



# REPORT ON THE SECOND SEASON OF EXCAVATIONS AT GIRDI QALA AND LOGARDAN

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*The site of Logardan, from the West - at the top, Trench D in excavation (October 2016).*

DIRECTORATE OF ANTIQUITIES OF SOULEYMANIEH  
GENERAL DIRECTORATE OF ANTIQUITIES OF KURDISTAN REGIONAL GOVERNMENT

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# INTRODUCTION

Régis VALLET

The second campaign of the archaeological mission to Girdi Qala and Logardan (fig. 1) lasted from 25 September to 25 October, 2016, through five weeks of fieldwork. The team, under the responsibility of Régis Vallet (CNRS/University of Paris 1), gathered 17 researchers and engineers from France, Belgium, Italy, Syria and Iraq (by alphabetic order): Rateb al Debs (archaeologist), Adel Hama Amin (Directorate of Antiquities of Souleymanieh, epigrapher and archaeologist), Johnny Samuele Baldi (IFPO, archaeologist and ceramologist),

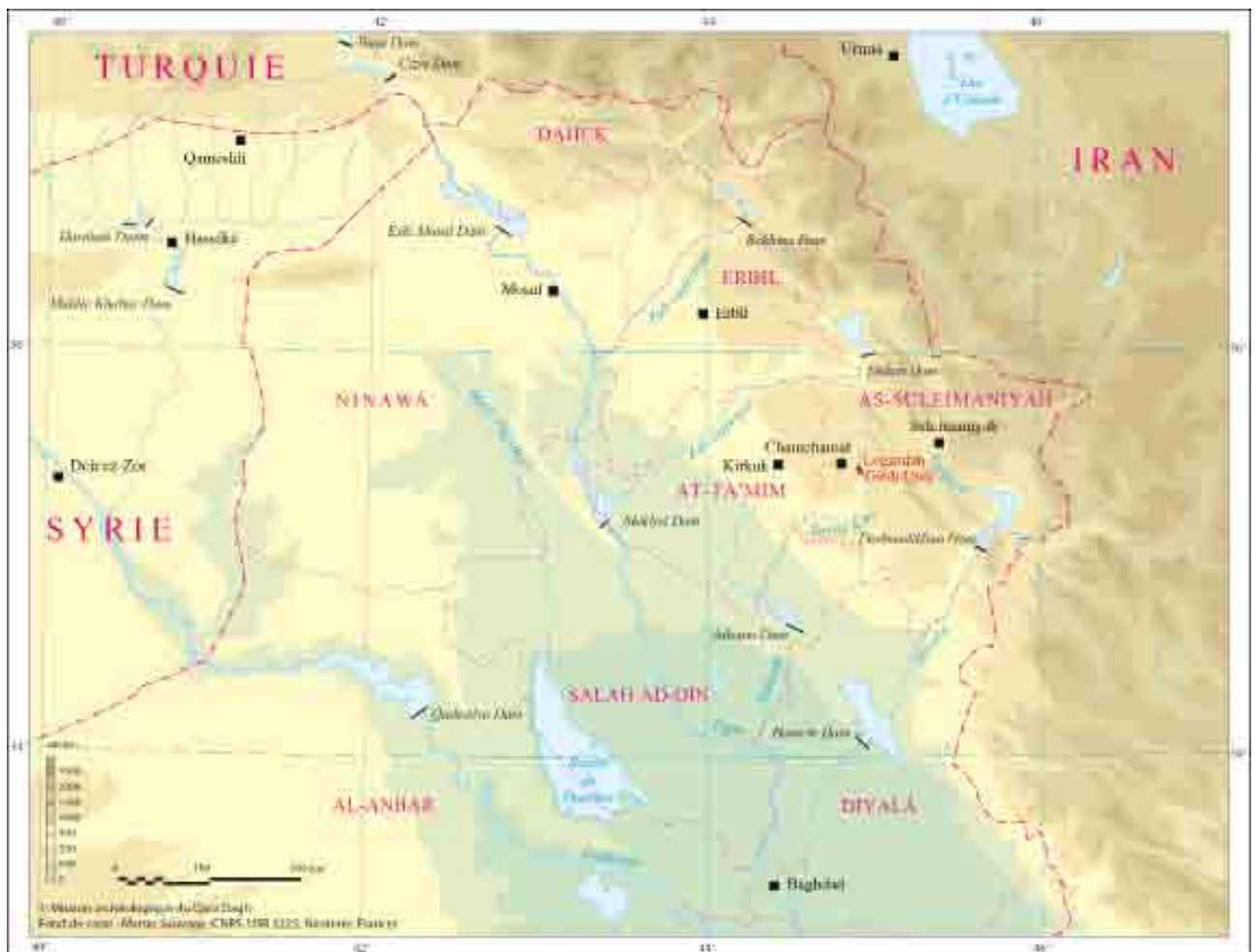


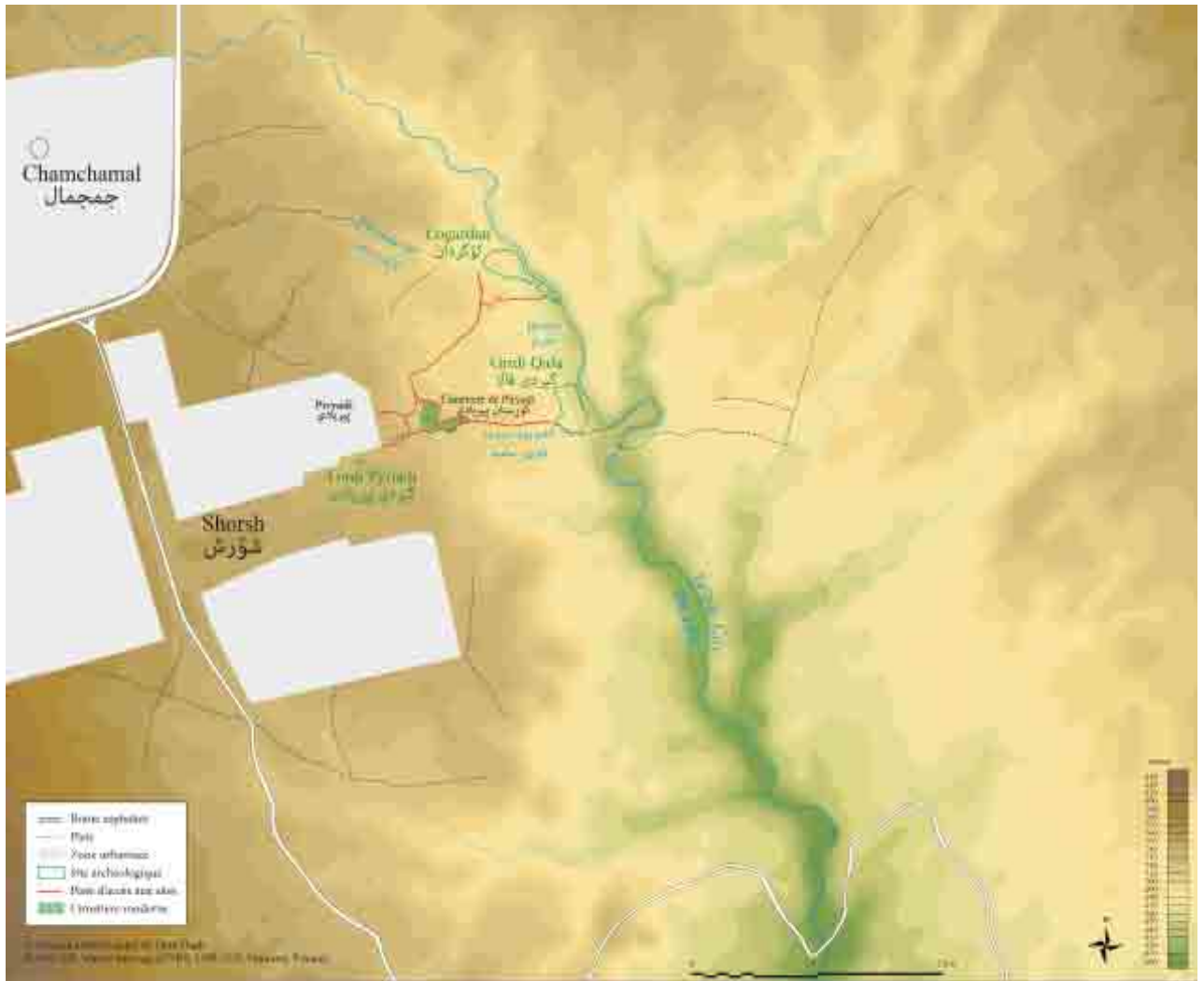
Fig. 1 - Map of Northern Iraq showing the localization of the sites.

Victoria de Casteja (CNRS, database expert), Laurent Colonna d'Istria (University of Liège, epigrapher and archaeologist), Lionel Darras (CNRS, geophysicist), Elise Devidal (drawer), Alisée Devillers (University of Liège, archaeologist), Hawzen Jalaj (Museum of Sulaymaniah, archaeologist), Micheline Kurdy (architect), Hugo Naccaro (University of Paris 1, archaeologist), Clélia Paladre (University of Paris 1, archaeologist), Kamal Rahoof (Directorate of Antiquities of Soulaymaniah, archaeologist), Bahra Salah (Museum of Sulaymaniah, archaeologist), Martin Sauvage (CNRS, archaeologist) and Melania Zingarello (University of Roma La Sapienza/Paris 1, archaeologist and ceramologist) (fig. 2). Mustafa Ahmad (IFPO/



**Fig. 2** - Part of the team of the 2016 season (from left to right): Régis Vallet, Elise Devidal, Rateb Al-Debs, Bahra Salah, Johnny Samuele Baldi, Laurent Colonna d'Istria, Alisée Devillers, Mélania Zingarello, Micheline Kurdy, Martin Sauvage, Victoria de Casteja, Clélia Paladre, Hugo Naccaro.

University of Lyon 2, archaeologist and ceramologist) joined us later on for a short study season. The logistic team was composed by Saleh Fatiah (Directorate of Antiquities of Souleymanieh, driver), Hallo Wasie Karim (cook), Faizulla Abdullah Muhammad (driver) and Jamal Jalal Muhammad (sites and storage keeper). The whole team was accommodated in the city of Chamchamal, close to the sites, few kilometers to the south-east (fig. 3).



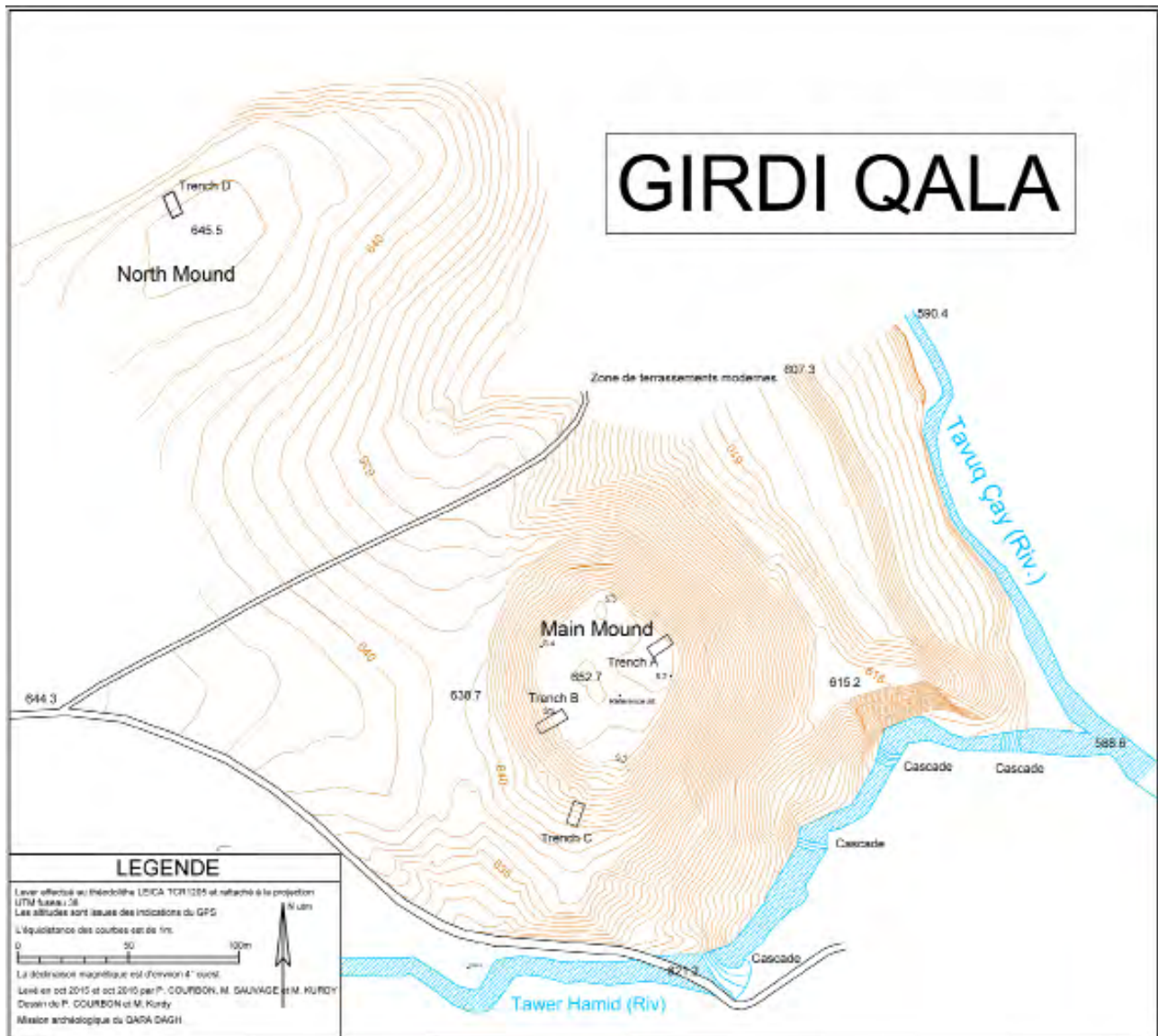
**Fig. 3** - Map of the upper Tavuq Cay Valley..

Excavation on the sites of Girdi Qala and Logardan started in fall 2015, after two brief surveys in 2014 and 2015. The scientific purpose of this new project is to study the formation of complex societies, the appearance of territorial polities and long-term intercultural processes. Indeed, despite recent developments (Kopaniak 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<sup>1</sup>. The main goal of the first campaigns was to begin to establish the sequence of the sites, by excavating well-preserved in

1. For an extensive presentation of the problematics of the project, see our ‘scientific proposal’. The project is funded and supported by several institutions. In France, these are mainly the ‘Commission des fouilles’ (Excavations committee) of the Ministry of Foreign Affairs (MEAE), but also the CNRS, Paris 1 University and the IFPO, and in Belgium the University of Liège. We would like to express our warmest thanks to our Kurdish partners, the DGA in Erbil, above all to Kamal Rasheed and his team at the Directorate of Antiquities of Souleymanieh, whose continuous support was greatly appreciated by all of us. We wish to thank Adel Hama Amin, Kamal Rahoof and Bahra Salah who were precious collaborators at all times. Lastly, we are very grateful to the authorities of Chamchamal and Shorsh for their support, the people of Chamchamal for their friendly welcome and, last but not least, the 15 fine workers that we were able to recruit there.

situ levels. In 2016, at both sites, after a geophysics and archaeological survey, we opened or reopened two trenches<sup>2</sup>.

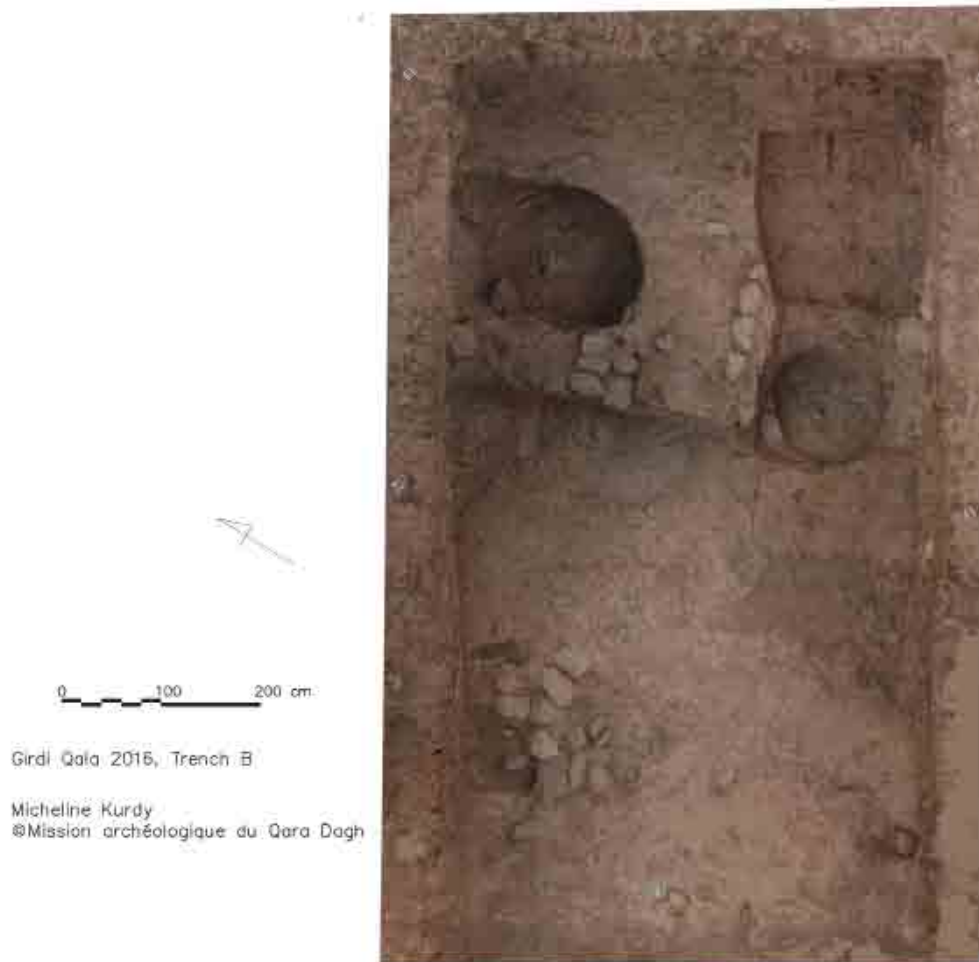
At Girdi Qala (fig. 4), at the top of the main mound (15m), we abandoned Trench A that gave inconclusive results to concentrate the work on the long-term stratigraphic objectives of Trench B (L. Colonna d'Istria and A. Devillers). Trench B was enlarged over 50 sq. m and



**Fig. 4** - Topographical map of Girdi Qala.

excavated to a depth of two meters that delivered six successive Islamic, Sasanian and Hellenistic levels (fig. 5). In particular, Level 5 contained a large mudbrick Sasanian building (with the intrusive tomb of a dog), while the Hellenistic occupation (level 6) dates back to the early phase of the period (late 4th-early 3rd c. BC). The types and fabrics of the pottery indicate that Girdi Qala was an important site in the network of Hellenistic sites in the region (M. Ahmad). The exploration of these late phases of occupation, badly preserved on the periphery of the high mound but particularly interesting, should continue in the next seasons.

2. For a physical description of the sites and their natural settings, see our previous report, Vallet (ed.) 2015.



**Fig. 5** - Girdi Qala Trench B, orthostatic view, 2016.

At the foot of the Main Mound, we know since 2015 that the southeastern slope was the center of large-scale pottery production during the first half of the fourth millennium BC. The excavation of Trench C had enabled to identify ten well-preserved overlapping layers close to the surface and almost the whole sequence has shown pottery production or firing structures. Although it is likely that the Main Mound of Girdi Qala was an indigenous Late Chalcolithic settlement (LC 2-3) the large majority (70%) of the ceramic assemblage collected in Trench C belongs to South Mesopotamian (Uruk) classical traditions, which shows that Uruk pottery was made on-site by resident craftsmen. Thus, the search for a residential area of the South-Mesopotamian settlers was amongst our main goals, and the settlement located on a secondary North Mound was opened this year.

A comprehensive survey of the site, geophysical (L. Darras and C. Benech) and archaeological (C. Paladre, R. al Debs and A. Hama Amin) was carried out. Its combined results allowed us to identify an Ubaid settlement in the west part of the mound (probably the original village that moved to the main mound during the LC1 period), but also, and more important, the precise limits of an Uruk enclave. It covers the elongated summit and northern slope of this low mound, over less than 1 ha. The geophysical image is very homogenous, and matches perfectly the pottery distribution, but spotted three denser areas, one of which was selected for a first test trench (Trench D), on the north slope of the mound, not far from a (natural ?) ramp leading down to the river along the abrupt north flank of the mound.



**Fig. 6** - Girdi Qala North Mound, Trench D, from the north.

Trench D (fig. 6) gave five successive levels of middle-Uruk domestic architecture (C. Paladre, R. al Debs, A. H. Amin and R. Vallet), with features such as pottery pipes (level 3, the oldest known of this type<sup>3</sup>, fig. 7) or a carefully pebbled street (level 5), but the sequence continues below. The most significant feature is that any local shapes or wares are virtually absent: the pottery belongs exclusively to Southern Uruk traditions (J. S. Baldi). The domestic areas exposed in Trench D of Girdi Qala northern mound constitute the first evidence of a south-Mesopotamian Middle-Uruk settlement east to the Tigris River and north to the Hamrin basin.

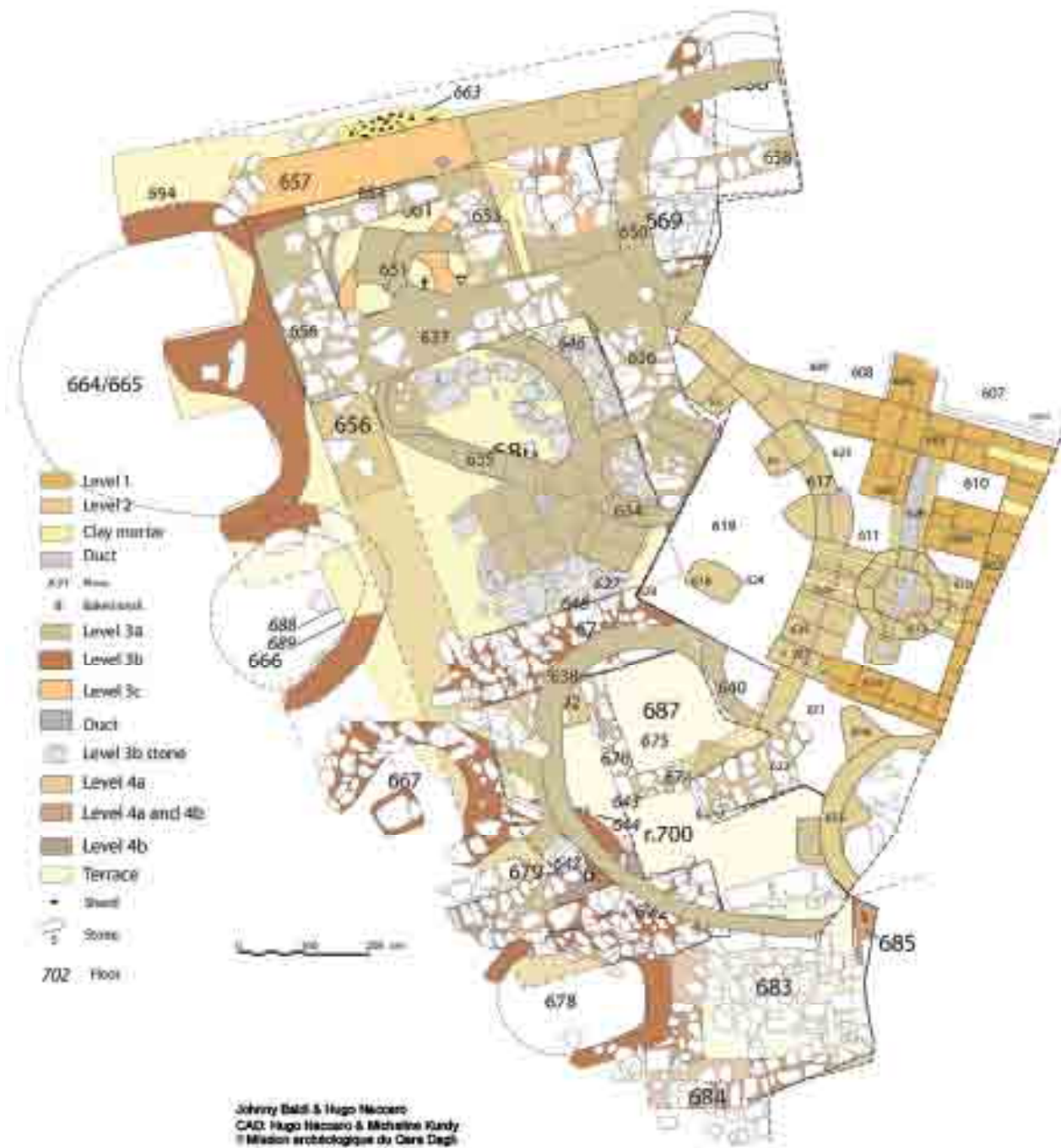


**Fig. 7** - Clélia Paladre unblocking the 4th mil. pottery pipes.

3. Level 3 produced a C14 dating, consistent with its Middle-Uruk assemblage, see Appendix B.

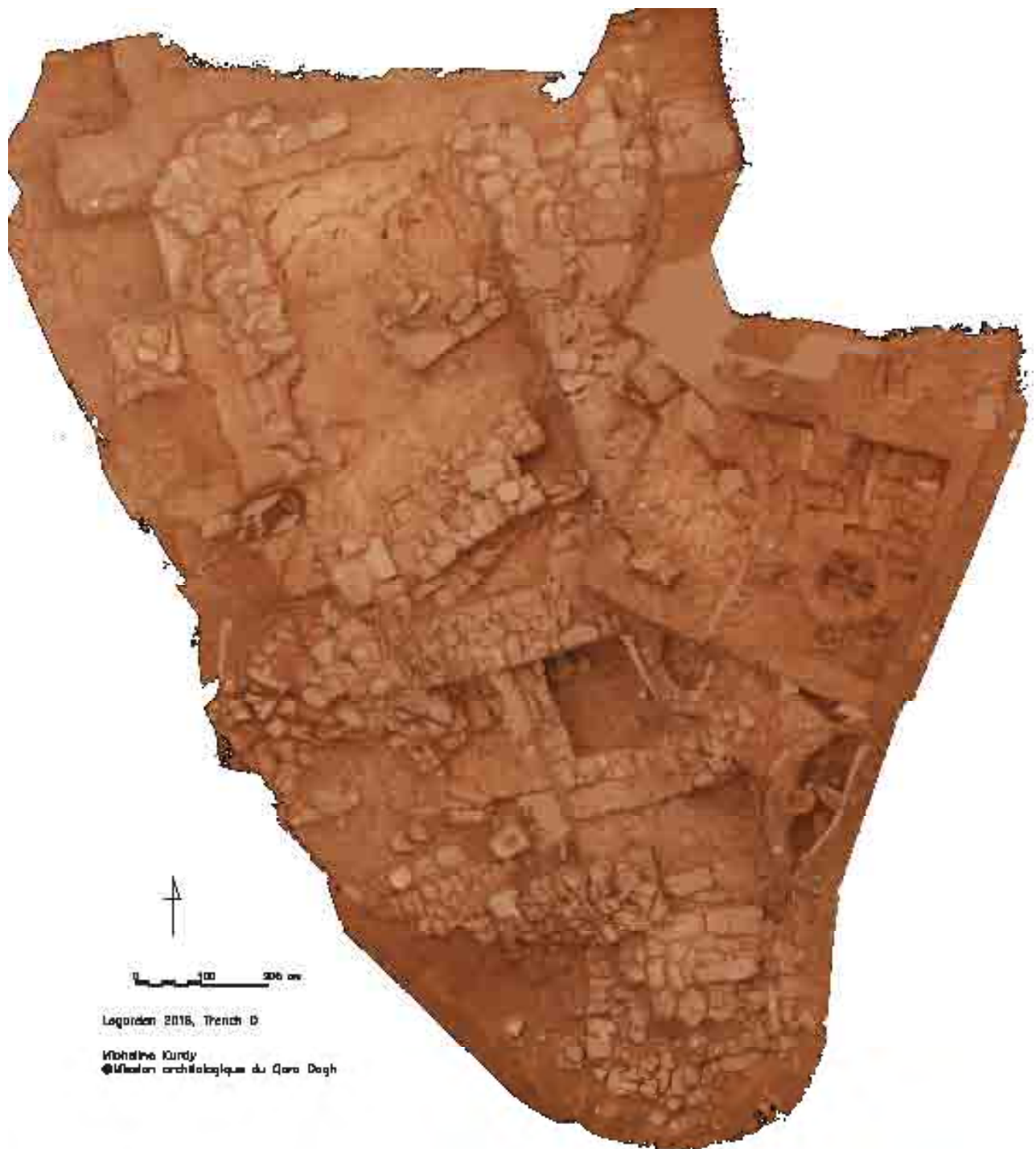






**Fig. 9** - Logardan Trench D, composite plan of the successive architectural levels.

the neighboring areas (M. Zingarello). Levels 3a and b provided two C14 dating consistent with their respective assemblage (Appendix B), as well as a cylinder-seal of an Akkad imperial official (C. Paladre), for we know that the site was not restricted to industrial activities (Trench E). The earlier ceramic workshop area was built through Level 4 building, whose ruins were reused and partly adapted: a monumental Early Uruk public building, provided with massive stone foundations resting upon a recessed mudbrick terrace (fig. 10). Moreover, unlike Trench C at Girdi Qala, where a local LC2 tradition was also documented, Level 4 of Logardan Trench D yielded exclusively south-Mesopotamian-related shapes (J. S. Baldi).



**Fig. 10** - Logardan Trench D, orthostatic view.

The presence of such early and massive architectures in central-northern Mesopotamia is an unexpected discovery. For the moment, it has no parallel north of Tell Uqair.

In order to obtain more information on the Bronze Age occupation of the site, we launched another operation, on the upper terrace, right next to the hilltop. The survey (M. Sauvage, M. Zingarello and B. Salah) has indicated a probable occupation of the Halaf and Ubaid periods in the northern part of the terrace (and a possible Uruk occupation at the junction of the upper and the median terraces), but the entire central part of the terrace appeared to have been lastly occupied by Bronze Age structures. It was therefore decided to lay a NW/SE Trench E (10 x 5m) from the 'citadel' to a building identified by the geomagnetic survey. Trench E (M.

Sauvage, M. Zingarello and B. Salah) encountered five successive Early Bronze Age levels, at the foot of the retaining wall of the 3rd millennium 'citadel', a massive mudbrick structure with a stone basement and a passageway provided with a set of steps made of rammed earth. A street, littered with material, accessed it. At the SE of the trench, the corner of a storage yielded seven jars (and three smaller pots), under the remains of the collapsed earthen roof that sealed the room (fig. 11). Several jars have a characteristic appliqué motive of 'snakes', ED III to late third millennium in date (M. Zingarello), but the area disclosed also some Late Bronze Age material whose context is still unclear due to the limited stretch of the excavation (possibly from late pits). However, since Trench C we know that the upper part of the site was occupied and fortified in the Late Bronze age (Vallet ed. 2015).

Therefore, the four trenches conducted in 2016 have produced interesting results and shall be continued and extended next year. The most unexpected discoveries concern the Uruk presence that the excavations are just starting to reveal. Despite longstanding assumptions that the Uruk expansion began during the late LC3 phase, it is 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 ca 3600 BC, but rather ca 3900 BC. Incidentally, the Qara Dagh seems to represent the limit of this expansion in the late LC2, as there is not (yet) evidence of a Southern Uruk manifestation east of this range before the LC3. Girdi Qala and Logardan have already provided and should continue to provide in coming years startling new archaeological evidence, re-opening the debate on the Uruk expansion and interactions between Southern and Northern Mesopotamia.



**Fig. 11** - Logardan Trench E, the storage room in excavation, from left to right : Bahra Salah, Mélanie Zingarello and Martin Sauvage.



# MAGNETIC SURVEYS ON THE ARCHAEOLOGICAL SITES OF GIRDI QALA AND LOGARDAN

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Lionel Darras and Christophe Benech

**F**rom September 25<sup>th</sup> to October 14<sup>th</sup>, a second campaign of geophysical survey has been carried out in the frame of the French archaeological mission of Girdi Qala and Logardan in Iraki Kurdistan, directed by Régis Vallet (CNRS). The goal was to complete the results of the 2015 campaign: at Girdi Qala, only the main tell and its immediate vicinity was covered and according to the observations of the pedestrian survey, it appeared particularly interesting to extend the survey to the northwest to another eminence limited to the North by an abrupt slope. In the case of Logardan, the first purpose was to link the two magnetic maps of 2015 to follow the layout of the structures detected on the southern slope. An extension of the survey was also carried out to the southeast to check if there is –or not- an extension of the settlement in this direction.

## METHODOLOGY

The geophysical survey was carried on by using the magnetic method that proved its speed and efficiency in this archaeological and environmental context. The principle of the magnetic method is to measure the local variations<sup>1</sup> of the Earth magnetic field due to the presence of iron oxides in the soils and in the archaeological structures. The magnetic survey has been carried out with a cesium gradiometer G858 (Geometrics Inc) with a mesh grid of 1 m x 0.10 m interpolated at 0.50 m.

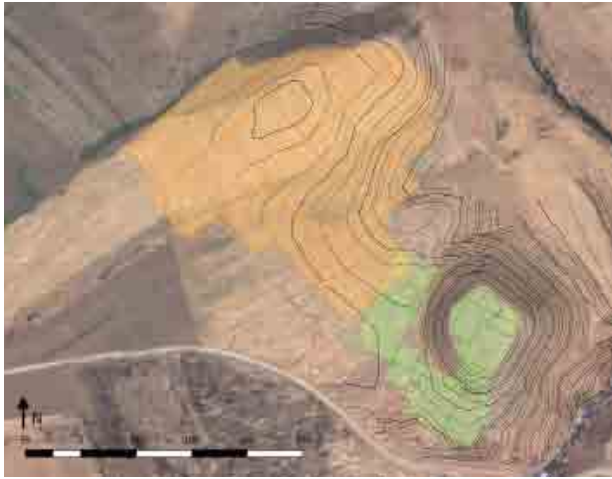
## RESULTS OF THE MAGNETIC SURVEY

### GIRDI QALA (FIGURES 1A-E)

In 2016, a surface of 4 ha has been covered by magnetic survey at the north of the main tell (figure 1a). The magnetic map (figure 1b) shows a very clear image of the archaeological settlements rarely disturbed by modern activities or erosion layouts.

Three areas with different kinds of magnetic anomalies can be identified (Figure 1d):

- ▶ Area with a high density of magnetic anomalies, possibly showing an organized settlement, well delimited on 3 sides (1<sup>st</sup> area, red outline).
- ▶ Area with punctual anomalies of different sizes and high amplitude (2<sup>nd</sup> area, pink outline).
- ▶ Less dense area characterized by some linear anomalies excepted in the southern part marked by a set of small punctual anomalies (3<sup>rd</sup> area, blue outline).



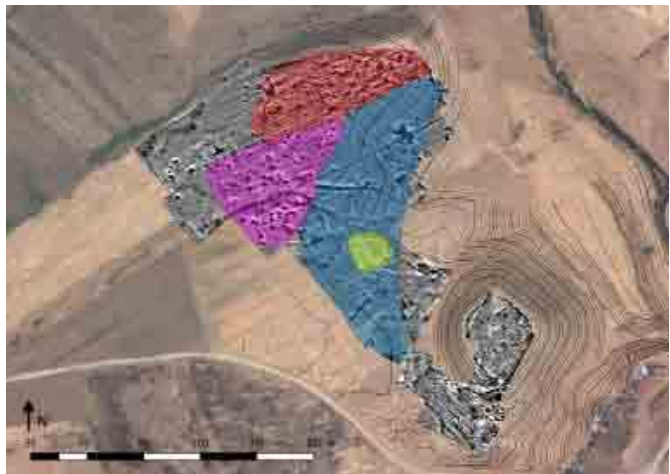
**Fig. 1a** - Magnetic survey implantation on the site of Girdi Qala in 2015 (green) and 2016 (orange).



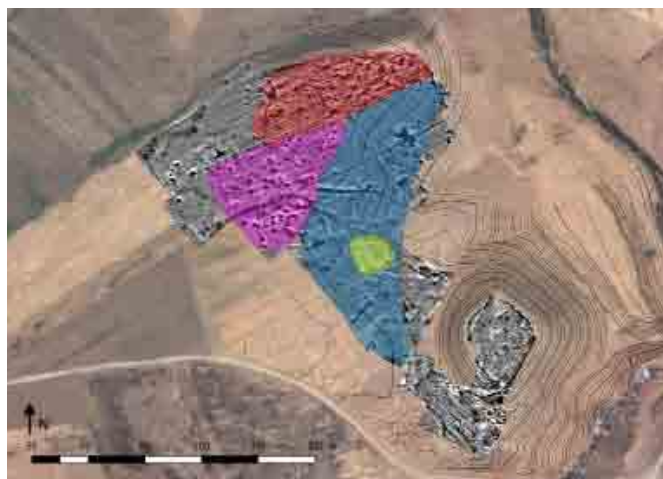
**Fig. 1b** - Magnetic survey results on the site of Girdi Qala (-5nT(White)/+5nT(Black)).



**Fig. 1c** - Location of non-Archaeological anomalies in the site of Girdi Qala North.



**Fig. 1d** - Location of interesting magnetic anomalies on the site of Girdi Qala North.



**Fig. 1e** - Magnetic map of Girdi Qala and location (in red) of the Trench D.

Some magnetic anomalies (figure 1c) can be interpreted as channels (light green lines) for field's irrigation, road tracks (yellow lines), ploughing (blue lines) and modern fences (orange lines). The erosion of the site due to water runoff is also visible on the magnetic map (dark green lines) to the northern eminence.

On the northern part (1<sup>st</sup> area), a set of aggregated magnetic anomalies might be related to a settlement from the Uruk period, according to the analysis of the ceramics collected during the pedestrian survey and the first archaeological sounding above the largest magnetic anomaly (diam. 10m and magnetic amplitude around 8nT)<sup>1</sup>(figure 1e). It is very difficult to identify an organization through this set of anomalies, probably due to the erosion of the site, but they look also partly aligned. The observation was already done last year concerning the magnetic anomalies from the top of the tell corresponding to poorly preserved structures<sup>2</sup>.

Nevertheless, these anomalies are also well delimited in a specific area even if a fence or a ditch does not mark this delimitation. Cautious must be taken in the interpretation of the alignments of this area: they are indeed partly due to modern ploughing.

Immediately to the South of this probable settlement, there is an area with numerous punctual anomalies always apart from each other at least from few meters: here again, they are delimited inside a specific area even if this delimitation is characterized by a specific structure. These anomalies are rather similar in terms of size and magnetic amplitude (diam. 4m and magnetic amplitude around 15-20nT). These characteristics are also very close to the anomalies detected at the bottom of the tell: according to the archaeological sounding opened during the last campaign in this area<sup>2</sup>, close to the surveyed one, these magnetic anomalies could match to fireplaces. These anomalies are in the same size than fireplaces identified last year<sup>2</sup> (diam.3-4m and magnetic amplitude around 6nT), but with a stronger magnetic amplitude. This area could be therefore identified as artisanal area whose exact function is still hypothesis according to the magnetic results. Between these anomalies, we can also observe some linear negative anomalies which might correspond to walls of houses.

A long magnetic anomaly (blue line) (length: 60m, thickness: 4m, and magnetic amplitude around 20nT) could perhaps indicates the location a ramp. Its shape and magnetic amplitude is therefore similar to the one identified on the southern slope of the tell.

To the East, in the 3<sup>rd</sup> area, small punctual anomalies similar to those observed in the previous area (even if a little bit smaller) are visible but they don't appear as belonging to a coherent and well delimited group. There is also a big anomaly (extension around 10m, and magnetic amplitude around 5-10nT) whose shape is particularly irregular and does not help for its identification: it could be a ruined building as well as a waste deposit of magnetic material from any historical period.

To the South, a set of linear and more punctual anomalies seem to delimitate two enclosures. The first one, to the East, has a semicircular shape opened on its oriental side. The positive and rather thick anomaly might indicate the presence of a ditch. The western limit is more surprising with a set of small anomalies but also very clear. The interior of the enclo-

1. About the results, see in this report the chapter "Archaeological Survey of Girdi Qala North Mound" pxx-yy.

2. About the results, see Vallet (ed.) 2015, pp. 48-52.

sure is also scattered by some small and positive anomalies (pits?). The other enclosure, to the West, looks widest even if its western limit is beyond the surveyed area. The southern limit appears very clearly with a linear anomaly whereas the other sides are marked by more punctual anomalies: it could possibly be traces of an eroded ditch. Nevertheless, there is no evidence to propose a date for these both structures.

To the southeast of this last enclosure, several small anomalies (diam.1m and magnetic amplitude around 5nT) could be pits: there are also located in a well delimited area, at the bottom of the eastern slope of the tell (blue outline, south part).

### LOGARDAN (FIGURES 2A C)

Last year, in 2015, a geophysical survey (figure 2a) contributed to retrieve some information about the organization of the site and help to choose the location of the first archaeological soundings. During this campaign, the goal of the geophysical survey was to complete the results by linking the two parts of the magnetic map for a more homogeneous vision and to check if there was –or not- an extension of the settlement to the East.

The results of the magnetic survey during both campaigns are displayed on figure 2b. Concerning the results of 2016, four specific areas can be identified (figure 2c):

- ▶ Area with a lot of small anomalies (diam.0.5 to 1m, magnetic amplitude around 3 or 4nT) which could be rubbishes or magnetic material (1<sup>st</sup> Area, green outline).
- ▶ Area with the prolongation of the water runoff (2<sup>nd</sup> Area, red outline).
- ▶ Area with several circular anomalies (diam.3m, magnetic amplitude around 10-20nT) which could be fireplaces (3<sup>rd</sup> Area, blue outline).
- ▶ Area without specific anomalies which probably confirms the southeastern limit of the settlement (4<sup>th</sup> Area, yellow outline).

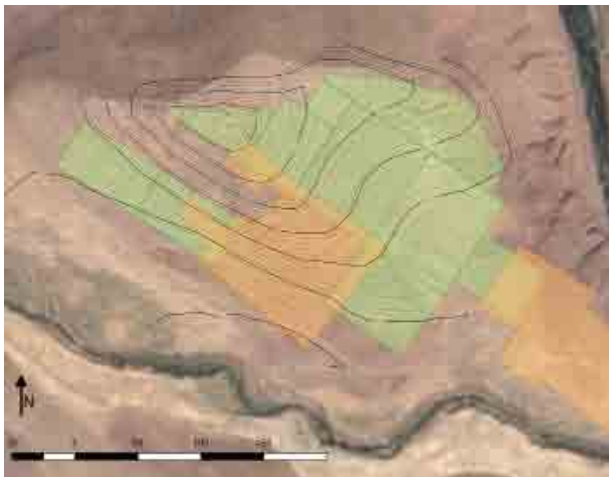
### CONCLUSION

The magnetic map reveals the presence of different types of structures, although it is not sure at the moment that they all date from the Uruk period. Only the northern part, where an archaeological survey has been carried out, is for the moment well-documented. This sector is characterized by a high density of magnetic anomalies but does not however allow a detailed view of the organization of the constructions. Contiguous to this sector, a series of strong magnetic anomalies seems to signal the presence of a series of furnaces, close in dimensions to those excavated in 2015 at the foot of the tell. Further to the south, two well-defined forms could correspond to enclosures, without being sure that they are not more recent. They are adjoined to the south by a set of point anomalies, less magnetic than those described above, which could therefore rather correspond to pits.



On Lugardan, the magnetic survey achieved the exploration with no more significant information. In the southern part, a set of small anomalies could correspond to backfills. On the eastern side, there is no specific sign of an extension excepted only isolated anomalies.

This campaign achieves the magnetic survey as planned in the program of the archaeological mission. Next step will be a more detailed interpretation of the results by the joint analysis of geophysical data and the results of current and forthcoming archaeological soundings: it will make possible a better characterization of the origin of the magnetic anomalies and extrapolate the extension and the organisation of the excavated structures.



**Fig. 2a** - Magnetic survey implantation on the site of Logardan in 2015 (green) and 2016 (orange).



**Fig. 2b** - Magnetic survey results on the site of Logardan (-5nT(White)/+5nT(Black)), and location of the Trenches D & E (in red) excavated during this campaign.



**Fig. 2c** - Interpretation of magnetic survey result on the site of Logardan.



# LOGARDAN TRENCH D: STRATIGRAPHY AND ARCHITECTURE

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Johnny Samuele Baldi, Hugo Naccaro and Kamal Rahoof

**T**he excavations have been carried-out during 4 weeks in October 2016 in the aim to identify the whole stratigraphy of Logardan on its western edge. In this area, the top of the hill is badly disturbed by several recent large illegal excavations. First, a 10x10 m trench was opened, but this initial sounding has been progressively enlarged to assure a better understanding of the architectural remains, especially of those of Levels 3 and 4. At the end of the 2016 campaign, Trench D had a surface of about 250 m<sup>2</sup>, excavated on 4 levels with a height difference of about 5 m between the surface and the deepest vestiges. This extensive excavation allowed us to recognize different phases of occupation between the beginning of the 4<sup>th</sup> and the second half of the 3<sup>rd</sup> millennium BC at the top of the site. The size of some structures requires further widening of the investigated area during the next campaign.

► **Level 4** is represented by two distinct architectural phases of a monumental early Uruk complex (Fig. 1). The presence of such early and massive architectures in central-northern Mesopotamia is an unexpected discovery, which opens completely new perspectives on the so-called Uruk expansion. Indeed, it is the first time that in this area monumental buildings are discovered associated to early 4<sup>th</sup> millennium ceramic materials belonging to a south-Mesopotamian tradition. An important early 4<sup>th</sup> millennium southern Uruk presence in the Qara Dagh region was documented since the discovery, in 2015, of the complex pottery kilns in the basal levels of Trench C at Girdi Qala. But architectures as ancient and important as those of Logardan Trench D Level 4 are an unforeseen discovery which, for the moment, has no parallel north of Tell Uqair. 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, an enlargement of the excavated surface is needed in the next campaigns to better understand the structural organization of the monumental area.

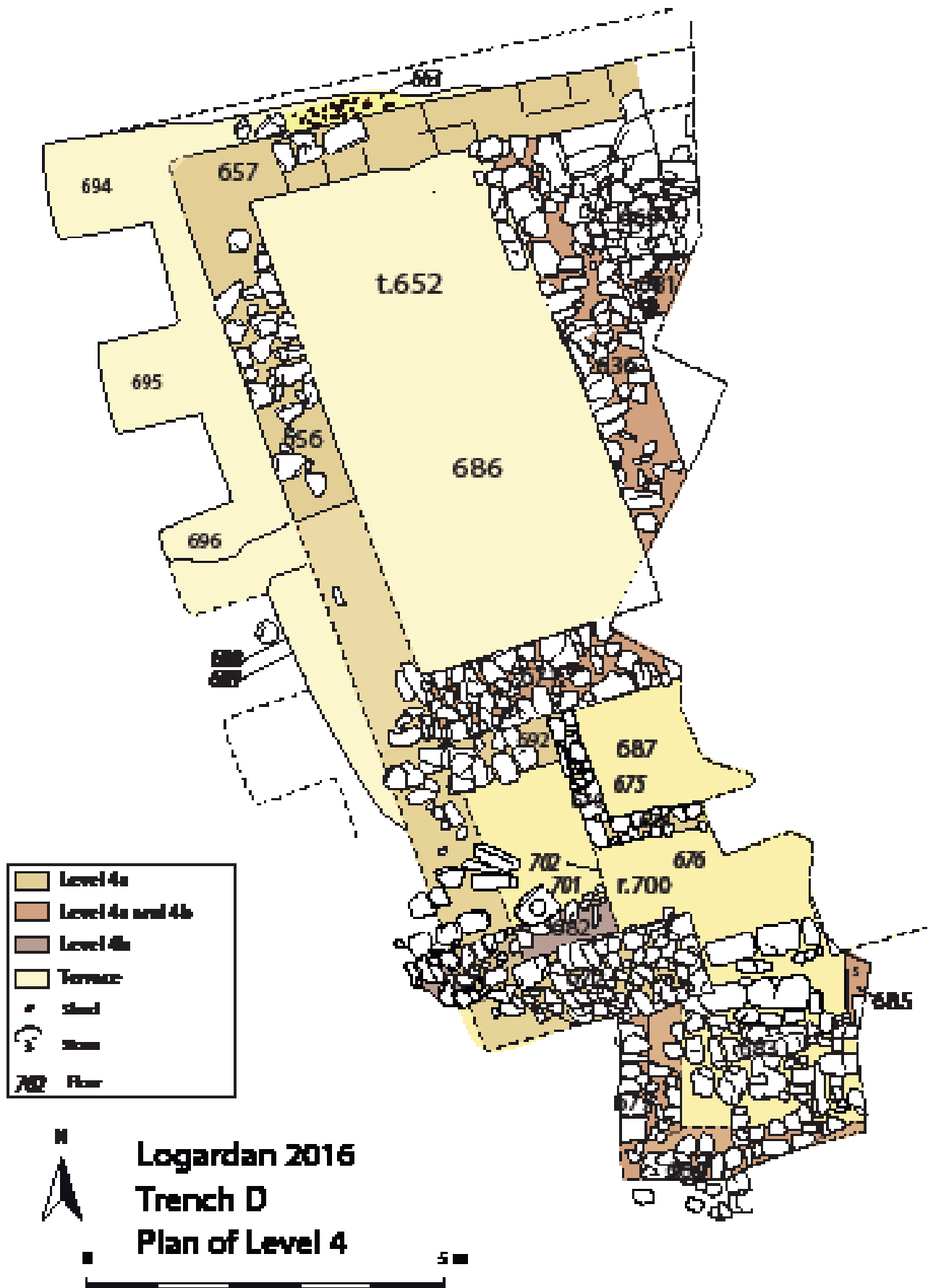


Fig. 1 - Plan of level 4.

During a first phase (Sub-level 4b), it is possible to recognize the west wing of a large complex built on a terrace in mud-bricks (652) laying on a quite flat floor (688). The construction of a terrace on the edge of Logardan constitutes in itself a significant architectural work, whose aim is not simply to create a basement for the construction of the building, but also to level the entire area. The main walls (656, 657, 671, 636 and 682)<sup>1</sup>, with foundation trenches dug deep into the mud-brick terrace, are between 80 cm and 1 m thick and are made of large-sized flat stones (Fig. 2 and 3). They define the west wing of a roughly north-west – south-east oriented complex. It is difficult to offer an accurate reading of this construction both because of the poor state of preservation of the northern and western structures, and because of the impossibility during this campaign to push further east the eastern limit of the excavation by removing Level 2 structures. In this sense, it is not yet clear whether Wall 636 and 682 are connected or whether Wall 636 simply forms an angle with Wall 671 and does not continue towards the south. Likewise, the kilns of Level 3b have almost completely erased the segment of Wall 656 south of its angle with Wall 671. The enlargement of the trench during the next campaigns could offer a different overview because if Walls 656 and 636 do not continue to the south, the monumental complex could 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 of all, even if Wall 656 is not preserved in its southern sector, its



**Fig. 2** - Level 4 - loc 636.

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.



**Fig. 3** - Level 4 - loc 671.

foundation trench continues south of the angle with Wall 671. Moreover, the western façade of the mud-brick terrace was reinforced by a series of regularly spaced large (1,6 m thick) buttresses and, 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 Wall 682. 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 made reusing the masonry of Wall 656 – see below) have erased any kind of floor of Room 686, but 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 (Fig. 4). This one constitutes



**Fig. 4** - Level 4 - loc 663.

the northern façade of the edifice even east of its angle with Wall 636. Despite the limited surface excavated in this central sector of the building, it has been possible to recognize Wall 681 (with 8 layers of stones for a 1,6 m of preservation): it is roughly parallel to Wall 657 and connected to Wall 636 (Fig. 5). The space defined by these three walls is paved with stones (669) amongst which some in-situ early 4<sup>th</sup> millennium ceramic materials have been recovered.

South of Room 686, the space between Walls 671 and 682 (Fig. 6) is very poorly known for



**Fig. 5** - Level 4 - loc 681.



**Fig. 6** - Level 4 - loc 682.

the Sub-level 4b. However, even if the later Wall 672 overlaps it and makes difficult to verify its connections, Wall 682 is associated to a southern paved space delimited by the north-south oriented Walls 677 and 685, as well as by the east-west oriented Wall 684. No trace of the mud-brick Terrace 652 has been identified south of Wall 682. Therefore, the forecourt paved with large-sized stones between Walls 677, 684 and 685 seems to represent the southern limit of the architectural complex in this sector. Since the different orientation between the paved forecourt and the building respects the shape of the hill in this area, it is not a problematic element in itself. Anyway, it confirms that for the moment our understanding of the first stage of Level 4 is quite partial.

In a second moment (Sub-level 4a), the whole complex was restructured. Walls 656 and 657 are erased. Then, on the whole surface of the sector north of Wall 671, Terrace 652 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 Sub-level 4a (Floor 689). Starting from this level (689) the masonry of the western buttresses, which in Sub-level 4b were leaned against the terrace, is intertwined with the terrace itself. 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 definitely lost. Once restructured the terrace, Walls 656 and 657 were rebuilt upon it using both bricks and large-sized rounded stones: for this reason their masonries, even if absolutely solid, are visibly different from Walls 636 and 671, which remained unchanged. East of Wall 636, Wall 681 and the paved room 669 seem to have not been affected by the renovation. On the contrary, the entire space south of Wall 671 has undergone a dramatic transformation. The mud-brick terrace was almost completely dismantled over several layers of bricks without being rebuilt. Wall 682 was destroyed and replaced by another roughly east-west oriented and thick wall (672), which is built without a foundation trench and simply lays on what was left of Terrace 652. It is likely that the new east-west oriented Wall 672 and the reconstructed north-south oriented Wall 656 did not form an angle because of an access door crossing through Wall 656 in its closest segment to Wall 672. In this area, a big stone used as pivot for a door could be in its primary deposition context (Fig. 6). Actually, the southern room of the west wing becomes a transit zone within the complex because the forecourt delimited by Walls 677, 684 and 685 becomes a monumental staircase (683) (Fig. 7). The orientation of this space remains unchanged (i. e. north-south oriented, divergent if compared to the rest of the edifice and defined by Wall 672 and the cornerstone facing it), but the steps of the staircase go east and progressively change their orientation. Each of them is formed by some elongated stones: 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. In the next campaigns, it will be necessary to verify if the staircase leads to an upper terrace.

During the last phase, the space between Walls 671 and 672 (Room 700, with different floors as 702) laying on what was left of Terrace 652, has been divided by the construction of two little walls. The first one (670) is perpendicular to Wall 671 (Fig. 3), while the other one (674) is parallel to the big wall 671. They delimited a little room (687) whose floor (675) has



**Fig. 7** - Level 4 - staircase 683.



**Fig. 8** - Level 4 - floor 675.

yielded some in-situ bowls (Fig. 8). 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. Floor 676 was also associated to Staircase 683, which is still in use in this phase (Fig. 7). But it seems evident that the presence of these domestic or craft structures, devoted to a merely functional use partially cluttering the area in front of Staircase 683, indicates the beginning of the re-use of the monumental complex following the loss of its primary function.



► **Level 3.** Since the erosion of the slope had erased the structures of Level 2 on the western portion of the initial 10x10 m trench, two sections have been cut deep into the filling layers east of the preserved structures of Level 2. It allowed us to uncover the remains of Level 3.

First (in Sub-level 3c – Fig. 9), two medium-sized sub-circular kilns (659 and 660) were built close to the ruined Wall 657 (Fig. 10). Both these firing structures were two-storey up-draught kilns: even if they were independent from each other (initially 659 had a *praefurnium* pit on its northern side, while the mouth of 660 was on the southern side), they shared a portion of their external wall and a subterranean duct to evacuate the smokes. This channel was physically connected to Kiln 660 and emerged from underground with a chimney resulting from the reuse of the ruined Wall 657.

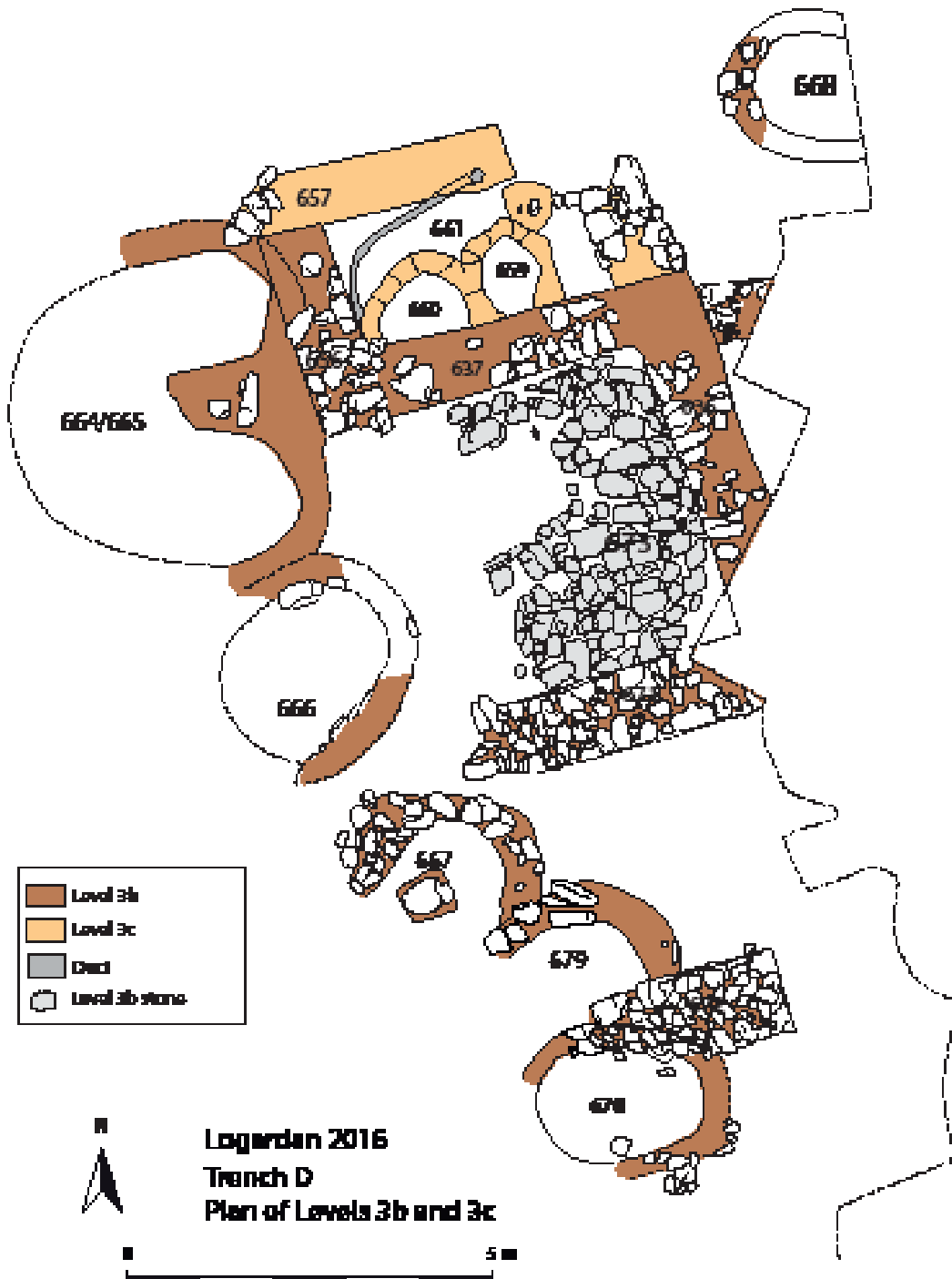
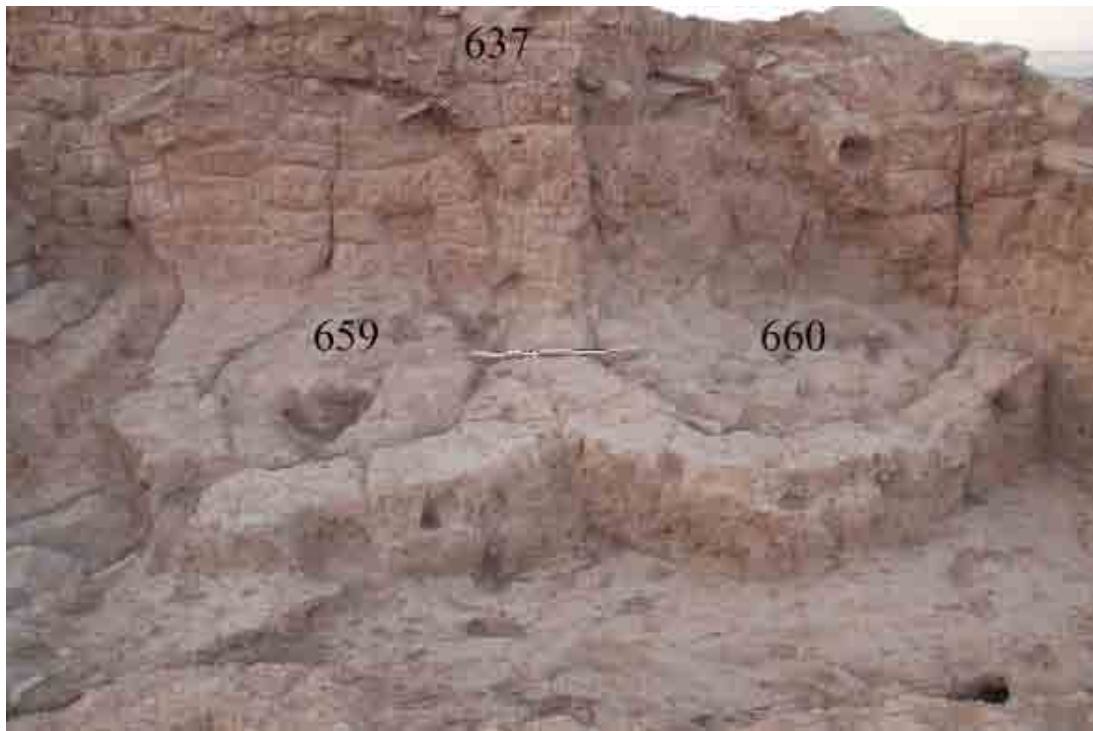


Fig. 9 - Plan of levels 3b and 3c.



**Fig. 10** - Level 3c - Kilns 659-660.

Later (Sub-level 3b) a massive wall (637) was built on the southern side of Kilns 659 and 660. Likewise, the northern portion of Wall 656 was also rebuilt. Wall 637 is a roughly east-west oriented and almost 1 m large structure, built of bricks and reused stones (of Level 4). Even if it overlaps the southern portion of Kilns 659 and 660, they are restructured and remain in use, with firing chambers covered by domes recessed into the northern face of Wall 637. Therefore, this sector becomes a closed workspace (661) defined by three walls (656, 657 and 637). But the architectural transformations in Level 3b are not limited at the northern sector of Trench D. On the contrary, this phase is represented by a generalized reuse of the ruins of Level 4 (particularly Walls 671, 672, 636, 681, 657 and the northern portion of 656) to create 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 of Level 4 to facilitate the evacuation of the fumes along the edge of the hill, while inside the ancient building of Level 4 the space was used to manufacture and dry the vessels. To the north, besides the restructured kilns 659 and 660 in the room 661, a one chamber oval kiln (668) was associated to a production unit located east of the Wall 636. To the west, several kilns (664-665, 666, 667, 678, 679) were arranged in a row along ancient Wall 656 of Level 4 (Fig. 11). The ruins of this wall,



**Fig. 11** - Level 3b - Kiln 667.

was reused to sustain the domed roofs of the kilns. The largest amongst them (the enormous structure 664-665, with a diameter of about 4 m) was covered by a double dome reusing an external buttress of the Level 4 building. In the same way, to the south, Kilns 678 and 679 reused the Wall 672 to sustain their domes (Fig. 12). The presence of different typologies of potter's



**Fig. 12** - Level 3b - Kiln 678.

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 chamber<sup>2</sup>. On the other hand, kilns 668 and 679 were one chamber firing structures with a domed roof covering a space dedicated both to the fuel and the ceramic materials<sup>3</sup>. East of this row of fur-

naces, the ruins of the previous level were adapted to define different production units. South of the Room 661, the space between Wall 671, 636 and 637 was carefully paved with large stones taken from the ancient Wall 656 (which was 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 Wall 637 and make the



**Fig. 13** - Level 3b - loc 673.

stone Floor 673 (Fig. 13). South of this room, between Walls 671 and 672, there was another production unit that, unlike the paved space 673, had an ashy clay soil. Probably, this architectural difference depends on the different functions of the two units. Indeed, several potter's

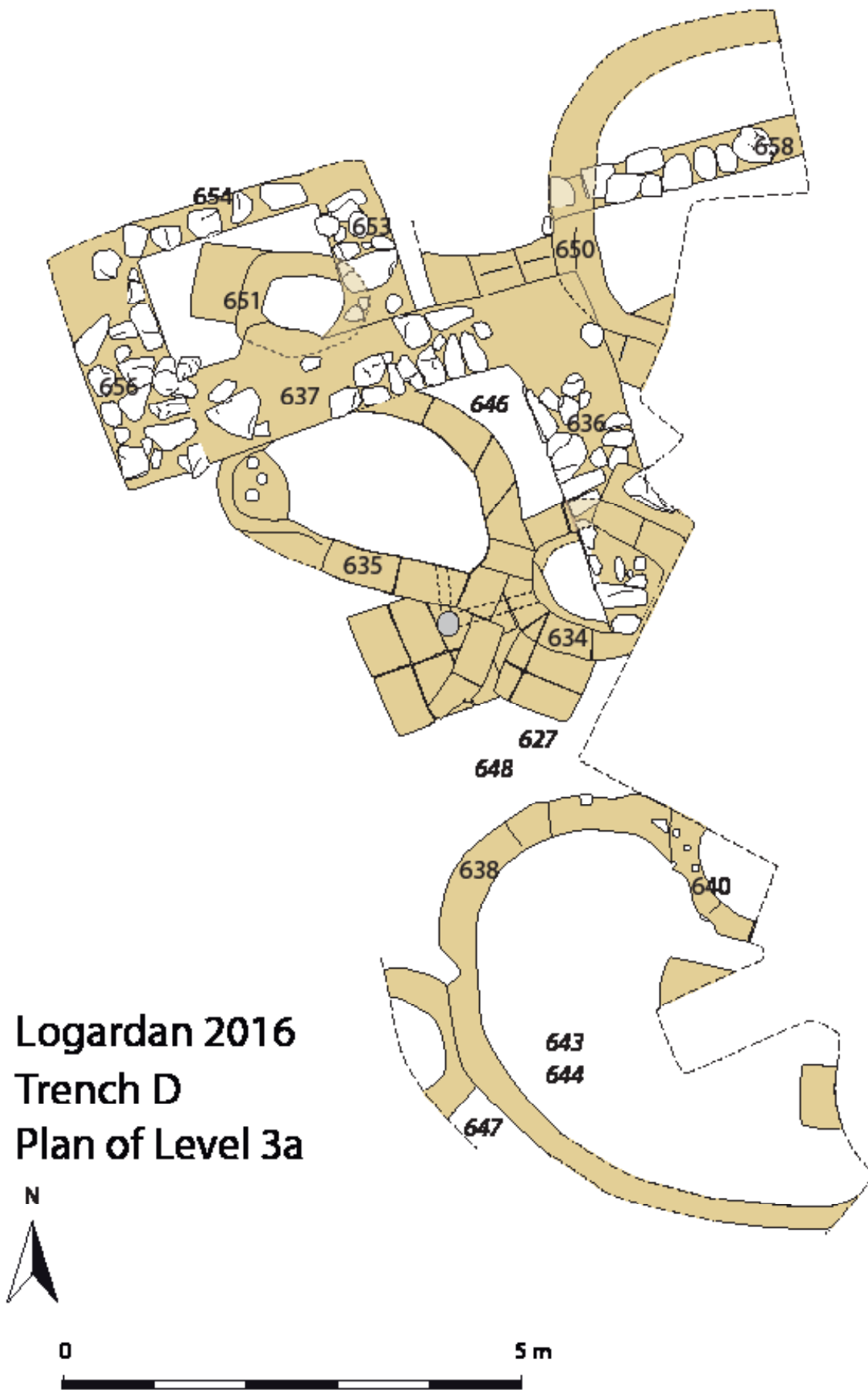
- 
2. For Early-Dynastic Two-storey kilns see at Tell Hazna (Bader, Merpert and Munchaev 1997-98: fig. 6), Tell Banat (Porter and McClellan 1998: fig. 2-4), Uch-Tepe-Tell Razuk Level VB (Gibson 1981: pl. 27), Tell Madhhur (Killick and Roaf 1976: Abb 183), Khafajah (Delougaz 1940: plan IV, VII; Delougaz 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).
  3. For Early-Dynastic one 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).

tools – especially 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 (Fig.14). 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.



**Fig. 14** - Level 3b - loc 649 - painted jar.

Sub-level 3a (Fig. 15) represents a later occupation that occurred after an abandonment of the workshop. When the area was reoccupied, the profile of the hill, determined by the accumulation of the previous structures of Levels 4 and 3c-b, was very sloping, both towards the north and the west. Instead of levelling the whole sector, the artisans of level 3a chose to adapt their new workshop to the topography: they reused some parts of previous structures and built new kilns adjusting the slope. To the north, Room 661 and its kilns (659-660) of Level 3b were replaced by a smaller space with just one medium-sized kiln (651). Like the earlier kilns in this same area, this firing structure is partially recessed into the wall 637: two thin walls (653 and 654) built with recycled materials close a room whose southern corner is formed by walls 636, 637 and 656. Actually, the upper part of 637 is further restructured in Level 3a, 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 Level 3b, determines a total change of the previous structural organization of the workshop. To the north, in the area previously occupied by the 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. But Kiln 650 did not have any sole and its chambers were not perfectly built one on the other, but they 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



Logardan 2016  
Trench D  
Plan of Level 3a

Fig. 15 - Plan of level 3a.

and 635 were not independent furnaces, but parts of one sloping kiln (Fig. 16 and 17). The oval fireplace 635 was used for the fuel, as indicated by its *prae-furnium* 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 ruins 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 which centralizes the evacuation of the smoke. To the south, another structure composed of different chambers (638-640) works in the same way (Fig. 18). Combustion began in a western *prae-furnium* 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 abandoned at the same time (as demonstrated by Floor 627, which covers the ruins of this late Level 3 occupation). 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



Fig. 16 - Level 3a - Kiln 634.



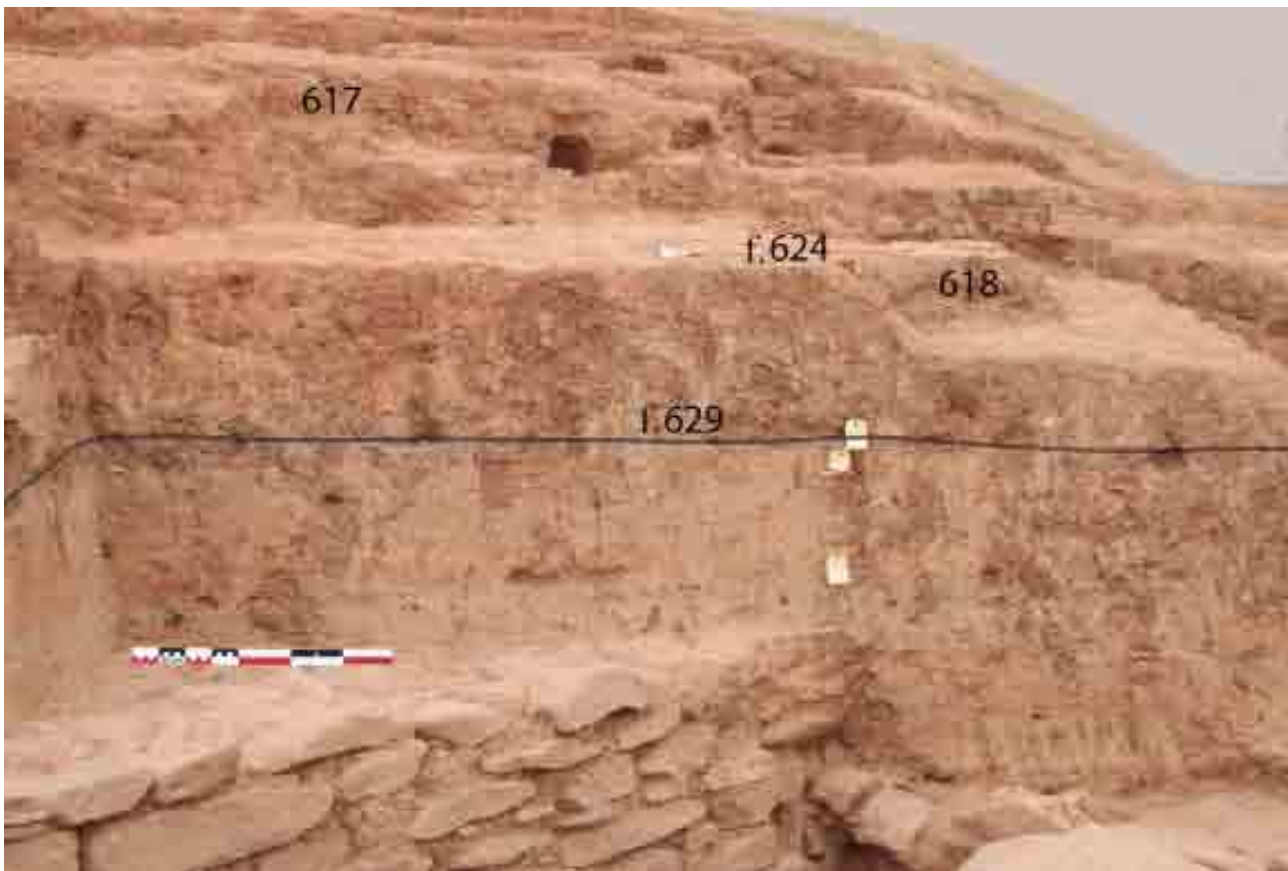
Fig. 17 - Level 3a - Kiln 635.



Fig. 18 - Level 3a - Kiln 638.

since the 2<sup>nd</sup> millennium BC<sup>4</sup>. Therefore, the kilns of Level 3a in Trench D offer a unique documentation about the evolution of this firing technology and allow to fill the absence of any archaeological record for the mid and late 3<sup>rd</sup> millennium BC<sup>5</sup>.

► **Level 2** is clearly separated from Level 3 by a thick and regular clay floor (629, visible in section – Fig. 19) laying on the destruction of the previous structures. This level is represented by a ceramic workshop devoted to the firing of the vessels (Fig. 20). The explored area (about 48 m<sup>2</sup>) 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 conserved on 5 layers of bricks, but its width is unknown because of the proximity of the



**Fig. 19** - Level 2 - floor 629.

eastern limit of Trench D, which allows to recognize only the western side of Wall 602. The northern Wall 603 is 1.5 rows of bricks wide 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 of Wall 603. The entire space was carefully built. Walls 602 and 603 were reinforced by internal

4. 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).

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

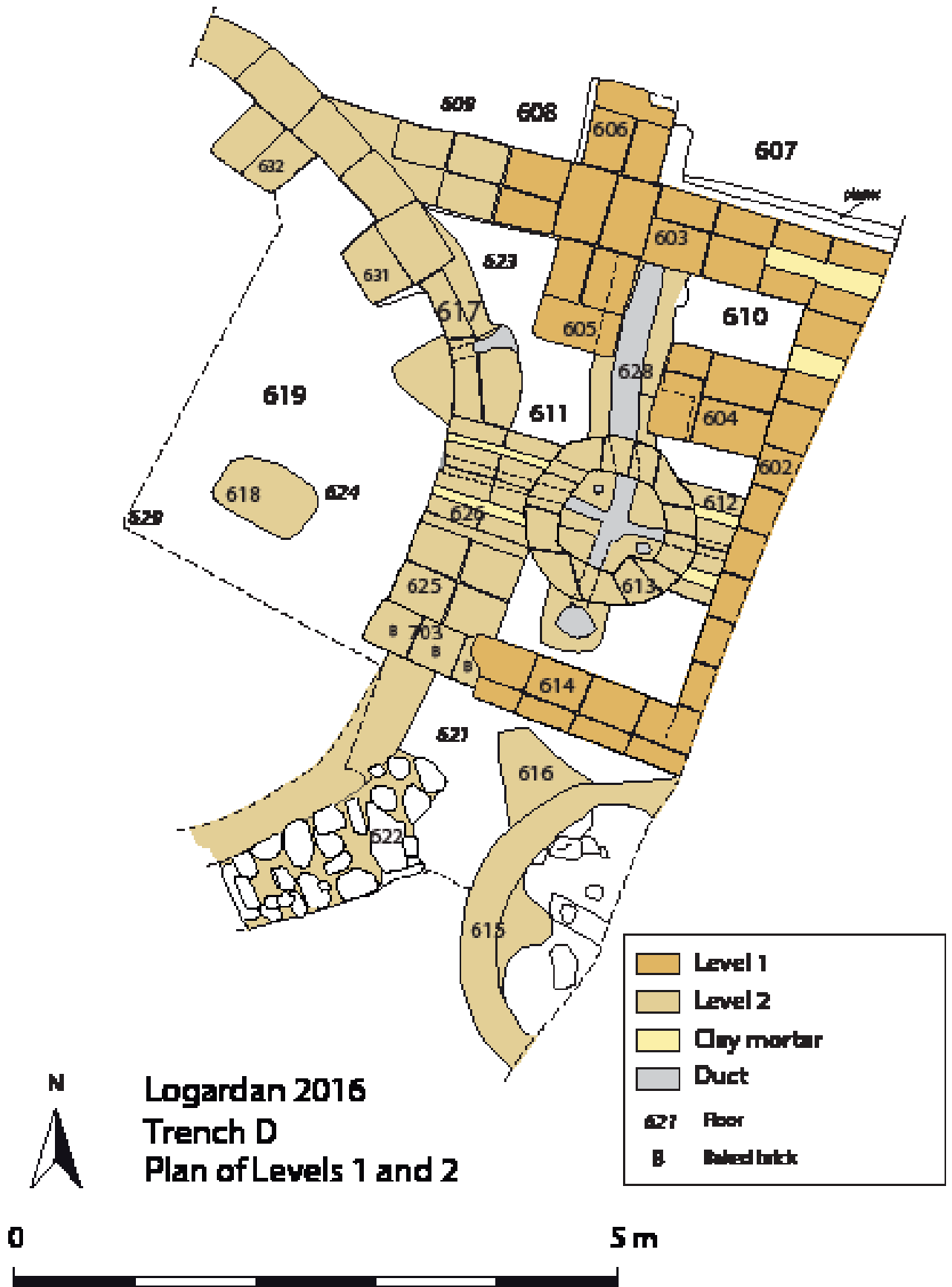


Fig. 20 - Plan of levels 1-2

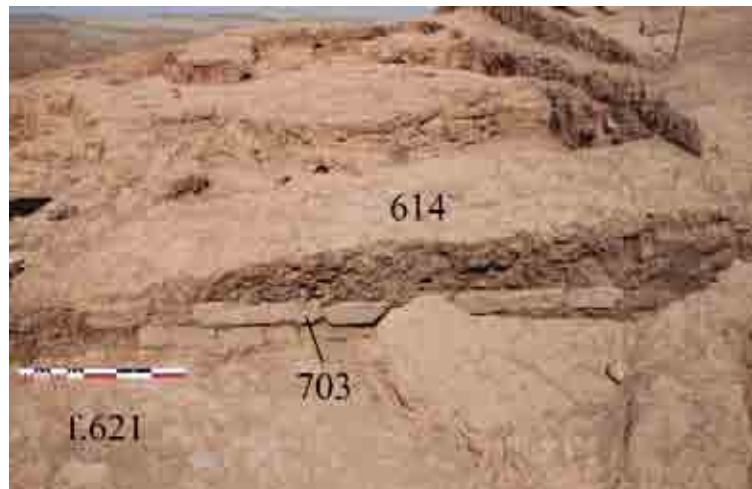




**Fig. 21** - Levels 1 and 2 - duct 628.

buttresses (604 and 605) probably used as benches for drying and pre-firing vessels during the firing cycles, when the temperature inside the workspace 611 was high (Fig. 21). 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). But the clearest proof that Room 611 was very carefully built is offered by the walls themselves: not only the masonries of 602, 603 and 703 were intertwined (i. e. designed and built as a single structure), but at this stage Wall 703 was constituted by yellowish 40x40x8cm well baked bricks (Fig. 22). The absence of plaster on its southern face suggests that, south of the workspace 611, there was another closed room.

This area is occupied by the large Kiln 615 (Fig. 23). This rounded structure close to the eastern limit of Trench D has been excavated in its western portion: it has a diameter of about 2 m, and it was visible over 3 layers of bricks on its exterior side (above Floor 621). 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 (only 1 brick large), the exterior wall is reinforced by two little pilasters, one on the interior side and the other (616) used as an external work-bench. However, it seems that this area was strongly sloping, as it is still the case. Kiln 615 was dug deep into a filling layer used to level the ground and an 80 cm large stone wall (622)



**Fig. 22** - Levels 1 and 2 - loc 703 and 614.



**Fig. 23** - Levels 2 - Kiln 615.

separated this workspace from Kiln 617. It confirms that the whole workshop has been carefully built by means of considerable works.

The better evidence for massive dimensions and care for architectural details comes from Kilns 617 and 613. 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 a 8 cm thick clay floor (624) hardened by the heat. Its 1.5 bricks large external wall was reinforced by internal buttresses (632, 631). 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 both from the architectural and the physical point of view. The excavated surface allows us only a partial understanding of this extremely complex system. Kiln 613 is an example in this sense (Fig. 24). 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. But, on the other hand, it was also used as a way to evacuate the



**Fig. 24** - Level 2 - Kiln 613.

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 the 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 (Fig. 21). South of kiln 613, this same duct was connected to a chimney. Likewise, a west-east oriented duct connected Kilns 617 and 613. It seems evident that the fumes passing through this channel were incandescent: 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 the kiln 613 and passes under the wall 602, suggesting that other firing structures or chimneys were connected to kiln 617. The entire system – kilns 613-617, as well as the ducts 626-612 and 628 – was conceived and constructed as one huge structure, as demonstrated by the fact that masonries of kilns and channels were embedded to each other. Moreover, it is not occasional that the mouth through which the 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 the 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, Kiln 615 (and Kiln 613, if considered as an isolated furnace) is an up-draught two-storey firing structure, a well-known kind of kilns since the Halaf phase in the 6<sup>th</sup> millennium BC (Hansen Streily 2000)<sup>6</sup>. Kilns with one chamber used both for the fuel and the vessels are also well documented in this period<sup>7</sup>. But the system constituted by kilns 617 and 613 is rather a cross-draught (or horizontal draught) kiln, where air flowed horizontally, from Kiln 617 through the duct 626-612 and kiln 613. Given the enormous dimensions of kiln 617 (more than adequate for a brick kiln)<sup>8</sup>, 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. 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 3<sup>rd</sup> millennium.

Level 1 is represented by the reconstruction of walls 602, 603 and 614. The latter, whose first stage (Level 2 – 703) was in baked bricks, was rebuilt in 49x35 large mud-bricks (Fig. 22). The masonries of the three walls are embedded to each other as in Level 2, which suggests that Level 1 corresponds to a general reconstruction of the ceramic workshop. In the eastern corner of the excavation, 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. In the next campaign, it will be interesting to check if it is inherent to another firing structure further east.

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6. During the second half of the 3<sup>rd</sup> 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).

7. 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)

8. 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.

# AN AKKAD CYLINDER-SEAL FROM LOGARDAN

Clélia Paladre

## TYPOLOGICAL DESCRIPTION

The object LOG D P 236.1 is a cylinder seal made of serpentine (Fig. 1) with a longitudinal perforation (0.6 cm in diameter). It is around 1.7 cm in diameter and 3 cm high. It was found in the Trench D of Logardan, among the stones of a collapsed layer (locus 600) of Level 3a (late Akkad), near the kiln 638.

The technique of execution is exemplary: we can see the utilisation of an abrasive (sand or quartz) which served the seal-cutter using two different methods: filling with a thin file and micro-chipping with a kind of spatula-shaped tool for the larger motives (bodies of the figures). The details were made with a thin tip certainly in metal (the tool traces are still visible). Finally, the seal was polished with stone polishers or powdered hematite (“jeweller’s rouge”)<sup>1</sup>. The creation technique of the star seems different; it has been made with a larger spatula-shaped tool with curved cutting edges that gives a gouged aspect to this motif. It could be a late addition, and shows no polishing. The seal perforation was drilled from each end with a drill tip (Fig. 2).



**Fig. 1** - The cylinder seal LOG D P 236.1.



**Fig. 2** - The perforation.

1. All these precisions about the creation techniques are possible thanks to the discovery, in Ur, of an Akkadian bead-maker's grave where a tool kit was placed (Sax et al. 1998 p. 2).

The state of preservation is variable. One face is very well preserved whereas the other is heavily eroded and worn, like if it was studded. It could be explain by a long period of exposure to the heat (Fig. 3a and 3b).



**Fig. 3a** - Illustration of the preservation of the cylinder seal.



**Fig. 3b** - The "studded" face of the cylinder seal.

## DATING

The strong parallels with the « classic akkadian style - [arad-zu] » seals allow us to suggest a relative dating between ca. 2250 and 2100 BCE. Indeed, this type of cylinder seal is associated with the radical change in the administrative practices under the reign of Naram Sin. So it was probably in use from this reign to the end of the Akkadian Empire, and certainly also during the post Akkad period. Frankfort dates this type from the "Mature phase" of the Akkad period (on the basis of stylistic criteria, the style becoming more and more modelled and realistic)<sup>2</sup> and Boehmer from the "Akkadische III period" (on the basis of iconographic features, compositions becoming more and more "simple" with only two pairs of contestants)<sup>3</sup>. However, most of those seals are dating from the reign of Shar-Kalli-Shari<sup>4</sup>. Thus, we can suggest a more precise dating around 2190 BCE. From a stratigraphic point of view, level 3a has provided a C14 dating, that fits perfectly well with our stylistic expertise of the object: 2201-2131BC (68.2% probability, see Appendix B).

2. Rakic 2003 p. 83 and p. 122.

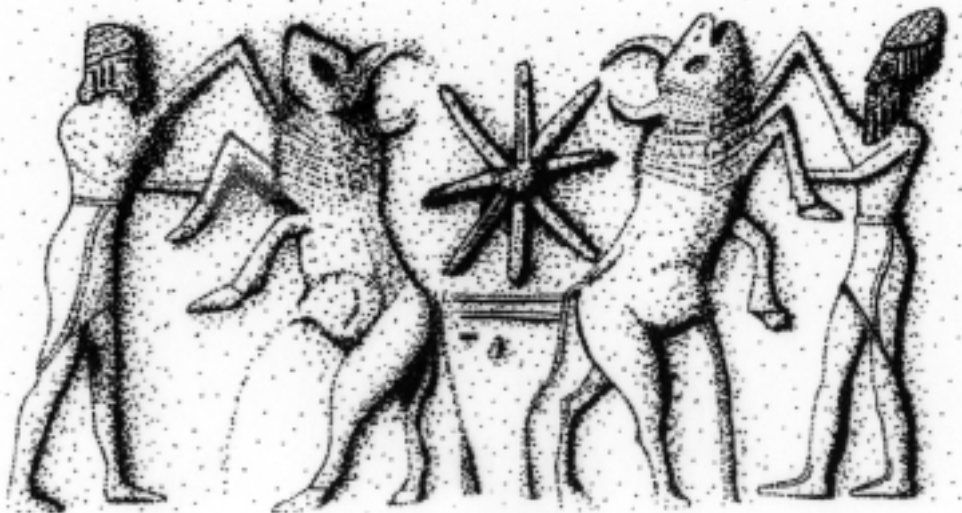
3. Boehmer 1965 p. 136.

4. Rakic 2003 p. 336

## STYLISTIC AND ICONOGRAPHIC DESCRIPTION (FIG. 4 AND 5)



**Fig. 4** - The cylinder seal and its impression.



**Fig. 5** - Drawing of the impression (C. Paladre).

The composition is symmetric, elaborated and elegant showing perfectly balanced figures. The style is precise with an emphasis on the physical details and on the modelling of the figures. Thus, an impression of strength and dynamism is put forward. The seal is a perfect example of the “mature Akkadian glyptic”, which entire characteristics are here illustrated: details (anatomic features, clothes, hairs and hats ...), naturalistic rendering of the figures and emphasis on the muscles. However, the motif of the star is more schematic and crude. It can be characterised as a “gouged motif”.

There are two pairs of contestants organized in a mirror-like composition. Two half faces bearded heroes are wearing a wrap-over skirt with curved ends and sandals. They are back-to-back. The right side hero is wearing a conical cap whereas the left side hero is wearing a bobbed hairstyle. Both are mastering a bull (*bos primigenius*<sup>5</sup>) with their hands holding one

5. Collon 1982 p. 35.

of the bull front legs. At the same time, they are hitting the bulls with a dagger. Bulls are standing on their hind legs with an impressive fleece on the chest. They are looking at the sky and ejaculating. Between these two contest scenes, we can see a star with eight points (a characteristic feature of the contest scene<sup>6</sup>). Just below, we can see two horizontal and parallel lines and a small circular depression (Fig. 6).

The composition could be understood as the struggle between wild and civilized worlds<sup>7</sup>, it clearly expresses the power of the beasts as well as the completeness of its defeat.

## DISCUSSION

This cylinder seal belongs to the “classic akkadian court seals” series. It is clearly related to the “[arad-zu] seals”, intended for imperial officers, characterized by their compositions, consisting of two pairs of contestants, perfectly balanced, and by a framed inscription, that carries the name, the title and affiliation of the owner<sup>8</sup> (Fig. 7). The quality of execution and the material itself, since the serpentine is the most frequent material during this period, connect this seal to the official Akkadian production. The absence of inscription is singular but not surprising. Indeed, Rakic mention a subgroup with no inscription<sup>9</sup>. Instead of it stands a secondary motif, here a star (Fig. 8). This subgroup illustrates the iconographic influence, popularity and prestige of the Akkadian motifs in the peripheral regions. Thus, it should be a local production<sup>10</sup>.

However, the presence of a roughly carved star that differs from the rest of the figures is not anecdotic. Two theories can here be suggested:

- It could be a failed seal. The two thin parallel lines and the circular depression would then be some mistakes made by the seal cutter, who drew the star in order to fill the space originally devoted to the inscription and transformed the seal into an ornamental object. By doing so, it prevented also to use the object as a seal. It could explain why the star is not polished. We can mention here an observation made by Zettler: the great majority of the seals and impressions with inscription [arad zu] presenting this kind of scene are well-planned, with a high quality and seem to be the product of a specific state-controlled workshop, since these seals were the prerogative of persons close to the royal administration<sup>11</sup>. Thus, it could be understandable



**Fig. 6** - The star, the two parallel and horizontal lines and the circular depression.

6. Rakic 2003 p. 81.

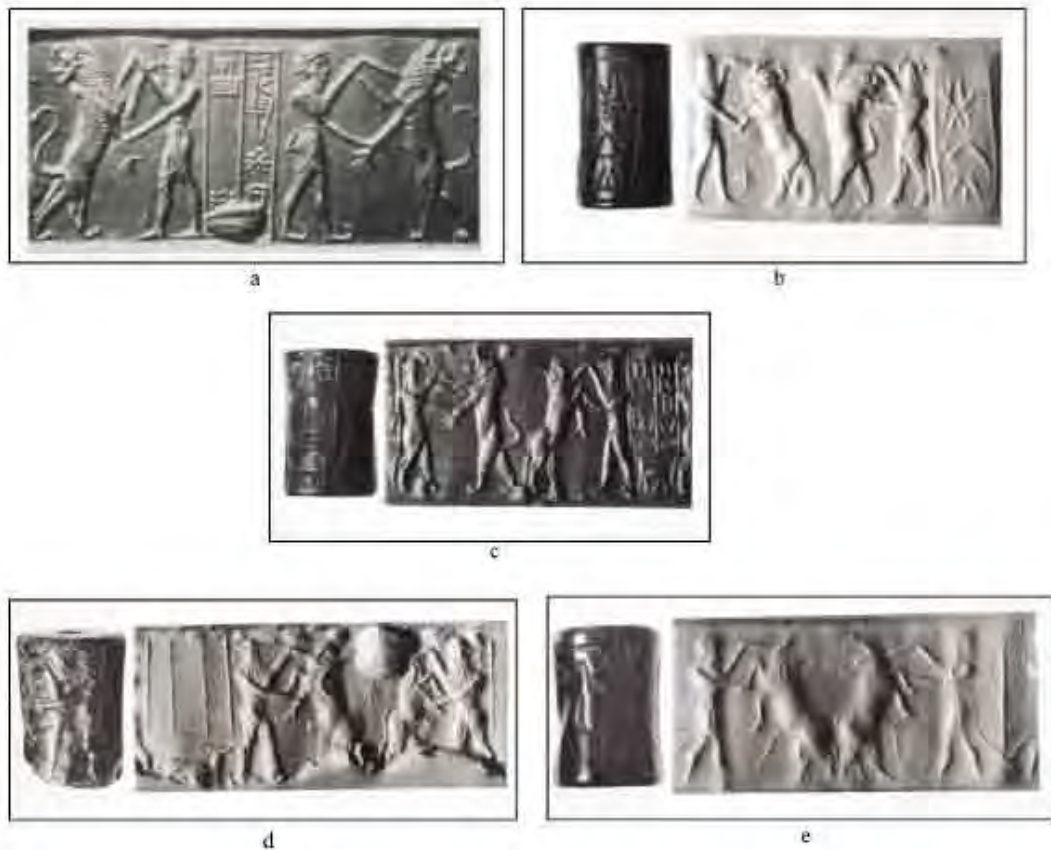
7. Rakic 2003 p. 78.

8. Pittman 2013 p. 334.

9. Rakic 2003 p. 117.

10. Rakic 2003 p. 369.

11. Zettler 1977 p. 36.



**Fig. 7** - Examples of “[arad-zu] cylinder seals” – comparative plate.

- 7.a: cylinder seal, two pairs of contestants and inscription, Guimet Collection (abb. 195 taffel XVII Boehmer 1965).  
 7.b: cylinder seal, lapis lazuli, two pairs of contestants, star and inscription, British Museum (fig. 74 pl. X Collon 1982).  
 7.c: cylinder seal, green stone, two pairs of contestants and inscription, British Museum (fig. 83 pl. XI Collon 1982).  
 7.d: cylinder seal, serpentine, two pairs of contestants, a star and an empty frame for inscription, British Museum (fig. 99 pl. XIII Collon 1982).  
 7.e: cylinder seal, serpentine, two pairs of contestants and inscription, British Museum (fig. 100 pl. XIII Collon 1982).



**Fig. 8** - Examples of non-inscribed “contest scene cylinder seals” – comparative plate.

- 8.a: cylinder seal from Tello, two pairs of contestants (abb. 267 taffel XXIII Boehmer 1965).  
 8.b: cylinder seal from Kish, limestone, two pairs of contestants, Ashmolean Museum (fig. 309 pl. 25 Buchanan 1966).  
 8.c: cylinder seal, two pairs of contestants, British Museum (fig. 19 pl. IV Collon 1982).  
 8.d: cylinder seal, chalcedony, two pairs of contestants and scorpion, British Museum (fig. 33 pl. VI Collon 1982).



that the seal cutter abandoned the making of this failed seal that did not fit into the criteria of this prestigious type. Indeed, the ordered seal had to be perfect to satisfy the “sponsor”, otherwise the seal cutter could to abandon its making<sup>12</sup>. It can also be corroborated by a reflexion of Frankfort who precises that only the best seals of this type have an inscribed panel<sup>13</sup>.

- Or it could be a re-used cylinder seal. The two lines could be understandable as the rest of the inner edge of the frame originally devoted to the inscription, a good parallel is possible with a seal without provenance (Fig. 3a). Frames situated in the upper part of the space are attested and if inscriptions between two “adversaries” are scarce (it uses to be situated between the two heroes), it is not unknown. We can mention an example of the Louvre, coming from Suse (Fig. 3b). Another example from Tello is also a good parallel since the inner edge of the frame is made with two parallel lines (Fig. 3c).

For Zettler, they are used only in an official context and never in a personal one, because it is the mark of affiliation of the owner to the power<sup>14</sup>. So we can imagine that if the owner of the seal wants to use it in a personal context or offers it as a gift to someone else, he needs to erase the inscription. Hence, it seems logical to find a secondary motif to fill the space originally devoted to the inscription.

## CONCLUSION

Whatever the answer to the matter of its specific secondary motif, this seal is a new evidence of the direct relations between the Akkadian imperial system and the Qara Dagh area in both administrative and economic fields, since the “two pair contest scene” attests an imperial administration controlled by the court<sup>15</sup>. However, it also demonstrates the presence of local elite in the Qara Dagh region (or perhaps of an officer at Logardan), who wants and needs prestige brands and adornments, which were appreciated and popular at this time.

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12. Collon 1982 p. 22.

13. Frankfort 1955 p. 31.

14. Zettler 1977 p. 36.

15. Rakic 2003 p. 368.



# CHALCOLITHIC CERAMICS FROM LOGARDAN TRENCH D AND GIRDI QALA NORTHERN MOUND: TECHNICAL FEATURES

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As in the 2015 campaign, the analysis of the chalcolithic ceramics from Girdi Qala and Logardan implied a technical approach to all the passages of the *chaîne opératoire*. The classificatory investigation of the sherds encompasses all the stages of the manufacturing process and highlights different traditions corresponding to different groups of producers, in accordance with a methodology already employed (Roux and Courty 2005, 2007; Baldi 2013b) for Levantine and north-Mesopotamian chalcolithic assemblages (Baldi 2012a, 2012b, 2012c, 2012d, 2013a; Baldi and Roux 2016). The technological reading of the surface features aims at characterizing the fashioning and finishing operations, while petrographic examinations allow detecting raw materials and the treatments to which they have been subjected during manufacture. It implies to take into account both surface features and micro-fabrics and to call upon ethnographic and experimental data. Given the often-polysemic character of the technical attributes, it is crucial to combine different scales and methods of investigation, both an autoptic and naked-eye analysis and a microscopic one. The result is a synoptic view of the different *chaînes opératoires* present in the assemblage, as well as of the finished products the *chaînes opératoires* were implemented for. On this basis, it is possible to discuss the nature – whether functional or cultural – of the techno-stylistic variability of the assemblage. Shaping methods, surface treatments, petrographic compositions of the pastes, firing procedures and morphological variants within the assemblage have been sorted to identify traditional ways to produce ceramics, specific to certain social groups.

Each *chaîne opératoire* was typical of a particular group of craftspeople because it was transmitted through generations by a specific network of apprenticeship and, therefore, it expressed the technical identity of the social group underlying the technical tradition (Gelbert 2003, 2005; Gosselain 2002; Roux and Courty 2005, 2007; Roux 2010; Baldi 2013a, 2013b). Hence, the different traditional *chaînes opératoires* can be observed in their synchronic spatial distribution as well as in their diachronic evolution through conservatisms, borrowings (i. e. in their continuities), disappearance of some of them and emergence of some innovations (that is in their discontinuities).

The first moment of the study consists in distinguishing technical entities and their variants: recurrent combinations of macro traces of fashioning and finishing show a set of specific operations or techniques that correspond to different technical groups.

In a second phase, within the different technical groups, all sherds are classified on the basis of their petrographic features, both on the basis of the fine mass (its colour, aspect and granulometry) and of non-plastic inclusions (nature, size, distribution, morphology and quantity).

The third and concluding stage of the analysis is represented by the morphological and stylistic classification (that is a traditional typology) of the sherds within each techno-petrographic group.

The sorting of all these aspects allows to recognize both regional parallels and evolutionary elements. Indeed, the results largely confirm the technical panorama documented during the 2015 campaign for the assemblage from Trench C at Girdi Qala. Nevertheless, some new elements seem to be particularly relevant for the evolution of the *chaînes opératoires* in the micro-region of Girdi Qala and Logardan.

The chalcolithic ceramics discovered during the last campaign are shaped by (Fig. 1):

- ▶ 1. a moulding technique;
- ▶ 2. overlapping rounded coils (namely rings) of 2-2.5 cm thick<sup>1</sup>, with sub-elliptic section and external oblique orientation;
  - ▶ 2.i. wheel-coiling technique (by overlapping rounded coils of about 2 cm thick and then finishing the containers by the rotational kinetic energy;
- ▶ 3. overlapping flattened coils of 3-3.5 cm thick, with sub-elliptic section and alternating oblique orientation;
  - ▶ 3.i. wheel-coiling technique (by overlapping flattened coils of 3.5 cm thick and then finishing the containers by the rotational kinetic energy;
- ▶ 4. hollowing out a lump of clay and pinching and stretching it.

Techniques 2.i and 3.i are sporadically documented during the Early Uruk phase: it means that wheel-coiling – attested by some rare and fine small-sized bowls – constitutes a complex and uncommon variants of two distinct coiling traditions (2 and 3). These ones are characterized by an important dimensional difference of the coils and by an unlike disposition of the junctions (sub-elliptic section with external oblique orientation for Technique 2 vs. sub-elliptic section with alternating oblique orientation for Technique 3). Yet, both of these shaping methods seem to disappear in the Middle Uruk phase, when the wheel-coiling is not documented at all during the central centuries of the 4<sup>th</sup> millennium BC. Only the next campaigns will reveal whether this absence of data depends on the fact that, for the moment, the excavated areas for the Middle Uruk (especially in Trench D at Girdi Qala northern mound) are quite restricted, or if the wheel-coiling (and therefore the use of the potter's wheel) completely disappears at the beginning of the Middle Uruk (local LC3) period<sup>2</sup>.

Anyway, the restricted number of techniques and petrographic variants indicates that, as already demonstrated for other sectors of the 4<sup>th</sup> millennium northern Mesopotamia (Baldi 2012c, 2012d), the ceramic production was a very hierarchized and centralized activity,

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1. During the 2015 campaign, a first examination of the sherds belonging to this technical group led me to estimate the thickness of the coils was about 1.5 cm. Later, it has been possible to verify that this evaluation (made essentially on the basis of surface grooves and cracks corresponding to the junctions of the coils) was inaccurate. Indeed, according to the inclination of the joints between the coils used for this technique, their thickness (measured not only on the surfaces but also on the transversal sections) is a bit greater, around 2-2.5 cm.
  2. A temporary abandonment of this technique would not be surprising, since similar data, with a discontinuity in the use of the potter's wheel during the LC3 and a reappearance in the LC4-LC5, have already been observed in northern Syria (Baldi and Roux 2016: fig. 9).

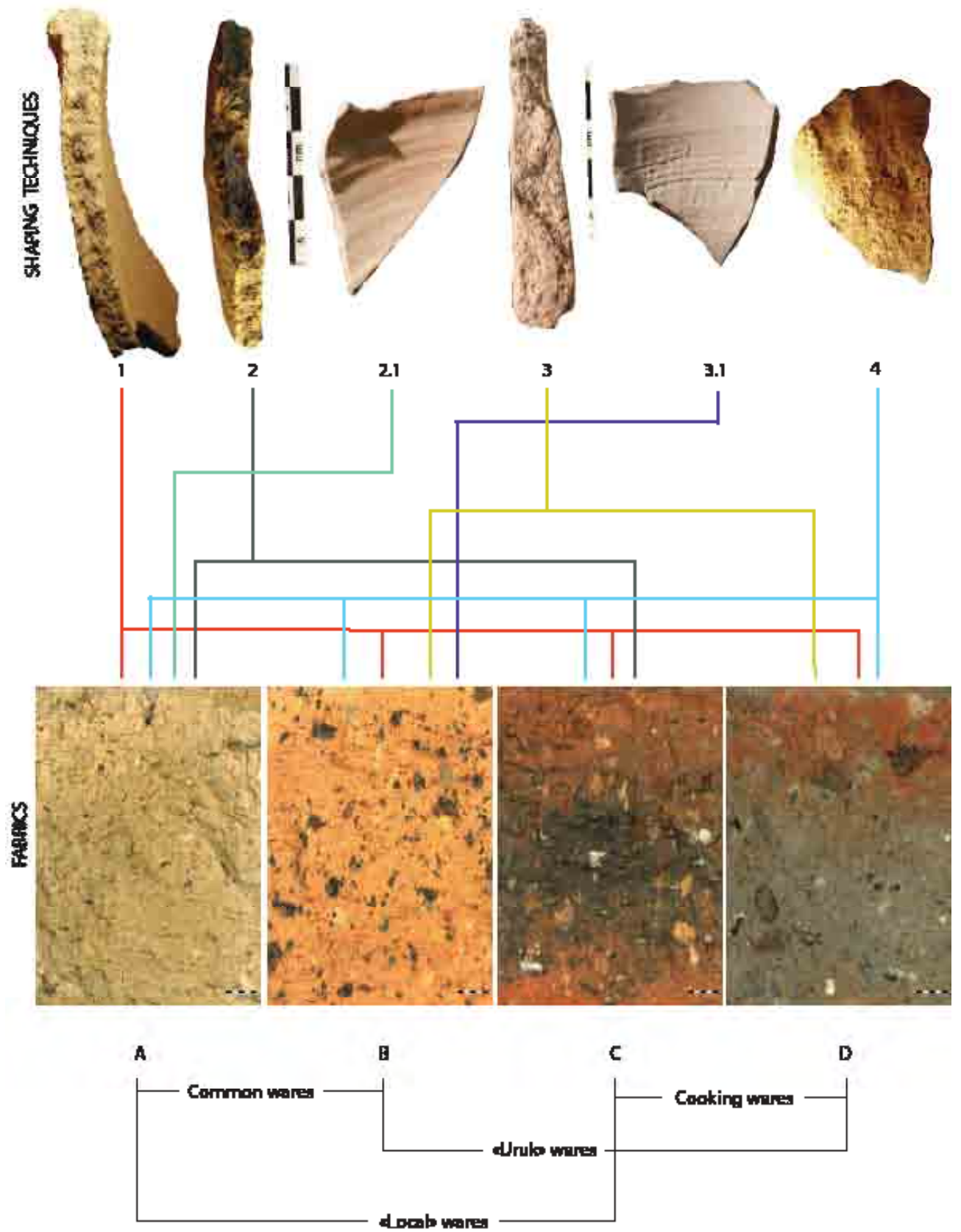


Fig. 1 - "Chaines opératoires" of the 4th mil. BC

carried on by a restricted number of specialists. These artisans were in charge of the manufacture for large groups, exceeding by far the horizon of their own village community, as also suggested by the kilns in the centralized firing area at Girdi Qala Trench C<sup>3</sup>.

**Four main petrographic macro-groups have been identified.**

- A Group: beige or brownish porous fabrics, fired in an incomplete oxidizing atmosphere during short firing cycles (sometimes grey core), with abundant coarse vegetal and dispersed mineral inclusions (mainly basalt, quartz, sub-angular calcite, ferruginous particles and micas).
- B Group: beige and light orange dense mineral fabrics, fired in oxidizing atmosphere, with traces of serpentine and carbonates in the fine mass of the clay, and significant quantities of grinded shells and ferruginous inclusions.
- C Group: orange-reddish fabrics, fired in incomplete oxidizing atmosphere (short firings, black core) with large vegetal and small-sized mineral inclusions (basalt, limestone) and coal particles.
- D Group: orange-brownish fabrics, fired in reducing atmosphere (grey core and surfaces), with abundant basalt, quartz and metamorphic inclusions (silicates, chlorite, marble, etc.).

Petrographic Groups A and B gather different common wares and some (rare) fine wares (with depurated small-sized inclusions), while Groups C and D are cooking wares.

During the 2015 campaign, it became apparent that, despite some kind of distinction, there is no real dichotomy between local and Uruk wares. Indeed, fabrics belonging to A and C Groups perfectly fit the definition of the well-known north-Mesopotamian Late Chalcolithic Chaff-Faced wares. Most often, in 2015, these pastes have been found associated with local ceramic shapes in Trench C at Girdi Qala. Therefore, they seemed to represent a local version (with raw materials largely available in the Qara Dagħ region) of the large north-Mesopotamian Chaff-Faced *koiné* (extended from central Mesopotamia to southern Caucasus – Marro 2010). On the other hand, B and D Groups, generally associated with foreign Uruk shapes in Trench C at Girdi Qala, seemed to reflect the south-Mesopotamian mineral tradition (Helwing 2002). This general framework includes some (rare) specimens belonging to A and B groups sharing a firing in a reducing atmosphere and, therefore, a grey aspect. These grey wares can be coarse chaff-faced vegetal (A) or mineral and relatively fine (B) tempered wares. Some kind of division is also visible on the basis of the shaping methods, since techniques 2-2i and 3-3i are always respectively associated with local-related (A-C) and southern-related (B-D) fabrics. But even in 2015 these technical traits did not seem to establish a sharp and unambiguous divide, with a clear dichotomy between the “Uruk” and the “local”.

The last campaign confirmed that there is no schematic distinction between “local” and “foreign” wares: indeed, in Girdi Qala and Logardan, data about ceramic pastes are not elusive in themselves, but rather they tend to evolve. In this sense, on the basis of the technical aspects examined in 2015 and 2016, it is possible to sketch some evolutionary trends about traditional *chaînes opératoires*.

3. See Vallet (ed.) 2015.

First of all, the notion of “foreign” wares is highly inappropriate because, even if sometimes associated with south-Mesopotamian ceramic shapes, all the fabrics are made of locally available raw materials, which demonstrates that the entire ceramic production (even the Uruk pottery)<sup>4</sup> was essentially local. Moreover, during the Early Uruk phase (at Girdi Qala Trench C Levels 10-8 and, above all, at Logardan Trench D Level 4), all the fabrics are to produce ceramic shapes belonging to a south-Mesopotamian Uruk tradition. Actually, in the basal levels of Girdi Qala Trench C, straw-tempered fabrics (A and D Groups), frequently associated with local LC2 shapes (64% of the assemblage in Levels 10-8 at Girdi Qala C), were also used to manufacture Early Uruk ceramic types. In Level 4 at Logardan Trench D, in a context characterized by a complete absence of local LC2 materials, the same vegetal A and D Groups were routinely used for early Uruk types (53% of the assemblage). Likewise, in the same contexts, for the production of the same southern early Uruk shapes, mineral-tempered fabrics (B and D Groups) were used as frequently as the chaff-faced ones (about 47% of the sherds in Trench D Level 4 at Logardan). It clearly indicates that, at the beginning of the Uruk period (namely in the first moment of the cultural contact between local inhabitants and southern settlers), there was no distinction between the fabrics used for local LC2 shapes and foreign Early Uruk vessels.

This quite surprising technical framework is very coherent with the analysis of the 6<sup>th</sup> millennium pastes carried-out in 2015 for the Halaf and HUT pottery from Logardan Trench C. As a matter of fact, A, B, C and D Groups of fabrics were already documented amongst the pastes used in the western Qara Dagh since the 6<sup>th</sup> millennium BC. A and C Groups are very conservative and remain unchanged over the Middle and Late Chalcolithic, while B and D Fabrics preserve their mineralogical composition, even once subjected to a quite noticeable process of adaptation. In particular, since the beginning of the 4<sup>th</sup> millennium, nature and quantity of the components of B Group remain the same they were in the 6<sup>th</sup> millennium BC, but their granulometry becomes increasingly coarse. Concerning D Pastes, they conserve the same mineralogy and fine mass than before, but they lose the coarse vegetal inclusions they had in the 6<sup>th</sup> millennium and become exclusively mineral-tempered. Thus, the appearance of the first Uruk ceramics does not imply the use of new raw materials or fabrics, but just some adjustments of previous petrographic traditions.

To obtain a more complete picture, this framework has to be integrated with the evolution of the shaping techniques. Amongst them, three of those attested in the 4<sup>th</sup> millennium contexts (Techniques 2, 3 and 4) were already documented in the 6<sup>th</sup> millennium assemblage from Trench C at Logardan. Nevertheless, since the Early Uruk phase, innovations are important. The potter's wheel briefly appear in the technical panorama with two variants of the wheel coiling technique (shaping Methods 2.i and 3.i), based on the different modalities of overlapping coils which are documented since the 6<sup>th</sup> millennium. Moreover, the long-lasting tradition of shaping by hollowing out a lump of clay (Technique 4) becomes more and more rare, and eventually disappears since the beginning of the Middle Uruk phase. In the same time, the moulding technique (1) emerges as an innovation since the beginning of the 4<sup>th</sup>

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4. As demonstrated by Berman 1986: 243; Ghazal *et al.* 2008: 93-99, fig. 90-91; Emberling and Minc 2016.

millennium and becomes widespread during the Middle Uruk<sup>5</sup>. Both these shaping methods – the rising moulding technique (1) and the vanishing hollowing technique (4) – were associated with all the groups of fabrics (A, B, C and D).

Overall, the supposed divide between local Late Chalcolithic and foreign Uruk ceramic traditions does not appear as an obvious reality, but rather as an ongoing evolutionary process. In this dynamics, the Early Uruk phase represents a crucial moment. Some traditional techniques tend to disappear, some others emerge, while new complex shaping methods appear. On the basis of the last campaign, it is clearly evident that there is no reason to attribute these changes exclusively to new south-Mesopotamian people. On the contrary, the south-Mesopotamian artisans immediately adopt local pastes and adapt just some components in the preparation of some fabrics. Despite evident morpho-functional differences between local and Uruk repertoires, the integration between the respective production systems has been very high since the beginning of the 4<sup>th</sup> millennium and all technical innovations equally impact both Uruk and local shapes<sup>6</sup>. Later, in the Middle Uruk period, a kind of distinction emerges between local LC3 shapes associated with chaff-faced A-C Fabrics, and Uruk shapes associated with mineral B-D Pastes. In 2015, this dynamics was recognized as a quite fuzzy scheme<sup>7</sup> within the assemblage of Trench C at Girdi Qala and, on the basis of similar data from the Euphrates and Khabur basins<sup>8</sup>, it was interpreted as the corollary of increasing technical borrowings between local and Uruk traditions. Actually, it was the opposite. After the 2016 campaign, it is possible to identify a tendency towards a distinction between local and Uruk traditions during the Middle Uruk: if, during the Early Uruk, both the repertoires shared the same wares, in the Middle Uruk, south-Mesopotamian shapes were more and more frequently made of mineral fabrics, while local shapes remained mainly linked to chaff-faced pastes.

Actually, the technical analysis of the ceramic *chaînes opératoires* at Girdi Qala and Logardan show the cultural contact between local and Uruk craftsmen under a completely new light: not just as an encounter between distinct realities, but rather as an emerging differentiation on the basis of a widely shared substrate.

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5. In 2015, on the basis of the materials from Trench C at Girdi Qala, it was doubtful if the moulding technique (used for about 16% of the assemblage from Girdi Qala Trench C) was to consider as an emerging innovation or as a disappearing tradition. But after the last campaign, it has been possible to carry-out a finer diachronic analysis. During the Early Uruk (at Girdi Qala Trench C Levels 10-8 and at Logardan Trench D Level 4), the moulding technique represents about 4% of the assemblage, while in Middle Uruk contexts (at Girdi Qala Trench C Levels 7-1 and Girdi Qala northern mound Trench D) it was used to produce about 28% of the ceramics. This trend is confirmed by similar data from other sectors of the northern Mesopotamia (Baldi and Roux 2016) and clearly suggests that the moulding technique was a new and rapidly emerging shaping method.
  6. In this sense, the hollowing-out technique disappears in the same time within both the repertoires, the moulding technique spreads amongst Uruk shapes as amongst the local ones and, at the end of the LC2, the potter's wheel is temporarily documented for some (both Uruk-related and local) rare and fine bowls.
  7. The most dramatic exception to this pattern is represented by the most typical shape of the Uruk repertoire, the bevelled-rim bowls, which continue to be manufactured using both mineral and vegetal fabrics.
  8. Substantial technical borrowings between local LC3-LC4 and Middle Uruk traditions are attested, for instance, at Hassek Höyük, Tell Feres and Zeytinli Bahçe (Helwing 2002; Baldi 2016; concerning Zeytinli, Frangipane personal communication)