



REPORT ON THE THIRD SEASON OF EXCAVATIONS AT GIRDI QALA AND LOGARDAN

RÉGIS VALLET

EDITOR

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INSTITUT FRANCAIS DU PROCHE-ORIENT (I.F.P.O.)
UMIFRE 6



The site of Logardan, from the west. In the forefront, the Tchachma Spi river (2017).

DIRECTORATE OF ANTIQUITIES OF SULEYMANIAH
GENERAL DIRECTORATE OF ANTIQUITIES OF KURDISTAN REGIONAL GOVERNMENT

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TABLE OF CONTENTS

INTRODUCTION	
<i>Régis Vallet</i>	5
LOGARDAN TRENCH D: STRATIGRAPHY AND ARCHITECTURE	
<i>Johnny Samuele Baldi, Hugo Naccaro and François Bridey</i>	17
LOGARDAN TRENCH E: STRATIGRAPHY AND ARCHITECTURE	
<i>Martin Sauvage, Melania Zingarello, Sidonia Obreja and Hawkar Ahmed Abdulrahman</i>	41
CHALCOLITHIC CERAMICS FROM LOGARDAN TRENCHES D AND E: MORPHO-STYLISTIC FEATURES AND REGIONAL PARALLELS	
<i>Johnny Samuele Baldi</i>	57
BRONZE AGE POTTERY FROM LOGARDAN: PRELIMINARY RESULTS FROM THE THIRD EXCAVATIONS CAMPAIGN	
<i>Melania Zingarello</i>	67
GIRDI QALA, STRATIGRAPHIC TRENCH B	
<i>Laurent Colonna d'Istria, Alisée Devillers, Claudia Venier and Mustafa Ahmad</i>	81
GIRDI QALA NORTH, TRENCH D: STRATIGRAPHY AND ARCHITECTURE	
<i>Clélia Paladre, Régis Vallet, Alain Gaulon, Kamal Rahoof and Rateb al Debs</i>	89
CHALCOLITHIC CERAMICS FROM GIRDI QALA TRENCH D (NORTH MOUND): MORPHO-STYLISTIC FEATURES AND REGIONAL PARALLELS	
<i>Johnny Samuele Baldi</i>	103
TWO STAMP SEALS FROM GIRDI QALA AND LOGARDAN	
<i>Clélia Paladre</i>	111
BIBLIOGRAPHY	115
APPENDIX A: TOPOGRAPHICAL REPORT	
<i>Micheline Kurdy</i>	127
APPENDIX B: AERIAL MAPPING AND MODELING OF GIRDI QALA AND LOGARDAN	
<i>Vincent Tournadre</i>	131
APPENDIX C: FINDINGS LIST: SMALL OBJECTS AND POTTERY	135



INTRODUCTION

Régis Vallet

The third campaign of the archaeological mission to Girdi Qala and Logardan (fig. 1) lasted from 16 September to 12 October, 2017, through four weeks of field-work. The team, under the direction of Régis Vallet (IFPO-CNRS), gathered 18 researchers and engineers from France, Belgium, Italy, Syria and Iraq (by alphabetic order): Hawkar Ahmed Abdullrahman (Salahaddin University, Arbil, archaeologist), Rateb al Debs (archaeologist), Johnny Samuele Baldi (IFPO, archaeologist and ceramologist), François Bridey (Musée du Louvre, archaeologist), Victoria de Casteja (CNRS, database expert),

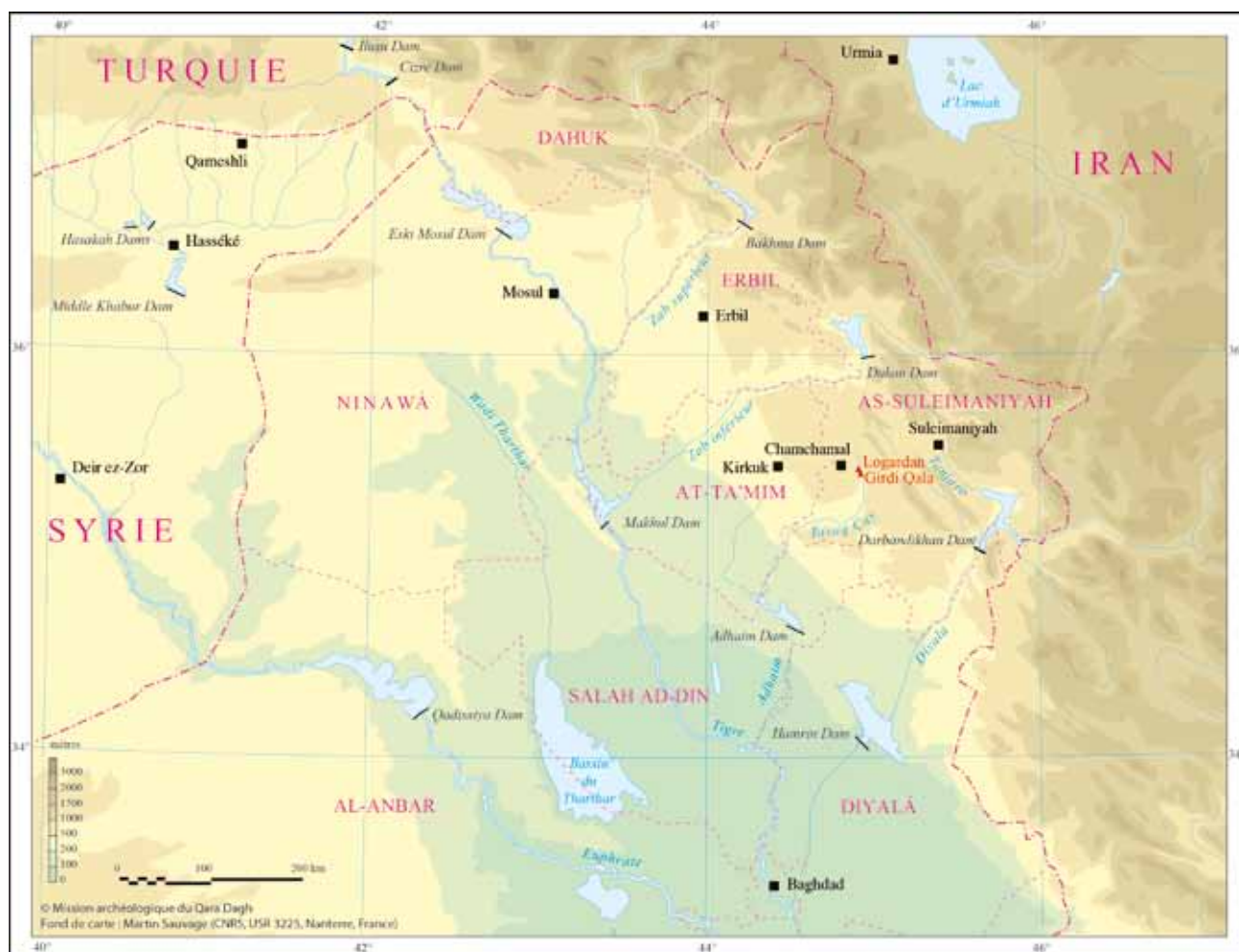


Fig. 1 - Map of Northern Iraq showing the localization of the sites.

Laurent Colonna d'Istria (University of Liège, epigrapher and archaeologist), Alisée Devil-
 lers (University of Liège, archaeologist), Alain Gaulon (archaeologist), Micheline Kurdy
 (architect), Hugo Naccaro (University of Paris 1, archaeologist), Sidonia Obreja (Univer-
 sity of Paris 1, archaeologist), Clélia Paladre (University of Paris 1, archaeologist), Nariman
 Khana Rahim (Salaheddin University, Arbil, archaeologist), Kamal Rahoof (Directorate of
 Antiquities of Sulaymaniah, archaeologist), Martin Sauvage (CNRS, archaeologist), Claudia
 Venier (University of Liège, archaeologist), Lorvan Walika (drawer) and Melania Zingarello
 (University of Strasbourg, archaeologist and ceramologist) (fig. 2). Mustafa Ahmad (Univer-
 sity of Lyon 2, archaeologist and ceramologist) studied the pottery from Girdi Qala Trench
 B and Vincent Tournadre (ICONEM) joined us later on to start the aerial mapping and



Fig. 2 - Part of the 2017 team, at Logardan Trench E.

modelling of the sites and their surroundings (appendix B). The logistic team was composed by Garmian Ruzgar Fatah and Jaza Kader (site guards), Hallo Wasie Karim (cook), Faizulla Abdullah Muhammad, Muhammad Tahir and Kamal Jalal Muhammed (drivers) and Jamal Jalal Muhammad, steward of the expedition and keeper of our storage (fig. 3). The whole team was accommodated in the city of Chamchamal, close to the sites, few kilometres to the south-east¹.

1. Needless to say that nothing would have been possible without the assistance of the 22 fine workers that worked with us. We are very grateful to the authorities of Shorsh and Chemchemal for their friendly welcome and efficient help. We wish to express our warmest thanks to Kamal Rashid, director of the Department of Antiquities and Heritage of Suleymaniah, for his constant support, greatly appreciated by all of us. The project is sponsored by the Excavations Committee of the French Ministry of Foreign Affairs (MEAE), the IFPO and the cultural service of the french embassy in Iraq, the University of Liège (Belgium), the University of Paris 1 and the CNRS.



Fig. 3 - Kak Jamal Jalal Muhammad, steward of the expedition.

Excavations on the sites of Girdi Qala and Logardan started in fall 2015, after two brief surveys in 2014 and 2015. The scientific purpose of the project is to study the formation of complex societies, the appearance of territorial polities and long-term intercultural processes. Indeed, despite recent developments (Kopaniias and MacGinnis 2016), southern Kurdistan remains poorly documented. The project is more specifically focused on the Chalcolithic, following on from our previous work at both ends of the Fertile Crescent, at Tell el 'Oueili in southern Iraq and Tell Feres in northern Syria, and on the Bronze Age, two periods for which the redefinition of cultures on a regional basis is a major issue. The main goal of the first campaigns was to begin to establish the sequence of the sites, by excavating well-preserved in situ levels.

In 2016, beside a the long-term stratigraphic Trench B in Girdi Qala, we had opened three new trenches, after geophysics and archaeological surveys : Trench D on the north mound of Girdi Qala, and Trenches D and E at the top of Logardan, respectively at the north edge of the summit and on the upper terrace of the site. The promising results collected in the four trenches (see our 2016 report) led us to continue and enlarge the same operations in 2017.

At Girdi Qala Trench B, at the top of the southern slope of the main mound (15m) of the site (Fig. 4)², work focused on level 6, now entirely cleared at the bottom of the trench,



Fig. 4 - Aerial view of Girdi Qala.

2. For a physical description of the two close sites (2.5 km away) and their natural settings, see our 2015 report.

2.4m below the surface, after removal of the heavily disturbed (by later pits) remains of level 5, a multi-phased Sasanian house provided with some kind of a forecourt (Laurent Colonna d'Istria, Alisée Devillers, Claudia Venier and Mustafa Ahmad). Level 6 below (Fig. 5),

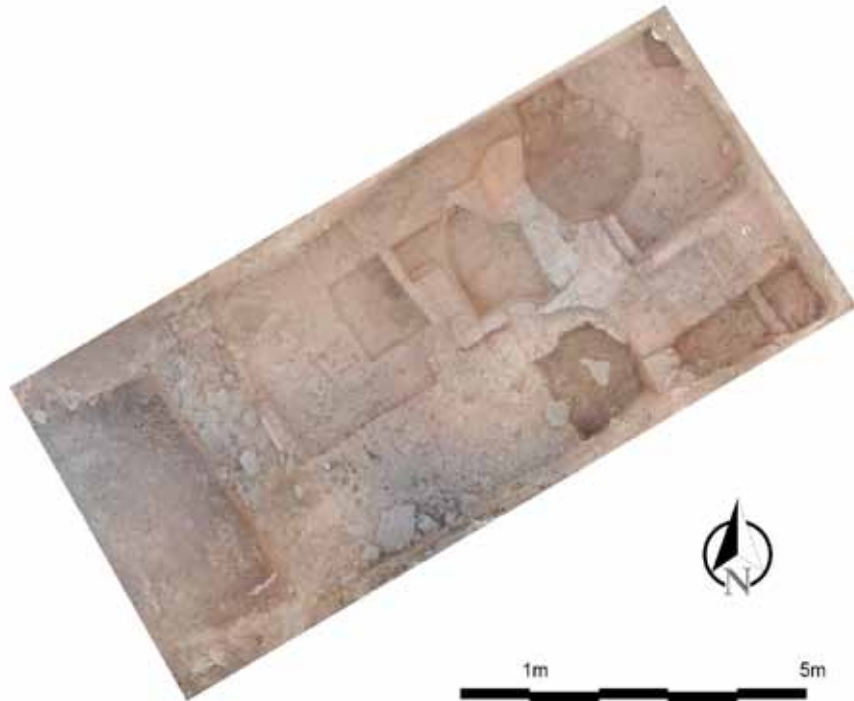


Fig. 5 - Orthostatic view of Girdi Qala Trench B.

contains a monumental Hellenistic building, with strong mudbrick walls (up to 1.8m wide), preserved on more than 1m height, coated by several layers of fine plaster (Fig. 6). The building has indeed a long history, and displays a final phase of occupation by some kind of squatters (level 6A). The material yielded dates to the beginning of the Hellenistic period (with a



Fig. 6 - Girdi Qala Trench B: Alisée Devillers (right) and Claudia Venier (left) surveying the Hellenistic building of Level 6.

piece of motif existing since the Achaemenid period -Mustafa Ahmad). Because of the obvious interest of this official building, we plan to enlarge Trench B next year, in order to excavate level 6 more extensively.

On the North Mound of Girdi Qala, we know since 2016 that most of its surface is occupied by a small Uruk colony (see our 2016 report) that Trench D, on the northern slope of this low mound, has begun to explore. Five levels of domestic architecture were already known. In 2017, the trench was lengthened of four new squares, reaching a total length of 30m (Fig. 7). This allowed us to recognize about ten successive levels of occupation, all of



Fig. 7 - Orthostatic view of Girdi Qala Trench D.



Fig. 8 - Girdi Qala Trench D: Level 6 appeared just under the stone and sherd floor of level 5 (on the right, Rateb al Debs).

them dating back to the Middle Uruk period (Clélia Paladre, Régis Vallet, Alain Gaulon, Kamal Rahoof and Rateb al Debs).

Level 2 is represented by small constructions, maybe tripartite in plan, which we planned to clear more extensively but that turned out disappointing, disappearing quickly in the ploughing. Level 3 contains a large building, with stone foundations up to 1.2 m in width. The building was provided with pottery pipes (similar to those found in the Late Uruk colonies) to drain wastewaters and some clay cones were found in the associated layers. It was severely levelled and followed by a period of abandonment (level 2B), not of the entire site but of that specific place, during which a tomb was dug through one of its walls.

In the slope to the north, the numerous floors of level 4A provided most of the findings of the trench (including a nice stamp seal - Clélia Paladre *infra*), while level 4B contains a building with an especially wide entrance (1.1m wide). Level 5 is a carefully pebbled open space, entirely covered with stones and sherds, cut to the north by large pits full of pottery, especially BRB. Those large tips, at the periphery of the settlement, were probably in use during the whole life of the enclave. Finally, level 6, immediately below the floor covering of level 5 (Fig. 8), is attested by another building provided with stone foundations (but thinner walls than level 3), and the sequence could continue below as we stopped here.



Fig. 9 - Aerial view of Logardan.

The most significant feature is that any local shapes or wares are virtually absent: 98% of the pottery of Trench D belong to the south-Mesopotamian Middle Uruk horizon (as at Uruk Eanna VIII-VI, Abu Salabikh Uruk Mound, Nippur Inanna XX-XVII or Gurga Chiya). The whole panoply of the Middle Uruk assemblage is documented (Johnny Samuele Baldi), with massive amounts of Bevelled-rim bowls, that we stop collecting after we get 1200 pieces.

At Logardan (Fig. 9), the excavations provided also clear evidence for an Uruk presence. In 2016, Trench D opened at the top excavated on four levels, on a surface that reached more than 400 sq. m in 2017 (Fig. 10), with a height difference of about 6m between the surface and the deepest vestiges (Johnny Samuele Baldi, Hugo Naccaro and François Bridey). Level 4 is represented by three distinct architectural phases of a monumental complex dating from Early Uruk (Eanna XII-IX) and beginning of Middle Uruk (Eanna VIII-VII). The Early Uruk buildings of Levels 4b-4c yielded the same assemblage collected in the bottom levels (8-10) of Girdi Qala Trench C (for our 2015 results, see now VALLET R., BALDI J. S., NACCARO H., RASHEED K., SABER S. A. AND HAMARASHEED S. J. 2017), while the assemblage of Level 4a matches with GQC Levels 7-3. However, unlike Trench C at Girdi Qala, where a local LC2-LC3 tradition was also documented, Level 4 of Logardan Trench D contained exclusively south-Mesopotamian-related shapes (Johnny Samuele Baldi).



Fig. 10 - Orthostatic view of Logardan Trench D.

In 2017, the clearing of the monumental building of level 4b remained our main objective, but didn't progress very much in plan, due to the increasing amount of later deposits as the excavations progress towards the inside of the tell (Fig. 11). However, we have now a much better understanding of the stratigraphy and the evolution of the successive occupations. The first Early Uruk phase recognized so far, Level 4c, that sees the initial building of the mudbrick terrace (without buttress during this phase), is still very little known but could be characterized by some agglutinated architectures rather than wide planned structures as in the next level. During a second phase (Level 4b), the terrace is rebuilt and raised to constitute the base of the west wing of a large complex, of which we have for the time being the west wing (with a main room of 7m x 3.5m, i.e. 24.5 sq. m) of a possibly bi-partite building, part of an acropolis probably covering the whole summit of the site (see Trench E, below). Level 4a represents the last stage dating back to the 4th millennium occupation and a major phase in the evolution of the area. The monumental building of Level 4b no longer exists, replaced by quite small agglutinated units, with narrow doors through very strong walls, suggesting that the complex became some sort of stronghold.



Fig. 11 - From left to right: Hugo Naccaro, Johnny Samuele Baldi, Victoria de Casteja and Rateb al Debs, standing on Level 3c. In the back, the east section of Trench D, with levels 1-2-3a1-3a2 and 3b. Level 4 is deeper as we progress to the south-east



Fig. 12 - Logardan Trench D: Micheline Kurdy surveying the architectures of Levels 3c-3d that just appeared, nested in the Uruk ruins.

As the trench was enlarged to the East, we discovered, almost nested within the ruins of the Uruk building and systematically taking advantage of it, an additional early Bronze Age level (3d), ED III in date, provided with nice stone paving, which could represent, after a long gap and together with the following level 3c, another stronghold overlooking the site (Fig. 12). The following Bronze Age levels, labelled 1-3a-b from top to bottom (3a divided into two phases, 3a1 and 3a2), saw the construction and use of more than 45 pottery kilns, some of them offering a unique perspective on firing technologies that were not documented for the 3rd millennium. The Early Bronze pottery assemblage finds the most consistent parallels in the ED III to 'Ur III' phases of the Tigridian Region, with connections with the neighbouring areas (Hamrin, Upper Diyala and Khabur Valley), including limited but important parallels with Southern Mesopotamia (Melania Zingarello).

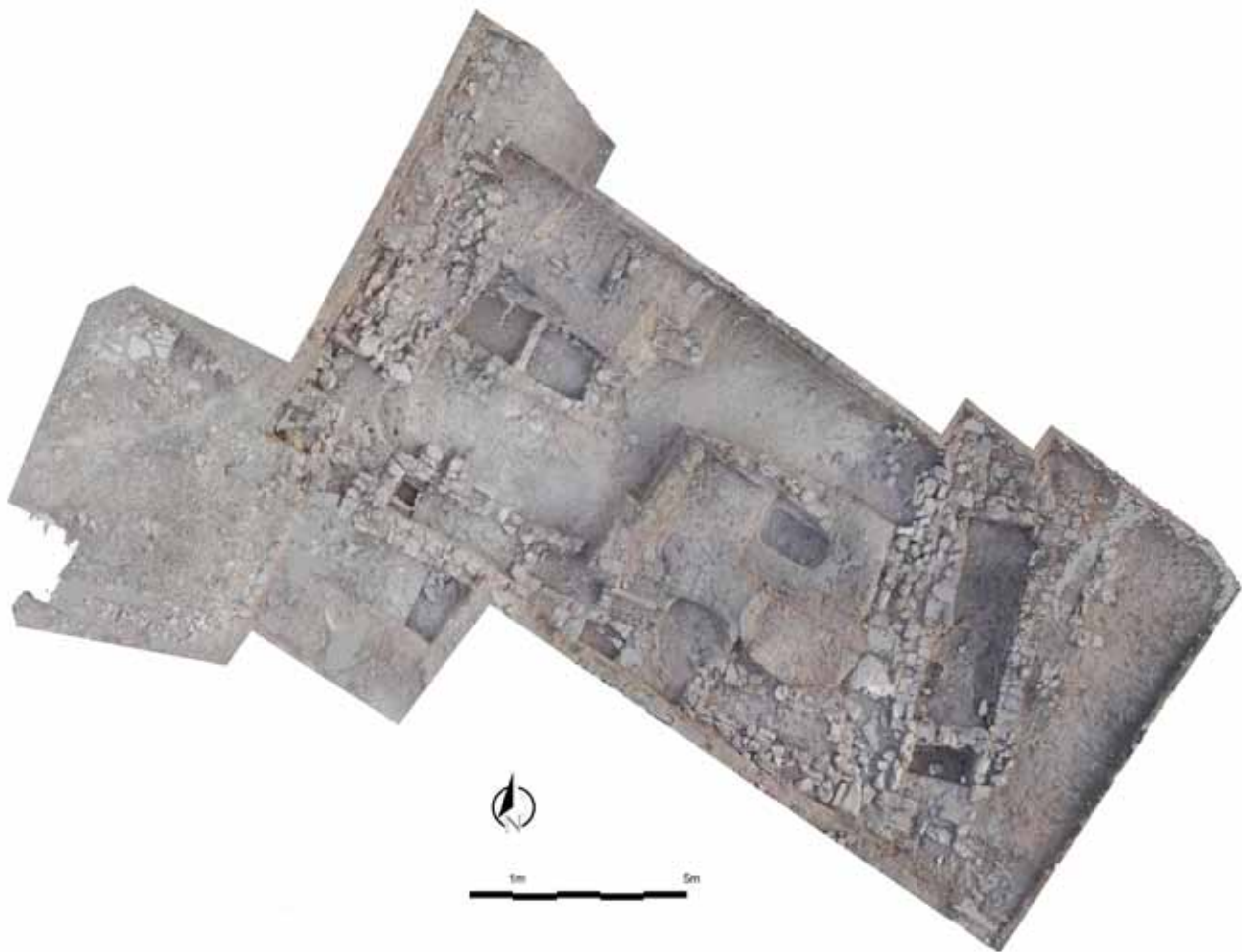


Fig. 13 - Orthostatic view of Logardan Trench E.

Trench E (Fig. 13), on the upper terrace of the site, more to the East, gave probably the most unexpected results of the campaign, which led to a major revision of its sequence. Originally, following a detailed survey, geomagnetic and archaeological, it was devised to provide information on the Bronze Age occupation of the site. And in 2016 indeed, Late and Early Bronze material, and architecture, were found, a storage building and the access way to the 'Citadel' (see our 2016 report), even if we were wondering about the high quantity of mixed material, Uruk and Early Bronze in particular. It was clear that the stratigraphy was far from being set, but we were expecting an important Bronze Age sequence. In 2017, the Trench was

extended in all directions (except the north), and it turned out that the Uruk occupation was much closer to the surface than expected, and the late 3rd millennium material gathered so far entirely out of context.

Roughly, Trench E (Martin Sauvage, Melania Zingarello, Sidonia Obreja and Hawkar Ahmed Abdullrahman) produced the same sequence than Trench D, except that the late 3rd millennium occupation (ED III to Ur III) is here missing, replaced if we may say by Late Bronze layers (Levels IA-IB) displaying mostly kilns. Immediately resting below those layers are three levels, III, IVA and IVB, respectively early 3rd millennium (ED I), Middle and Early Uruk in date, the two latter contemporaneous with their counterparts of Trench D.

As we already knew, the entrance to the top of the site was located in the west end of the trench, its passageway being rebuilt and enlarged at the same place through time. In front of it, the slope is quite steep, and leads to a large rectangular courtyard, surrounded by rows of small rooms at level III, some of them equipped with a very narrow opening (0.2m) flanked by outward walls, possibly silos for the storage of grain. It is possible that the Uruk layout was quite the same, but we have not yet enough to say. At the opposite of the trench (Fig. 14), the room revealed by the survey proved to be a storage (containing jars in level III), turned into a craft area during level IVA, with a triple kiln of the same type than in Girdi Qala C level 7.



Fig. 14 - Logardan Trench E, from the east. In the forefront, the storage rooms under excavation.

It is probably too early to pretend to draw any definitive conclusions, but despite long-standing assumptions that the Uruk expansion began during the late LC3 phase, it seems now clear in the Qara Dagh area that contact with Southern Uruk people occurred from a very early period (late LC2). In terms of absolute chronology, the Uruk expansion at Girdi Qala and Logardan does not appear around 3600 BC, but rather 3900 BC.

Moreover, the data collected so far begin to shed light on the history and organization of the south-Mesopotamian presence on the two sites. At the beginning of the 4th millennium BC, the upper part of Logardan was occupied by a monumental acropolis, while artisans were used to produce south-Mesopotamian ceramics at the foot of the Main mound of Girdi Qala (GQC levels 10-8), high mound that probably housed a LC village. Later, at the beginning of the Middle Uruk, the top of Logardan was reused for small-scale domestic activities, while Uruk ceramics were still produced at the Main mound of Girdi Qala (GQC levels 7-3). Finally, a bit later, during the mature Middle Uruk, Logardan was abandoned and south-Mesopotamian settlers lived in a small village (1 ha) on the North mound of Girdi Qala, but still produced pottery, at least for a while, at the foot of the Main mound (GQC levels 2-1). Needless to say that a lot of work remains to be done to corroborate this scenario (we don't have yet the foundation level of the Uruk colony neither on the North mound of Girdi Qala nor at Logardan, and only a part of the sequence of the Uruk occupation at the foot of the Main mound), but the available data point in this way.

Finally, it is most probable that the early Uruk diaspora was not confined to our sites, but spread on the whole plain of Chemchemal and neighbour areas (Kirkuk, Nuzi). However, it is possible that the Qara Dagh represented the limit of its expansion in the late LC2, as there is not (yet) evidence of a Southern Uruk manifestation east of this range before the LC3. It is very likely that the valleys of the Zagros Piedmont in the Qara Dagh area were part of crucial exchange zone centred on a main road network: the so-called Great Road of Khorasan. Girdi Qala and Logardan could represent initial steps of the building of the Uruk network in that direction.



From left to right: Kak Serkaut, Jaza Kader, Garmian Ruzgar Fatah and Jamal Jalal Muhammed at Girdi Qala Trench D.

LOGARDAN TRENCH D: STRATIGRAPHY AND ARCHITECTURE

Johnny Samuele Baldi, Hugo Naccaro and François Bridey

The excavations have been carried-out during four weeks between September 16th and October 12th in the aim to better understand the planimetric organization of the structures identified during the 2016 campaign on the western edge of the site. For this purpose, the trench has been considerably widened towards south and southeast, where several recent large illegal excavations have badly disturbed the top of the hill. The entire currently excavated area exceeds 400 m² on four main architectural levels, with a height difference of about 6 m between the surface and the deepest vestiges (Fig. 1). Many questions remain open and can be answered only in the coming years. Nevertheless, the main chronological phases recognized during the 2016 campaign (between the beginning of the 4th and the second half of the 3rd millennium BC) have been confirmed in 2017, and they are now much better known as far as both their stratigraphic evolution and their spatial development.



Fig. 1 - View of Trench D at the end of the 2017 campaign.

LEVEL 4

Level 4 is represented by three distinct architectural phases of a monumental complex dating from Early Uruk and beginning of Middle Uruk (Fig. 2). In 2017, excavations focused mainly on Levels 1-3, but compared to the 2016 campaign an additional architectural Level has been recognized in Level 4 and the architectural and stratigraphic development of the Early Uruk complex has been studied more in details. As already stressed in 2016, it is the first time that in northern and central Mesopotamia monumental buildings are associated to early 4th millennium ceramic materials belonging to the Early Uruk south-Mesopotamian

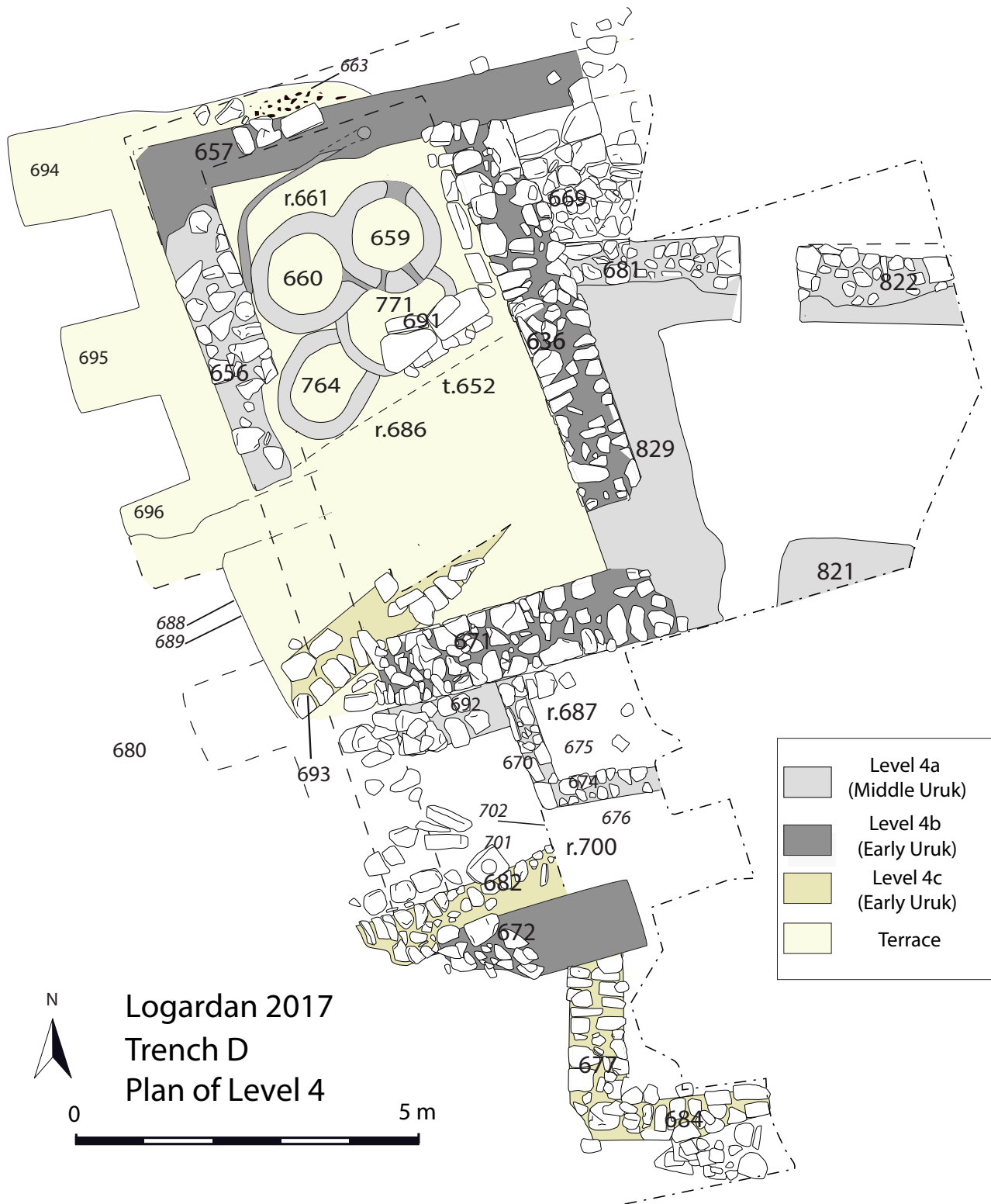


Fig. 2 - Plan of Level 4.

tradition. The northern and western sectors of the complex are severely damaged, both by the reuse of the structures in later levels 3a and 3b, and by the strong erosion on the slopes. Therefore, the enlargement of the excavated surface towards south and east was aimed at better understand the structural organization of the massive architectures.

The first phase (Level 4c) is very little known. First of all, a terrace in mud-bricks (652) has been built on a quite flat floor (688). Some stone walls of this phase (693, 682, 677, 684) have been also identified. But, since for the moment there is no connection between these walls, it is difficult even to state whether they all belong to the same construction stage. In particular, Wall 682 lays at a lower altitude than Wall 693, which is founded on the mud-bricks platform. Walls 677 and 684 are cut through some remains on this same platform in the southern part of the trench. It indicates that some difference existed between the northern sector, where Wall 693 were founded on Platform 652 (Fig. 3), and the southern area, where Walls 677 and 684 were cut through the platform in a deep foundation trench. The reading of all these structures is complicated not only because they are only partially exposed, but also by the fact that, in the sector between Walls 693 and 682, Platform 652 has been completely removed during the phase 4a. However, despite their solid character, all the walls of Level 4c are thinner than the main structures of Levels 4b and 4a, while their orientation does not seem to follow any standardised criteria. It could indicate that, before the construction of the monumental complex in Level 4b, the Early Uruk presence on the western edge of Logardan was characterized by some agglutinated architectures rather than wide planned structures.



Fig. 3 - Wall 673 on Platform 652

During a second phase (Level 4b), the terrace in mudbricks (652) is rebuilt and raised to constitute the base of the west wing of a large complex. The whole platform was partially stripped and rebuilt by replacing 4 layers of bricks. On the western face of Terrace 652 a clear distinction is visible between its basal floor (688) and the base of the four layers of bricks added in Level 4b (Floor 689). The main walls (656, 657, 671 and 636)¹ delineate a rectangular structure, their foundation trenches are dug deep into the ancient stage (Level 4c) of the mud-brick terrace, while the rising of this platform leans against Wall 636 on the eastern side and against Wall 671 to the south². All these walls have a size between 80 cm and 1 m

1. Walls 656 and 657 were observable in their second stage (Level 4a, see below) even if their emplacement and foundation trenches were the same than in Level 4b.
2. This reconstruction of the phases of Platform 652 is still tentative. It could be possible that the second stage (Level 4b) of this terrace continues east of Wall 636 (which, in this case, could be cut through the both phases of the platform). But Level 4 has not yet been reached in the north-eastern sector of Trench D.

thick and are made of large-sized flat stones (Fig. 4). They define the west wing of a roughly north-west – south-east oriented complex. In its southeastern corner, Walls 636 and 671 were not connected because of the presence of a passageway allowing the circulation with the eastern (and not yet excavated) wing of the compound. Moreover, it is still impossible to establish whether, beyond this door and the corner with Wall 671, Wall 636 continues towards the south.



Fig. 4 - Stone walls 671 and 636, from the South.

Likewise, the kilns of Level 3b have almost completely erased the segment of Wall 656 south of its angle with Wall 671. Indeed, if Walls 656 and 636 do not continue to the south, the monumental complex would consist of two separate buildings. The considerable thickness of wall 671 could also be considered as a clue in this sense. Nevertheless, for the moment, some evidences suggest that it is reasonable to consider the architectural complex as one large edifice. First, even if Wall 656 is not preserved in its southern sector, its foundation trench continues south of the angle with Wall 671. Moreover, in Level 4b, the western façade of the mud-brick terrace was reinforced by a series of regularly spaced large (1,6 m thick) buttresses with a masonry that, starting from Floor 689, is intertwined with Terrace 652³. Despite the erosion of the slope, a slight trace of one of these buttresses has been identified exactly where Wall 656 probably formed an angle with the first stage of Wall 672, which thickness and orientation are the same than Wall 671. Not only the presence of a buttress at this place would be coherent from an architectural point of view, but it also respects the regular distance between the buttresses. Therefore, it seems that, for the moment, the complex can be interpreted as a bi-partite building.

To the north, the main room of the west wing (686) has an internal size of about 7 m x 3,5 m. The structures of Level 3, especially the stone pavement 673 made reusing the masonry of Wall 656 (see below), have erased any kind of floor of Room 686. However, an external floor (663, associated to the foundation trench of Wall 657) laying on Terrace 652 and connected to the building has been identified north of Wall 657 (Baldi, Naccaro and Rahoof 2016, fig. 4 p. 24). This one (more specifically) foundation trench of Wall 656 does constitutes the northern façade of the edifice, that continues east of the angle between Walls 657 and 636, demonstrating the existence in Level 4b of an eastern wing of the complex. South of Room 686, the sector between Walls 671 and 672 (first stage) is very poorly known for the Level 4b. The only traces of the mud-brick Terrace 652 identified south of Wall 672 are inherent to the first stage of this platform (Level 4c), while there is no evidence for the rising of the terrace in Level 4b. It could suggest that Wall 672 represents in this phase the southern limit

3. Because of the atmospheric erosion and the very strong slope, it is impossible to know whether a similar renovation also occurred north of wall 657: the mud-brick terrace extends beyond this wall, but any kind of structures (or possible buttresses) on its northern face is lost.

of the architectural complex. Another clue in this sense could be the fact that the foundation trench of Wall 656 does not continue south of its corner with Wall 672. Nevertheless, there is another possible reading. It could be possible that the construction of 3d Level structures (as Terrace 815 and the paved forecourt 683) produced the complete destruction of the second stage of Platform 652 south of Wall 672. This kind of evolution, which seems quite likely, could imply that the southern limit of the complex was since Level 4b the north-east – south-west oriented Wall 833 (Fig. 10), characterized by the same alignment of Walls 671 and 672. In fact, some stones of its foundation trench cut deep in Terrace 652 could suggest that Wall 833 constitutes the southern façade of the Early Uruk building of 4b Level.

In a third moment (Level 4a), the whole complex was restructured. It no longer consists of a single building, but it is rather composed by several agglutinated units with divergent orientations. In the north-eastern area of the complex, Wall 829 is built against Wall 636 (Fig. 5): it has the same orientation and thickness as Wall 636 and forms a 90° angle with wall 671, sealing the door that, in Level 4b, existed between Walls 671 and 636. This north-eastern sector of Trench D, which was the eastern wing of the complex in Level 4b, becomes an independent quadrangular unit, delimited by Walls 821, 822 and 681. This unit communicated with other internal and external spaces through two doors, respectively on its northern (between Walls 681 and 822) and southern side (between Walls 829 and 821), but was separated from Room 686.

Moreover, the orientation of these two spaces diverges significantly: if the alignment of Room 686 remains approximatively the same as in Level 4b, the eastern space appears north south oriented. Wall 681 provides an additional proof in this sense (with 6 layers of stones for 80 cm of preservation in its 4a Level phase): it is connected to Wall 636, but it does not form with it a 90° angle and it is not parallel to Wall 657. The space defined by these three walls (657, 636 and 681) is paved with stones (669) amongst which some in-situ early 4th millennium ceramic materials have been recovered (Baldi, Naccaro and Rahoof 2016, fig. 5 p. 25) (Fig. 6). This paved space (669) played a key-role for the reorganization and reorientation



Fig. 5 - Level 4a - Wall 829 against Wall 636.



Fig. 6 - Level 4a - Paved space 669

of the different units of the complex. Indeed, Space 669 was in continuity with Wall 829, but to put in place its stones, the northern portion of Wall 636 was restructured (Fig. 7) and, in the same way, Wall 657 – the northern limit of the complex – was rebuilt with a slightly different orientation, further north-east – south-west oriented than in Level 4b. Simultaneously, Wall 656 was also rebuilt (with a slightly more north-west – south-east orientation, to form a 90° angle with the new version of Wall 657) according to the same construction technique than Wall 657, namely by using both bricks and large-sized rounded stones. Their masonries, even if solid, are visibly different from stone Walls 636 and 671.



Fig. 7 - Level 4a - restructured portion of Wall 636.



Fig. 8 - Level 4a - kitchen with several ovens, from the East.

The northern portion of Room 686 was occupied by several ovens (first Oven 771, then 764 and finally Ovens 659-660) (Fig. 8). In all probability, they were food installations, as suggested by several bones in their filling layers, by the absence of ceramic slags, as well as by the presence of an important quantity of bowls in this sector (Fig. 9). On the southern side, this space (Room 661) was delimited by a wall (691), parallel to 657 and built in bricks and large stones. Room 661 was probably a kitchen intended for large-scale distributions of food, as indicated not only by the dimensions of the ovens, but also by the fact they have been intensively used. Their intricate ventilation system has been restructured and regularly maintained, with the application of several layers of clay to plaster the cooking chamber and the aeration pipes. The chimneys were stuck in Wall 691 and a funnel (reusing a part of the foundation trench of the first stage of Wall 657) was devoted to evacuate the smoke to the outside. South of Room 661, a door was opened through Wall 656, where in Level 4b there was a buttress (696). It demonstrates that in Level 4a there was no longer any external buttress or pillar.

The entire area south of Wall 671 has undergone a dramatic transformation. The 4b Level mud-brick terrace (652) was almost completely dismantled over several layers of bricks without being rebuilt. Wall



Fig. 9 - Level 4a - BRB in masonries of Wall 691.

672 still exists: it has no foundation trench and simply lays on what was left of Terrace 652 (as at Level 4b). The newly reconstructed Wall 656 no longer continues south of the angle it forms with Wall 671: it means that, in 4a Level, the same separation one can observe between the ancient eastern and western wings of the complex also occurs between its northern and southern portions. Actually, the space between Walls 671 and 672 (Room 700) becomes a transit zone within the compound, partially occupied by a little utilitarian area (Room 687), with a floor (675) covered by some *in-situ* bevelled-rim bowls and delimited by two thin walls (Baldi, Naccaro and Rahoof 2016, fig. 8 p. 27). The first one (670) is perpendicular to Wall 671, while the other one (674) is parallel to the big wall 671. The construction of this closed space dates back to the same period of the construction, along Wall 671, of a solid wall in bricks and stones (692). All these walls laid on Floor 702 without any foundation trench and were associated to an external 8 cm thick grey floor (676) representing the later phase of occupation of Room 700.

Level 4a represents both the last stage dating back to the 4th millennium (Uruk) occupation and a major phase in the evolution of the entire excavated area. The large monumental building of Level 4b no longer exists, replaced by quite small agglutinated units. The thickness of the external walls, their re-orientation according to the topography of the edge of the tell and the circulation inside the complex – with narrow doors through very strong walls – seems to suggest that the complex became a sort of stronghold. In this sense, the location of the external doors (through Wall 656 on the western side and through Walls 681-822 to the north) suggests the existence of a narrow path (to patrol and supply?) on the exterior side, where no easy access could exist because of the extremely steep nature of the slopes.

LEVEL 3

This phase is inherent to a series of activities that occurred after a long hiatus and it marks the transition to the 3rd millennium BC (Fig. 10). First, in Level 3d (Early Dynastic III) the north-eastern sector is separated in two different rooms (825 and 826) by the construction of Wall 820 (Fig. 11). It compartmentalizes the interior space and even if it is thinner than the other walls it is reinforced by various smaller structures. In the south-eastern corner of Room 825, close to the door, a stone bench (827) supports the corner between Walls 820 and 821. On the other side, in the north-western corner of Room 826, a small stone fireplace (824) is built against the corner between Wall 820 and 822. On the exterior side of this same corner, Wall 822 reinforced by a stone pillar (832) is settled almost exactly in continuity with Wall 820. Two different clay floors, located at the same altitude, have been recognized respectively in Room 825 and Room 826. Bench 827 and Fireplace 824 were founded on these floors and the entire area has yielded some *in-situ* materials.

After a long hiatus during the second half of the 4th millennium, the reconstruction of the acropolis of Logardan renews the fortified nature of the Uruk structure, with narrow accesses close to the slopes, thick buttressed walls and little rooms. Both the spaces identified in this sector of the complex have a utilitarian nature. On the contrary, in the western Room 661, the alimentary ovens were no longer in function. Some important changes occur in the southern sector. The upper portion of Wall 672 is rebuilt and, on its southern side, a mud-bricks



Fig. 10 - Plan of levels 3d-3c (ED III).

terrace (815) is built to raise the floor (Fig. 12). This one is paved with large-sized stones to cover the entire forecourt (685-683). This paved area, delimited to the south by Wall 833, represents the southern limit of the complex. A large staircase (683) occupies the paved forecourt. All these structures are built according to the orientation of ancient 4th millennium vestiges (as also Walls 677-684 of Level 4c), reused as foundation. Therefore, Staircase 683 is north-south oriented and appears divergent if compared to the rest of the edifice, even if it respects the topography of the tell in this area. The steps of the staircase go east and progressively change their orientation. Some elongated stones form each of them: the first and lower one is perfectly aligned with Wall 672, the second step turns slightly to the east, the third one turns in an even more pronounced way and so on, according to a curved path.



Fig. 11 - Level 3d - Room 825 with two different doors, view from the East.



Fig. 12 - Architectural modification in the southern sector at Level 3d.

The following phase (Level 3c, Early Dynastic III) is represented by the construction, in the western Room 686, of a solid stone staircase (690) (Fig. 13). It is north-east – south-west oriented, according to the orientation of Wall 691 and, above all, according to the northern limit of the room (Wall 657) since Level 4a. Staircase 690 represents the main segment of a path that, from the west slope of the tell and by the door through Wall 656, gives access to the eastern part of the complex allowing to climb over Wall 636. This one was crossed thanks to a chicane-shaped passage: first, the staircase turned south leaning on the stone pillar 831 (stuck in the corner of room 686), then the path went beyond Wall 636 through the area where,



Fig. 13 - Level 3c - Stone staircase 690, from the East.



Fig. 14 - Level 3c - Staircase in chicane-shaped passage.

in Level 4b, there was a door (830) then closed in 4a (Fig. 14). In front of this passage, Wall 829 was used as a threshold to access the eastern unit of the complex. This area was no longer represented by different rooms, but by a single space, delimited by Walls 828 (to the east) and Wall 823 (to the north). In continuity with Wall 823, on the western side of Wall 636 (the northern portion of which is rebuilt in Level 4a) a massive wall (637), almost 1 m wide, was built (incorporating the remains of 4a Level Wall 691) according to the same technique as Walls 828 and 823 (stones and irregular mud-bricks) and orientation of Wall 657 (since its 4a Level stage) and Staircase 690. In the southern sector of the trench, the construction of a thin wall (819) with an orientation that does not fit with other structures indicates a major architectural change in this zone. In the next campaign, it will be necessary to enlarge the excavated area (under the vestiges of Level 2) to better understand the architectural plan in

the southern sector. In the same way, the southern limit of the complex is still represented by Wall 833, against which a very homogeneously paved forecourt is built (818), covering the remains of the earlier 3d Level forecourt (683-685) (Fig. 15).



Fig. 15 - Level 3d and 3c - Paved forecourt 818 and Wall 833 (Level 3c) and paved forecourt 685 (level 3d).

Later, during the Akkad period, Level 3b (Fig. 16) is represented by an overall reuse of ruins of Level 4 and 3d-c (particularly Walls 671, 672, 636, 637, 823, 828 and the northern part of 656) to structure a huge workshop for firing ceramics. The strong erosion and the very steep slope on the northern and western sides have severely damaged the firing structures, but the architectural and functional organization of the workshop is clear. The firing structures were aligned along the exterior sides of the ruined building

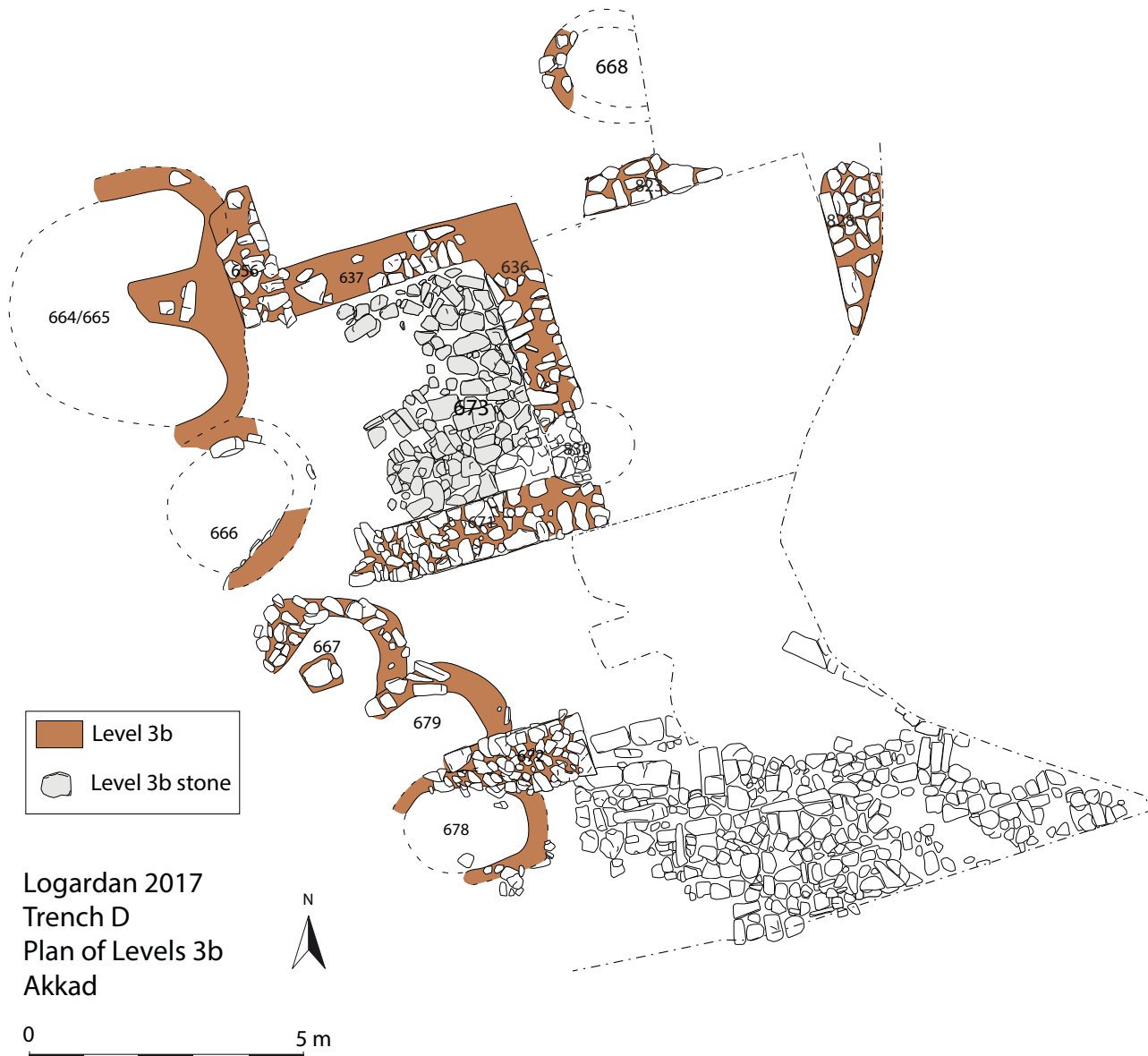


Fig. 16 - Plan of Level 3b.

of Level 4 to facilitate the evacuation of the fumes along the edge of the hill, while inside the ancient building the space was used to manufacture and dry the vessels. To the north, a one chamber oval kiln (668) was associated to a production unit located east of Wall 636. To the west, several kilns (664-665, 666, 667, 678, and 679) were arranged in a row along ancient Wall 656 of Level 4. The ruins of this wall were used to sustain the domed roofs of the kilns. A double dome reusing an external buttress of the Level 4 building covered the largest amongst them (the enormous structure 664-665, with a diameter of about 4 m). In the same way, to the south, Kilns 678 and 679 reused the Wall 672 to sustain their domes. The presence of different typologies of potter's kilns confirms the complexity of the ceramic workshop. Despite their architectural and dimensional differences, furnaces 659, 660, 664-665, 666, 667 and 678 were two-storey up-draught kilns, with a lower partially buried heating chamber and an upper domed firing chamber⁴. On the other hand, kilns 668 and 679 were single chamber firing structures with a domed roof covering a space dedicated to both the fuel and the ceramic materials⁵. East of this row of furnaces, the ruins of the previous level were adapted to define different production units. The space between Wall 671, 636 and 637 was carefully paved with large stones taken from ancient Wall 656 (rebuilt in stones and bricks in Level 4a). Its northern portion was restructured, but the large majority of its stone masonry was reused to build both Wall 637 and stone Floor 673 (Baldi, Naccaro and Rahoof 2016, fig. 13 p. 30). South of this room, between Walls 671 and 672, another production unit had an ashy clay soil. Probably, this architectural difference depends on the different functions of the two units. Indeed, several potter's tools – scrapers, spherical stone pestles and shells – come from the southern space, while some little complete vessels (as the little painted jar LOG_D.243.1) come from the stone-paved northern unit. It could suggest that the southern room was used for operations inherent to the shaping, while the northern space was rather dedicated to finish, dry, decorate and store the pottery.

Level 3a2 (Fig. 17) represents a later occupation occurred after an abandonment of the workshop, dating from Late Akkadian period. When the area was reoccupied, the profile of the hill, determined by the accumulation of the previous structures of Levels 4 and 3d-c-b, was very sloping, towards both the north and the west. Instead of levelling the whole sector, the artisans of Level 3a chosen to adapt their new workshop to the topography: they reused some parts of previous structures and built new kilns respecting the slope. North of Wall 637, a little workspace, with a medium-sized kiln (651), is created. This firing structure is partially recessed into Wall 637: two thin walls (653 and 654) built with recycled materials close a room whose southern corner is formed by Walls 656 and 637. Actually, the upper part of 637 is further restructured in Level 3a2, while the northern portion of Level 4 Wall 656 is the only segment still existing of it. The absence of the Level 4 large walls, which were reused in

4. For Early-Dynastic Two-storey kilns see at Tell Hazna (Bader, Merpert and Munchaev 1997-98: fig. 6), Tell Banat (Porter and McClellan 1998: fig. 2-4), Uch-Tepe-Tell Razuk Level VB (Gibson 1981: pl. 27), Tell Madhhur (Killick and Roaf 1976: Abb 183), Khafajah (Delougaz 1940: plan IV, VII; Delougaz 1942: plan VII, fig. 17.i; Delougaz 1967: plan. VII, 8, 9), Abu Salabikh (Postgate and Moon 1981: fig. 7), Tell Barri (Pecorella 2004: fig. p.18).

5. For Early-Dynastic single chamber kilns see for instance at Tell Banat (Porter and McClellan 1998: fig. 5), Tell Chuera (Moorgat and Moorgat-Correns 1976: Abb. 27), Khafajah (Delougaz 1942: fig. 21.a-b), Tell Barri (Pecorella 2004: fig. p.15).

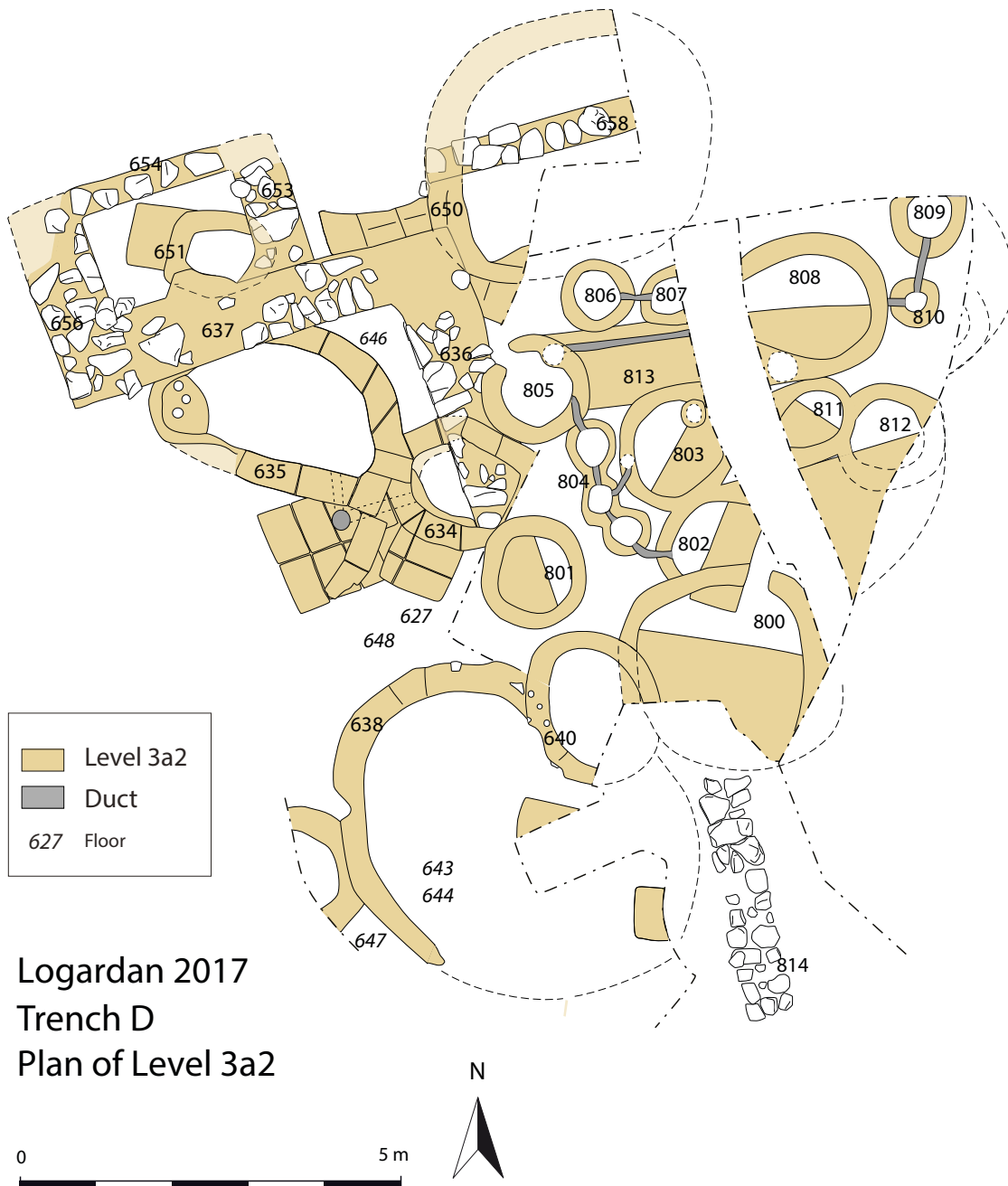


Fig. 17 - Plan of Level 3a2 (Late Akkad).

Level 3b, determines a total change of the previous structural organization of the workshop. To the north, in the area previously occupied by stone Floor 669 and Wall 681, the 3 m large Kiln 650 is associated to a workbench along Wall 637 and uses the corner between Walls 636 and 637 (as well as the ancient Level 4 Wall 681) to sustain its domed roof. This sub-circular structure is built in a sector of the hill where the steep gradient is very strong and the traces of the dome in the eastern section of the trench show that this kiln was about 3.5 m high. It would be a very important size even for a two-storey kiln with two superposed chambers separated by a pierced sole. However, Kiln 650 did not have any sole and its chambers were not perfectly built one on the other, but formed a sort of stairs. A wall (658) runs through the structure and constitutes a 1.30 m high step between the lower chamber and the upper one. Therefore, this firing structure is not an up-draught kiln, but rather a furnace where draught was almost horizontal.

Although with a lower internal slope, the kilns inside the space delimited by walls 636 and 637 were built according with the same criterion on the stone-paved space 673. In this sense, structures as 634 and 635 were not independent furnaces, but parts of one sloping kiln. The oval fireplace 635 was used for the fuel, as indicated by its *praefurnium* pit on the western side. During the firing cycles, the heat rose-up towards Chamber 634, where vessels were stacked on two different levels. In fact, this chamber incorporates a segment of wall 636 using this Level 4 ruin as an internal step to facilitate the draught. On the western side, both the chambers (634 and 635) of this horizontal-draught complex kiln were connected to a bench in mud-bricks built around a vertical chimney that centralizes the evacuation of the smoke. To the south, another structure composed of different chambers (638-640) works in the same way. Combustion began in a western *praefurnium* full of ashes; the fuel was loaded in an oval structure (638), whose floor, hardened and cracked by the heat, has been rearranged several times (internal Floors 643 and 644); then heat attained another higher chamber (640), where vessels were fired. Given the size of the lower chamber (638), it is even possible that several upper firing chambers were connected to it. The two complex furnaces of this workspace (635-634 and 638-640) lay on the same external floor (648), worked during the same period and were abandoned in the same time (as demonstrated by Floor 627, which covers the ruins of this early Level 3a occupation).

The eastern sector of the trench (excavated in 2016) was flatter than the western area. A small figurine was discovered there in secondary context, in the levelling of previous structures (Fig. 18). It was occupied by firing structures built according to the same architectural and technical criterion as the other ones. They were horizontal-draught kilns reusing (where possible) ruins of the previous levels to create an internal step to facilitate the circulation of the heat. It is the case of Kiln 801, a circular structure located in the middle of the trench (and connected to 635-634), that reuses the remains of ancient Wall 636 to arrange an internal bench (Fig. 19). However, where there were no ancient ruins to re-employ, the internal bench was built in mud-bricks, as in the chamber of Kiln 800, the biggest furnace of this sector with a diameter of about 3 m. From a technical point of view, internal benches are the essential equipment of this kind of horizontal-draught kilns. Nevertheless, from an architectural point of view, their construction does not depend simply on a structural logic concerning every single furnace: it rather obeys a criterion of connection and integration of the various firing



Fig. 18 - Level 3 - Equid figurine, with mane and tail (Tc387).



Fig. 19 - Level 3a2 - Kiln 801 with its internal bench.

structures within the workshop. In this sense, the internal bench of large Kiln 800 does constitute not only its inner step to enable the draught, but it also constitutes a connection between Kilns 800 and 640 (namely the upper chamber of the complex structure 638-640). Indeed, the two kilns worked separately, but have been built as one structure: their internal benches form a single mud-bricks block upon which the walls of the respective chambers have been founded. In the same way, Kiln 800 is physically connected to Kiln 802 because on the north, close to its mouth, the wall of Kiln 800 is founded on the bench of Kiln 801. Most of the time, the architectural connections between the different furnaces imply also a technical linking during the firing cycles. The walls of the chambers of Kilns 802 and 803 were entangled to each other and the chamber of Kiln 803 was founded on an external bench (813) connected to Kilns 805, 806 and 807. In the same time, Kilns 802, 803 and 805 were connected through a triple set of external chimneys (804) that was joined to some internal smokestacks, located inside the walls of the chambers of Kilns 803 and 805. The vertical conduit inside the

wall of Kiln 805 is linked to a horizontal duct that runs through Bench 813 and connects Kiln 805 (and therefore the entire system of Furnaces 802-803-805) to Kiln 808 (Fig. 20). Both the circular installations 806 and 807 are also connected to 808. This one, according to the same architectural and technical criteria, has an internal bench that represents the extension of the external work platform 813. As Kilns 803 and 805, a chimney located at the edge of the internal bench and

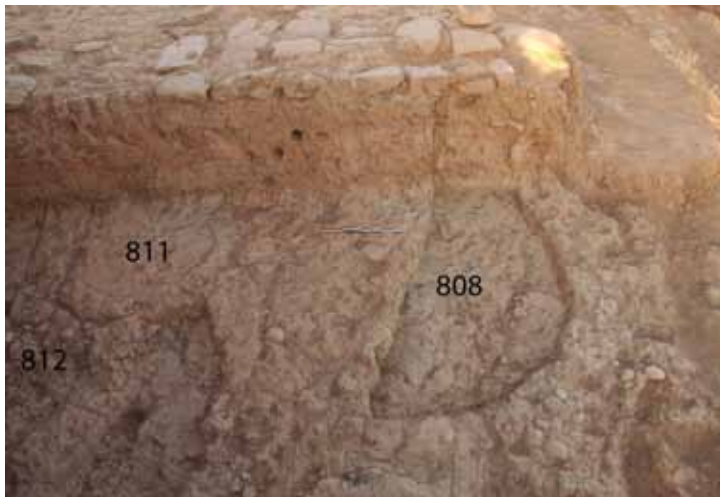


Fig. 20 - Level 3a2 - Kiln 808 with its bench, from the East.

integrated into the wall of the chamber also characterizes Kiln 808. Moreover, it is connected to some external chimneys (809-810) that play the same role as the triple chimney (804) between Kilns 803, 802 and 805. South of Kiln 808, the walls of its chamber are built against the chamber of Kiln 811. The chamber of this one is entangled with the masonry of the chamber of Kiln 812 and their respective benches represent two internal extensions of an external mud-bricks block. In other terms, the entire workshop is constituted of interdependent firing structures, built together and, in most cases, also intended for working together.

The intricate and apparently chaotic chain of firing chambers, external work platforms, internal benches, funnels and chimneys composes a workshop where some sets of firing installations can be recognized. They can work separately even if all the structures are interconnected. On the north-western side, the complex furnace 635-634-801 is connected to Kiln 805 and, through the latter, to Kiln 808. To the south, the large structure 638 formed a single system with 640, 800, 802 and (probably) 803. On the northern side, the huge kiln 650 is functionally connected to the installations 806-807-808-810-809. Similarly, on the eastern side of the workshop, Kilns 811-812 were probably connected to other furnaces. All these different clusters of firing structures present the same architectural and technical features.

They have external platforms where pots were placed for the drying and pre-firing, using the heat released by the chambers during the firing cycles. Internal benches that enabled the horizontal draught of the heat characterize them. They are built in accordance with the slope of the tell to facilitate the draught and they are all interconnected through some chimneys (as 804, 806-807, or 809-810). Actually, the apparently disordered design of the workshop is the product of an extremely complex and well-planned set of structures integrated to each other.

Horizontal-draught kilns are documented in Mesopotamia since the Halaf-Ubaid transition at Tell Ziyada (Buccellati and Buia 1991: fig. 6), but they represent an extremely rare typology and become better documented since the 2nd millennium BC⁶. Therefore, the kilns of Level 3a2 in Trench D offer a unique documentation about the evolution of this firing technology and allow filling the absence of any archaeological record for the mid and late 3rd millennium BC⁷.

A later phase, Level 3a1 (Fig. 21) of this workshop has been identified in the eastern side of the excavated area, while at this stage the western zone has been largely disturbed by the enor-

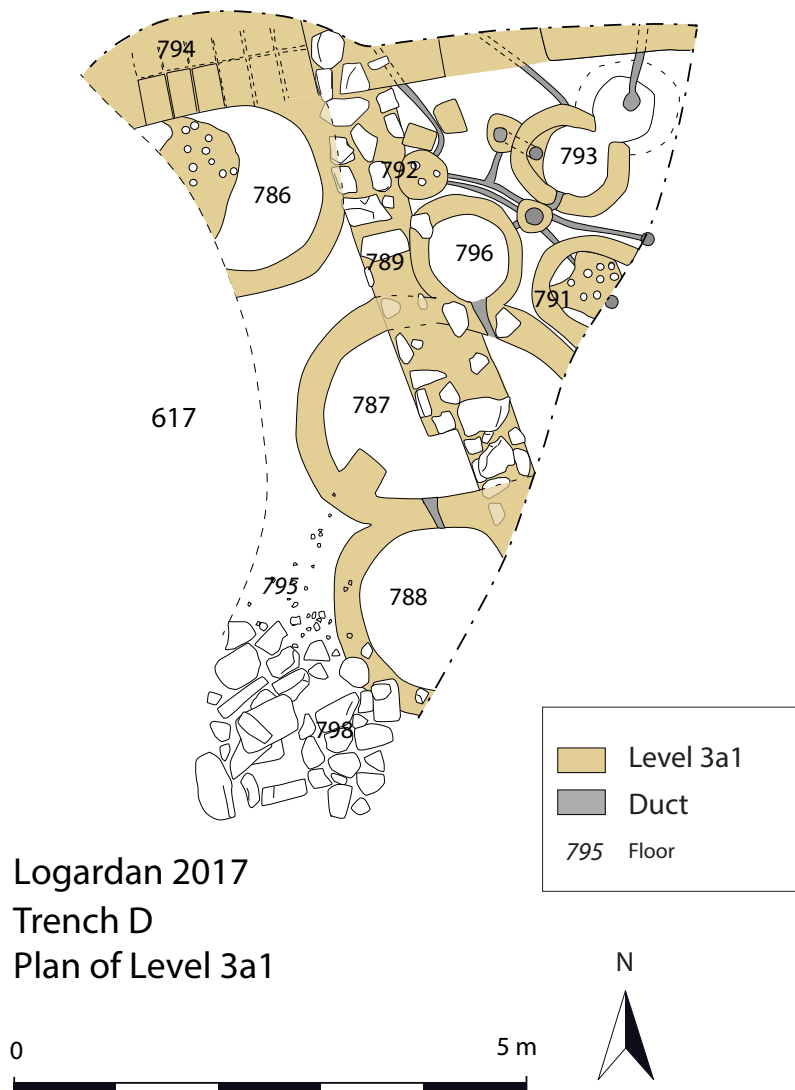


Fig. 21 - Plan of Level 3a1 (Late Akkad).

6. See for instance at Qatna (Middle Bronze I Furnaces SU1574-1576, or Middle Bronze II furnace in area J – Morandi Bonacossi 2003: fig. 5, fig. 11), Tell Barri (Mitannian Kiln 470 – Pecorella 1998: fig. pag. 81).

7. The only early 3rd millennium sample of horizontal-draught kiln is documented at Tell Karrana 3 (Wilhelm and Zaccagnini 1993: fig. 16).

mous Kiln 617 of Level 1-2. The exposed surface is quite limited, but one can observe that, despite the construction of new kilns, the main techno-architectural criteria that determined the organization of the workshop in Level 3a2 were still respected (Fig. 22). On the one hand, kilns were connected because they often shared a part of their walls, but also because of the presence of structures used both as external work platforms and as internal benches. It is the case of Kilns 788-787-796, which have common masonries where they are in contact to each other. Besides, Wall 789 links them to Kiln 786: this one is a long bench, used to create an internal step and facilitate the draught inside Kiln 787, but also as an external work shelf, that forms an angle with a brick platform (794) around Kiln 786, where a model chariot wheel was discovered in its filling (Fig. 23). On the other hand, as in Level 3a2, kilns are also connected by an elaborate system to evacuate the smokes. The walls of Kilns 788-787-796



Fig. 22 - Level 3a1 workshop, from the South-east.



Fig. 23 - Kiln 786 - Model chariot-wheel (LOGD.Tc366).

are crossed by ducts and, through some underground funnels, all the firing installations (not only Kilns 788-787-796 and Kiln 786, but Kilns 793 and 791) were connected to vertical chimneys. The circulation of the heat (that is the main reason to join the firing structures to each other) and the evacuation of the smokes (channelled towards the outside) were the functional problems to which, in this period, the artisans of Logardan responded by developing the interconnection between groups of structures that nonetheless remained separate. In fact, despite the limited excavated surface, furnaces of Level 3a1 appear organised according to the same rule observed in Level 3a2. Even if connected, the set of Kilns 788-787-796 and the large structure 786 with its banquette 794 represent distinct production units. Smokestacks as 792 and 791 were common installations to mutualize the heat and share the flow of hot air, while the circular installation 793, close to the northern limit of the workshop, was intended to centralize the evacuation of the smokes towards the slope of the tell. In this organization, the low wall 789 (a mud-bricks bench paved with stones on its upper surface) represented both a connection and a separation between the different units.

LEVEL 2

This phase is clearly separated from Level 3 by a thick and regular clay floor (629) plainly visible in section (Baldi, Naccaro and Rahoof 2016, fig. 19 p. 34) laying on the destruction of the previous structures. This level is represented by a ceramic workshop devoted to the firing of the vessels, dating from late 3rd millennium (Fig. 24). The excavated area (about 120 m²)

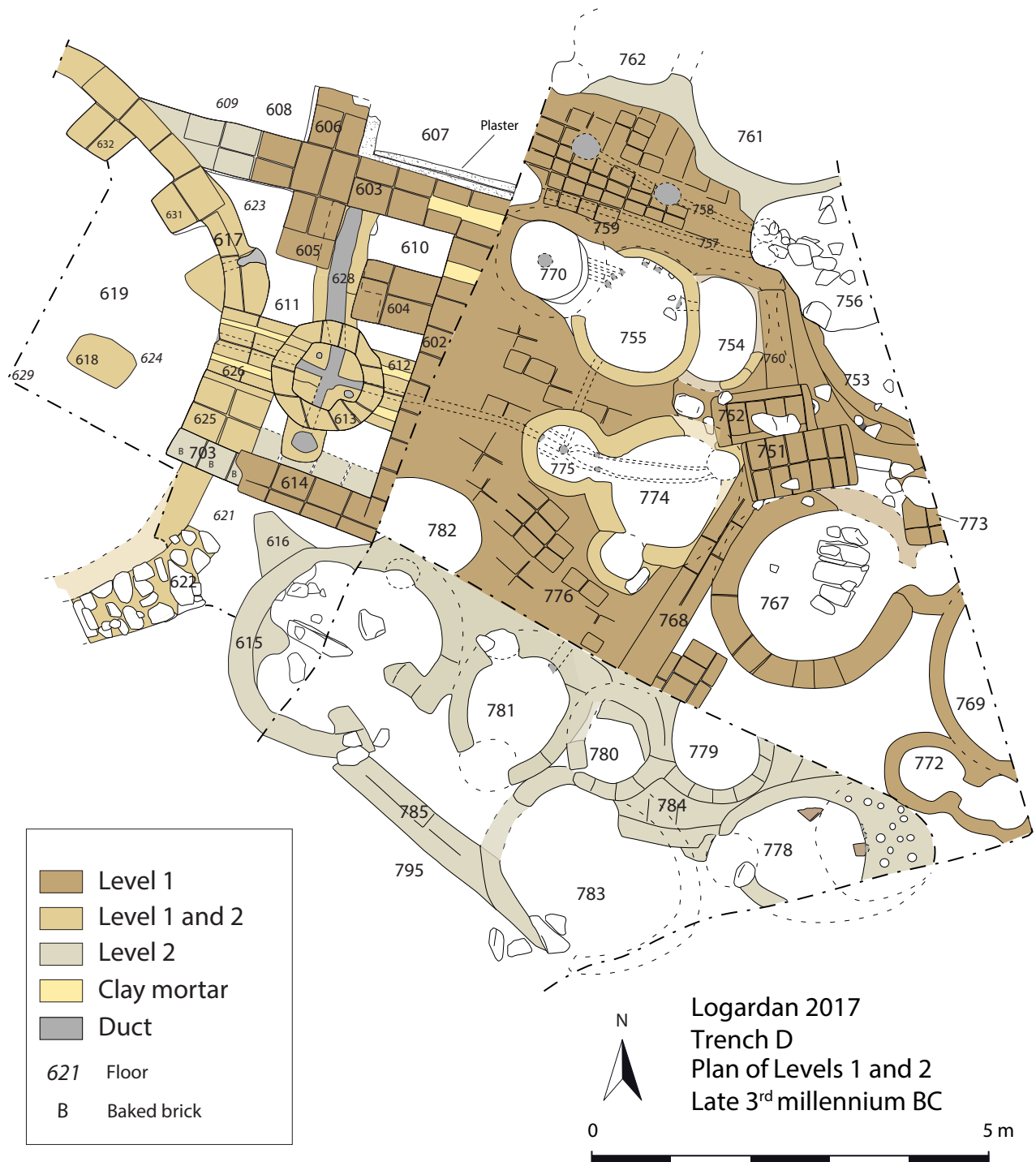


Fig. 24 - Plan of Levels 2-1.

constitutes a little portion of a much larger complex, as suggested by the dimensions of some firing structures. In particular, it has been possible to identify a 3,6m large workspace (611) delimited by three walls: 602, 603 and 703. The roughly north-south oriented Wall 602 is 1.5 rows of bricks wide and is conserved on 5 layers of bricks. The northern Wall 603 is 1.5 rows of bricks large and visible over 5 layers of bricks in its eastern portion (where 2 of these layers belong to a later reconstruction in Level 1) and over just one layer of bricks to the west, where the slope is much more exposed to the atmospheric erosion. On the southern side of the workspace 611, Wall 703 has the same east-west orientation and similar thickness of Wall 603. The entire space was carefully built. Walls 602 and 603 were reinforced by internal



Fig. 25 - Level 2 - Wall 703 with re-used baked bricks.

buttresses (604 and 605) probably used as banquettes for drying and pre-firing vessels during the firing cycles, when the temperature inside the workspace 611 was certainly very high. Both walls 603 and 703 were clay-coated on their inner face up to the ground and Wall 603 was well plastered on the exterior side. Indeed, to the north, the thick layer of green clay plaster applied to Wall 603 and the poorly preserved floor 609 suggest the existence of an open area, where an external pillar (606, corresponding to the inner buttress 605) defines two different working spaces (608 and 607), that were probably occupied by kilns of which no trace remains. However, the clearest proof that Room 611 was very carefully built is offered by the walls themselves. The masonries of 602 and 603 were joined together, namely designed and built as a single structure. Furthermore, at this stage, Wall 703 was constituted by yellowish 40x40x8 cm slabs made of re-used baked bricks: these bricks were fragmentary, but meticulously assembled (Fig. 25). The absence of plaster on the southern face of Wall 703 (and its different nature of this latter) suggests that there was another closed room south of the workspace 611.

A large production unit occupied the southern area. Since in the eastern portion of the workshop (east of Wall 602) Level 2 has not yet been reached under the structures of a later renovation (Level 1) of the atelier, it is difficult to establish precisely the surface of the production unit occupying this southern sector. Anyway, Walls 703, 785 and 622, delimited it. Both Wall 703 and 785 are north-west/south-east oriented, but they are not parallel: it does not depend on a random arrangement of the structures, but on the necessity of organizing them according to the topography of the tell and to the slope that, south of Wall 703, becomes quite steep. This is the reason why Wall 622 (built by reusing stones from Level 4 structures) constitutes a ramp going up the slope and giving access to this portion of the workshop. Six firing installations (615, 781, 780, 773, 778 and 779) have been identified in this sector. Kiln 615 was visible over 3 layers of bricks on its exterior side (above Floor 621): it has a large rounded structure, with a diameter of about 2 m (Fig. 26). Its lower chamber was dug deep into the soil and lined with bricks, while the pierced sole (whose fragments were sustained by a stone lintel and have been recovered in the lower chamber) was located at the same height than the exterior floor (621). Even if quite thin (just one brick large), some little buttresses reinforced the wall of its chamber: one on the interior side, two others flanking the mouth of the chamber, and another external pilaster (616) used as an external workbench. Close to the opening of Kiln 615, built against its eastern wall, Kiln 781 appears as the first installation of a series of firing structures (781, 780, 779, 783) whose masonries were entangled to each other (Fig. 27). Nevertheless, these kilns did not form a single complex structure (as Kilns of Levels 3a2-1). They have different sizes, features and orientations. Three of them (781, 779, and 783) were single-chamber up-draught kilns, while the small intermediate furnace (780) was a horizontal-draught structure with a little internal banquette. The mouth of Kiln 779 was



Fig. 26 - Level 2 - Kiln 615, view from the North.

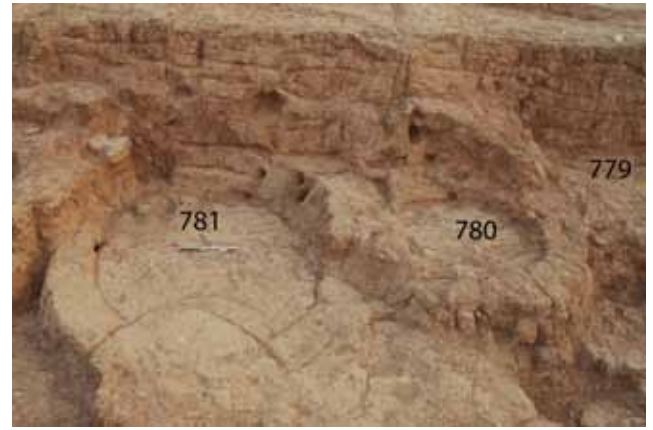


Fig. 27 - Level 2 - Kilns 781, 780 and 779.

probably located on its northern side (under the not-yet removed vestiges of Level 1), while Kiln 781 has a south-oriented mouth occupied by a pit used as *praefurnium* to ignite the fuel and start the heating cycles. It was also equipped with an internal chimney integrated in the masonry of its perimeter. Close to the eastern limit on the trench, Kiln 778 does not share its masonry with other installations but is built against 779. It shows some features similar to Kiln 781, as the ovoid shapes and a *praefurnium* pit in front of the mouth. Nevertheless, from a technological point of view, Kiln 778 is a two-chamber up-draught structure (as Kiln 615), with a well-preserved pierced sole (Fig. 28). Therefore, a cluster of architecturally and technically different kilns occupies the southern production unit: they are stuck into the same mud-bricks platform (784), they are adjacent to each other and sometime even built together (as demonstrated by their intertwined walls and shared masonries). However, they are functionally independent and their proximity to each other was just intended as a structural economic solution to construct their domed roofs. Some of them could be built at the beginning of each firing cycle and then destroyed at the end of the process to take out the pots. The clear advantage of roofs leaned against each other was that they were easier to reconstruct than isolated domes.



Fig. 28 - Level 2 - pierced sole of Kiln 778.

Probably, this kind of organization characterized also another production unit, on the northern side of the excavated area, where the erosion of the very steep slope has almost completely obliterated the architectural vestiges. Nevertheless, the ruins of Kilns 761 and 762 seem to respect the same planning observed in the southern sector, with different agglutinated firing installations, sometimes equipped with a smokestack (as 762) or a little banquette (761), showing distinct technical features (with one-chamber and a horizontal draught as 762, or two superposed chambers and a vertical draught as 761), and sharing a portion of their perimeter to easily support their respective roofs.

The better evidence for massive dimensions and care for architectural details comes from Kilns 617 and 613, in the western production unit of the workshop. Kiln 617 is a huge roughly circular structure, which was completely obliterated by the atmospheric erosion in its

western portion. Based on the excavated sector, Kiln 617 had a diameter of about 8 m, with an internal space (619) constituted by an 8 cm thick clay floor (624) hardened by the heat. Internal buttresses (632, 631) reinforced its 1.5 bricks large external wall. Some of these buttresses were hollowed structures used as chimneys to evacuate the smoke. Because of the enormous dimensions of Kiln 617, the system of aeration and evacuation constituted a critical element from both the architectural and the physical point of view. The excavated surface allows us only a partial understanding of this extremely complex system, where Kiln 613 played a central role. On the one hand, it is a medium-sized (internal diameter of about 80 cm) two-storey kiln, with a pierced sole separating the chambers and supporting the vessels during the firing cycles. On the other hand, it was also used as a way to evacuate the smoke of Kiln 617. In fact, under the pierced sole, the heating chamber of kiln 613 was not intended to contain the fuel: it was occupied by the intersection of two evacuation channels. Two little internal chimneys (about 20 cm of diameter) had the function of conveying the smoke outside from the firing chamber (the upper one) of Kiln 613. But the most impressive structures were represented by the system connected to Kiln 617. North of Kiln 613, a north-south-oriented 20 cm large duct (628) formed an underground (under Floor 623) conduit lined and covered by bricks that passed under Wall 603 and carried a part of the fumes to the outside. South of kiln 613, this same duct was connected to a chimney. Likewise, a west-east oriented duct connected Kilns 617 and 613. The fumes passing through this channel were incandescent:

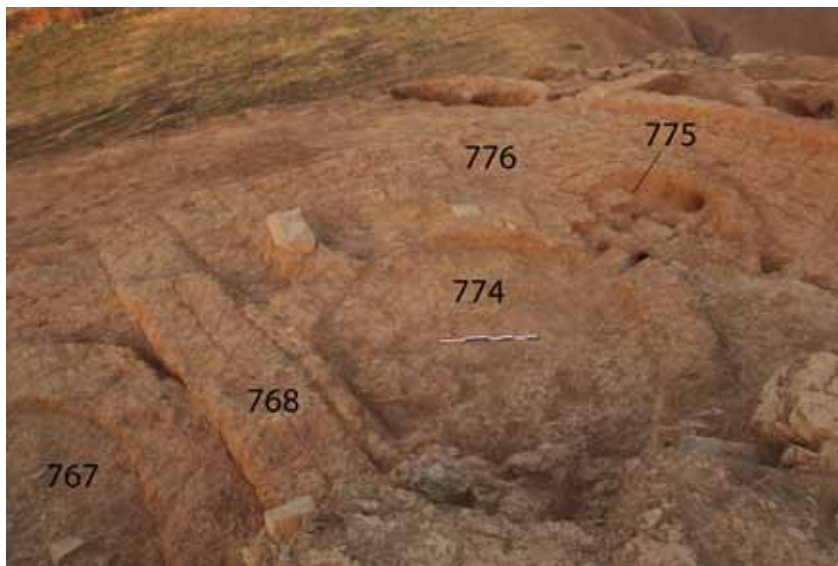


Fig. 29 - Level 2-1 - Kiln 774 ant praefurnium 775.

to isolate this pipe, the connection between Kilns 617 and 613 is constituted of bricks hardened by the heat, laid sideways and separated by thick layers of clay mortar. This same structure continues to the east of Kiln 613, passes under the wall 602 and reach another complex structure, composed by a *praefurnium* intended for centralize the incandescent smokes (775) and by a kiln (774) equipped with two large chimneys (Fig. 29).

This multiple firing installation worked similarly to Kiln 613: the *praefurnium* (775) was an antechamber collecting smokes and heat that were conveyed through the ducts 626 and 612, while the two-storey up-draught Kiln 774 served both to fire pots exploiting the heat that was channelled there, and to evacuate the fumes through its lateral chimneys. As Kiln 613, also *praefurnium* 775 distributed heat not only on an east-west axis (namely towards Furnace 774), but also towards north, where, through an underground duct (similar to 628), the *praefurnium* 775 was connected to a two-chamber (755-754) horizontal-draught kiln. This double structure (a third chamber, 770, has been added later) used the heat channelled through the underground ducts to enable the internal horizontal draught thanks to the little

step between the two compartments, 755 and 754. The entire system – Kilns 617-613, Ducts 626-612 and 628, *Praefurnium* 774, vertical Kiln 775 and horizontal Kiln 755-754 – was conceived and constructed as one huge structure, as demonstrated by the fact that masonries of kilns and channels were embedded to each other. The whole firing complex, and especially the whole set of all pipes and funnels, was built according to a small slope towards north and towards east, in order to facilitate the draught of heat and fumes of the huge Kiln 617. Moreover, it is not occasional that the mouth through which Furnace 617 was supplied with fuel and vessels is located between Wall 703 and the channel (626) connecting Kilns 617 and 613. The hardened (or rather baked) bricks of Floor 625 constituted the entrance of the inner space of Kilns 617 and represent an additional evidence of the fact that the entire workspace 611 has been built to organize firing structures working together.

From a typological point of view, several structures of the workshop, as Kilns 615, 778, 761 (and even Kiln 613 and 774, if considered as isolated furnaces) are up-draught two-storey firing installations, a well-known kind of kilns since the Halaf phase in the 6th millennium BC (Hansen Streily 2000)⁸. Kilns with one chamber used both for fuel and for vessels (as 617 or 783) are also well documented in this period⁹. But the system constituted by kilns 617-613-775-774-755-754 is rather a cross-draught (or horizontal draught) kiln, where air flowed horizontally, from Kiln 617 through the duct 626-612 and Kiln 613 towards Kilns 774 and 755-754. Given the enormous dimensions of kiln 617 (more than adequate for a brick kiln)¹⁰, able to contain hundreds of pots, the draught was not provided by a fan. On the contrary, the air movement was caused by the draught created by the chimneys and by the slight slope towards the north and the east. In this sense, the firing system of Level 2 offers a unique perspective on a firing technology that was not documented until now for the 3rd millennium.

LEVEL 1

The most recent phase is represented by a renovation of the workshop. In the western sector, Walls 602, 603 and 703-614 are rebuilt. The latter, whose first stage (Level 2) was in baked bricks, was rebuilt in 49x35 large mud-bricks. The masonries of the three walls are embedded to each other as in Level 2, which confirms that Level 1 corresponds to a general reconstruction of the ceramic workshop. In the corner, both Walls 602 and 603 show regular fillings of mortar between some bricks, according to the same technique used in Level 2 for the isolation of the aeration duct 626-612. This is a clear evidence for the presence of channels leading to the horizontal Kiln 755-754, newly restructured by building a *praefurnium* (770) (Fig. 30). They were certainly connected to duct 628 under Wall 603. Therefore, they were part of the horizontal-draught system that extended starting from the huge Kiln 617 and the crossroad

8. During the second half of the 3rd millennium, similar two-storey kilns are widely attested, as at Tell Jigan (Kiln k3 – Fuji 1985: fig. 5), Tell Brak Area FS (Oates, Oates and McDonalds 2001: 64), Tell Bi'a-Tuttul (Strommenger and Kohlmeyer 2000: Taf. 76.1-76.2).

9. See for instance at Tell Barri (Kiln 1140 – Pecorella 2004: fig. p.20), Tell Jigan (Kiln 2 – Fuji 1985: fig. 5), Tell Bi'a-Tuttul (Strommenger and Kohlmeyer 2000: Taf. 50.3-50.4)

10. Nevertheless, the entire area yielded exclusively large amounts of ceramic slags. Moreover, the rarity of burnt bricks in this period makes it unlikely the hypothesis that 617 was a brick kiln.

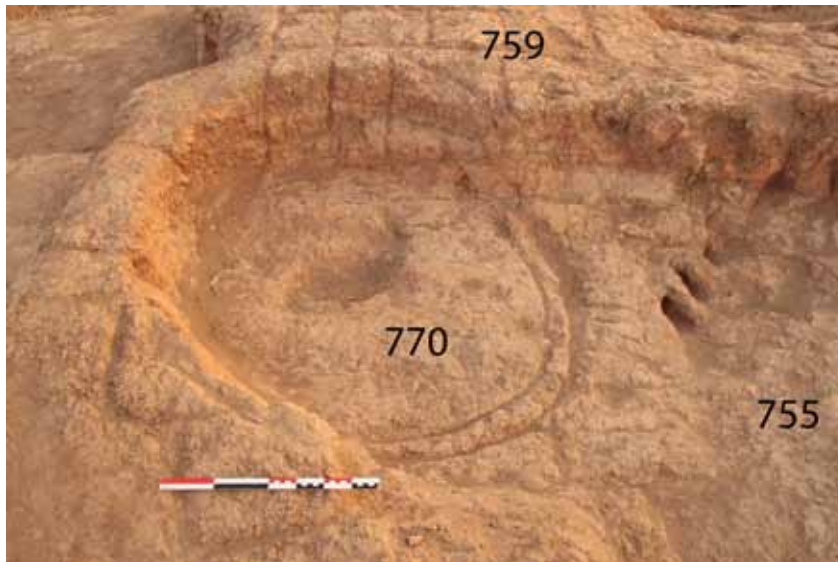


Fig. 30 - Level 1 - Kiln 770, view from the South.

of chimneys 613. These latter remain in function in Level 1, as well as *praefurnium* 775 and kiln 774, and the entire system becomes even more complex than in Level 2. In the northern portion of the system, a noticeable development is represented by the extension of the structure formerly composed by the double horizontal kiln 755-754. In Level 1, a workbench (752) is also built between Kiln 775-774 and this mul-

multiple installation, that becomes a triple structure. Its *praefurnium* (770) worked according to the same mechanism of *praefurnium* 775 (which was connected to the halfway chamber of this triple horizontal kiln): it collected heat and smokes conveyed from an underground duct running through Wall 603 and re-injected incandescent gasses into the triple kiln (770-755-754) triggering a horizontal draught. It is the same mechanism one can observe north of Wall 603. At the northern edge of the workshop, where the erosion of the slope is too severe to identify any vestiges, Workplace 607 was an external (because Wall 603 had a thick coat of plaster on its northern surface) space probably occupied by a kiln heated by gasses channelled through Duct 628. According to the general design of this kiln system, from Workspace 607, heat and smokes were conveyed eastwards, where two horizontal pipes (757 and 758) were equipped with vertical chimneys and led to another kiln (753), alongside the eastern limit of the excavation. Even if Kiln 753 is badly damaged by a recent pit (756), its rubified walls, as well as the many slags and overfired ceramics it yielded, leave no doubts about the high temperatures reached inside its chamber. Even if the erosion of northern slope does not allow to reconstruct the entire firing system which radiated from the enormous Kiln 617, the functioning of this chains of kilns can be easily read. Kiln 617 was not only the heart of the system, but also the only place where fuel burned. The energetic input developed inside Kiln 617 was sufficient to power several other horizontal kilns (775-774, 770-755-754 and other devices between Workplace 607 and Kiln 753). But even this technical expedient was not enough to disperse the heat without it being destructive to the structures. This must have been a serious architectural problem and was certainly the reason that inspired all the solutions put in place both to disperse and to exploit the heat. From a structural point of view, an important measure during the renovation of Level 1 has been the construction of a series of mud-bricks platforms (Platform 776 south of triple Kiln 770-755-754, and Platform 759 north of this same installation) covering the whole area east of Wall 602. Indeed, this one, that was a wall in Level 2, is no longer a wall in Level 1: it is incorporated in the platform, that plays both an architectural and a technical role (Fig. 29). On the one hand it constitutes a floor layering the entire area and, on the other hand, it isolates the ducts conveying the heat between

the different installations of the system. Both portions of the platform (759 and 776) were built to allow the passage of the ducts, while bricks were arranged to wrap and isolate them. This way, the floor, where probably pots were piled-up to dry, was not too hot for the workers. The extension of these platforms indicates the limits of the wide production unit constituted by the system of kilns around Furnace 617. It suggests that the renovation of the workshop in Level 1 implied that its northern portion (that constituted a separate production unit in Level 2) was incorporated in the Kiln 617-centred workplace. The eastern limit of the production unit and of its platform is indicated by a roughly north-east/south-west oriented two-rows of bricks wide wall (778). It represents a major partition within the workshop and a significant change compared to the previous phase, where production units extended eastwards without any divider, as demonstrated by the southern portion of the Workshop in Level 2. The presence of a deep illegal excavation on the southern side of the atelier did not allow to reconstruct the organization of the Level 1 workshop in this area: all the structures have been removed by a profound east-west oriented trench that damaged some portions of Platform 776 (as the pit or kiln 782), but above all vestiges close to the eastern limit of the excavation. Nevertheless, the organization of the workshop is still understandable. Given the absence of southern pipes and ducts radiating from Kiln 617, the southern limit of its production unit (and therefore also the southern limit of Platform 776) probably matched with Wall 614. But East of Wall 768 some structures (as a banquette built against 768) are clearly fragmentary and indicate that the production unit located in this area developed also southwards. The only installation completely excavated is Kiln 767, with a large external chimney on its eastern side (Fig. 31). But also Kiln 769 (partially visible along the limit of Trench D) probably had the same structure, with a large external double chimney (772). Installations of this production unit are built close to those of the unit characterized by the complex system of kilns and pipes around Furnace 617. A banquette (751) related to Kiln 767 was built against another banquette inherent to Installations 770-755-754 and 775-774. The two workbenches constituted a mud-bricks block shared by the two production units, as also Wall 768. This one incorporated in its own masonry the perimeter walls of Kilns 774 and 767, which represents an additional proof that the entire workshop of Level 1 was planned and built as one single edifice, since kilns of different production units were built together. Nevertheless, this architectural integration between different production units does not imply any kind of functional integration. On the contrary, Wall 768 represents a very substantial separation. On its western side, the floor was layered by a mud-brick platform, while



Fig. 31 - Level 1 - Kiln 767 and wall 768, view from the North.

On its western side, the floor was layered by a mud-brick platform, while

on its eastern side the space between the kilns was a simple clay soil. In the western production unit, the entire system developed around Kiln 617 worked according to a horizontal draught, while in the eastern unit Kilns 767 and 769 were two-storey up-draught structures. In the western unit all the firing facilities were multiple installations, while in the eastern unit kilns are simple circular structures where even chimneys are always external. It is obvious that the importance of Level 1 workshop goes beyond the extreme complexity of some of its firing structures and the architectural planning offers clear evidence for the organization of the production in the last quarter of the third millennium BC.



LOGARDAN TRENCH E: STRATIGRAPHY AND ARCHITECTURE

Martin Sauvage, Melania Zingarello, Sidonia Obreja
and Hawkar Ahmed Abdullrahman

A first excavation campaign was conducted in fall 2016 on the upper terrace of Logardan: a 13x5m Trench E, oriented NW-SE, was opened¹, following a surface² and a geomagnetic survey.³ Its purpose was to study the relationship between a clear magnetic anomaly of rectangular shape, indicating the presence of a significant architecture to the SE, and an interruption of the magnetic signal that seems to indicate an access to the “citadel” to the NW. In addition, the area provided the most Bronze Age potsherds, following the results of Trench C conducted in 2015,⁴ the upper levels of which belonging to the same period. The objective of this operation was therefore mainly to study Bronze Age levels. The excavations of the 2016 campaign have indeed revealed the presence of an important building, with part of a room devoted to storage and containing several large jars that can be dated to the beginning of the 3rd millennium.⁵

The aim of the 2017 campaign was to continue the research initiated in 2016, with three objectives: (i) the clearing of the access way leading to the “citadel” at the top of the site; (ii) the continuation of the excavation of the 3rd millennium storage compound (Fig. 1 and 2); (iii) a better understanding of the occupation of this part of the site from the 4th to the 2nd millennium BC.⁶

1. See Sauvage et al. 2016b; Zingarello 2016.

2. Sauvage et al. 2016a.

3. Daras and Benech 2016.

4. Baldi and Nacarro 2015.

5. See Zingarello 2016.

6. The excavations of Trench E took place from September the 16th to October the 12th 2017 under the direction of Dr Martin Sauvage (CNRS, UMR 7041 ArScAn, Nanterre) with the participation of Melania Zingarello (PhD Candidate, University of Strasbourg, UMR 7044 Archimède), Sidonia Obreja (PhD Candidate, University Paris 1 –Panthéon-Sorbonne, UMR 7041 ArScAn, Nanterre) and Dr Hawkar Ahmed Abdullrahman (assistant professor, University Salahaddin, Erbil). The pottery unearthed during the excavations has been studied by Dr Johnny S. Baldi for the 4th millennium and M. Zingarello for the Bronze Age, 3D photogrammetric survey of the excavation has been conducted by Dr Micheline Kurdy.

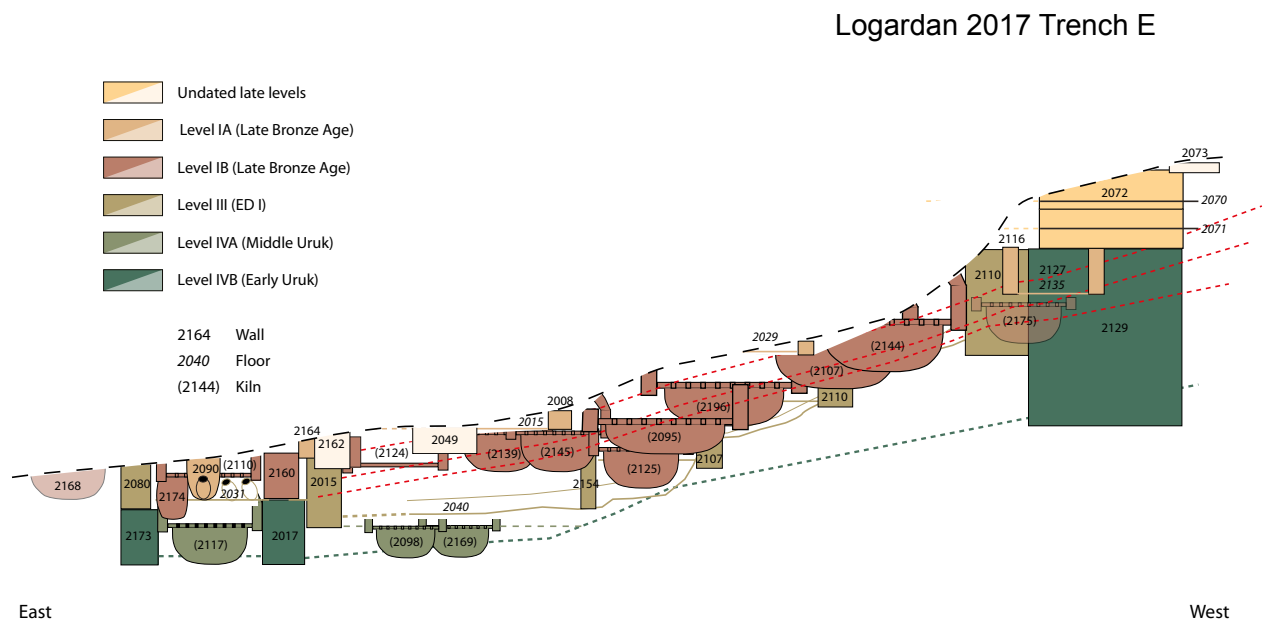


Fig. 1 - Orthostatic view of Trench E (M. Kurdy)..



Fig. 2 - General view of Trench E, from the east..

Seven levels have been identified so far, grouped into four phases (Fig. 3), some of them still undated due to the lack of associated floor and stratified material. This is the result of the strong erosion of the slope of the tell, that has partly destroyed the higher levels. This is also due, especially for the 3rd millennium layers, to the presence of many Late Bronze pottery kilns deeply dug through the previous levels.



CAD: Martin Sauvage (CNRS, UMR 7041 ArScAn-VEPMO, Nanterre)
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Fig. 3 - Stratigraphic simplified scheme (CAD M. Sauvage)..

LEVEL IVB (EARLY URUK)

The earliest level spotted (IVB) is to be dated to the Early Uruk period (with true Southern Uruk pottery), its assemblage being similar to that found in Trench C of Girdi Qala and in Trench D of Logardan.⁷ However, no floor of this level have yet been discovered (this will be one of the aims of the next campaign), only the stone foundations of few walls (Fig. 4).

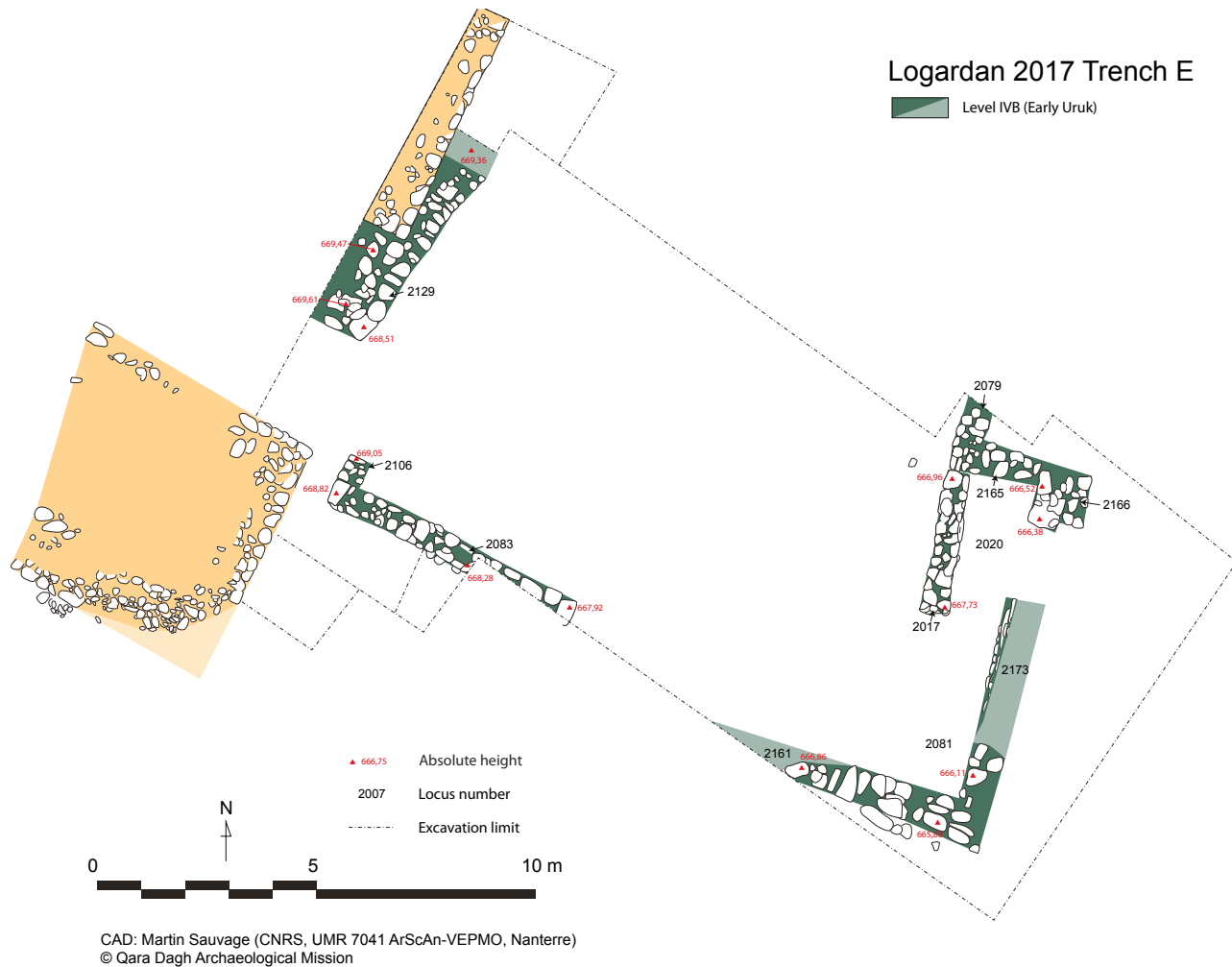


Fig. 4 - Plan of level IVB (CAD M. Sauvage).

In the south-east part of the trench, a set of stone wall foundations delimit a room 2020: wall 2017 to the west (Fig. 5), 2165 to the north and walls 2166/2173 to the east (Fig. 6), where is a doorway to access the room (Fig. 7). Wall 2173 was spotted at the base of the wall 2080 of Level III, which was installed on it with a slight shift of axis.

7. Baldi 2016 and this volume.



Fig. 5 - Level IVB, wall 2017 (center) with Level III wall 2015 (left) and level IA wall 2029 (right).



Fig. 7 - Level IVB, room 2020-2081, from the north.



Fig. 6 - Level IVB, room 2020, walls 2165 and 2166, from the north.

Wall 2079, in the extension of wall 2017, delimits another area to the north. Wall 2173 continues to the south with a return wall to the west (2161) and defines another locus, 2081 (Fig. 8). The presence here of structures and later walls (see below) does not allow, for the moment, to understand the organization of circulations west of locus 2081. Moreover, the reoccupation at level IVA, with the installation of several kilns (see below), prevented us from finding the corresponding floors in such a limited area excavated. Nevertheless, as already said, the ceramic found in the layers cut by level IVA indicates that level IVB must probably be dated to the Early Uruk period.



Fig. 8 - Level IVB, room 2020-2081, from the south.



Fig. 9 - Level IVB, walls 2083 and 2106, from the west.



Fig.10 - Level IVB, walls 2083 and 2106, on which walls of level III are abutted, from the north.

To this same level IV are to be assigned several walls in the western part of the trench. In the south-west corner of the trench, the stone base of a long wall 2083 runs about 6 m in length, where it turns to the north with wall 2106 (Fig. 9). Both are covered by level III whose walls come up against (Fig. 10).

To the north-west, at the foot of the abrupt slope of the “citadel”, a massive retaining stone wall (2129, Fig. 11), whose width is still unknown, stops to the south to make room for a passageway leading to the top of the tell. The excavation did not allow reaching the ground of the passageway for this level. The south side and hence the width of this passage is not yet known either because later structures (of the same passageway) were built there (see below) and remain to be extensively cleared.



Fig. 11 - Northern part of the passageway with the late ‘bastion’ settled on wall 2129 of level IVB. On the right, wall 2110 of level III abutted against wall 2129.

LEVEL IVA (MIDDLE URUK)

In the ruins of level IVB, pottery kilns dating to the Middle Uruk Period have been settled, taking advantage (as in room 2020) of the remains of the ancient walls (Fig. 12).

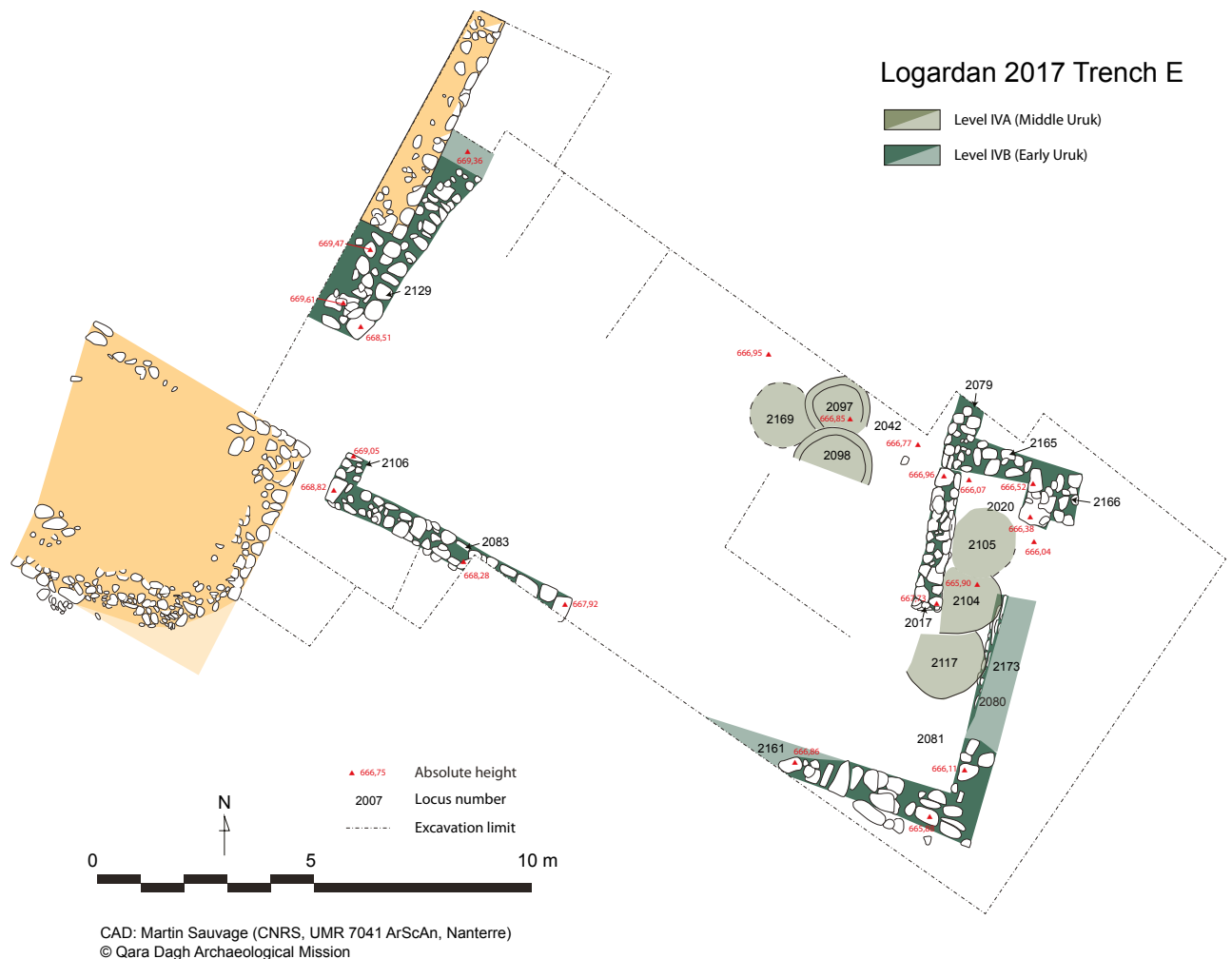


Fig. 12 - Plan of level IVA..

In locus 2020, the excavations stopped at the level of the soles of two furnaces, 2117 and 2104 (Fig. 13), with a third one to the north (2105) whose limits could not be completely delineated. These three kilns were set in the ruins of room 2020 of level IVB, the foundations of its walls, preserved on a height of approximately 50 cm, having been used to consolidate the construction of the vaults of the cooking chambers. Along wall 2173 to the east, a chimney of the level IB kilns was been dug down to this level (see below).



Fig. 13 - Level IVA, kiln 2117.

Taking up part of the basements of the Uruk walls and raising them up, the installation of the first half of the 3rd millennium constituting our level III begins to be better known (Fig. 16 and 17). It is a large building organized around a central courtyard lined with narrow rooms devoted to storage (see Fig. 18 for a hypothetical preliminary reconstruction).



Fig. 17 - General view of level III, from the northwest.

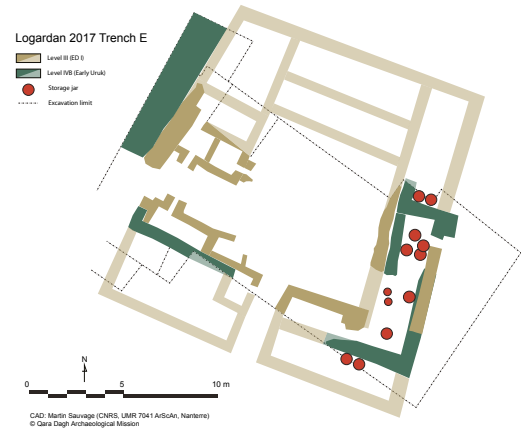


Fig. 18 - Hypothetical reconstruction of the level III.

In the southern part, a room (2020) of the building was partially cleared in 2016 and other similar rooms were identified in 2017. These are storage rooms containing large jars, some bearing an appliqué decoration of notched ropes.⁹ Room 2020 was completely excavated this year and confirmed a complex stratigraphy: the level III settled in the ruins of the occupation of the Uruk period (see above). This is clearly a storage room in which several large jars (Fig. 19) were stored with small pots.¹⁰ Its roof had collapsed on its contents, obviously because of a fire. Pottery kilns dating from the Late Bronze Age (level IB) were dug in this layer of collapse (Fig. 20) as well as pits from level IA (see below).



Fig. 19 - Level III, storage jar from room 2020.



Fig. 20 - Level III, view of room 2020, from the north. In the front, pit 2090 of level IA; behind, the collapsed roof on jars of level III, and in the background against the wall the mud-brick foundations of kiln 2100 of level IB.

9. See Zingarello this volume, for the Bronze Age ceramics from Logardan.

10. Sauvage et al. 2016b.



Fig. 21 - Level III, locus 2081 of room 2020-2081 with a storage jar and a domestic oven.



Fig. 22 - Rooms 2112, 2089 and 2189, from the west.



Fig. 23 - Level III, room 2137, from the south.



Fig. 24 - Level III, room 2134, from the north-west.

The same pattern was found in loci 2081 (Fig. 21) more to the south. The partition wall 2082 (with 2020) is probably much later (level IB), loci 2020 and 2081 forming only one long single room (approximately 7m long and 2m wide), provided with an access to the east (2178). To the north (2075) and south (2178) of room 2020/2081, storage jar sherds were also spotted. This indicates that the building was extending south and north of the trench with at least two more rooms on this side (Fig. 18). At right angles with room 2020-2081, to the south-west, another rectangular room was cleared (2142). The western part of the building seems to be occupied by silos rather than storage rooms. A passageway to the south (2132), possibly an entrance of the compound, separates room 2142 from a set of three small rooms (2189, 2089 and 2112), barely more than one meter wide (Fig. 22). Another much wider passageway, to the west (2118), divides this set from two other rooms of the same type to the north (2137 and 2134). Rooms 2112, 2137 (Fig. 23) and 2134 (Fig. 24) had a protruding narrow opening (0.2m), flanked by outward walls. Unfortunately, level IB kilns removed the floors of these rooms. Their function is therefore difficult to define, but we can suppose, given their size and openings, that they were silos, probably for the storage of grain.

The Level III compound seems to be organized around a central courtyard (2002-2006), equipped with a clay floor (2040). To the west, the path (loci 2118 and 2114) giving access to the “citadel” presented a steep slope (1.50 m of difference in height). Here again, it was heavily destroyed by the Late Bronze age kilns of level IB.

LEVEL II (AKKAD-UR III)

A number of potsherds from the Akkad and Ur III periods were found in Trench E, in layers at the interface between levels III and I or mixed with Late Bronze material¹¹. But no architecture can yet be assigned to these periods, well represented at the top of the site (Trench D). It seems that this part of the upper terrace was clear of construction at that time. We keep nonetheless the label “level II” for this phase as the possibility to find a contemporary building elsewhere on the terrace exists.

LEVEL IB (LATE BRONZE)

In the ruins of level III were installed many Late Bronze age pottery kilns (level IB). Several levels of ruined and stacked kilns have been identified, often organized in batteries like in Trench D¹², especially to the west (Fig. 25), where kilns 2175, 2144, and

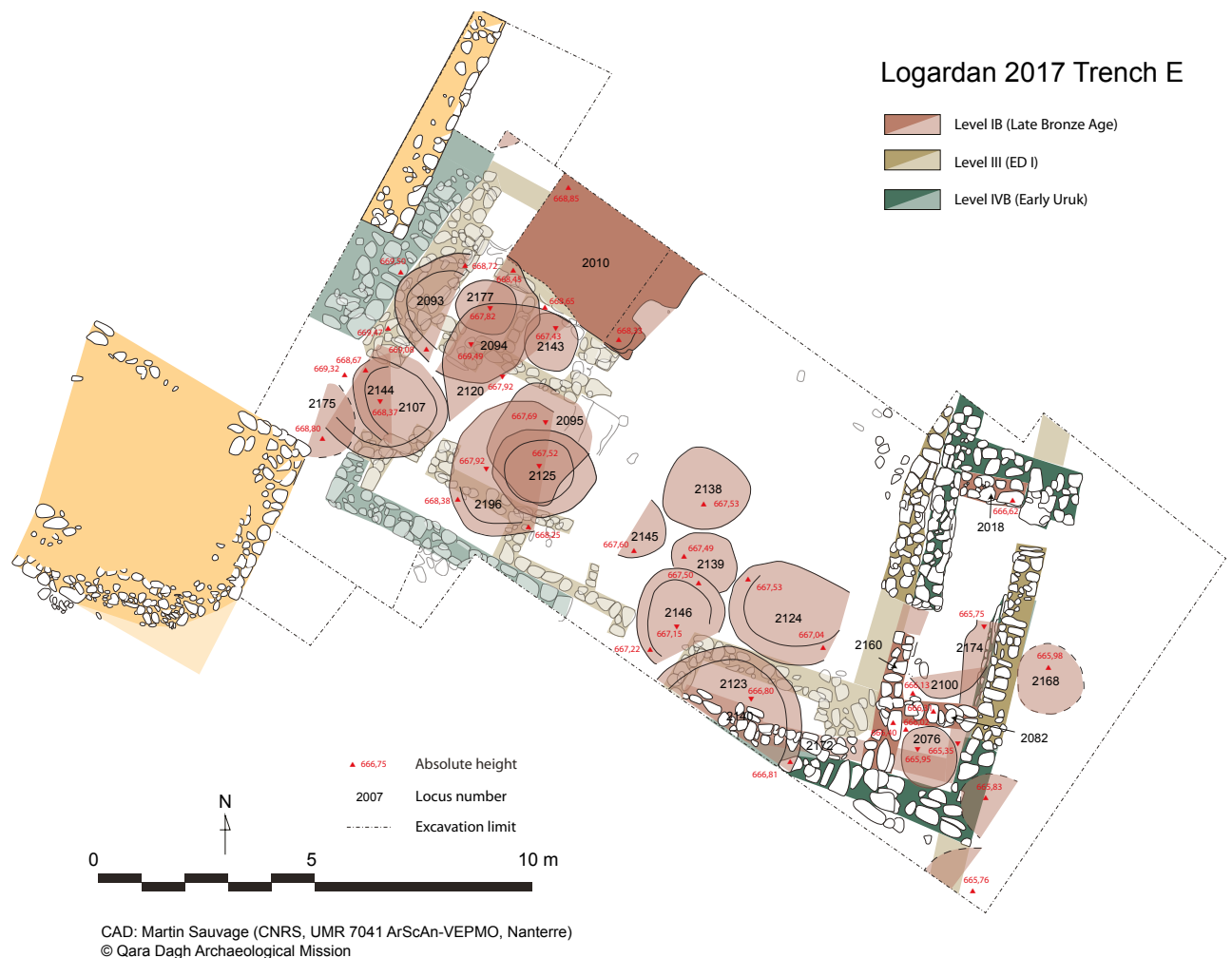


Fig. 25 - Plan of level IB.

11. Zingarello this volume.

12. Baldi, Nacarro, Bride and Rahoof, this volume.

2107 blocked the passageway towards the citadel. The whole of this level of kilns is to be dated to the Late Bronze Age¹³.

Most of the kilns took advantage of the walls of level III for their setting: it is the case, for example, of kiln 2093, partly installed on the wall 2110, or kiln 2196 on the wall 2107. It is also to be noted that many kilns have been built in rooms of level III: kiln 2177 in room 2137, kiln 2143 in room 2134. The long Room 2020-2081 to the east was arranged using the former walls and building new ones (2018, 2082 and 2160) in order to house a battery of kilns, only preserved in foundations (Fig. 26), dug in the collapse of level III (Fig. 27). These kiln batteries were equipped with chimneys and underground ducts (2140, provided with a cover of stone, and 2174, Fig. 28), which allowed the circulation of the heat between the kilns.

There are two types of kilns (Fig. 29). Furnaces without separated firing chamber (2124, Fig. 29 -on the left) and hearth furnaces with firing chamber and laboratory



Fig. 26 - Level IB, foundations of kiln 2076 in room 2081.



Fig. 27 - Level IB, foundations of kiln 2100 in room 2020.

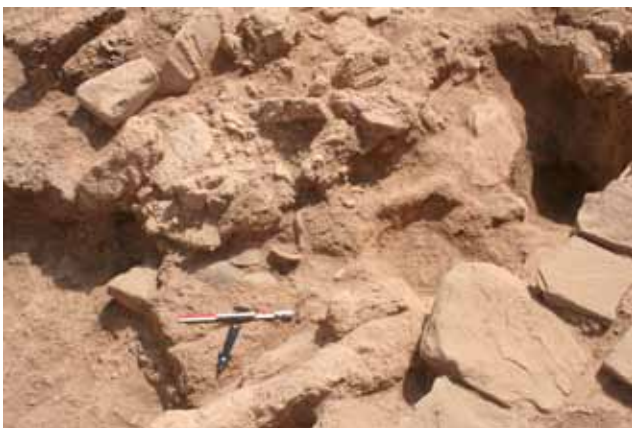


Fig. 28 - Level IB, duct 2174.



Fig. 29 - Level IB, two types of kilns. On the left, the foundations of the firing chamber of kiln 2146; on the right, furnace 2124.

13. Zingarello this volume.



Fig. 33 - Level IA, room 2127.



Fig. 34 - Level IA, stratigraphic sequence in room 2127.



Fig. 35 - Level IA, pit 2090 in room 2020.



Fig. 36 - Level IA, pit 2102 in room 2020.

Room 2007 and its floor (2015) had been cleared during the 2016 campaign, but revealed to be completely eroded to the South. Several fragmentary basis of stone or mudbrick walls belong to this level: Walls 2019 and 2164, already spotted in 2016, Walls 2085 and 2030 and probably 2148 and 2149, which delimit locus 2113 to the NW. The attribution of wall 2167, to the east, remains hypothetical. South of room 2007, a corridor or a street could be identified (loci 2076, 2089 and 2088), due to much eroded alignments of mudbricks.

To the west, two perpendicular walls 2116 and 2126 delimit a room 2127 with a floor (2136) and a *tannur* made of earth with a coating of potsherds, some of them dating to the Late Bronze Age (Fig. 33). The walls rest upon the floors of level IB (Fig. 34), while the *tannur* has been cut by the foundations of a later ‘bastion’ (2072, see below).

Finally, in the eastern part of the trench, pits of this period have pierced the layers of level III, especially in room 2020 (Fig. 35). One of these pits (2090) contained a storage jar (LOG.E.1108-1)¹⁴ while another pit (2102) partly destroyed another level III jar (Fig. 36).

14. Zingarello this volume, Fig. 8.

THE UPPER REMAINS

To the west end of Trench E, in the slope of the so-called “citadel”, seems to be installed atop of level IA some kind of a double bastion provided with stone foundations (Fig. 37). It seems to have been square-shaped for its southern part (2072), with 5.80 m

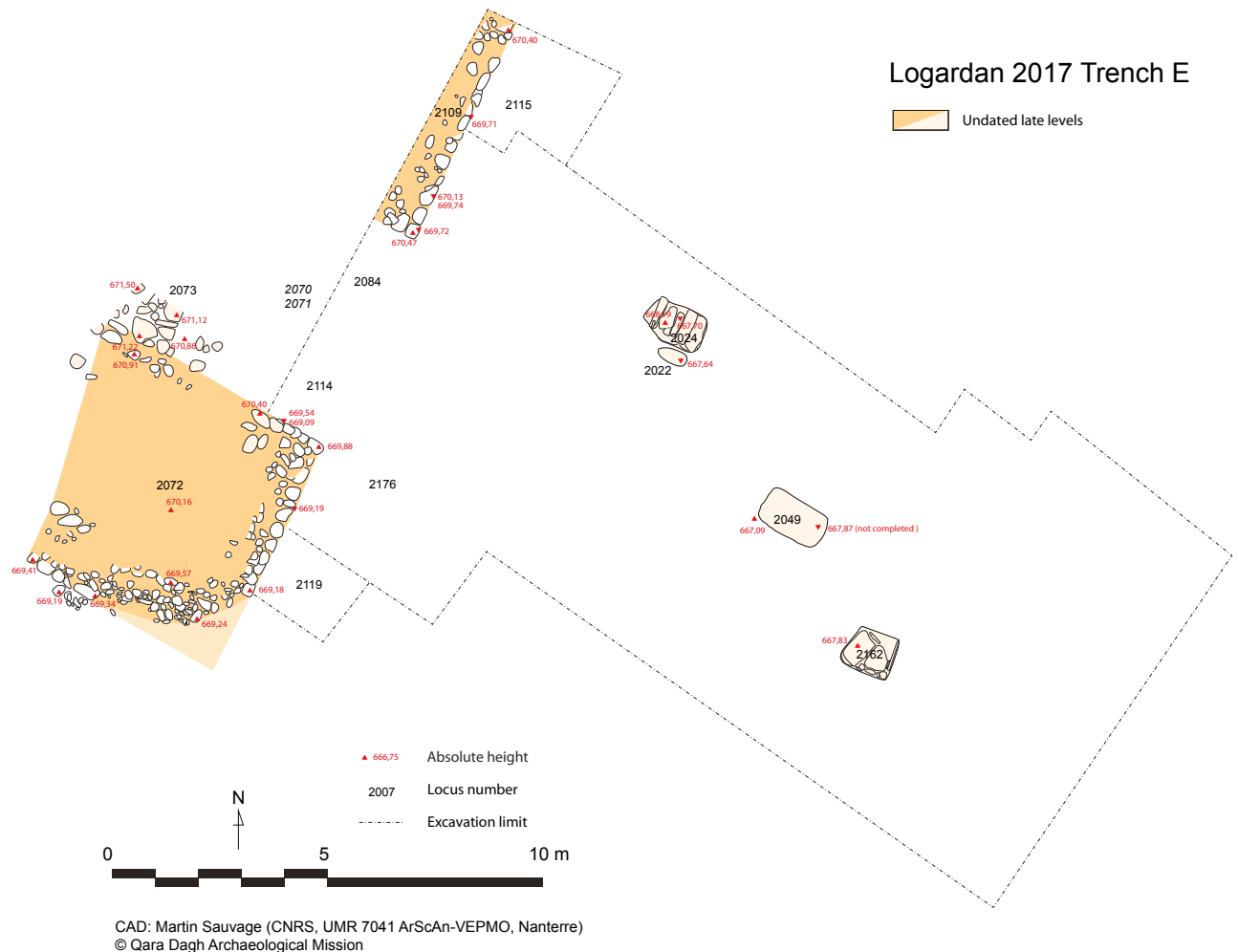


Fig. 37 - Plan of undated levels.

long sides, but could continue further west (Fig. 38). The northern part was cleared on a limited area of 5.50m on 0.8m (Fig. 39). A 5-meters wide passageway separates the bastions. In section, two successive floors could be spotted (2114 and 2084) in the passageway. Due to the slope and the erosion, they quickly disappeared to the east and did not give any material. The bastions display two successive states of



Fig. 38 - View of bastion 2072, from the south.



Fig. 39 - The two states of bastion 2109, from the east.



Fig. 40 - View of the two states of bastion 2072, from the north-east.



Fig. 41 - unexcavated Tomb 2162.

construction (Fig. 39 and 40) that must correspond to the two floors identified in the passageway. During the next campaign, it will be necessary to clear these structures more to the west, inside the citadel proper, in order to be able to date these levels of occupation.

Finally, Trench E contained a set of four tombs. Two of them (2024 and 2022), excavated in 2016, did not deliver any datable material (but the bones are yet to be studied). A fourth grave, 2162 (Fig. 41), was found at the end of the 2017 season and remains to be excavated: as 2024, it is a likely cist-grave with a flat slab cover.

CHALCOLITHIC CERAMICS FROM LOGARDAN TRENCHES D AND E: MORPHO-STYLISTIC FEATURES AND REGIONAL PARALLELS

Johnny Samuele Baldi

As already observed in 2016, the assemblage from Levels 1-3 of Trench D at Logardan dates back to the 3rd millennium BC: Levels 1-2 yielded Ur III ceramics, while pottery from Level 3 and its sub-levels belongs to a Proto-dynastic III-Akkad horizon¹. Although some out-of-context chalcolithic sherds have been collected in Levels 1-3², 4th millennium ceramics come essentially from Level 4a-c and date back to the Early and Middle Uruk Phase (Fig. 1). However, 4th millennium ceramics have also been collected this year in Trench E³, where two different 4th millennium phases of occupation are recognizable, Early and Middle Uruk respectively. Trench D yielded a limited amount of chalcolithic pottery (882 sherds, of which 63 typologically diagnostic samples), while a much more important quantity comes from Trench E (2018 sherds, of which 144 typologically diagnostic samples). It significantly improves the information available on the south-Mesopotamian repertoire in Central and Northern Mesopotamia. It demonstrates also that the Early Uruk presence (about 3900 BC) at Logardan is not limited at the edge of the hill (Trench D), but completely occupies the top of the anthropic tell and continues during the first part of the Middle Uruk period (about 3700 BC)⁴.



Fig. 1 - Early and Middle Uruk vessels.

Concerning the Early Uruk repertoire at Logardan Trench D Level 4 and Trench E Level IVB, open shapes, conical flat-base bowls with rims slightly rounded or thickened on the exterior side are roughly finished and sometimes scraped on the lower part of the exterior body⁵. Some

1. Zingarello, this volume.
2. Despite important building activities due to the construction of the kilns in Levels 1-3, only 89 chalcolithic sherds (7 Halaf, 39 Ubaid and 43 Early Uruk specimens) were found out of context in Trench D.
3. Several 4th millennium sherds were amongst other chalcolithic ceramics collected during the survey of the Area E, but stratified contexts in Trench E yielded only sporadic out-of-context 4th millennium fragments in 2016.
4. Since it has not yet been possible to excavate on an important surface the Middle Uruk phase in Trench E (the Middle Uruk occupation in Trench D has yielded a very limited quantity of materials), for the moment it is impossible to state whether these two phases correspond to a uninterrupted occupation, or if there is some intermediate hiatus.
5. Both morpho-stylistic and technical features of these conical bowls match with late (i. e. LC2) oriental samples of “V”-shaped Coba bowls attested in northern Mesopotamia during this phase (Baldi 2012b). For south-Mesopotamian Early Uruk parallels see Eridu (Safar *et al.* 1981: fig. 22; Wright 2014: fig. 7.2.a-b), Farukhabad (Wright 1981: fig. 46.d-f), Geser 15 (Alizadeh 2014: fig. 61.G).

samples of little carinated bowls are well-shaped and fine-walled (Pl. I.5)⁶. In-turned rim bowls are quite shallow and have rounded or somewhat inwards belled rims⁷, while a deeper type displays pinched or top-flattened rims (Pl. I.6)⁸ and a slight carination towards the middle of the body (Pl. I.4)⁹. Coarse flattened-base basins, a widespread shape of the Middle Uruk period, appear since this early phase (Pl. I.3), even if they are better attested in the Middle Uruk Level IVA in Trench E¹⁰. Bevelled-rim bowls (hereafter BRBs), which are considered the main hallmark of the Uruk period, are quite rare and not yet serially produced: their rims can be oblique, but most of time are vertically bevelled on the exterior side (Pl. I.1)¹¹. But the most characteristic open containers are the so-called proto BRBs¹², with rims sometimes thinned, rounded, or loosely cut and bevelled in various ways and with varying orientations (Pl. I.2, Fig. 2)¹³.

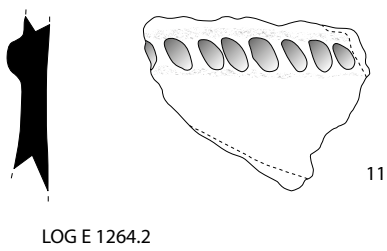
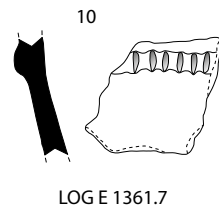
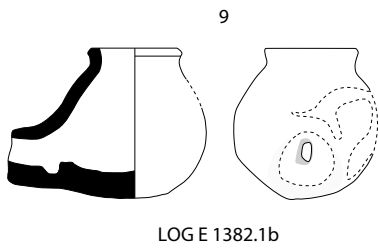
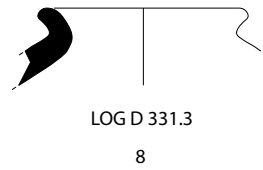
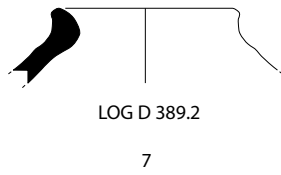
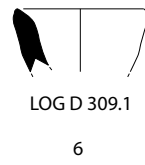
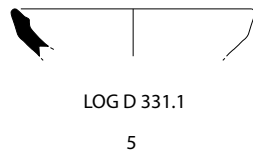
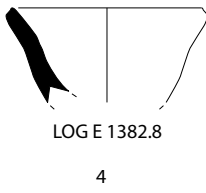
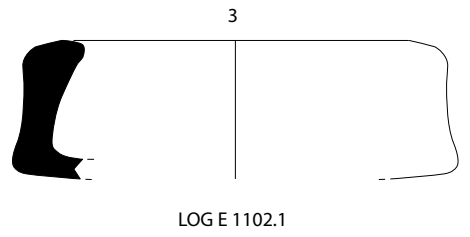
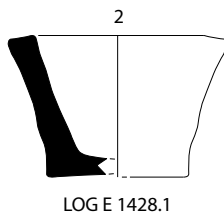
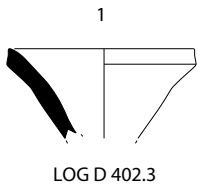


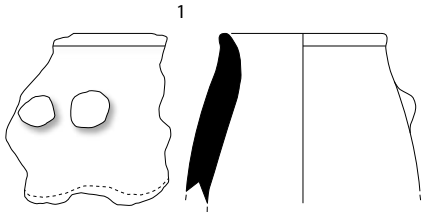
Fig. 2 - Proto bevelled-rim bowl from Logardan Trench D
Level 4B

Early Uruk closed shapes are basically represented by ovoid jars with flared necks and rounded or flattened rims, sometimes provided with straight or conical spouts (Pl. II.4-5, 7)¹⁴. Carinated pots with beaded rim are not frequent but diagnostic of Early Uruk assemblages

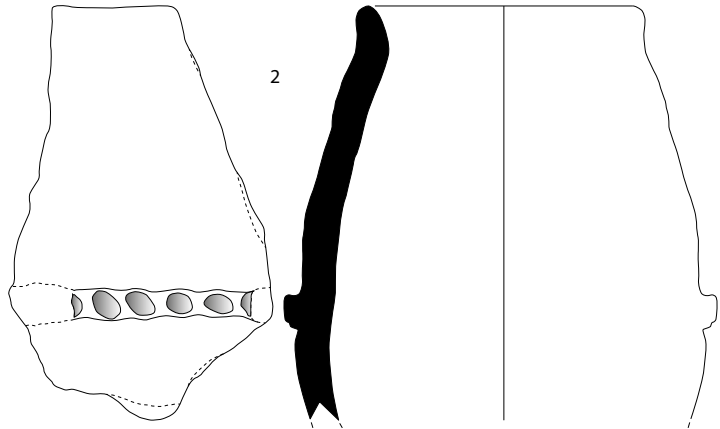
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6. See Geser 15 (Alizadeh 2014: fig. 61.I), Farukhabad (Wright 1981: fig. 47.p, q, r). This same type is also documented within contemporary north-Mesopotamian late LC2 assemblages, as at Nineveh (Gut 1995: Taf. 57.840) or Tepe Gawra (Rothman 2002: pl.8.743, pl. 22.2798).
 7. For rounded in-turned rims see Eridu (Wright 2014: 7.2d), Geser 12 (Alizadeh 2014: fig. 58.F). For inwards bevelled-rim bowls see Farukhabad (Wright 1981: fig. 46.h), Geser 13-14 (Alizadeh 2014: fig. 59.J, 60.D).
 8. See Susa “Acropole III” 7-11 (Wright 2014: fig. 7.5i), Farukhabad (Wright 1981: fig. 47.c, m), Geser 10-11 (Alizadeh 2014: fig. 57.C, O).
 9. See Eridu (Wright 2014: 7.2e-f), Susa “Acropole III” 7-11 (Wright 2014: fig. 7.5g), Geser 12 (Alizadeh 2014: fig. 58.H).
 10. See Uruk/Warka XII-IX (von Haller 1932: Taf. 18.B.v, Taf. 18.C.c), Farukhabad (Wright 1981: fig. 42.a), Geser 14 (Alizadeh 2014: fig. 60.B).
 11. BRBs appear as a generic open shape before being serially produced since the beginning of the Middle Uruk phase (at Uruk, they become a serial product since Level Eanna VIII-VII – Sürenhagen 1986). For Early Uruk BRBs, see Eridu (Safar *et al.* 1981: fig. 22 lower left; Wright 2014: fig. 7.2.c), Susa “Acropole III” 7-11 (Wright 2014: fig. 7.5c).
 12. Dyson 1966: 320; Alizadeh 2014: 30; Wright 2014: 119.
 13. See Susa “Acropole III” Levels 7-11 (Le Brun 1971: fig. 40.4; Wright 2014: fig. 7.5a-b), Farukhabad (Wright 1981: fig. 45.h-k), Geser 11, 13 (Alizadeh 2014: fig. 57.H, 59.H).
 14. See Eridu (Safar *et al.* 1981: table 3:1, 3:2, 3:12, 3:17, 3:18, 3:21; Wright 2014: fig. 7.3b-e), in the Uruk region Site WS022 (Adams and Nissen 1972: fig. 33.8, 53.6; Wright 2014: fig. 7.4f, 7.4g), Susa “Acropole III” 7-11 (Le Brun 1971: fig. 40.8-9; Wright 2014: fig. 7.6g, i, j, k), Farukhabad (Wright 1981: fig. 51.g-o), Geser 14-15 (Alizadeh 2014: fig. 60.F, 61.S – for straight spouts see since Levels 9-10 fig. 56.A).

Plate I

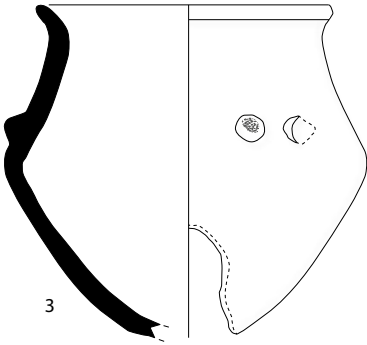




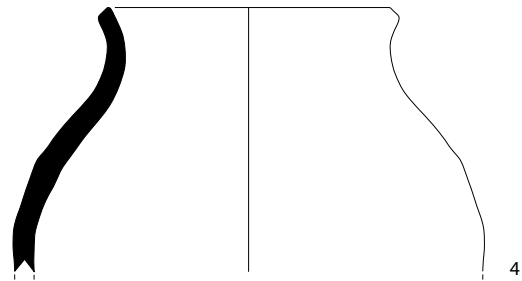
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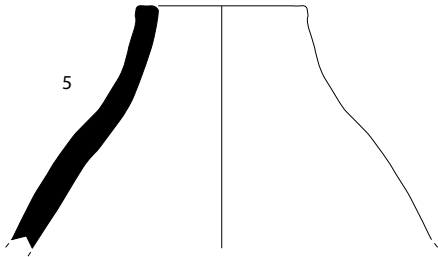
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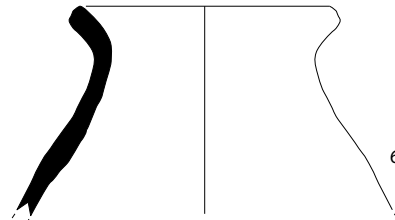
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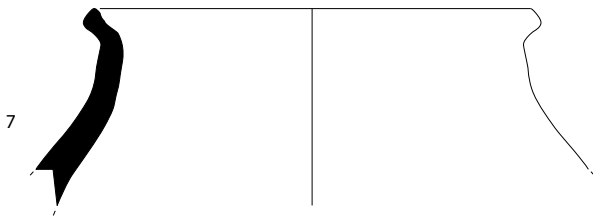
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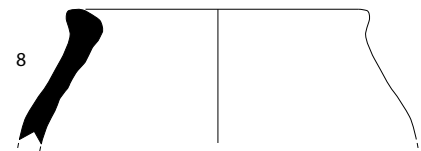
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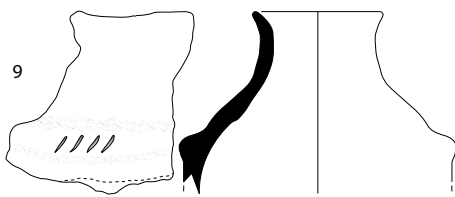
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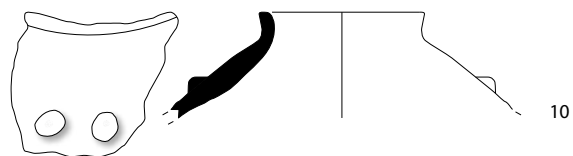
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LOG E 1326.5



LOG E 1257.1



LOG E 1083.1



(Pl. II.8)¹⁵. Some rare neckless samples have everted and rounded rims (Pl. II.6)¹⁶, while some sporadic specimens with developed necks have flaring pinched or hollowed rims and quite elliptical shapes (Pl. II.9)¹⁷. Another diagnostic closed shape, attested especially in Trench E Level IVB, is represented by deep urns with a restricted mouth and club-headed rims thickened on the exterior side¹⁸. Finally, some globular hole-mouth jars¹⁹ and the very first samples of jars with triangular-section everted rims (Pl. I.7) are documented during the Early Uruk phase²⁰. A remarkable Early Uruk trait that characterizes a disparate range of jars and closed shapes is represented by the hollowed inner profile of different kind of rims (Pl. II.7)²¹.

Concerning surface treatments, some rare (2% of the assemblage) but very distinctive red slipped sherds²² probably constitute the first appearance of the southern tradition known as Uruk red ware²³. Moreover, besides plain hand-finished surfaces, a consistent percentage of the sherds (22%) displays clear traces of scraping on the exterior body²⁴.

-
15. See Uruk/Warka XII-IX (von Haller 1932: Taf.18B.d', e', Taf. 18C.x), Geser 11-12 (Alizadeh fig. 57.f, fig.58.J), Sargarab (Wright *et al.* 1975: fig. 8.e), Kunji Cave (Wright *et al.* 1975: fig. 6.i).
 16. See in the Uruk region Site WS022 (Adams and Nissen 1972: fig. 33.11; Wright 2014: fig. 7.4a), Susa "Acropole III" 7-9 (Wright 2014: fig. 7.6c-d), Farukhabad (Wright 1981: fig. 48.i, j), Geser 10, 14 (Alizadeh 2014: fig. 57.A, 60.I).
 17. This type is very close to the typically LC1-LC2 north-Mesopotamian flaring-rim jars (for north Mesopotamian contemporary samples, see Tepe Gawra IX – Rothman 2002: pl. 20.2223, 2240). However, compared to northern specimens, flaring-rim Early Uruk jars are quite rare and have narrow shoulders and ovoid bodies, while in the North these jars are globular and sometimes characterized by a slight carination under the shoulder. For southern parallels, see in the Uruk region Site WS218 (Adams and Nissen 1972: fig. 49.7; Wright 2014: fig. 7.4b), Farukhabad (Wright 1981: fig. 49.b-c, h-l), Geser 11, 12 (Alizadeh 2014: fig. 57.I, 58.D).
 18. See Nineveh (Gut 2002: fig. 15.9-10), Eridu (Wright 2014: fig. 7.3a), Farukhabad (Wright 1981: fig. 52.I), Geser Level 14 (Alizadeh 2014: fig. 60.H, K).
 19. See Susa "Acropole III" (Wright 2014: fig. 7.6a-b), Geser Levels 12, 13, 15 (Alizadeh 2014: fig. 58.K, 59.D, 61.U-V).
 20. This type is very distinctive of the Middle Uruk phase (see for instance at Girdi Qala northern mound Trench D). Compared to the neckless Middle-Uruk samples, the first specimens have a slightly more developed neck and a rim forming a band on the exterior side. See Susa "Acropole III" (Wright 2014: fig. 7.6e-f), Farukhabad (Wright 1981: fig. 52.h, i, j).
 21. See Uruk/Warka XIII-XII (von Haller 1932: Taf. 17 D.h, I, n, Taf. 18A.p), Geser 12 (Alizadeh 2014: fig. 58.J), Susa "Acropole III" Level 9 (Wright 2014: fig. 7.6e), Kunji Cave (Wright *et al.* 1975: fig. 6.k), Sargarab (Wright *et al.* 1975: fig. 8.i), Farukhabad (Wright 1981: fig. 43.m-n, fig. 48.c).
 22. See Eridu (Wright 2014: 111), Geser 15 (Alizadeh 2014: fig. 61.U).
 23. The Uruk red ware is typical of the Middle Uruk phase in the South, as well as in central and northern Mesopotamia (see for instance at Nippur, Rubeidheh or Gurga Chiya – Hansen 1965: 204-205; McAdam and Mynors 1988: 39,48; Wengrow *et al.* 2016: fig. 8.13-15) and some very rare specimens are still documented in the Late Uruk (Eanna VI-V – Nissen 1970: 147), but its first appearance dates back to the end of the Ubaid period and to the Early Uruk phase (Eanna Levels XIV-XII – von Haller 1932: 38-40; Susa "Acropole I" 22 – Le Brun 1978: 181).
 24. Even if quite typical of the LC1-LC2 north-Mesopotamian repertoires (Baldi 2012a, 2012b), scraped surfaces are also documented within Early Uruk southern assemblages, as at Eridu (Wright 2014: 111, fig. 7.2a-b, e-f, 7.3a), in the Uruk region (Site WS022 – Adams and Nissen 1972: fig. 33.11), at Susa "Acropole III" (Wright 1985: fig. 4; Wright 2014: fig. 7.5i, 7.6a-b), Geser 9-10 (Alizadeh 2014: fig. 56.E).

Decorations are rare. The most noticeable amongst them, are some pierced lugs and the first appearance of some irregular nails (Pl. II.9)²⁵ or cross-hatched incisions²⁶. Finally, some rare samples (just 3 of them have been collected in Trench D and 5 in Trench E) indicate the emergence of appliqué fingered cordons (Fig. 3). This kind of decoration is largely attested during the Middle Uruk phase (both at Girdi Qala northern mound Trench D and at Logardan Trench E Level IVA – Pl. I.11, II.2)²⁷, but it is noteworthy that the first samples known from south-Mesopotamia, Khuzestan and Logardan are associated to similar types of deep goblets²⁸.

Even if basic, the repertoire from Level 4c-b at Logardan Trench D and Level IVB in Trench E represents a unique document. It is the only genuine Early Uruk (namely south-Mesopotamian) assemblage from central and northern Mesopotamia. Moreover, it offers a significant comparative base for the ceramic productions of a period that, even in southern Mesopotamia and Khuzestan, is known from a very restricted number of sites and contexts.

Actually, based on the ceramic chrono-typology established by Sürenhagen (1986), it is clear that the Early Uruk phase attested at Logardan Trenches D-E corresponds to Levels XII-IX of the “*Tiefschnitt*” sounding at Uruk/Warka, where the excavated contexts are quite restricted and not very informative. The only other south-Mesopotamian site which yielded stratified materials is Eridu (Lloyd 1948): vessels from a well-preserved tripartite building are documented by some photos and drawings (Safar *et al.* 1981: fig. 22-23) illustrating flared-rim jars with straight or conical spouts, “V”-shaped bowls with roughly scraped surfaces, rare BRBs and different types of proto-BRBs. It largely coincides with the typology from Trenches D-E at Logardan. But the range of shapes from Eridu is very restricted: the total absence of storage jars or cooking pots clearly depends on the function of the excavated context, namely a tripartite building whose main spaces were devoted to serve and consume food towards the end of their period of occupation. Some other Early Uruk ceramics are also documented in the Uruk region at Sites WS022, 178, 218 (Adams and Nissen 1972: 220, 226, 228), but they come from a survey and are, therefore, un-stratified.



Fig. 3 - Early Uruk finger-pressed cordon decoration from Logardan Trench E Level IVB.

25. Finger-nail impressed and incised decorations appear in Eanna XII-IX Levels (von Haller 1932: Taf. 18A.h', Taf. 18C.g) and become popular in the Middle Uruk phase: see at Rubeidheh (McAdam and Mynors 1988: types 90a-I, 91a-e).

26. See Eridu (Safar *et al.* 1981: table 4:1), Farukhabad (Wright 1981: fig. 55.a).

27. During the Middle Uruk Phase, finger-impressed cordons are frequent on the shoulder and body of the closed shapes – see for instance at Uruk: Warka Level VI (von Haller 1932: Taf. 19C.k-i).

28. See Uruk/Warka (Sürenhagen 1986: 42 T/198-223; von Haller 1932: Taf. 18C.n), Geser 13 (Alizadeh 2014: fig. 59.C).

In South-western Iran, Early Uruk materials are known from Levels 7-11 of the so-called “Acropole III” sounding (Wright 1985: 726-732 and fig. 4) and from Level 23-22 of the “Acropole I” at Susa (Johnson 1973; Le Brun 1978: 181). Despite the limited excavated surface, the morpho-functional repertoire from Susa is wider than that from Eridu because both “Acropole I” and “Acropole III” soundings cut deeply through layers deposited by different activities. Well-stratified Early Uruk ceramics are also documented in Levels 11-15 of the Step Trench at Tall-e-Geser (Caldwell 1968). But from an architectural point of view, the whole 4th millennium sequence is represented by a series of fragmentary floors, walls and mud-brick layers, without any possibility of detecting some coherent building plans (Alizadeh 2014: 12).

Likewise, the materials from Farukhabad offer an uncertain overview on the Early Uruk phase. Indeed, excavations at Farukhabad have reached Early Uruk strata in Trench B Levels 36-35, which yielded a large ceramic assemblage. But the sharp typological separation established by the excavator between Uruk materials and so-called Sargarab ware (Wright 1981: 91) seems problematic if one compares this production (supposed to be local) to the assemblage from the deepest levels of Trenches D-E at Logardan. Despite several features testifying of a clear continuity from the previous Susa I assemblage, Sargarab ware²⁹ shows an unmistakably Early Uruk-related repertoire (Wright 1981: fig. 40-44). Nevertheless, this typological continuity between the 5th millennium Farukh repertoire and the so-called Sargarab ware is not surprising if compared to the presence of many late-Ubaid-related types within the Early Uruk assemblages. Besides, even if Wright (1981: 168 and Table 2) places this tradition between the so-called Farukh phase and the beginning of the Uruk period, Sargarab ware is not typical of the late 5th millennium layers: on the contrary, it is very abundant and even dominant in the Early Uruk phase (Wright 1981: 91). Moreover, it shares several morpho-stylistic features with other sites in Luristan and Khuzestan³⁰, while some of its shapes are documented both in the north- and south-Mesopotamian assemblages of this period³¹. But it

29. Named this way because of the large amount of this pottery collected on the surface at the eponym village of Sargarab, in the Deh Luiran Plain (DL 169) (Neely and Wright 1994: 131-138).

30. See for instance the presence, both at Sargarab and Kunji Cave, of large club-headed bowls (Wright *et al.* 1975: fig. 6.n, 7.f), or the frequency of Sargarab appliqué finger-impressed cordons, as at Kozegarān, Khāvardi or Baba Jan V (Wright *et al.* 1975: fig. 7.e, h, j; Goff 1971: fig. 6.25-27, fig. 6.46, fig. 7.17, 21). Nevertheless, even if the early 4th millennium assemblages from northern Khuzestan and Luristan belong to a local tradition, it is evident that they are closely related both to the north-Mesopotamian LC2 chaff-faced traditions (see the in-turned rim bowls or Coba bowl-like scraped container from Chiā Sabz – Goff 1971: fig. 6.7-9, 13; see also the in-turned rim bowls and the inwards bevelled-rim bowl from Baba Jan V – Goff 1971: fig. 7.2-6, 13). At the same time, these assemblages show some south-Mesopotamian Early Uruk traits (as the slightly drooping spout of Baba Jan V or the flared rim deep bowl of Afrineh – Goff 1971: fig. 7.30; fig. 6.37).

31. For instance, the flaring-rim jars with thinned rims, which are generally considered as a LC1-LC2 north-Mesopotamian type (but see for instance at Sargarab – Wright *et al.* 1975: fig. 8.f). In the same way, some deep pots with restricted mouth and rims thickened on the exterior side are documented at Nineveh (“Lower” and “Middle” Nineveh 3 phase in a typically Gawra B horizon – Gut 2002: fig. 15.9-10), at Eridu (in a genuine Early southern Uruk context – Wright 2014: fig. 7.3a), as well as at Sargarab (Wright *et al.* 1975: fig. 7.i)

also shows several south-Mesopotamian Uruk traits from a morphological point of view³². In the same way, it is possible to recognize the first emergence of some Early Uruk decorations at Logardan Trenches D-E and within the Sargarab assemblage from Farukhabad³³. Therefore, it seems likely that the so-called Sargarab ware represents a production very close to (and strongly influenced by) the south-Mesopotamian Early Uruk tradition of the Khuzestan region, attested at Susa “Acropole I” 23-22 and “Acropole III” 7-11, as well as at Farukhabad Trench B 36-35.

As already observed in 2016, the Early Uruk assemblage from Logardan – as all the other Early Uruk sites known so far – shares important morpho-stylistic features with Godin VII-“early” VI and Uruk Eanna XII-IX. Moreover, from a technical point of view, it is remarkable that the first Uruk productions do not are exclusively mineral-tempered. On the contrary, at Eridu, Susa, Uruk, Farukhabad, Tall-e-Geser or Logardan, despite some mineral fabrics, the majority of the Early Uruk sherds has quite rough vegetal pastes. As already stressed last year, this intriguing element tends to remove a long-lasting prejudice on the existence of a dichotomy between north- and south-Mesopotamian late chalcolithic ceramics.

As far as the little Middle Uruk assemblage from Trench E Level IVA it is essentially composed by BRBs³⁴, little-sized pots with a low spout close to the bottom (Pl. I.9)³⁵, knobbed jars and pots (Pl. I.12, II.1, 3, 10)³⁶, shallow basins with irregular ovoid profiles³⁷, urns and jars decorated with finger-impressed cordons (Pl. I.11, II.2)³⁸, some red-slipped wares³⁹ and

32. Some samples of finger-impressed cordons are attested in Early Uruk contexts at Logardan Trenches D-E, or at Geser 13 (Alizadeh 2014: fig. 59.C); Sargarab shallow flat-base basins are a typically Uruk shape (Wright *et al.* 1975: fig. 8.l for a Sargarab ware specimen, while see Farukhabad and Geser 14 for Early Uruk samples – Wright 1981: fig. 42.a; Alizadeh 2014: fig. 60.B); some scraped and slightly carinated bowls are also attested in southern Mesopotamia (see Wright *et al.* 1975: fig. 7.b for a sample in Sargarab ware; see Wright 2014: fig. 7.2f for an Early Uruk sample from Eridu); some early types of BRBs are attested in Sargarab ware (Wright 1981: fig. 42.n); the typically early Uruk proto-BRBs seem to be documented also in Sargarab ware (Wright *et al.* 1975: fig. 7.a); conical bowls with pouring lips, which are attested at Farukhabad in Sargarab ware (Wright 1981: fig. 40.e.), are also typically Uruk (see for instance at Girdi Qala northern mound Trench D); upwards conical spouts represent another feature the Sargarab ware shares with south-Mesopotamian Early Uruk assemblages (see Farukhabad, Wright 1981: fig. 40.b; see Eridu, Wright 2014: fig. 7.3e), as well as square-section flared-rim jars (see in Sargarab ware from Farukhabad, Wright 1981: fig. 44.g-j; see Early Uruk samples from Eridu, Wright 2014: fig. 7.3b-d); finally, some very early specimens of jars with triangular-section rims – a very widespread and peculiar Middle Uruk type – appear at Farukhabad in Sargarab ware (Wright 1981: fig. 42.i, fig. 44.a) as at Logardan Trench D Level 4 and other Early Uruk contexts (see for instance at Susa “Acropole III” Level 7 – Wright 2014: fig. 7.6f). It is also remarkable that some jars in Sargarab ware have a rim hollowed on the inner side (see at Sargarab – Wright *et al.* 1975: fig. 8.i; or at Farukhabad in Sargarab ware – Wright 1981: fig. 43.l, m, n), as it is sometimes the case of jars and closed shapes from genuine Early Uruk assemblages (Pl. II.7) (see at Farukhabad in “Uruk ware” – Wright 1981: fig. 48.c; or Susa “Acropole III” Level 9 – Wright 2014: fig. 7.6e).

33. The most noteworthy example is represented by the vertical pierced lugs and the criss-cross incisions, which are typical of the south-Mesopotamian Uruk assemblages (as at See Eridu – Safar *et al.* 1981: table 4:1; but also at Farukhabad, in a ware that the excavator considers genuinely Early Uruk – Wright 1981: fig. 55.a; while for a sample in Sargarab ware from Farukhabad see Wright 1981: fig. 44.1).

34. As in Uruk/Warka Level VIII, BRBs (that were rare in Trench E Early Uruk Level IVB), begin to be serially produced in Trench E Level IVA.

35. See at Uruk/Warka Level VIII (von Haller 1932: Taf. 18C.v, w).

36. See at Uruk/Warka Level VIII (von Haller 1932: Taf. 18C.g^l).

37. See at Uruk/Warka Levels VIII-VII (von Haller 1932: Taf. 18C.c^l, 18D.a).

38. See at Rubeidheh (McAdam and Mynors 1988: fig. 30.46; 34.100; 36.122).

39. See at Uruk/Warka Levels VIII (von Haller 1932: Taf. 18C.f^l).

globular neckless jars with plain rounded rims (Pl. II.10)⁴⁰.

Obviously, 4th millennium pottery from Trenches D and E at Logardan largely confirms what already observed in Trench C at Girdi Qala in 2015 and in Trench D at Logardan in 2016: the repertoire is basically the same and some typological crossings can be observed between ceramics from Trench E Level IVA and Trench D at Girdi Qala northern mound (this volume, *infra*). This is completely normal, since, in both cases (as also in Trench C at Girdi Qala main mound), several Middle Uruk types are essentially the same. Nevertheless, some discrepancies can be stressed between the different Middle Uruk assemblages identified so far. Most of time, these variabilities are related to functional aspects of the pottery. In this sense, it is quite obvious to observe that the houses in Trench D at Girdi Qala northern mound yielded any kind of vessels devoted to any kind of domestic functions (storage, consumption or presentation of food), while the potter's kilns in Trench C at Girdi Qala main mound or in Trench E at Logardan contained only few storage jars and practically no fine ceramics⁴¹.

But other variabilities within Middle Uruk ceramics depend on chrono-cultural differences between the excavated areas. On the one hand, this aspect is very important because it is likely to offer information on the evolution and organization of the south-Mesopotamian presence at Logardan and Girdi Qala. However, on the other hand, it is difficult for the moment to establish clear chronological differences between the trenches because some Middle Uruk assemblages (as the one from Trench E at Logardan) are quantitatively limited. For the time being, it is important to stress that, unlike Trench C at Girdi Qala main mound, where a local LC2-LC3 tradition was also documented, Level 4 of Logardan Trench D and Levels IVA-IVB at Logardan Trench E yielded exclusively south-Mesopotamian-related shapes⁴². The same can be observed in Trench D at Girdi Qala northern mound. In other terms, although the firing area in Trench C at Girdi Qala main mound was essentially used by south-Mesopotamian artisans, it was a work space frequented also by local potters, or at least integrated within a local housing context. On the contrary, the Early Uruk architectural complexes at Logardan Trenches D and E, as well as the Middle Uruk houses and kilns of Trench D at Girdi Qala and of Trench E at Logardan appear as living or working spaces exclusively associated with an Uruk material culture and, therefore, presumably reserved for South-Mesopotamian inhabitants and workers. From a merely chronological point of view, there is no noticeable difference between the Early Uruk assemblages identified at Logardan (Trench D Level 4c-b and Trench E Level IVB) and in the basal levels (10-8) of Trench C at Girdi Qala main mound. It means that, at the beginning of the 4th millennium BC, south-Mesopotamian settlers were living and meeting in the architectural complexes of Logardan, while they were used to produce their own pottery at Girdi Qala main mound. Later, during the Middle Uruk Phase, some typological discrepancies can be recognized between the different trenches. If the assemblages from Levels 2-1 of Trench C at Girdi Qala main mound and from Trench D

40. See at Farukhabad (Alizadeh 2014: fig. 43.k).

41. Fine ceramics and jars are produced more rarely, respectively, because they are ostentatious ceramics (and therefore uncommon by definition), or because they have a life span longer than bowls (Baldi 2012b, 2012c): in both cases, it is more difficult to find substantial quantities of them in abandoned kilns rather than in dwellings or domestic contexts.


42. No diagnostic samples and just 4 body-sherds can be attributed to a north-Mesopotamian LC2-LC3 tradition.

at Girdi Qala northern mound appear almost identical⁴³, the little amount of pottery coming from Logardan Trench E seems slightly older⁴⁴. It could suggest that before the foundation of a south-Mesopotamian settlement separated from the rest of the village at Girdi Qala north, the Middle Uruk presence was not limited at Girdi Qala main mound (where, at the beginning of the local LC3 – in Trench C Levels 7-3 – south-Mesopotamian artisans were used to fire their pots). In this period, Logardan (Trench E Level IVA) was also occupied by Middle Uruk settlers, who produced their ceramics in firing installations built within the ruins of the Early Uruk buildings.

This reading of the ceramic assemblages seems to delineate a continuous dynamic of expansion of the South-Mesopotamian presence at Logardan and Girdi Qala during the first half of the 4th millennium BC. To validate this picture and to specify the temporalities of this dynamic, during the next campaigns it will be necessary to verify when the south-Mesopotamian settlement of Girdi Qala north was founded, as well as to understand the extension of the Middle Uruk presence at Logardan.

43. Tentatively to attribute to the second part (Eanna Level VI at Uruk) of the Middle Uruk (local LC3) period, around 3600-3500 BC.

44. Tentatively to attribute to the first part (Eanna Level VIII at Uruk) of the Middle Uruk (local LC3) period, around 3800-3700 BC.



BRONZE AGE POTTERY FROM LOGARDAN: PRELIMINARY RESULTS FROM THE THIRD CAMPAIGN

Melania Zingarello

The 2017 excavations campaign at Logardan focused on the two main trenches started in the second season (2016), namely Trench D and Trench E, at the top of the site and on the north-western side of the upper terrace respectively. As far as the Bronze Age architectural remains, the work in Trench D has provided further information about the extensive and complex ceramic production system, basically confirming the general evidence from the earlier campaign¹. Conversely, a substantial enlargement of the excavation area in Trench E has allowed a better understanding of a now recognized as multi-phased structure uncovered in 2016² and a first disentanglement of the overall complex stratigraphic situation of the area.

For both Trenches, as in the 2016 campaign, the methodological approach to the study of the ceramic assemblages was based on a morpho-functional classification. The sherds collected from each stratigraphic entity (called *numéro vert*) have been, in fact, quantified and divided into two broad categories of open and closed shapes, within which were classified into general functional and morphological types. Non-diagnostic body sherds have been counted and discarded when not useful for vessel reconstruction. As far as the diagnostic pottery fragments, for each of them a photographic record was produced and their technical features – color, texture, inclusions, surface treatment – have been recorded. A selection of diagnostic sherds deemed as being most significant, was drawn. The primary aim of this initial analysis is to: provide a reliable stratigraphic pottery sequence for the second half of 3rd millennium BC at Logardan Trench D and make a first assessment of the ceramic materials dated for the most to either the beginning of 3rd millennium BC or to Late Bronze Age as to Logardan Trench E (Table 1).

1. For the results of the 2017 excavations season in Trench D see Baldi, Naccaro and Bridey, this volume, whereas the 2016 campaign ones are reported in Baldi, Naccaro and Rahoof 2016.

2. See Sauvage, Zingarello and Salah 2016: 71-74.

TRENCH D		TRENCH E	
		Later Levels Undated	
		IA	Late Bronze Age
		IB	
1	Ur III period / End of the Early Bronze Age	II	Ur III period / End of the Early Bronze Age
2			
3a1	Late Akkad / Ur III		
3a2	Late Akkad		
3b	Akkad		
3c	Early Dynastic III / Akkad (mid-late 3 rd millennium BC)		
3d			
		III	Early Dynastic I / Beginning Early Bronze Age
4a	Middle Uruk	IVA	Middle Uruk
4b-c	Early Uruk	IVB	Early Uruk

Table 1 – Preliminary dating by level of Trenches D and E at Logardan.

Due to the lack of a regional relative chronological sequence, as a mostly uncharted region, the Logardan pottery repertoire's ascription to a given chronological phase is essentially based on the correlation with stratified assemblages from the few little-known sites in the region through both their morpho-stylistic comparisons and their diachronic changes and developments. A close morphological similarity and the affinity with pottery repertoires from different sites in the neighboring regions were, in fact, taken into account in establishing preliminary comparisons that will be corroborated and integrated with the investigation of ceramics technical and technological features in a future more in-depth pottery analysis.

LOGARDAN TRENCH D CERAMIC MATERIALS

The work carried out in Trench D during the third excavations campaign continued to focus on the exposure of the different superimposed pottery workshops covering the citadel area of Logardan. During the last season, three Bronze Age levels, labeled 1-3 from the latest to the earlier one, all dating to the mid-late 3rd millennium BC, were recognized. Level 3 was divided into three levels, named a-c from the latest to the earlier, to which this year a fourth level called 'd' has been added. Moreover, between levels 2 and 3a, a new architectural level has been recognized and hence called 3a1. The last season 3a level is therefore deemed to correspond to the new 3a2 level³.

The potsherds scattered on surface and sub-surface of the new trench enlargement or coming from posterior activities that had disturbed the first two Bronze Age levels (1-2) seem to be later in date compared to those gathered from the surface of the excavation area in the 2016 campaign. Except for a single fragment of a high-necked jug with an out-turned grooved rim (LOG.D.320-3) and the remnant of a handle under the rim, possibly dating to

3. For a detailed description of the stratigraphy and architecture in Trench D see Baldi, Naccaro and Bridey, this volume.

Sasanian-Early Islamic period, few miscellaneous fragments dating to the period of the Third Dynasty of Ur (hereafter Ur III) and possibly Late Bronze Age were collected⁴.

The first two levels (1-2), represented by the construction, use and reconstruction of a ceramic workshop, yielded a pottery assemblage consistent with the very late 3rd millennium BC date prompted by the few but significant chronological indicators of the previous season. These are strengthened by the retrieval of a substantial amount of ceramic materials from these two levels, including a quite extensive array of medium-to-large storage jars *in situ*. Among them, only a medium-sized ovoid jar with an out-turned flattened rim on a flared medium-high neck, slightly carinated shoulders, convex base and a decoration with three grooved horizontal lines at the base of the neck (LOG.D.348-1, Fig. 1: 1) has been restored. This jar

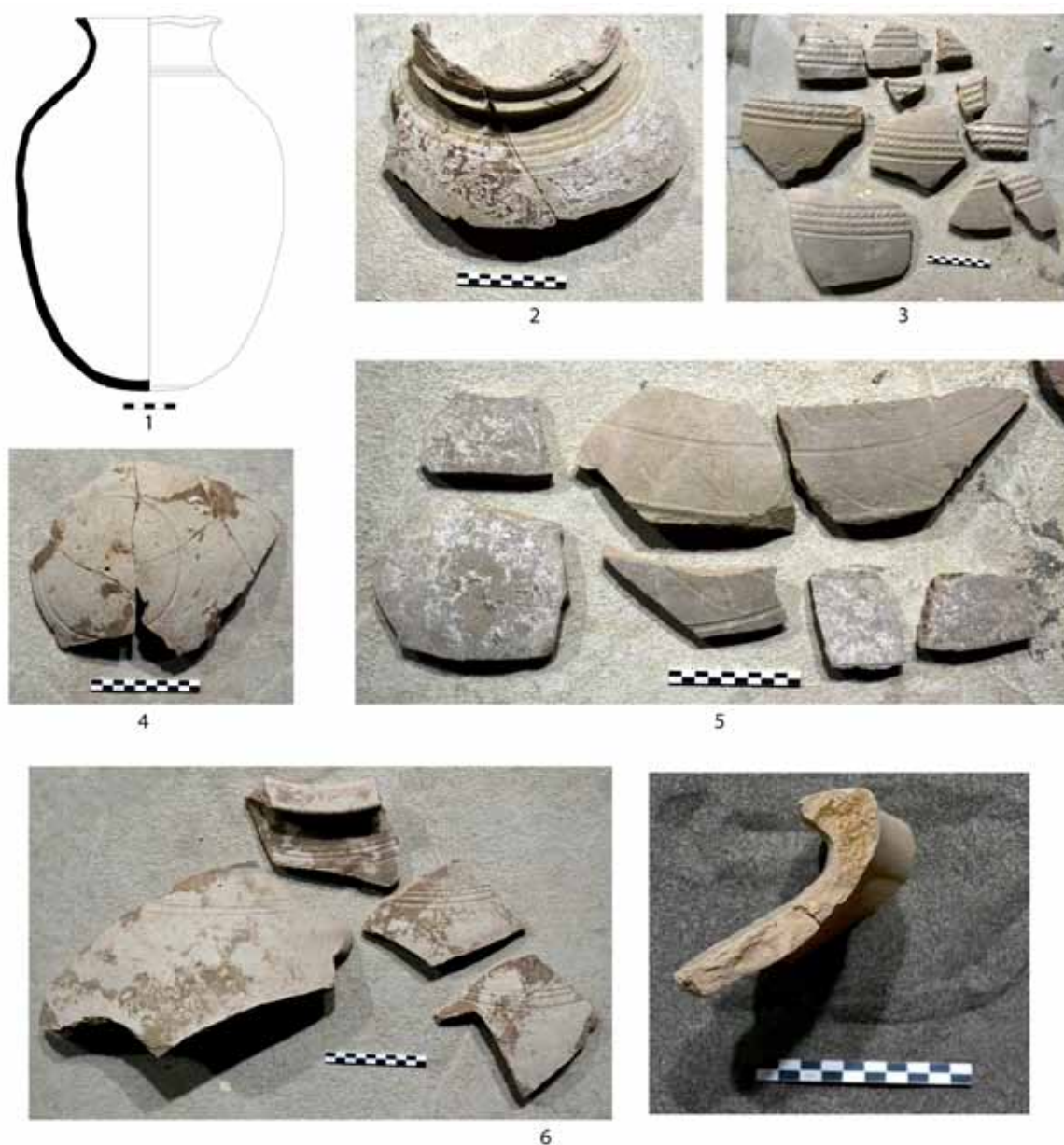


Fig. 1 - Group of medium-to-large-sized vessels from Trench D levels 1-2..

4. At least three fragments of overhanging rim bowls and a large sherd of a jar with rounded rim, flattened on top and slightly concave at the interior, rounded shoulder with a ridge at the neck base, belong to pottery types fairly common in Ur III period (see, for example, similar specimens from Tell Yelkhi: Bergamini 2002-2003, pl. 16, specifically no. 31 for the rounded rim jar). A large fragment of cylindrical stand with 'pie-crust' base would be generally considered as typical of the Late Bronze Age, although attested as early as the Late Akkadian period as revealed by their presence in Level 3a2 at Logardan itself (see below). Other sherds as flat bases probably belonging to jars and plain flared jar rims are not meaningful for a chronological purpose.

was probably discarded because of fire defects, as shown by its warped rim and body (poorly noticeable in drawing) and especially by its overfired green paste.

The initial estimate of at least 7 (almost) complete vessels coming from the same spot as the warped jar will be confirmed or reduced after a qualified restoration planned for the next campaign. It was deemed appropriate, in the meanwhile, to provide some basic information about their main characteristics. The range of medium and large-sized vessels includes triangular rim jars with rounded shoulder decorated by three horizontal grooves (LOG.D.348-2, Fig. 1: 6); a storage jar lacking the rim, with a slightly flared medium-high neck and a protruding ridge with a pointed section at the mid-neck. Its shoulder appears scored horizontally by five parallel superficial 0,8 cm large striations (Fig. 1: 2). Different kinds of decoration, usually located between the neck base and the shoulder, but in some cases also at the junction between the body and the shoulder, are attested. In addition, it is worth mentioning a band of three rounded-sectioned ridges bounded by wide grooved lines impressed vertically with a stick or a tapered profile tool (Fig. 1: 3). The final visual effect is that of a pattern of rectangular tiles. A decoration with a wavy incised line enclosed by two parallel horizontal lines (made with a single-blunt tool rather than a multiple-pointed comb, Fig. 1: 5) and an example of comb-incised decoration with three or four horizontal lines quite spaced-out each other are also represented. Moreover, this assemblage has yielded convex bases defined as ‘channel bases’ because of the shallow grooved ring encircling them (Fig. 1: 4): they almost certainly belong to the jars just mentioned.

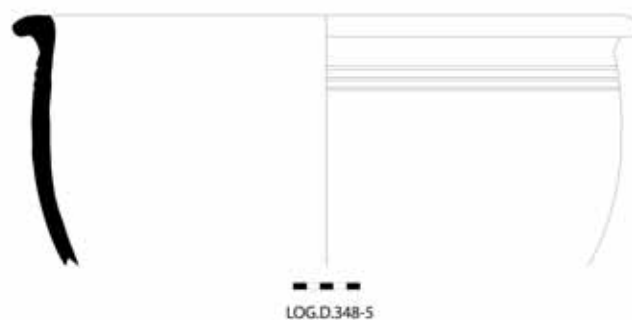


Fig. 2 - Deep bowls or basins (LOG.D.338-4 and LOG.D.348-5) from Trench D levels 1-2.

Another type of vessel belonging to this assemblage is a medium-sized deep bowl or small basin, of which at least two specimens were recovered (Fig. 2). They both have an elongated rounded rim and a comb-incised decoration with four horizontal lines⁵, but one of them has a cylindrical shape and a low ring base whereas the other one's shape is quite globular with the walls slightly inward inclined and a deep channel base. Certain features of some vessels – especially those of the two basins LOG.D.348-4 and LOG.D.348-5 – seem more pertinent to an early 2nd millennium BC date⁶. For the time being, however, in view of the seemingly homogeneity of the Levels 1-2 pottery assemblage, along with a complete absence of any painted pottery, a date to the very late 3rd millennium BC is retained, at least until otherwise proven. Similar wide-mouth elongated vessels with an everted rim with a prominence underneath and a wavy comb-incision (LOG.D.338-1, Fig. 3: 1) are likewise attested.⁷

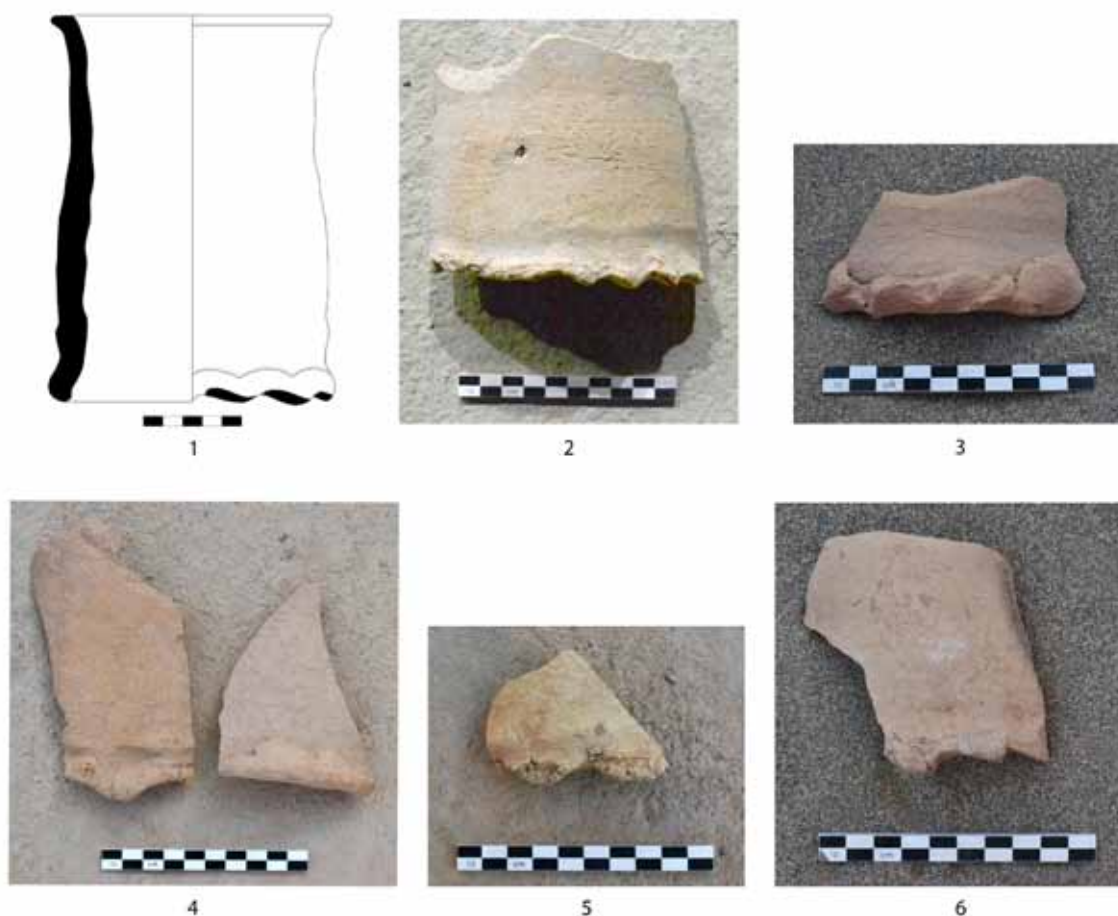


Fig. 3 - Potstands with 'pie-crust' base from Trench D Early Bronze Age levels: 1) LOG.D.350-1; 2) LOG.D.320-4; 3) LOG.D.346-1; 4) LOG.D.365-19 (left), LOG.D.365-no number (right); 5 – LOG.D.391-no number; 6 – LOG.D.398- no number.

5. The drawing of LOG.D.348-5 shown in Fig. 2 has been made from a point of the vessel's profile displaying three instead of four horizontal parallel lines. This is possibly due to a potter's mistake in making decoration or to a faulty comb.
6. For the description, chronology and comparisons of both mid-late 3rd millennium BC and first half of 2nd millennium BC types, see Bergamini 2002-2003: 24-26 and Gabutti 2002-2003: 89 respectively. Close parallels for our specimens type seem to be the Bergamini's A8 and possibly B4 types (Bergamini 2002-2003: pl. 6: 15-18 (A8 type) and pl. 6: 24-27, 29-42 (B4 type), dating as late as Ur III period, despite some morphological differences mainly in the rim shape. Cf. also the Tell Brak's 'Post-Akkadian urns' (Oates 2001: fig. 428).
7. Close parallels dating to Late Akkadian and/or Ur III periods can be found, among others, in: Area KG at Nineveh (McMahon 1998: pl. 9: 16-19); Ishtar Temple at Assur (Beuger 2013: pl. 9: 12); Levels VII-VIII at Tell Yelkhi (Bergamini 2002-2003: pl. 6: 36-41); in late drains at Abu Salabikh (Postgate – Moon 1984: fig. p. 79: no. 55).

Levels 1-2 also provided a complete specimen of a pot stand with a ‘pie-crust’ base (LOG.D.350-1, Fig. 3: 1), characterized by an undulating, finger-impressed lower edge and generally considered as typical of the Late Bronze Age. However, it may date to the Late Akkadian/Ur III period as revealed mainly by their presence in the stratigraphic sequence of Area KG at Nineveh since Level VIA or in Levels G, F and E of the Ishtar Temple at Assur.⁸ Moreover, the mid-late 3rd millennium BC levels of Logardan Trench D yielded a fair amount of sherds belonging to this pottery type (Fig. 3: 2-6). The only exception to the uniformity of Levels 1-2 pottery repertoire seems to be some ceramic materials from kiln 769, showing a high percentage of Late Bronze Age sherds (see for example Fig. 4: 2). The kiln, however, has been only partially excavated and it lies just under the surface going through later disturbance.

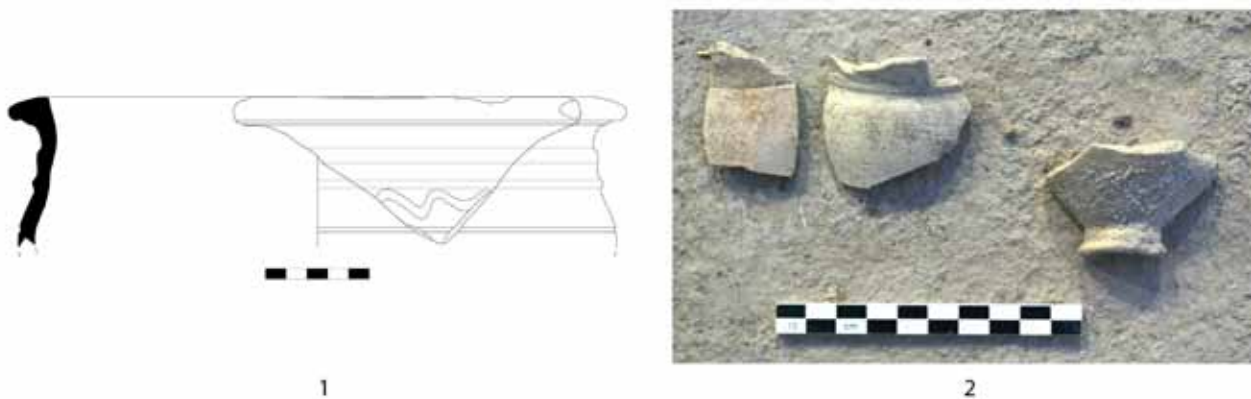


Fig. 4 - Selection of ceramic material from Trench D levels 1-2: 1) LOG.D.338-1 (levels 1-2); 2) Late Bronze Age sherds from LOG.D.328 (possibly intrusive in levels 1-2).

Ceramic material from level 3a1, recognized during the 2017 excavations season, as from level 3a2, did not differ significantly from that of the following Levels 1-2. However, in comparison, level 3a2 shows a slightly higher percentage of pottery types more common in Late Akkadian times. Both levels yielded sherds of carinated bowl with rounded, out-turned rim, a pointed carination just below the rim and a conical lower body (Fig. 5: 1, LOG.D.356-1). This pottery type is a chronological marker for this period, reaching his peak in the Ur III times.⁹ Earlier evidence of this pottery type, spreading across a very large area encompassing Western Iran, through Southern and Central Mesopotamia and reaching as far as the Northern Levant¹⁰, date from the end of Akkadian period¹¹. It is still present in the upper strata of levels 3a2, now with a blunted, upright rim and a pointed carination¹². Different types of carinated-sided bowls increase considerably compared to levels 1-2, including deep bowls

8. See the considerations expressed by McMahon 1998: 19, note 44 with relevant bibliography.

9. For the type's description and comparison, see McMahon 2006: pl. 90; Schmidt 2014.

10. Schmidt 2014: 411 and fig. 1.

11. Late Akkadian specimens, e. g., come from Level F of the Archaic Ishtar Temples at Assur (Beuger 2013: pl. 1:8), Level XI of the WF Sounding at Nippur (McMahon 2006: 80, type O-17) as well as from Tell Asmar (Delougaz 1952: pl. 150, B.151.210) in the Diyala, but also from Susa and some sites of Southern Mesopotamia.

12. See Zingarello 2016: 80, fig. 3: 2. A very close comparison can be found at Nineveh, in “band rim bowls” of the Area KG's Level VIB, dating to the Late Akkadian/Ur III period (McMahon 1998: fig. 7: 26-28).



Fig. 5 - Selection of ceramic material from Trench D levels 3a1-3a2: 1) LOG.D.356-1 (level 3a1); 2) LOG.D.363-1 (level 3a1); 3) LOG.D.365-1 (level 3a1); 4) Assemblage from 'green number' 389, including corrugated bowl LOG.D.389-1 (level 3a2); 5) LOG.D.389-1 (level 3a2); 6) Carinated shoulder fragment of a small-sized jar (level 3a2).

with flaring rim and high carination (LOG.D.365-1. Fig. 5: 3)¹³. Large bowls with triangular rim rounded on top with ridged convex wall (LOG.D.363-1. Fig. 5: 2) are also attested, at least in level 3a1¹⁴.

As for the closed shapes, levels 3a2 provided a variety of wide-mouthed bag-shaped vessels, small to medium in size, with or without combed incisions on the shoulder, and medium- and large-sized storage jars with rounded, rolled or thickened out-turned rims on medium-high neck or neckless, some examples of which are shown in Fig. 5: 4. Both these types are very often characterized by a decoration consisting of groups of band-combed lines on the shoulder, which seems to appear more frequently in the Akkadian and earlier periods¹⁵, or by horizontal and wavy lines made with a multiple-pointed comb. Corrugation, both on top, under the rim, and on the upper half of the body is likewise attested on wide-mouthed bag-shaped vessel (LOG.D.389-1. Fig. 5: 5).

13. The best parallels for this type of carinated bowl come from Level G of Archaic Ishtar Temples at Assur (Beuger 2013: pl. 5: 8), Tepe Gawra' Stratum VI (Speiser 1935: pl. LXVII:92), Tell Brak's Phase N (Oates 2001: figs. 418: 604, 606, 431: 933), and can all be dated to the Akkadian and post-Akkadian phases. Cf. also an almost identical specimen (LOG.D.228-1) from levels 3a2 (corresponding to the 2016 season' level 3a) at Logardan in Zingarello 2016: fig. 2: 5.

14. For some comparisons see Beuger 2013: pl. 6: 5 (decorated version), pl. 10 (both decorated and undecorated versions) and McMahon 1998: fig. 7: 23.

15. Oates 2001: 165.

Body sherds with notched horizontal applied rope(s) are also common in these (3a1-3a2) and in the earlier levels. Likewise, small jars with carinated shoulder and a possibly medium or medium-high neck were retrieved in 3a2 and earlier levels. Their presence showed a clear connection with the southern and central Mesopotamian repertoires, in which these features are typical of a high number of jars types with a wide variety of rims, but generally of small and medium size and with a ring base¹⁶.

If during the third excavations season, few level 3b's architectural remains have been detected (with no pottery to discuss), both level 3c and the new detected level 3d yielded typical shapes occurring in Akkadian time or dating back to the end of Early Dynastic III and to the beginning of the Akkadian period. Shallow bowls with carinated-sided in common ware as well as in fine ware with slightly thickened rounded or beaded rims respectively, whose comparisons come mostly from Akkadian contexts¹⁷, increase in percentage. Typical Akkadian pottery types seem to be the small cups or cylindrical beakers with beaded or slightly thickened and everted or folded outside rims with a convex or flat base¹⁸. Like other vessel types discussed above, these cups find the most consistent parallels in similar vessels from levels VII-VI in Area KG at Nineveh¹⁹, from levels G-F of Ishtar Temple at Assur²⁰, and, above all, from the levels dating from the end of the Early Dynastic III/Akkadian period at sites in the Eski-Mosul region²¹.

Moreover, as far as the open shapes, the hemispherical bowl LOG.D.384-1 (Fig. 6: 2) might be linked to some later bowls with two undecorated ridges under a slightly turned inward rim from Tell Brak²². Nonetheless, one might suggest that this sherd may conceivably be part of a stemmed bowl or 'fruit stand' with a rim shape somewhat different compared to elongated beveled southern Mesopotamian rims, having a rounded rim with two notched ridges underneath.²³ Similarly, another large bowl sherd with a rounded overhanging rim and a relatively wide groove immediately followed by a narrow applied ridge with a notched decoration (LOG.D.399-1, Fig. 6: 1) could belong to both the mid-late 3rd millennium large bowl type or to a medium-large-sized 'fruit stand'. Few but significant fragments of the latter vessel

16. This type of high carinated shoulder such as the one shown in Fig. 5: 6 is widely distributed in southern and central Mesopotamia as well as in the Diyala region especially during the Early Dynastic III and Akkadian periods. Broadly speaking, it is quite different from the high carinated shoulder jars of Late Akkadian times, which show an applied plain ridge at the carination. For an overview of the wide variety of jars displaying this feature see, for example, the chapter about ring-based jars in Moon 1987 or Delougaz 1952: pls. 142, 155 (only B.515.470), 180.

17. Besides the specimens from Area KG's Level VII at Nineveh (McMahon 1998: fig. 5: 9-13), the best parallels could be found in Ishtar Temple's level G at Assur (Beuger 2013: pl. 2: 13) and at sites in the Middle Tigris Valley such as Tell Fisna (Numoto 1988: fig. 21: 136-139).

18. See the specimens shown in Zingarello 2016: fig. 6: 1, 4 (in the middle and at the bottom left).

19. McMahon 2008: fig. 7: 1-7.

20. Beuger 2008: 356, fig. 6.

21. See Levels Vb-a at Tell Fisna (Numoto 1988: fig. 21: 125-132, 22: 150-155) and Tell Jigan (Fuji 1987: fig. 6: 68-69). This vessel type is attested also at sites in the Upper Khabur and the Eastern Jezirah, see Orsi 2011: pls. 59: 10-12 (Tell Leilan), 66: 20-22 (Tell Hamoukar), 74: 531 (Tell al-Rimah).

22. Oates 2001: fig. 418: 611-613. J. Oates (2001: 174) includes these three specimens among the 'band-rim bowls' typical of the Ur III period, commonly referred to as carinated bowls (such as our LOG.D.356-1, Fig. 5: 1). It should be stressed, however, that they show two plain ridges under the rim, rather than a proper carination.

23. Cf. for example type O-2 and type O-4 in McMahon 2006: pls. 77 and 79 respectively. Among others, a decoration with a double notched ridges is very typical of the southern and central Mesopotamian 'fruit stands'.



Fig. 6 - Selection of ceramic material from Trench D levels 3c-d: 1) LOG.D.399-1; 3) LOG.D.384-1; 3) LOG.D.399-4/2; 4) LOG.D.391-4; 5) LOG.D.357-1.

type were already found during the second season, in particular the undecorated base of such a pottery type's large specimen (LOG.D.262-12+241-1).²⁴

As far as closed shapes, also in levels 3c-d a wide variety of vessel types were retrieved, among which it is worth mentioning: a sherd of a wide-mouthed, bag-shaped jar (a pottery type again largely attested) with a slightly tapering rim pointing downward and a shallow groove inside, ornamented with an appliqué scorpion together with an incised vegetal motive (LOG.D.391-4, Fig. 6: 4); a medium-to-large-sized storage jar fragment with a triangular outward-turning rim with a decoration combining wavy and horizontal comb-incised lines with two rows of differently tilted slashes (LOG.D.399-4/2, Fig. 6: 3). Lastly, a cylindrical stand fragment with at least two series of excised triangles, the upper ones of which are encased in faint concentric triangles (LOG.D.357-1, Fig. 6: 5) seems to be dated to an earlier date compared to assemblages of the levels under discussion.²⁵

In sum, the framework outlined in the 2016 excavations season, in which Logardan is seemingly fully included within the ceramic tradition of the Tigridian region – according to the regional borders assessed by the ARCANE Project – with strong connections with the neighboring areas is confirmed and strengthened by the 2017 work. Furthermore, what is becoming increasingly clear is also the Logardan potters' craftsmanship, that combines a long standing, but evolving pottery regional tradition during the mid-late 3rd millennium BC with a significant local specificities that characterize it.

24. Zingarello 2016: 85, fig. 8: 2.

25. It has two close parallels in the Diyala region, both dating to Early Dynastic I period (Delougaz 1952: pl. 173: C.3--063 and C.3--0--).

LOGARDAN TRENCH E CERAMIC MATERIALS

Since the beginning of excavations, pottery from Trench E appeared quite mixed, although the 2017 work has partly clarified the existence of two main Bronze Age levels, dating back to the early 3rd millennium BC and to the beginning of Late Bronze Age respectively. The first one is mostly represented by a group of medium- and large-sized storage jars found in one of the rooms (L.2020) of the building uncovered in 2016, which was used through several phases, recognized during the last campaign. As much as it has been possible to establish so far, the earlier phase of the building can be traced back to the Early Uruk period, whose remains were reused and partly adapted since the Middle Uruk time.²⁶ The jars under discussion, most of which have not been restored yet, share both morpho-stylistic and technological characteristics, although further analysis still have to be undertaken: all of them have a rounded or slightly beveled flaring rim, (high- or slightly) carinated shoulder and peculiar decorations seldom attested so far. The jar LOG.E.1068-1 (Fig. 7: 4), featuring an applique



Fig. 7 - SMedium- and large-sized early 3rd millennium BC jars from room L.2020 in Trench E: 1) LOG.E.1103-1 (in the foreground) and LOG.E.1101-1 (at the top left) in situ (not yet restored); 2) LOG.E.1076-1; 3) LOG.E.1287-1 (not restored); 4) LOG.E.1068-1.

26. See both Trench E excavation report (Savage, Zingarello, Obreja and Abdullrahman, this volume) and the pottery analysis (Baldi, this volume).

notched crescent-shape rope along with a ceramic raised circle quite symmetrically placed on the shoulder, still had a lump of clay attached just below the rim, aimed at sealing the vessel's content. Other jars show a deeply and spaced notched rope applique on the shoulder with the edges facing downwards (LOG.E.1076-1, Fig. 7: 2) and a similar notched rope on shoulder with the edges equally facing downwards almost touching a second notched horizontal rope (LOG.E.1287-1, Fig. 7: 3)²⁷. A fourth, large-sized jar (LOG.E.1103-1, Fig. 7: 1 in the foreground) shows the same pattern of decoration, with two notched ropes pointing down applique on the sharply carinated shoulder and on the lower half of the body tapering to a rounded base, divided by a horizontal notched rope located just under the first one. This kind of applied ridges seems comparable to that from Early Dynastic I levels at Tell Sabra²⁸ and Tell Madhhur, both in the Hamrin region. A decoration with at least four alternating notched and impressed applique ropes over most of the body large-sized, is clearly recognizable on an elongated bag-shaped jar with a wide mouth and rounded base (LOG.E.1101-1, Fig. 7: 1 at the top left), despite its poor state of preservation.

The latest phases detected in Logardan Trench E, represented by intrusive pits (especially in the earlier room L.2020) and by a system of pottery kilns spread over the whole excavation area, is characterized by a broad presence of large wide-mouthed storage jars with square-sectioned rim (with or without a slight depression in its inner or outer edge) and horizontal ribs at the base of the neck and on the shoulder (for example LOG.E.1284-1, Fig. 9: 1; LOG.E.1374-21, Fig. 9: 2)²⁹; large wide-mouthed storage with a distinct inwardly beveled rim or incurved ledge rim (LOG.E.1382-17, Fig. 9: 3; LOG.E.1374-3, Fig. 9: 4)³⁰ and small unpainted beakers with plain or tapering rim and a footed base (LOG.E.1361-3, Fig. 9: 5; LOG.E.1319-1, Fig. 9: 6; LOG.E.1363-3, Fig. 9: 7)³¹.

A nearly complete large storage jar (LOG.E.1108-1, Fig. 8) was placed in a pit cutting the early 3rd millennium BC strata in room L.2020 and sparing, quite surprisingly, the earlier jar 1103-1 (Fig. 7: 1 in the foreground).³² This vessel shows an inwardly beveled rim, squat barrel-shaped body, round base and a decoration of quite regularly spaced both impressed and



Fig. 8 - Large storage jar LOG.E.1108-1 from a Late Bronze Age pit, Trench E.

27. It should be stressed that a feature of this roped jar – uncovered during the 2017 excavations campaign – namely the presence of a hole at its base (cf. Fig. 7: 3, fragment immediately under the measure) is meaningful with respect to its function: it may be involved, in fact, in a beverage manufacturing process, most likely beer.

28. See Tunca 1987: pls. 96: 4 (Early Dynastic I), 98: 3 (Early Dynastic I ?) for Tell Sabra; Moon and Roaf 1984: fig. 14: 10 for Tell Madhhur.

29. Cf. type T10/12 in VV.AA. 2012: 80 with relevant bibliography.

30. Cf. types T10/14 and T10/15 respectively, in VV.AA. 2012: 80 with relevant bibliography. These large wide-mouthed storage jars with different rim types have good parallels also in the Mitannian pottery from Nemrik (north of Mosul) for which see Reiche 2014: 295 and pls. 9-10.

31. For comparisons, see Gabutti 2002-2003: pls. 67-68, including several examples of late Middle Bronze Age.

32. Due to the relatively high amount of vessels apparently located along at least two walls of room L.2020 in the early 3rd millennium BC building phase, it is likely that the pit cut to accommodate the Late Bronze jar 1108-1 (Fig. 8) came across and took one or more earlier vessels out.

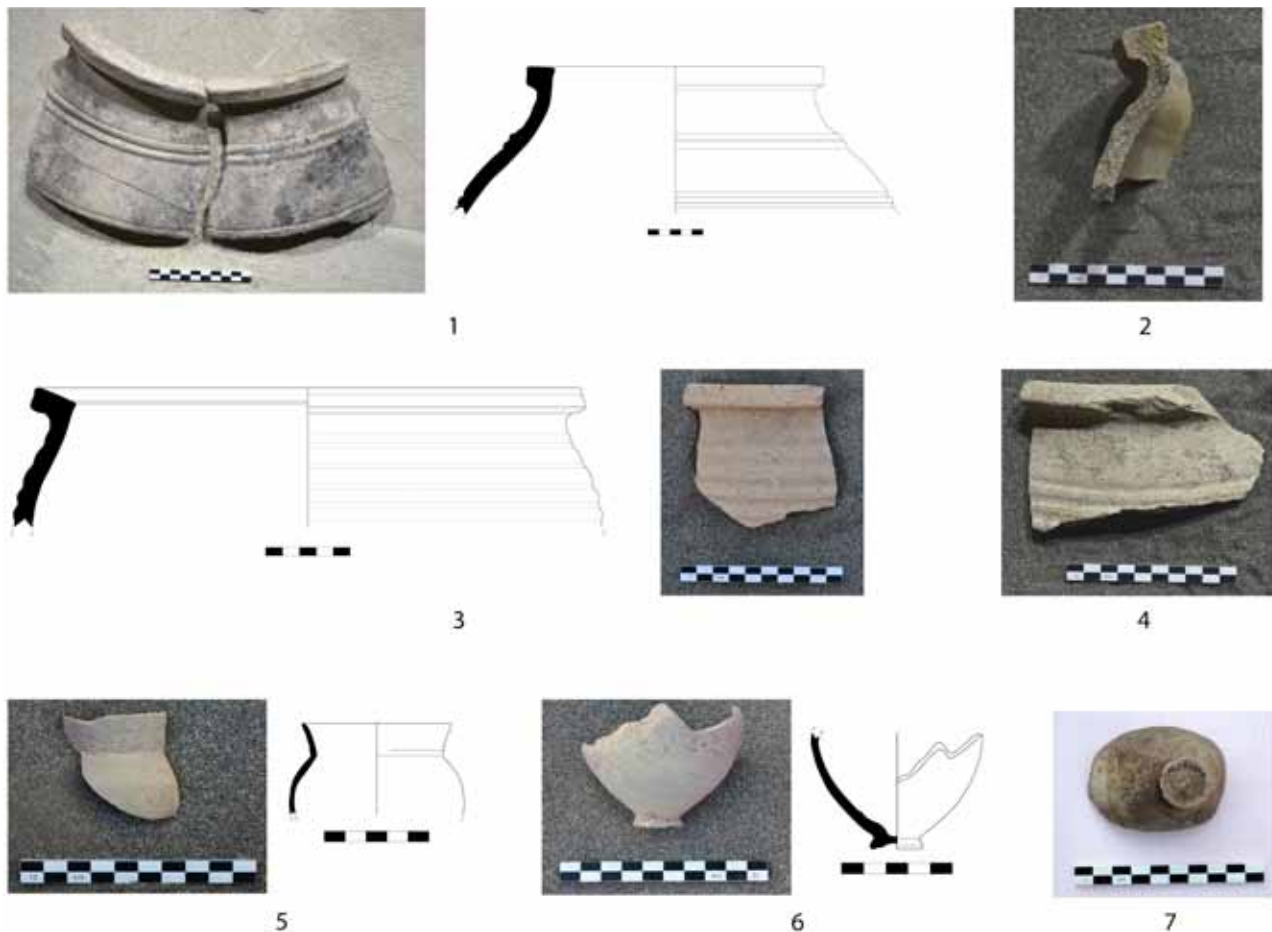


Fig. 9 - Selection of Late Bronze Age pottery from Trench E: 1) LOG.E.1284-1 (from a pit in south-west corner of room L.2020); 2) LOG.E.1374-2 (from kiln 2095); 3) LOG.E.1382-17 (from kiln 2120); 4) LOG.E.1374-3 (from kiln 2095); 5) LOG.E.1361-3 (from kiln 2095); 6) LOG.E.1319-1 (from a pit in south-west corner of room L.2020); 7) LOG.E.1363-3 (from a foundation layer).

oval-sectioned plain ridges. Between and partly above them a hard and heavy clay plaster was laid from the shoulder down on the body and base, aiming most likely at isolating the vessel's content. In this regard, it may be suggested as a working hypothesis, not only an aesthetic but also a functional purpose for the ridges applied on the jar's body as a support and 'grip' for this kind of mortar coating.

Currently, it still has to be understood whether the two Late Bronze Age levels recognized in this area have to be assigned to a very early phase of the Late Bronze Age (i.e. a 'transitional' phase between the end of the Middle Bronze and the beginning to the Late Bronze Age) or to a slightly later one. In this sense, the complete lack of painted sherds should be stressed: this situation may be due to a random event that affected the ceramic material distribution or may have a functional reason. The excavations completion of the system of pottery kilns in Trench E, planned for the next season, will help clarify this aspect.

Finally, a late 3rd millennium BC elusive phase seems to be marked by few vessel types, most of which are comparable to those retrieved in Trench D – such as a limited variety of carinated bowls with out-turned or thickened rim flattened on top, high carination and hemispherical body or wide-mouthed bag-shaped jars with a comb-incised decoration. However, the predominant shape of the late Early Bronze Age in Trench E, although not associated so far with a distinct architectural level, is a hemispherical bowl with a high vertical grooved

rim (Fig. 10). This kind of open vessel, both in carinated, straight-sided or curved version,³³ mainly attested in Period EME 5,³⁴ is among the most widespread shapes of the Middle Euphrates as well as in the Upper Khabur, e.g. at Tell Mozan and Tell Barri³⁵, but also in Southern Mesopotamia as a characteristic type of the Ur III period³⁶.



Fig. 10 - Carinated bowls with upturned, grooved rim from Trench E.

33. This bowl corresponds to 'type 116' of the typology elaborated by P. Sconzo (2015: 132-133, pl. 22: 4-6) for the Middle Euphrates region within the ARCANE project.

34. According to radiocarbon dates, phase EME 5 lasted little bit more than one century, from 2196-2076 BC (Finkbeiner *et al.* 2015: 436).

35. Orsi 2011: pls. 146: 28 (Phase 4, Tell Mozan), 181: 273 (Phase P, Tell Barri).

36. McMahon 2006: 82, Type O-22, pl. 94 with relevant bibliography.

GIRDI QALA MAIN MOUND, STRATIGRAPHIC TRENCH B

Laurent Colonna d'Istria, Alisée Devillers, Claudia Venier and Mustafa Ahmad

Trench B is located in the western part of the summit of the main mound (15m) of Girdi Qala. It consists of two contiguous 5 × 5 m squares at the top of the slope: Square 1 to the east and Square 2 to the west, partly in the slope. This trench was aimed at exploring the stratigraphic sequence of the site, from its top till its base. After three work seasons (2015-2017), approximately 2.4 m of stratified layers have been excavated.

In 2017, work in the Trench B began on Tuesday, September 26th, and ended on October 12th. The team was led by L. Colonna d'Istria with two doctoral students from the University of Liège, Alisée Devillers and Claudia Venier. Mustafa Ahmad (University of Lyon II) is in charge of the study of the ceramic material. The excavations of 2017 were focused on levels 5 and 6 of our preliminary sequence (see 2016 report). In particular, in the NE part of Square 1, less disturbed by the erosion than near the slope, we cleared part of an official building, provided with massive brick walls, dating back to the Hellenistic period (Level 6).

LEVEL 5

In the last days of the previous season, a level of occupation attested by a mud-brick wall (m.85) crossed by a passageway provided with a door-socket (84, alt. max. 652.25 m) was discovered, constituting a Level 5 B, dating to the Sasanian period according to the associated pottery. A built structure (78), about 1.3 x 0.8m, made of flat stones on three layers, 10 to 15 cm each, was also cleared. It is oriented East-West with a slight inclination towards the slope of the tell (fig. 1 and 2). At the end of the 2016 season, this alignment of flat stones was not really understood, the level being largely cut by several later pits (28, 73, 75 and 58), but we could observed that it was connected with walls m. 85 (south of 78), m. 86 (north of 78) and with the door-socket 84. Structure 78 and wall 86 were especially disturbed by pit 73 of Level 3 B (see 2016 report). Our hypothesis was to recognize the elements of a powerful wall possibly belonging to a defensive system, close to the slope of the tell.

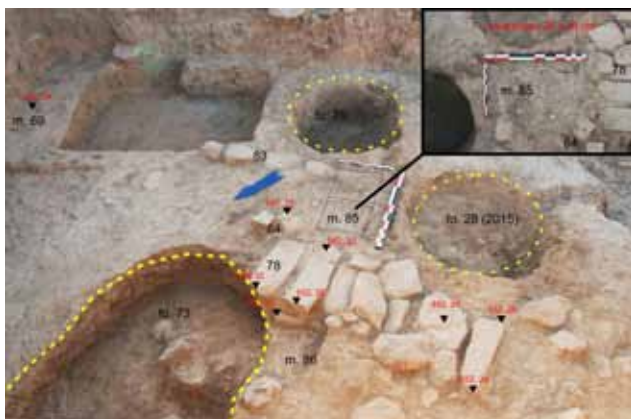


Fig. 1 - Square 1, Level 5 (78.2 and 78.3), to the SE

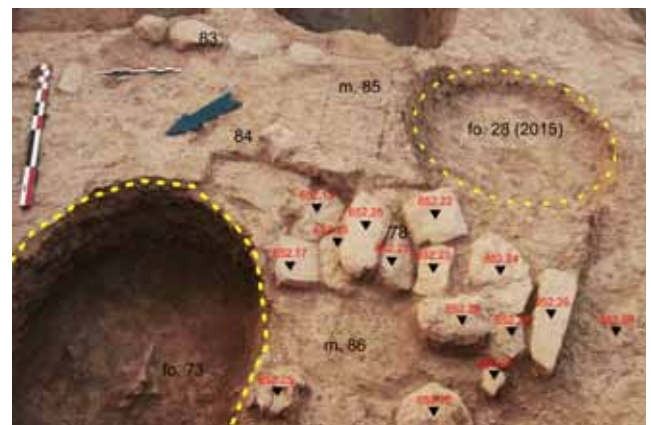


Fig. 2 - Square 1, Level 5 (78.2), to the SE

In 2017, structure 78 was carefully removed. Composed of three seats of flat stones, it is a succession of door thresholds. Indeed, two other door-sockets (122 and 117; see fig. 3), placed on top of each other, were found below door-socket 84. The altitudes of the different door-sockets and associated thresholds (78) suggest four successive phases of occupation, corroborated by the layers observed to the north-east of threshold 78. Therefore Level 5 has been divided into 4 phases, A to D from top to bottom (see Fig. 3), all dating to the Sasanian period.

► - *Phase 5A* (alt. 652.34 m):_door threshold 78 (recent phase = 78.1) + floor 71-rubified (alt. 652.34 m) + fire place 74 (alt. 652.28 m) + walls 77 (NW-SE), 65 (SW-NE) (mud brick: rectangular or square format). Remains of “djuss” between pit 88 and 73, and over wall 86 probably belong to this phase. Unfortunately, we did not find a wall aligned with wall 77 north of threshold 78.1.

► - *Phase 5B* (alt. 652.20 m): door threshold 78 (intermediate phase = 78.2) + floor + door-socket 84 (alt. 652.22 - 652.12 m) + walls 85, 86 (oriented N-S, mud brick: square format 35 × 35 cm) on both sides of threshold 78.2 + stones alignment 83 (E-S) topped with bricks 79 (rectangular format).

► - *Phase 5C* (alt. 652.10 m):_door threshold 78 (old phase = 78.3) + floor + door-socket 122 (alt. 652.12 - 652.04 m) + walls 85 and 86 (mud brick: square format 35 × 35 cm).

► - *Phase 5D* (alt. 652.02 m):_no door threshold, floor + door-socket 117 (alt. 652.04 - 651.93 m) + walls 85 (alt. min. 651.87 m) and 86 (mud bricks: square format 35 × 35 cm).

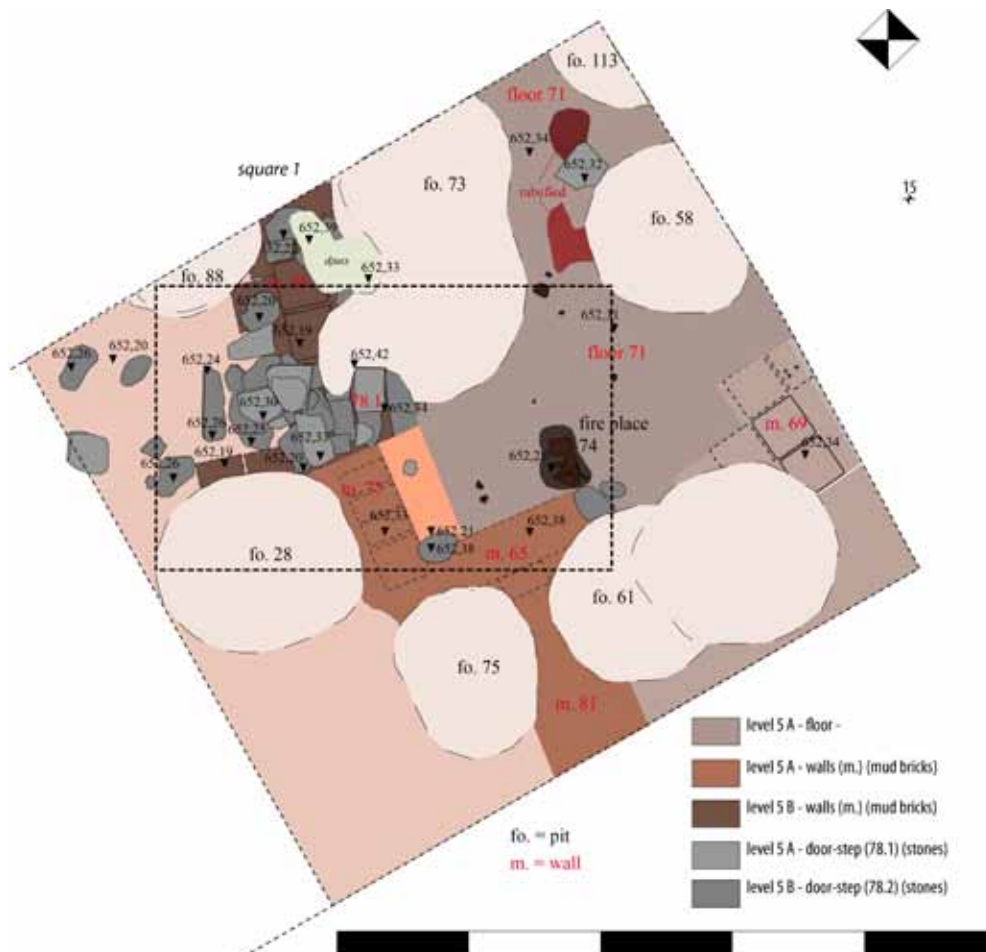


Fig. 3a - Levels 5A and 5B

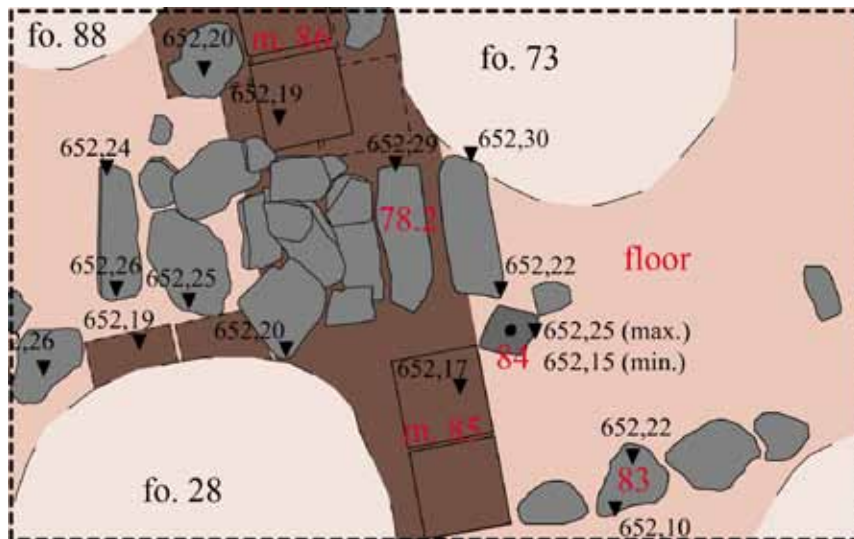


Fig. 3b - Level 5B (78.2).

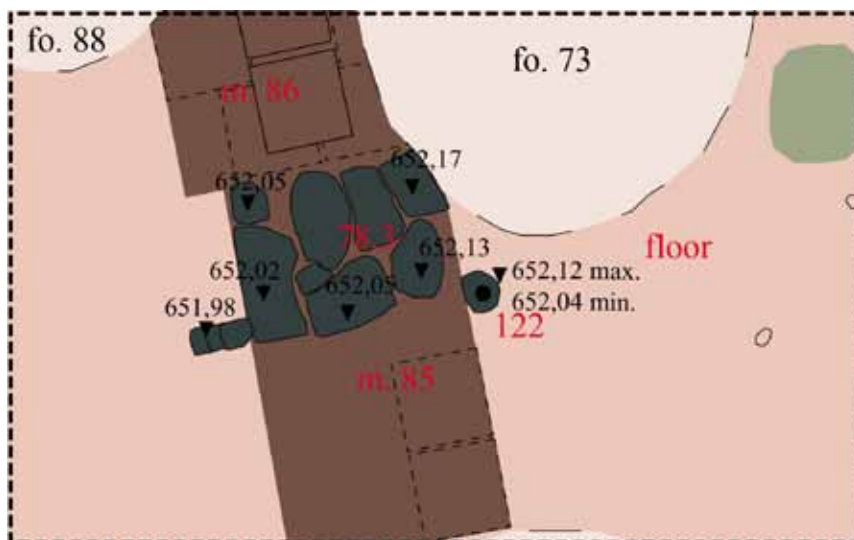


Fig. 3c - Level 5C (78.3).

As a preliminary conclusion, the remains are those of the entrance of a Sassanid domestic building, four times rebuilt as shown also by the raising internal floors. Moreover, the observations made on the floors associated to this entrance suggest that it led to an unroofed space, some kind of a forecourt.

LEVEL 6

Level 6, dating to the Hellenistic period, was also already identified in 2016: the top of wall 69 (alt. 652.34 m - mud brick: square shape 35 × 35 cm) and some filling layers in the northern part of square 2 and western part of square 1 (see 2016 report). At the end of the 2017 season, two levels must be distinguished. Level 6A is characterized by domestic or craft installations, whereas Level 6B below is a more monumental construction (see fig. 4).

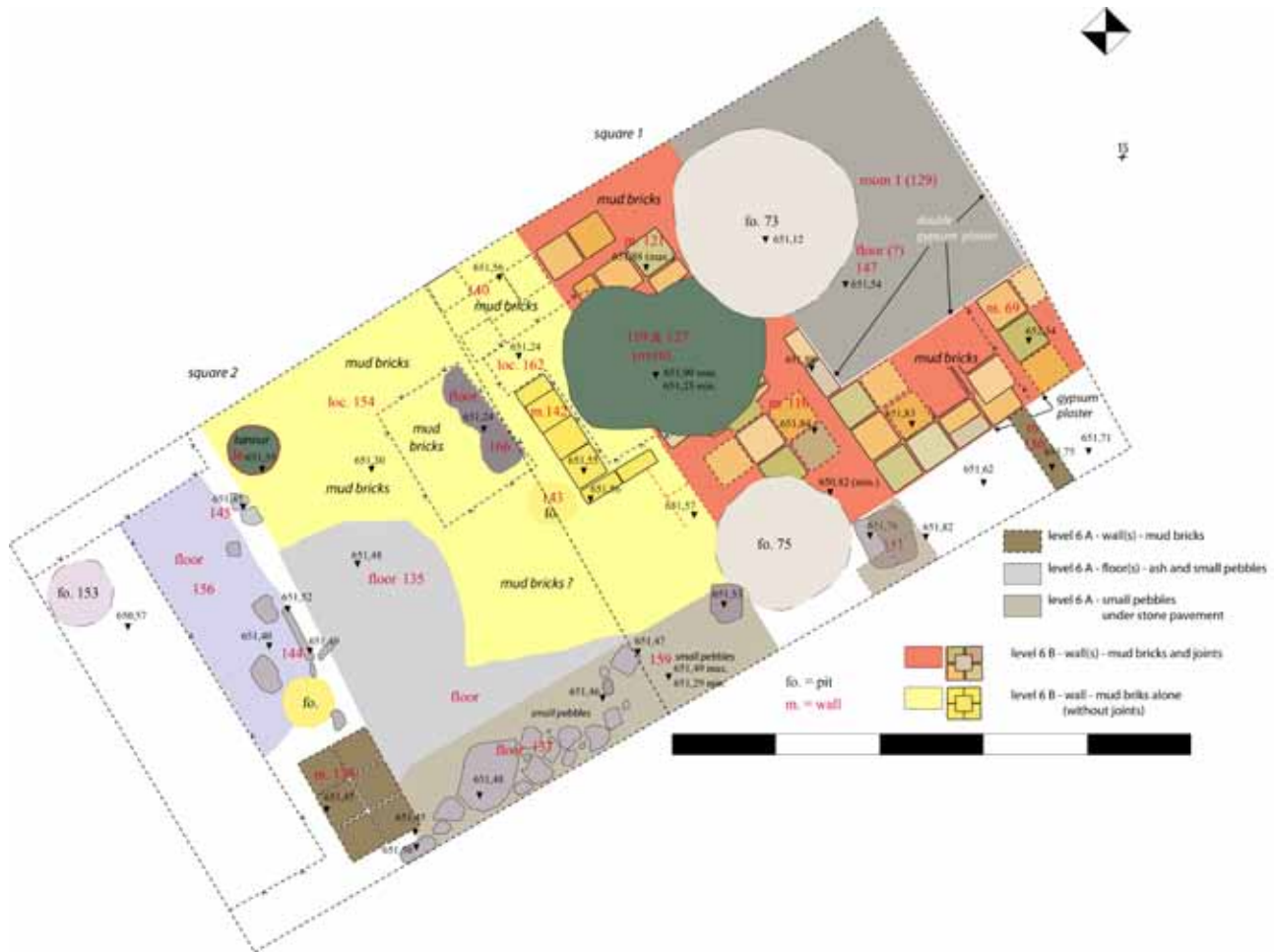


Fig. 4 - Preliminary Plan of Levels 6A and 6B

Level 6A

This level, heavily leveled to accommodate the Sassanid domestic building of level 5, is defined by various kind of installations, most of them set in the ruins of the «monumental building» of level 6B. The stratigraphic relationship of some of them suggests that Level 6A can be split into at least two phases:

Some mud bricks (square shape) on stone slab 151 (itself belonging to level 6A, square 1).

Wall 138 is later than floor 156 and installation 144.

Fireplace 166 (alt. 651.24m) is later than floors 156 (alt. 651.40m) and 137 (alt. 651.46m) south and east of square 2.

The various installations are identified as follows :

Oven 119/127, lately reused as a waste pit, is intrusive into the monumental Hellenistic complex of level 6B. During the disassembly of this oven, unbaked small weights and spindle whorl were found (fig. 5).

An alley of flat stones (137) + pebble bed with small potsherd (159) (alt. 651.50 ~ 651.45 m), in the south corner of square 1 and along the south-east berm of square 2

Ashy floor 156 (alt. 651.40 m), disturbed by a small pit north-west of 138, associated with the installation 144 composed of several stones (one of them placed on edge, alt. 651.52 ~ 651.49 m).



Fig. 5 - Unbaked weights and spindle whorl from Oven 119/127, Level 6A

Another ashy floor 135 (alt. 651.52 m, square 2), east of 144.

Fireplace 166 (alt. 651.24m).

Tannour 36 (alt. 651.55 m), close to the NW berm of square 2, associated with floor 135 (alt. 651.52 m) characterized by small potsherd and ashen earth. A potsherd with 'crescent' and 'dog-teeth' motif has been found on the floor (NV-1135 - alt. 651.55m).

Stone slab 151 at the eastern limit of pit 75 in square 1, the bricks on this slab and wall 150 (alt. max. 651.75 m), perpendicular to wall 69, testify a new arrangement of the area south-east of walls 69 and 116 of Level 6 B.

All these installations can be interpreted as the result of a loose reoccupation, during the Hellenistic period, of the sector of the underlying monumental building of level 6B, partially leveled to accommodate them.

Level 6B

This level is currently the main object of the excavations, that we plan to extend due to its importance, and therefore its interpretation will be subject to change as a result of future works. This level consists of two contiguous architectural sets:

In the SW part of square 1 and in square 2, a large and compact set of mud bricks (154), without visible joint. However, several sets of bricks such as 140 and 142 could be distinguished. The disassembling of the intrusive oven 119-127 (loc. 162) has shown that at least three layers of brick were present, but without visible mortar (142, max. alt. 651.58 - min. alt. 651.24). The future work should provide a better understanding of this set that we understand as a possible rampart associated with a building located to the NE (fig. 4).

In square 1, a building was found, characterized by walls made of square mudbricks (35 cm × 35 cm, clay mortar joints of 3 to 5 cm). Walls 121 (top at 651.93m – followed down to 651.51 m and continues below), 116 (alt. max. 651.83 - alt. min. 650.82) and 69 (alt. max. 652.34 m) delimit a Room 1 in the north corner of square 1. The wall closing the room to the NE (130) was located exactly in our east berm. Two heavy coats of fine white plaster covered

the face of the walls in room 1. A single layer of the same plaster was applied on the south face of wall 69, where the associated floors has not yet been found (end of works at 651.62 m). The intrusive silo-pit 73 destroyed the western part of room 1, as pit 75 destroyed the angle of walls 116-69, but helped us to locate the foundations of wall 116 at an alt. of 650.82 m. (fig. 6).



Fig. 6 - Plastered east face of wall 116

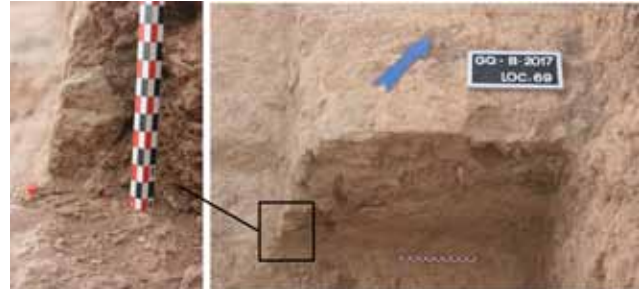


Fig. 7 - Plaster south face of wall 69

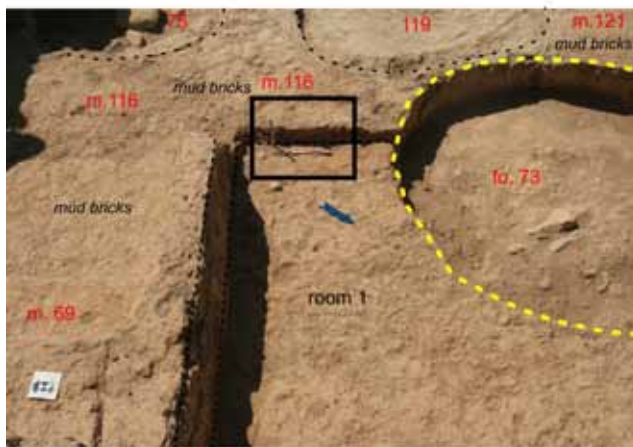


Fig. 8 - General View of Trench B, to the SW.

In room 1, a very clean floor (147) with very few potsherds, was found at 651.54 m. Among the few potsherds, a fragment with an applied decorative element (fig.7) is to be noticed.

The coming work in Trench B should focus on better understanding this official/monumental building of the beginning of the Hellenistic period (fig. 8) and continue to document the different occupations of the main mound of Girdi Qala.

THE POTTERY (MUSTAFA AHMAD)

The amount of pottery collected this season is not high but very informative. It shows the pertinence in the ceramic traditions and dating. The excavation has been done this season mainly in level 6, that has been divided into two phases (6A & 6B). The pottery sherds coming from this level are dated to the Hellenistic period.

Few forms of pottery jars, jugs and bowls have been identified. The implemented decorations on the pottery, in association with the fabrics and forms, demonstrate the strength of the Hellenistic ceramic traditions that is common and well spread in the region at this period.

Among these decorations, the dog-teeth motif is found on few sherds (GQ-B-17-1118-1, GQ-B-17-1118-2), very common in this period in the region. (fig. 9).

This décor was combined with a series of crescents motif implemented on a jar (GQ-B-17-1135-1; fig. 10). The combination of dog-teeth and crescent decors is not common in this period, but attested in other contemporary sites, Babylon (Cellerino 2004. Fig. 15:110) and Khirbet Khatunyah (Curtis & Green 1997, fig. 68:541).

A barbotine applied circle with oblique incisions-on-top is also attested (fig. 11). This motif as well is not common in this period. It is attested in Khirbet Khatunyah where it is dated to the Hellenistic period (Curtis & Green 1997, fig. 66:509) but exists since the Achaemenid period in Abu Qubur (Warburton RC & Warburton DA, 1991).

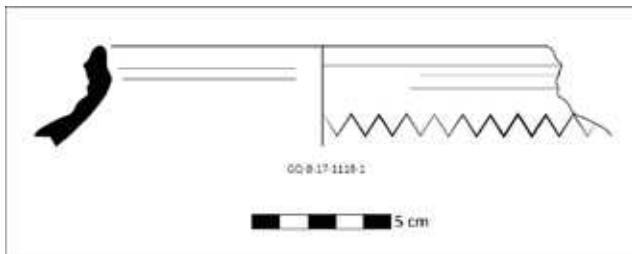


Fig. 9 - Dog-teeth decoration, Hellenistic period.

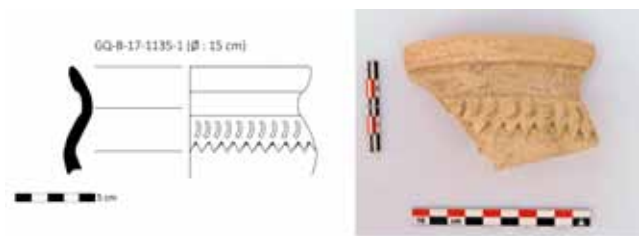


Fig. 10 - Potsherd GQB-17-1135-1 with 'crescent' and 'dog-tooth' motifs.

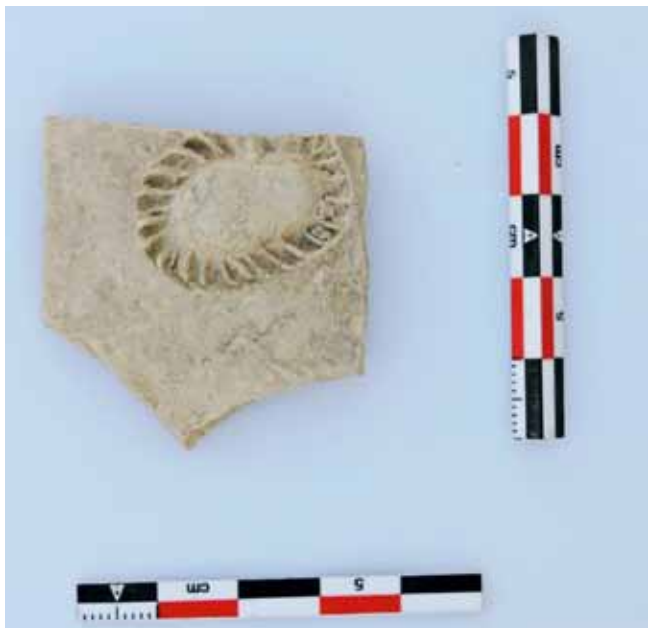


Fig. 11 - Potsherd GQB-17-1142-9 with applied decoration, from Room 1 of level 6B.

GIRDI QALA NORTH, TRENCH D: STRATIGRAPHY AND ARCHITECTURE

Clélia Paladre, Régis Vallet, Rateb al Debs, Kamal Rahoof and Alain Gaulon

The excavations of Trench D have been carried out from the 16th of September to the 12th of October. The team was composed of five archaeologists: Clélia Paladre, Rateb al Debs, Alain Gaulon, Kamal Rahoof and Régis Vallet, assisted by four workers. The aim of these excavations was to extend the stratigraphic trench opened in 2016 in the northern slope of the mound. The trench was lengthened of one square (of 5m side) to the south and three squares to the north. Thus, the full size of the trench is now reaching the 30m length (Fig. 1). The excavations were not equally deep in every part of the trench; it goes from 1.8m in the center to only 0.1m to its north end. The total altitude gain is about 3.65m. These excavations allowed us to recognize about ten successive levels of occupation, all of them dating back from the Middle Uruk period¹ (Fig. 2 and 3).



Fig. 1 - Trench D, view from the North and from the South.

1. See the pottery study, Baldi, *infra*.



Fig. 2 - General plan of Trench D.

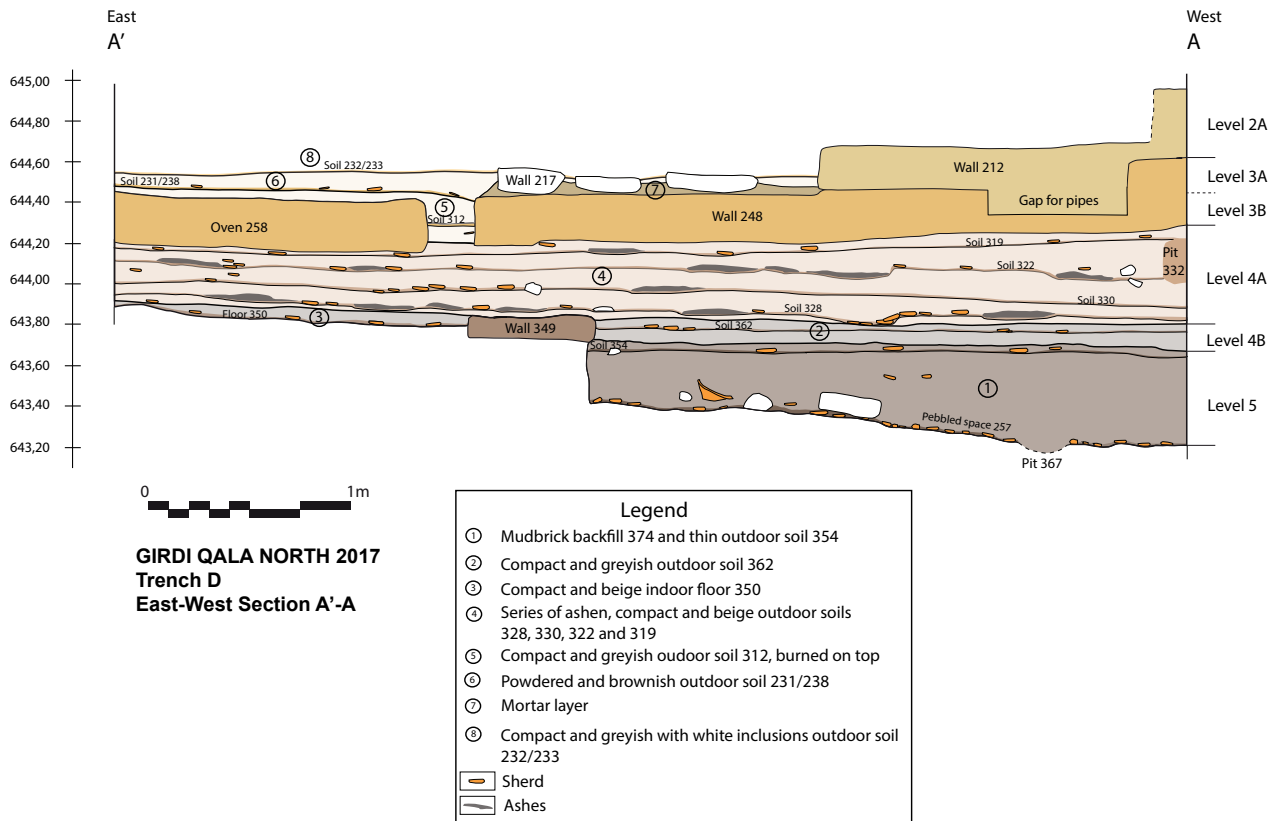


Fig. 3 - East-west Section A'-A in the middle of Trench D.

LEVEL 1

An imposing pit (203) represents this latest level, already known in 2016. We finally define its limits; it is around 4.30m length and 3m width. The bottom of the pit is still unreached. It has disturbed level 2 (especially level 2B, another large pit and external floors, full of materials) and level 3. Thus, its materials were mixed with some material from the deeper levels. Pit 203 gave some Early Bronze Age pottery, showing that the occupation continued (or rather restarted) at the beginning of the 3rd millennium BCE. However, the much higher amount of Middle Uruk materials (Fig. 4) proves its origin at the end of the Uruk occupation, after level 2A. Therefore, it is still considered as the level 1 of our temporary occupation sequence.



Fig. 4 - Material coming from pit 203 from level 1
a : terracotta bead (GQD.Tc1308.1)
b : fragment of a basalt weight (GQD.P1315.1)
c : obsidian blade (GQD.Obs1382.1)

LEVEL 2

This level has been recognized since the opening of the trench last year, but is now subdivided in two different levels: 2A (late) and 2B (earlier). Indeed, in 2016, level 2(A) was cleared in the northern part of the trench, directly above level 3. However, in 2017, the new square opened to the south revealed new layers (consequently 2B) in between levels 3 and 2.

Level 2A

In 2016, two buildings represented this level. One was potentially tripartite in plan (oriented north-south) and we expected to get a complete view of its plan with the opening of a new square more to the south. Unfortunately, the state of preservation of its remains was extremely disappointing.

As already noted in 2016, walls have stair-like foundations, which rise to the south until they disappear. The tripartite plan is still possible but remains to be demonstrated (Fig. 5).

In the north part of our new square, we were able to follow wall 208 until wall 323, oriented east-west (Fig. 6) and preserved on 0.5m width and 1.2m length, cut by pit 203 from level 1. Wall 208 has stair-like foundations, with two steps of one brick height each. We identified a wide foundation trench for 353, of about 1.5m width. This dimension is surprising and it can be explained by the structure of wall 217 of level 3 just beneath. Indeed, wall 217 has large stone foundations slabs that builders of level 2A obviously removed, thus creating the oversized foundation trench.



Fig. 5 - General view from the south of the possible tripartite building of level 2A, damaged by pit 203 to the left



Fig. 6 - Corner of walls 208 and 323 of level 2A with the composite wall 373 in the background

Wall 323 closes the vestibule 214 of about 2.5m width and 2m length. Vestibule 214 yielded an internal floor, the end of floor 228 identified in 2016, easily recognizable with its grey color and white inclusions. Eight complete ceramics (fragmented) and two stones (one of which was engraved) were arranged on this floor (Fig. 7).



Fig. 7 - Floor 228 of vestibule 214 (level 2A)

Wall 323 extends up to the east where it joins wall 373, oriented north-south and extending up to the south for about 2.2m before it disappears. It seems that wall 373 is located above 251, a late partitioning wall link to wall 250 of level 3A. However, walls 251 and 373 could be part of the same wall. In this case, wall 251 should be attached to level 2A. We need to extend the excavations more to the east to have the information.

Wall 373 has a size of about 4.3m length and 0.5m width. It is made of stones, mudbrick fragments and mortar. Its upper stone course has slipped to the east. As wall 323, it has stair-like foundations with at least two steps. In the corner of 323 and 373, wall 373's base was not cleared, whereas 1.5m to the south, we could see two base-courses. It steps across wall 217 of level 3. A last step is visible, with a large rectangular stone (Fig. 8), and then the wall disappears, without reaching the south end of the trench. In its northern part, a pipe is present in between two stones (wide of about 10cm). In the south part of the trench, we have no attestation of level 2A. First, because of the erosion (mainly because of the ploughing) and second, because of the stair-like foundations of its walls.



Fig. 8 - Wall 373 with its stair-like foundations .

The second building of level 2A is located lower in the slope, to the north. It has been removed in 2017 (walls 213, 222 and 221). Walls 221 and 222 were bonded to wall 213, with one brick and a half laid as stretcher. The half brick was alternatively located on either face (Fig. 9). Bricks have a size of 0.3m length, 0.2m width and the half bricks have a width of 0.1m. All bricks share the same thickness, about 0.1m. The horizontal joints, made of mortar mixed with sherds, have a thickness of 2cm.



Fig. 9 - Organization of the bricks of wall 213

Level 2B

This level yields no architecture and is only represented by ashy layers, belonging to pits or external floors located in between level 2A and level 3. Indeed, these layers pass below wall 373 and above wall 217. We assume that it was also present north of wall 323, but removed with the foundation of level 2A. Level 2B is subdivided in two sub-levels: 2B1 (late) and 2B2 (early).

► **Level 2B1** is represented by the large pit 326. Successive hollow-shaped layers filled it. It has a size of 0.7m deep and 3.8m in diameter. The deepest layers, very ashy, were especially rich in material (notably BRBs). This pit is cut in its north part by pit 203 from level 1, but it also cuts itself layers and architecture of level 3. Indeed, in the south-west corner of the

trench, it cuts hearth 358, stone wall 357 and their associated floor 372. In the east part of the trench, pit 326 cuts level 2B2 floors (335) and goes down to the foundations of wall 217. In the center of the trench, it goes down until level 4A floors (348/361).

► Level 2B2 is represented by a series of external and compact floors (335), which seals directly the level 3 and is mainly located in the trench south-east corner and along its east limit. In the west part of the trench, it is characterized by brown and clayey sediment, whereas in the east part, it is more ashy, white and powdery. All of the floors yielded a high quantity of material, especially complete ceramics. Grave 331 is also attached to this phase, dug from one of the 2B2 floors (Fig. 10). It is a pit-grave, obviously a primary burial, which cuts and partly removes wall 217 of level 3. Some of its stones were reused in order to maintain the body of

the young child. He or she is in a flexed position, oriented north-south. His/her head rests on a stone to the south, facing west. Bones are heavily damaged and the associated material consists in only two BRBs, located near the knees.

Level 2B is clearly representing a long phase of abandonment of that precise sector of the site, before its re-occupation at level 2A. It explains the voluntary and significant leveling of the imposing building of level 3.



Fig. 10 - Grave 331 (level 2B2) cutting the wall 217 (level 3)

LEVEL 3

This level has been recognized in 2016 and is represented by an imposing construction with two phases of occupation, 3A (late) and 3B (early). However, we still do not know if the main structures were rebuilt or not. Phase 3A was attested in the north part of the trench but it has been almost entirely removed in 2016.

To the south, we followed wall 217 in the new square. Its state of preservation was unfortunately not as good as we expected. Indeed, it has been leveled until its stone foundation layer and widely destroyed in number of places (mainly by pit 203 of level 1, the foundation trench of wall 323 of level 2A and by grave 331 of level 2B2). Nevertheless, two sections are still preserved that we followed until the south berm of the square.

It has a size of 0.9m wide in its north part but is wider in its south part with a size of 1.2m (Fig. 11). Its west face is carefully made with long rectangular stones, very well carved, whereas its east face is made of rubbles. As we already noted in 2016, wall 217 rested on a thick mortar layer (about 0.15m). Another mortar layer was located above the stones in order to obtain a horizontal plan on which mudbrick courses were built (some rare and fragile remains were still visible in some places).

East of wall 217, Level 3 continues with two possible stone walls oriented east-west, 369 and 370, that could also form a stone pavement. The excavations are not large enough to

understand the exact nature of these structures. Five cones, coming certainly from the west face of wall 217, and two terracotta tokens have been discovered there. Four additional cones, that certainly rolled down the slope, were discovered further north (Fig. 12 and 13).



Fig. 11 - Wall 217 of level 3, from the south.



Fig. 13 - Middle Uruk token
(GQD Tc1357.2.)



Fig. 12 - Terracotta cones discovered in 2017 (GQD.Tc1305.1, GQD.Tc1338.1, GQD.Tc1362.2, GQD.Tc1369.1, GQD.Tc1363.2, GQD.Tc1368.1, GQD.Tc1383.1 et GQD.Tc1383.2).



Fig. 14 - Wall 359 of level 3, from the south-east.

Level 2B pits, in the area directly west of wall 217, had destroyed level 3. However, we can find it again in the south-west corner of the trench. There, the mudbrick wall 359, oriented east-west, is certainly linked to wall 217 since both walls are perpendicular and have the same size (1.2m width). If wall 248, located further north, has also the same size (which is not certain since later layers are still in place above this wall), then the room defined (except to the west) would have a size of 4.2m from north to south (Fig. 14).

South of wall 359, we identified a rectangular hearth made of burned clay (358) and a stone wall (357). Both were associated to a floor (372), which extends until the south-west corner of the trench. Hearth 358 is cut by pit 326 from level 2B1; it has a size of 0.57m length and 0.35 to 0.12m width. Wall 357 has foundations made of small size stones. It is parallel to 217 and based at the same altitude (Fig. 15). It could be a simple partitioning wall and it is not certain that it joined wall 359. Thus, a passage could have been present in the north part. Wall 359 is based deeper than 357 and 217. Below floor 372, a brown and compact clayey layer was passing below wall 357 and continuing until wall 359's base. It is probably a backfill which was aimed at compensate the slope.



Fig. 15 - Wall 357 and hearth 358.



Fig. 16 - Floor 312 associated with oven 258, platform 314 and pipes 225.



Fig. 17 - Tubular stone bead (GQD. P1372.1) from floor 312 (level 3).

In the north part of the trench, after removing the level 2 remains, we discovered a large rectangular platform (314). It was made of a clay and straw mortar and had a size of 1.8m length and 0,7m width. A burned floor 312 was associated with the platform 314, the oven 258 and the pipes 225 further west (prints were clearly visible on the floor), demonstrating the contemporaneity of all these structures (Fig. 16). Floor 312 yielded a small tubular stone bead (Fig. 17). In between oven 258 and platform 314, we were able to observe a blockage made of bricks and mortar (more or less the same than the one observed in 2016 between wall 248 and oven 258). It has to be noted that this blockage was wrongly identified as a possible small platform in 2016.

Oven 258 yielded a second utilization floor with a complete jar and a big animal bone. The base of the oven has been cleared this year; it was dug into level 4A layers to a depth of around 0,15m. We defined the size of the bricks: 0,15m length, 0,20m width and 6 to 8cm thick. Joints have a size of about 2cm and are made of mortar mixed with sherds (Fig. 18).



Fig. 18 - Oven 258 and its first floor.

LEVEL 4

The 2016 campaign yielded a level 4 represented by a series of external floors and some pits. The 2017 campaign reveals a subdivision with two successive levels, 4A (late) and 4B (early)².

Level 4A

This level yielded only external floors, very well laid, and pits.

In the two-thirds and center of the new square to the south, 4A floors (348/361) were present below level 3. This is our final stop there for this campaign. These series of floors were compact, greyish to light beige with ashy and coal inclusions. Some scattered stones were also present. Pit 360, dug from one of these floors (348), is also attached to this layer. It has a size of 1.35m length and 1.4m width but it continues to the south of the trench and below wall 217 of level 3, partly based upon the powdery filling of pit 360.



Fig. 19 - Floor 328, first floor of level 4A.



Fig. 20 - Material discovered on the floor 328 of level 4A – a: large perforated Middle Uruk cylinder (GQD.Tc1378.1) – b: stone beads (GQD.P1367.1 et GQD.P1377.2) – c: grinding tools kit (GQD.P1367.2)

The main part of level 4A is however located in the north part of the trench, at the vertical of remains of level 3B (oven 258 and wall 248) that were kept in place (except platform 314). Four successive floors of level 4A were identified (319, 322, 330 and 328), preserved on 0.9m to the west and 0.7m to the east. Each floor was carefully excavated and removed. As in the north part of the trench, it was compact, light beige to greyish with ashy inclusions and rich in material. Some scattered hearths were present. The first 4A floor (328, at the bottom) showed an especially high concentration of material (Fig. 19 and 20).

2. The small ovoid oven 259, removed in 2016, has to be reassigned to level 4A (and not 3B). Indeed, we were finally able to follow further north the floor 319 associated to oven 259, and this one was passing below pipes 225 of level 3B.



Fig. 21 - Green stone stamp seal (GQD.P1339.2) from floor 322 of level 4A

Floor 322, above, yielded a nice stamp seal³ (Fig. 21).

Level 4B

This level, immediately below 4A floors, yielded mudbrick structures (Fig. 22) and two associated floors, external (362/305) and internal (307). This level is heavily leveled, 0.10m to 0.20m of elevation still exist.

The architectural remains consist in two perpendicular walls, which are certainly part of a large room. To the north, an east-west wall, 302, with a size of 0.5m width shows a coat of 5cm on its south face. It is preserved on 0.15m high. Bricks are melted and thus, we cannot define their size and layout. Two possible joints could define a layout of one brick and a half with a size of 0.7m length and 0.35m width for the complete bricks, 0.2m width for the “half” one. Wall 302 presents a pipe of 10cm in diameter, connected to a second pipe oriented east-west. It has a size of 6cm in diameter and leads to the west face of the perpendicular wall, 304. On top of wall 304, a large sherd was covering the pipe (Fig. 23).



Fig. 23 - Base of wall 304. The extremity of the pipe, the animal's jawbone, the trace of wall 302 and the reused stone of level 5 are all clearly visible.



Fig. 22 - Structures of level 4B (walls 302, 304 and 359 and threshold 352, associated with internal floor 350).

Perpendicular wall 304/349 presents an original aspect. Its north face was strengthened and trapezoidal. It could be explain by the presence of the above-mentioned pipes. 304/349 is 0.12m to 0.18m high and 0.5m width (to the south). As 302, bricks are too badly preserved to be defined. To settle the west face, builders based the wall on a large stone of level 5. The altitude of foundation of 302 is slightly variable from north to south (about 6cm). A mortar layer below the first course offsets this difference. Finally, an animal's jawbone was included in the masonry, certainly a propitiatory deposit. Wall 304/349 shows an especially wide (1.10m) mudbrick threshold (352). Its internal face, to the east, was quite well preserved, the west one heavily damaged.

3. See Paladre, *infra*.



Fig. 24 - Posthole 351 (level 4A), section and plan .

External floors were associated to these structures, 305 to the north and 362 to the west, powdery and irregular. The west floor (362) yielded the bottom of a posthole (351) of 0.28m in diameter and deep of at least 0.15m (Fig. 24). In the excavated room, a floor (350) was also identified. It was well-laid, compact, light beige with ashy inclusions, and provided some material.

LEVEL 5

Level 4B lies on a thick and compact dark brown clayey layer (374). In 2016, it looked like a destruction layer made of fallen mudbricks, located above a pebbled ‘street’ showing an opposite dip compared to the natural slope of the mound. Therefore, we were expecting a building in direction of the center of the tell (see Paladre et al. 2016). In 2017, we followed the pebbled street until a section A-A’ (Fig. 3) set directly below level 3 structures (the deepest point of the excavations, 643,26m), but no associated wall was discovered. Layer 374 seems to be a backfill, aimed at compensate the opposite slope of level 5, rather than a destruction layer. It yielded stones of medium caliber, some material, and a thin occupation layer was visible (354) in its upper part.

In any case, level 5 yielded absolutely no architecture and is still represented by the pebbled street 257, a very well laid floor, made of stones and sherds (it provided three beads in its center part, Fig. 25), covering a large area (almost the totality of the three new squares to the north of the trench). Thus, it has a length of 18m (north-south) for the

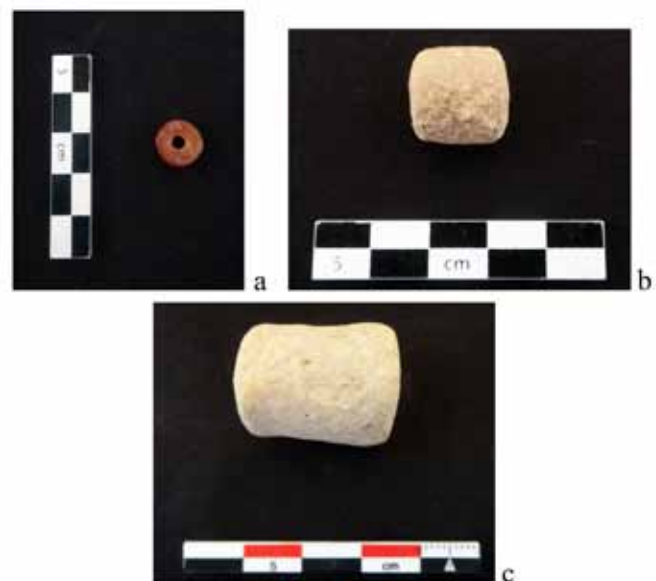


Fig. 25 - Beads discovered in the pebbled street 257 of level 5
 a : cornelian bead (GQD.P1305.1) – b : terracotta bead (GQD.Tc1300.1) – c : terracotta bead (GQD.Tc1300.2)

moment. To the north, it follows the natural slope of the mound and goes down regularly until an imposing pit (320). Pit 320 is temporarily attached to level 5, as it could have very well been made during this phase, but its stratigraphic position is rather indecisive for the time being. It has a size of 8m length and 1.5 to 3.5m width and is oriented NNW-SSE. This pit was full of material (thousands of ceramics, many almost complete) and was sampled only, in front of the amount of material (Fig. 26). It is obviously a collective dump settled in the periphery of the site.



Fig. 26 - South part of the pebbled street 257, pit 320 and the potential virgin soil.



Fig. 27a & b - Pebbled street 257 in the middle of the trench near Section A'-A, view of the high concentration of falling stones



Fig. 28 - Pit 367 dug from the pebbled street 257 of level 5.

To the south, pebbled street 257 presents a high concentration of large caliber stones, that could come from a collapsed wall that remains to be found. A small pit (367), of 0.4m in diameter, was present (Fig. 27a and b) near the section. Finally, a circular arc of small size stones, slightly higher, was located near the west berm of the trench. It could cover some remains of level 6, just below the pebbled street (Fig. 28).

LEVEL 6

North of the 4B remains that were kept in place, we opened in the last days of the campaign a small sounding of 7m length and 2m width along the east limit of the trench. This sounding revealed another occupation level, immediately below the pebbled street 257 (Fig. 2).



Fig. 29 - Structures of Level 6, from the west.

This level 6 contains a building, which seems relatively important (Fig. 29). At this time, four walls are attested. Wall 337, oriented north-south, crosses the entire length of the sounding (7m). It is made of mudbricks based on stone foundations of 0.7m width. The mudbrick part is badly preserved, probably because of the leveling operated for the installation of the pebbled street 257. However, the upper mortar kept the brick prints. Bricks had a size of 0.6 length and 0.3m width. Thanks to the slope, we were able to observe that the successive courses show alternating layers of stretchers and headers. An especially wide joint (0.15m) could be the filling of a pipe. The stone foundations are made of two to three large size blocks sealed by mortar.

Wall 337 was bonded to the perpendicular wall 336, also of 0.7m width and crossing the trench (2m). Only its stone foundations are preserved. Two other perpendicular mudbricks walls were found, 364 and 368. All of these perpendicular walls defined small rooms, storage boxes-like (365, 366). It could mean that we are dealing with a granary or a warehouse, but this has yet to be demonstrated.

In both north-east rooms (338 and 341), the building yielded a floor. In the room 341, floor 344 was well laid, with an orange coat. On the other side of wall 337, no floor was left because of two pits (318 and 345, rich in material). These pits were located in between level 5 and level 6, but their stratigraphic attribution has to be better defined during the next campaign (maybe a level 6A).

Finally, the north-east corner of the main trench was occupied by a homogeneous ground, dark brown and compact, which could be the virgin soil. The relation between this matter and level 6 is unclear, since pit 318 lies in between. We still do not know if level 6 is the original foundation level of this small Middle Uruk colony or if there are any deeper levels. The next campaign should allow us to obtain a complete occupation sequence of the site. In any case, it is already obvious that this sequence is quite long and have probably filled the whole period.

CHALCOLITHIC CERAMICS FROM GIRDI QALA TRENCH D (NORTH MOUND): MORPHO-STYLISTIC FEATURES AND REGIONAL PARALLELS

Johnny Samuele Baldi

The assemblage from Girdi Qala Trench D processed during the 2017 campaign does not present any surprising feature and largely confirms the typological and chrono-cultural characteristics already observed in 2016. Almost all (about 97%) the 11.808 sherds belong to a standard southern-Mesopotamian Middle Uruk repertoire, with a very limited quantity (less than 2%) of local late LC3-early LC4 chaff-tempered pottery and sporadic (about 1,5%) Early Bronze samples or Ubaid specimens (with black-on-buff painted decorations or combed wavy lines)¹. This little quantity of 5th millennium intrusive sherds, confirms that a late Ubaid-LC1 installation has existed at least in the north-western sectors of Girdi Qala northern mound (see Paladre *et al.* 2016, 89-97).

Generally speaking, the large amount of the assemblage fits well with the structures identified in Trench D. Medium-sized bowls, domestic storage jars, some fine containers and cooking pots belong to morpho-functional categories consistent with everyday activities carried-out on a domestic scale by south-Mesopotamian settlers in their-own residential areas.

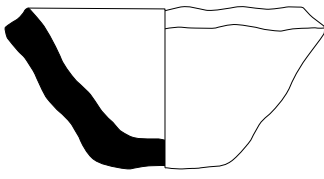
The only noticeable difference from the 2016 material is the amount of the sherds (much more abundant in 2017) because of the excavation of several large pits filled with pottery. Nevertheless, despite the amount of ceramics in secondary deposition, the fragmentation ratio is very high (about 43% all levels and all ceramic types combined), as confirmed by the quantity of complete pots collected. It indicates that the materials from the different levels identified in Trench D have to be considered as a unitary and remarkably homogeneous assemblage whose deposits were relatively undisturbed over time.

Amongst open shapes, the large majority of the specimens is represented by serially produced BRBs² (Pl. III.1-2 – Fig. 1): their dimensional variability is the same observed in 2016, with three categories (diameters of 12-14 cm, 16-18 cm and 22-24 cm). Medium- and little-sized hemispherical bowls



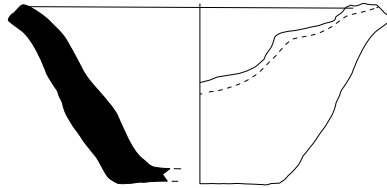
Fig. 1 - Bevelled-rim bowl from Girdi Qala Trench D.

1. For parallels, see for instance at Tell Abada (Jasim 1985: fig. 214), Tell Abu Husaini (Chiocchetti 2007: fig. 2.d), Surezha (Stein and Alizadeh 2014: fig. 12) or Khirbet Hatara (Fiorina 2001).
2. They have always rims sharply bevelled towards the exterior. Therefore, they match with the mature shape of these containers and are quite different than the Early Uruk proto-BRBs from Trenches D-E at Logardan or from Levels 10-8 of Trench C at Girdi Qala, see Vallet (ed.) 2015.



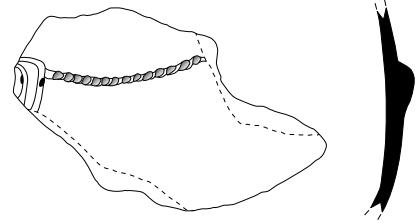
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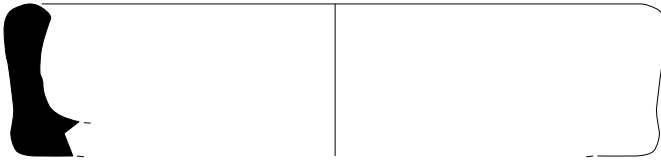
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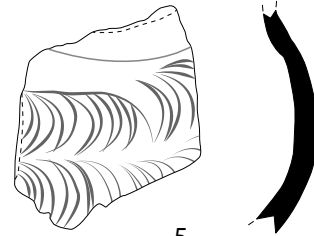
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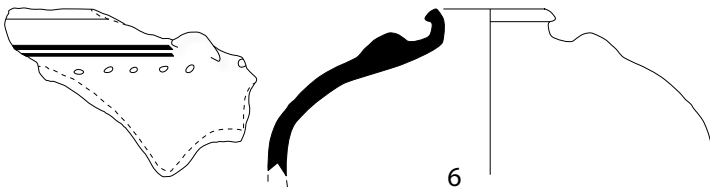
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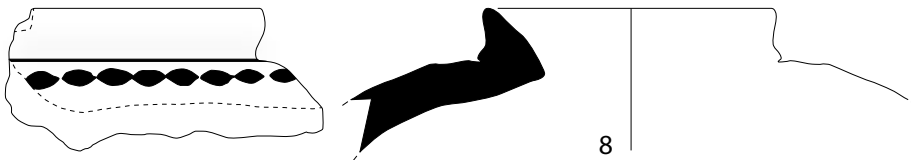
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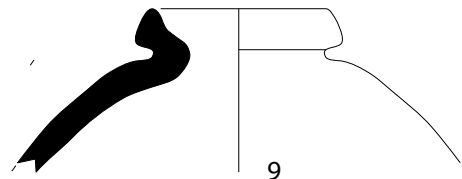
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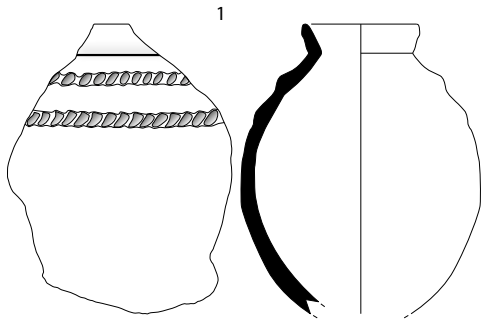
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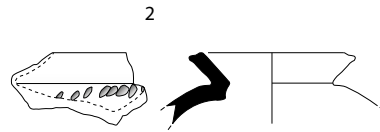
with plain rounded rims³, carinated bowls⁴, in-turned rim bowls⁵ and V-shaped bowls with thinned rims⁶ are also largely attested (10% of the assemblage). Amongst the V-shaped ones, several samples with pouring lips⁷ belong to a very distinctive Middle Uruk type. The same observation can be made about shallow basins with thick walls and bases used for cooking and presenting food (Pl. III.4)⁸.

The whole range of the closed shapes constitute 35% of the assemblage from Trench D. Some small neckless samples with a diameter varying between 4 and 8 cm have rounded, thinned-pinched, or quite square flaring rims (Pl. III.6, IV.2)⁹. However, the most widespread jars belong to a medium-sized type with interior-angled rims. These neckless containers are typologically similar to the small jars, but their average dimensions are much bigger, with diameters varying between 18 and 26 cm. Their bevelled or rectangular section flaring rims display a sharp interior angle at the junction with the shoulder (Pl. III.7-8, IV.3). These typically Uruk jars, are often characterized by little pierced handles on the shoulder (Pl. III.3)¹⁰. Other typically Uruk samples of interior-angled jars have rims with a triangular section and a

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3. See Ahmad al-Hattu (Sürehagen 1979: Abb. 10), Godin "late" VI (Badler 2002: fig. 7: N3 34 #26, B20 #251), Abu Salabikh 'Uruk Mound' (Pollock 1987: fig. 5: c, d), Nippur 'Inanna' XXXV (Hansen 1965: fig. 5), Sheikh Hassan 10 (Boese 1995: 41, Abb. 9: b, d; 42: Abb. 10: d; 85: Abb. 22: b), or Sheikh Hassan 7/6 (Bachmann 1998a: Abb. 7: n; Boese 1995: 50, Abb. 18: d).
 4. See Rubeidheh (McAdam and Mynors 1988: fig. 28: 18), Sheikh Hassan 10 (Boese 1995: 85, Abb. 22: f, g), Abu Salabikh (Pollock 1987: fig. 5: f; 6: b), or Uruk/Warka "Eanna-Tiefschnitt" VI" (von Haller 1932: Taf. 19A: u').
 5. See Rubeidheh (McAdam and Mynors 1988: 45; fig. 28: 10), Ahmed al-Hattu (McAdam and Mynors 1988: 45), Farukhabad (Wright 1981: fig. 41: e, f; fig. 46: i, j), Nineveh (Gut 1995: Taf. LVII.840), or Godin "early" V (Badler 2002: fig. 10: B17#132). In southern Mesopotamia, this same type is characterized by a more angular profile, as at Abu Salabikh "West Mound" and "Uruk Mound" (Postgate 1983: fig. 37-38; Pollock 1987: fig. 5: g, h).
 6. See Sheikh Hassan (Boese 1995: 40, Abb. 8: f-k, 80, Abb. 17: d; 85, Abb. 22: a; Bachmann 1998a: Abb. 7: d-k), Uruk/Warka "Eanna-Tiefschnitt" VI (Sürehagen 1986: T/20, Nr. S/32; von Haller 1932: Taf. 18C: y; 19B: g, h, i, q, o Taf. 19C: y'), Rubeidheh (McAdam and Mynors 1988: 44-45, fig. 28: 6, 11), Abu Salabikh "Uruk Mound" (Pollock 1987: fig. 5: a, b; Pollock 1990: fig. 4: c), Nippur 'Inanna' XX-XVI (Hansen 1965: fig. 5), Susa "Acropole" I 18-17 (Le Brun 1978a: fig.: 19: 6; 1978b: 32: 7), Farukhabad (Wright 1981: fig. 40: e; 45: a, b, i, m), Hacinebi B2 (Stein and Mısır 1994: fig. 15, J-L; Pearce 2000: fig. 13: g).
 7. See Sheikh Hassan (Boese 1995: 84 fig. 21; Bachmann 1998a: pl. 7.d-g), Hacinebi B2 (Stein 2001: fig. 8.6, J-L), el Kowm 2 (Cauvin and Stordeur 1985: fig. 6.2), Tell Brak TW 13 (Oates and Oates 1993: fig. 51.33-35), Susa "Acropole I" 18 (Le Brun 1978: fig. 32.7), Choga Mish Protoliterate (Alizadeh 2008: fig. 26.E).
 8. See Abu Salabikh "Uruk Mound" (Pollock 1990: fig. 5: I), Nippur "Inanna" XX-XVII (Hansen 1965: fig. 8), Uruk/Warka 'Eanna-Tiefschnitt' XI-VI (von Haller 1932: Taf. 18B: y; 19A: d'; Sürehagen 1986: Nr. T/99), Sheikh Hassan 10 (Boese 1995: 84, Abb. 21: f), Hacinebi B2 (Stein 2002: fig. 11: k), Godin "middle" and "late" VI (Badler 2002: fig. 7: B20 #252, P4 20 #4), Ahmad al-Hattu (Sürehagen 1979: Abb. 10), Rubeidheh (McAdam and Mynors 1988: fig. 37: 140).
 9. Concerning the samples with rounded rim, see Rubeidheh (McAdam and Mynors 1988: fig. 32: 67) Abu Salabikh "Uruk Mound" (Pollock 1987: fig. 7: e, i; 1990: fig. 3: d), Nippur "Inanna" XIX (Hansen 1965: fig. 13), Uruk/Warka 'Eanna-Tiefschnitt' VI (Von Haller 1932: Taf. 19B: s'), Sheikh Hassan 8 (Boese 1995: 77, Abb. 14: b, j, k) and Hacinebi B2 (Pearce 2000: fig. 15: b). About the variant with rectangular-section or square rims, see Godin "middle" and "late" VI (Badler 2002: fig. 8: B23 #366, B20 #239), Abu Salabikh "Uruk Mound" (Pollock 1990: fig. 4: b) or Sheikh Hassan (Boese 1995: 78, Abb. 15: b).
 10. See Hacinebi B2 (Stein 2002: fig. 10: e, fig. 11: g), Rubeidheh (McAdam and Mynors 1988: fig. 31: 66, fig. 34: 98-99), Abu Salabikh "Uruk Mound" (Pollock 1987: fig. 7: m; Pollock 1990: fig. 3: e), Nippur 'Inanna' XVIII (Hansen 1965: fig. 14), Uruk/Warka 'Eanna-Tiefschnitt' VI (Sürehagen 1986: Nr. T/48, 77, 93), Sheikh Hassan 7/6 (Bachmann 1998a: Abb. 12: a; Boese 1995: 172, Abb. 10: d, e), Susa "Acropole I" 18 (Le Brun 1978: fig. 32.13).



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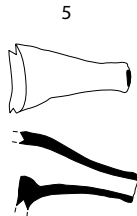
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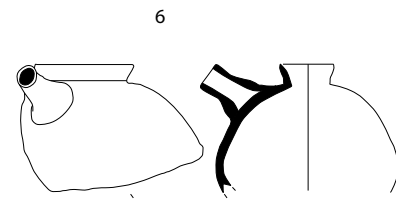
GQND 1309.2



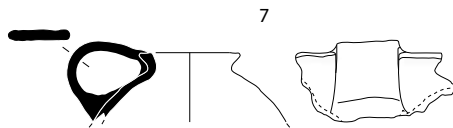
GQND 1397.4



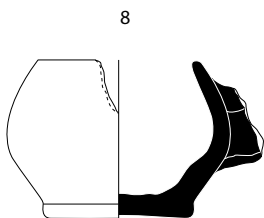
GQND 1325.1



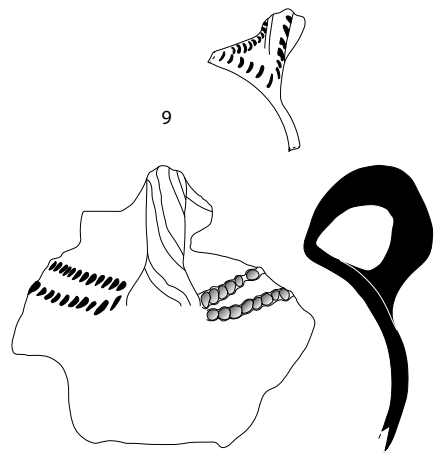
GQND 1393.1b



GQND 1310.2



GQND 1383.3



GQND 1383.2

sinuous or vertical exterior profile (Pl. III.9)¹¹. Short-necked jars with thinner walls and pinched rims are uncommon, but still quite distinctive of the Middle Uruk phase¹². Spouts are associated with all these categories of jars without any kind of regularity. Not only each type of jar can have a spout, but these ones were also of different shapes: both upwards conical and slightly drooping (Pl. IV.5-6 – Fig. 2). The strongly drooping samples, typical of the Late Uruk phase, are extremely rare at Girdi Qala northern mound (one sample collected in 2017)¹³.



Fig. 2 - Slightly drooping spout of a Middle Uruk jar from Girdi Qala Trench D.

During the last campaign, Girdi Qala Trench D also yielded some other peculiar Middle Uruk types, as pots with flattened (and sometimes incised – Pl. IV.4, 9) handles attached directly to the rim (Pl. IV.7)¹⁴, a little-sized flattened-base container with a low spout close to the bottom (Pl. IV.8)¹⁵ and a twisted handle (Pl. IV.9)¹⁶.

Decorations are exclusively documented on closed shapes and they are typical of the Middle Uruk period. In particular, besides finger-impressed, dot-impressed or incised cordons (Pl. III.6, IV.1-2, 9)¹⁷, decorative knobs (Pl. III.6)¹⁸, herringbone and triangular incised motifs

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11. See Rubeidheh (McAdam and Mynors 1988: fig. 31: 57, 59; 32: 73; fig. 32: 78), Abu Salabikh “Uruk Mound” (Pollock 1987: fig. 7: t, u, v), Uruk/Warka ‘Eanna-Tiefschnitt’ and ‘Sagegraben’ VI (von Haller 1932: Taf. 19B: q’, t’; Surenhagen 1986: Nr. S/9), Sheikh Hassan 8/9-12/13 (Boese 1995: 77, Abb. 14: i; 82), Hacinebi B2 (Pearce 2000: fig. 15: e), Susa “Acropole I” (Le Brun 1978: fig. 32.2, 3).
 12. See Sheikh Hassan 13/12, 10 and 8 (Boese 1995: 45, Abb. 13: a; 75, Abb. 12: e; 79, Abb. 16: a, b; 201: Abb. 13: h), Abu Salabikh “Uruk Mound” (Pollock 1987: fig. 7: o; 1990: fig. 5: f), Rubeidheh (McAdam and Mynors 1988: fig. 32: 76-77), Uruk/Warka ‘Eanna-Tiefschnitt’ VI (von Haller 1932: Taf. 19C: u’), Hacinebi B2 (Pearce 2000: fig. 15: c; Stein 2002: fig. 11: c, f).
 13. Just three samples come from Trench D, while one specimen has been collected during the survey of the Area VI, where it is difficult to establish whether this late drooping spout, identified along with some sherds of Early Bronze goblets, dates back to the very end of the Late Uruk phase or rather to the Early Bronze Age. Moreover, all the samples from Trench D have a slightly curved shape, quite different from the strongly arched profile of the Late Uruk drooping spouts (see for instance at Susa “Acropole I” 17 – Le Brun 1978: fig. 34.8; Choga Mish Protoliterate – Alizadeh 2008: fig. 31.E, I-K).
 14. See for parallels at Tell Rubeidheh (McAdam and Mynors 1988: fig. 33.83, 87, 90).
 15. See for parallels at Tell Rubeidheh (McAdam and Mynors 1988: fig. 36.116, 117), or at Uruk/Warka “Eanna-Tiefschnitt’ VI” (von Haller 1932: Taf. 19B: u’).
 16. This type, represented by only one occurrence at Girdi Qala Trench D (as for instance at Rubeidheh – McAdam and Mynors 1988: fig. 33.93), becomes more widespread during the late Uruk (see for instance at Susa “Acropole I” 18 – Brun 1978: fig. 32.1).
 17. See Susa “Acropole I” 18 (Le Brun 1978: fig. 32.2-3), or Rubeidheh (McAdam and Mynors 1988: fig. 30.46; 34.100; 36.122).
 18. See Abu Salabikh (Pollock 1987: 133), Rubeidheh (McAdam and Mynors 1988: 44-48, 51), Sheikh Hassan (Boese 1995: 249-271), Tell Leilan (Schwartz 2001: 241, fig. 7.5; Wright 2001: 125-126; Brustolon and Rova 2007: 23).



Fig. 3 - Crescent-incised decorations on a bodysherd of jar from Girdi Qala Trench D.

on the shoulder of the jars, as well as crescent-incised uninterrupted chains on the bodies (Pl. III.5 – Fig. 3)¹⁹ are also documented, according to a general Uruk tendency towards the middle of the 4th millennium BC²⁰. Moreover, two small groups of respectively 21 and 31 bodysherds display a thick reddish-brownish or grey slip on the exterior surface. They probably represent the so-called Red and Grey Uruk Wares, typical hallmarks of the Uruk period in southern Mesopotamia as well as in the Hamrin Basin²¹.

Although the ceramic typology of the different Uruk phases is controversial, the assemblage from the survey of Girdi Qala northern mound and from Trench D clearly belong to a “normative” Middle-Uruk²² repertoire and completely lacks

some typical Late Uruk indicators, as banded-rims bottles and bowls, twisted handles, long and bandy-shaped drooping spouts, or reserved-slipped vessels. Morpho-stylistic parallels emphasize the matching with Middle Uruk stages of both south- (Uruk/Warka ‘Eanna-*Tiefschnitt*’ VIII-VI, Abu Salabikh “Uruk Mound” and Nippur ‘Inanna’ XX-XVII) and north-Mesopotamian sites (Rubeidheh²³, Nineveh ‘Uruk B’, Sheikh Hassan 6-13²⁴, Hacinebi B2 and). Likewise, given the proximity of the Zagros range, it is not surprising to observe the very close similarities between the assemblages from Girdi Qala northern mound and Godin VI²⁵.

19. See for parallels at Tell Rubeidheh (McAdam and Mynors 1988: fig. 29.34, 33.88), or at Uruk/Warka “Eanna-*Tiefschnitt*’ VI” (von Haller 1932: Taf. 19D.a).

20. See Sheikh Hassan 7-5 (Bachmann 1998: figs. 8, 10, 12-13), Nineveh “Norduruk B” -37-31 (Gut 1995: pls. 60-62, pl. 68: 952; Gut 2002), Hacinebi B2 (Pearce 2000: fig. 15: d-e), Choga Mish Protoliterate B (Delougaz and Kantor 1996), Habuba Kabira Süd (Sürenhagen 1974-1975: pl. 27.95, pl. 28.130).

21. Despite the impossibility to distinguish red or grey (sometimes slipped and sometimes plain) Uruk traditions on the basis of very sketchy descriptions (von Haller 1932: 39), it seems sure that during the Early and Middle Uruk periods (Eanna XIV-VI at Uruk – von Haller 1932: pl.17.D. c’-d’, pl.18.B.r-s and d’-h’, pl.18.C.p, q, s, t, u; Inanna XX-XVII at Nippur – Hansen 1965: 202-204) this kind of productions have been a quite rare but constant presence within the Uruk repertoires (see at Ahmad al-Hattu and Rubeidheh, where red and grey wares represent about 4% of the assemblage – Sürenhagen 1979 :47-50; McAdam and Mynors 1988: 49).

22. See the differences in the chrono-typologies of Hansen (1965: 202-204), Johnson (1973: 56-58) and Wright (1981: 165-172).

23. Despite the evident parallels with Girdi Qala northern mound, the occupation at Tell Rubeidheh dates back to a late stage of the Middle Uruk and to an early phase of the Late Uruk period, as indicated by the presence of reserved slip bottles, strongly arched drooping spouts and other later types.

24. Bachmann (1998b) indicates these same levels as 15/13-6/5.

As already observed in 2016, the increase in number of small Middle-Uruk agricultural settlements in the Hamrin region (Invernizzi 1986) coincides with growing contacts between Godin and the Uruk cultural sphere. It is very likely that the valleys of the Zagros Piedmont in the Qara Dagh area were part of crucial exchange zone centred on a main road network: the so-called Great Road of Khorasan. In its southern sector, this system of connections between Mesopotamia and Iranian plateau followed the Diyala River and then cross the central part of the Zagros Mountains through a series of high fertile districts as the Mahidashat and the Kangavar Valleys (Henrickson 1994: 86). Similarly, in the northern sector, the main paths seem to have been the Shahizor Valley with its scattered Middle-Uruk installations (Wengrow *et al.* 2016) and the Sangao-Qara Dagh road, with south-Mesopotamian settlements as Girdi Qala northern mound.

TWO STAMP SEALS FROM GIRDI QALA AND LOGARDAN

Clélia Paladre

STAMP SEAL GQD.P1339.2 (FIG, 1)

Typological description

The object GQD.P1339.2 is a hemispheroid and lenticular flat faced stamp seal made of malachite. It is around 2.3cm in diameter and 0.7cm thick. It presents a perforation of 0.3cm in diameter. It was found in Trench D of Girdi Qala North mound, during the 2017 campaign, on the floor 322 (*n° vert* 1339) of level 4A, middle Uruk in date. The technique of execution is crude and mixes cutting and gouging. The state of preservation is relatively good, except for a small blow on the reverse side.

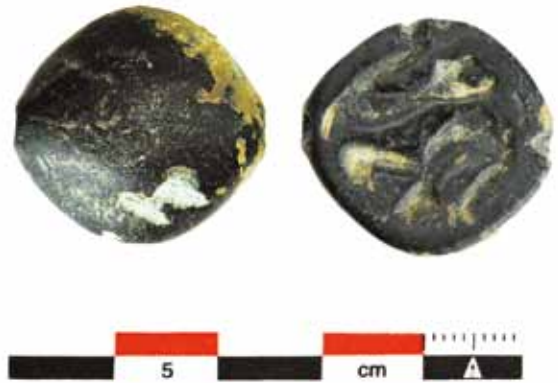


Fig. 1 - Malachite stamp seal from Girdi Qala North, level 4A, obverse and reverse sides (GQD.P1339.2).

Stylistic and iconographic description

The style of the composition is naturalistic but without any detailed anatomic rendering ambition. Motifs are figurative and present two “*tête-bêche*” animals. It is a quadruped (maybe a doglike animal) and a reptilian figure with a gaping mouth (maybe a folded snake).

Dating and discussion

The possible parallels with a stamp seal coming from TW 16-14 levels of Tell Brak¹ and with another stamp seal from the late chalcolithic levels of Tepe Giyan², clearly attach GQD.P1339.2 to the LC3-4 glyptic tradition of Northern Mesopotamia. This dating is coherent with the context of the stamp seal. Indeed, level 4A of Girdi Qala North, as the whole Trench D sequence, is confidently dated to the Middle Uruk period based on the ceramic study³. Moreover, the composition of the motifs gives us a *terminal post quem*, since the “*tête-bêche*” disposition of the animals appears in the LC3 period⁴.

1. See fig. 4 pl. XX Mallowan 1947. This stamp seal was first assigned to the Djemdet Nasr period, but H. Pittman reassigned it to the LC3 period (Pittman 1999 p.48).
2. See fig. 228 p. 52 Rashad 1990, coming from late chalcolithic 3-4 levels (between c.3800-3300 BCE). We cannot have a clearer dating since the chronology of Tepe Giyan is heavily complex.
3. See Baldi, *supra*.
4. Pittman 2001 p. 416 et 424.

Nevertheless, many elements link this stamp seal to the earlier glyptic tradition of the Late Chalcolithic 2, between c.4200-3800 BCE. Indeed, during the Vth and the beginning of the IVth millennium BCE, a very specific glyptic develops in the Upper Tigris, across the entire piedmont arc. There we can see the development of a flourishing glyptic tradition shared by Tepe Gawra, Tepe Giyan, Niniveh, Arpachiyah and Değirmentepe⁵. The specificity of this glyptic remind the one from our stamp seal; motifs are mainly animal, the engraving is made with large tools and rather gouging than filling, style is schematic and tends to naturalism, and finally stamp seals are mainly hemispheroid. We can mention here some examples coming from Tepe Gawra XI, Xa⁶ and VIII⁷, and from Arpachiyah⁸ and Niniveh⁹ for the so-called “Gawra period”, that can be compared with our stamp seal. However, it has to be emphasized that if characteristics are shared, each center retained its own peculiarities.

From the late LC2 and the beginning of the LC3, these productions showing ancient concepts persist and coexist with the new glyptic tradition coming from south Mesopotamia, the so-called Uruk one, characterized by the utilization of a drilling tool¹⁰. The presence of our stamp seal within an occupation identified as “colonial” illustrates a phase of intense contacts between southern Uruk urban centers and communities of the northern piedmonts¹¹, attesting the cohabitation of both glyptic traditions during this period.

STAMP SEAL LOGD.P379.1 (FIG. 2)

Typological description

The object LOGD.P379.1 is a hemispheroid and circular flat faced stamp seal, made of steatite. It has a size of 2cm in diameter and 0.9cm thick. On the reverse side, we can observe a “diametrical strip” of 0.3cm width. This element is surprising and has no typological parallel. Thus, we can assume that we are dealing with a perforated stamp seal with a broken obverse side¹². The perforation edges would have been polished in order to be in use or for esthetic purposes. The stamp

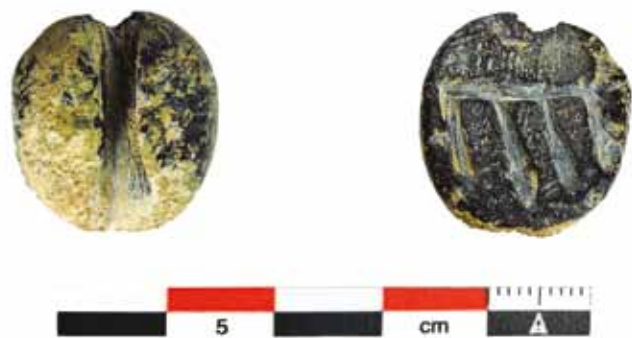


Fig. 2 - Steatite stamp seal from Logardan D level 2, obverse and reverse sides (LOGD.P379.1).

5. Pittman 2001 pp. 412-414

6. See fig. 26 p. 278 Buchanan 1967 (stamp seal) and Taffeln 293 Von Wickede 1990 (sealing).

7. See fig. 180 pl. XIII Homès-Fredericq 1970 (sealing).

8. See Taffeln 404 Von Wickede 1990 (sealing).

9. See Abb. 37.1 p. 191 Von Wickede 1990 (sealing).

10. This technique of execution becomes a characteristic of the so-called Uruk glyptic, since the transition from the Late Ubaid to the Early Uruk period (Pittman 2001 p. 416 et 418).

11. Pittman 1999 p. 48.

12. Similar example in fig. 70 pl. V Buchanan and Moorey 1984.

seal was found in the Trench D of Logardan, into a brick of the oven 615 of level 2, dating to the Ur III period. As GQD.P1339.2, the technique of execution is crude with a rough cutting made by a small chisel. The state of preservation is bad, with concretions and a heavy erosion.

Stylistic and iconographic description

The style is linear and rough, tending to schematism. It looks like an abstract motif that shows four vertical and parallel grooves drawn down from a horizontal one. However, it could be a schematic quadruped, based on the “*animaux-peigne*” model.

Dating and discussion

A possible parallel with a sealing coming from Tepe Gawra XIII¹³ allows us to define a dating around the middle of the Vth millennium BCE. This is the so-called Ubaid 4 period, between 4900 and 4500 BCE. Others possible parallels can be mentioned, but without safe stratigraphic context: a package of stamp seals bought on near-eastern markets at the beginning of the XXth century and published by B. Buchanan and P. R. S. Moorey in 1984¹⁴. Another comparison is possible with a stamp seal discovered at Susa¹⁵. However, its discovery context is unclear since it is coming from old excavations. P. Amiet attached it to the so-called Susa I period, between 4200 and 3800 BCE.

The discovery context of our stamp seal within a so-called “Ur III” level is not a problem. Indeed, it is well known that stamp seals are often discovered into mudbricks and mudbrick joints¹⁶. People reused the earth-brick available on the spot for their constructions. Thus, they picked up artifacts, sherds, etc. An Ubaid occupation is attested at Logardan (in Trench C, cf. Vallet 2015) and explains the presence of our stamp seal in a late 3rd millennium mudbrick.

LOGD.P379.1 is fully integrated into the glyptic production of the Northern Mesopotamia regions in the middle of the Vth millennium BCE. Indeed, it has the same general specificities: first typologically with its hemispheroid shape, then iconographically with the apparition of simple animal motif engraved in a linear style¹⁷, and finally with its technique of execution showing a heavy and schematic engraving.

CONCLUSION

Both of these stamp seals are linked to the old glyptic tradition of the Northern Mesopotamia regions. During the Vth and a large part of the IVth millennium BCE, we can see a real homogeneity and cohesion within the glyptic productions of the Upper Tigris. Our stamp seals illustrate the integration of Girdi Qala North and Logardan to this general panorama.

13. See fig. 134 pl. CLXVII Tobler 1950.

14. See fig. 60 et 61 pl. IV, fig. 62 to 64 pl. V and fig. 101 à 104 pl. VIII Buchanan and Moorey 1984.

15. See fig. 187 pl. 47 Amiet 1972.

16. Homès-Fredericq 1970 p. 3.

17. It has to be noted nevertheless that it could also be a purely geometric motif, legacy of the Hassuna and Halaf cultures (Buchanan and Moorey 1984 p. 5) that flourished in the same region (for the late Halaf levels of Logardan Trench C, Vallet 2015).



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APPENDIX A

TOPOGRAPHICAL REPORT

Micheline Kurdy

During the excavation campaign of 2017, the same photogrammetric survey method of the previous year was applied for all the excavation sectors in Girdi Qala and Logardan. The implemented topographic system was attached to the UTM38 projection to be integrated into a KRG general GIS. A three-dimensional survey was realized for each excavation sectors along the campaign: first, in the aim to survey and document in 2D/3D the excavation evolution for each sector, and second, to provide a high-resolution work support for archaeologists as a base for the site analysis and post-excavation work. The work method followed made it possible to carry out for each excavation sector a series of 3D georeferenced models in the topographic system, with possibilities for producing ortho-images in plans, sections and elevations.

GIRDI QALA

The topographic points were measured based on the central point of the Main Tell from the previous year and three electric pylons. Two additional points were added to reinforce the system: ST12 to the north of the main Tell and ST13 to the south. All along the excavation campaign, the two excavation areas (B and D) were surveyed with photogrammetric method and geo-referenced in the topographical system, with 6 documentations for sector B and 6 documentations for sector D. 3D models were created and ortho-image plans and sections were generated (Fig. 1 and 2). The objective of these multiple surveys was to provide the archaeologists with a technical support faithful to reality for analysis and a base for the realization of the architectural plans.

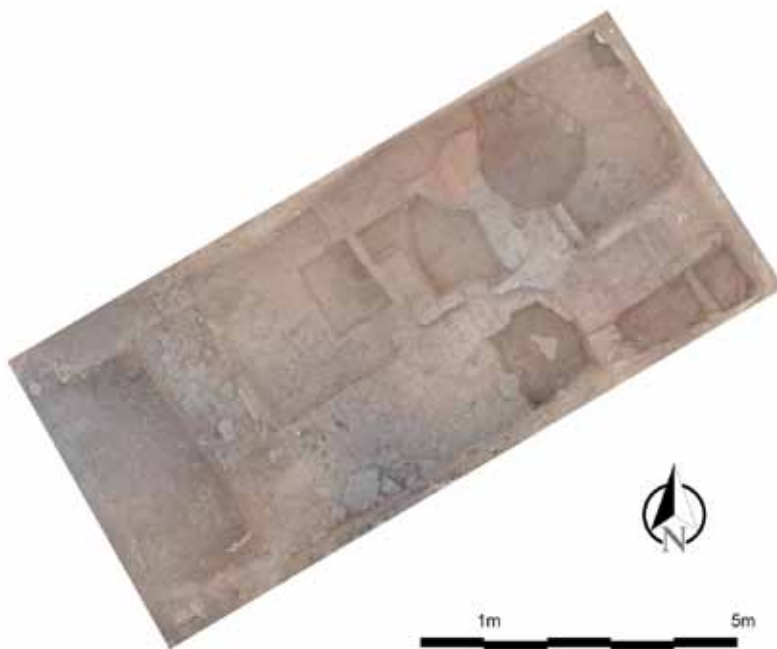


Fig. 1 - Ortho-image of sector B of Girdi Qala at the end of the campaign.



Fig. 2 - Ortho-image of sector D of Girdi Qala at the end of the campaign.

LOGARDAN

The topographic points were measured based on the stations set up the previous year. The two excavation sectors (D and E) were surveyed with photogrammetric method and geo-referenced in the topographical system. All along the excavation campaign, 7 documentations for sector D and 6 documentations for sector E were produced. 3D models were created and ortho-image plans and sectors were generated (Fig. 3 and 4). Here again, the objective of these multiple surveys was to provide the archaeologists with a technical support faithful to reality for analysis and a base for the realization of the architectural plan.

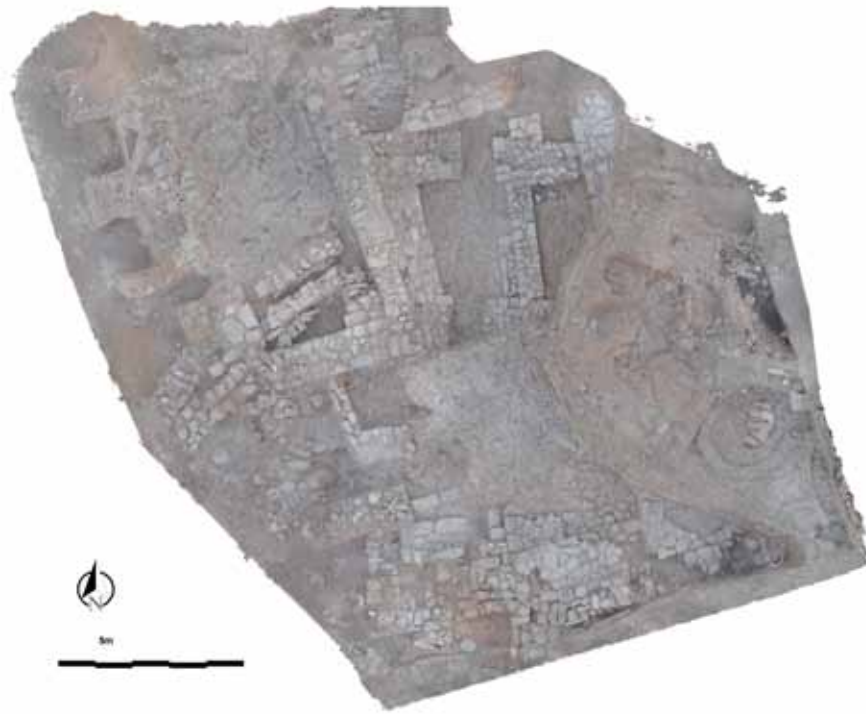


Fig. 3 - Ortho-image of sector D of Logardan at the end of the campaign.

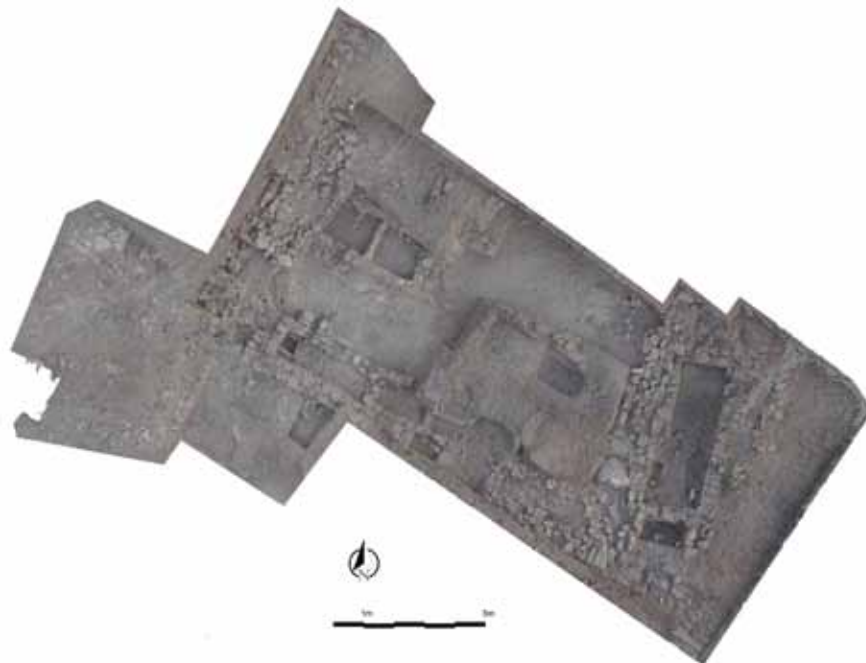


Fig. 4 - Ortho-image of sector E of Logardan at the end of the campaign.



APPENDIX B

AERIAL MAPPING AND MODELING OF GIRDI QALA AND LOGARDAN

Vincent Tournadre

ORGANISATION GÉNÉRALE

Le relevé a eu lieu les 29 et 30 juin 2018 (Fig. 1). Étaient présents sur les lieux :

- ▶ M. Régis Vallet (CNRS-IFPO), directeur de la mission
- ▶ M. Vincent Tournadre, photogrammètre chez ICONEM
- ▶ Messieurs Jamal Jalal Muhammad (intendant de la mission) et Rebaz Sardar (IFPO)
- ▶ qui ont assuré l'intendance et la logistique.

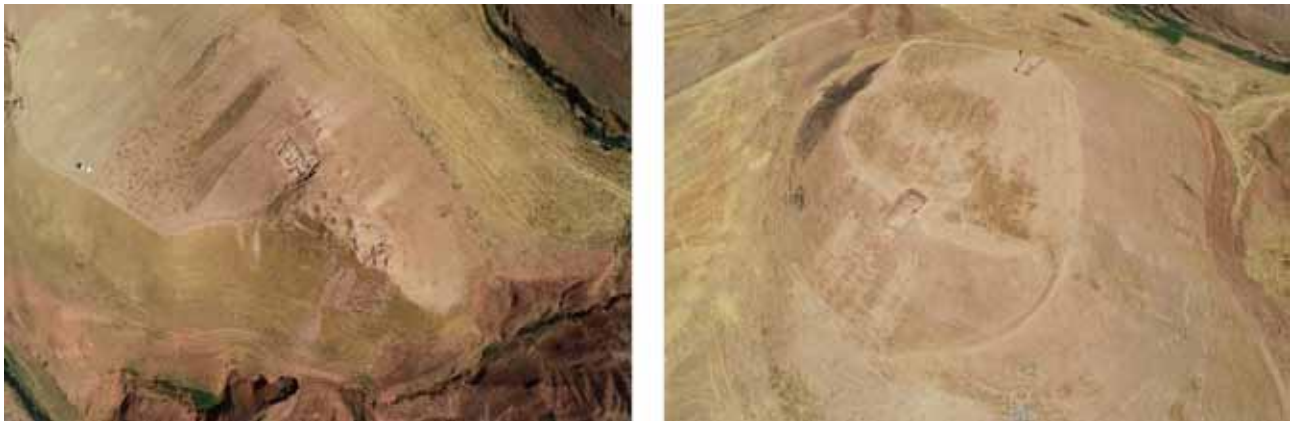


Fig. 1 - Vues du sommet de Logardan (à gauche) et du tell principal de Girdi Qala (à droite).

MATÉRIEL

Le matériel utilisé pour le relevé aérien était un drone DJI Phantom 4 Pro Plus (Fig. 2). À noter qu'en raison des restrictions de vol mises en place par le constructeur de drones, la quasi-totalité du territoire Irakien est frappée d'une interdiction de vol. Ces zones sont consultables à cette adresse : <https://www.dji.com/flysafe/geo-map>

Deux parades permettent de contourner ces restrictions. La première consiste à envoyer au constructeur une demande de déblocage (<https://www.dji.com/flysafe/custom-unlock>). ICONEM a pu faire cette démarche pour de nombreux pays. La seconde consiste à utiliser une version alternative du firmware installé dans le contrôleur de vol. Cette solution présente aussi l'avantage de débloquer les limitations de hauteur de vol.



Fig. 2 - Drone DJI Phantom 4 Pro Plus.

RELEVÉ

Les sites de Logardan et Girdi Qala sont situés à 2.5 km l'un de l'autre. Afin de placer ces lieux dans leur environnement, il a été souhaité d'allonger l'emprise du relevé de 1000 mètres, et de couvrir 1500 mètres de part de d'autres sur sa largeur. Compte tenu de ces contraintes, du matériel à notre disposition et du temps dont nous disposons pour ces relevés, nous avons choisi de survoler le site à une hauteur de 650 mètres, résultant en un pixel terrain légèrement inférieur à 20 cm (au centre de l'image il vaut 19.2 cm). La photogrammétrie par corrélation dense permettant des calculs subpixelaires (de l'ordre de 0.5 pixel), nous pouvons ainsi espérer une résolution décimétrique. Des images ont aussi été acquises lors des décollages et atterrissages (depuis chacun des sites), permettant une résolution plus élevée sur ces 2 collines.

5 vols ont été menés le 29/06, et 3 vols le 30/06. Plusieurs difficultés sont à relever :

- ▶ des vents très forts auraient pu compromettre la mission, mais nous avons pu bénéficier d'accalmies au moment de voler
- ▶ ces mêmes vents ont soulevé de gros nuages de poussière qui ont dégradé partiellement la luminosité et donc la qualité des images
- ▶ le drone utilisé étant équipé d'un logiciel alternatif, certains bugs sont survenus compliquant la tâche du pilote, notamment la disparition des traces de vol. Le pilote a donc dû effectuer les vols « de mémoire », ce qui implique des plans de vols plus hasardeux
- ▶ le drone ne pouvant être connecté à internet, il n'était pas possible d'avoir un fond cartographique pour faciliter le survol
- ▶ un chargeur allume-cigare était prévu pour recharger à la volée les 5 batteries dont nous disposons. De trop faible puissance, son intérêt n'a été que très marginal
- ▶ seules 3 batteries étaient disponibles le 30/06, car le pilote, malade la veille, a mal géré leur rechargement

PREMIERS RÉSULTATS

Sur les 1744 images acquises, 1742 ont pu être alignées (c'est à dire positionnées et orientées dans l'espace). Cette étape critique du processus photogrammétrique confirme que l'acquisition a bien fonctionné dans l'ensemble, et qu'il est possible d'en dériver une modélisation 3D plus complète et précise. On notera le caractère aléatoire des trajectoires et la redondance de certaines prises de vue (Fig. 3).

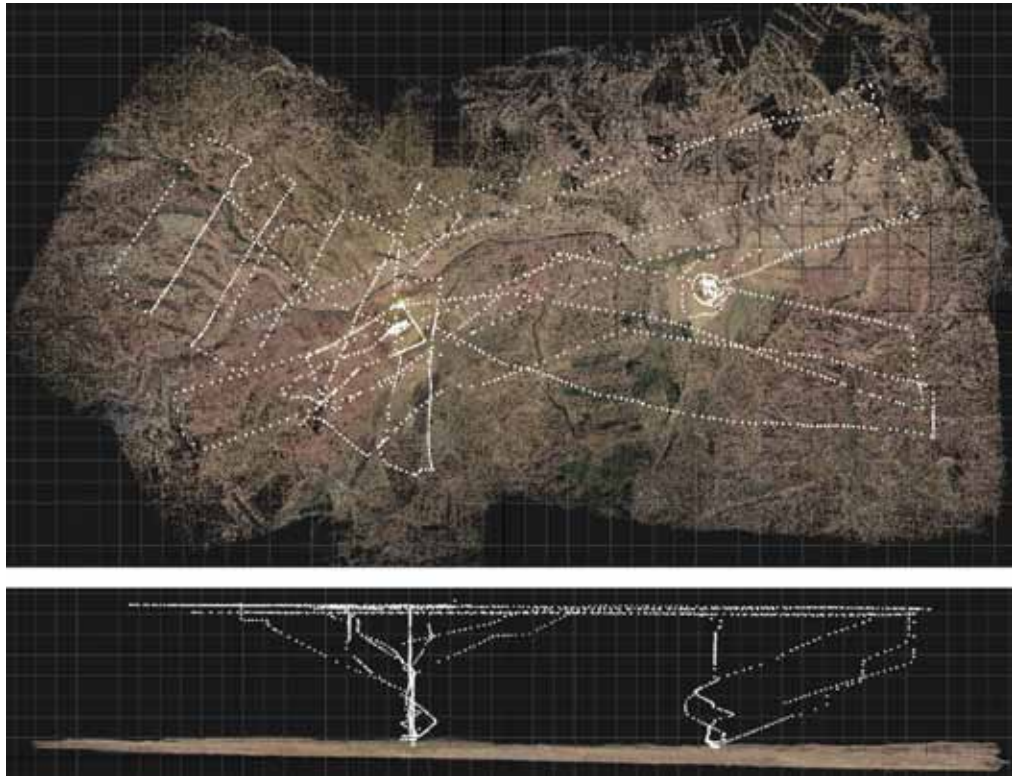


Fig. 3 - Vue de dessus (en haut) et de face (en bas) du résultat du calcul d'orientation.
Les points blancs représentent la position des clichés.

TYPES DE RENDUS RÉALISABLES

Les technologies de modélisation 3D permettent de réaliser une large variété de produits. Nuage de point dense, modèle maillé (avec ou sans texture), et orthophotographie en sont les principaux. Ces produits deviennent alors le support d'une réflexion plus large et peuvent avoir une large variété d'applications (Fig. 4 à 7).

Les données collectées à Logardan et Girdi Qala seront traitées dans le courant de l'année et serviront à établir un modèle 3D géoréférencé des sites et de leur environnement proche (la haute vallée du Tavuq Cay), qui servira de support aux plans architecturaux et aux restitutions 3D. L'ensemble monumental exceptionnel au sommet du site de Logardan (acropole du 4^e millénaire), qui pourrait faire l'objet d'un programme de restauration, justifie à lui seul l'investissement technologique en cours.

Les données acquises seront communiquées au photogrammètre de la prochaine campagne, Jonathan Lisein, collaborateur d'ICONEM et pilote certifié de drone. Nous recommandons l'investissement dans un drone de type « Parrot Anafi » (ou équivalent), avec ses accessoires (batteries de rechange notamment), pour poursuivre le travail lors des prochaines campagnes de terrain de la mission.



Fig. 4 - Exemple de modèle maillé, texturé sur la partie gauche et brut sur la partie droite.



Fig. 5 - Exemple d'intégration d'une anastylose dans une vidéo.

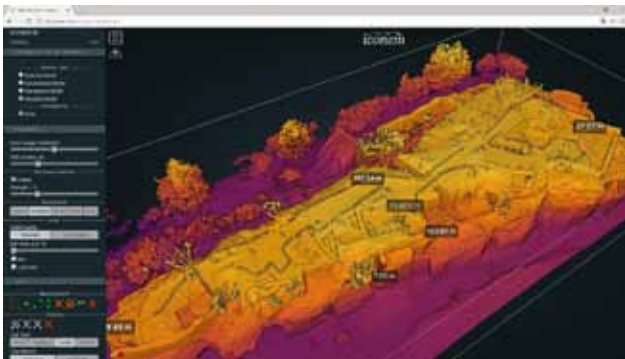


Fig. 6 : Viewer interactif permettant d'exploiter des nuages de points massifs à travers un navigateur web. Sans installation, fonctionne avec une configuration informatique basique.



Fig. 7 - ERecalage de plans de fouille sur un modèle 3D. Il est possible d'intégrer ces résultats dans une animation vidéo ou d'en extraire une image, pour une publication scientifique par exemple.

APPENDIX C


FINDINGS LIST






Excavations at Girdi Qala (GQ) and Logardan (LOG) 2017 تاابي قنت


Finds: Small Objects and Pottery


الصورة او رسم Photo or drawing	الوصف description	رقم المعثر locus no	القياسات dimensions	مادة الأثر material	نوع الأثر kind of object	الرقم Code
	Round shaped, spouted, flat base	72	L. 8,5 cm W. 6,8 cm Th. 4 cm	Ceramic	Oil lamp Islamic period	GQB Tc1105.1
	Lenticular, semi-circular-ovoid. Perforated. 2 animals head to tail.	355	Diam. 2,3 cm Th. 0,7 cm Perf. 0,3 cm	Malachite	Amulet stamp seal Middle Uruk period	GQD P1339.2
	Round	309	Diam. 4,2 Perforation 1cm Th. 2,3	Black stone	Weight (fragment) Middle Uruk period	GQD P1315.1
	Oval. Broken perforation at one end	203	L. 2,4 cm W. 1 cm	Obsidian	Pendant Middle Uruk period	GQD Obs1382.1




	Tubular biconical. Complete	315	L. 2,6 cm Diam. 0,6 Perf. 0,3	Black stone	Bead Middle Uruk period	GQD P1372.1
	Round, complete	328	Diam 1 cm Perf. 0,3 cm	White stone	Bead Middle Uruk period	GQD P1367.1
	Round, complete	328	Diam. 1cm Perf. 0,3 cm	White stone	Bead Middle Uruk period	GQD P1377.1
	Oval shaped. One end broken. Sculpted band wrapped around top, one side and bottom.	310	L. 14,1 cm W. 8,3 cm Th. 4,5 cm	White stone	Sculpted stone Middle Uruk period	GQD P1357.2
	Cylindrical. Complete	300	L. 2,2 cm Diam. 1,1 cm Perf. 0,3 cm	Clay	Bead Middle Uruk period	GQD Tc1300.2

	Short, cylindrical. Complete	301	L. 1,8 cm Diam. 2,3 cm Perf. 0,4 cm	Clay	Bead Middle Uruk period	GQD Tc 1308.1
	Small cone	355	H. 1,5 cm Diam base 1,5 cm	White clay	Token Middle Uruk period	GQD Tc1337.1
	Bell-shaped. Round concave perforated base.	310	L. 2,2 cm Diam. base 2,3 cm	Clay	Token Middle Uruk period	GQD Tc1357.2
	Square in shape. One complete triangular compartment, and part of a second compartment.	310	L. 7,3 cm W. 7,2 cm Th. 2,4 cm	Clay	Compartmented Model? Middle Uruk period	GQD Tc1341.3
	Miniature hole-mouthed round jar	310	Diam. 4,4 cm H. 4,1 cm	Clay	Miniature jar Middle Uruk period	GQD Tc1341.2

	Broken at both ends	328	L. 16,5 cm Diam. 6 cm	Red-slipped Clay	Large perforated cylinder Middle Uruk period	GQD Tc1378.1
	Round	326	W. 7,6 cm Diam. 9,2 cm	Clay	Stopper Middle Uruk period	GQD Tc1368.2
	Fragment. Concave top. Two legs, one complete	310	L. 14,4 cm W. 9 cm Th. 9 cm	Clay	Tripod stand Middle Uruk period	GQD Tc1318.1
	Mineral tempered, flattened base, cannot spouted holemouth	326	Diam. 12 cm H. 10 cm	Ceramic	Spouted pot Early/Middle Uruk period	GQN.D.1383.3
	Mixed mineral-chaff temper, beige surface	361	Diam. 14 cm H. 8 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1397.6


	Mineral temper, pink surface	361	Diam. 12 cm H. 7 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1411.2
	Mineral temper, beige surface	326	Diam. 14 cm H. 6 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1344.1
	Chaff temper, pink-orange surface	203	Diam. 10 cm H. 8 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1310.7
	Chaff temper, pink-orange surface	203	Diam. 18 cm H. 8 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1310.1
	Chaff temper, pink-orange surface	203	Diam. 16 cm H. 8 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1387.2

	Mixed mineral-chaff temper, beige surface	320	Diam. 20 cm H. 6 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1334.2
	Mixed mineral-chaff temper, beige surface	361	Diam. 12 cm H. 8 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1411.1
	Chaff temper, beige surface	203	Diam. 16 cm H. 8 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1310.6
	Chaff temper, pink-orange surface	203	Diam. 14 cm H. 6 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1374.2
	Chaff temper, pink-orange surface	203	Diam. 8cm H. 6 cm	Ceramic	Bevelled rim bowl Middle Uruk period	GQN.D.1387.1

	With projecting wheel-hubs	786	Diam. 5,50 cm W. 3,15 cm Th. 0,38-0,64 cm	Clay	Model chariot-wheel Akkad period	LOGD Tc366.1
	Sheep hindquarters, short tail.	781	L. 3,61 cm W. 2,15-2,54 cm H. 2,69 cm	Clay	Animal figurine (fragment) Akkad period	LOGD Tc381.2
	Equid, with mane and tail.	816	L. 9,06 cm H. 7,33 cm W. max 2,72 cm	Clay	Animal figurine (uncomplete) ED III-Akkad period	LOGD Tc387.1
	Rounded grooved top. Flat base incised with comb lines	615	Diam. 2 cm Th. 0,87 cm	Grey chlorite	Button seal Early Uruk Period	LOGD P379.1
	Miniature carinated jar. Short neck. Rounded rim	NV 403	Diam. 6 cm H. 4,79 cm	White marble	Miniature vessel (fragment) Middle Uruk Period	LOGD P403.1

	Mineral beige paste, trinagular rim, deformed by the firing	611	Diam. 12 cm H. 33 cm	Ceramic	Jar Akkad Period	LOG.D.348.1
	Mineral beige paste, wavy shaped lower rim	611	Diam. 14 cm H. 11 cm	Ceramic	Stand. Akkad period	LOG.D.350.1
	Uncomplete	2114	Diam. 9 cm Th. 4,5 cm	Clay	Model chariot wheel Mid-3rd mill BC	LOGE Tc1336.1

	Ram head	2134	L. 5,5 cm Th. 3cm H. 5,8 cm	Clay	Animal figurine Mid-3rd mill. BC	LOGE Tc1405.1
	Complete. Red paint. Concave base	2147	L. 7,3 cm Diam max. 2,5 cm	Clay	Painted Cone Early Uruk Period	LOGE TC1425.1
	Complete	2081	L. 3,4 cm W. 2,7 cm Th. 0,5 cm	Black stone (chlorite ?)	Adze Early Third mill. BC	LOGE P1427.1
	Mineral beige paste, beaded rim, spout on the lower part of the body	2120	Diam. 6 cm H. 9 cm	Ceramic	Spouted pot Early Dynastic I	LOG.E.1382.1

	Reducing atmosphere fired mineral tempered ware, double knobbed decoration on the shoulder	2020	Diam. 18 cm H. 2 cm	Ceramic	Cooking pot Middle Uruk	LOG.E. 1293.1
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