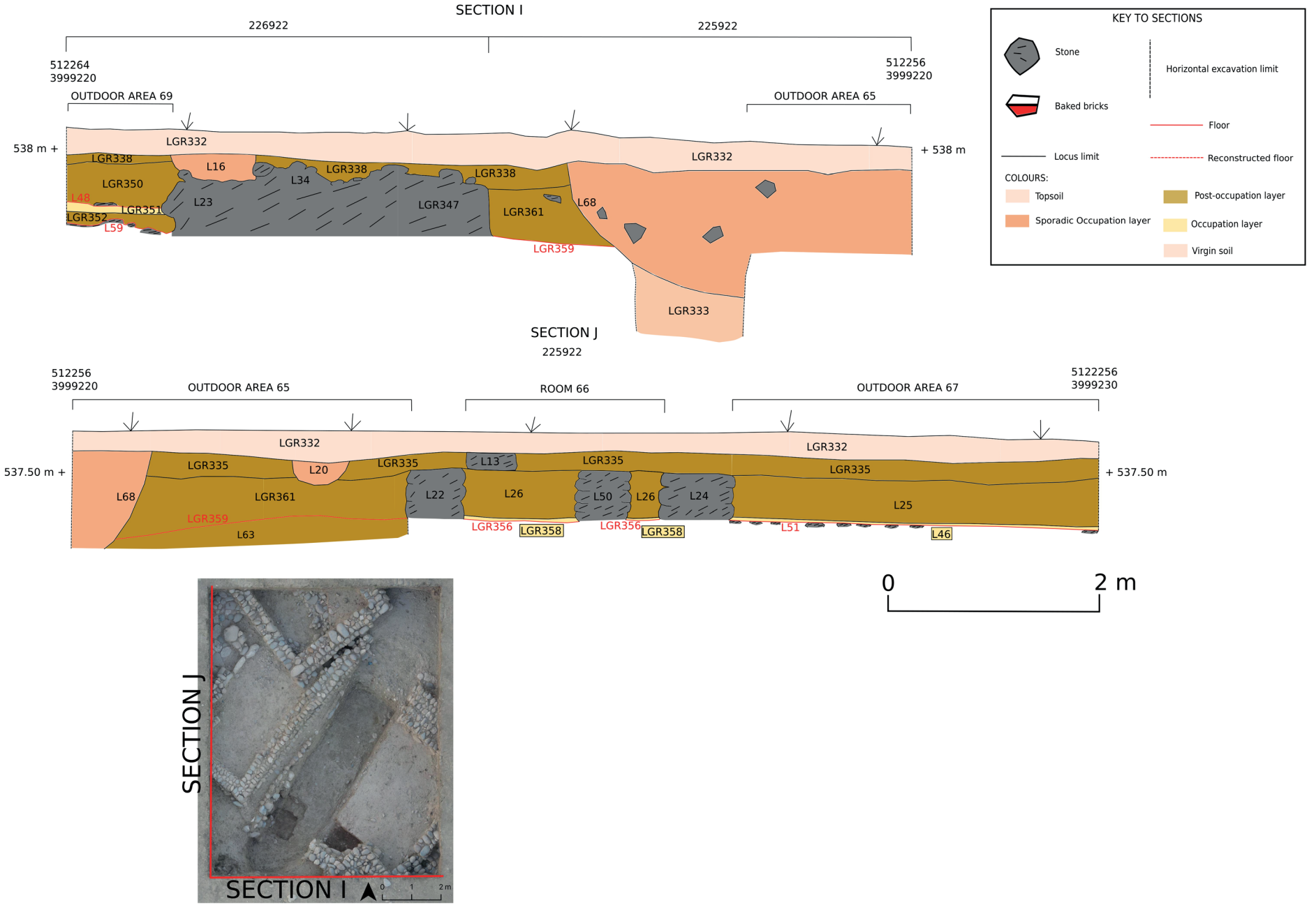

Fig. E19: DLT3's southern section (= section I) and western section (= section J). Prepared by Andrea Squitieri and Nikola Wenner, based on field drawings by Sophie Pietsch and Alessio Palmisano.

the building's layout, firstly because of the limited extension of the excavation area and secondly because of the subsequent construction of Building Q, which was erected on the northern portion of Building S during the Main Occupation Period 2.

Room 66 of Building S is bounded to the south by the wall Locus:225922:022, to the east by the wall LGR:0345, to the west by the walls Locus:225922:024 and Locus: 225922:050, and to the north by the wall LGR:0362, running below Building Q, which creates a double wall together with wall LGR:0355. A row of upright stones (Locus:226922:065) was set against wall LGR:0355 to form a kind of protective installation (visible under the floor of the younger Room 62). The northern wall LGR:0362 is connected to the eastern wall (LGR:0345). The walls Locus:225922:022, LGR:0345 and Locus:225922:024 are 55 cm wide and preserved to a height of 4-5 courses and approximately 45 cm high, built with medium-sized cobbles with an average diameter of around 25 cm.

Room 66 was accessible (at least) from the northwestern side, where a stone threshold (Locus:225922:052) and a door socket (Locus:225922:041) are located (**Fig. E20**).

Fig. E20: Room 66 / Building S, with the floor LGR:0357 covered by pottery sherds, the collapse Locus:225922:037, the threshold Locus:225922:051 and the door socket Locus: 225922:041 leading to Outdoor Area 67. Photo by Alessio Palmisano.

Room 66 has a beaten mud floor with some embedded pebbles (LGR:0356, composed of Locus:225922:044 across most of the surface of the room, Locus:225922:058 along the eastern edge of the room, and Locus:225922:062, which runs below the floor of Room 62 of Building Q). This floor abuts the walls Locus:225922:024, Locus:225922:022 and LGR:0345 (**Fig. E20**).

Right above the floor LGR:0356 lies a deposit (LGR:0358: Locus:225922:038, Locus:225922:054 and Locus:225922:048) of brown, moist, friable, silty soil, moderately sorted, with pebbles and white inclusions. This layer was very rich in small pottery sherds covering the whole room's floor. The pottery clearly extends below the younger wall Locus: 225922:011 of Building Q. After the end of the Main Occupation Period 1, wall LGR:0345 collapsed partially, and the collapse (Locus:225922:037) covered some of the pottery on the floor (**Fig. E20**).

Towards the northeast, within the narrow space between the younger Building Q and Room 66's wall LGR:0345, we excavated a deposit (LGR:0341: Locus:225922:029, Locus: 226922:028and Locus:226922:038), which runs below wall LGR:0337 of Building Q. It is not clear, however, whether Building S was still in use during Main Occupation Period 2 when Building Q was built. It is likely that the later construction of Building Q was responsible for the removal of the walls bounding Building S to the north, and that during the Main Occupation Period 2 the remains of Building S, south of Building Q, may have been left in ruins and were not repaired.

The fill of Room 66 (Locus:225922:026) is a dark brown, moist, friable, silty soil, moderately sorted, with some pottery, ashes and traces of burning.

Above this fill Locus:225922:026 and Room 66's walls is a deposit (LGR:0335) of dark brown, moist, firm, clayey soil, moderately sorted, with several pebbles and sherds. Within this deposit, a circular stone feature (Locus:225922:012) was found, extending above the northern half of Building S and the southern part of Building Q, and composed of a course of stones of approximately 25-30 cm set roughly in a circle (**Fig. E21**). Because this installation lies on top of

Fig. E21: The circular installation Locus:225922:012, probably dating to the Sasanian period, above the Iron Age wall Locus:225922:011. Photo by Alessio Palmisano.

the walls of Building Q (Locus:225922:011 and LGR:0337) it must be younger than the latter. The installation has therefore been assigned to the Sporadic Occupation Period. No datable finds were collected during the excavation of this installation although it certainly postdates the Iron Age period.

Another feature that we attribute to this Sporadic Occupation Period is wall Locus:225922:013, which runs east to west and was found roughly in the centre of Room 66, close to the western baulk (**Fig. E19**: section J, **Fig. E22**). It is 1.60 m long and 65 cm wide, made of two rows of medium-sized stones and stands one course high. Its construction technique differs from that of earlier walls. The stones are placed almost vertically instead of horizontally. The wall continues under the baulk towards the west, but no other feature connected to it has been found. The wall was assigned to the Sporadic Occupation Period, and it may belong to the Sasanian period, although there is presently no clear evidence for its dating. This later wall (Locus:225922:013), the circular installation (Locus: 225922:012) and the deposit LGR:0355 were all covered by the topsoil (LGR:0332).

Fig. E22: The wall Locus:225922:013, probably dating to the Sasanian period, located stratigraphically above the Iron Age walls Locus:225922:022 and LGR:0345. Note the construction technique of Locus:225922:013, with cobbles placed in upright position, which differs from the technique used for the Iron Age walls. Photo by Alessio Palmisano.

E5.7 Outdoor Area 67

Alessio Palmisano

Outdoor Area 67 is located to the northwest of Room 66. It is bounded to the southeast by wall Locus:225922:024 and to the north and west by the limits of the excavation area (**Figs. E4**, **E11**, **E19**: section J). The boundaries of Outdoor Area 67 to the northeast are not known because of the construction of Building Q.

The floor of Outdoor Area 67 (Locus:225922:051) is paved with medium-sized, flat stones with a diameter of c. 30-40 cm (**Fig. E23**); it abuts wall Locus:225922:024 and runs underneath wall Locus:225922:011, belonging to Building Q of the Main Occupation Period 2 (**Fig. E10**: section G). A threshold (Locus:225922:052: **Fig. E24**) was found, extending north of wall Locus:225922:024 and made of a large oblong stone with a door socket still in situ (Locus:225922:041). The doorway that connects Outdoor Area 67 to Room 66 is limited to the north by a feature (Locus:225922:053) composed of medium-sized stones (diameter of 30-50 cm) with a large circular stone on top. Because the complete layout of Outdoor Area 67 is not known (also because it was damaged by the construction of the younger Building Q), the function of this structure is difficult to interpret. One possibility is that it was the base of a pillar located on the right side of the entrance in order to support a portico.

Right above the floor of Outdoor Area 67 was a greyish-brown, moist, friable, clayey soil, containing a few pebbles, stones, pottery and some ashes (Locus:225922:046). Above this layer was a fill (Locus:225922:025) of dark brown, clayey soil, which formed from the Post Main Oc-

Fig. E23: The paved floor of Outdoor Area 67. Photo by Alessio Palmisano.

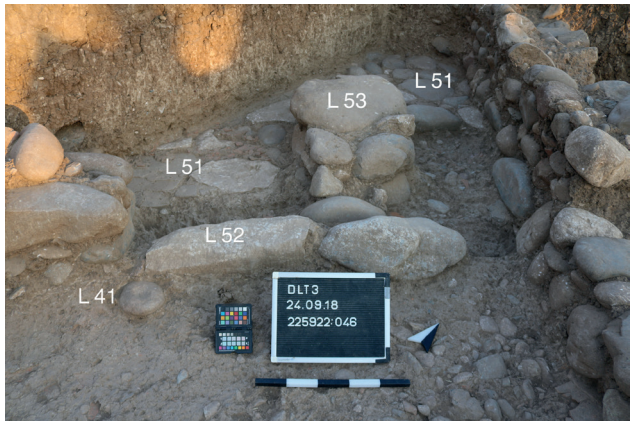

Fig. E24: Outdoor Area 67, with the floor Locus:225922:051, the possible pillar base Locus:225922:053, the threshold Locus: 225922:052 and the door socket Locus:225922:041. Photo by Alessio Palmisano.

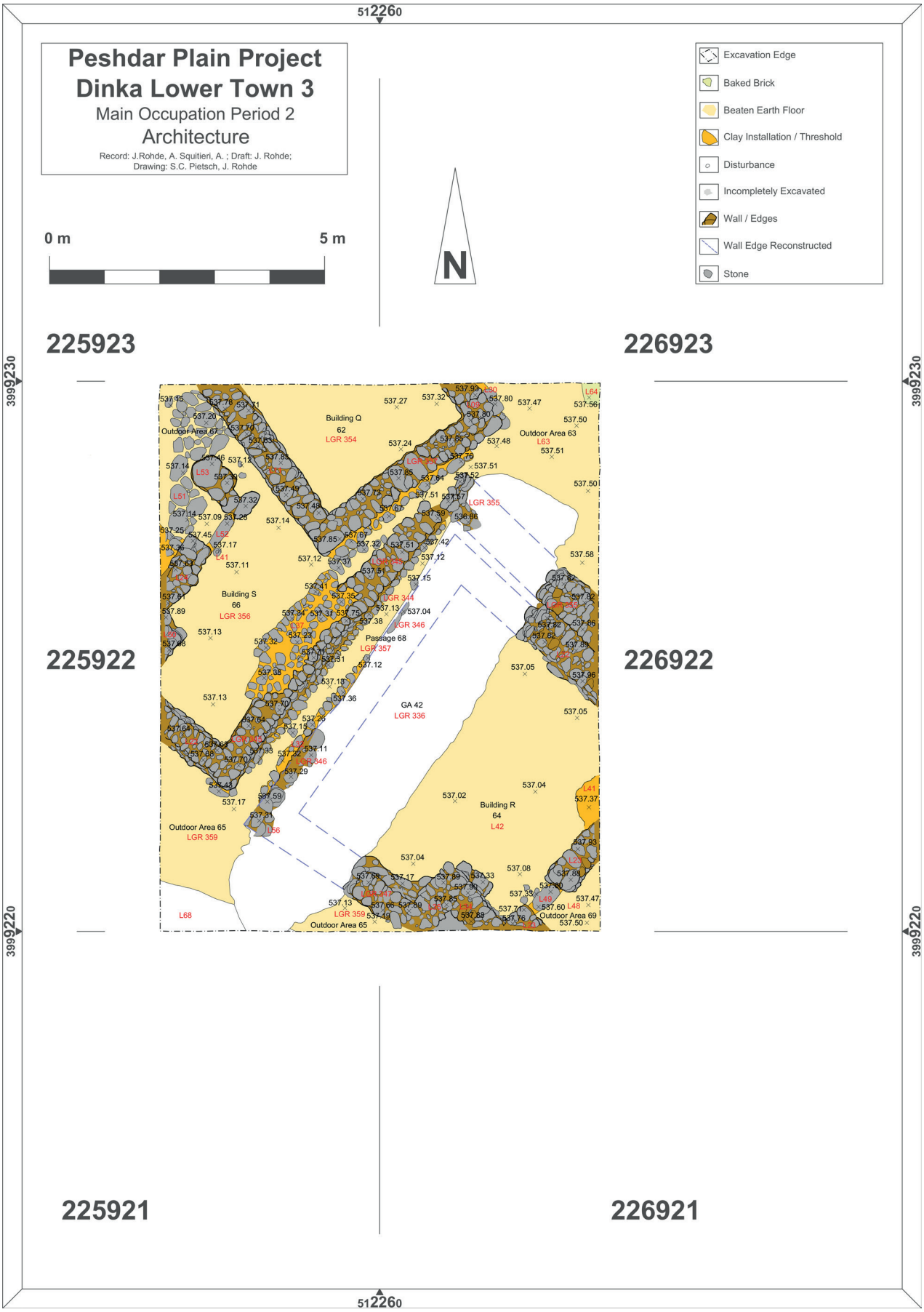

Fig. E25: Plan of the Main Occupation Period 2 levels in DLT3. Prepared by Jens Rohde.

cupation Period 1 to the end of the Post Main Occupation 2 (**Fig. E19**: section J). During the Main Occupation Period 2, that is when Building Q was in use, this outdoor area may have been in ruins, similar to Building S. The fill Locus:225922:025 was covered by a dark brown fill with pebbles and some pottery (LGR:0335), which also covered the walls (**Fig. E9**: section G; **Fig. E17**: section J). It was in turn sealed by the topsoil (LGR:0332).

E5.8 Building Q and Room 62

Jens Rohde & Alessio Palmisano

Building Q (**Figs. E4**, **E25**) belongs to the Main Occupation Period 2, which is one stratigraphic phase younger than the period during which Buildings R and S were erected. Despite its younger age, Building Q belongs to the Iron Age chronological horizon because its floor has yielded the same pottery types as those found on the older, Main Occupation Period 1 floor (**§G1**).

Due to the erection of Building Q, the architectural structure and the functions of Outdoor Area 63 and Building S changed drastically. Building Q is oriented very differently from the architectural features underneath it and its construction caused the partial destruction of both Building S and Outdoor Area 67. It is not clear what the function of the latter two areas was during the use of Building Q, although it is possible that they were both left in ruins (**§E5.6-7**).

Room 62 is the only known room from the excavated, southern part of Building Q. It is delineated by wall Locus:226922:009 to the northeast, wall LGR:0337 (Locus: 226922:008 and Locus:225922:017) to the southeast and wall Locus:225922:011 to the southwest. All these walls are made with the same technique as the older walls of the Main Occupation Period 1.

Wall Locus:226922:009 is about 55 cm wide. It is composed of two rows of cobbles with small pebbles in between and preserved to a height of 4-5 courses of cobbles of ovoid or flattish shape and a size of about 20-30 cm. The lowest course lies on approximately 1 cm of soil accumulation, which clearly indicates that it was built after the floor of the Outdoor Area 63 ceased to be used (**Fig. E26**). Against the northeastern face of the wall Locus:226922:009, there is a row of cobbles set upright in a leaning position, which was used as a protective installation.

Wall Locus:226922:009 is connected to wall LGR:0337, which is about 55 cm wide and consists of 4-5 courses of cobbles set in two rows. The cobbles have an ovoid or flattish shape and a size of about 20-30 cm, with the exception of two cobbles that are larger than the others and set at a right angle to the alignment of the wall along its entire width. Small pebbles and cobbles fill the wall core. Like wall Locus:225922:009, this wall is also equipped with a protective installation (LGR:0343) made of vertically set cobbles leaning against its outer face (**Fig. E26**).

Fig. E26: Building Q's wall LGR:0337, sitting atop the walls of Building S (LGR:0345 and LGR:0355), as seen from the east. Note the row of vertically placed cobbles LGR:0343 that marks the floor level abutting Building Q's wall LGR:0337. Similar vertically placed cobbles (LGR:0344) are also visible as leaning against the older Building S's wall (LGR:0345). Photo by Jens Rohde.

Wall LGR:0337 is connected in the west to wall Locus: 225922:011, which is 3.22 m long and 47 cm wide. It is made of two rows of medium-sized stones, on average 20-25 cm long, and four courses high (corresponding to c. 58 cm).

For the foundation of the walls Locus:225922:009, LGR:0337 and Locus:225922:011, the older walls of Building S (LGR:0355 and LGR:0362) were partially, but not completely, destroyed. Parts of them were found below the floor of Room 62.

Room 62's floor is a compact beaten mud floor with a few embedded pebbles (LGR:0354: Locus:225922:067 and Locus:226922:061), abutting walls Locus:226922:009 and LGR:0337 (**Fig. E10**: section G). The floor lies above layer LGR:0358 which in turn covers the older floor LGR:0356, both going underneath wall Locus:225922:011 and belonging to the Main Occupation Period 1. Right above Room 62's floor LGR:0354 is a dark brown, moist, friable, silty soil (Locus:225922:060), containing a few bones, some pebbles and a few pottery sherds. This soil marks the end of the Main Occupation Period 2 and had been identified only in the eastern portion of the room (**Fig. E10**: section G). It is covered by Locus:226922:044, a dark brown, moist, firm, silty-clayey soil with only a few pebbles and some sherds, which was also identified only in the western part of the room. This deposit formed as a result of erosion processes that occurred after the end of Main Occupation Period

2. It is covered by LGR:0334, a dark brown, moist, firm, silty-clayey soil with some pebbles and sherds, which lies above the walls.

Within deposit LGR:0334 is a circular stone feature (LGR:0349: Locus 225922:030, Locus:226922:043; **Fig. E27**), which is interpreted as being connected to the circular stone installation Locus:225922:012 (described above; **§E5.6**). Both belong to the Sporadic Occupation phase. Finally, all these features are overlaid by the topsoil (LGR:0332).

Fig. E27: The circular installation LGR:0349, probably dating to the Sasanian period, in the upper fill of Room 62. Photo by Jens Rohde.

E6. The Sporadic Occupation Phase of DLT3

The features discussed in this section are clearly located stratigraphically above the Iron Age features of the Main Occupation Periods 1 and 2 (**Fig. E28**), indicating that a considerable span of time had passed since the end of the Iron Age occupation.

In addition to the features discussed below, six small pits were found in different locations of the excavated area (cuts: Locus:225922:021; Locus:225922:068; Locus:225922:019; Locus:226922:017; Locus:226922:018; and Locus:226922:024). These pits have not yielded diagnostic pottery that would allow us to narrow down their chronology. They could also be considerably younger than the Sasanian period.

E.6.1 Buildings structures of the Sporadic Occupation Phase

Andrea Squitieri

In excavation area DLT3, Sasanian-period sherds (**§G1**) have been found only from the deposit LGR:0338, which is located underneath the topsoil in the western part of the trench (above the Iron Age Room 64 and Outdoor Areas 65 and 69: **§§E5.1-2**; **§E5.5**). Nevertheless, we assume that the features discussed here generally belong to the Sasanian period. Additional Sasanian-period pottery was recovered from the topsoil throughout the trench (**§G1**).

The wall Locus:225922:013 (discussed in **§E5.6**; **Fig. E22**) is located in the western part of the excavation area DLT3, but was not completely excavated because it continues under the western baulk. This wall was found at a higher level than the Iron Age walls and is not oriented according to any of the older features, moreover with a construction technique that was very different from that of the Iron Age walls. It was made with cobbles that were set slightly upwards instead of horizontally, as was typical for the attested Iron Age walls.

Two circular stone installations (Locus:225922:012 and LGR:0349, discussed in **§E5.6** and **§E5.8**; **Figs. E21**, **E27**) were unearthed in the northwestern part of the excavation area DLT3 above the Iron Age Buildings S and Q. The two installations probably belonged to the same structure, whose function remains unknown.

E.6.2 Human remains of the Sporadic Occupation Phase: Grave 100

Kathleen Downey

In the upper layers of the northern part of the excavation area DLT3, corresponding to the upper fill in Room 62, some bones of a cranial vault were uncovered (**Fig. E29**) right below the stone circular installation LGR:0349 (**§E5.8**; **Fig. E27**). At a first glance, this pile of stones above the bones appeared to have been lined in a row at roughly the same level as (and similar in appearance to) the stone capping used to cover the Sasanian graves of Gird-i Bazar. However, further excavation revealed that the stone pile represented an installation connected to a second stone installation (Locus:225922:012; **§E5.6**). While the function of this combined feature remains unknown, it cannot represent a grave capping. No cut of any possible grave pit was identified either.

The cranium appears to have been facing southeast, but the occipital and posterior portion of parietals were moved. The nuchal crest was directly upward and rotated counter clockwise. The anterior of the sagittal suture was positioned touching the left parietal.

Only limited diagnostic features are present on the bones, but these are definitely the remains of an adult human. No other bones were found in association with this cranium, nor were other human bones collected from other parts of DLT3. Following our documentation system for the registration of human remains, a grave number

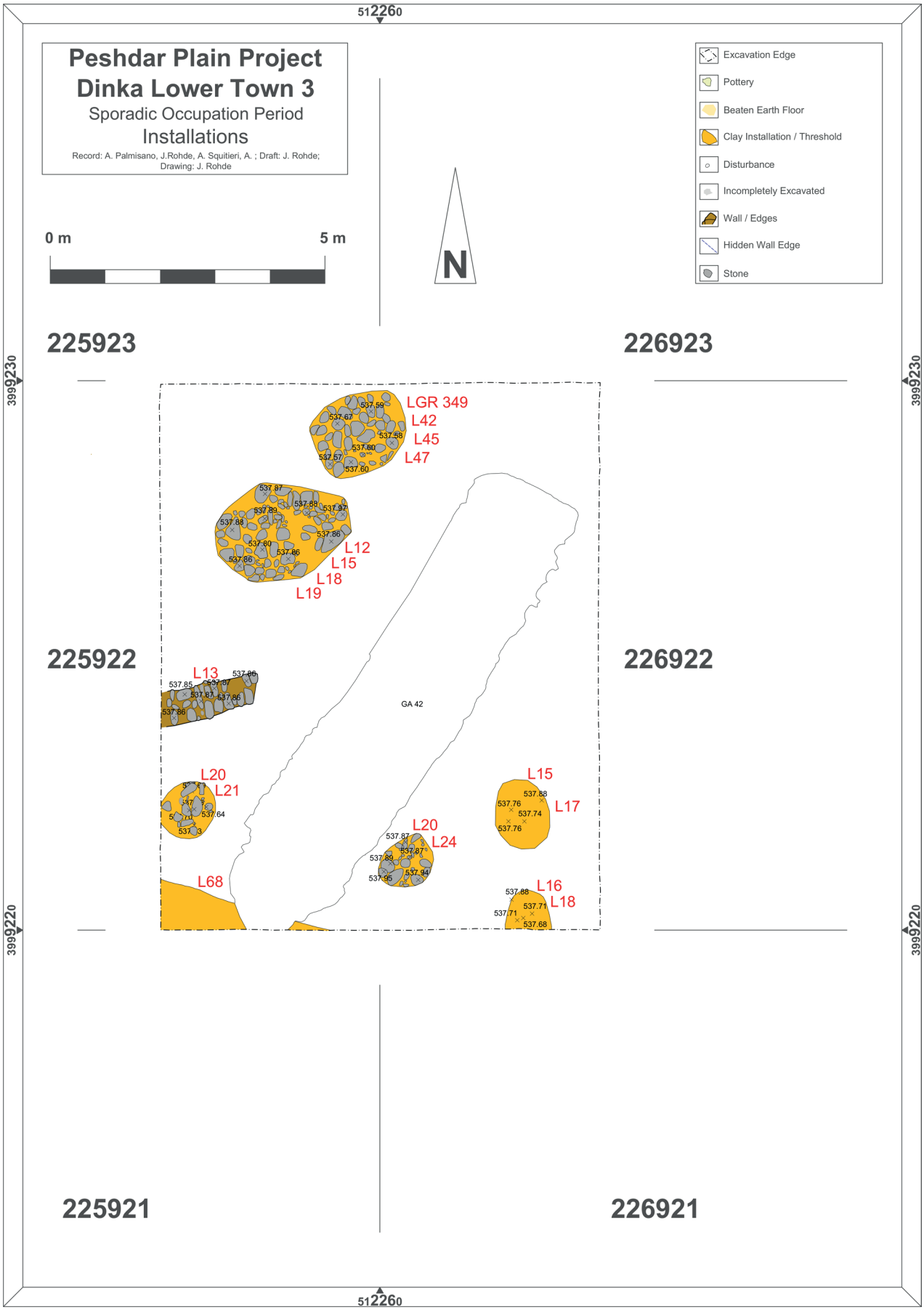

Fig. E28: Plan of the Sporadic Occupation Period levels in DLT3. Prepared by Jens Rohde.

Fig. E29: Human remains (registered as Grave 100) found below the installation LGR:0349 in the upper fill of Room 62. Photo by Kathleen Downey.

(Grave 100) was assigned to this cranium, despite the fact that no clear grave cut could be identified.

These isolated human remains are difficult to interpret, but stratigraphically they surely belong to a period after the Iron Age Main Occupation Period 2. Therefore, they have been tentatively assigned to the Sporadic Occupation Period. Due to the presence of Sasanian-period pottery in the upper layers of DLT3 and because of the Sasanian-period graveyard at Gird-i Bazar[56], it seems possible that the human remains from DLT3 also belong to the Sasanian era, but there is no direct evidence for this chronological attribution.

E7. Recent interventions at DLT3: GA42 and the topsoil

Andrea Squitieri

The geoarchaeological trench GA42 was excavated with a digger in 2015 and then backfilled (**§E1**). During the 2018 campaign, we located the cut of this trench (LGR:0336: Locus:225922:016 and Locus:226922:014; **Figs. E2**, **E11**, **E25**) and re-excavated it (**Fig. E30**). The 2015 refill (LGR:0333: Locus:226922:003 and Locus:226922:006) was partially removed during this campaign in order to uncover the archaeological structures visible in 2015.

Above all the archaeological features of DLT3 lies the topsoil (LGR:0332: Locus:225922:002, Locus:225922:004; Locus:225922:005; Locus:225922:010; Locus:226922:002 and Locus:226922:005), which was heavily affected by recent ploughing.

56 Downey 2018b.

Fig. E30: After the removal of the topsoil of DLT3: the tops of some stone walls are already visible while the cut of the 2015 geoarchaeological trench GA42 was not yet evident at this stage. Photo by Jens Rohde.

A small number of modern objects were recovered from this topsoil, including a glass fragment (PPP 226922:002:003). Possible Iron Age items retrieved from the topsoil are the perforated stone PPP 226922:005:004 and the whetstone PPP 226922:005:005 (**§H**, nos. 41-42).

E8. Preliminary conclusions

F. Janoscha Kreppner

An important result of the excavations conducted in DLT3 was that, in stark contrast to the various other excavation areas investigated so far within the Dinka Settlement Complex, we could for the first time identify an occupation phase that is older than the Iron Age occupation.

East of the geoarchaeological trench GA 42, ceramic material was discovered lying flat on an uneven floor (Locus:226922:055), which suggests in regard to technology, fabric and morphology a dating into the Late Chalcolithic period. Deposits overlying this floor were sealed by the floor (Locus:226922:042) of Building R of the Iron Age Dinka Settlement Complex (DSC).

In the western section of the geoarchaeological trench GA42, sunk into the virgin soil and covered by the wall LGR:0346 of the Iron Age Building R, we found the remains of a pottery kiln that can be assigned to the same Late Chalcolithic occupation phase. The excavation of this kiln was completed in April 2019, with the help of additional funding made available by the Rust Family Foundation to Mark Altaweel and Andrea Squitieri. In the meantime, the kiln was the subject of Sophie Pietsch's 2019 BA thesis "Untersuchungen eines chalkolithischen Keramik-

brennofens in Dinka, Peshdar Ebene, Autonome Region Kurdistan des Nord-Irak" at the Institut für Prähistorische Archäologie, Freie Universität Berlin, supervised by Wolfram Schier (FU Berlin) and F. Janoscha Kreppner (WWU Münster). The results will be published in a future publication.

After a long hiatus of several millennia, this part of the settlement was again inhabited in the Iron Age during the so-called Main Occupation Period of DSC.

At the beginning of the Main Occupation Period 1, there was Building R which we located east of the geoarchaeological trench GA 42. Its Room 64 could be accessed via a passage from the east. In the northwest, southwest and southeast, there are connected spaces but their excavated areas are too small to allow their safe identification as covered rooms, courtyards or outdoor areas. The very narrow Passage 68 separates Building R from Building S. Its Room 66 could be entered from the west through a passage with a single-leaf doorway, of which the door socket in front of the threshold has been preserved. The north of Building S has not been preserved, as a new Building Q was later erected here that partially destroying the older structure.

The use of the new Building Q defines the Main Occupation Period 2. In some areas, new floors were installed (Outdoor Area 63 and Outdoor Area 69). On the other hand, in Building R, Outdoor Area 65 and Outdoor Area 67, the original floors continued to be used during the Main Occupation Period 2. It is for this reason that we attribute the two sub-phases to the Main Occupation Period, which represents a continuous settlement development before the buildings were finally abandoned.

The ground plans of all these buildings are neither completely preserved nor completely located within the excavated area. However, it can be said that the architecture is small and irregular, without any indication of a representative or ceremonial character. Only a few installations and finds provide information about the room functions. In Building R (= Room 64), the installation Locus:226922:041 suggests activities involving fire. In terms of furnishings and finds, Building S (= Room 66) is reminiscent of the living and reception rooms excavated in Gird-i Bazar. The fact that the area in front of its entrance is paved might suggest that this is a courtyard from which rooms were accessible. The pottery and construction methods attested for DLT3's Main Occupation Period are similar to those found in the other excavation operations of DSC and thus belong to the local Iron Age cultural tradition of the first half of the first millennium BC.

The recovery of charcoal remains that provide a ^{14}C date range of 830-789 calBC (95.4 % probability)[57] in 2015 and the 2018 discovery of the fragment of a brick with a cuneiform inscription, most likely of an Assyrian ruler (**§I**), clearly indicate that the structures encountered in DLT3 were (still) in use at a time when the Peshdar Plain and the Dinka Settlement Complex had been integrated into the Province of the Palace Herald and formed part of the holdings of the Assyrian Empire[58]. Nevertheless, none of the remains excavated so far in DLT3, or elsewhere in the Lower Town, point towards a change in material culture or an Assyrianising influence.

57 Altaweel/Marsh 2016, 27-28 with Fig. B2.7.

58 Radner 2016.

F. Grave 71 in the well of Building I at Gird-i Bazar

Jens Rohde & Kathleen Downey

During the 2017 excavation campaign in Gird-i Bazar, human remains (registered as Grave 71) were unearthed inside a well located in Room 49 of Building I (**Fig. F1**). From 1-15 October 2018, the authors of this chapter continued the excavation of the well and Grave 71. The results complement and update the previous reports published by Peter Bartl and Kathleen Downey[59].

The continuation of Grave 71's excavation was prompted by the results of the ^{14}C analysis conducted on the femur (sample PPP 267930:037:004) of one of the three individu-

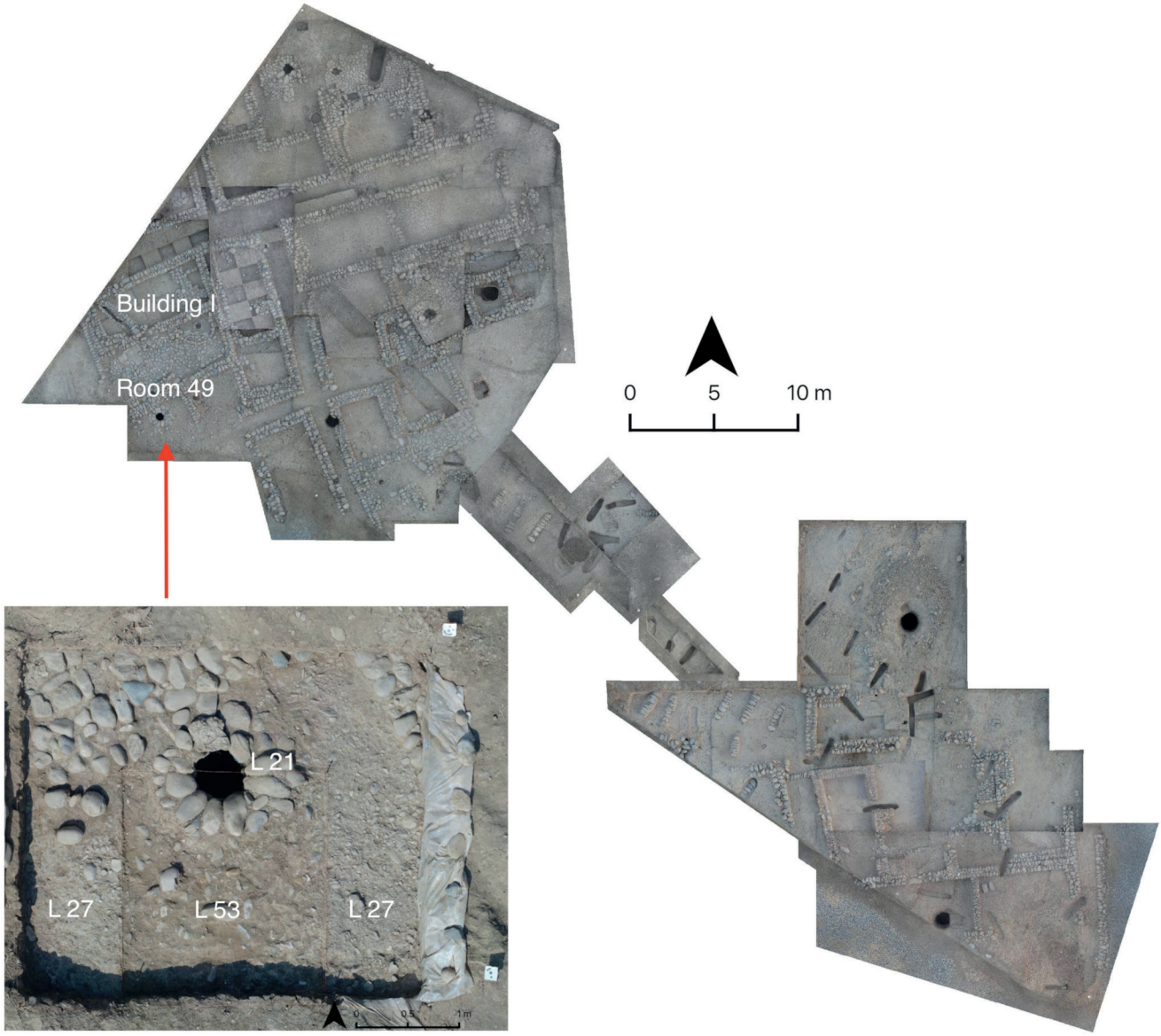

Fig. F1: Orthophoto of the Gird-i Bazar excavations at the end of the 2017 autumn season, with an inset showing the well in Building I with Grave 71 at the beginning of the 2018 excavations (after removing the 2017 backfill). Prepared by Andrea Squitieri.

59 Bartl 2018; Downey 2018a.

als excavated in 2017 in the uppermost level of the well's fill. This was Individual 1, a female aged 40-55+ years[60]. The probable date range obtained was 748-409 calBC (95.4 % probability)[61]. This long date range is due to the notorious Hallstatt Plateau, a flat area in the radiocarbon graph affecting the dates of samples between c. 800-400 BC[62].

While we cannot say when the bodies were placed in the well after their death, this act would certainly have ended the use of the well as a source of water. However, as deposits had already accumulated to a substantial height at the time that the bodies were deposited this seems to have happened only after Building I (if not the entire area of Gird-i Bazar) had been abandoned for a considerable time span. Due to the ^{14}C results, the bodies of Grave 71 cannot have been victims of the Assyrian campaigns in the region that led to the establishment of the Province of the Palace Herald during the reign of Shalmaneser III (r. 858-824 BC). The bodies may have been placed in the well much later, most likely as a consequence of the turmoil spreading across the region when the Assyrian Empire lost control over the Peshdar Plain sometimes during the course of the 7th century BC[63]. Additional radiocarbon dates, as well as further analysis on the bones, will hopefully help to clarify the circumstances in which these individuals were deposited in the well.

F1. The stratigraphy and general features of the well

Jens Rohde

F1.1 The structure of the well

The stratigraphy of the well was already established in 2017[64]. Locus:267930:045 is the cut of the well into the virgin soil; Locus:267930:021 is the cobble installation set along the cut that comprises the well itself (**Fig. F1**). Inside the well, there are several different layers of fill. The oldest so far unearthed include the deposit Locus:267930:046 and a layer of large stones, Locus:267930:044. Both surround and cover the human remains. Inside these two loci, the skeletons of Individual 1 (Locus:267930:037), the stillborn Individual 2 (Locus:267930:043) and Individual 3 (Locus:267930:051) were found, as discussed in the previous report[65]. The fill Locus:267930:022 covered all these loci, up to the top of the well opening.

The experiences gained during the 2017 excavation led us to proceed in a different way in 2018. Because the well was too narrow and the skeletons located too deeply to reach them safely from above, we removed half of the well installation (Locus:267930:021) by excavating alongside it down to below the virgin soil, reaching the natural bedrock. This allowed us to excavate safely and had the added benefit that we could investigate the construction of the well and its relationship to the floor of Room 49, as described below in detail.

Initially, we focused on the area immediately outside the well, to the south, by removing the 2017 backfill (Locus:267930:052) in order to uncover the floor reached in 2017 (registered as Locus:267930:027[66]). Below the floor was a brown, moist, loose, silty-clayey soil with many pebbles, some pottery sherds and medium sized cobbles (Locus:267930:053; **Fig. F2**). This layer functioned as a substructure and therefore belongs to the construction

Fig. F2: Locus:267930:053, a substructure made of large pebbles, underneath the floor Locus:267930:027, both abutting the well architecture Locus:267930:021. Photo by Jens Rohde.

phase of Main Occupation Period 1. This substructure, along with floor (Locus:267930:027), abuts six of the courses of cobbles forming the border of the well (Locus:267930:021). Hence, it became clear that the cut of the well (Locus:267930:045) and the construction of the well architecture took place before the construction of both floor Locus:267930:027 and its substructure.

A new locus (Locus:267930:055) was assigned to the cobbles removed while dismantling the southern half the well. The cut of the well has a C-shaped section in its up-

60 Downey 2018a, 98.
61 Kreppner/Radner 2018, 56-57, Table D1: no. 8 and Fig. D5: d.
62 Plicht 2004.
63 Kreppner/Radner 2018, 57-58; cf. Radner 2016, 21 for the fragility of the control over the region already during the reign of Esarhaddon of Assyria (r. 680-669 BC).
64 Bartl 2018, 96.
65 Downey 2018a
66 Bartl 2018, 96.

permost part, undercutting the sediment before it starts to run vertically (**Fig. F3**). The lowest course was set on the resulting step in the sediment, which was cut almost horizontally. The next two courses above were set in such a way that their inner edges narrowed the diameter of the well, moving upwards. These cobbles were small and extended into the undercut. They were fixed in place by the undercut, the soil and the course of cobbles above them. The next courses up were set to create a vertical shaft in the inner diameter of the well, and the uppermost course was built with the largest stones, bringing the outer diameter into the same position as the undercut lowest layer.

Fig. F3: In order to continue the excavation of Grave 71 inside the well, half of the well structure was removed by excavating down to the bedrock with a digger. Photo by Jens Rohde.

Well Locus:267930:045 cut through more than 2 metres of brown soil filled with pebbles and cobbles. This natural accumulation (Locus:267930:054) was the result of alluvial processes and therefore contained no archaeological finds.

F1.2 The fills inside the well

Inside the well, the deepest fills to be reached in 2017 were Locus:267930:046 and Locus:267930:044. Below these, the well fill excavated during the 2018 campaign was given the label Locus:267930:057. This fill was a brown, moist, friable, clayey soil, which contained one sherd as well as some pebbles and cobbles. Inside this layer, we also found the remains of three individuals: a juvenile and at least two adults (**§F2**). It is currently not clear, however, whether any of these bones might belong to either of Individuals 1-3, excavated in 2017, or whether they all belong to entirely different individuals.

Overall, some bones appear to have been articulated although it would seem that the bodies were placed relatively carelessly inside the well (**Figs. F4-F5**), as many bones are missing or were not found in articulated positions (or else are not yet fully understood). A left leg found

Fig. F4: Articulated human bones in Grave 71. Photos by Jens Rohde.

Fig. F5: Articulated human bones in Grave 71, towards the end of the 2018 excavation. Photos by Jens Rohde.

in the northern part of the well was bent in such a way that the femoral and lower leg were above each other, the pelvis was positioned in the south-west, and the backbone partially leaned against the edge of the well to the south. An upside-down cranium was found to the east, while ribs were uncovered both west and south of several vertebrae. There is the clear suggestion of violent treatment in the placement of these bones. However, as long as there are human remains still to be unearthed, and while the anthropological analyses remain unfinished, it must be left undecided whether Grave 71 represents a purposeful burial process or whether the bodies were simply discarded in the well. It is still uncertain how many more human remains are yet to be excavated.

F2. The human remains of Grave 71

Kathleen Downey

At the beginning of the 2018 excavation, it became clear that many of the bones with thin cortical bone survived

only as shadows in the soil and were impossible to remove from the burial context. Therefore, we decided to give each group of bones uncovered their own bone group number within Locus:267930:057 so that there would be separate documentation, photographs and measurements for each group of closely related bones. Such bone groups did not necessarily have to indicate bone articulation, but the generally close positioning of the bone fragments.

During the initial cleaning, the flat bones of a juvenile cranium were uncovered (PPP 267930:057:002). They appeared to have good surface preservation, but were very fragile and fragmented easily upon removal. However, the petrous portion is well preserved and not fused. These bones were found in the north-northeast section of the well during the cleaning of that section. In the north-northwest section, just east of and approximately level with the closest large stone, was a group of bone fragments. The westernmost fragment was identified in the field as a part of the ischium of an adult pelvis. The middle bone has very thin cortical bone and is not as well preserved. An official identification can only be made after more careful cleaning in the lab. In the east, almost in direct contact with the middle bone fragment, was a lone distal hand phalanx.

Upon removing the south-southwest large stone, a group of ribs became visible. They were not all in articulation, but it appears that many were in groups of two or three. There were many rib bones layered in different directions. Four bones were removed and documented as bone group PPP 267930:057:005. Furthermore, the middle of the superior portion of the thoracic vertebra was found. Another thoracic rib spine was removed with the thoracic bone intact, but this was only discovered after cleaning. At this level, the bones were better preserved. Although still quite fragile, these ribs and vertebrae did not dissolve during cleaning like those in the 2017 excavation. So far, there also seems to be an improvement in the post-excavation survival rate, compared to the 2017 remains.

During cleaning for photographs, small fragments were revealed, some of which were from the ASIS and AIIS of the ilium. Further cleaning showed the femoral head to be directly articulated with the acetabulum. The superior of the L pubis was also present and articulated with the R pubis by the pubic symphysis. Both of these appeared fragile and were easily damaged during cleaning, so it was decided to leave the pubic bones to be cleaned later, closer to the time of documentation and removal. This was done to give the pelvic inlet outline the best chance of survival for the photographs necessary for helping assess the individual's biological sex. These are the first group of the non-fused articulated bones. The upper layers may have been confused by bioturbation, geological post-deposition processes, and a hostile soil microenvironment. During excavation around the iliac blade and pelvic inlet, a large, dense concentration of white flecks in the soil was observed and sampled. After cleaning, the articulations between the femur, os coxa, sacrum, and the last three lumbar vertebrae were visible. The collapse of the ribs above and to the south was very clear and indicates that the individual was placed in the well in some type of sitting position. As decomposition occurred the upper portion of the thorax collapsed down in this area.

In the course of cleaning and removing the initially found bones, more bones continued to appear, including a nicely articulated left wrist and hand as well as a right humerus. During the process, the right lower arm bones (radius and ulna) were found as well as the well preserved anterior of an iliac blade. This signaled that another individual was most likely to be resting quite closely underneath. The greatly improved preservation and level of articulation at this level would have presented more material than could have been appropriately documented and removed from the archaeological record in the time available to us. We therefore decided to cease excavation once all bones that had already been completely uncovered were removed. Cleaning and analysis will have to be continued to fully analyse the material excavated during the 2018 campaign and to compare it to the 2017 material.

The minimal number of individuals (MNI) of the skeletal material removed during the 2018 campaign is three: one juvenile individual represented by the immature cranium, and two adults represented by the third os coxa and two right humeri. Also, the two tibia recovered are likely to be from separate individuals because they are of different lengths. Initially, it was thought that the cranium belonged to the individual represented by the articulated hips and legs. But given the location of the newest os coxa (part of the pelvis) it is possible that this was actually the first group of bones uncovered from the individual below. Only further excavation of the well will allow us to better understand the location and relationships of these bones and facilitate a more accurate interpretation of the material.

While more thorough cleaning and more in-depth study is needed to analyse the wealth of skeletal material recovered from the well, for the time being, we can at least assess one of the two adult individuals for age and biological sex. The recovered skull is estimated to belong to an adult male aged 40+ years as the features of both the cranium and the mandible indicate a male (nuchal crest, glabella, supraorbital torus, orbital sharpness, gonial angle, and mental eminence). The individual had heavily worn teeth and partially obliterated cranial sutures, which leads to the estimate of an older individual.

G. 2018 Pottery studies

G1. The 2018 pottery from the Dinka Settlement Complex

Jean-Jacques Herr,
with contributions by
Abdullah Bakr Othman & Hero Salih Ahmed

In this chapter, we present a survey of the pottery excavated in two excavation areas of the Dinka Settlement Complex (DSC)[67]. Firstly, we will discuss the pottery recovered in 2018 on the western slope of Qalat-i Dinka in the three trenches QID1, QID2 and QID3 as well as the pottery unearthed already in 2016 in a test trench in the area of QID1. Secondly, we discuss the pottery from the 2018 excavations in the Lower Town in the excavation area called Dinka Lower Town 3 (DLT3).

Most of this pottery dates to the Iron Age and was found in occupation levels of the Main Occupation Period (cf. **Tables D2** and **E2**). This chapter serves to demonstrate that these pottery assemblages share the same characteristics as the pottery recovered during earlier campaigns in other excavation areas of the Lower Town (Gird-i Bazar = DLT1; DLT2) in the Main Occupation Period levels, thus establishing a contemporaneous occupation horizon throughout all these areas.

In addition to the discussion of the Iron Age pottery from Qalat-i Dinka and DLT3, this chapter also presents pottery finds dating to other periods (**§G1.4**; **§G1.5.2**) as well as the Sasanian-period pottery retrieved from the 2018 geoarchaeological trench GA44 (**§G1.6**). Moreover, we also share some observations on a specific type of Iron Age pottery with animal-head appliqués, several examples of which have been found across DSC (**§G1.7**).

67 During the 2018 spring campaign on Qalat-i Dinka, the pottery was processed by Jean-Jacques Herr, Hero Salih Ahmed, Abdullah Bakr Othman and Awas Jihad. During the 2018 autumn campaign at DLT3, the pottery was processed by Jean-Jacques Herr, Hero Salih Ahmed, Jamal Jameel Asaad and Abu Bakr Qasim while Emo Muhamad Mala Issa washed the pottery. The 2018 pottery was further processed during winter 2018/19 in the Sulaymaniyah Archaeological Museum by Abdullah Bakr Othman and Hero Salih Ahmed. The text of the chapter was revised by Karen Radner.

G1.1 Methodology

The study of the pottery from the Dinka Settlement Complex follows the Peshdar Plain Project's (PPP) systematic and standardised process, which was first established in 2015 and has since been updated and refined every year to take into account new material and the results of the ongoing analyses[68].

Our method goes beyond a mere morphological approach and includes the reconstruction of the *chaînes opératoires* used by the potters[69]. We pay particular attention to the macro-traces that the potters left while fashioning the vessels in order to highlight the technological choices that they made at every stage of the production process. This starts with the choice of material and continues down to the decoration and finishing processes.

We document these traces and the granulometry of the sherds, as seen by both the naked eye and with the use of a Dino-Lite Digital Microscope (Model AM4113T). After this preliminary analysis is made in the field, samples are chosen that undergo further in-depth microscopic and archaeometric analyses carried out in the laboratory by Silvia Amicone at the Competence Center Archaeometry Baden-Wuerttemberg (CCA-BW), University of Tübingen.

The *chaîne opératoire* methodology has been applied to all sherds recovered during the PPP excavations, including body sherds. As a result, we have established several techno-petrographic groups. Each group combines information about fabric, form, and fashioning techniques. The pottery from the Main Occupation Period of the Dinka Settlement Complex has been organised into 10 techno-petrographic groups (labelled TechP1 to 10), which have been described in detail[70]. Sherds that cannot be filed under any of these groups are classified as "unknown". This category includes in the main sherds that are attributed to periods other than the Main Occupation Period on the basis of their stylistical, technological and petrographical observations. So far, we refrain from creating techno-petrographical groupings for such materials, as they have not yet been recovered in any substantial quantity from primary find contexts. The only exceptions are the

68 See Herr 2016, 83; Herr 2017, 110; Herr *et al.* 2018, 120.

69 E.g., Roux 2016.

70 Herr 2017; Herr *et al.* 2018.

sherds from the Late Chalcolithic period (discussed below, **§G1.5.2.2**) whose techno-petrographical groups will be presented in a later publication.

The advantage of this method is that it provides many more criteria for pottery identification and classification than the traditional morpho-stylistic approach. Because the pottery of the Main Occupation Period shows diagnostic characteristics in both shapes and techniques, this method allows us to assign pottery to the Main Occupation Period even when it is recovered from contexts lacking radiocarbon dates and / or without stratigraphic connections to well-dated contexts. For example, in the 2018 excavations on Qalat-i Dinka, the method has been useful for dating the pottery of the trench QID2 (**§G1.3.2**), which is not connected stratigraphically to any other trench and without any ^{14}C date, as well as the pottery from above the floor of Room 58 in QID1, where modern looting activities have caused considerable damage and disturbance and from where very few diagnostic sherds (e.g., rims, bases, handles) were collected (**§G1.3.1.1**).

Continuing the study of the Dinka Settlement Complex pottery with the *chaîne opératoire* method will help define the pottery tradition of this site with a higher definition than the morpho-stylistic approach alone; it will help, for example, to define the technological choices made by the potters based on factors such as availability of raw materials, technological knowledge, cultural orientation, or even social class affiliation. Moreover, it will offer a broader range of criteria to employ in order to establish the chronological connections between the pottery tradition of the Dinka Settlement Complex and the traditions of the neighbouring sites.

G1.2 Iron Age pottery periodisation issues

An attempt to establish an absolute date for the pottery recovered from the Dinka Settlement Complex can be made on the basis of the ^{14}C dates obtained from several floors of Gird-i Bazar ranging from 1216-1053 calBC (95.4 % probability) to 906-816 calBC (95.4 % probability)[71]; the fill of an *in situ* storage jar in the excavation area DLT2, with two carbonized cereal grains yielding ^{14}C dates of 1012-894 calBC (94.4 % probability) and 930-824 calBC (95.4 % probability)[72]; the excavation area DLT3, with a charcoal sample retrieved already in 2015 yielding a probable date range of 830-789 calBC (95.4 % probability; **§E**); and the floors of QID1 and QID2, where two charcoals were dated to 1001-891 calBC (85.9 % probability) and 1043-893 calBC (91.8 % probability), respectively (**§D2.1**). In the relative stratigraphy, we refer to the levels covered by these radiocarbon date ranges as the Main Occupation Period (see **Tables D2** and **E2**).

The current terminology used to refer to this period varies according to the geographical location of the sites in question. For northwestern Iran, this corresponds to "Iron Age I" (c. 1250-1050 BC) and "Iron Age II" (c. 1050-800 BC)[73]. In northern Mesopotamia, Arnulf Hausleiter proposed on the basis of pottery finds from Assur and Kalhu (Nimrud) that the latter period corresponds to the "Neo-Assyrian Period I" (NAI; 10th to 9th century BC)[74]. These broad chronological horizons predate the integration of the Peshdar Plain into the Assyrian provincial system in the second half of the 9th century BC during the reign of Shalmaneser III (858-824 BC)[75]. As the above-mentioned charcoal sample from DLT3 provided a probable date range of 830-789 calBC (95.4 % probability) it is possible that the Main Occupation Period pottery from the Dinka Settlement Complex also covers (parts of) the 8th century BC, which is labelled "Iron Age III" in Western Iran[76] and "Neo-Assyrian Period IIa (NAIIa)" in northern Mesopotamia[77].

Based on current evidence, we conclude that the pottery of the Main Occupation Period is used over a long period spanning from the end of the second millennium BC until at least the early 8th century BC. Throughout this long time period, this pottery does not show any significant changes in both shapes and manufacturing techniques. From the vantage point of the Dinka Settlement Complex pottery, therefore, the sub-periodisations into Iron Age I, II and III and Neo-Assyrian Period I and IIa are not meaningful.

Following a culturalist approach, past scholarship has often tried to link each of these Iron Age sub-periodisations to specific types of pottery[78]. Michael Danti has convincingly argued against such attempts, questioning, for example, the attribution of the so-called "Grey Ware" to a specific period in northwestern and western Iran as it was used and produced at the same time as "Monochrome Burnished Ware"[79].

In conclusion, based on the current state of our knowledge, we prefer to use the local terminology of "Dinka Set-

71 Kreppner/Radner 2018, 56-58 with figs. D4-D5; cf. Radner/Kreppner/Squitieri 2018, 186 Fig. I1.

72 Radner 2018, 31, 32 Fig. C3.

73 Danti/Cifarelli 2013, 16-23.

74 Hausleiter 2010, 12-15.

75 Radner 2016a.

76 Boucharlat 2005.

77 Cf. Herr 2016, 81-83.

78 E.g., Young 1965.

79 Danti/Cifarelli 2013, 325-326.

tlement Complex (DSC) Main Occupation Period pottery" when referring to the pottery that was uncovered in the layers constituting the Main Occupation Period with the diagnostic features of the Techno-Petrographic groups 1-10. From our vantage point, we avoid confusion by not using the above-discussed terminology for northwestern Iran and northern Mesopotamia, which in our point of view is in need of reassessment.

G1.3 The 2018 Iron Age pottery from Qalat-i Dinka (DSC Main Occupation Period)

Already the surface collections of the Sulaymaniyah Governorate Archaeological Survey (SGAS) team led by Jessica Giraud in 2013 and the 2016 test excavations had yielded material very similar to the pottery recovered from the Main Occupation Period levels at Gird-i Bazar[80]. This section deals with all Iron Age pottery recovered from the 2016 and 2018 excavations on the western slope of Qalat-i Dinka: from the 2018 operations QID1, QID2 and QID3 as well from the 2016 test trench[81] that came to be part of 2018's QID1. The material is organised by excavation area (QID1, QID2 and QID3) and architectural unit (buildings, rooms and open areas), starting with the levels of the Iron Age Main Occupation Period.

None of the three trenches on Qalat-i Dinka are physically or stratigraphically connected to each other (cf. **§D**), and their synchronisation therefore needs to be established through the material recovered in them. In the outdoor areas of QID2 and QID3, we were expecting material to potentially date to different periods due to downhill erosion and disturbances related to looting. However, at least in QID2, the latest material recovered so far, embedded between the pebbles of the glacis structure (LGR:0314), matches the Main Occupation Period pottery of QID1 and the Lower Town areas. In the deposits recovered above the floors of QID3, the chronological homogeneity of the pottery material is less certain. Nevertheless, our hypothesis is that the defensive structures excavated in QID2 and QID3 belong to the same chronological horizon as Building P in QID1.

In turn, the Iron Age material from the excavations on the western slope of Qalat-i Dinka broadly matches the pottery from the Main Occupation Period of the excavated Lower Town areas. This chapter seeks to further clarify the relationship of the excavated Iron Age pottery from Qalat-i Dinka to the material recovered in the Lower Town in the excavation areas of Gird-i Bazar, DLT2 and DLT3. Our results show that the Qalat-i Dinka material exhibits very strong similarities to the pottery recovered from the Lower Town. Already this suggests the occupation of Qalat-i Dinka during the Main Occupation Period of the Lower Town, and this link is further confirmed by the probable date ranges resulting from ^{14}C analysis of a piece of charcoal found in QID1's Building P on the paved floor (LGR:0324) of Room 58 (1001-891 calBC; 85.9 % probability) and of a carbonized seed collected from a floor accumulation (Locus:176905:031) in the trench QID3 (1043-893 calBC; 91.8 % probability; cf. **§D2.1**).

The two campaigns of excavations on Qalat-i Dinka in 2016 and 2018 have yielded 15,883 sherds (diagnostic and non-diagnostic) totalling 295 kg, but under 4 % of this material comes from *in situ* contexts. The rest of the material comes from the fills of looting pits and very disturbed deposits. Therefore, the material recovered *in situ* is frustratingly limited.

Nevertheless, the similarity with pottery recovered from the DSC Lower Town operations Gird-i Bazar, DLT2 and DLT3 is obvious, and the identification of new Iron Age materials such as glazed and decorated pottery provides new insights into the range of ceramics and techniques used at the Dinkas Settlement Complex in the Iron Age.

G1.3.1 Pottery from QID1

G1.3.1.1 Pottery from Building P

In Building P's Room 58, the excavation of the deposit (LGR:0323) above the paved floor (LGR:0324) has yielded 144 sherds (totalling a weight of 2.4 kg) that were found together with some animal bones, ivory fragments, beads and other pieces of jewelry (cf. **§H**). The pottery remains of this deposit[82] come mainly from the eastern part of the room, which was less heavily affected by looting (**Fig. G1.1**).

Due to the low number of sherds and their poor level of preservation, only a few morphological types can be identified and consequently, morphological comparisons with the known material found in levels dated to the Main Occupation Period in other areas of DSC are scanty.

However, the same techno-petrographic groups (TechP1-10) associated with the same morphological types of pottery have been successfully identified among the pottery

80 Cf. J.-J. Herr *apud* Kreppner/Squitieri 2017a, 53-54.

81 Kreppner/Squitieri 2017a, 48.

82 Pottery collections PPP 181909:038:003, PPP 181909:038:006, PPP 181909:038:009, PPP 181909:038:015, PPP 181909:038:018, PPP 181909:038:021, PPP 181909:038:024 and PPP 181908:014:006.

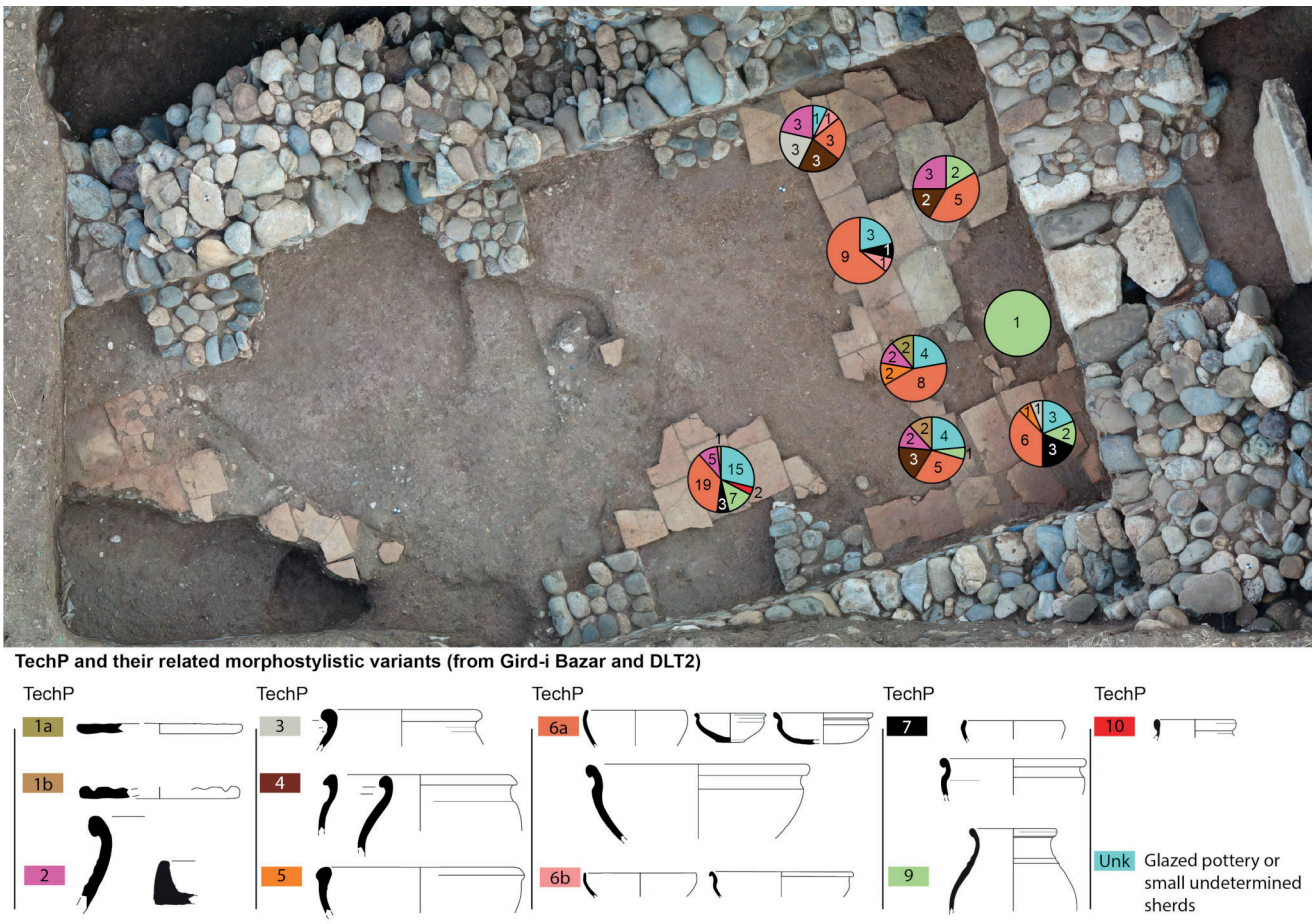

Fig. G1.1: Quantitative and qualitative distribution of the pottery recovered on the floor of Building P, Room 58 (QID1). Prepared by Jean-Jacques Herr.

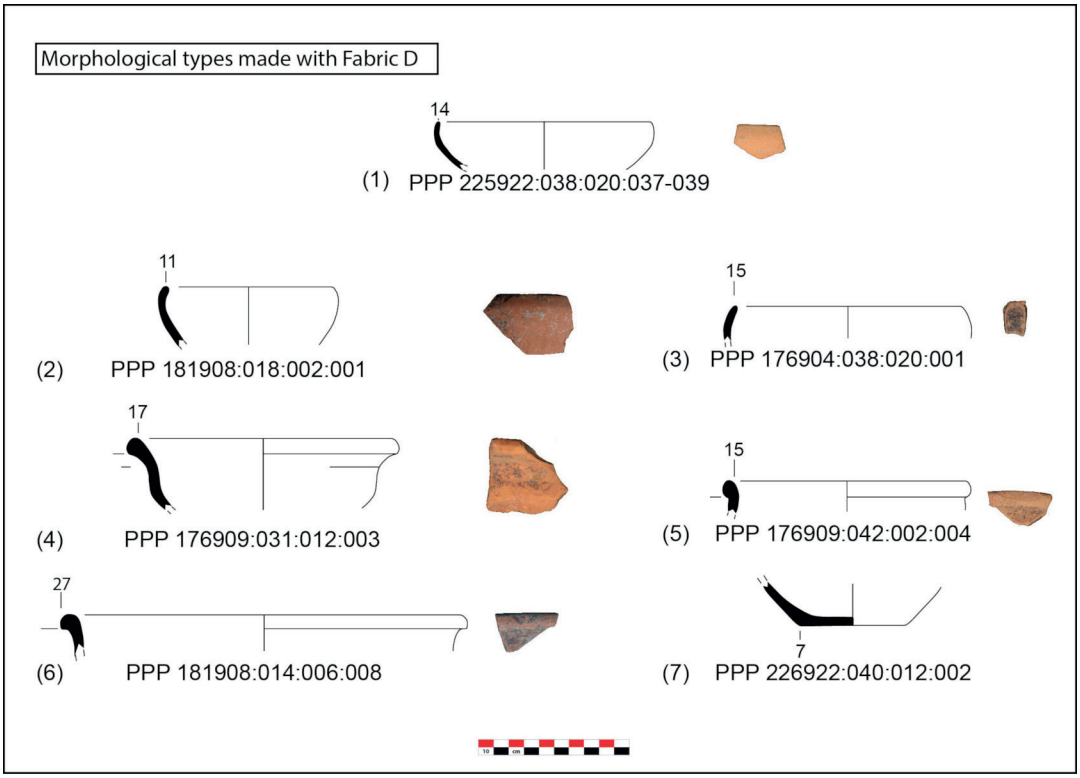

Fig. G1.2: Morphological types made with Fabric D from DLT3 (1, 7) and QID (2-6): hemispherical bowls (1-3); carinated bowls (4-6); flat base of a bowl (7). Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

recovered from Room 58 as in the excavation areas Gird-i Bazar, DLT2 and DLT3 in the Lower Town of DSC. We identified body sherds of large vessels (cooking pots) made with TechP 1, 2, and 4 as well as thinner, non-diagnostic sherds of TechP 6a and 6b. A few body sherds of jars have also been noticed featuring TechP 10 (red barbotine) and TechP 9 (burnished). Some body sherds with vegetal tempering, typical of TechP 3 jars, were also identified (**Fig. G1.1**). The number of unclassified bodysherds is very small. Of these, it is their fragmentary preservation (averaging 16.6 g per sherd) that hinders identification with one of our techno-petrographic groups.

Although the amount of diagnostic material is quite small (28 sherds totalling less than 1 kg), there are some significant diagnostic specimens. We have identified three small sherds of a carinated bowl with a diameter of 24-27 cm (**Fig. G1.2: 6**; **Fig. G1.3: 5**, **16**). Two sherds have been found of Fabric B cooking pots (**Fig. G1.5: 7**). All base sherds recovered have a flat bottom (**Fig. G1.4: 7**).

G1.3.1.2 Pottery associated with Grave 99

Between the two pilasters LGR:0320 and LGR:0317 of Building P, we found disturbed human remains that were radiocarbon dated to a probable date range of 1234-1117 calBC (92.8 % probability). These remains were associated with pottery that is morphologically, technologically and petrographically similar to the Iron Age Main Occupation Period pottery from Gird-i Bazar, DLT2, and DLT3.

The material is quite limited, though, as there are only 16 sherds. Many of these seem to belong to a single, broken TechP 9 jar that was decorated on its shoulder with an animal-head appliqué, as also found in other excavation areas of DSC (**Fig. G1.13: 1**; cf. **§G1.7**); this head has two pointed horns and a long burnished muzzle. Moreover, a rim sherd of a well-burnished, incurved rim bowl was recovered (**Fig. G1.2: 2**).

The skeletal remains of a human hand enclosed a conical fragment of pottery with a 1 cm thick wall (**Fig. D23**), filled with sediment and white powdery remains. The vessel was burnished, and white colour covers its surface. The vessel may be a conical beaker whose foot was not preserved. This would be the first such vessel to be found so far at DSC. At Hasanlu in western Iran, burnished, conical-footed beakers are attested in the graves. Some have walls that are about 0.5 cm thick and handles with animal-head appliqués[83], quite similar to what is attested at DSC. Nevertheless, the wall of our vessel may be too thick to suggest identification with a thin-walled beaker.

Associated with the skeletal remains, we also found some very eroded and badly preserved sherds of a type of quartz ceramic or "faïence"[84] with white, yellow and dark colours that recall finds from Hasanlu[85] (cf. **§G3**).

G1.3.1.3 Glazed pottery

Only a few fragments of glazed pottery have been found within the deposits above the floor of Room 58 and in the disturbed fills associated with looting activity.

Five pieces found in the deposits (LGR:0323) above the tiled floor (LGR:0324; **Fig. G1.8: 2**; **5**) and in the disturbed fill (LGR:0290; **Fig. G1.8: 1**; **3-4**) may date to the end of the second or the beginning of the first millennium BC. While four of these glazed sherds are made of a light brown and vegetally-tempered fabric the fifth sherd (PPP 181909:038:015:003; **Fig. G1.8: 5**) is made of an orange fabric marked by 5 % sub-angular yellowish inclusions, which could be grog.

The surface of the glaze is porous due to many air bubbles. The colour ranges between white with turquoise and pale green shades, which is quite common for first millennium BC pottery, characterized by copper oxide colourant[86]. The white colour could be the consequence of pigment loss due the humid environment[87].

All these glazed sherds can be attributed to bottles or small jars. Convex button bases such as the one of PPP 181909:010:001:034 (**Fig. G1.8: 1**) are well documented for early first millennium BC jars in northern Mesopotamia and western Iran[88]. Across this broad geographical area, such glazed pottery types are mainly associated with ritual activities. Glazed bottles such as these are mainly found within funerary contexts whereas "bucket" types tend to be recovered in temples[89].

83 Dyson 1989, 113 Fig. 7: UM 63-5-117 (University of Pennsylvania Museum of Archaeology and Anthropology); cf. Danti/Cifarelli 2013.

84 For a definition of "faïence" see Caubet *et al.* 2005, 13; Caubet 2007, 13.

85 Dyson 1989, 113 Fig 8: UM 65-31-403. In the Hasanlu classification, the Buff Ware Ia is "medium size grit or sand" similar to what we observe in Fabric C1. No barbotine, like the one used in TechP10, has been documented for Hasanlu.

86 Matoïan 2007, 15.

87 Kaczmarczyk 2007, 30.

88 In Assur: Andrae 1925, pl. 17 a-c, e; pl. 18; in Hasanlu IVB: Danti/Cifarelli 2013, 111; cf. Hassanzadeh 2016.

89 Cf. Andrae 1925; Hausleiter 2010; Hassanzadeh 2016. For a piece from a burial context in the Upper Tigris region see Kozbe 2018, 430, Fig. 8.

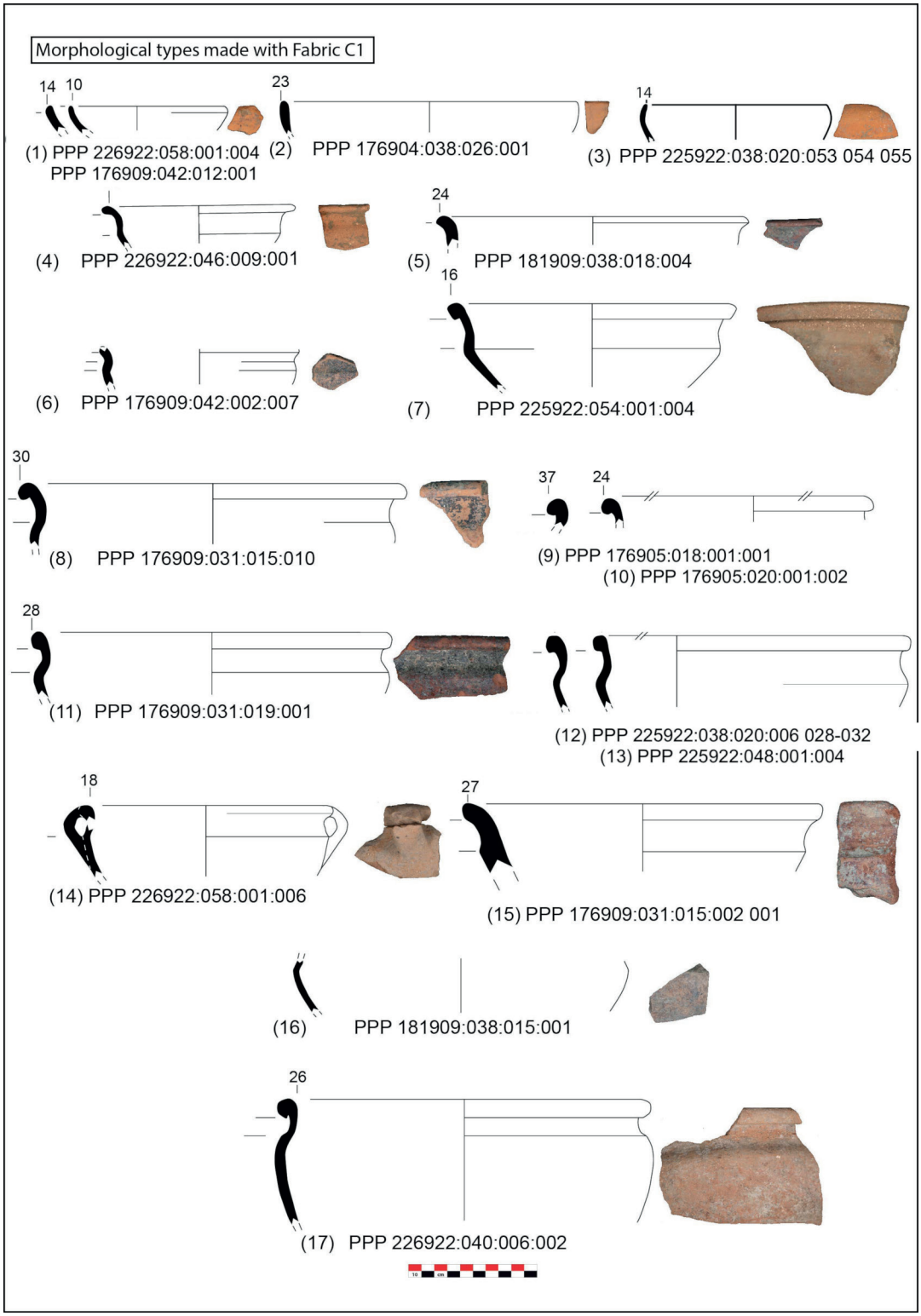

Fig. G1.3: Morphological types made with Fabric C1 from DLT3 (3-4, 7, 12-14, 17) and QID (1-2, 5-6, 8-11, 15-16): hemispherical bowls (1-3); carinated bowls (4-17). Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

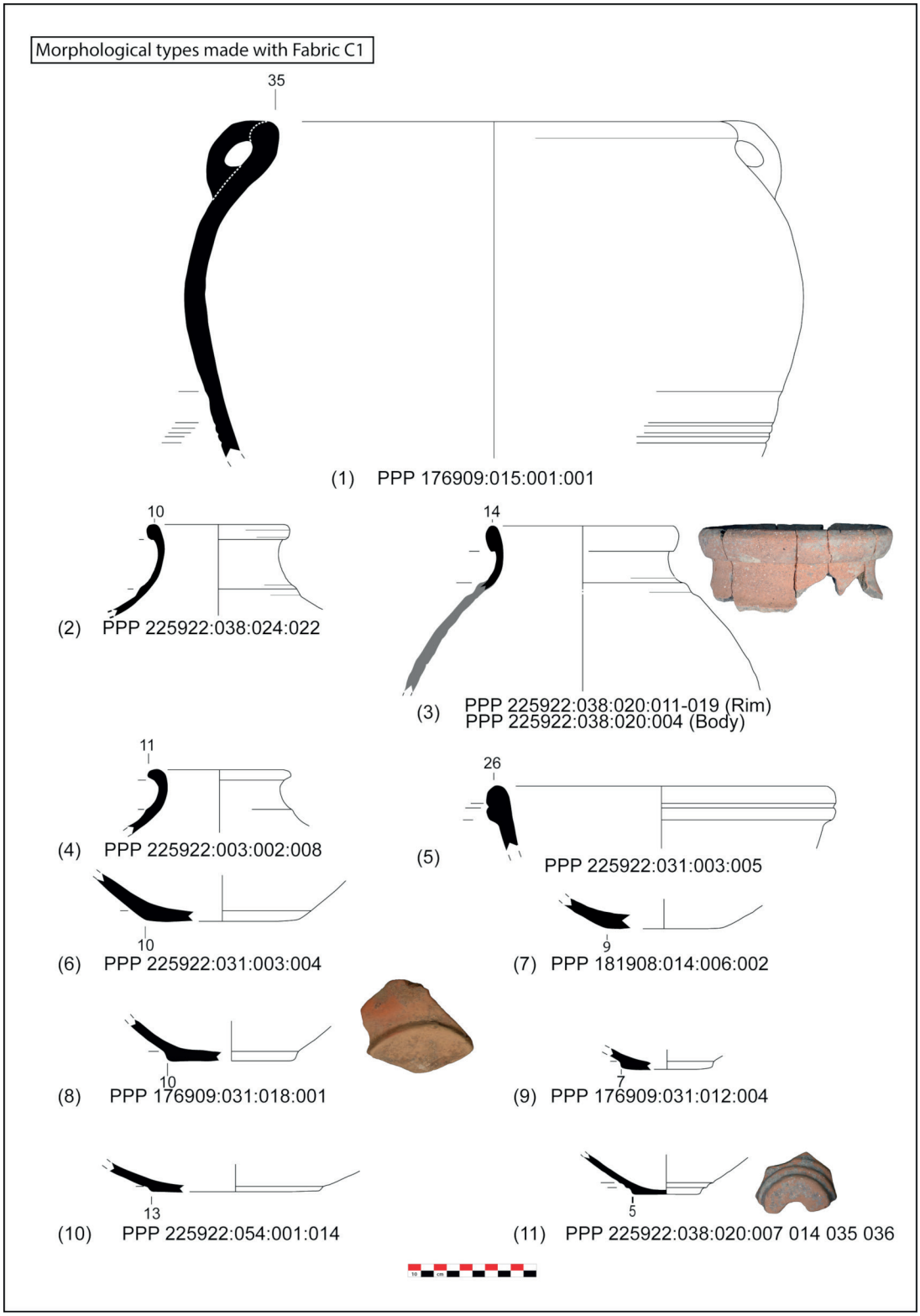

Fig. G1.4: More morphological types made with Fabric C1 from DLT3 (2-6, 10-11) and QID (1, 7-9): neckless jar (1); necked jars (2-5); bases (6-11). Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

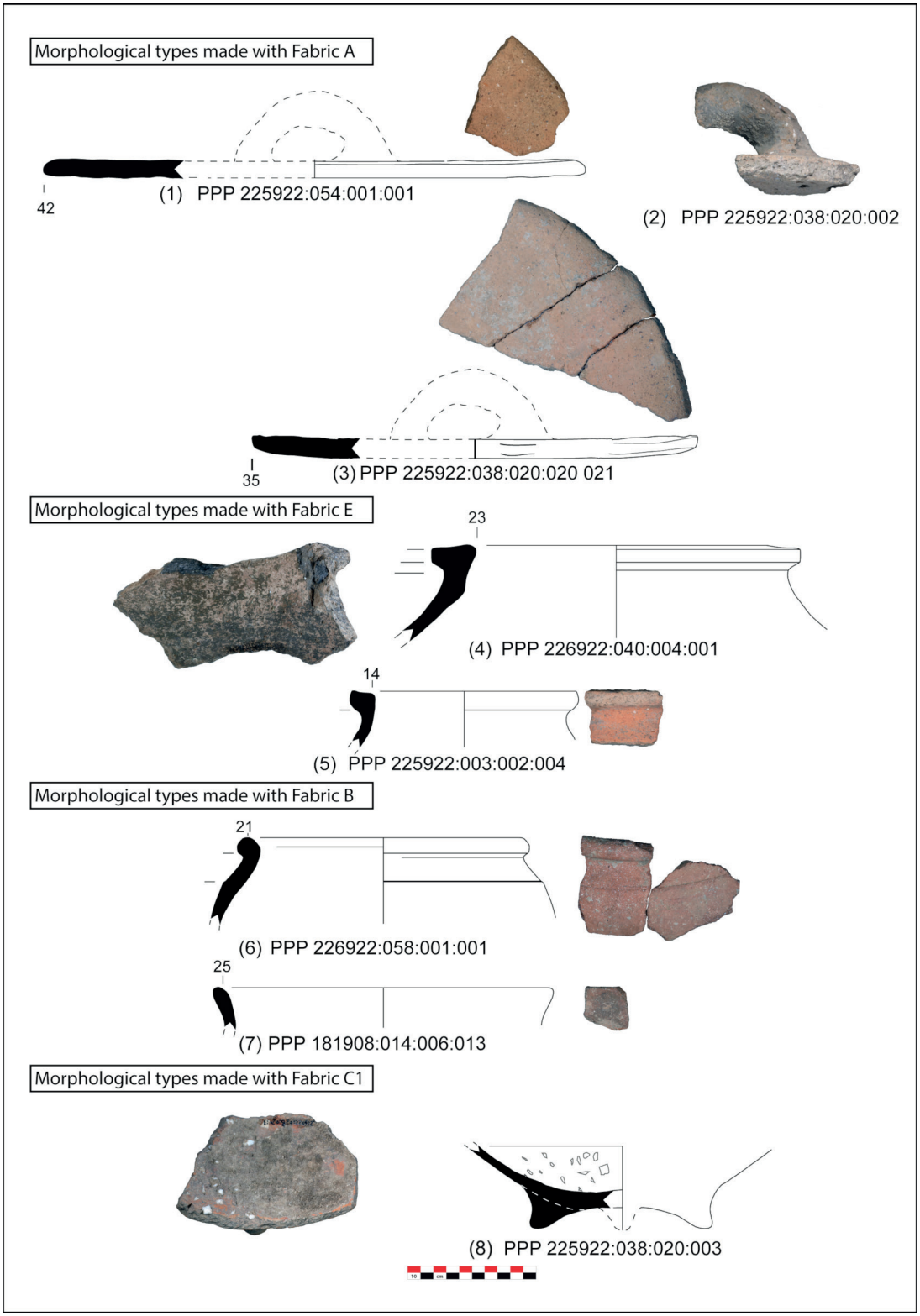

Fig. G1.5: Morphological types made with various fabrics from DLT3 (1-6, 8) and QID (7): lids (1-3) made with Fabric A; jars (4-5) made with Fabric E; cooking pots (6-7) and a ceramic mortar (8) made with Fabric C1. Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

Furthermore, a dark trace was noticed on the inside wall of a base that was found amongst first millennium BC material from QID1 (**Fig. G1.8: 1a**), and this might be a glaze. Dark glazes did exist during this period and were made with manganese and iron oxides in Mesopotamia and Iran[90]. However, this dark trace could also be secondary and perhaps unintentional; it may be the remains of bitumen or carbon-black absorption.

Due to the disturbed nature of the contexts in which all these glazed sherds were found, no petrographic or chemical analyses have yet been performed as they are not considered a priority in our sampling procedure. Any better-contextualized and ideally also better-preserved glazed material that may be found in future excavations will be sampled for such analyses. Until then, we refrain from adding to the ongoing debates regarding Iron Age glazed pottery and its origins[91].

G1.3.1.4 A jar with figurative decoration

During the 2016 excavations, an intriguing fragmentary jar with an incised figurative decoration was found that consists of two joined sherds (PPP 100000:007:001:131 and PPP 100000:007:001:132). These pieces were recovered from within the disturbed deposit (LGR:0290) of a looting pit inside the area of Building P.

What survives of our jar consists of two joining body sherds (**Fig. G1.6**) made with Fabric C1 in the coiling technique, planed on the inside wall and vertically burnished on the outside wall. This corresponds to the techno-petrographic group TechP 9, as classified on the basis of the Iron Age material from the ongoing excavations of DSC's Lower Town, chiefly from Gird-i Bazar[92].

Beneath three horizontal grooves that once marked the base of the jar's now lost neck, a circular clay lug with a diameter of 1.5 cm is attached to the jar's shoulder. For both these decorative elements, pots and jars found in the Iron Age Main Occupation Period levels in excavation areas in the Lower Town of DSC provide good parallels[93].

So far unique, however, is the third element in the jar's decoration: an incised combination of two figures. A two-legged human-like figure appears to stand on top of a larger four-legged animal-like figure whose 2.7 cm long tail undulates upwards towards the circular lug (**Fig. G1.6: 1-2**). The quadruped's hind legs appear firmly planted to the ground (although their feet are broken off) while its front legs are raised up. This position could be interpreted either as showing the creature as rising up on its hind legs in a rampant, fighting position or else in a flying position. The raised upper front leg appears to end in a bird talon-like claw (**Fig. G1.6: 4**).

The biped figure on the back of the quadruped creature has a round head, with the face unfortunately broken off, and its long, narrow left arm appears to grasp the tail of the quadruped (**Fig. G1.6: 3**). The figure's waist is marked by two incisions that seem to indicate a belt. The right arm is broken off but what remains of the figure's torso suggests that the arm was raised up high, perhaps brandishing a weapon.

The iconography of belief and ritual as attested in Mesopotamia and Iran offers many instances of human-shaped figures standing on top of four-legged creatures since the late third millennium BC, and the motif continues to be widespread during the second and first millennium BC on a wide range of materials including cylinder seals, rock reliefs, stone monuments and bronze artefacts. Whenever we can identify them, the figures portray various gods and their sacred beasts, and they are either shown by themselves (e.g. on Neo-Assyrian stone stelae[94] or on Urartian votive plaques[95]) or in groups (e.g. on the Neo-Assyrian rock reliefs of Khinis, Shiru Maliktha, Maltai and Faideh[96] or on a bronze shield from the Urartian fortress of Yukarı Anzaf[97]). Examples of such iconography have also been identified on Iron Age vessels. In northwestern Iran, metal vessels e.g. from the graveyard of Marlik and the Burned Building II in Hasanlu are decorated with animal motifs such as lions, bulls and rams in repoussée technique. The most famous example is the so-called "Golden Bowl of Hasanlu"[98].

Due to the fact that the biped figure on our jar stands on the back of the beast, rather than sitting astride in a riding position, we propose to interpret this figure as the representation of a male deity. Hints towards the nature

90 Kaczmarczyk 2007, 33-34.

91 Cf. Hassanzadeh 2016, 382 who proposes that the glazing technique originated in the Urmia region. But Late Bronze Age glazed materials are already known from e.g. Ugarit, Mari and Nuzi: Caubet 2007; Moorey 1994, 159.

92 Cf. Herr 2017, 124, 126 Fig. E1.15.

93 Circular lug (Gird-i Bazar): Herr 2017, 107, Fig. E1.3:2; grooves marking the base of a neck (Gird-i Bazar): Herr 2017, 107, Fig. E1.3: 2, 6, 7, 9; and in DLT3: **Fig. G1.13: 2-4**.

94 Thureau-Dangin/Dunand 1936, 156-157 pl. XIV; Thureau-Dangin *et al.* 1931, pl. 2:1.

95 Seidl 2004, 169-183.

96 Bachmann 1927; Morandi Bonacossi/Iamoni 2015.

97 Belli 1999; Seidl 2004, 84-85, Fig. 48. The shield depicts the gods' sacred animals in a flying position with raised forelegs; its inscription dates it to the co-regency of Išpuini and Menua of Urartu, c. 820-810 BC.

98 Porada 1959; Winter 1989.

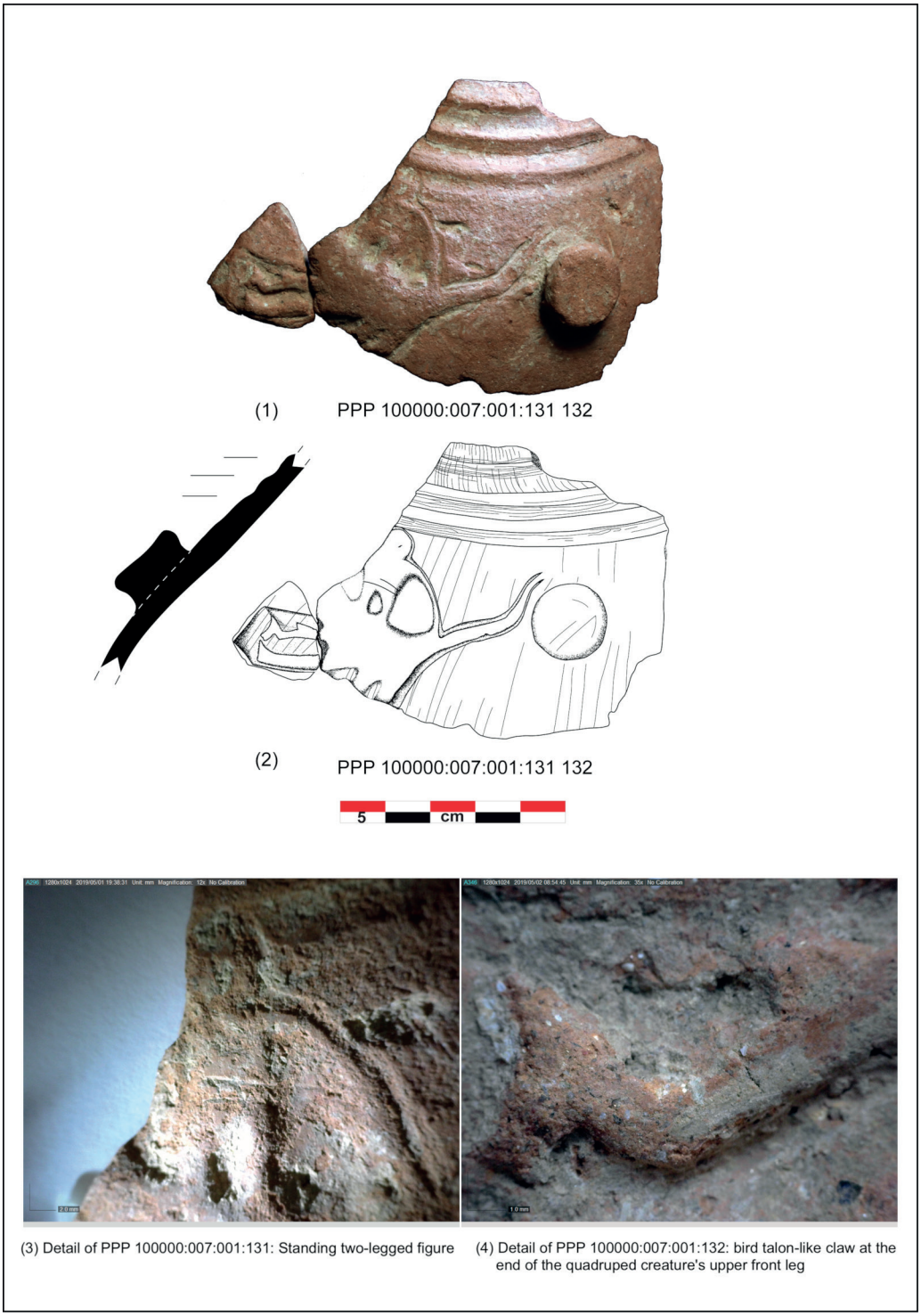

Fig. G1.6: Sherds of a jar with figurative decoration from Qalat-i Dinka, area of QID1 (PPP 100000: 007:001:131 and PPP 100000:007:001:132; found in the 2016 test trench). Photos by Jean-Jacques Herr, drawings by Zuhair Rajab al-Samaree and Felix Wolter; prepared by Jean-Jacques Herr.

of the god's companion are provided by the creature's front legs and its tail. Bird talons on the front leg might indicate a griffin[99] while the undulating tail perhaps recalls that of the *mušhuššu* dragon, in the first millennium BC famously the sacred animal of the god Marduk (and during the reign of Sennacherib of Assyria also of Aššur and his consort Mullissu[100]) but originally the companion of the god Tišpak of Ešnunna in the Diyala region.

Even though the identification of the deity depicted on our fragmentary jar is impossible, this is the first evidence for the belief system of the inhabitants of the Dinka Settlement Complex. Presumably locally produced, as the jar corresponds to TechP 9, the piece provides further evidence for the local artistic traditions of DSC.

G1.3.2 Pottery from QID2

In the excavation area QID2, 2,843 sherds (diagnostic and non-diagnostic) have been recovered with a total weight of 42.6 kg, but only 27 % of this total weight were found in good context such as floors and deposits above floors (Locus:176909:015; Locus:176909:017; Locus:176909:031; LGR:0312; LGR:0314).

The sherds are very fragmented (with an average weight of 15 g per sherd) and badly eroded and thus of a state of preservation similar to the material found in the open areas and alleyways in Gird-i Bazar, which is markedly different from the much better preserved pieces recovered from a pit[101], a well[102] and a kiln[103] at Gird-i Bazar. The largest and best preserved QID2 sherds come from Locus:176909:015 and belong to a pot (**Fig. G1.4: 1**).

G1.3.2.1 Pottery from the oldest deposit

At the bottom of the sounding, underneath the package of floor LGR:0312, sherds totalling 2.4 kg were found that represent roughly a quarter of a large pot made with TechP 10 (**Fig. G1.4: 1**). The pot has a spherical form with a handle in the shape of a vertical loop attached directly to the round thickened rim. Silvia Amicone sampled this specimen for petrographic analysis and confirmed the macroscopic classification as Fabric C1 (**§G2**: Sample 102), with eroded orange-red barbotine coating the surface of the vessel. This is the first time that this shape of pot has been recovered made with TechP 10, which until now had been attested only for jars and bowls. Possible morphological parallels for this jar are attested at Hasanlu (Level V, c. 1450-1250 BC)[104].

G1.3.2.2 Pottery from the top of the glacis

A deposit (LGR:0312) above a floor which seems to correspond to an accumulation of consecutive floors on top of the glacis yielded 193 sherds (totalling 3.5 kg), with only very few diagnostic ones. Among those are the thickened rims of carinated bowls made with TechP 6a and TechP 7 (**Fig. G1.2: 5**, **Fig. G1.3: 6**) and the simple round rim of a hemispherical bowl (**Fig. G1.3: 1**), forms typical of DSC's Iron Age Main Occupation Period pottery.

There is also unknown material, including the horizontal round rim of a closed vessel, made of organically tempered clay with the coiling technique and then smoothed on a wheel. The colour of the surface is "very pale brown" (10YR8/4) on the Munsell chart. A thin dark layer is visible on the outside and this might represent the type of dark painting characteristic of the so-called "Khabur Ware"[105] of the Middle Bronze Age (**Fig. G1.10: 2**).

G1.3.2.3 Pottery from the latest surface of the glacis

The preliminary dating of the glacis surface is related to the excavation of the deposit (Locus:176909:031) above the glacis (LGR:0314). 251 pottery sherds totalling 5.5 kg were found, but only 33 of those are diagnostics (totalling 1.1 kg).

We have identified fragments of carinated bowls made with TechP 6a and 6b (**Fig. G1.2: 4**) and others coated with the dark slip of TechP 7 (**Fig. G1.3: 8**, **11**), cooking pots made with TechP 4 and a large carinated bowl with a simple round everted rim made with Fabric C1 (**Fig. G1.3: 15**). So far, no such thick-walled carinated bowls had been

99 Depicted e.g. on the shield from Yukarı Anzaf (but with wings); see above.

100 Depicted e.g. with the gods Aššur and Mullissu in Sennacherib's rock reliefs at Maltai and Khinis; see above. Note that the *mušhuššu* dragon's back claws are bird talons.

101 Building A, Room 1, LGR:0014. For the context of this pottery assemblage see MacGinnis/Kreppner 2016, 57 Fig. C3.4.

102 Outdoor Area 7, Locus:271929:056. For the context of this pottery assemblage see Rohde 2018.

103 Outdoor Area 8, Locus:269929:006. For the context of this pottery assemblage see Stone 2016, 66-67 and Amicone 2018a.

104 Danti/Cifarelli 2013, 194 Fig. 4.23 F; 218. It is unclear whether pottery with only a reddish coating of barbotine is attested at Hasanlu, as the usual designations are "red-slipped" and "burnished".

105 Attested at Hasanlu (Level VIb) and Dinkha (Level IV, c. 1700-1600 BC): Danti/Cifarelli 2013, 150 Fig. 4.2 H, J, L.

identified among the DSC pottery. The macroscopic study led to the identification as Fabric C1, which was confirmed by microscopic analysis (**§G2**: Sample 99).

Also some bases were found among the QID2 material, which represent the same techniques and shapes as the ones found in Gird-i Bazar, DLT2 and DLT3, including disc bases made with TechP 6a (**Fig. G1.4: 8**; **9**).

G1.3.3 Pottery from QID3

The material recovered in QID3 is quite frustrating in terms of quality and quantity, especially of the diagnostic pottery. 1,819 sherds (totalling 21 kg) have been found in this large space but only 5 % (corresponding to 1.3 kg) come from deposits above floors.

In the deposits above the western floors LGR:0295 and LGR:0301, eleven very eroded diagnostic sherds have been found. They include some pieces representing the typical techno-petrographic groups of the Iron Age Main Occupation Period of DSC (**Fig. G1.2: 3**; **Fig. G1.3: 2**) but also a mixed collection of ceramic materials that has not yet been conclusively assigned to any specific period (**Fig. G1.10: 7-8**).

The floor package (Locus:176905:031) has provided a charcoal sample that was radiocarbon dated to a probable date range of 1043-893 calBC (91.8 % probability; **§D2.1**), but as this outdoor area is located downhill on the western slope of Qalat-i Dinka and it is difficult to be certain about the definitive dating of all materials found there. Some sherds have good comparisons with Iron Age Main Occupation Period pottery, such as the round folded rims of two carinated bowls made with TechP 6a (**Fig. G1.3: 9-10**). However, other sherds do not represent the characteristics of the Iron Age Main Occupation Period assemblage as known from the Lower Town excavations at Gird-i Bazar, DLT2 and DLT3, such as some large closed and open vessels made with an unidentified mineral fabric with large angular inclusions (**Fig. G1.10: 6**; **8**).

G1.3.4 Conclusions

When considering the pottery materials recovered in the three trenches QID1, QID2 and QID3 on the western slope of Qalat-i Dinka, we observe the presence of the same morpho-stylistic types and techniques already known from the Iron Age Main Occupation Period pottery in the Lower Town of the DSC (Gird-i Bazar, DLT2 and DLT3), despite the fact that well contextualised materials found directly in deposits above the floors are very limited in numbers. In QID1, this is due to heavy looting in modern times. The synchronicity of QID2 and QID3 with QID1 and the locations in the Lower Town is still somewhat hypothetical as some sherds found in the associated open areas have no parallels in the known assemblage of the Iron Age Main Occupation Period elsewhere.

Among the pottery found in QID1, new techniques have been observed, namely whitish and bluish glazing.

G1.4 Pottery from other periods recovered from Qalat-i Dinka

In this section, we present the Qalat-i Dinka pottery finds that date to periods other than the Iron Age. Such materials were retrieved in secondary contexts in the topsoil and the fills of looting pits. Some sherds can be attributed to the Early Bronze Age (late third millennium BC) and the Middle Islamic period (c. 11^{th}-15^{th} centuries AD), and such pottery was already previously observed on Qalat-i Dinka during the surface survey conducted in 2013 by the Sulaymaniyah Governorate Archaeological Survey (SGAS) team led by Jessica Giraud[106].

G1.4.1 A possible late third millennium BC pottery sherd

Materials from different periods were found mixed together in a looting pit (LGR:0318) in the area of QID1 during the 2016 campaign, and one sherd might date to the late third millennium BC.

The straight plain round rim sherd of a pot or jar (PPP 100000:009:001:057; **Fig. G1.10: 1a-b**) is formed with the coiling technique (as indicated by the preferential fracture) and made with an organically tempered fabric, with thin chaff voids visible on the surface of the orange-coloured sherd. A fragmentarily preserved appliqué decoration is found on its shoulder, possibly depicting a scorpion (**Fig. G1.10: 1b**). The scorpion motif often appears on vessels dated to the late third millennium BC, sometimes combined with snakes along the rim, shoulders and handles of large containers. Such vessels are known from various sites in the eastern Tigris region, namely in the Shahrizor plain at Kunara[107], in the Qaradagh region at Logardan[108],

106 Cf. Giraud 2016, 33 Fig. B3.4. On the Bronze Age pottery see Verdellet 2018, 94, Fig. 2: site no. 53.

107 Kunara: Chantier C, niveau II, us 315: Tenu *et al.* 2016, 159 Fig. 42: b.KN515.

108 Logardan: Trench D, level 3c-3 dated to mid- to late third millennium BC: Zingarello 2017, 75 Fig 6.4.

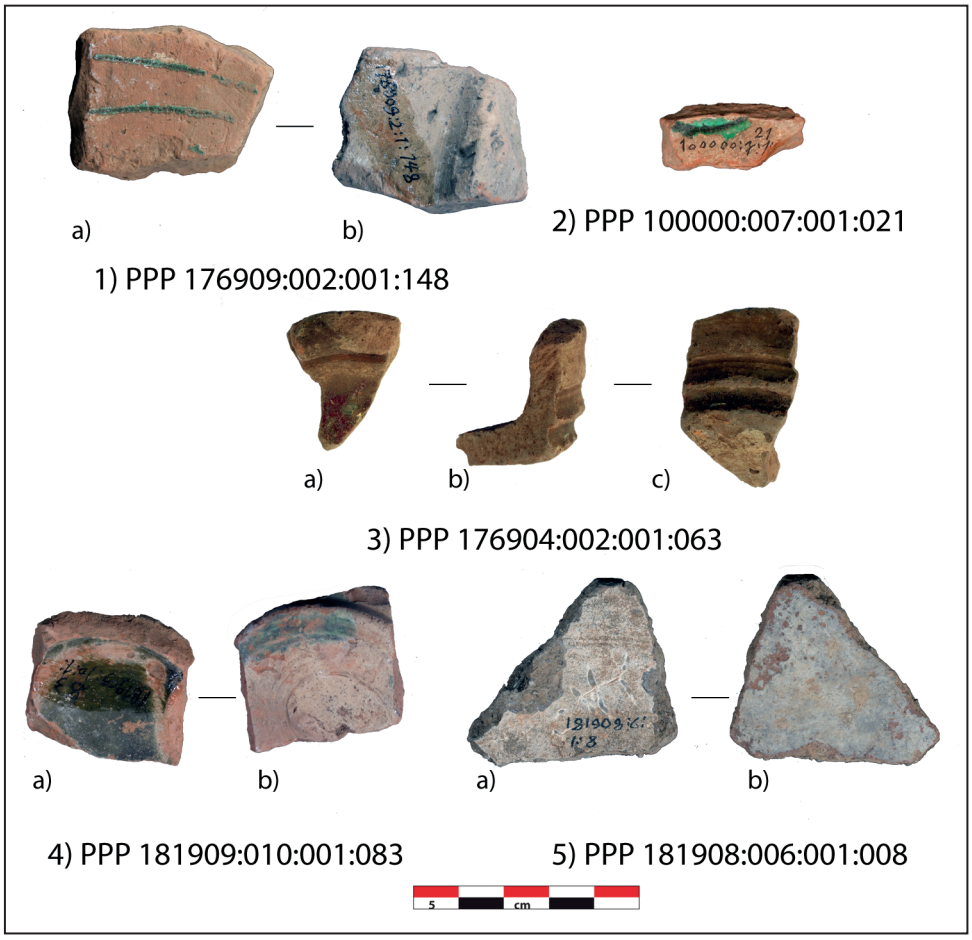

Fig. G1.7: Glazed pottery sherds from Qalat-i Dinka, part 1. Photos by Abdullah Bakr Othman; prepared by Jean-Jacques Herr.

in the Kirkuk plain at Yorgan Tepe[109] and in the Diyala region[110], but also attested elsewhere[111].

G1.4.2 Middle Islamic pottery

The topsoil and later fills of looting pits excavated on Qalat-i Dinka yielded evidence for Middle Islamic pottery, a type of material already noted during the SGAS surface survey[112], although no matching architectural contexts have been identified so far.

Safely identified specimens of Islamic period pottery are limited to only four glazed sherds recovered from QID1 (**Fig. G1.7: 2, 4-5**) and QID2 (**Fig. G1.7: 1**), whose macroscopically observable properties distinguish them clearly from the Iron Age material.

The glazed sherd PPP 176909:002:001:148 (**Fig. G1.7: 1**) was found in the topsoil of trench QID2 whereas the glazed sherd PPP 100000:007:001:021 (**Fig. G1.7: 2**) was recovered in the fill of a looting pit in QID1. Both can be identified as examples of a type of incised, monochrome-glazed pottery known as Gārrus Ware[113], so called after the Gārrus area southwest of the Caspian Sea where it is widespread. Our sherds are ring bases of bowls made with a levigated light-brown to yellow fabric that is often called "earthenware", with faint traces of white slip (or "engobe") marking their inside walls. Into this slip, curvilinear patterns were incised, which were then covered with a transparent glaze that firing turned green. Such decorations are called *sgraffiato* and mainly consist of medallions and interlaced circular pattern drawn by a pair of compasses. Examples of Gārrus Ware have been recovered in western Iran at sites such as Takht-i Suleiman and Hasanlu (Period I)[114] but also west of the Zagros, e.g. on the Erbil citadel[115].

At Erbil, this type of decoration first appears around the 9th century AD and is widely used in the 11th and 12th

109 Yorgan Tepe: "GA.SUR Period", in drain H10 from room N120 pav. 4: Starr 1939, pl. 60: D and G.

110 Pottery with snake appliqués was found in Tell Asmar (Trench A) and Tell Agrab (surface find): Delougaz 1952, pl. 128-129, 173; Delougaz/Hill/Lloyd 1967, 271.

111 E.g., in Khabur triangle at Tell Brak (Phase M/N): Oates/Oates/McDonald 2001, 430-431. For a similar type see Beuger 2005, Kat. I, pl. 25:4. For a general discussion of appliqué decoration, and more specifically on the snakes motif in the Early Bronze Age, see Quenet 2014, 229-245.

112 Cf. Giraud 2016, 33. Mustafa Ahmad was responsible for the identification of Islamic-period pottery among the surface survey material.

113 Jenkins 1983, 17.

114 Schnyder 1972, 189-197; Naumann/Naumann 1976, pl. 4: 95, 90; Danti 2004, pl. A, Fig. 6 (Building III).

115 Nováček *et al.* 2008, 289-290.

centuries AD[116]. Based on the study of the pottery found at Takht-i Suleiman[117], Rudolf Schnyder stated that this type of ceramics was mainly used during the Saljuq era from the second half of the 11th to the 13th century AD[118]. At Hasanlu, such pottery was found in a level dated to the early Ilkhanid period of the 14th century AD[119]. As we currently lack any context at Qalat-i Dinka, we merely attribute this material to the broadly defined Middle Islamic Period (MIP; 1000-1400 AD)[120].

Another sherd, PPP 176904:002:001:063 from the topsoil of QID3 (**Fig. G1.7: 3**), may date to the same period. It is a rim sherd of a vessel with a diameter of 9 cm, decorated with Manganese Violet. This monochrome-coloured glaze is known also from the MIP assemblages of Takht-i Suleiman in western Iran (12th-13th century AD levels)[121]. Our sherd also has green splash glazing, a surface treatment already attested in other areas of DSC[122].

Also the disc base of a vessel (**Fig. G1.7: 4a-b**) that was found in the fill of a looting pit in QID1 could be attributed to the MIP. The vessel was shaped on a fast wheel, as concentric striations of the string cut are visible on the base (**Fig. G1.7: 4b**). Its levigated fabric is similar to that of the already-discussed glazed sherds PPP 176909:002:001:148 and PPP 100000:007:001:021 (**Fig. G1.7: 1-2**), and the sherd shows green monochrome glaze on the inside and outside walls.

Another possible MIP piece is a 0.9 cm thick sherd made with a fabric of 15 % large sub-angular bluish-grey and red inclusions and a white opaque glaze on both inside and outside walls that is quite badly preserved (**Fig. G1.7: 5**).

Among the 15,883 sherds recovered during the excavations at the Dinka Settlement Complex since 2015, only the four glazed sherds recovered during the 2016 and 2018 excavations on the western slope of Qalat-i Dinka can be dated with confidence to the Middle Islamic Period. But during the 2018 spring campaign, Jean-Jacques Herr noted further examples of Gārrus Ware as surface finds on the heavily looted western part of the summit of Qalat-i Dinka, and this material may therefore originate from this area.

116 Nováček *et al.* 2008, 289-290.
117 Naumann/Naumann 1976.
118 Schnyder 1972.
119 Danti 2004, 36-42.
120 For the periodization see Nováček *et al.* 2017, 1-2.
121 Schnyder 1972; Danti 2004, 61, pl. G: 10.
122 Herr *et al.* 2018, 133 Fig. F1.9.2

G1.5 The 2018 pottery from DLT3: a first assessment

From the operation DLT3, 111 pottery collections have been recovered, consisting of 1,106 diagnostic sherds (33,704 kg) and 4,635 non-diagnostic sherds (70,392 kg).

For the Iron Age pottery, we present in the following the different morphological types, techniques and fabrics attested among the material from the Main Occupation Period recovered during the 2018 campaign in DLT3 according to their find contexts. As ever, we are concerned with identifying and highlighting links with the material from other excavation areas in DSC. Although the ^{14}C analysis of a piece of charcoal recovered in 2015 from the geoarchaeological trench GA42 produced the probable date range of 830-789 calBC (95.4 % probability)[123], which is one of the latest dates currently available for the Iron Age contexts of DSC, we can state with confidence that the pottery found in the Main Occupation Period levels of DLT3 largely matches the material found in the Main Occupation Period levels of Gird-i Bazar, DLT2 and Qalat-i Dinka. Although the stratigraphy of DLT3 allows us to distinguish between Main Occupation Period 1 and Main Occupation Period 2, there are currently no noticable changes in local pottery production observable from the material retrieved in the respective contexts.

The pottery that is assigned to periods other than DCS's Main Occupation Period is presented separately (**§G1.5.2**).

G1.5.1 The Iron Age pottery of DLT3 (DSC Main Occupation Period)

The excavations in DLT3 have yielded all the techno-petrographic groups and morphological types recovered so far in the other areas of the Lower Town and on the western slope of Qalat-i Dinka for the Main Occupation Period.

Five architectural units yielded pottery collections from floors and deposits above floors: Outdoor Area 63, 67 and 69, Building R / Room 64 and Building S / Room 66, and we present this material in the following according to these units.

G1.5.1.1 Pottery from Outdoor Area 69

Above the oldest floor (Locus:226922:059), 61 sherds were found in the filling LGR:0352 lying directly underneath

123 Altaweel/Marsh 2016, 27-28 Fig. B2.7, cf. **§E1**.

the threshold of the Main Occupation Period 1. The collection consists of sherds of cooking pots made with TechP 5, of a carinated bowl with a handle and of the frequently attested type of incurved rim bowl made with TechP 6a (**Fig. G1.3: 1**, **14**; **Fig. G1.5: 6**).

In the deposit LGR:0350 above the floor that is attributed to the Main Occupation Period 2, a complete pot stand with a weight of 1.563 kg (**Figs. G1.15-16**) was found, as well as a fragmentary carinated bowl made with TechP 6a and some sherds of jars of TechP 2 and TechP 4 and further carinated bowls of TechP 6a (**Fig. G1.3: 4**).

G1.5.1.2 Pottery from Building R / Room 64

In Room 64, in the deposit Locus:226922:040 above the trodden floor Locus:226922:42 that is attributed to the Main Occupation Period 2, 150 sherds (diagnostic and non-diagnostic, totalling 5.4 kg) have been found lying flat on the floor.

This collection is the second largest found so far in DLT3. It contained a fragmentary jar made with TechP 3 (**Fig. G1.5: 4**) that is identical to types found at Gird-i Bazar and DLT2 (**Fig. E13**) and that may have been reused as a pot stand; an almost complete carinated bowl made with TechP 6a (**Fig. G1.3: 17**); a disc base made with TechP 6a and a flat base made with TechP 6b (**Fig. G1.2: 7**) as well as sherds of carinated bowls and strap handles made with TechP 6a. A few non-diagnostic sherds of a large jar made with TechP 2 and of a lid made with TechP 1b are worth mentioning, as they demonstrate the use of the same *chaînes opératoires* as in Gird-i Bazar and DLT2.

Finally, a red painted potsherd which might belong to a Late Chalcolithic cooking pot has been found in this deposit (similar to **Fig. G1.9: 9**).

G1.5.1.3 Pottery from Outdoor Area 63

A few sherds have been recovered in the deposit Locus 226922:047 above the floor, some presenting the same chaff and mineral fabrics as the older Late Chalcolithic pottery. Of the Iron Age Main Occupation Period pottery, we found sherds of incurved rim bowls with TechP 6a (similar to **Fig. G1.3: 1-3**).

G1.5.1.4 Pottery from Outdoor Area 68

A few sherds have been recovered in the installation LGR:0342: flat bases and the sherd of a possible jar with a rim, thickened on the outside with a groove and showing traces of horizontal burnishing on both sides, possibly made with C1 Fabric (**Fig. G1.4: 5**).

G1.5.1.5 Pottery from Building S / Room 66

The deposit LGR:0358 above the floor Locus:225922:058 in Room 66 yielded the largest quantity of pottery dated to the Main Occupation Period 1 in DLT3. 154 diagnostic sherds (totalling 4.6kg) have been recovered and 835 non-diagnostic sherds (totalling 5.6 kg), all very fragmentary (average weight 10 g per sherd); no complete vessels have been found in the collection.

The collection includes a fragment of an incurved rim bowl made with TechP 6b (**Fig. G1.2: 1**); a small jar with a cylindrical concave neck made with TechP 9 (**Fig. G1.4: 3**); probably two lids made with TechP 2 (**Fig. G1.5: 1**; **2-3**); and fragments of carinated bowls (**Fig. G1.3: 7**). Bases are also common: flat, with a disc (**Fig. G1.4: 10**) or grooved (**Fig. G1.4: 11**). As before in Gird-i Bazar[124], we found a fragment of a ceramic mortar in the shape of a tripod bowl; the same type of large angular quartz marks the surface of the inside wall, against which foodstuffs were likely ground (**Fig. G1.5: 8**).

A further interesting piece is a fragment of a pot or jar made with Fabric C1 and TechP 9 (with the coiling technique discernable in the preferential fractures and the joins visible in section: **Fig. G1.11: 2**) and decorated with an animal-head appliqué (**Fig. G1.13: 2-4**). The rim of the vessel consists of a coil added to the outside and shaped to form a triangle in section, with two grooves on top; the shoulder of the vessel is decorated with horizontal grooves running parallel, made while the pot's surface was of leather-hard consistency. The surface of the outside is burnished (**Fig. G1.11: 4**) and the inside is planned vertically. At least three animal-head appliqués belong to this vessel, fixed to its body underneath eight grooves. This decoration is similar to a piece found in Gird-i Bazar in 2016 (**Fig. G1.13: 1**). We discuss the Iron Age pottery with animal-head appliqués further below (**§G1.7**).

G1.5.1.6 Pottery from Outdoor Area 67

Despite its small size, almost 1 kg of pottery was recovered in the deposit above the floor Locus: 225922:046 in Outdoor Area 67. The collection includes fragments of cooking pots made with TechP 4 and sherds of a jar with barbotine made with TechP 10.

124 Herr 2016, 97, Fig. D2.7.2 (PPP 269929:005:006:034).

G1.5.1.7 Pottery found in the post-occupation fill

In the later fill LGR:0335, 70 diagnostic sherds and 267 non-diagnostic sherds were recovered (totalling 5.2 kg). The mixed material includes the usual Iron Age sherds of a necked jar made with TechP 9 (**Fig. G1.4: 4**), of large jars made with TechP 2 and of a jar made with TechP 3 (**Fig. G1.5: 5**), with similar types previously found in Gird-i Bazar, as well as a sherd of a grey burnished hemispherical incurved rim bowl made with TechP 6b.

Other sherds cannot be attributed to the known Iron Age pottery and could be dated to a later period, such as a sherd of a concave necked jar of buff colour (**Fig. G1.10: 9**). There is also older material mixed into this same fill, such as sherds of trays that probably date to the Late Chalcolithic period, made with organically tempered clay and large coils of 2 cm diameter (**Fig. G1.10: 4**).

G1.5.1.8 Conclusions

The pottery recovered in DLT3 during the 2018 season matches the pottery found in the Main Occupation Period levels in Gird-i Bazar and DLT2 in the Lower Town as well as QID1 and QID2 on the western slope of Qalat-i Dinka. The usual burnished hemispherical incurved rim bowls, carinated bowls and necked jars have been identified, together with cooking pots with sparry calcite temper and an organically tempered jar made with TechP 3 as well as sherds of lids with handles made with TechP 1b and fragments of large jars and trays made with TechP 2. This suggests the chronological horizon of the Main Occupation Period for DLT3, contemporaneous to the other areas in DSC that feature such pottery material.

G1.5.2 Pottery from other periods recovered in DLT3

G1.5.2.1 A possible Halaf pottery sherd

A small painted sherd was recovered in a fill (Locus:225922:036) in Outdoor Area 65, dated to the post-occupation phase of the Main Occupation Period 2, which might be dated to the Halaf period. If this identification is correct, this piece would be the oldest material recovered so far in DSC.

The sherd is part of a bowl with a round thinned rim (**Fig. G1.14**). The bowl appears to have been made with very thin coils of a diameter of 2 mm. The fabric is a highly levigated clay with 5 % tiny shiny inclusions. The bowl's outside wall is decorated with dark painting: three horizontal lines run underneath the rim while the second register consists of a hatched lines pattern.

A close parallel for this fragment was found at Tell Begum in the Shahrizor Plain[125] and further comparisons for this pattern are known from Nineveh's Ubaid-period level[126].

G1.5.2.2 Pottery from the Late Chalcolithic period (LC 1-2)

The occupation level underneath the Iron Age Main Occupation Period 1 layer (Locus:22622:042) is called Older Occupation Period in the relative stratigraphy (**Table E2**). Pottery sherds were retrieved from the floor (Locus:226922:055), the deposit above the floor (Locus: 226922:056), the fill (Locus:226922:057) and the pottery kiln fill, (Locus:225922:049; **Fig. E8**). Within these contexts, 32 diagnostic sherds (totalling 2,8 kg) and 140 non-diagnostic sherds (totalling 3,1 kg) have been recovered.

Already when removing the refill of the 2015 geoarchaeological trench GA42 (Locus:226922:003), we recovered some sherds made with chaff-tempered fabric and decorated on the outside with a comb that can be assigned to DSC's Late Chalcolithic period occupation. These include a sherd from a jar with a flaring rim (PPP 226922:003:001:014; **Fig. G1.9: 4**): the piece features a simple round rim on a conical neck and the shoulder is marked with combed grooves made when the surface was wet as no thin deep striations have been noticed).

The excavation of the deposit Locus:226922:056 above the floor and the floor itself (Locus:226922:055) allowed us to retrieve what appear to be further pieces of this jar, which seems to have been destroyed by the digger in 2015 (**Fig. G1.9: 6**). Within the younger fill (Locus:226922:057), we found sherds matching this type and decoration with remains of black paint (PPP 22692257:001:009; **Fig. G1.9: 7**). Parallels have also been found in various northern Mesopotamian sites, including Tepe Gawra (Level XII A)[127], Nineveh (deep sounding)[128] and Tell Ibrahim Bayis[129] as well as nearby Qalat Said Ahmadan (Layer 1) in the Peshdar Plain[130]. Other jar fragments from these contexts

125 Altaweel *et al.* 2012, 24, Fig. 13.
126 Gut 1995, pl. 51: 782.
127 Tobler 1950, pl. CXXXVIII: 300, 302, 304.
128 In layers dated to the end of Ubaid and LC1-2 according to cross-dating with Levels XII A and XII of Tepe Gawra: Gut 1995, pl. 50: 754-759.
129 Mallowan/Al-Amin 1949, pl. X: 35 classify the material as Nineveh 3-period pottery whereas Gut 1995, 224-228 dates it to the end of the Ubaid Period.
130 Tsuneki *et al.* 2016, Fig. 2.10: 1.

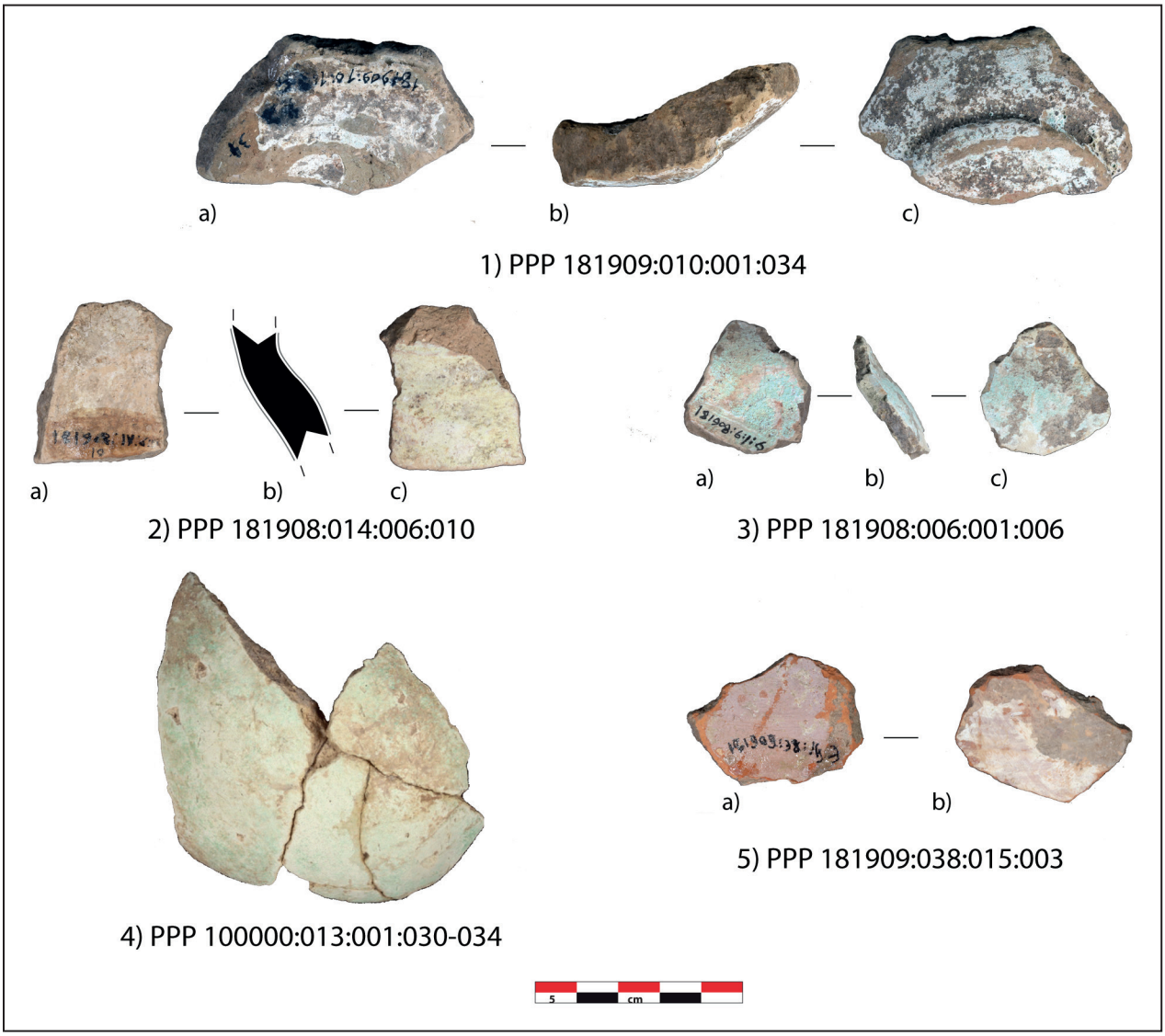

Fig. G1.8: Glazed pottery sherds from Qalat-i Dinka, part 2. Photos by Abdullah Bakr Othman; prepared by Jean-Jacques Herr.

were made with coils and had no combed decoration on the shoulder (**Fig. G1.9: 5**).

Together with this type of jar, we found round and thinned everted rims made with chaff-tempered clay of orange colour that probably belong to deep bowls (**Fig. G1.9: 3**). Parallels occur again at Tepe Gawra (Level XII)[131]. This pottery was made with coils and probably smoothed by hand due to the horizontal orientation of the organic material on the surface and fluid striations noticed. One piece of this type has the faint remains of a thin layer of red painting outside and inside (**Fig. G1.9: 2**).

Small and large fragments of reddish and dark cooking pots have been found in the fill (Locus:226922:057) and in the deposit (Locus:226922:056) above the floor (**Fig. G1.9: 8-9**). They consist of everted round rims, either with a conical neck, or a "short neck" or no neck at all. The fabric of such vessels contains large mineral fragments, probably schist. The vessels were formed with coils. On the inside, they were then planed with a tool horizontally on the inside when the surface had dried somewhat but was still not quite leather-hard[132] while the outside walls were

131 Tobler 1950, pl. CXXXV: 267.

132 The observable traces are very different from the vertical planning of TechP 9, typical for jars of the DSC's Iron Age Main Occupation Period: Herr 2017, 124, 126 Fig. E.1.15.

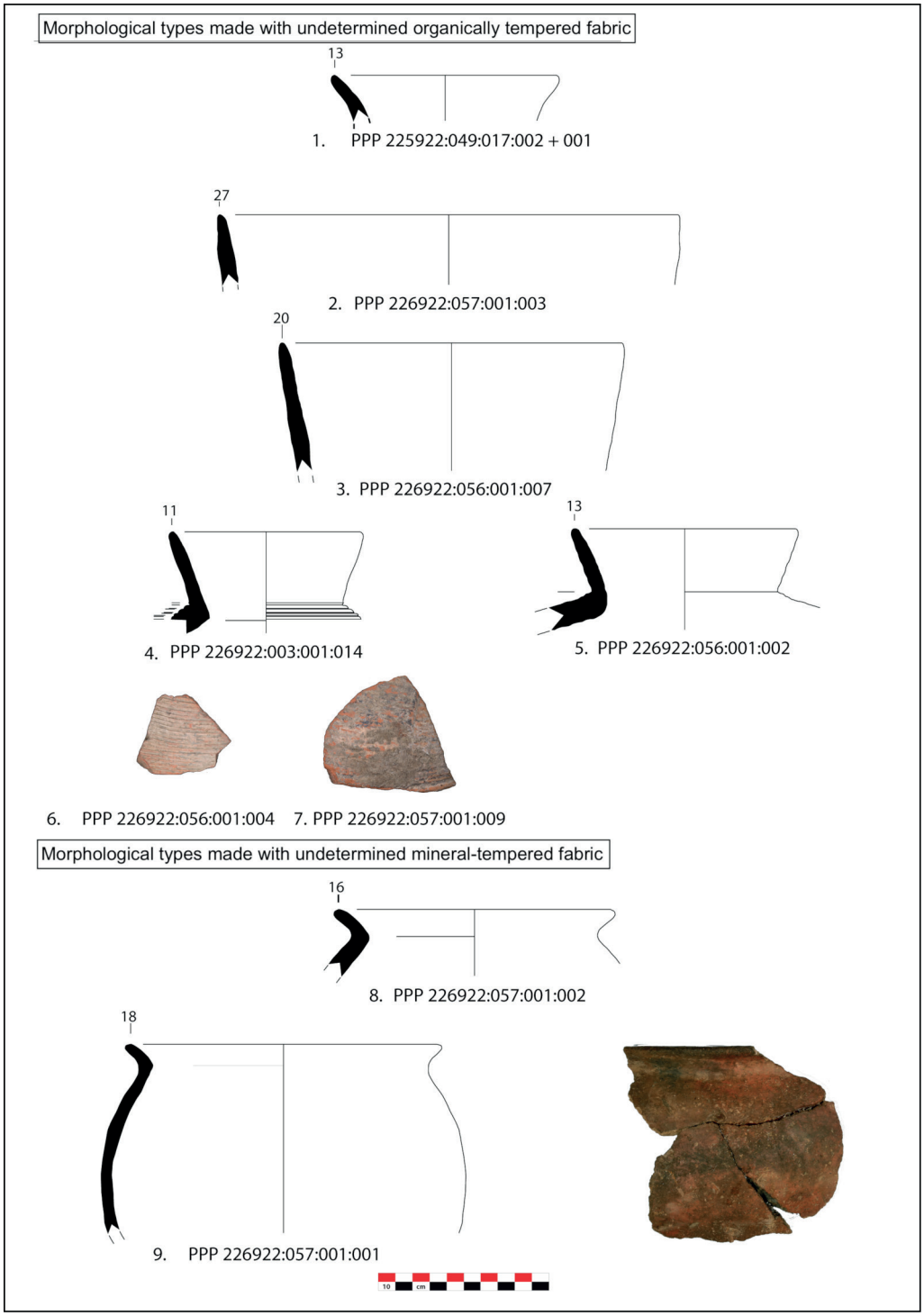

Fig. G1.9: Morphological types made with undetermined, organically tempered fabric. Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

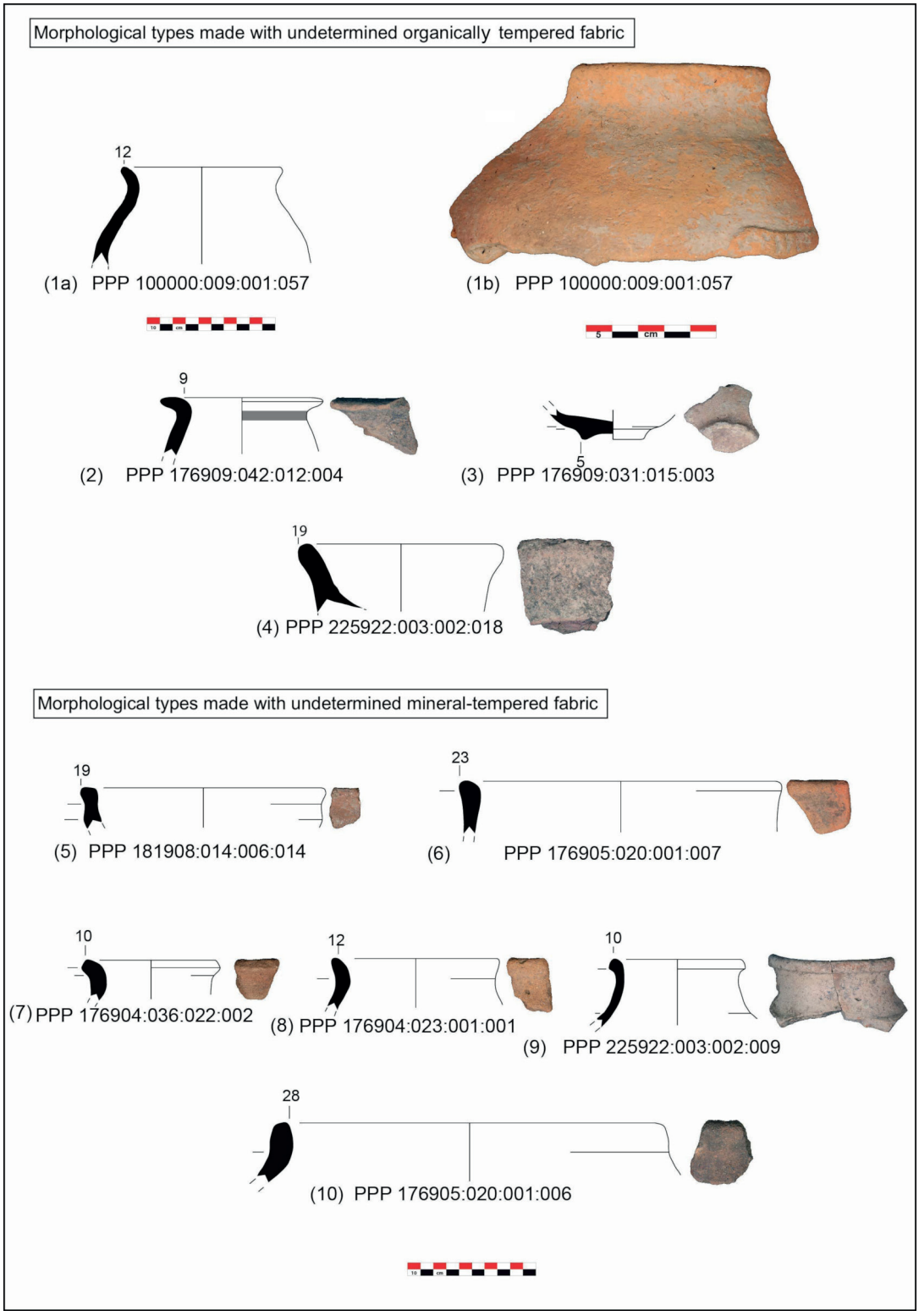

Fig. G1.10: More morphological types made with undetermined, organically tempered fabric. Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

Fig. G1.11: Detail photos of various 2018 pottery sherds. Prepared by Jean-Jacques Herr with a Dino-Lite microscope.

polished to shine; but the colour of the vessels is quite heterogeneous and traces of dark areas are visible on the outside and the inside. Parallels have again been found at Tepe Gawra[133] and at nearby Qalat Said Ahmadan (Level 1)[134].

The 2018 discovery of Late Chalcolithic pottery (LC1-2, c. 4600-3800 BC) in undisturbed contexts underneath the Iron Age occupation at DLT3 is a good opportunity to document a well stratified context in the Peshdar Plain, which is assumed to have been densely occupied in this period on the basis of the results of the SGAS surface survey led by Jessica Giraud[135]. Locally, it allows us to better understand pottery production in the (very) *longue durée* and to better contextualise some of the non-Iron Age pottery recovered in the surface survey and also from some mixed loci (mainly topsoil and fills) in the excavation areas.

G1.5.2.3 Sasanian-period pottery

Some sherds have been recovered in the area of DLT3 that can probably be assigned to the Sasanian period in the third to seventh centuries AD.

During the 2018 excavations, some sherds of a shallow bowl with a stepped base turned on a wheel have been found scattered in a fill (LGR:0338) and in the topsoil (Locus:226922:005; **Fig. G1.12: 1**); no surface treatment could be observed. The fabric has mineral inclusions and is similar to Sasanian-period pottery previously recovered in Gird-i Bazar[136].

G1.6 Sasanian-period pottery from the geological trench GA44

The geological trench GA44 was dug in 2018 in order to investigate the former wadi running through a part of the Lower Town (**§B2**). In the fill close to the surface (Locus:254926:002), Sasanian-period pottery sherds of a large bowl or a "thick basin" with incurved rim thickened on the outside and shaped triangular in section (**Fig. G1.12: 2**) were found. The vessel was formed with the coiling technique and probably afterwards shaped on a wheel. This type of Sasanian-period pottery is well known in the Zagros region and further east as far as Central Asia[137].

In addition, a stamped sherd, probably of a jar, has been recovered in this same fill, also typical for the Sasanian period. The stamped relief is heavily weathered but it is possible to discern a cross design with protruding dots located in each of the four cells (**Fig. G1.12: 3**). This design recalls the diamond stamp-decorated pottery from northern Mesopotamia, often attributed to the Parthian Period[138], in which, however, the cross design is set within a lozenge. More similar to our sherd is the circular stamp-decorated pottery found in Sasanian sites from Isfahan to Damghan in the Jibal area[139], which suggests a Sasanian date also for our sherd. This type of decoration was stamped into the surface of pottery vessels using wooden tools that often show the cross or animals and is widely attested in northern Mesopotamian sites dating to the Sasanian Period[140].

These two sherds are likely connected to the Sasanian-period occupation of the Dinka Settlement Complex, to which the cemetery of Gird-i Bazar belongs[141].

Lastly, a triangular rim sherd of a necked jar was also found in the geological trench GA44 (**Fig. G1.12: 4**).

G1.7 Excursus: Iron Age pottery with animal-head appliqués

Pottery fragments decorated with animal-head appliqués have been recovered at the Dinka Settlement Complex in contexts dated to the Iron Age Main Occupation Period in the Lower Town at Gird-i Bazar (Building D, Room 30: PPP 269931:008:003:001)[142] and DLT3 (Building S, Room 66: PPP 225922:038:002:011 and joining sherds) and in the Upper Town at QID1 (Building P, Grave 99: PPP 181908:018:002:002).

All known pieces have clay appliqués in the shape of a horned animal's head on the shoulder of closed vessels (pots or jars) made with TechP 6a or TechP 9. The animals' muzzle is long and their horns are pointed or rounded, so

133 Tobler 1950, pl. CXXXVIII: 291.

134 Tsuneki *et al.* 2016, 98, Fig. 2.10: 2.

135 Baldi 2018, 4.

136 For the rim a parallel has been found in the Gorgan area: Priestman 2013, 483, Fig.18:18: d, e, g.

137 Morphological parallels for such thick-rimmed basins are known from western Iran, namely Kaleh Karabeh in the Gorgan Plain (Priestman 2013, 481, Fig. 18: 16a) and Qal'eh-i Yazdigird / Tepe Rash (Keall/Keall 1981, Fig. 17.15).

138 Gavagnin/Iamoni/Palermo 2016, 153.

139 Keall/Keall 1981, Fig. 14.5 (sherd from Tepe Hajiabad); Fig. 22.1 (sherd from Chal Tarkhan: Tepe Eshqabad); Fig. 22.3 (sherd from Nezamabad: Gorg Tepe); Fig. 31.6 (stamped decoration).

140 Simpson 2013.

141 Downey 2018.

142 Herr 2017, 109 Fig. E1.4.5.

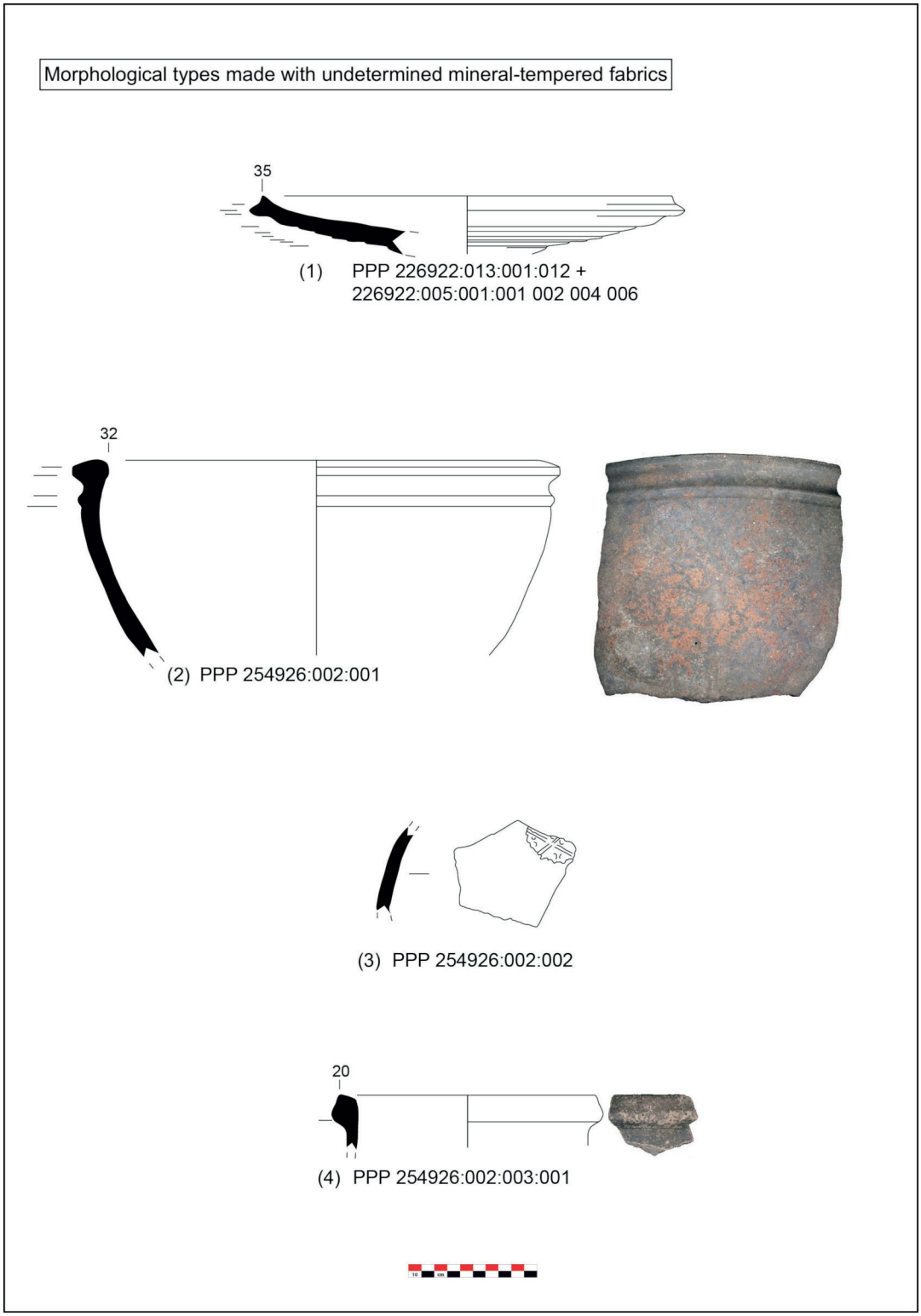

Fig. G1.12: Morphological types made with undetermined, minerally tempered fabric. Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

that they most likely represent bull heads. The muzzles bear thick striations with compact topography, typical of the burnishing surface treatment. The whole head is either modelled from the same piece of clay (**Fig. G1.13: 1**) or else the horns were later added to the head (cf. PPP 225922:038:002:011 from DLT3: **Fig. G1.13: 2-4**).

Animal-head appliqués are mentioned as typical discoveries for the first half of the first millennium BC levels in Bakr Awa in the Shahrizor Plain[143], although no illustrations have yet been published. An example of a bull-head appliqué on the shoulder of a carinated bowl comes from the Uratian site of Karmir Blur in Armenia[144]. However, the tradition of decorating pottery vessels with protruding animal heads has especially good and frequent parallels in Iran during the late second and early first millennium BC, from the Zagros highlands as far as the Caspian Sea[145]. The closest parallels to the DSC specimens come from the region of Lake Urmia in burial contexts at Dinkha (Level II)[146] where animal-head appliqués appear on small jars (where they are sometimes pierced)[147] and on bowls with handles[148]. Such pierced animal-head appliqués have also been found in Tappah Gijlar[149] on small burnished jars, with horizontal grooves on the base of the neck that are comparable to the sherd found in DLT3. The combination of an animal-head appliqué and four horizontal grooves is also known from Goey Tepe (Period A) on pottery that resembles the DSC sherds closely, as it is described as "polished on a light red slip on both sides"[150]. Further parallels are known from Zendan-e Suleiman and Hasanlu (Level IVb) where R.M. Boehmer and later J. Thomalsky documented animal-head appliqués of a roughly triangular shape in combination with grooves (German "Kanneluren")[151]. In Hasanlu (Level IVb, Burned Building II), a beaker – a type of vessel not yet attested in DSC – that was burnished and fired in a reductive atmosphere shows an animal-head appliqué above a vertical handle, which has been interpreted as an ibex[152]. Further south, burial contexts in Tappeh Sialk (Necropole B) yielded animal-head appliqués attached to bowls[153]. As our example from DLT3 and specimens from Hasanlu[154] show, several animal-head appliqués can be found on one single vessel.

This type of decoration is also attested on metal vessels, such as the beakers and bowls with bull-head appliqués from Kalardasht and Marlik (Tomb 26)[155] dated to the late second and early first millennium BC.

G1.8 Overview of the ceramics distribution across the periods

The discoveries made by the Peshdar Plain Project in the different operations (Gird-i Bazar, DLT2, DLT3, Qalat-i Dinka-QiD and GA) help to better establish a chronological sequence of occupation from the Chalcolithic to the Middle Islamic Period. We can summarise the distribution of the pottery dated to these different periods as follows:

Period	*Area of DSC*	*Provenance*
Halaf or Ubaid period	Lower Town ?	DLT3 (one sherd only, out of context in topsoil)
Late Chalcolithic 1-2	Lower Town	DLT3
Late third millennium BC	Upper Town (western slope) ?	QID1 (out of context in topsoil)
Iron Age Main Occupation Period	Upper Town (western slope); Lower Town	QID1-3; Gird-i Bazar; DLT2; DLT3
Sasanian period	Lower Town	Gird-i Bazar; DLT3; GA44
Middle Islamic period	Upper Town (western slope); Lower Town ?	QID1-3; DLT2; DLT3 (out of context in topsoil and fills)

143 Miglus *et al.* 2013, 48 Fig. 7a.
144 Piotrovskij 1959, pl. XLIV; van Loon 1966, pl. 1.
145 Thomalsky 2006.
146 Muscarella 1974, 59.
147 Muscarella 1974, 63 Fig. 32 (burial 14, vessel 401T)
148 Muscarella 1974, 66 (vessel 227T).
149 Pecorella/Salvini 1984, pl. XLI: d.
150 Burton-Brown 1951, 157 Fig. 36.915.
151 Boehmer 1961, pl. 46c; pl. 57: 1-7; Thomalsky 2006, 246 Fig. 12: 1; 264 Fig. 25: 3, 9; 272.
152 Dyson 1989. According to Danti/Cifarelli 2013, 302; 310, this type of decoration is "popular" among Hasanlu IVb pottery.
153 Ghirshman 1939, pl. XVIII: 4, 6; pl. LIV: s 817.
154 Animal-head appliqués from Hasanlu in the Metropolitan Museum of Art: sherd 60.20.64; beaker 63.109.11; beaker 63.109.12.
155 Negahban 1996, 57-63, pl. XIIB, XIII.

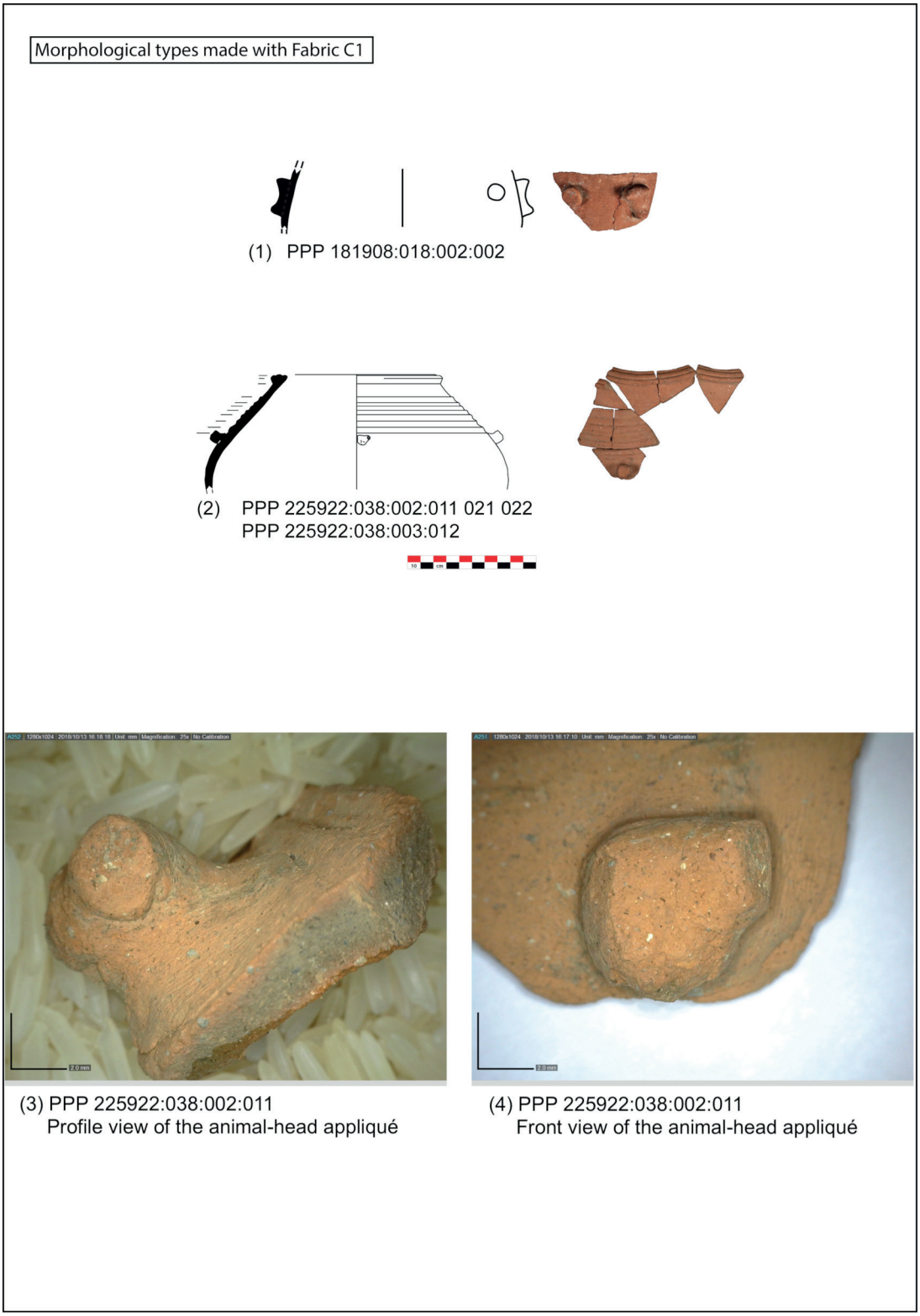

Fig. G1.13: Morphological types made with Fabric C1: body sherd (1) from QID; neckless jar with animal-head applique (2-4) from DLT3. Photos by Abdullah Bakr Othman; vectorised drawings by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

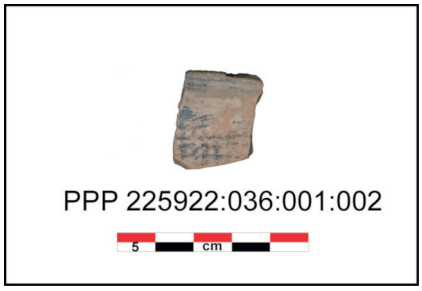

Fig. G1.14: Painted sherd of a bowl (PPP 225922:036:001:002), dating to the Halaf or Ubaid period, from DLT3. Photo by Abdullah Bakr Othman.

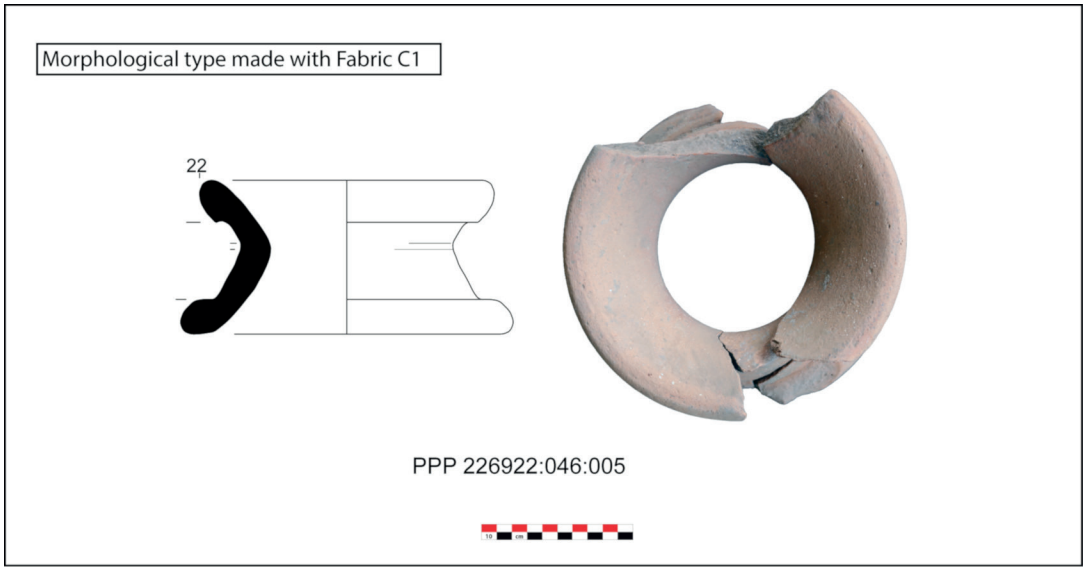

Fig. G1.15: Pottery stand PPP 226922:046:005 made with Fabric C1, from DLT3. Photo by Abdullah Bakr Othman, vectorised drawing by Hero Salih Ahmad; prepared by Jean-Jacques Herr.

Fig. G1.16: Pottery stand PPP 226922:046:005 in its find context in DLT3. Photo by Jens Rohde.

G2. Petrographic analyses of selected 2018 pottery from Qalat-i Dinka

Silvia Amicone

Abbreviations and terminology used in the following discussion:
eq. = equant
el. = elongate
sa. = sub-angular
sr. = sub-rounded
wr. = well rounded

Frequency of inclusions	%
Predominant	> 70 %
Dominant	50-70 %
Frequent	30-50 %
Common	15-30 %
Few	5-15 %
Very few	2-5%
Rare	0.5-2 %
Very rare	< 0.5 %

This section presents the results of the petrographic analyses conducted on two pottery sherds coming from the excavation area QID2 on Qalat-i Dinka (Sample 99 = PPP 176909:031:015:001 and Sample 102 = PPP 176909:015:001:001, see **Table G2.1**). Their macroscopic technological study show that they were fashioned according the same techniques observed in the assemblage of the Main Occupation Period of the Dinka Settlement Complex.

The petrographic study showed that these samples belong to Fabric C1, that is the fabric characterising most of the sherds of the Main Occupation Period of the Dinka Settlement Complex[67]. The samples are marked by rounded inclusions of micrite and fragments of metamorphic rocks (**Fig. G2.1**). Quartz (sa.-eq., max=0.30 mm, mode=0.20 mm) and fragments of foliated metamorphic rocks (sr.-el., max=1 mm, mode=0.30 mm) composed of quartz and muscovite are common. Fragments of mudstone (sr.-el., max=1.25 mm, mode=0.60 mm) are common in Sample 99 and rare in Sample 102. Micrite and sparry calcite (wr.-eq., max=2.5 mm, mode=0.85 mm) are common in Sample 102 and rare in Sample 99. A few inclusions of amphibole (sr.-el., max=0.35 mm, mode=0.30 mm), plagioclase (sr.-eq., max=0.50 mm, mode=0.20 mm), biotite (sr.-el., max=0.35 mm, mode=0.20 mm), muscovite (sa.-el., max=0.30 mm, mode=0.20 mm) and clay pellets (wr.-eq., max=0.65 mm, mode=0.50 mm) were observed. Very rarely epidote (sa.-eq., max=0.35 mm, mode=0.30 mm) and fragments of igneous rocks (sr.-el., max=0.35 mm, mode=0.20 mm) composed from quartz were found. The grain size distribution is polymodal. Voids are vesicles and vughs, and they do not show any preferential orientation. The matrix is light brown in PPL and orange to brown in XP. The matrix is non-calcareous and the samples exhibit both high and low optical activities.

In conclusion, the petrographic analyses conducted on two pottery sherds from QID2 have confirmed their affiliation to the Main Occupation Period pottery assemblage of the Dinka Settlement Complex despite the fact that it was not possible to find morphological parallels to them in the other operations of the site so far (cf. **§G1.3.2.1** for Sample 102; **§G1.3.2.3** for Sample 99).

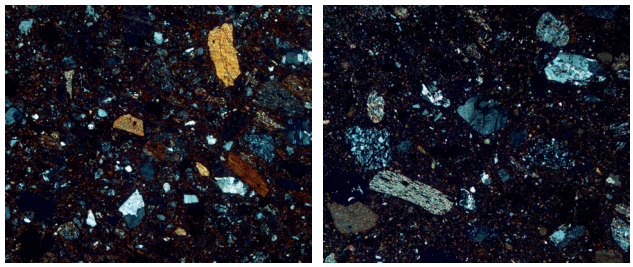

Fig. G2.1: Thin section photomicrographs of selected ceramics from QID2: (a) Sample 99 = PPP 176909:031:015:001: Fabric C1, with fragments of metamorphic rocks, biotite, amphiboles and plagioclases, XP; (b) Sample 102 = PPP 176909:015:001:001: Fabric C1, with fragments of metamorphic rocks, micrite, feldspars, XP. Image width = 4 mm.
Prepared by Silvia Amicone.

Sample no.	Registration no.	Locus	Building	Space	Occupational Period	Petrographic Group	Firing	TechP	Morphological Type	Shape	Optical Activity
99	176909:031:015:001	176909	top of glacis	/	End of Main Occupation Period	C1/C2?	oxidising	10	rim sherd	carinated bowl	low
102	176909:015:001:001	176909	glacis	/	Main Occupation Period	C1/C2?	oxidising	10b	rim sherd	pot	low

Table G2.1: List of thin-sections of the pottery samples from excavation area QID2. Prepared by Silvia Amicone.

67 Amicone 2017; 2018.

G3. Egyptian faience and Naples Yellow: results of the archaeometric analysis of a sintered quartz ceramic sample from Qalat-i Dinka

Christoph Berthold, Jörg Fischer & Silvia Amicone[68]

We present the results of analyses conducted on the fragmented item PPP 181908:018:008 collected in Room 58 of Building P in the excavation area QID1 on the western slope of Qalat-i Dinka, in close proximity to the skeleton of Grave 99 (**§D3.2.2**).

An initial macroscopic examination revealed the presence of a soft and chalky material with some possible remnants of a coloured decoration (**Fig. G3.1**). For a more detailed first characterisation, not only of the material but also of the decoration, we used a multimethodological archaeometric approach that includes petrographic microscopy, powder X-Ray Diffraction (XRD), µ-X-Ray Diffraction (µ-XRD²), µ-Raman Spectroscopy and µ-X-Ray fluorescence (µ-XRF).

The analysis of the matrix by XRD demonstrated that the matrix is composed of almost pure quartz (**Fig. G3.2**). A more detailed insight into the microstructure by petrographic microscopy (**Fig. G3.3**) and µ-XRD² revealed the presence of few highly fractured and very angular large quartz grains (max. diameter around 1 mm) embedded in a matrix of fine and very angular quartz grains, with the possible occurrence of glass. These results point to a sintered-quartz ceramic (known as "Egyptian faience" or "Egyptian paste"), a non-clay based ceramic produced using crushed pure quartz and small quantities of mixed alkalis[69]. The soft and chalky condition of this material is likely the result of alteration of the glassy matrix during deposition.

First results of the yellowish residue on the surface of the item using a combination of XRF, µ-XRD² and µ-Raman Spectroscopy suggest the presence of a yellow synthetic pigment known as "Naples Yellow" (Bindheimite, $Pb_2Sb_2O_7$ lead antimonate). This pigment was used in Egypt from the 18th Dynasty of the New Kingdom onwards, but it is also attested in Mesopotamia during the Neo-Assyrian period[70].

Fig. G3.1: Sherd sample PPP 181908:018:008 with yellow and black surface decoration. Photo by Jörg Fischer.

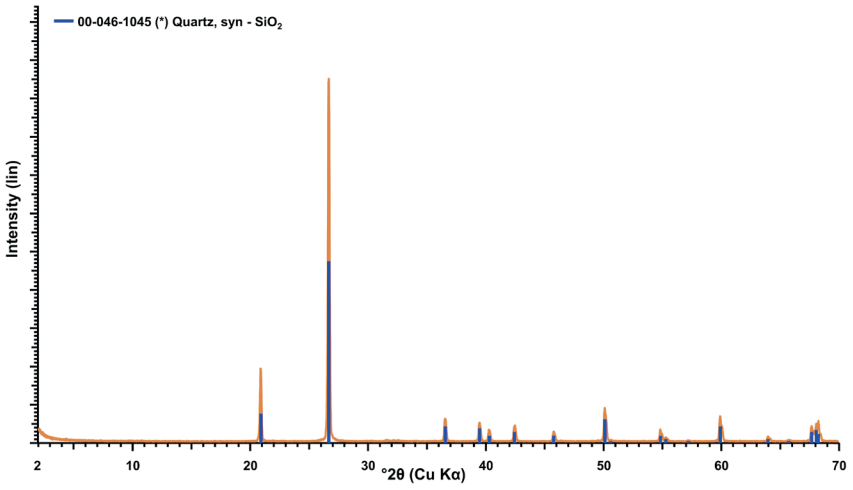

Fig. G3.2: Powder X-ray diffractogram of extracted bulk material from PPP 181908:018:008 showing only the intensities of quartz. Theoretical peak positions and intensities of quartz from the pdf-database are also shown. Prepared by Jörg Fischer and Christoph Berthold.

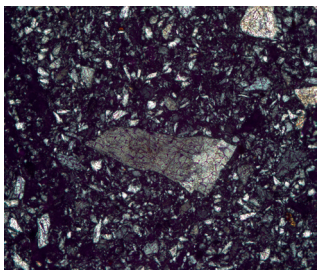

Fig. G3.3: Thin section micrograph showing some large highly fractured quartz grains in a matrix composed of fine quartz grains and amorphous material consisting of glass but also embedding resin in former porosity. Image width = 4 mm. Prepared by Silvia Amicone and Christoph Berthold.

68 We would like to thank the Excellence Initiative at Eberhard Karls Universität Tübingen, the Ministry for Science, Research and Art of Baden-Württemberg and Helmut Fischer GmbH Institut für Elektronik und Messtechnik (Sindelfingen) for the support provided to this research.

69 Nicholson/Shaw 1999, 729.

70 Noll 1991; Moorey 1994, 319-320; Thompson/Hutchinson 1929, pl. LVII.

H. The 2018 small finds from Qalat-i Dinka and DLT3

Andrea Squitieri

H1. The 2018 small finds from Qalat-i Dinka

During the 2018 campaign on Qalat-i Dinka, a total of 69 small finds was collected from the three trenches opened on the western slope of the mound. Room 58 of the monumental Building P, excavated in QID1 (**§D3.1.1**), yielded the highest number of objects, namely 65. These include fragments of ivory items, beads of Egyptian Blue and carnelian, bronze earrings and iron arrowheads. These find categories are markedly different from those found in the excavation areas in the Lower Town of the Dinka Settlement Complex (i.e., Gird-i Bazar, DTL2 and DLT3). Trenches QID2 (**§D4**) and QID3 (**§D5**), where parts of the fortifications protecting Qalat-i Dinka were unearthed, yielded only one and three small finds, respectively.

H1.1 Small finds from QID1: Building P Room 58

The study of the small finds from Room 58 of Building P poses two main problems. Firstly, most of the items were found in very fragmentary condition because of the heavy looting that occurred in recent times in the area of QID1 (**§D3.3**). Secondly, the numerous and large looting pits irremediably altered the stratigraphy of the area, so that modern items left behind by the looters (mainly pieces of plastic and metal, not discussed in the present chapter) were found scattered from the topsoil down to the virgin soil. As a consequence, the ancient finds from Room 58 cannot be presented in a stratigraphic sequence, which sometimes present a problem when attempting to assign them to specific chronological horizons.

Thanks to radiocarbon evidence, we know that in the area of QID1, at least two pre-modern chronological horizons existed. The first is the Iron Age Main Occupation Period of the Dinka Settlement Complex, to which the architecture encountered in QID1, most of the pottery as well as Grave 99 (**§D3.2.2**) belong. The second is represented by the later graves that were irremediably destroyed by the looters, with scattered human remains found in large quantities in the looting pits. However, one of these remains may have been in its original position, sticking out of the northern section of the trench (Grave 98; **§D3.2.1**). The skeleton was radiocarbon dated to the date range of 355-93 calBC (95.4 % probability, with 355-291 calBC at 27.1 % and 232-93 calBC at 68.2 %; **Fig. D5d**), which suggests the existence of a late occupation horizon in the area of QID1, at some point during the late Achaemenid, Seleucid or Parthian periods (cf. **§D3.2.1**).

Because of the disturbed stratigraphic sequence, however, it is not easy to assign the small finds from Room 58 to either chronological horizon. In some cases, however, comparative material from the other excavation areas in the Dinka Settlement Complex as well as other archaeological sites can help to propose a date for the items. Because they lack stratigraphic information, all ancient objects collected from Room 58 are presented in this chapter in categories based on their raw materials, shapes and decorative motifs, and the objects' chronological attributions are discussed individually.

H1.1.1 Ivory objects

(1) Registration numbers: PPP 181908:004:007; PPP 181909:004:035; PPP 181909:004:037; PPP 181909:004:042; PPP 181909:004:068; PPP 181909:004:075; PPP 181909:006:012; PPP 181909:006:024; PPP 181909:024:007; PPP 181909:038:028; PPP 181909:038:029; PPP 181909:038:046; PPP 181909:038:047; PPP 181909:038:048.
Several undecorated ivory fragments with a rectangular shape and a rectangular section, most likely belonging to small bars. Their preserved lengths lie between 1-2.5 cm; their width is about 1 cm and their thickness about 0.5-0.6 cm. No visible perforations or decorative patterns.

(2) Registration numbers: PPP 181909:004:007; PPP 181909:004:034; PPP 181909:004:038; PPP 181909:004:059.
Dimensions: length: < 2 cm (except for PPP 181909:004:059); width: 1-2 cm; thickness: c. 0.5-1 cm.
Fragments of rectangular ivory bars decorated on one side with a guilloche motif. The bar PPP 181909:004:059 (**Fig. H1**) is the best preserved piece, with a length of 9.5 cm, a width of 1.1 cm and a thickness of 0.9 cm. It was found broken in three pieces next to each other. On one side, the bar is decorated with a continuous guilloche mo-

Fig. H1: Ivory bar, decorated with guilloche motif (PPP 181909:004:059). Photo by Andrea Squitieri.

tif. On the undecorated side, it shows a regular circular cavity, not quite drilled through, which may have helped to fix the bar to another object. During the Iron Age, the guilloche motif was a common decorative design, attested all over the Middle East where it was applied on many small items in ivory and other media[71].

(3) Registration numbers: PPP 181909:004:025; PPP 181909:004:058; PPP 181909:004:065.
Three perforated ivory fragments. Similar perforated ivory fittings, with a square shape, were also found in the 2016 trench excavated on Qalat-i Dinka[72].
The first item (PPP 181909:004:025; length: 2.8 cm; width: 1 cm; thickness: 0.8 cm) has two straight edges meeting at roughly 160 degrees. It is broken at the perforation, which has straight walls and is about 0.3 cm in diameter. Possibly used as a plaque to decorate another object, perhaps a piece of furniture.
The second fragment (PPP 181909:004:058; diameter: 2.2 cm; thickness: 0.3 cm) is broken in half. It is a thin disc with a perforation in the centre, 0.5 cm in diameter (**Fig. H2**). On one side, the piece is decorated with the dot-in-circle motif, with three circles fully and one partially preserved. The edges and the backside of the disc are rather uneven. It was likely used as a decorative fitting that was applied to another object, perhaps a piece of furniture.
The third fragment (PPP 181909:004:065; length: 3 cm; width: 1.8 cm; thickness: 0.5 cm) belongs to a flat bar with a hole off-centre (**Fig. H3**). One face is flat and smooth whereas the opposite face is quite uneven. As the other two items, this was likely used as a decorative application, perhaps affixed to a piece of furniture.

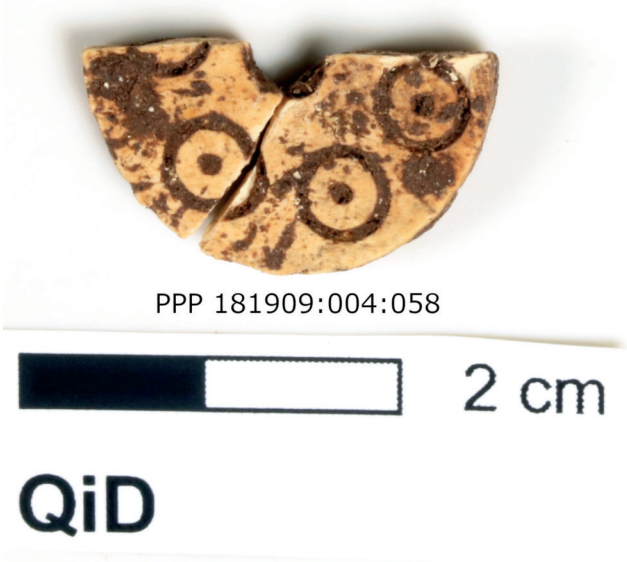

Fig. H2: Decorated ivory disc with dot-in-circle motif (PPP 181909:004:058). Photo by Andrea Squitieri.

Fig. H3: Ivory fragment with perforation (PPP 181909:004:065). Photo by Andrea Squitieri.

(4) Registration numbers: PPP 181909:004:005; PPP 181909:004:033; PPP 181909:004:041; PPP 181909:004:045; PPP 181909:004:046; PPP 181909:004:047; PPP 181908:018:007.

Fig. H4: Ivory bead with criss-cross decoration (PPP 181909:004:047). Photo by Andrea Squitieri.

71 See e.g., Winter 2010, 413, 568, 571-572; Herrmann 2002; Hermann *et al.* 2004, 12.

72 PPP 100000:021:001 and PPP 100000:021:015: Kreppner/Squitieri 2017a, 54-55 Fig. C25.

Dimensions: diameter 0.5-0.6 cm; thickness: 0.2-0.3 cm.
Seven small ivory beads, six of which have a cylindrical shape with a central circular perforation about 0.2 cm wide. PPP 181908:018:007 was found close to the skeleton of the Iron Age Grave 99 (**§D3.2.2**). The seventh bead (PPP 181909:004:047) is broken and about 0.5 cm long. It has an elliptical shape and is characterised by an incised decoration that forms a criss-cross design (**Fig. H4**). Parallels to this design are known from ivories from the Assyrian capital city Kalhu (Nimrud)[73].

(5) Registration numbers: PPP 181909:004:031-1 and PPP 181909:004:031-2.
Two fragments of ivory, found together. The first piece (PPP 181909:004:031-1; **Fig. H5**) has an oval shape and is 1.8 cm wide, 1.8 cm long and 0.9 cm thick, but broken on one edge. The two opposite faces are flat. One face shows a decorative motif resembling a palmette, possibly part of the "Tree of Life" motif. The palmette design, often in association with the "Tree of Life" motif, is commonly attested during the Iron Age on ivory and other media[74].

Fig. H5: Ivory fragment with palmette decoration (PPP 181909:004:031-1). Photo by Andrea Squitieri.

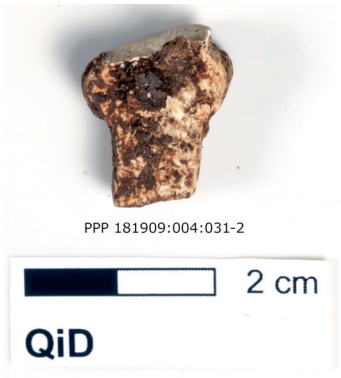

Fig. H6: Ivory fragment with Aeolic-style capital decoration (PPP 181909:004:031-2). Photo by Andrea Squitieri.

73 Herrmann *et al.* 2004, 11.
74 E.g., Winter 2010, 167; Herrmann 2002.

The second fragment (PPP 181909:004:031-2; **Fig. H6**) is 1.8 cm long, 1.5 cm wide and 0.5 cm thick. It is in the shape of a stem of a width of 0.9 cm that opens up into volutes forming an Aeolic-style capital, partially broken. The back is completely flat, indicating that this piece was applied to another object. The Aeolic-style capital is a common motif which is attested on several Iron Age ivory items[75].

(6) Registration number: PPP 181909:006:022.
Dimensions: length: 2.8 cm; width: 0.8 cm.
Flat item composed of a broken shaft with an ovoid-shaped end (**Fig. H7**). Its design recalls the column pattern that is found on the "Woman at the Window" ivory plaques of the Iron Age[76], although it is somewhat less elaborate.

Fig. H7: Ivory fragment with column decoration (PPP 181909:006:022). Photo by Andrea Squitieri.

H1.1.2 Bronze objects

(7) Registration numbers: PPP 181908:018:005; PPP 181909:004:040; PPP 181909:038:045.
Dimensions: (a) length 1.2 cm; thickness: 0.4 cm; (b) length 1.5 cm; 3. diameter 1.8 cm; thickness: 0.5 cm.
Three bronze earrings of crescent shape, partially preserved (**Fig. H8**). Three similar earrings, although slightly thicker and with smaller hooks, have been found during the 2016 excavations on Qalat-i Dinka[77]. PPP 181908:018:005 was found next to the left temporal bone of the skeleton of Grave 99, i.e. where the ear lobe would have been; this burial was radiocarbon dated to a probably date range of 1234-1117 calBC (92.8 % probability; **Fig.**

75 E.g, Bunnens 1997; Herrmann 2002.
76 E.g., Herrmann *et al.* 2004, 12, 102.
77 PPP 100000:021:012: Kreppner/Squitieri 2017a, 54-55 Fig. C26.

Fig. H8: Crescent-shaped bronze earring (PPP 181909:004:040). Photo by Andrea Squitieri.

D5c; **§D3.2.2**). Although the grave was found disturbed by modern looting, it is relatively likely that this bronze earring belonged to the original furniture of the burial. Crescent-shaped earrings are widely found in the Middle East during the Iron Age[78].

(8) Registration number: PPP 181909:038:055.
Dimensions: diameter 2.2 cm; thickness: 0.4 cm.
Bronze ring with two tapering and touching extremities (**Fig. H9**). On the external surface, an incised decoration is visible. Starting from the tip of the extremities and symmetrically from both sides, these are: two tiny parallel, transversal grooves; a cross; two parallel, transversal grooves; and two grooves running longitudinally across the body of the ring enclosing an indented decorative pattern. Due its size, this is most likely a finger ring.

Fig. H9: Bronze finger ring with decoration (PPP 181909:038:055). Photo by Andrea Squitieri.

(9) Registration number: PPP 181909:002:005.
Dimensions: diameter 1.8 cm; thickness: 0.8 cm.
Bronze ring made of a flat band that is folded onto itself. The band is 0.8 cm wide and 0.1 cm thick. As this object is too small to be a finger ring it may be a hair ring (**Fig. H10**).

Fig. H10: Small bronze ring (PPP 181909:002:005). Photo by Andrea Squitieri.

H1.1.3 Iron objects

(10) Registration numbers: PPP 181908:002:008; PPP 181908:002:009; PPP 181908:002:010; PPP 181908:002:011; PPP 181908:002:012; PPP 181908:002:013; PPP 181909:004:032; PPP 181909:004:049; PPP 181909:004:043.
Dimensions: length: 5.5-7 cm; width: c. 1.8-2 cm (head); thickness: c. 0.5 cm (tang).
Nine leaf-shaped, flat-tanged iron arrowheads with stem, all of the same type (**Fig. H11**). Broken and highly corroded. They belong to a well-known type of arrowhead that is well attested in Mesopotamia and Western Iran during the Iron Age[79]. Note that an iron arrowhead of a different shape ("bodkin") was found as a surface find at Gird-i Bazar[80].

Fig. H11: Iron arrowhead (PPP 181909:002:008). Photo by Andrea Squitieri.

78 Curtis 2012, pls. 84-85.

79 See e.g., Helmuth Kramberger 2015, 36-37. Preliminary classification of the QID1 arrowheads was carried out in the field by Zahra Hashemi.

80 Wilkinson/Squitieri/Hashemi 2016, 102-103 Fig. D3.3

H1.1.4 Stone objects

(11) Registration numbers: PPP 181908:004:006; PPP 181908:006:008; PPP 181908:018:006; PPP 181908:018:015; PPP 181909:004:023; PPP 181909:004:048; PPP 181909:004:050; PPP 181909:004:052; PPP 181909:004:063; PPP 181909:006:016; PPP 181909:006:017; PPP 181909:006:021; PPP 181909:018:001; PPP 181909:038:056.
14 red spherical beads made of carnelian with diameters between 0.5-1 cm (**Fig. H12**), from the fill of Room 58. Very similar beads have been found in the Sasanian-period cemetery of Gird-i Bazar[81]. However, beads of this shape and material are also widely attested during the Iron Age, e.g. at Hasanlu[82].

Fig. H12: Carnelian bead (PPP 181909:004:023). Photo by Andrea Squitieri.

The bead PPP 181908:004:006 has a tubular shape with a circular section (length: 2.5 cm; diameter: 0.5 cm), drilled through from side to side (**Fig. H13**). It was found along with the red spherical bead PPP 181908:018:015 very close to the skeleton of Grave 99, which was radiocarbon dated to the date range of 1234-1117 calBC (92.8 % probability; **Fig. D5c**; **§D3.2.2**). Although this burial was heavily plundered in modern times, both beads may have belonged to the original burial furniture. The tubular shape of the bead is not attested in the Sasanian cemetery of Gird-i Bazar. However, parallels are available from 9th century BC Hasanlu in Western Iran[83].

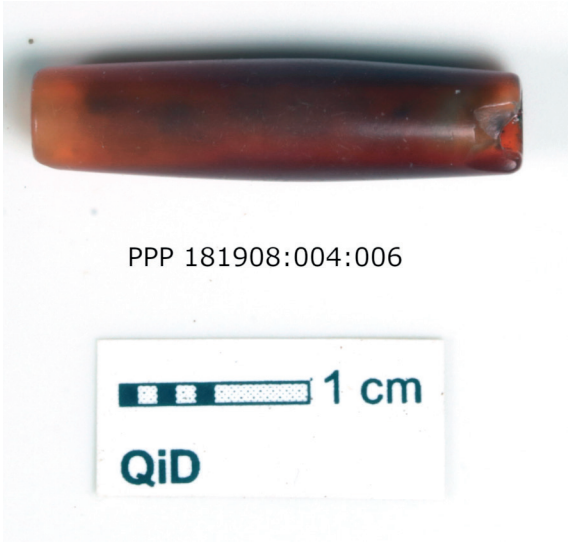

Fig. H13: Tubular carnelian bead (PPP 181908:004:006). Photo by Andrea Squitieri.

(12) Registration number: PPP 181909:002:003.
Material: limestone.
Dimensions: diameter: 13.5 cm; thickness: 4 cm.
Disc-shaped perforated stone, half broken. Pecking marks are visible on the edges, possibly due to manufacture. The stone is greyish, medium-grained and covered by a thick patina. This is the only utilitarian tool so far excavated in QID1 but it has a parallel in a similar perforated stone that was collected as a surface find on Qalat-i Dinka in 2016 (PPP 100000:001:002).
Two similar tools were found in QID3 (**§H1.2**, nos. 15-16), and many more examples of these tools come from the excavation areas in the Dinka Settlement Complex's Lower Town: in 2018, two were excavated in DLT3 (**§H2**, nos. 26, 41) and more were found in previous years in Gird-i Bazar and DLT2[84], making it very likely that we can assign this find to the Iron Age occupation of QID1. The function of this type of tool is not clear. Such items were likely used as weights for digging sticks attached to a plough in order to loosen the soil[85], but other usages are also feasible.

81 Downey 2018b.
82 Cf. the cup from Hasanlu Level IV (c. 1250-800 BC) that is decorated with red spherical beads (University of Pennsylvania Museum of Archaeology and Anthropology; registration no. 65-31-23: https://www.penn.museum/collections/object/257669), and the 9th century BC necklaces from Hasanlu (Metropolitan Museum of New York, accession nos. 61.100.140 and 60.20.20: https://www.metmuseum.org/art/collection/).
83 Including the already mentioned necklaces (Metropolitan Museum of New York; accession nos. 61.100.140 and 60.20.20), and cf. Cifarelli 2013.
84 Squitieri 2018, 153, no. 32; 155, no. 33; 166, no. 65; 167, nos. 69-71.
85 Czichon/Werner 1998, 243.

H1.1.5 Egyptian Blue objects

(13) Registration numbers: PPP 181909:002:007; PPP 181909:004:010; PPP 181909:006:015; PPP 181909:006:018; PPP 181908:018:013.
Five beads made of Egyptian Blue. The first bead (PPP 181909:002:007; length: 0.8 cm; diameter: 2 cm) has a domed shape. It was found along with a short iron pin going through the perforation. The second bead (PPP 181909:006:018; **Fig. H14**) is very similar to the first specimen and shares its domed shape, but is half broken. The third bead (PPP 181909:004:010; length: 0.8 cm long; diameter: 0.5 cm) has a barrel shape and is decorated with longitudinal grooves. The fourth bead (PPP 181909:006:015; length: 0.9 cm; diameter: 0.4 cm; **Fig. H15**), is very similar to the third example, also with a barrel shape with longitudinal grooves as decoration. The fifth bead (PPP 181908:018:013) is a tiny fragment that was found close to Grave 99, whose skeleton was radiocarbon dated to a probable date range of 1234-1117 calBC (92.8 % probability; **Fig. D5c**; **§D3.2.2**), and this item may have belonged to the original grave furniture.

Fig. H14: Dome-shaped Egyptian Blue bead (PPP 181909:006:018). Photo by Andrea Squitieri.

Fig. H15: Decorated Egyptian Blue bead (PPP 181909:006:015). Photo by Andrea Squitieri.

A µ-XRD2 analysis carried out on the first four beads by Christoph Berthold (CCA-BW Tübingen) showed that they are made of cuprorivaite, a synthetic copper-based material commonly referred to as Egyptian Blue. It was invented and widely used in Egypt, but use of this material spread to Mesopotamia and Western Iran, where it is well attested during the Iron Age[86].
Because a fragment of a cylindrical bead or inlay in Egyptian Blue was found in a secure Iron Age context in the excavation area DLT2 in the Lower Town of the Dinka Settlement Complex[87], we know for certain that this material was used in the Dinka Settlement Complex during the Iron Age. Therefore, it is likely that also the Egyptian Blue beads from Qalat-i Dinka date to this period. Similar beads to those presented here have been found in the 9th century BC levels of Hasanlu[88].

H1.2 Small finds from QID2 and QID3

The following items were collected from QID2 and QID3, which yielded the remains of a large sloping structure in stone interpreted as a glacis (QID2: **§D4**), and the remains of a loosely-made stone-earth structure that is interpreted as the foundation of a palisade (QID3: **§D5**). One small find (no. 14) was retrieved from QID2 whereas three objects come from QID3 (nos. 15-17).

(14) Registration number: PPP 176909:042:005.
Material: possibly basalt.
Dimensions: length: 2.6 cm; width: 2 cm.
Broken rectangular stone object, with a squarish section and a polished shiny surface. Possibly used as a whetstone. The item was found on the glacis in QID2.

(15) Registration number: PPP 176905:032:004.
Material: limestone.
Dimensions: diameter: 12 cm; thickness: 3 cm.
Half-broken perforated object of whitish limestone with a biconical perforation. Broken longitudinally into half. The item was found in a fill west of the "wall" LGR:0304 in QID3. For comparisons from QID1 and DLT3 see nos. 12, 26 and 41 in this chapter.

86 Moorey 1994, 186-189.
87 Squitieri 2018, 149, no. 10.
88 E.g., Metropolitan Museum of New York, accession no. 61.100.109; https://www.metmuseum.org/art/collection.

(16) Registration number: PPP 176904:002:004.
Material: limestone.
Dimensions: diameter: 15 cm; thickness 5.5 cm.
Half-broken perforated stone with a disc shape (**Fig. H16**). The hole has a diameter of 4 cm and a biconic section. The stone is whitish limestone with some striations. The object comes from the topsoil of QID3. For comparisons from QID1 and DLT3 see nos. 12, 26 and 41 in this chapter.

Fig. H16: Half broken perforated stone (PPP 176904:002:004). Photo by Andrea Squitieri.

(17) Registration number: PPP 176904:002:005.
Material: bronze.
Dimensions: length: 1.6 cm; max. thickness: 0.4 cm.
Crescent-shaped bronze earring, with both extremities broken off. The earring comes from the topsoil of QID3. Similar earrings were found in QID1 (**§H1.1.2**, no. 7).

H1.3 Final remarks on the 2018 small finds from Qalat-i Dinka

The small finds from Building P in the excavation area QID1 include luxury objects, personal ornaments and weapons. Sadly, the effects of modern looting prevent us from studying the finds from a stratigraphic point of view. However, their shape and raw materials help to assign them to the Iron Age levels with reasonably high confidence.

The ivory finds consist of fragmentary rectangular bars, sometimes with well-known decorative motifs (guilloches; dot-in-circle), as well as decorative items sculpted in the round. These ivory fragments add to the small collection of ivories from Qalat-i Dinka already unearthed in 2016 that included a decorated disc with a rosette motif, rectangular fittings with perforations, and beads[89]. Like the objects found in 2016, the 2018 ivory fragments from QID1 can be dated to the Iron Age based on their comparisons from many Iron Age sites across the Middle East.

The metal objects consist of bronze and iron items. The bronze objects include crescent-shaped earrings which are likely to belong to the Iron Age. Although their design is not distinctive for only this period[90], one of the earrings (PPP 181908:018:005) was found in close proximity to what would have been the position of the ear of the skeleton of Grave 99 (**§D3.2.2**), which was radiocarbon dated to the Iron Age (**§D2.1**). The iron objects consist of a group of nine arrowheads whose shape has close parallels in pieces from Iron Age sites across Mesopotamia and Western Iran.

The stone items include carnelian beads, whose attribution to the Iron Age is made likely due to their parallels from the Iron Age levels of Hasanlu. Moreover, two beads (PPP 181908:018:006, PPP 181908:018:015) very probably belong to the above-mentioned Iron Age Grave 99 (**§D3.2.2**). There are also beads made from Egyptian Blue that can be dated to the Iron Age with some confidence, as a closely comparable fragmentary specimen was excavated in a secure Iron Age context in the Lower Town of the Dinka Settlement Complex (DLT2).

In summary, it is possible to assign the ivory, bronze, iron, carnelian and Egyptian Blue items from Building P to the Iron Age period occupation of Qalat-i Dinka with reasonable confidence. Provided that these attributions are correct, we can conclude that the Iron Age small find repertoire of Building P sets it apart from all buildings unearthed so far in the Lower Town of the Dinka Settlement Complex (Gird-i Bazar, DLT2 and DLT3). In these excavation areas, the small finds belonged overwhelmingly to non-luxury and utilitarian categories that can be linked to everyday production and processing activities (e.g., small portable stone tools). The items from Building P, on the other hand, are clearly luxury items that better fit an elite context. The only exception is a perforated stone tool (no. 12) of a type also commonly found in the excavation areas of the Lower Town. The nine iron arrowheads retrieved from Building P are of a uniform style and point towards military activities which fit the fortification character of Qalat-i Dinka well.

In conclusion, the small finds retrieved from Building P point both to an elite presence and to a military function for the citadel of Qalat-i Dinka, as it had been previously inferred also from other evidence[91]. On the other hand, the few objects from QID2 and QID3 exhibit a more util-

89 Kreppner/Squitieri 2017a, 55.

90 See e.g., Ilan 2014.

91 Radner 2016, 21-22.

itarian nature and have close comparison with the items from the Lower Town.

H2. The 2018 small finds from DLT3

The repertoire of small finds collected from DLT3 consists of 27 items: eight from the Late Chalcolithic levels, 14 from the Main Occupation Period dating to the Iron Age, and two from the Sporadic Occupation levels (possibly of the Sasanian period). Additionally, an item of possible Iron Age date was retrieved from the backfill of the geoarchaeological trench GA42 (excavated in 2015). A further two items of likely Iron Age date were found in the topsoil. This chapter presents these objects following the stratigraphic sequence of DLT3, from the oldest to the more recent levels.

H2.1 Small finds from the Late Chalcolithic levels

The Late Chalcolithic levels in DLT3 are represented by (a) the pottery kiln that was partially excavated in the south-western part of the trench, right underneath the Iron Age walls, and (b) the portion of a floor intercepted below the Iron Age floor of Room 64, opposite the kiln, on the south-eastern side of the trench (**§E**). While the kiln fill did not yield finds apart from pottery sherds and fragments of architectural elements, the Late Chalcolithic floor and the fill right above it have produced some finds, which are discussed in the following.

(18) Registration number: PPP 226922:056:006.
Material: flint.
Dimensions: (a) width: 5 cm; length: 4.5 (left); (b) width: 2 cm; length: 4 cm (right).
Two flintstones. Found right above the Late Chalcolithic floor that we reached under the Iron Age floor of Room 64.

(19) Registration number: PPP 226922:057:003.
Material: granite.
Dimensions: max. diameter 7.5 cm.
Sub-spherical tool with two opposite flattish sides on which tiny pits are visible. Possibly used as a pounder. The object was found in the fill above the Late Chalcolithic floor.

(20) Registration number: 226922:057:004.
Material: limestone.
Dimensions: diameter 3.8 cm: thickness: 1 cm.
Small and regular flat stone disc, with smooth surfaces and no evident wear marks (**Fig. H17**). Perhaps a token? The stone is compact, fine grained, dark-violet in colour, and may be a variety of limestone. It was found in the fill above the Late Chalcolithic floor.

Fig. H17: Stone disc, possibly used as a token (PPP 226922:056:004). Photo by Andrea Squitieri.

(21) Registration number: PPP 226922:057:002.
Material: flint.
Dimensions: length: 6 cm; width: 1.4 cm; thickness: 0.4 cm.
Symmetric flint blade with indentations visible on both edges and a pointed tip (**Fig. H18**). It has a trapezoidal section with a downside flat. The blade was found in the fill above the Late Chalcolithic floor.

Fig. H18: Flint blade (PPP 226922:057:002). Photo by Andrea Squitieri.

(22) Registration number: PPP 226922:057:007.
Material: obsidian.
Dimensions: length: 1.5 cm; width: 0.8 cm; thickness: 0.3 cm.
Tiny and irregular fragment of an obsidian object, possibly a tool. It was found in the fill above the Late Chalcolithic floor.

(23) Registration number: PPP 226922:057:005.
Material: flint.
Two small flint flakes from the fill above the Late Chalcolithic floor.

H2.2 Small finds from the Iron Age levels (Main Occupation Periods 1 and 2)

H2.2.1 Objects from floors

(24) Registration number: PPP 226922:047:023.
Material: iron.
Dimensions: width: 5 cm; length: 4.7 cm.
Shapeless iron object, highly corroded, found on the floor of Outdoor Area 63.

(25) Registration number: PPP 226922:040:050
Material: likely basalt.
Dimensions: max. diameter: 7.5 cm; thickness: 4.5 cm.
Sub-spherical tool with two very flat and shiny faces. This indicates that it was used as a polisher (**Fig. H19**). The stone is a blueish and finely grained, likely basalt. It comes from the floor of Room 64. Several very similar polishers were unearthed at Gird-i Bazar[92].

Fig. H19: Basalt polisher (PPP 226922:040:050). Photo by Andrea Squitieri.

(26) Registration number: PPP 226922:040:053.
Material: limestone.
Dimensions: diameter: 9.5 cm.
Disc-shaped perforated stone with a regular circular shape, pointed edges and a perforation in the centre showing a biconic section whose hole has a diameter of 1.5 cm (**Fig. H20**). The material is white limestone, covered by a thick patina. The object was found on the floor of Room 64. As mentioned above (nos. 12, 15-16), this type of perforated stone is commonly attested in the Lower Town of the Dinka Settlement Complex. The present item is the first perforated stone from the Dinka Settlement Complex found on a floor, whereas all the other examples come from fills, topsoil or the modern site surface. This find therefore establishes for the first time a clear connection between the use of these tools and the Iron Age occupation of the site.

Fig. H20: Perforated stone (PPP 226922:040:053). Photo by Andrea Squitieri.

(27) Registration number: PPP 225922:038:008.
Material: limestone.
Dimensions: length: 20 cm; width: 15 cm; height: 12 cm.
Door socket made out of an unworked cobblestone with a slightly triangular plan view. In the centre, a depression with a diameter of 9 cm and a depth of 4 cm is visible, with some wide circular grooves inside formed due to rotary movement. The material is a whitish limestone. The item was found on the floor of Room 66 in Building S and was not in its original architectural position as it was excavated upside-down.

H2.2.2 Objects from fills

(28) Registration number: PPP 226922:013:005.
Material: fired clay.
Dimensions: length: 5.2 cm; diameter 3.2 cm.
Broken ceramic object of a cylindrical shape, with a groove of a depth of 0.5 cm and a width of 1 cm on one of the extremities. The surface is burnished, with some inclusions visible. The original function and shape of the object is unknown. It was found in the fill of Room 64.

(29) Registration number: PPP 226922:019:014.
Material: granite.
Dimensions: max. diameter: 8 cm.
Sub-spherical tool with three flat and polished faces (**Fig. H21**), on which some pits are visible. The object may have been used as a polisher and pounder. The material is granite, with light and dark medium-sized minerals visible on the surface. The object was found in the fill of Room 64.

92 Squitieri 2018, 158-160, nos. 41, 43-44, 47, 49; 164, no. 59.

Fig. H21: Granite tool, possibly used as a pounder and olisher (PPP 226922:019:014). Photo by Andrea Squitieri.

(30) Registration number: PPP 226922:019:015.
Material: possibly granite.
Dimensions: max. diameter: 7.8 cm.
Sub-spherical tool with a least one flattish face; there may be a second, smaller face just opposite the first one. The stone is possibly granite with dark and light medium-sized minerals, some of which are shiny. The object was found in the fill of Room 64, in the same context as no. 29. It, too, may have been used as a polisher and pounder.

(31) Registration number: PPP 226922:013:004.
Material: likely limestone.
Dimensions: length: 10 cm; width: 9 cm; thickness: 3.5 cm.
Irregular stone object with a perforated off-centre hole in an otherwise unworked pebble. The hole has an irregular section and the two opposite openings do not correspond. This item may perhaps have served as a weight for a fish-net or a loom. The material is a fine-grained rock of light-grey colour, most likely limestone. The object was found in the fill of Room 64.

(32) Registration number: PPP 226922:044:002.
Material: bone.
Dimensions: length: 3.4 cm; width: 1.4 cm; thickness: 0.5 cm.
Broken cylindrical bone object with a flat and wide extremity, ending with tiny indentations. Possibly part of a bone spatula. The item comes from the fill of Room 62.

(33) Registration number: PPP 226922:011:004.
Material: granite.
Dimensions: max. diameter: 6.5 cm.
Stone object of slightly oval shape with a flattish side and many tiny pits all over the surface. Possibly used as a pounder. The rock is coarse-grained with white and dark crystals, likely granite. The object was found in the fill below the topsoil in the northeastern part of the trench.

(34) Registration number: PPP 226922:011:005.
Material: possibly basalt.
Dimensions: max. diameter 6 cm.
Sub-spherical stone object with two shiny and flat surfaces and a damaged spot that may be a third flat surface (**Fig. H22**). On the edges outside the flat surfaces, tiny pits are visible. It is therefore possible that this tool was used as both a polisher and a pounder. It was found in the fill below the topsoil in the northeastern part of the trench. The stone is dark grey-blueish, medium-grained, with mostly dark minerals and only a few light ones scattered through: possibly basalt.

Fig. H22: Basalt polisher (PPP 226922:011:005). Photo by Andrea Squitieri.

(35) Registration number: PPP 225922:003:003.
Material: possibly diabase.
Dimensions: max. diameter: 5.4 cm.
Cuboid polisher with two flat shiny faces in opposite positions. On one side, it shows tiny pits which are likely due to manufacture: it is possible that the tool was given a regular shape by pecking its side and that these pits constitute pecking marks. The material is a grey stone with mostly dark medium-grained minerals, possibly diabase. The object was found in the fill right below the topsoil in the northwestern part of the trench.

(36) Registration number: PPP 225922:003:005.
Material: possibly basalt.
Dimensions: max. diameter: 7.5 cm.
Sub-spherical polisher with three flat, polished and dark faces. One side is broken. The object could have been used as a pounder as many tiny pits are visible on its surface. The stone is greyish, with a medium-grained texture showing dark and light minerals, possibly basalt or an-

other type of igneous rock. The object was found in the fill right below the topsoil in the northwestern part of the trench.

H2.3 Small finds from the Sporadic Occupation Period

(37) Registration number: PPP 226922:043:001.
Material: limestone.
Dimensions: length: 25 cm; width: 20 cm; height: 13 cm.
Door socket made out of an unworked limestone cobble with a central depression of a diameter of 6 cm and a depth of 2 cm. Not found in its original position but reused to build the stone installation Locus:226922:043. Although this installation belongs stratigraphically to the Sporadic Occupation Period, it is possible that this door socket was reused from older Iron Age architecture.

(38) Registration number: PPP 225922:012:005.
Material: limestone.
Dimensions: length: 35 cm; width: 30 cm; height: 14 cm.
Door socket made out of an unworked limestone cobble with a central depression of a diameter of 10 cm and a depth of 4 cm. It was reused to build the stone installation Locus:225922:012 belonging to the Sporadic Occupation Phase but may have been reused from older Iron Age architecture.

H2.4 Small finds from the Modern Occupation Period levels and the topsoil

The items in this section were collected from the refill of the 2015 geoarchaeological trench GA42 and from the topsoil covering the DLT3 trench and assigned to the Modern Occupation Period (cf. **Table E2**). The shapes of these objects, however, could suggest Iron Age datings as there are parallels from other excavation areas in the Lower Town.

(39) Registration number: PPP 226922:003:003.
Material: bronze.
Dimensions: length: 5 cm; thickness: 0.4 cm.
Two fragments of a bronze bracelet with signs of corrosion. They were found in the fill of the 2015 geoarchaeological trench GA42.

(40) Registration number: PPP 226922:005:004
Material: limestone.
Dimensions: diameter: 15 cm; thickness: 5 cm.
Perforated circular stone of regular shape. The edges are pointed and there is a hole in the centre. The hole has a biconic section indicating that it was perforated from both sides and not drilled through. On the edges, small pits are visible that may derive from manufacture. Possibly the original pebble was slightly worked on the edges before/after the hole was created. Some circular marks are visible inside the hole. The material is greyish limestone. The object was found in the topsoil. No. 26 is a similar tool from the floor of Room 64.

(41) Registration number: PPP 226922:005:005.
Material: stone.
Dimensions: length: 10.5 cm; width: 2 cm; thickness: 1.5 cm.
Rectangular object, very regular, with a rectangular section and a rounded tip. The surface is very polished and on the long sides, tiny straight lines are visible. The object is interpreted as a whetstone. The material is a fine-grained brownish stone with short and irregular whitish veins. The item was found in the topsoil, but a very similar object was excavated in Gird-i Bazar[93].

H2.5 Final remarks on the 2018 small finds from DLT3

The items from the Iron Age levels of DLT3 are utilitarian objects that have good parallels in materials from the other excavation areas of the Lower Town of the Dinka Settlement Complex. This indicates contemporaneity of use as well as similarities in the activities taking place in these areas.

The items found in levels of the Sporadic Occupation Period (possibly to be dated to the Sasanian period) consist of two door sockets that may well have been reused from earlier Iron Age architecture, as they have close morphological parallels in the Iron Age buildings excavated in DLT2 and Gird-i Bazar.

93 Squitieri 2018, 160, no. 46.

I. A fragmentary brick with a Neo-Assyrian cuneiform inscription from DLT3

Karen Radner[94]

The area DLT3 was chosen for excavation because of the radiocarbon analysis results of a piece of charcoal from the south section of the 2015 geoarchaeological trench GA42, which was taken "from above a floor at a depth of around 1.0 m [below the modern surface], near a collapsed wall"[95]. With a probable date range of 830-789 calBC (95.4 % probability)[96], this was the first ^{14}C date from the Lower Town[97] to unequivocally fall into the time when the Dinka Settlement Complex (DSC) was situated within the Border March of the Palace Herald and therefore the provincial system of the Neo-Assyrian Empire[98].

Unlike in the previously excavated areas of the Lower Town of the Dinka Settlement Complex, two distinct architectural phases of the Main Occupation Period are attested in DLT3 (**§E3**). Although it was not possible to correlate the south section of GA42 exactly with the loci of DLT3 as excavated in 2018, the context in which the charcoal was found in 2015 matches the later of these two architectural phases (Main Occupation Period 2).

Building Q (**§E5.8**) was built in the Main Occupation Period 2, as it covers parts of the older Building S and the adjoining Outdoor Area 63, causing their partial destruction. The construction of Building Q, which is oriented differently from the previous structures, fundamentally changed the local architectural setting. A post-occupation layer (LGR:0335: Locus:225922:003 and Locus:226922:010; **§E5.4-6**), which covered the stone wall bases of Building Q, contained, in addition to some pebbles and sherds, a fragment of a fired brick.

The brick fragment measures 5.6 × 6.5 cm and is 3.4 cm thick. It bears a small part of a Neo-Assyrian cuneiform inscription (PPP 226922:010:004; **Fig. I1**); as is usually the case, the inscription was not oriented parallel to the sides of the brick but sits at a seemingly random angle. This angle probably reflects the position of the body of the scribe vis-à-vis the brick that he inscribed when the piece was not yet quite dried out but leather-hard on the surface; this is bound to have happened in an outside setting somewhere close to the kiln where this and other bricks were fired afterwards, with the bricks lying on the ground while being inscribed.

Very little of our fragmentary brick's inscription is preserved, which was set into a rectangular frame and inscribed, rather than stamped, into the brick before it was fired. But as the end of the first line concludes with the relatively intact sign KIŠ, the logogram for *kiššatu* "universe; world", we can assume with confidence that this line reads either "PN, king of the universe" or "PN, strong king, king of the universe", continuing in the second line with "king of Assyria" and then the genealogy of the ruler, mentioning his father and grandfather with their titles. Further upstreams on the Lower Zab, the rulers of Idu (modern Satu Qala), a former province of the kingdom of Assyria until the reign of Tiglath-pileser I (r. 1114-1076 BC) which was in the 11th and 10th century BC an independent polity[99], also commissioned inscribed bricks[100]. But these local rulers wisely refrained from stretching their readers' credulity by styling themselves as "kings of the universe"[101], which is a title used in the wider region exclusively by the Assyrian hegemons.

94 I am very grateful to Jamie Novotny (LMU Munich) for sharing his thoughts on the brick fragment and for his comments on this chapter.

95 Altaweel/Marsh 2016, 27 Fig. B2.5.

96 Altaweel/Marsh 2016, 27-28 Fig. B2.7.

97 Radner 2018, 30-33; Kreppner/Radner 2018, 56-58.

98 Radner 2016, 17-22.

99 C.W. Hess in van Soldt *et al.* 2013, 216-220; cf. Fuchs 2011, 261-262; Pappi 2012, 605-606.

100 See the editions of W.H. van Soldt and C.W. Hess in van Soldt *et al.* 2013, 209-213, 237-238 Figs. 21-25 (hand copies); also a fragment of an inscribed brick of Assurnasirpal II (r. 883-859 BC) was found at Satu Qala (cf. hand copy on Fig. 26), dating to the period after Idu had been reintegrated into the Assyrian provincial system.

101 They use only the titles MAN KUR URU.*I-di* "king of the country of the city of Idu"; MAN KUR.*I-di* "king of the country of Idu" and MAN U[RU.*I-di*] "king of the city of Idu".

An inscription of Shalmaneser III of Assyria (r. 859-824 BC) from bricks found in Assur[102] that documents his reconstruction of that city's fortifications offers a good parallel and can be used to reconstruct the inscription of the brick from the Dinka Settlement Complex:

(1) ^{PN}^{d}DI-*ma-nu*–MAŠ MAN KAL MAN KIŠ
(2) MAN KUR.AŠ DUMU ^{PN}AŠ–PAP–A MAN KAL MAN KIŠ
(3) MAN KUR.AŠ DUMU ^{PN}TUKUL–MAŠ MAN KUR.AŠ-*ma*
(4) DÙ BÀD URU.ŠÀ-URU

"Shalmaneser (III), strong king, king of the universe, king of Assyria, son of Ashurnasirpal (II), strong king, king of the universe, king of Assyria, son of Tukultī-Ninurta (II), (who was) also king of Assyria: builder of the wall of Libbi-ali (i.e., the city of Assur)."[103]

Like our fragmentary inscription, this Assur inscription was not produced with a brick stamp. Therefore, it is important to note that the above edition of the Assur brick inscription, as offered by A.K. Grayson, is an artificial composite text that combines 14 complete and fragmentary brick inscriptions, which all arrange the text in very different ways across three or four lines. Not any two examples are completely identical, as they were all written individually. Some versions replace the logogram KIŠ "universe" with the equivalent sign ŠÚ[104] or the logogram DUMU "son" with its equivalent A; some others omit "strong king" in the titulary[105], vary the titles of the ancestors or replace "builder of the wall of Libbi-ali" with "of the wall of Libbi-ali". This results in a great variety of versions, such as for example this relatively short one:

(1) ^{PN}^{d}DI-*ma-nu*–MAŠ MAN KIŠ MAN KUR.AŠ A AŠ–PAP–A MAN
(2) A TUKUL–MAŠ MAN KIŠ MAN KUR.AŠ-*ma*
(3) *šá* BÀD URU.ŠÀ-URU

"Shalmaneser (III), king of the universe, king of Assyria, son of king Ashurnasirpal (II), son of Tukultī-Ninurta (II), king of the universe, (who was) also king of Assyria: builder of the wall of Libbi-ali (i.e., the city of Assur)."[106]

Similar brick inscriptions, also using the writing MAN KIŠ "king of the universe", begin the first line with "Palace of Shalmaneser" (É.GAL)[107]; at Assur, such inscriptions are used to commemorate also construction work on buildings other than royal palaces, such as of the façade of the Anu-Adad temple at Assur[108]. However, brick inscriptions starting with É.GAL are only attested from sites that indeed housed one of the king's palaces[109]. As I hesitate to contemplate the possible presence of a royal palace at the Dinka Settlement Complex, I therefore assume that our inscription, like that of the bricks from the city wall of Assur, began with the name of the king, without É.GAL.

While the title "king of the universe" is very common among the titularies used by Assyrian rulers[110], the use of the logogram KIŠ in brick inscriptions of the Neo-Assyrian period is remarkably rare[111], and Shalmaneser's brick inscriptions from the city wall of Assur indeed offer the best and only parallels for our inscribed, not stamped specimen. It was during this king's reign that the Province of the Palace Herald was created in the region that included the Peshdar Plain, in which the Dinka Settlement Complex is situated, as a defensive administrative unit

102 And in one case (exemplar 12) on the nearby site of "Tell Huweisch B", i.e. Tell al-Huwēš west of Assur; cf. Nashef 1982, 269.

103 Grayson 1996, 155-156 no. A.0.102.99. Also available online (http://oracc.museum.upenn.edu/riao/Q004704; last accessed 19 July 2019) as part of the retro-digitisation effort of the "Royal Inscriptions of Assyria online" project (http://oracc.museum.upenn.edu/riao/index.html), based at LMU Munich.

104 E.g., Schroeder 1922, no. 101; Jakob-Rost/Marzahn 1985, nos. 106 and 118.

105 E.g., Jakob-Rost/Marzahn 1985, nos. 105 and 107.

106 Jakob-Rost/Marzahn 1985, no. 107 (VA Ass 3262g = Grayson 1996, 156 no. A.0.102.99 ex. 4).

107 Including Grayson 1996, 160 no. A.0.102.104 (Assur and Šibaniba); 161-163 no. A.0.102.106 (Assur and Nineveh; cf. list of variants for use of KIŠ).

108 Grayson 1996, 158-159 no. A.0.102.102.

109 The construction of a royal palace in a provincial centre was a key component of establishing Assyrian state control over newly integrated regions; on these "provincial palaces" see Liverani 2012.

110 Cf. Cifola 1995.

111 Among the brick inscriptions of Shalmaneser's successors until the end of the empire, we can only note a four-line brick inscription of Adad-nerari III (r. 810-783 BC) from Kalhu (Nimrud), which was, however, created with a brick stamp: Grayson 1996, 156 no. A.0.104.16. From the time of Shalmaneser's immediate predecessors, there are only brick inscriptions of Aššur-dan II (r. 934-912 BC: Grayson 1991, 140 no. A.0.98.5) and Tukulti-Ninurta II (r. 890-884 BC: Grayson 1991, 184 no. A.0.100.14; 185-186 no. A.0.100.16) from Assur, but these are too early in date to be of relevance for DSC. All Neo-Assyrian brick inscriptions have been checked, including the ones of Sargon II and Assurbanipal on the basis of the forthcoming editions of Grant Frame and of Jamie Novotny and Joshua Jeffers, to whom I owe my thanks.

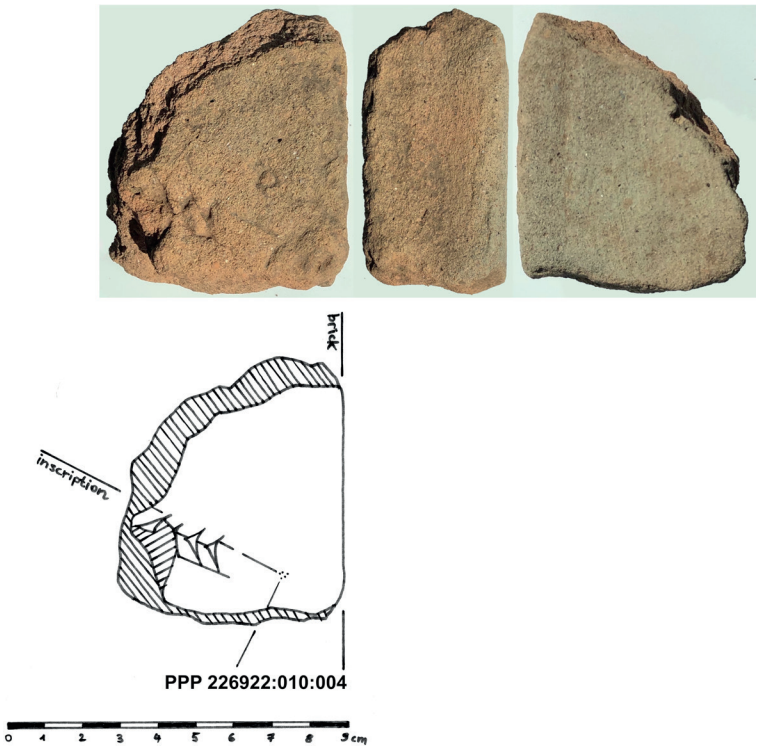

Fig. I1: Fragment of a baked brick (PPP 226922:010:004) with a partial Neo-Assyrian cuneiform inscription, excavated in DLT3. Photos and drawing by Karen Radner.

guarding the Assyrian Empire against its neighbours[112]. He is therefore a highly likely candidate for having commissioned building work at the Dinka Settlement Complex. But whatever its precise date and attribution, the brick fragment surely dates to the time of the Neo-Assyrian occupation of the Dinka Settlement Complex.

If the brick fragment from DLT3 bore an inscription similar to that of Shalmaneser's Assur fortification wall bricks, then it could have featured in the final line a mention of the building works in question. There is therefore a chance that the ancient name of the Dinka Settlement Complex would have been given in the complete version of the inscription. It is of course equally possible that the inscription was shorter, listing only the name and titles of the ruler responsible for the inscription and those of his father and grandfather.

In any case, in its find context within DLT3, the brick fragment was certainly in a secondary position but nevertheless still in a clear and well documented Iron Age context. It might originate from a building somewhere on the rocky outcrop of Qalat-i Dinka, as many broken fired bricks with roughly the same original dimensions as our brick fragment can be observed on the surface of the slopes surrounding the peak. Occasionally, fragments of such bricks have been recovered from fills and sediment layers in excavation areas in the Lower Town, including Gird-i Bazar[113]. However, the present fragment is the only specimen with an inscription encountered so far at the Dinka Settlement Complex.

Moreover, the inscribed brick fragment is the first textual evidence for the Assyrian presence that has been unearthed during properly documented archaeological excavations at the Dinka Settlement Complex. The discovery of this artifact should put at rest any doubts as to whether the fragmentary Neo-Assyrian slave sale contract dated to 725 BC in the reign of Shalmaneser V (r. 726-722 BC)[114] indeed originates from Qalat-i Dinka[115], where the specimen was found during agricultural work in 2013 on the much looted western slope. We hope that in time more, and better preserved, textual materials will be recovered during the excavations.

112 Radner 2015; 2016.

113 E.g. Wilkinson/Squitieri/Hashemi 2016, 102 Fig. D3.2: brick fragment PPP 271928:013:006 from the fill layer Locus PPP 271928:013 above Building P.

114 Radner 2015; 2016, 17-18.

115 Such as Yamada 2019, 55 n. 80, quoting Dlshad Marf (Salahaddin University Erbil): "As noted by D. Marf (personal communication), it is possible that the slave sale contract published by Radner (2015) could have been carried to Qalat-i Dinka from some place further distant, where the agreement was made."

J. Analytical results from the zooarchaeological remains at Gird-i Bazar, 2015-16

Tina Greenfield[116]

The sampling procedures and protocols followed for the organic remains uncovered at the Dinka Settlement Complex have already been described in detail elsewhere[117]. The following analysis includes newly integrated zooarchaeological data from all the squares excavated during the 2015 and 2016 seasons at Gird-i Bazar.

In order to determine diet and species preference as well as distribution, consumption and disposal practices for animals and their by-products across the site, animal bone specimens were preliminarily analysed during the 2015 and 2016 field campaigns. A total of 229 specimens from different deposits were identified, mostly from architectural contexts of the Iron Age settlement and, in one instance, from a Sasanian-period burial (heron, *Ardeidae sp.*: **§J8.2.7**). Also two chicken bones (*Gallus gallus* dom.) were identified (**§J6**). These come from modern contexts and therefore add nothing to the discussions concerning the date of the arrival of the domesticated chicken in Mesopotamia[118].

The following study does not include the materials retrieved through flotation, which is routinely practiced during excavation in order to collect smaller materials[119].

J1. Recovery and collection

A concerted effort to recover the full faunal assemblage from each square was attempted. Each of the primary contexts was carefully hand-collected, and sieved when possible which allowed for a greater recovery of smaller fragments and microfauna.

Faunal remains (n=229) were recovered from all areas excavated during the first two seasons of excavation at Gird-i Bazar (**Table J1**): Buildings A-H including courtyards, alleyways and outdoor areas, each with unique architectural features and material remains.

The faunal remains uncovered across the site, while small in frequencies, allow for a broad understanding of the activities related to food consumption for this settlement. Additionally, within each of these areas, unique patterns of faunal distributions were evident and help determine economic behaviours of the inhabitants.

Square	Sum of NISP
267931	3
267932	3
268931	11
268932	38
269929	61
269930	3
269932	9
270928	2
270929	1
271927	85
271928	13
Grand total	**229**

Table J1: Sum of NISP of faunal remains from the 2015-2016 campaigns at Gird-i Bazar according to square.

J2. General taphonomic patterns (site-wide)

J2.1 Fragmentation

Due to the shallow nature of the deposits and contexts, the vast majority of the remains were in relatively poor condition for analysis and significantly fragmented. This issue was further compounded by excavation damage that occurred on some of the specimens, and a limited amount of further fragmentation was noted due to the shipment of a portion of the remains to Canada, where

116 Department of Religion and Culture, St. Thomas More College, University of Saskatchewan, Saskatoon (Canada); co-Director of the Near Eastern Biblical Archaeological Laboratory (NEBAL), St. Paul's College, University of Manitoba, Winnipeg (Canada).

117 Greenfield 2016; 2017.

118 Cf. Redding 2015.

119 Cf. Greenfield 2016.

the present author is based. A reasonable portion of the total (>50 %), however, was of a suitable size and condition for general identification.

J2.2 Weathering

The close proximity of the remains to the surface also resulted in the vast majority (80 %) of the specimens being covered with calcium carbonate. Thus, it was often very difficult to identify specific modifications that might have occurred on the bones, such as butchering marks or polish.

The majority of the remains were also sun bleached (14 %) and demineralized (49 %), which is generally indicative of them being left on the ground surface exposed to the elements for extended periods of time. Once buried, however, the remains were exposed to roots from plants that further damaged the surface of a large portion (68 %) of the specimens.

The remains were also catalogued as having either light, medium, or heavy levels of weathering. The highest frequency of weathering was for medium levels (67 %), followed by light levels with just under 30 % and heavy levels with only 4 % frequency within the assemblage (**Table J2**).

Weathering level	Sum of NISP	% of total NISP
heavy	9	4 %
light	66	29 %
medium	154	67 %
Grand total	**229**	**100 %**

Table J2: Sum of NISP and percentage frequencies of faunal remains from the 2015-2016 campaigns at Gird-i Bazar according to their level of weathering.

J2.3 Gnawing

Interestingly, although the bones were left on the surface to weather, there is no evidence of gnawing present on any specimens. This suggests that the remains were not moved across the landscape via carnivore activity.

J2.4 Pathologies

There is no evidence on any specimens of signs of pathologies related to extra growth on bones usually associated with traction (which is the result of pulling heavy equipment).

J3. Cultural modifications

J3.1 Burning

A total of 5 specimens were burned (4 calcined/white, 1 tanned), out of the entire corpus. This represents just over 2 % of the complete assemblage. The specimens were found on floors, within the kiln, and in secondary fills. This is not suggestive of one particular event or activity.

J3.2 Butchering

A total of 11 individual specimens exhibited evidence of butchering, or food processing, marks on their surface. The highest frequency within the total amount of butchered bones comes from slices (64 %), followed by equal proportions of chops and slice & bash marks (18 %). Overall, butchered remains represent just under 5 % of the total corpus of specimens. While this is a relatively small percentage, it is indicative that food processing occurred on some individuals from this area (**Table J3**).

Butchered type	Sum of NISP	% of total butchered NISP (n=11)	% of total assemblage (n=229)
chop	2	18.18%	0.87 %
slice	7	63.64%	3.05 %
slice & bash	2	18.18%	0.87 %
Grand total	**11**	**100%**	**4.79 %**

Table J3: Sum of NISP and percentage frequencies (for both total butchered bones and total assemblage) of butchered faunal remains from the 2015-2016 campaigns at Gird-i Bazar.

J3.3 Tools and polished elements

Polish was identified on a total of 4 specimens (2 % of the total assemblage), indicative of tool use. A rib appears to have been used as a spatula. Another example of a modified bone was a horn core that was smoothed on both sides, but it is unclear what the function of the specimen was (**Fig. J1**).

J4. Zooarchaeological methods

J4.1 Sample size

Due to the small number of specimens (n=229), it was necessary to combine data from both of the primary and

Fig. J1: Two worked bones (likely tools or ornaments) from the kiln fill (Locus:269929: 020) in Open Area 8. The bone on the left is a polished rib of a large mammal and comes from the bone collection PPP 269929:020:002; the image on the right is of a culturally modified specimen from the bone collection PPP 269929:020:006. Prepared by Tina Greenfield.

secondary contexts into one analytical unit in order to observe some statistically significant patterns, which are indicative of the economic behaviour of the inhabitants of the site on the whole. General information on age, sex, metrics, cultural modifications, and other data were recorded[120]. A selection of data are presented here, first in a general discussion of the remains site-wide and then according to different categories of analyses (i.e. rooms, elements).

J4.2 Quantitative analyses

Each specimen was identified to the species, or a higher taxonomic category, and to the element (i.e., individual bone within the body) whenever possible. Mammalian size categories (i.e., small, medium, and large) were used for generalized designations when a more specific identification was not possible.

The technique chosen for the quantification of the data was Number of Identified Specimens (NISP)[121]. This technique is the most appropriate measure of abundance for samples since it quantifies each unarticulated fragment as a separate individual. It is particularly useful in this assemblage due to the spatial distribution of the remains across Gird-i Bazar[122].

Given the fragmentary nature of the assemblage, few specimens were measurable. Wild taxa were separated from domestic taxa on the basis of a combination of metrics[123], thickness of bone, and development of muscle insertion points[124]. The wild taxa (e.g., birds) were identified by comparison to modern and archaeological specimens curated within comparative collections in Canada and the United Kingdom.

J5. Taxonomic and species diversity

In general, the species population appears to be composed of mainly herded animals (cattle, sheep and goat), followed by domestic pig, and birds in varying degrees of frequency. Due to the high fragmentation and poor preservation of the material determining the demographics of the population is problematic, as the highest frequency for determining the state of domestication is from the unknown category (59 %), followed by Domestic with 41 % and Wild with just 1 % frequency of the assemblage. Nevertheless, it is clear that the assemblage corpus is overwhelmingly dominated by domestic versus wild animals, which suggests the management strategies for this settlement were focused on domestic animals (**Table J4**).

State of domestication	Sum of NISP	% of total NISP
Unknown	134	58 %
Domestic	93	41 %
Wild	2	1 %
Grand total	**229**	**100 %**

Table J4: Sum of NISP and percentage frequencies of faunal remains from the 2015-2016 campaigns at Gird-i Bazar according to the state of domestication.

While the assemblage is quantitatively quite small, it is possible to tentatively observe some patterns of species diversity. The majority of specimens are mammal bones (226 of 229, that is 99 %). The standard herded domestic mammals are present and include sheep (*Ovis aries*), goat (*Capra hircus*), and cattle (*Bos taurus*) as well as domestic pig (*Sus scrofa* dom.). General categories of large to small

120 Greenfield 2014.
121 Grayson 1984.
122 Cf. Lyman 2008, 27-28, 214; Maltby 1979; O'Connor 2000; Reitz/Wing 2008.
123 Walker 1985; von den Driesch 1976.
124 Greenfield 1986; Stampfli 1963.

mammals were present within the assemblage. In addition, there were birds (*Aves*) present within the assemblage.

The presence of these taxa is not surprising given the pastoral communities attested in the landscape of Zagros for millennia, including in the Iron Age[125]. The lack of diversity of taxa is interesting, considering the wealth of species to be expected in this environment which is located in the path of migration for several mammals and birds. The lack of wild species, specifically cervids, is intriguing, considering that deer is a standard animal present in this region (**Table J5**).

Only after the general site-wide faunal analyses were conducted, the present author realised that three specimens come from modern contexts: 2× *Gallus gallus* dom., 1× *Sus scrofa* dom. They are included only in the general site information and have been removed from all analyses related to buildings, space, and room categories.

All Taxa (ID and non-ID)	Sum of NISP	% of total NISP
Aves (birds)	**3**	**1.31 %**
Ardeidae sp.	1	0.44 %
Gallus gallus dom.	2	0.87 %
Mammals	**226**	**98.69 %**
Bos taurus	19	8.30 %
Capra hircus	5	2.18 %
Capreolus/Ovis/Capra	1	0.44 %
Homo sapiens sp.	1	0.44 %
large mammals, unidentified	20	8.73 %
medium mammals, unidentified	116	50.65 %
Ovis aries	10	4.37 %
Ovis/Capra	25	10.91 %
small mammal, unidentified	1	0.44 %
rodent	1	0.44 %
Sus scrofa dom.	26	11.35 %
Sus scrofa dom. ?	1	0.44 %
Grand total	**229**	**100 %**

Table J5: Sum of NISP and percentage frequencies of taxa from all the identified and unidentified faunal remains from the 2015-2016 campaigns at Gird-i Bazar.

J6. Species preference and consumption patterns (site-wide)

In order to get a more accurate picture of which specific taxa were consumed at Gird-i Bazar it is necessary to analyse only those specimens that were identified with certainty. While the sample size is compromised, patterns of species preference and consumption can be observed (**Table J6**).

97 % of the entire corpus of identifiable specimens (n=88) are mammals, followed by only 3 % of Aves specimens. Not surprisingly, caprines (sheep and goat) are the highest frequency specimens in the mammals category, with just under 50 % of the total assemblage. *Sus scrofa* dom. is the second most frequent species with a 30 % frequency, followed by *Bos taurus* with just over a 20 % frequency.

Ardeidae sp. (heron; from a Sasanian-period burial) and *Gallus gallus* dom. (domestic chicken; from a modern context) within the category of *Aves* are the smallest group of taxa represented and of course considerably younger than the Iron Age settlement at Gird-i Bazar.

Taxa	Sum of NISP	% of total NISP
Aves	3	3 %
Ardeidae sp	1	1 %
Gallus gallus dom.	2	2 %
Mammal	85	97 %
Bos taurus	19	22 %
Capra hircus	5	6 %
Ovis aries	10	11 %
Ovis/Capra	25	28 %
Sus scrofa dom.	26	30 %
Grand total	**88**	**100 %**

Table J6: Sum of NISP and percentage frequencies of identifiable taxa from the 2015-2016 campaigns at Gird-i Bazar.

J6.1 Body portions (site-wide)

The distribution of specific portions (via elements) is integral to the identification of social and economic issues within a settlement[126]. Each combined body-value portion or individual segment can be an indication of status and

125 Cf. Greco 2003; Balatti 2017.

126 deFrance 2009; Greenfield 2014; Marom *et al.* 2009; Reitz 1987: 109.

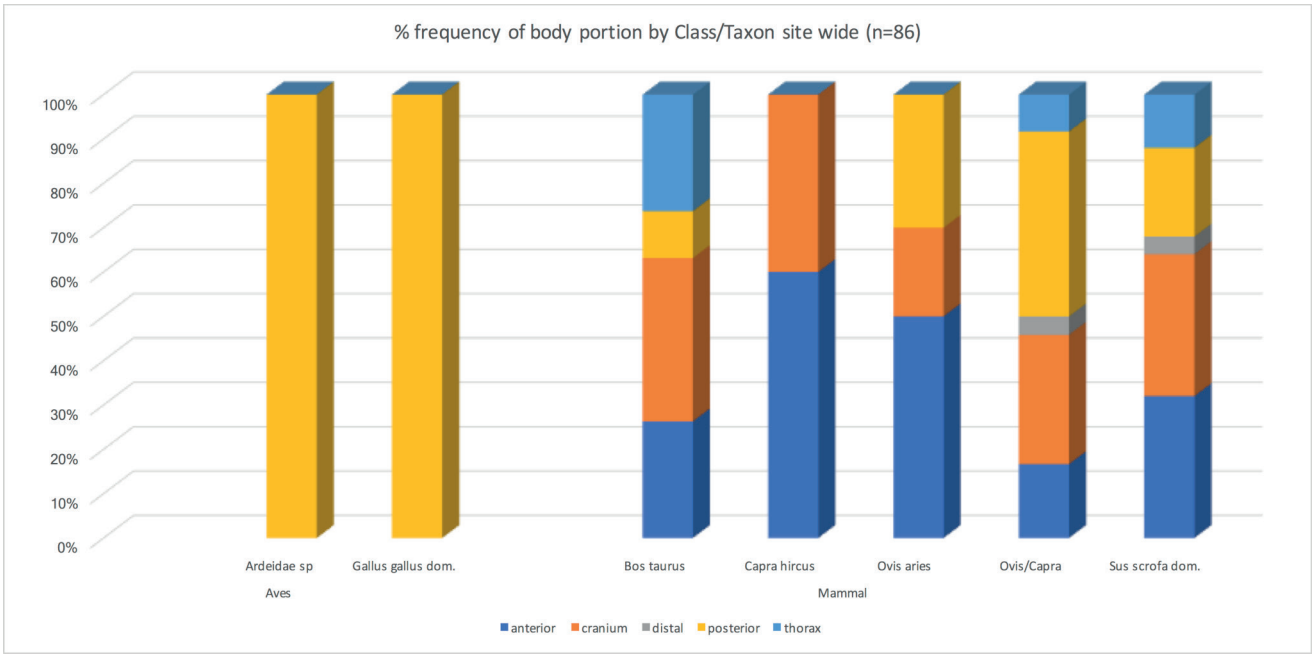

Fig. J2: Histogram of percentage frequencies of faunal specimens within identified buildings (n=137). Prepared by Tina Greenfield.

social inequality between consumers within a community[127] (**Fig. J2**).

J6.2 Age demographics

When all identifiable taxa are combined for analysing ageing data, it is clear that the majority of the individuals were slaughtered later in life, chiefly as subadults (1-3 years; 37 %) when they are in their prime of life and the meat is the most desirable, followed by the combined category of subadult/adult (28 %; **Table J7**). There is no evidence for very old individuals (senile), or neonates. However, juveniles and adults are equally represented, with 13 % frequencies of the total corpus each, and round out both ends of the spectrum when looking at age demographics of a settlement. The pattern suggests that the inhabitants were using a broad spectrum of exploitation strategies for food management and consumption.

Age	Sum of NISP	% of total NISP
adult	11	13 %
infant	2	2 %
juvenile	11	13 %
juvenile/subadult	7	8 %
subadult	32	37 %
subadult/adult	24	28 %
Grand total	**87**	**100 %**

Table J7: Sum of NISP and percentage frequencies of identified faunal remains from the 2015-2016 campaigns according age group.

J7. Architectural contexts

The integration of zooarchaeological data can help determine the activities practiced in architectural spaces, which in some cases may lead to the modification of room designations as previously suggested by architectural layout, installations, or other evidence. Furthermore, the integration of zooarchaeological data can enhance the spatial data in order to establish patterns of domestic, utilitarian, industrial or ritual behaviour within a single building or between different buildings at one site[128].

127 Albarella/Davis 1996; Arbuckle 2012a; 2012b; Crabtree 1990; Grant 2002; Greenfield 2014; Greenfield *et al.* 2013; Lev-Tov 2000; Reitz 1987; Stallibrass 2000.

128 See Greenfield *et al.* 2013, 2; Marom/Zuckerman 2012; Reitz/Wing 2008.

J7.1 Buildings

In order to understand potential differences in consumption, distribution and disposal patterns at Gird-i Bazar it is helpful to break down the faunal data according to their spatial distribution across the buildings of the site. From this, it is apparent that Buildings A and F have the highest frequencies of identifiable specimens, with Building A possessing the highest frequency within the total corpus (38 %). The second highest frequency of remains does not have a connection to a designated building. From within identifiable buildings, Building F has the second highest frequency of remains with 18 % of the assemblage, followed by Buildings B and D with each 3 % of the total corpus. Buildings E, G and H yielded very limited evidence, with one identifiable specimen each (**Table J8**).

Row labels	Sum of NISP	% of total NISP
Building A	87	38 %
Building B	7	3.05 %
Building D	8	3.49 %
Building E	1	0.44 %
Building F	42	18.34 %
Building G	1	0.44 %
Building H	1	0.44 %
External building areas (i.e., alleys and outdoor areas)	82	35.80 %
Grand total	**229**	**100 %**

Table J8: Sum of NISP and percentage frequencies of faunal remains from the 2015-2016 campaigns according to their building.

J7.2 Rooms within buildings

In order to analyse the proportions of specimens deriving from defined spaces it is necessary to use a smaller sample size. This lower sample size of n=137 is the result of removing all specimens from layers with modern contamination as well as from the Sasanian-period Grave 26 from the analyses. This sample size more accurately represents the percentage frequencies for the Iron Age contexts.

Although Building A has 63 % of the total corpus of specimens, a total of 61 % is represented from Room 1, followed by only 2 % in Room 3 from the same building. Building B has only 5 % of the total corpus frequency, and all of the specimens come from one subunit (Room 6). The second highest frequency of remains comes from Building F with 25 % of the corpus, and the specimens are spread between three rooms: Room 15 with 2 %, Room 22 with 12 % and Room 28 with 11 %. Building D has 6 % of the total frequency of specimens, and they all derive from Room 10. Buildings G and H only have a 1 % frequency of the corpus each, and only one room in each building has any remains: Room 16 and Room 17, respectively (**Table J9**; **Fig. J3**).

While the sample size is small, it is possible to determine that there are specific rooms where the specimens were deposited. They are not found evenly across the site. These data suggest that these specific rooms may have been reserved for either cooking, food preparation or consumption within the buildings.

Building / Room	Sum of NISP	% of total NISP
Building A	86	63%
Room 1	83	61%
Room 3	3	2%
Building B	7	5%
Room 6	7	5%
Building D	8	6%
Room 10	8	6%
Building F	34	25%
Room 15	3	2%
Room 22	16	12%
Room 28	15	11%
Building G	1	1%
Room 16	1	1%
Building H	1	1%
Room 17	1	1%
Grand total	**137**	**100%**

Table J9: Sum of NISP and percentage frequencies of faunal remains from the 2015-2016 campaigns according to their building and room numbers.

J8. Species preference and consumption patterns within architectural contexts

J8.1 Taxonomic diversity

When these faunal data are manipulated further to include species representation within each building and its constituent architectural spaces as well as within alleys, courtyards, and outdoor areas, it is possible to gain a deeper understanding of the economic behaviours associated with animal remains (**Table J10**; **Fig. J4**). The archi-

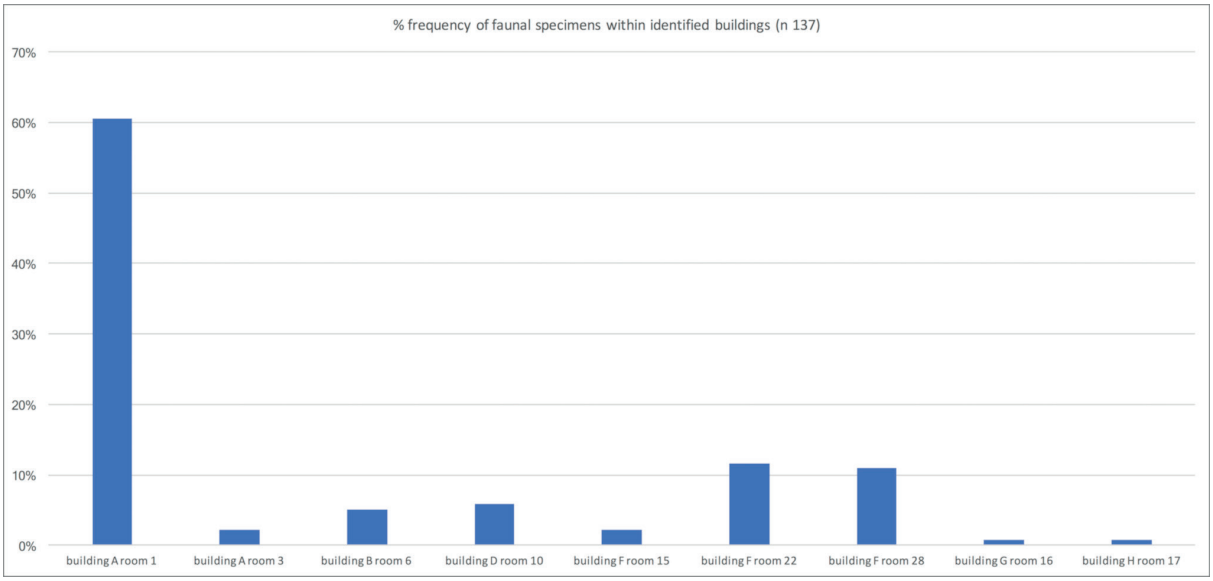

Fig. J3: Histogram of percentage frequencies of taxa within each space/building and room (n=83). Prepared by Tina Greenfield.

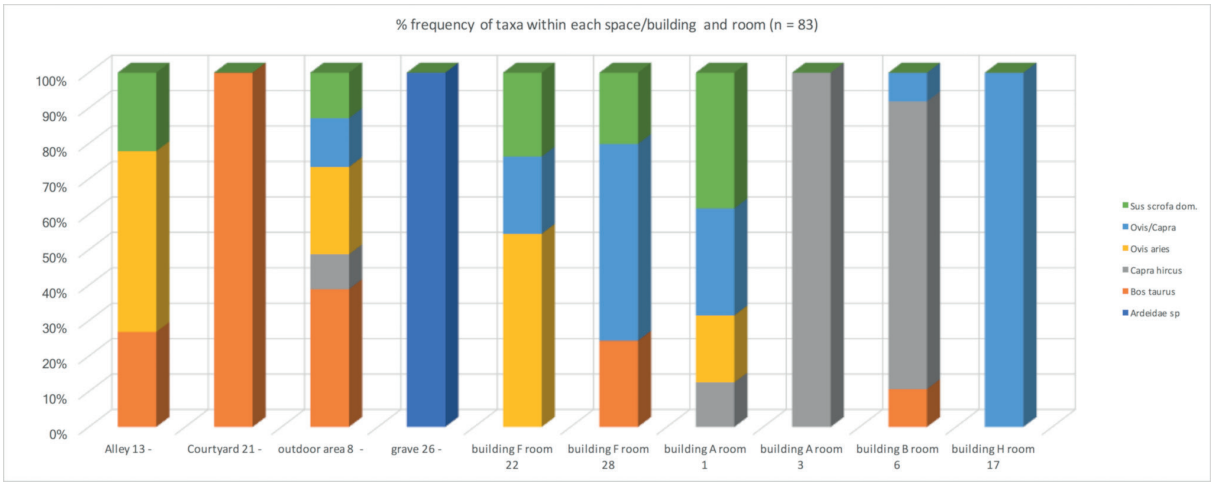

Fig. J4: Histogram of percentage frequencies of body portion per taxa within each space, building and room (n=66). Prepared by Tina Greenfield.

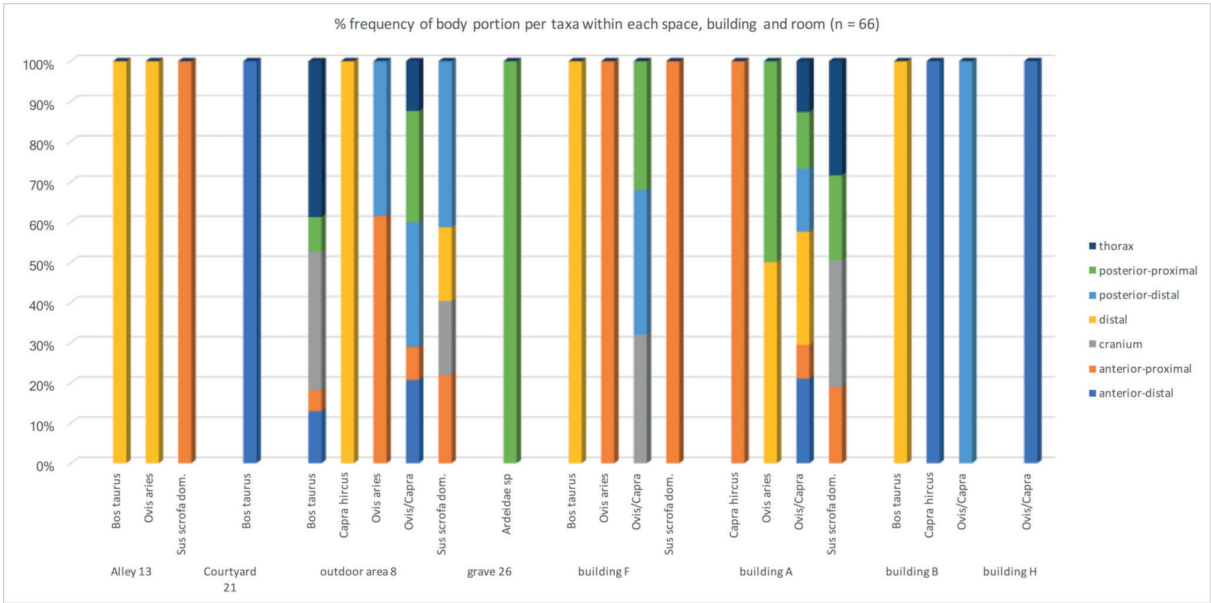

Fig. J5: Histogram of percentage frequencies of body portions by Class/Taxon, site-wide (n=86). Prepared by Tina Greenfield.

tectural units in the table and in the section are arranged from east to west, as in previous publications[129].

Space / taxa	Sum of NISP	% of total NISP
Building A	31	37 %
Room 1	30	36 %
Capra hircus	1	1 %
Ovis aries	3	4 %
Ovis/Capra	12	14 %
Sus scrofa dom.	14	17 %
Room 3	1	1 %
Capra hircus	1	1 %
Building B	4	5 %
Room 6	4	5 %
Bos taurus	1	1 %
Capra hircus	2	2 %
Ovis/Capra	1	1 %
Outdoor Area 8	34	41 %
Bos taurus	15	18 %
Capra hircus	1	1 %
Ovis aries	5	6 %
Ovis/Capra	7	8 %
Sus scrofa dom.	6	7 %
Alley 13	3	4 %
Bos taurus	1	1 %
Ovis aries	1	1 %
Sus scrofa dom.	1	1 %
Courtyard 21	1	1 %
Bos taurus	1	1 %
Building F	8	10 %
Room 22	3	4 %
Ovis aries	1	1 %
Ovis/Capra	1	1 %
Sus scrofa dom.	1	1 %
Room 28	5	6 %
Bos taurus	1	1 %
Ovis/Capra	3	4 %
Sus scrofa dom.	1	1 %
Building H	1	1 %
Room 17	1	1 %
Ovis/Capra	1	1 %
Grave 26 (Sasanian)	1	1 %
Ardeidae sp.	1	1 %
Grand total	**83**	**100 %**

Table J10: Sum of NISP and percentage frequencies of identifiable taxa from the 2015-2016 campaigns at Gird-i Bazar according to architectural context.

At a first glance, it appears that within the total corpus (n=83) there is taxon/species diversity between and within each category.

Ovis/Capra (including *Ovis aries* and *Capra hircus*) are present in varying degrees of frequency in some spaces and rooms but there is no evidence of these animals in Courtyard 21 or Building H. Like *Ovis/Capra*, *Sus scrofa* dom. is also not present in all buildings or spaces, with no evidence of the animal in Courtyard 21 or Building H.

Differing patterns of species frequencies and consumption patterns suggest that not all species are preferred within the designated spaces. This observation is clear when looking at the rooms within the buildings in particular. *Bos taurus* is present in all of the spaces and rooms, except for Building H. In Building F, while both *Ovis/Capra* and *Sus scrofa* dom. are present, *Bos taurus* is present only in Room 28, and not Room 22. In Building A, only Room 1 has a variety of taxa (*Ovis/Capra*, *Sus scrofa* dom.) present but *Bos taurus* is lacking while Room 3 has only one species present (*Capra hircus*). Conversely, Building B has *Bos taurus* and *Capra hircus*, but no evidence of *Sus scrofa* dom. or *Ovis aries*. Further differences occur with Room 17 in Building H where there is evidence for only *Ovis/Capra* without any other species present. Three areas have only one specimen per space (Courtyard 21: *Bos taurus*; Room 3: *Capra hircus*; Room 17: *Ovis/Capra*).

While all of these are from Iron Age contexts, note that the Sasanian-period Grave 26[130] has one species of bird (*Ardeidae sp.*) present.

J8.2 Body portion preferences

The various osteological elements of animals can be grouped into three categories based on value: high = highly desired portions of the body (heavy meat/fat bearing);

129 The same order followed in Kreppner *et al.* 2017; 2018a.

130 Downey 2018b.

medium = less desired portions of the body (moderate meat/fat); and low = the least desired portions of the body (very little meat/fat)[131] (**Table J11**).

In socially stratified societies, distinct groups have different and preferred access to each of these body categories. As a result, expectations can be generated for elite versus non-elite dietary markers. The division of the body along these lines is based on numerous zooarchaeological and ethnographic studies from across the globe[132].

Quality and value of body portion	Body portion	Elements included
High	Anterior-proximal (upper front limb)	scapula, humerus
	Posterior-Proximal (upper hind limb)	pelvis, femur, patella
Medium	Anterior-Distal (lower front limb)	radius, ulna
	Posterior-Distal (lower back limb)	tibia, fibula
	Thorax	vertebrae, sternum, clavicle, hyoid, ribs
Low	Cranial	mandible, maxilla
	Distal	metapodials, phalanges, sesamoids, carpals, tarsals

Table J11: The utility index of combined body portions and associated element categories for high-, medium-, and low-valued meat. Reproduced from Greenfield 2015, 18.

J8.2.1 Building A

There is less diversity for taxa in Building A than in other spaces at Gird-i Bazar. However, the meat portion variety is only second to Outdoor Area 8. There is no evidence of *Bos taurus* in this building. There is a variety of meat portions of Ovis aries and *Capra hircus* in this building, with the greatest frequency (even if just slightly) for high-value portions, followed by medium-value and then low-value elements. It is important to note, however, that a large pit was located in this building and the majority of the bones came from this context.

J8.2.2 Building B

There is a unique pattern of distribution within this building. Only *Bos taurus*, *Ovis aries* and *Capra hircus* are present. Each of the meat portions of *Ovis aries* and *Capra hircus* derives from either a medium-value or low-value part of the animal. *Bos taurus*, however, is only represented with low-value distal body portions, suggestive of discard behaviour rather than consumption.

J8.2.3 Outdoor Area 8

Outdoor Area 8 has produced the widest diversity of taxa: cattle, sheep, goat and pig are present. This space also has the most varied presence of body portions. There is little in the way of disposed distal ends of individuals, which would suggest this area was not originally used for disposal purposes. However, there is a large kiln located in this area, and the majority of the remains come from inside this installation.

Bos taurus has both high value and medium value body portions present, with a lack of low value elements. For *Ovis aries* and *Capra hircus*, there are no low value elements present in this space, with the exception of one distal element. The highest frequencies of body portions belong to the high value portions, followed by limb bones in general. In still lower frequencies, medium valued portions of cranium and thorax are present. These patterns suggest that desired cuts were consumed and the remains disposed of, specifically within the kiln.

Sus scrofa dom. shows a different pattern of consumption; similar frequencies can be observed for one high value portion (front upper limb), two medium value portions (cranium and back lower limb), and one low value portion (distal). This pattern suggests that the entire animal was consumed in the area, and not just selected body portions.

J8.2.4 Alley 13

Based on the meat portions present in Alley 13, it appears that this served as a discard area since only distal remains from *Bos taurus* and *Ovis aries* are present. However, one highly valued element is represented for *Sus scrofa* dom.

J8.2.5 Courtyard 21

Only one element was found from the anterior limb of *Bos taurus*, but this is a less desired portion than the proximal end of the limb.

131 Cf. Greenfield 2014; 2015.

132 Costin/Earle 1989; Crabtree 1990; Curet/Pestle 2010; Driver 2002; Grant 2002; Lapham 2002; Marom *et al.* 2009; Redding 2010; Zeder 1991.

J8.2.6 Building F

Unlike Outdoor Area 8, there is much less portion diversity present within the different taxa. The majority are high-value portions (upper portions of limbs), followed by medium-value portions (lower limbs and cranium) and then low-value distal ends.

Bos taurus is only represented with distal body portions, suggestive of discard behaviour rather than consumption. *Ovis aries* and *Capra hircus* have a greater frequency of limb bones with an emphasis on upper limbs, followed by medium-value elements. There is no evidence of low-value portions which suggests that for *Ovis aries* and *Capra hircus*, the consumption of body portions of higher value was preferred. *Sus scrofa* dom. is only represented by high-value body portions (upper front limb) suggestive of consumption practices rather than disposal.

J8.2.6 Building H

There is only a medium-value portion from the lower front limb of *Ovis/Capra* present.

J8.2.7 Grave 26 (Sasanian period)

Only one body portion is present in this deposit, which is a Sasanian-period burial[133]: an *Ardeidae sp.* (heron) represented by a high value element (upper front limb). It is possible that this unique and rare specimen was part of the grave goods for the individual buried in Grave 26.

J9. Preliminary conclusions

Domestic herded and non-herded mammals are by far the dominant source of food for Gird-i Bazar, with a general uniformity of taxonomic demographics: caprines are the most frequent taxa, followed by *Sus scrofa* dom. and *Bos taurus*. Nevertheless, there are clear differences across the site, within and between spaces, buildings and rooms.

We found very little evidence for the consumption of the entire animal within the spaces and buildings, as seen by consumption patterns linked to body portions. Aside from Outdoor Area 8, where an entire pig appears to have been processed and consumed, separate meat portions were brought into the architectural spaces, consumed and disposed of post-consumption. It is therefore possible that the processing (i.e. disarticulation) of the animals took place in Outdoor Area 8. However, it is important to remember that the large kiln in this area affects the interpretation of the space, as the recovered bones were mostly discarded in the kiln. Buildings G and H have produced only less desired meat portions (regardless of taxa), suggesting that these buildings might have housed individuals that consumed meat of a lesser quality. Conversely, Buildings A and F have produced higher-value meat portions that are furthermore suggestive of a preferential diet consisting of caprines and domestic pig.

Across Gird-i Bazar, *Bos taurus* is represented mostly by the lowest-value meat portions, followed by medium-value cuts, and finally a very small percentage of high-value portions. Equally, while there are low- and medium-value meat portions of *Ovis aries*, *Capra hircus* high-value portions appear in greater frequency. *Sus scrofa* dom. appears to have a variety of meat portions that change according to architectural context.

In conclusion, despite the small numbers of animal bones recovered from Gird-i Bazar during the 2015-2016 seasons, it is still possible to observe unique patterns of behaviour in relation to food distribution, consumption and disposal.

133 Downey 2018b.

K. An archaeomagnetic study on a kiln from Gird-i Bazar

Patrick Arneitz & Roman Leonhardt[134]

K1. Introduction

Archaeomagnetism deals with the investigation of the thermoremanent magnetization (TRM) acquired by archeological materials upon cooling from high temperatures[135]. The remanence is acquired parallel and proportional to the ambient magnetic field and, consequently, provides a record of the geomagnetic field for the last firing of an artifact.

For this study, the wall of a pottery kiln excavated in Gird-i Bazar in the Dinka Settlement Complex (DSC) was sampled for the purpose of archaeomagnetic dating. DSC was mainly occupied during the Iron Age (cf. **Fig. A4** for an overview of the ^{14}C dates available so far). Several recent archaeomagnetic studies focus on this period, which is associated with high geomagnetic field intensities termed as the "Levantine Iron Age Anomaly"[136]. Therefore, geomagnetic field components reconstructed from laboratory analyses of the kiln material can be compared to secular variation (SV) curves derived from well dated archaeomagnetic data yielding an archaeomagnetic age estimate. The sampling, experimental and dating procedures are presented in the following.

K2. Sampling and preparation

During the first excavations at Gird-i Bazar in 2015, a pottery kiln was found[137] and, following a suggestion of the geophysicist Jörg Fassbinder to the project director Karen Radner, a sample (**Fig. K1a**) was taken for the purpose of an archaeomagnetic study and subsequently transported to Vienna for analysis at the Zentralanstalt für Meteorologie und Geodynamik (ZAMG). At this point, it should be noted that additional independently oriented samples are generally necessary in order to provide very precise reconstructions of ancient geomagnetic field directions.

The kiln wall material was consolidated using Wacker Stone Strengthener OH[138] and then cut into cubes with 2 cm edge length (**Fig. K1b**) in the Laboratory Grubenhagen of the Leibniz Institute for Applied Geophysics (LIAG) in Einbeck (Germany). Cubes from "column" 5 are located in the innermost part of the wall with respect to the interior of the kiln (e.g., specimen GB100A1**5**), while "column" 1 is the outermost part (e.g., specimen GB100C1**1**). In the figures, columns 5 to 1 are depicted with colours red, orange, yellow, green, and blue. The position of the specimens is important because temperatures and, consequently, magnetic properties can change considerably within the wall as a function of the horizontal distance to the kiln interior[139].

K3. Magnetic measurements

Magnetic measurements have been carried out at the Conrad Observatory of the Zentralanstalt für Meteorologie und Geodynamik (ZAMG) in Vienna using the following instruments: AGICO JR-6A Dual Spinner Magnetometer, Bartington Instruments magnetic susceptibility meter, D-2000 AF Demagnetizer, MMTD24 Paleomagnetic Furnace, and PMC MicroMag 3900 Series VSM.

K4. Mineral magnetism

Temperature-dependent and field-dependent measurements have been conducted to analyse magnetic mineral composition, grain sizes and stability (**Fig. K2**). Variations of the Koenigsberger ratio Q with respect to specimen location can be useful in order to distinguish well-heated

134 Zentralanstalt für Meteorologie und Geodynamik (ZAMG), Vienna (Austria).

135 E.g., Pavón-Carrasco *et al.* 2015.

136 E.g., Shaar *et al.* 2017.

137 Stone 2016.

138 Schnepp *et al.* 2008.

139 E.g., Spassov/Hus 2006.

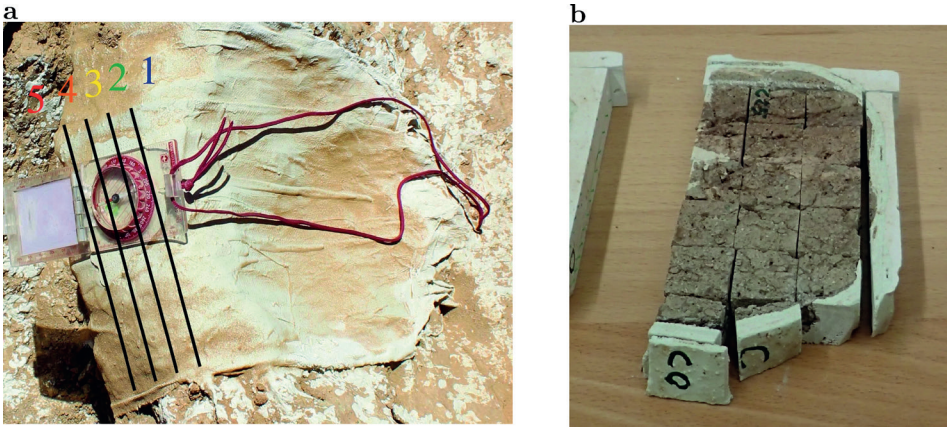

Fig. K1: (a) Sampled kiln wall. For magnetic measurements the sample was cut into cubes: cut columns are indicated by the lines ranging from the innermost (5) to the outermost part (1). (b) Prepared cubes in the laboratory. Photo by Adam Stone, annotated by Patrick Arneitz.

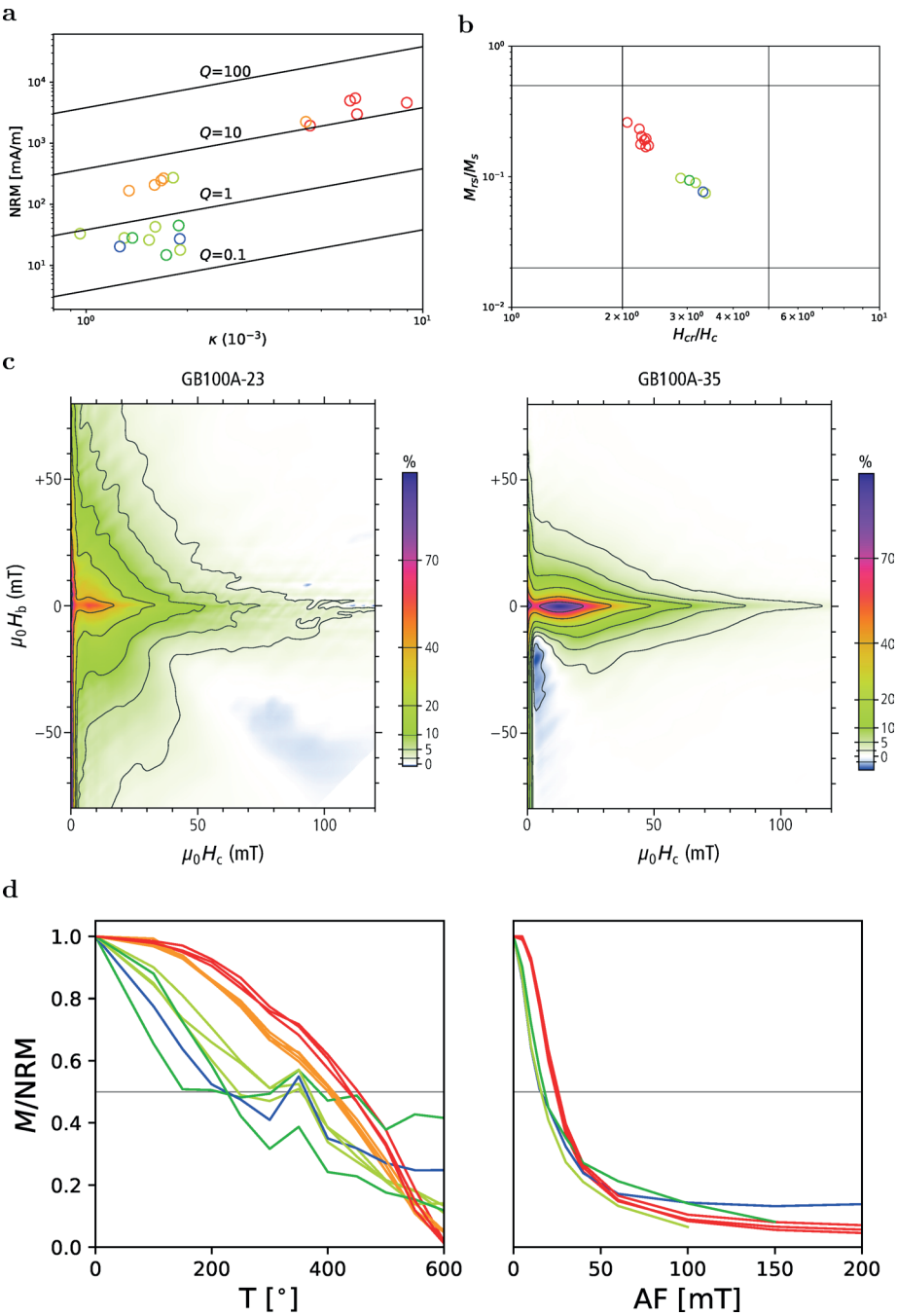

Fig. K2: (a) Magnetic susceptibility κ versus NRM intensity. (b) Day Diagram. (c) FORCs of specimens GB100A23 (left) and GB100A35 (right). (d) Thermal (left) and AF demagnetization behavior. (right). Colours in (a), (b) and (d) refer to the specimen position within the kiln wall (see text for details). Prepared by Patrick Arneitz.

specimens from those that were not sufficiently heated to maintain a stable remanence[140]. Innermost specimens within the kiln wall show highest Q ratios indicating stronger magnetic enhancement and potentially higher heating temperatures (**Fig. K2a**). Higher heating temperatures accompanied by the formation of finer grains in the past[141] are also indicated by the Day Diagram[142] for the innermost wall range (**Fig. K2b**). This observation is confirmed by first-order reversal curves (FORCs[143]) representatively carried out for two specimens: GB100A35 shows the signature of single domain (SD) particles, while GB100A23 yields results associated with more coarse-grained pseudo-single domain (PSD) minerals (**Fig. K2c**). Stepwise thermal and alternating field (AF) demagnetizations of the innermost specimens reveal almost complete loss of NRM for T≈580° and predominance of low coercivity minerals (**Fig. K2d**) indicating (titano)magnetite as primary remanence carriers.

In summary, mineral magnetic investigations indicate that the innermost part of the kiln wall (columns 4 and 5) is suitable for reliable geomagnetic field reconstructions. Specimens from this wall part are characterised by fine-grained remanence carriers, which is particularly important for successful archeointensity experiments.

K5. Field directions

Ancient field directions have been derived from 24 specimens located within wall columns 4 and 5 after thermal (n=7, additional 14 from intensity experiments) and AF demagnetizations (n = 3). Minor overprints were generally removed for temperatures higher than 150-250°. Stable characteristic remanent magnetization (ChRM) directions were determined with maximum angular deviations MAD<4° (**Fig. K3a**) using the principal component analysis[144]. Mean values of declination D=−8.1° and inclination I=53.0° with low angular dispersion α95=1.0° (**Fig. K3b**) were determined with Fisher statistics[145].

K6. Field intensity

Archeointesity (F) experiments based on a modified Thellier technique including pTRM, additivity and tail checks[146] were performed on 16 specimens. Specimens show different behavior in Arai plots depending on the position within the kiln wall: linearity up to high temperatures can be observed for specimens from column 5, while for those from column 4 curvature is detected (**Fig. K4**). For the latter, the lower temperature segment up to 460° was evaluated; two specimens (GB100E14, GB100E24) were rejected due to unstable directions.

Four selected specimens (GB100A14, GB10025, GB100C15 and GB100D24) were checked for anisotropic effects[147]. The determination of the tensor of anhysteretic remanent magnetization (ARM), which can be seen as an adequate substitute for thermal experiments[148], reveals low P values < 1.09 and, consequently, no corrections were necessary. The presence of SD particles, however, requires the correction for effects due to different cooling rates in nature and the laboratory[149]: two fast cooling runs (~25 minutes from 530° to 30°) and one slow run in between (~12.5 hours) have been performed. Repeated fast runs revealed an increase of magnetization capacity of investigated specimens. These effects account for 2-4 % of acquired magnetization and have been used as uncertainty estimates upon the extrapolation of cooling rate effects. A natural cooling rate of ~60 hours[150] was estimated yielding correction factors f_{CR} ranging from 1.08-1.17 (**Table K1**).

Finally, 11 specimens (3 specimens crumbled during cooling rate experiments) are used to calculate corrected intensity estimates $F_{cor}=F/f_{CR}$ with corresponding uncertainties given by error propagation. These estimates are used to calculate the weighted mean value of 58.7±4.9 μT.

K7. Archaeomagnetic dating

Measured field components F, D, and I are compared to reference curves for archaeomagnetic dating purposes. The uncertainty of the reconstructed field direction is higher than the given statistical estimate, because only one oriented wall sample was taken at the excavation. Therefore, an estimated error of 3°, which is the typical ac-

140 E.g., Schnepp *et al.* 2004.
141 E.g., Kostadinova-Avramova/Kovacheva 2013.
142 Day *et al.* 1977.
143 E.g., Egli 2013.
144 Kirschvink 1980.
145 Fisher 1953.
146 Leonhardt *et al.* 2003.
147 E.g., Veitch *et al.* 1984.
148 E.g., Tema 2009.
149 Leonhardt *et al.* 2006.
150 Schnepp *et al.* 2016.

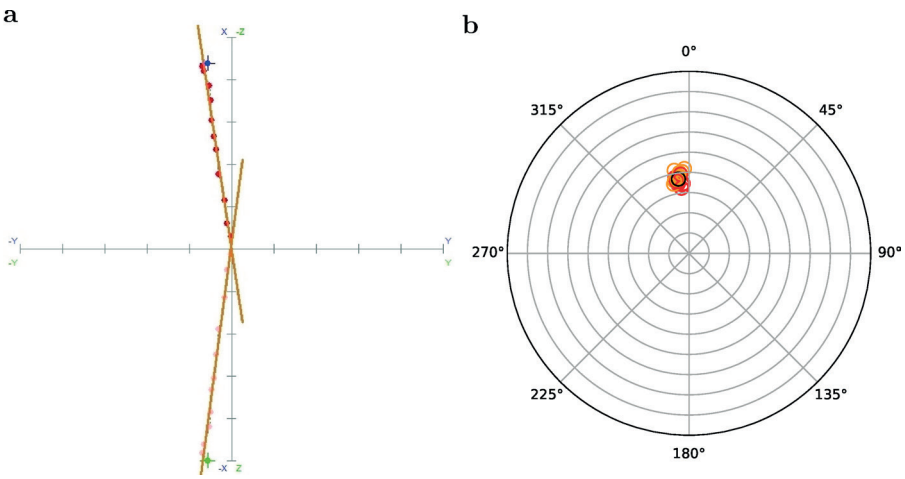

Fig. K3: (a) Typical Zijderveld diagram for specimen GB100C14. (b) ChRM of evaluated specimens. The mean value (D=−8.1°, I=53.0°, α_{95}=1.0°, k=860, n=24) is given by the black circle, while other colours refer to the specimen position within the kiln wall (see text for details). Prepared by Patrick Arneitz.

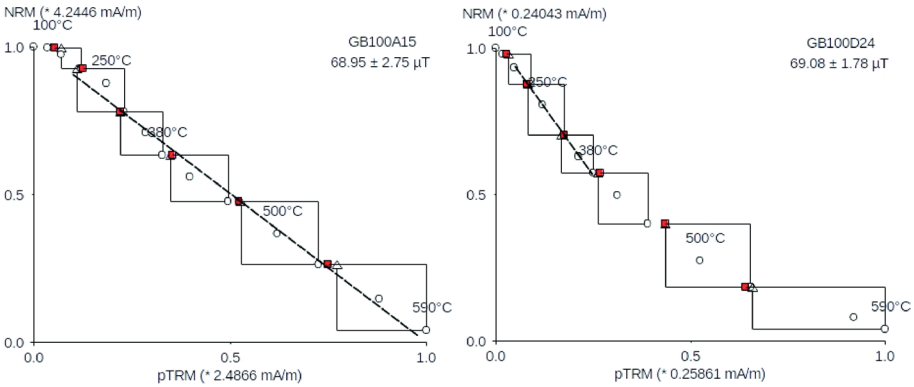

Fig. K4: Arai diagrams, evaluated with ThellierTool software (Leonhardt *et al.* 2004) for specimens GB100A15 (left) and GB100D24 (right), respectively. Prepared by Patrick Arneitz.

curacy of paleomagnetic orientation methods[151], was added to the α95 value. SV curves (**Fig. K5**) are derived from one global geomagnetic field model (BIGMUDI4k.1[152]) and one regional model generated with a Bayesian approach[153]. BIGMUDI4k.1 is mainly based on the HISTMAG database[154], while for the regional model very recent directional data[155] were additionally regarded (within a distance of 1,100 km to Gird-i Bazar).

The dating approach[156] is presented in **Fig. K6**. Most probable dated ages are younger than 500 BC for both models using the combined approach considering all three geomagnetic components. This contradicts the results of radiocarbon dating and the historical context suggesting that the last firing of the kiln was carried out during the reign of Shalmaneser III (r. 858-824 BC), when Gird-i Bazar may have been taken over by the Assyrian forces[157].

Several explanations for the differences obtained by the different dating approaches are conceivable. The measured I value of 53° strongly contradicts model predictions of >60° for the period around 1000 BC. In this context three aspects have to be considered: (i) the directional model curves are only based on few data sets, (ii) possible tilting of the *in situ* kiln wall remains cannot be excluded and (iii) the reconstructed field direction is not strongly reliable being based only on one sample. Neglecting the directional components (i.e., using only F) for archaeomagnetic dating yields various possible time intervals for the last firing of the kiln. This also includes ages between 843 and 750 BC (regional model), which would fall into the period of the Assyrian conquest.

K8. Conclusions

Archaeomagnetic investigations of the pottery kiln from Gird-i Bazar are presented in this study. Mineral magnetic experiments revealed fine-grained (titano)magnetite as primary remanence carriers providing an excellent basis for the reconstruction of ancient field direction and intensity. Archaeomagnetic measurements yielded stable ChRM directions and a cooling-rate-corrected intensity

151 Tauxe 2010.
152 Arneitz *et al.* 2019.
153 Lanos 2004; Schnepp *et al.* 2015.
154 Arneitz *et al.* 2017.
155 Shaar *et al.* 2018.
156 Lanos 2004.
157 Kreppner/Radner 2018.

value of 58.7 µT, which can be associated with the "Levantine Iron Age Anomaly".

Contradictions of archaeomagnetic and radiocarbon/historical dating approaches especially arise from differences of measured inclination, which is however based only on one oriented sample, and reference curves. In this context, tilting of the kiln wall after last firing is conceivable. Furthermore, new directional data sets from the Near East are necessary to better constrain SV curves for this region.

Name	**F** [µT]	**σF** [µT]	**T_{min}** [°]	**T_{max}** [°]	**N**	**f**	**g**	**q**	**f_{CR}**	**σf_{CR}**	**F_{cor}** [µT]	**σF_{cor}** [µT]
GB100A15	69	2,8	200	590	11	0,88	0,89	19,7	1,1	0,02	62,4	2,8
GB100A25	70,3	2,5	200	590	11	0,9	0,89	22,5	1,08	0,02	65,1	2,7
GB100B25	65,6	2,2	150	590	12	0,97	0,9	25,9	1,09	0,02	60,1	2,2
GB100C15	66,6	2,4	150	590	12	0,95	0,9	23,9	1,11	0,02	59,9	2,4
GB100C25	66,9	1,9	150	590	12	0,94	0,89	30,1	1,12	0,03	60	2,2
GB100D15	67,3	2,9	250	530	8	0,67	0,85	13,3	1,14	0,02	59,1	2,7
GB100A14	56,5	0,9	100	420	8	0,48	0,85	25,2	1,14	0,03	49,7	1,7
GB100B14	55	2,8	150	460	8	0,5	0,85	8,3	1,16	0,03	47,4	2,7
GB100B24	67	3,2	150	460	8	0,55	0,85	9,8	1,14	0,03	59	3,1
GB100B34	69,8	2	150	420	7	0,45	0,82	13,3	1,14	0,04	61,4	2,7
GB100D24	69,1	1,8	150	380	6	0,36	0,79	10,9	1,17	0,04	59	2,5
Weighted mean											58,7	4,9

Table K1: Results of intensity experiments (F, σF) evaluated within a certain temperature interval (T_{min}, T_{max}) over N successive points along with fraction of the NRM (f), the gap factor (g) and the quality factor (q). Cooling rate corrections (f_{CR}, σf_{CR}) are applied yielding final corrected intensity values (F_{cor}, σF_{cor}). Prepared by Patrick Arneitz.

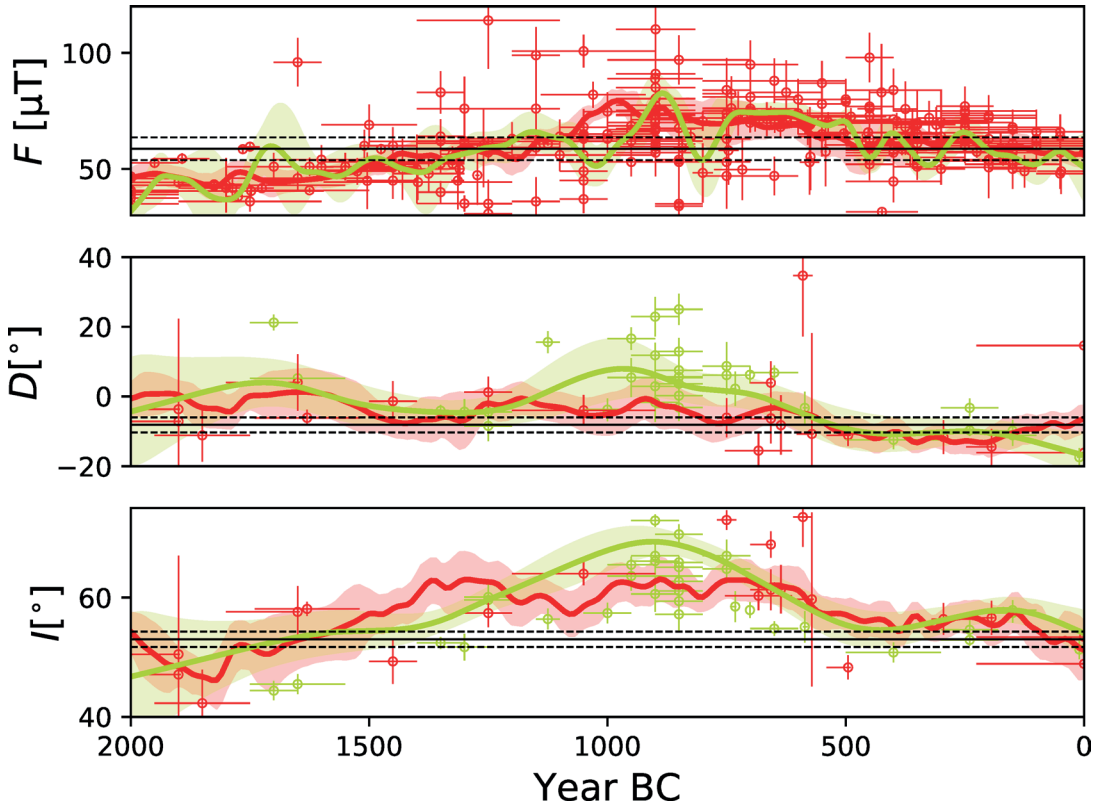

Fig. K5: Temporal evolution of F (top), D (middle), and I (bottom) within the period 2000 BC to 0 AD for the location of Gird-i Bazar (45.1° E, 36.1° N) predicted by global model BIGMUDI4k.1 (red curves) and a regional model (yellow curves). Red circles indicate input data for both modelling approaches, while for the regional curves additional directional data were used. Measured D, I, and F with uncertainties are given by solid and dashed black lines, respectively. Prepared by Patrick Arneitz.

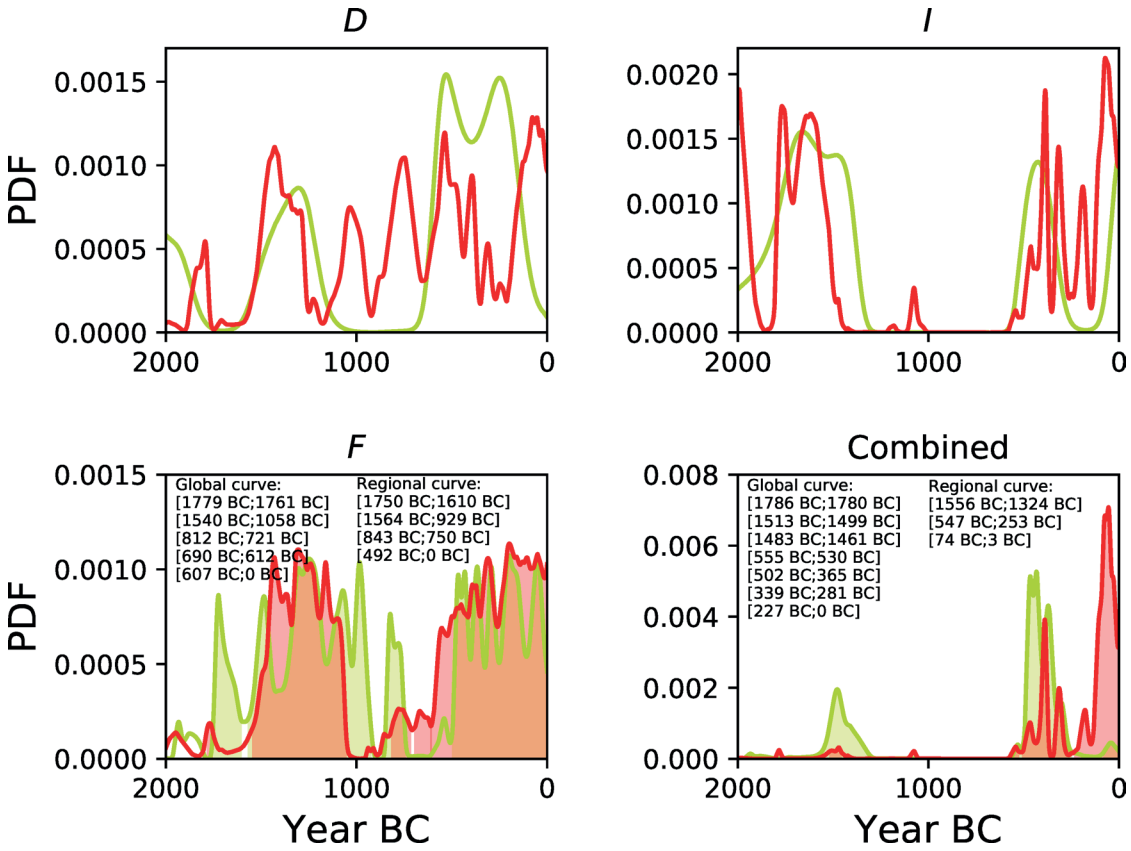

Fig. K6: Archeomagnetic dating: probability density functions are given for D, I, F as well as the combined age probability using all three components. Possible age intervals derived from global (red) and regional model curves (yellow) are given for the approach using only F (bottom left) and using all three field components (bottom right). Prepared by Patrick Arneitz.

L. Conclusions and perspectives

Karen Radner & F. Janoscha Kreppner

The 2018 excavations at the Dinka Settlement Complex (DSC) and the continuing geophysical survey and palaeo-environmental investigations have done much to further improve our understanding of the extended Iron Age settlement, and moreover brought to light significant new information also on other periods of the Bora Plain's long history, both much older (Late Chalcolithic 1-2; **§E4**; **§G1.5.2.2**) and much younger (Middle Islamic Period; **§G1.4.2**) than the Iron Age occupation on which our field research continues to focus.

The 2018 excavations took place in two different areas of DSC, one on the Upper Town (or citadel) of Qalat-i Dinka and one in the Lower Town in the Bora Plain. Both have provided us with important new insights for the overall understanding of the Dinka Settlement Complex, and therefore the excavations are being continued in both areas: in spring 2019, the Late Chalcolithic levels of DLT3 were further investigated (cf. **§E8**), and as we are writing these lines, preparations are underway for a further campaign at QID1 on Qalat-i Dinka in autumn 2019.

On the western slope of Qalat-i Dinka, the excavations in QID1, QID2 and QID3 (**§D**) revealed on the one hand the monumental Building P, occupied by elite inhabitants as suggested by the high quality and value of the finds encountered there, and on the other hand an elaborate fortification that once consisted of a high wooden palisade (of which the base survives) and a glacis that protected its more sensitive stretches.

In excavation area QID1 (**§D3.1**, **Figs. D3**, **D6-8**), further parts of Building P were uncovered, which had first been identified in 2016. Room 58 is bounded in the north, east and south by walls that are up to 1.60 m wide. These walls are therefore much wider than those observed in all buildings uncovered so far in the Lower Town: at Gird-i Bazar (retrospectively known as DLT1) and also in the three large Buildings K, L and M partially unearthed in 2017 in the excavation area DLT2, the walls have a width of only about 60 cm[158]. Nevertheless, the construction technique of Building P's walls, which consist of stone bases with a now lost mudbrick superstructure on top, corresponds to that used for the buildings in the Lower Town. The almost disproportionate thickness of the walls of Building P gives the architecture a fortress-like character. The floor is covered with fired bricks (many lost due to looting), which is therefore also much more elaborate than the rammed earth floors or the river pebble paving attested in the buildings of the Lower Town.

Characteristic features of Room 58 are the stone settings in front of the walls, which may have served as the lower parts for a pilaster-like wall design or else as the substructure for some type of furniture (e.g., benches, shelving). Overall, the architecture gives the impression of representing a local architectural tradition, which is more elaborate here than in the Lower Town but still shares the same core characteristics. On the other hand, specific architectural elements that are typical for the Assyrian heartland have not yet been identified.

The finds so far consist of types of ceramics (**§G1.3**) as they are already well-known from Gird-i Bazar and elsewhere in the Lower Town of DSC. Again, typical Assyrian forms and wares such as bowls with everted and thickened rims or dimpled beakers of the so-called Palace Ware are not attested. The ceramic material from Building 58 thus demonstrates that its inhabitants used the same clay vessels of local production and tradition as the people occupying the houses in the Lower Town. Other objects found, however, bear testimony to the refined tastes shared by elites across the influence sphere of the Assyrian Empire and beyond: attested are luxury items such as ivory inlays (**§H1.1.1**), presumably for elaborate pieces of wooden furniture, beads made of the synthetic copper-based material Egyptian Blue (**§H1.1.5**) and sintered-quartz ceramic objects ("Egyptian faience") painted with the synthetic pigment Naples Yellow (**§G3**). Nevertheless, the material culture uncovered so far in Building P can be characterised as an expression of the close connection its inhabitants shared with the greater Zagros region.

Although we can already state with certainty that Building P is a very substantial structure it is not yet possible to reconstruct its ground plan or assess its overall extent and spatial organisation. Further work on Building P will be undertaken in September and October 2019, for

158 Radner/Kreppner/Squitieri 2018.

which Andrea Squitieri has secured additional funding from the Gerda Henkel Foundation.

Further down on the western slope of Qalat-i Dinka, a linear anomaly suggestive of some type of fortification structure was clearly discernible in the magnetogram of the 2015 geophysical survey (**Fig. D2**). Its investigation in 2018 demonstrated that this structure was indeed defensive and protective in character and that it consisted of two components. The northern section of the fortification line runs in relatively straight fashion from northeast to southwest. We placed the excavation area QiD2 in this section (**§D4**; **Fig. D29**), and a glacis-like stone structure came to light, which rises 2 m in height over a length of 7 m in eastern direction. Near its highest point, a narrow depression runs parallel to the course of the glacis, and we interpret this as the location of the now lost wooden palisade. To the east, there is a thick package of floors, created one on top of the other during the use of this open space over time, a series of walking surfaces that are characterized by their high number of pebbles.

Where the linear anomaly in the magnetogram turns to the south (**Fig. D2**) we investigated the structure in the excavation area QID3 (**§D5**; **Figs. D37-38**) and encountered a rather different archaeological record there. What remains of the fortification structure here is constructed of stones and dark brown earth in a manner that is very different from the orderly construction of the stone bases of the walls encountered so far in the Dinka Settlement Complex. The stones were not laid in a masonry bond, but embedded rather loosely in the earth material. As can be clearly seen in the sections, the earth and stones have been piled up to form a sort of rampart, with floor horizons abutting on either side (**Fig. D39**). On this structure's eastern side, a thick deposit represents a multitude of walking surfaces, one over the other, indicating that the open space inside the defensive line was used much more than its equivalent on the outer side. In this section of the fortification structure, there is no glacis on the outside; instead, a simple pebble floor abuts the feature horizontally.

Even if nothing of the construction of the superstructure has survived, we confidently reconstruct it as a high wooden palisade on top of the stone-earth structure. The two door sockets made from enormous river cobbles with a diameter of 1 m each, found on the surface in 2015[159], give an indication of the substantial height of the two-leaved gate and hence the palisade that it once traversed.

However, our hypothesis – formed on the basis of the results of geophysical prospection – that this gate might have been located in the excavation area QID3 has not been confirmed. We now know that the gap in the linear anomaly in this area results from the fact that the stone-earth structure is not preserved here. The remains of the building are very close to the recent surface, and ploughing in modern times will have caused the structure to be gradually shaved off.

A comparison of the magnetogram **Fig. D2** with our findings from the excavation areas QID2 and QID3 shows that the bright area east of the fortification line on the magnetogram represents a large outdoor area, of whose floor small sections were detected in both areas.

Two charcoal samples collected from QID1 and QID3, respectively, produced probable ^{14}C date ranges of the same broad Iron Age horizon as evidenced by the radiocarbon date ranges derived from samples taken in the Lower Town at Gird-i Bazar and DLT2 (from 1215 to 816 calBC; **§D2.1**). The first sample from QID1 was collected from the floor of Building P (PPP 181909:038:049: 1001-891 calBC; 85.9 % probability: **Fig. D5a**) and the second sample from the outdoor area inside the fortification structure in QID3 (PPP 176905:031:005: 1043-893 calBC; 91.8 % probability: **Fig. D5b**). This evidence for the contemporaneity of the occupation of all these areas in the settlement leads to the additional new and important conclusion that during this period, the Dinka Settlement Complex consisted of a fortified Upper Town and an exposed Lower Town: already last year's magnetometer prospection has demonstrated that the Lower Town was not protected by any kind of enclosure[160].

Based on the distribution of the surface pottery[161], the size of the Dinka Settlement Complex is estimated at approximately 60 hectares. In the Lower Town, we first unearthed a quarter of small and irregularly built residential buildings with integrated workshops and several centrally located pottery kilns, connected by an orderly system of alleyways and open spaces, in the excavation area Gird-i Bazar (or DLT1)[162]. In our second Lower Town excavation area DLT2, on the other hand, we encountered very different architecture. The building ensemble of three large houses in a relatively isolated, separate location was first detected in the 2016 magnetogram and subsequently partially excavated in a 2017 test sounding. Due to the considerable size of their rooms and the voluminous storage vessels found therein, the three large buildings of DLT2

159 Found nearby on the surface in 2015 by Karen Radner and F. Janoscha Kreppner: Fassbinder/Ašandulesei 2016, 42 Fig. B4.7a-b.

160 Fassbinder *et al.* 2018, 23.

161 Giraud 2016, 31-33.

162 Radner/Kreppner/Squitieri 2018.

may have been used as storage facilities, perhaps fulfilling centralised administrative functions for the entire Lower Town, or even all of DSC. Despite the very obvious functional differences between these three quarters of the settlement, in terms of material culture and especially the ceramic inventories (cf. **§G1),** the findings of the excavation area QID1-3 on Qalat-i Dinka as well as Gird-i Bazar and DLT2 in the Lower Town produce an impressively homogeneous picture for the period of the early Iron Age, as represented by the ^{14}C data. The construction of all buildings conforms to the same principles, with differences in size and execution reflecting the buildings' diverging functions.

The excavations in DLT3 were aimed at investigating continuities and discontinuities that might have resulted from the annexation of the Bora Plain and the Dinka Settlement Complex into the Assyrian Empire at the time when the Border March of the Palace Herald was established sometime in the second half of the 9th century BC. The area seemed ideally suited for this purpose as radiocarbon analysis of a charcoal sample recovered in 2015 from the section of the geoarchaeological trench GA42 had produced a probable date range of 830-789 calBC (95.4 % probability)[163], indicating that the charcoal originated from a context that certainly dated to the time when the region was part of the Assyrian provincial system.

In order to provide an architectural context for this radiocarbon sample, an excavation area of 80 m² was opened up around the former geoarchaeological trench in autumn 2018, designated as DLT3 (**§E**) and located about 150 m south of DLT2. Our work brought to light rooms constructed in the typical cobblestone architecture that is well known to us from elsewhere in the Lower Town as well as the distinctive, locally made pottery that we had first encountered at Gird-i Bazar. However, in contrast to the other Lower Town excavations, we observed two different construction phases as parts of Building S were covered by Building Q in the later phase. Building R, on the other hand, remained unchanged and was continuously in use throughout the existence of both Building S and Building Q.

In a deposit of the later occupation phase, a fragment of a fired mudbrick with a cuneiform inscription (inscribed, not stamped) was found in a secondary position (**§I**). The one sign that survives of this cuneiform inscription nevertheless identifies the text as a Neo-Assyrian composition, as the title "king of the universe" is used; checking all known brick inscriptions of the Assyrian Empire indicates that due to parallel compositions, it is Shalmaneser III (r. 859-824 BC) who is the most likely ruler to be responsible for the text. Coincidentally, it is during this king's reign that the Peshdar Plain was integrated into the provincial holdings of the Assyrian Empire. While the fragmentary brick thus clearly reflects the Assyrian presence in the Dinka Settlement Complex, there is no suggestion that a royally commissioned building featuring such inscribed bricks would have been constructed in the area of DLT3. A more likely hypothesis is that the brick fragment would have originated from some other place in DLC, perhaps on the Upper Town where many burnt brick fragments are visible on the surface of Qalat-i Dinka's slopes, presumably due to erosion.

In terms of architecture and ceramics, the material culture of both construction phases attested in the excavation area DLT3 corresponds to the findings known from the other operations, especially Gird-i Bazar. As the botanical remains recovered during the autumn campaign still await processing we do not yet have any additional radiocarbon dates from carbonised seeds and therefore cannot say much about the date of DLT3's older building phase. For the time being, we assume that the area was built up at some point before the foundation of the Border March of the Palace Herald under Shalmaneser III of Assyria (r. 858-824 BC) and that it continued to be inhabited into the 8th century BC (and presumably later). So far, the material culture brought to light in this excavation area lacks any obvious Assyrian influence (for the pottery: **§G1**) and instead seems comfortably rooted in the local traditions of the Zagros. Thus, whatever form processes of "Assyrianisation" might have taken at the Dinka Settlement Complex clearly differed from scenarios as they have been reconstructed for example for the Upper Tigris region[164].

Three radiocarbon samples from Qalat-i Dinka (PPP 181908:018:016; **§D2.1**; **Fig. D5c**) and Gird-i Bazar (PPP 268932:042:001 and PPP 268931:041:012[165]) show that settling activity in these two areas probably dates back to as early as the period that is commonly labelled "Iron Age I" (c. 1250-1050 BC) in the chronology of northwestern Iran[166]. However, our knowledge about this period at the Dinka Settlement Complex is still limited and neither stratigraphic sequences nor changes in the pottery production can be isolated. So far, DSC can be best reconstructed for the period designated as "Iron Age II" (c. 1050-800 BC) in the chronology of northwestern Iran, a timespan to which nine of our analysed ^{14}C samples have

163 Altaweel/Marsh 2016, 28 Fig. B2.7.

164 E.g., Parker 2001.

165 Kreppner/Radner 2018.

166 Danti/Cifarelli 2013.

been dated[167]. All settlement areas in which excavations were undertaken so far were very likely inhabited during a common Main Occupation Phase.

In October 2018, we also continued to excavate the accumulation of human remains in a well in Building I in Gird-i Bazar, first identified in 2017. For the moment, six individuals have been recovered: a female aged 40-55+ years; a 36-38 week-old fetus; a female aged 24-35 years; a male aged 40+ years; a juvenile; and another adult[168]. These results are very important for our understanding of the end of the Iron Age occupation of the Dinka Settlement Complex, as the radiocarbon analysis of a bone from one of the 2017 skeletons yielded a probable date range of 748-409 calBC (95.4 % probability)[169] and therefore the latest Iron Age dating currently available for the site, suggesting that the bodies were deposited at a time when the settlement was abandoned for good. The excavation work must proceed at a very slow pace as the well has to be dismantled from the outside in order to reach the human remains in the narrow well shaft, and these are very fragile. Although the excavations at Gird-i Bazar have been otherwise completed we intend to continue the investigation inside the well in order to recover all human remains.

As ever, the newest excavation results gave us cause to rethink, adapt and modify our preliminary interpretations. We now assume that the Dinka Settlement Complex was populated to its fullest extent already well before the Border March of the Palace Herold was founded in the wider region during the reign of Shalmaneser III of Assyria (r. 858-824 BC). However, in the course of the 8th and 7th centuries BC ("Iron Age III" according to the chronology of northwestern Iran), the settlement started to fade as not all of its areas seem to have been inhabited anymore if the probable radiocarbon date ranges available from some buildings can be understood to reflect their end-of-use dates. Nevertheless, there is evidence including the Neo-Assyrian cuneiform tablet dated to 725 BC (found by a farmer during agricultural work on Qalat-i Dinka[170]), the newly discovered baked brick fragment with a partial Neo-Assyrian cuneiform inscription (**§I**) as well as ^{14}C dates from the area of DLT3[171] and from the well of Building I in Gird-i Bazar[172] that show that certain areas of the Dinka Settlement Complex remained inhabited and/or at least occasionally used.

Finally, the generally good state of preservation and especially the excellent archaeological accessibility directly below the surface make the Dinka Settlement Complex a key site for further investigation of the Iron Age in the Zagros mountains of northeastern Iraq and northwestern Iran. We are looking forward to further explore DSC and the Bora Plain.

167 Gird-i Bazar: PPP 271929:042:004, PPP 268932:052:002, PPP 271927:014:008, PPP 268931:032:017, PPP 272927:020:017; cf. Kreppner/Radner 2018. DLT2: two samples from PPP 235934:003:001 (MAMS 34635 and MAMS 34636); cf. Radner 2018. QID1: PPP 181909:038:049, cf. **§D2.1**. QID3: PPP 176905:031:005, cf. **§D2.1**.

168 According to Downey 2018a, 98 and **§F2**.

169 Kreppner/Radner 2018, 56-57, Table D1: no. 8 and Fig. D5: d. Note that the long date range reflects the so-called Hallstatt Plateau, the flat area in the radiocarbon graph between c. 800-400 BC which hinders more precise dating.

170 Radner 2016.

171 UGAMS-23561; cf. Altaweel/Marsh 2016.

172 PPP 267930:037:004; cf. Kreppner/Radner 2018.

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