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Larsa-‘Uwaili Annual Report 2019

Regis Vallet, Jonathan Lisein, Joël Suire, Mathilde Mura, Lionel Darras,
Jessica Giraud, Valentina Oselini, Jean-Jacques Herr, Luc Bachelot,
Dominique Charpin, et al.

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LARSA - 'UWAILI ANNUAL REPORT 2019

PRELIMINARY REPORT ON THE RESULTS OF THE
XIVTH & XVTH CAMPAIGNS AT LARSA AND THE
VIIITH & IXTH CAMPAIGNS AT TELL EL 'UWAILI

Régis VALLET

C.N.R.S. - Institut Français du Proche-Orient (I.F.P.O.) - University of Paris I



Larsa, the E-Babbar seen from the 'Parrot' gate (photo R. Vallet, 2018)

STATE BOARD OF ANTIQUITIES AND HERITAGE
REPUBLIC OF IRAQ



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Fig. 1 – Map of Thi Qar governorate showing the location of Larsa and Tell el 'Uwaili.

INTRODUCTION

Régis Vallet

After a thirty-year hiatus, the French mission in Larsa (Tell es-Senkereh) and Tell el 'Uwaili (Fig. 1) resumed its field work in 2019 for two seasons of one month each. The XIVth campaign in Larsa and the VIIIth campaign in 'Uwaili lasted from May 25 to June 24, after the director came to Nasriyah on May the 1st, to install the home of the expedition and manage a preliminary mapping by drone of Larsa with an ICONEM engineer, from May 5 to 11. The XVth campaign in Larsa and the IXth campaign in 'Uwaili lasted from October 12 to November 16, from October 21 to November 7 only in 'Uwaili.

The team assembled for the two seasons combined counted, under the direction of Régis Vallet (CNRS, IFPO in Iraq), 27 researchers and engineers from France, Iraq, Italy, Belgium and Germany (by alphabetic order): Jamal Abd-el-Ali (SBAH), Rafat Abd-el-Kadim (SBAH), Rateb Al-Debs (University of Damascus, currently in Osnabrück), Tahir Al-Hossany (SBAH), Fadhil Ali (SBAH), Luc Bachelot (CNRS), Johnny Baldi (CNRS, IFPO), Dominique Charpin (Collège de France), Lionel Darras (CNRS), Carolyne Douché (MNHN), Firas Farhan (SBAH), Jessica Giraud (Archaios), Zahra Hashemi (Archaios), Jean-Jacques Herr (LMU Munich fellow), Chanel Ibrahim (SBAH), Jonathan Lisein (Certus Visio), Ali Murad (National Museum of Iraq), Laetitia Munduteguy (independent drawer), Mathilde Mura (University of Paris 1), Sidonia Obreja (University of Paris 1), Valentina Oselini (University of Roma La Sapienza research fellow), Ali Othman (University of Paris 1), Claire Padovani (University of Paris 1), Panida Pesonel (FactStories executive producer), Marie-Aliette Pot (University of Paris 1), Ayar Rasool

(ICONEM) and Joël Suire (CNRS) (Fig. 2). The logistic team was composed by Raad Abd-el-Nabi, Yasser Abed, Jaffar Nedjem Al-Hussein and Ghani Muhsin Nayis (SBAH drivers), Riad Awad and Ali Musa (cooks), Hessam Hassam Eissa (housekeeper) and Awad Abd-el-Hussein (SBAH sites keeper).



Fig. 2 – Part of the Larsa-Uwaili fall 2019 team, from left to right: Rateb al-Debs, Jonathan Lisein, Carolyne Douché, Lionel Darras, Sidonia Obreja, Luc Bachelot, Joël Suire, Dominique Charpin, Régis Vallet, Laetitia Munduteguy, Johnny Baldi and Claire Padovani.

The mission received a very warm welcome and was greatly helped by all our Iraqi friends and colleagues. We would like to express our warmest thanks to Dr Abdulameer Al-Hamdani (Minister of Culture and Chairman of the SBAH), Dr Qais Rasheed (Chairman of the SBAH) and to Mrs Saba Al-Omari (SBAH) and Luma Joda (SBAH) in Baghdad, to Tahir Al-Hossani (SBAH) and Ali Ghanim (SBAH) in Nasriyah. We wish to address a special thanks to Dr Adil Alkenzawi, Honorary Consul of France in Nasriyah, who provided our accommodation in Nasriyah, a large house that the mission renovated entirely. He and Marwan Alkenzawi (secretary of the French Consulate in Nasriyah) were a constant and efficient support for all of us, and we will not forget the good time passed in the Alkenzawi Mudhif on the road to Ur. We would like also to thank the president of Thi Qar University, Dr Yahya A. Abbas who signed with the mission a memorandum of scientific collaboration and training. We hope that Larsa will become in the next years a familiar place for the students as well as our colleagues of Thi Qar University, who visited the site on June 20. We wish also to express our gratefulness to the cultural service (SCAC) of the French Embassy in Baghdad (Jean-Noël Baléo) and to the department of archaeology and ancient history (DAHA) of the IFPO (Dominique Piéri), that support the project through a specific funding (FSPI) provided by the French Ministry of Foreign Affairs (MAEDI). Finally, we extend our gratefulness to Jean-Louis Huot (University of Paris 1) who, with the late Jean-Daniel Forest (CNRS), trained us on the field in 'Uwaili and fully supported our reopening project. May all of them here be thanked, as well as the thirty workers who joined us and without whom nothing would be possible.

The spring season was devoted to different complementary surveys of Larsa and the reopening of 'Uwaili, the fall season to excavations and the continuation of the geophysics program. Apart from the architectural prospectings carried out in 1985-87 (Huot, Rougeulle and Suire 1989, Suire 2003), Larsa was never surveyed. The first priority was then to make a new topographical map of the site and create the digital tools required for its study and management, by means of ortho-photo images and photogrammetrically computed relief (Ayar Rasool, Jonathan Lisein and Joël Suire). All the information, new and old, including the aerial views of 1974 that have been extensively used during previous campaigns, were merged into a unique geographic information system (GIS). On this occasion we realized that the old topographic plan was imprecise (and the grid of the site badly oriented), which is not a surprise but important to note insofar as previous proposals of reconstruction of the site layout were therefore based on inaccurate data.

Like many other sites, Larsa has been looted for a very long time, which had motivated the competent authorities of the time, after the First World War, to suggest excavation to the Louvre Museum. We know that the phenomenon has unfortunately reappeared in force following recent conflicts. The condition of the site was therefore one of our major concerns and a specific program is dedicated to it (Mathilde Mura). The site has in fact been heavily looted and there are around 2300 looters' holes on its surface. However, the situation is better than one might have feared. On the one hand, the looting seems concentrated in space, on the northeast residential area of the city, which therefore spared most of the rest of the site; on the other hand, the extent of the lootings has been greatly reduced over the past ten years. A result that we certainly owe to the effective vigilance of our guard and his family, to whom we would like to pay tribute. Furthermore, mechanized looting is almost nonexistent, except a 4m wide notch across the ziggurat.

However, this initial estimate is based on an examination, on the ground, of only half of the site, and will therefore have to be confirmed. The archaeological prospecting with which it was coupled could indeed examine only 46% of the surface of Larsa, which extends over a little more than 200ha (according to our new calculations). This result is due to the extremely trying conditions that prevail in June (52 ° Celsius in the shade, but there is no shade), and it is already a small feat that Jessica Giraud and her team were able to prospect almost a hundred hectares under these conditions¹. The method used, extensively tested on other terrains (Kurdistan and Oman in particular) had to be adapted to a site of the magnitude of Larsa. The operation was therefore also of methodological interest. Its preliminary results, currently being processed and awaiting completion (next year normally), are promising. 9000 ceramic shards and 306 objects have been collected, of which 2800 (33%) are currently dated (Fig. 3). Without surprise, the majority of the corpus (56%) dates from the beginning of the second millennium BC (Valentina Oselini and Jean-Jacques Herr).



Fig. 3 – Second millennium terra-cotta ex-voto collected on the surface of Larsa.

¹ Initially, the spring season was scheduled for April-May, but had to be delayed until May-June.

The geophysical survey gave results that surpassed by far our expectations (Lionel Darras and Régis Vallet). In four weeks (two in June and two others in October), 18 ha were prospected in total, in six areas. These operations had two objectives: to make a magnetic map of a large area north-west of the E-Babbar, the temple of the Sun-God Shamash, prior to excavations; to get information on the route of suspected canals crossing the site. At the end of these works, the main lines of the hydraulic network that supplied the city are much clearer, some matters discussed for decades found answers while new questions arise. However, as long as excavations are not carried out (normally next season), interpretations remain hypothetical (and the detected structures undated). That is why we remain cautious and only map for the time being the structures attested by several sources, among which geophysics. Nevertheless, for those solid elements, the imagery is particularly clear and leaves only a limited place for doubt (Fig. 4).

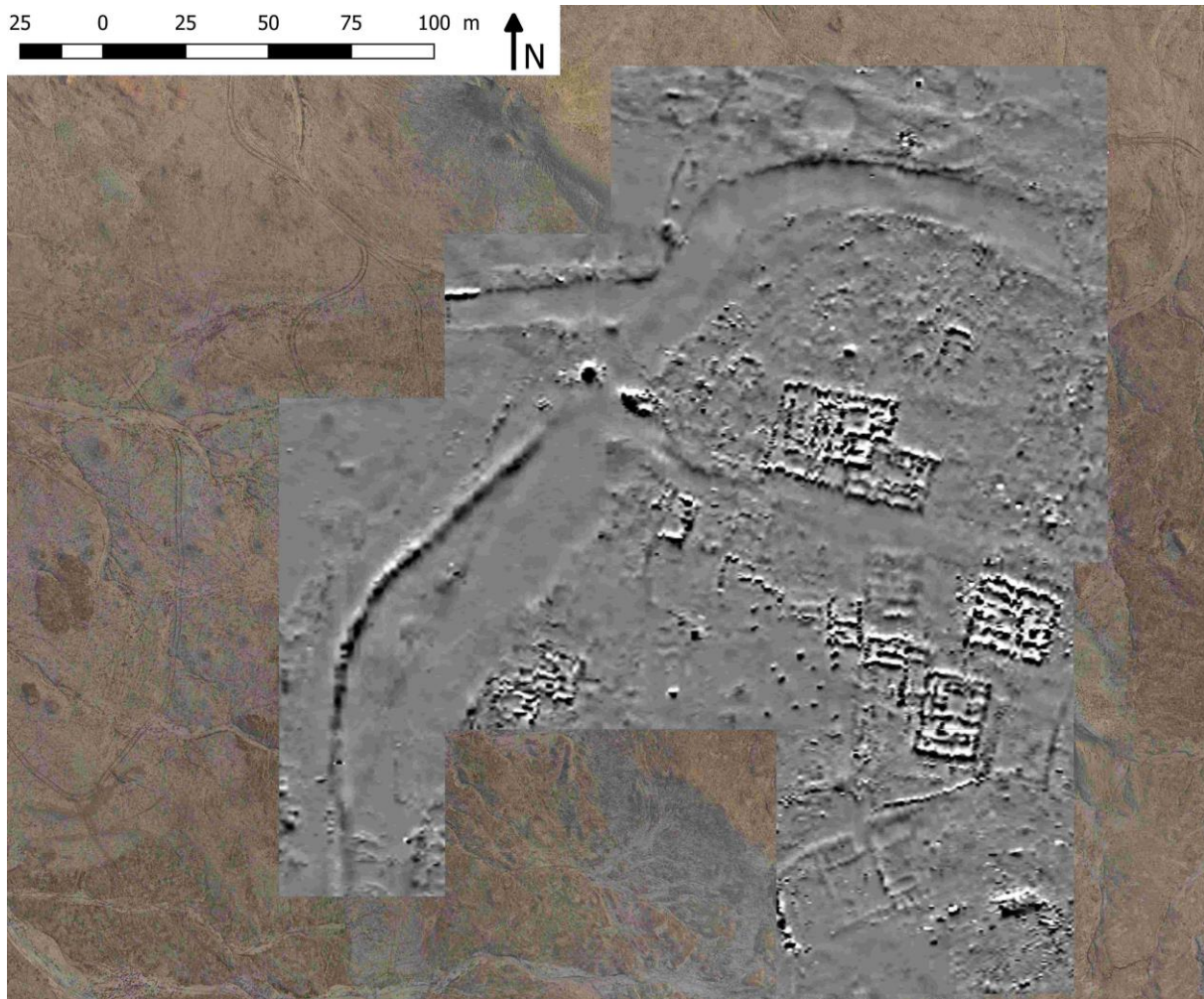


Fig. 4 – Magnetic map north of Larsa showing the junction of major canals (L. Darras).

Several parts of the presumed and discussed (Huot, Rougeulle and Suire 1989: 34, Margueron 2013: 140-146 with references) central canal of the city, a pale strip of land 22m wide running north-south down to the ziggurat, have been surveyed and the structure recognized as a canal (and not a street) all along its route. Near the ziggurat, in the center of the city, a bridge, revealed by its two large masonry piers, served by a long east-west street (R4), crosses what we will call from now on the 'Grand Canal' of Larsa. A little further south, the Grand Canal turns southeast and its width suddenly decreases. This smaller extension channel seems to run in a straight line towards the northeast of the 'Chameau' ('Tell of the Camel', as nicknamed by the locals since Loftus' visit in 1854), according to micro-topography, where it gets out of the city. To the north, the Grand Canal was followed to the edge of the city, where it is wider, forming a sort of basin, flanked to the west by what seems to be a landing stage, to a bridge which crosses it further north, bridge connected to an important street coming from the East (R2).

The main surprise was to discover that the Grand Canal was directly connected to another, of equal importance, surrounding the city but still inside it, the city walls being beyond this peripheral channel. The latter canal was followed westwards, where it flows into a very large basin, perhaps a port or reservoir, bounded to the north and east by enormous mudbrick dykes, and eastward (where it had been seen previously but interpreted as the city wall or a street), where it extends at least all along the northeast quarter of the city. At the eastern tip of the city perimeter, another narrow canal, derived from the Grand Canal north of the ziggurat, joined it, before it turns east, probably to connect to the regional water supply network. Indeed, we know that in historical times, a canal coming from Bad Tibira, in the northeast, and perhaps, to a lesser extent, a canal coming from the west (Uruk) supplied the city. To the southwest, precisely, another large canal crossed the city. We spotted it in the southeast where it leaves the city, across the rampart, between two large rectangular masonry piles, certainly towers, protecting the wall itself, very similar to a configuration attested in Uruk (van Ess and Fassbinder 2005, 2019; Fassbinder, Ostner, Scheiblecker and van Ess 2018).

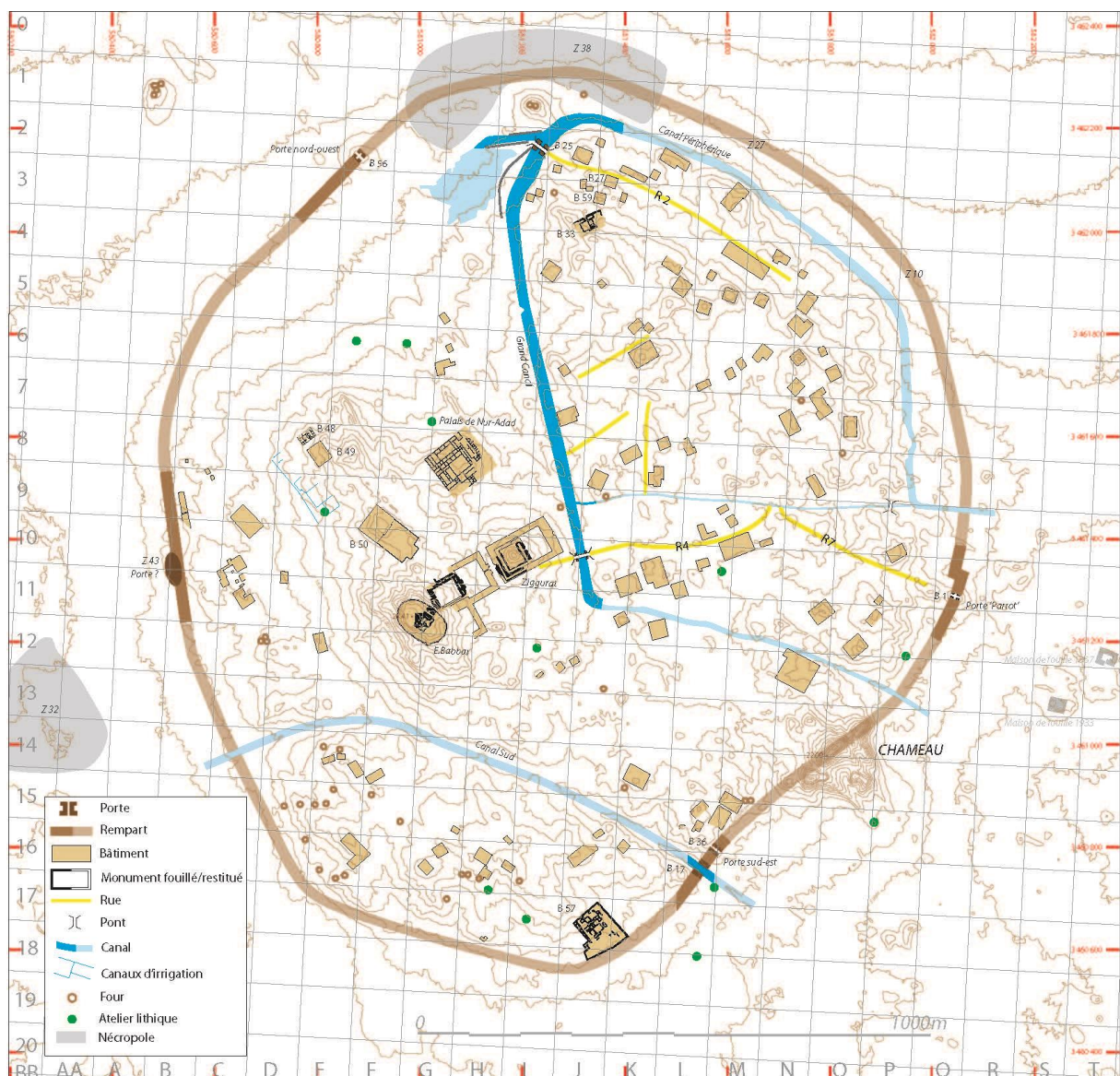


Fig. 5 – Map of Larsa (J. Suire and R. Vallet, 2020).

Regarding the ramparts, the results are less important since they were not the subject of current work, apart from a short section of the west wall. This will be one of the objectives of our next survey season. Nevertheless, the progress made on the network of canals and the general layout of the city allows us to propose a preliminary reconstruction of their route. In the north and northeast in particular, it probably corresponds to several bands of land clearly visible on aerial imagery. Certain sections, made of mud bricks (Z27, Z10), have indeed been known for a long time and

suspected of being part of the wall (Huot, Rougeulle and Suire 1989: 40). Finally, many streets and buildings could also be added to the city map. In total, we are able to produce a revised plan of the city of Larsa, which the coming seasons should help to correct and complete (Fig. 5).

The excavations at Larsa focused on two large buildings in the western sector of the site, known from the 1985-87 field surveys and re-examined during the spring 2019 surveys. These investigations revealed the existence north of the E-Babbar, of a large rectangular building of 110 x 60 m, of which the highest part only, forming a small Tell, was known as building B50. It seems that the entrance to this vast complex (6,600 sq. m.) was to the south, where a recessed facade is visible geomagnetically, followed by a courtyard and the core building of the compound to the north. Further north, Buildings B48-49 are two large nearby housing complexes, made of fired bricks, the plan of which was partly drawn in the 1980s. However, the sand dunes that covered it have since disappeared, giving wider access to these constructions.

Thus, the sector makes it possible to study both residential housing and the monumental religious heart of the city. Another advantage of this zone is that it is contiguous to other topographical sectors of the site, i. e. other terraces (lower), to the west and north. Excavation trenches in this area could provide valuable information on the buildings themselves but also on the surrounding areas. According to the material collected during the prospecting, we expected an occupation of the second millennium on the surface (probably covering levels of the third millennium). It turned out that the entire area was rebuilt during the Hellenistic period, just above the Old-Babylonian ruins.

In Trench B48 (Luc Bachelot, Dominique Charpin, Ali Murad and Jamal Abd-el-Ali), the plan of Building B48 could be fully cleared. It is a large rectangular house (650 sq. m.) comprising 19 rooms around a central courtyard, the most private part of the house arranged in a tripartite fashion to the east. The associated material (Valentina Oselini and Jean-Jacques Herr) gives a dating around the beginning of the Hellenistic period. In the south, beyond a narrow plot of very loose construction, another large house (B49) stretches out, equipped with fired brick foundations like B48. However, the contrast between the size and elaborate plan of this habitat and the poor implementation of its masonry, made of recycled bricks and fragments, is remarkable. In 1969-70, Margueron (1970: 270) had observed that the walls of the palace of Nur-Adad had been, long after its abandonment, partly dismantled to recover the bricks. Fifty years later, we can finally identify the thieves, as the bricks format (30 x 20 x 6/8 cm) of the Hellenistic dwellings is characteristic, in Larsa, of the only palace of Nûr-Adad. Like the brickwork, the assemblage collected so far *in situ* is heterogeneous, containing earlier vessels probably recovered from lower levels during the rebuilding of the neighborhood. Indeed, we were able to observe that the exposed baked brick basements of B48 were built on top of older mud brick buildings. We spotted them to the east as well as to the west of B48, in a small sounding. This deeper level produced Old-Babylonian pottery and a clay sealing of that period.

In Trench B50 (Sidonia Obreja, Rateb al Debs, Régis Vallet and Chamel Ibrahim), due to the large scale of the construction, the method chosen for the excavation was not to open trenches crosswise, but to begin to clear the main structures and walls visible on the height in the northern part of the compound. By the end of the season, a surface of 625 m² was exposed (Fig. 6). Two superposed buildings have been recognized. A very poorly preserved Hellenistic building, with thin walls made of reused baked bricks (here mainly recovered from the E-Babbar), is set on top of a monumental construction dating to the Old-Babylonian period, according to the associated material (Valentina Oselini), including a tablet¹. Entirely made of mudbrick, its walls are more than 2.3 m wide and 5.6 m for the facade, to the south. Six rooms and two courtyards are known for the moment. We were puzzled by the absence of passageway between the rooms, until we realized that we were

¹ An economic text, unfortunately not yet deciphered as our epigraphers, Dominique Charpin and Ali Murad, had to leave the mission the day before its discovery.

excavating the first storey of the building (above the floor level but below the thresholds of the storey). A deep sounding in the corner of a room (3019) revealed indeed that the building is preserved on 4.5 m high (Fig. 7). A shift in the masonry of the walls (a little bit thinner at the first storey) clearly marks the level of the first floor. Needless to say that the floors proper had completely collapsed, but we did not yet find their remains (the large pieces of wood being in any event certainly recovered when the building was abandoned), due to the colossal amount of filling to remove to clear the bottom of the rooms.



Fig. 6 – Trench B50, general view, from the south.



Fig. 7 – The base of Building B50 in the south-east corner of Room 3019.

Given the characteristics of the construction, we interpret it as one of the main temple of the city, which we hope to identify in the coming seasons. For similar architectural reasons, the location, size and shape of the building as well as the presence of altars in its courtyard, the late building probably also had a religious function. In any case, excavations this year demonstrate that Larsa in the Hellenistic era, although a second-tier site at that time, saTellite of Uruk, was occupied more widely than previously thought. North of the E-Babbar, still in operation (Lecomte 1987, 1993), all the land, left in ruins since the second millennium BC, has been reconstructed over at least 400m in length. A new temple and further north a housing estate were built, the latter comprising at least one strip of large rectangular plots, flanked on either side by streets and perhaps associated, if contemporaneous, to irrigated fields and gardens to the west (Lionel Darras).

At Tell el'Uwaili (Johnny Samuele Baldi, Claire Padovani and Rafat Abd-el-Kadim), we had the joy and relief of finding our own excavation site intact, exactly thirty years after we had to leave it. Here, the objective of the fieldwork was to obtain a stratigraphic sequence as complete as possible, from the most recent phases of the Ubaid at the top to the Ubaid 0 levels at the bottom. For this purpose, we opened an L-shaped trench 10m wide south of our 1989 trench (Ubaid 0) then which turns east to reach the trenches made at the top of the site (Late Ubaid) in the 1970s. Excavations are therefore both stratigraphic and extensive. At the end of the fall season, approximately 300 square meters were cleared and five architectural levels identified, numbered from 1 to 5 from top to bottom.

At the top of the new trench, fragmentary structures (level 3) that could belong to the Ubaid 3 terrace, cleared in the early 1980s (Huot 1987), were recognized, cut by a small Ubaid 4 platform (level 2) and several Ubaid 5 kilns (level 1). In the lower part, several Ubaid 0 buildings (level 5), deeply cut by Ubaid 1 kilns (level 4), have been cleared, five grid-plan granaries and a tripartite dwelling with narrow walls and pillars, of the same type than Building 41 excavated in 1989 (Vallet 1996). The numerous Ubaid 1 kilns of level 4 constitute the oldest known ceramic workshops of the whole south Mesopotamia, but their relations with the habitat is not yet known. Did they constitute independent workshops from contemporary housing or, conversely, associated with Ubaid 1 dwellings (Buildings 90 and 34 in particular) known a little further north? The stratigraphy of the Ubaid 1 levels has always been a difficult question in 'Uwaili, due to the particularly fragmentary state of the remains of this cultural phase. Level 5, for its part, corresponds well to level I of the Ubaid 0 phase of our previous excavations, which it extends without break south of Building 37/41. The structures of level 5 are not only much better preserved than one might have thought, but also easy to access over a large area. Many questions are already emerging. The habitat is much denser than expected, and combines housing with small associated storage structures, in a configuration in rupture with the large collective granaries of level III of the Ubaid 0 phase and that we thought appeared later, in Ubaid 1 (Forest, Vallet and Breniquet 1996). An evolutionary dynamic therefore seems to be at work since the formative period of the Ubaid. The extension of the excavations in the next campaigns should bring more insights on the organization of the early Ubaid village and provide answers.

Since the exploration of the site began in 1976, 'Uwaili ceramics has been the subject of both morpho-stylistic and technological studies (by Liliane Courtois and Bruce Velde). Johnny Samuele Baldi continues this tradition according to current methods of ceramology and the 'chaîne opératoire' approach in particular. One of the objectives remains the development of a chronotypology anchored in a reliable stratigraphic sequence, extending to the origins of the Ubaid. It is true that, for the Ubaid 0, the absence of regional parallel (except Eridu XIX) does not facilitate understanding of the specificities of this ceramic, clearly at the origin of the Ubaid 1 but which differs significantly from it on almost every aspect. At the other end of the sequence, the work in progress should also deepen our knowledge on the Ubaid 5 assemblage. It seems to coincide with

levels XVI-XIII at Uruk, and sees in particular the appearance of the first 'proto-BRBs'. Despite its 'proto-Uruk' nature, we remain faithful for the moment to the Ubaid 5 label (Forest 1996: 387), rather than pull back the Uruk in the middle of the fifth millennium or creating an intermediate period.

Finally, Caroline Douché relaunched the paleobotany component of the project, initiated in the 1980s by Reinder Neef, by carrying out a systematic sampling of all the layers excavated at both 'Uwaili and Larsa, of which she gives a first overview. We know that plant remains on the two sites are neither abundant nor well preserved, mainly due to extensive irrigation practices, leaving a very damaging gypsum crust everywhere. Despite this, we can hope that the data collected as the excavations progress help us to understand the birth and development of cereal economy in southern Iraq, as well as clear factual indicators on the much debated questions of climate change and in particular the phases of supposed drought, and their possible impact on human societies. The combined study of Larsa and 'Uwaili offers a unique opportunity to study these phenomena over the very long term, no less than six and a half millennia.

I – NOTE ON PHOTOGRAMMETRIC SURVEYING AND MAPPING OF LARSA

Jonathan Lisein and Joël Suire



Fig. 1 – Left: the Mavic Air 2 pro drone flying above the ‘Uwaili excavation sector, Right: a ground control point made up of bricks and measured with the Emlid Reach RS+ GPS.

During the 2019 campaigns at Larsa, a small unmanned aerial vehicle (drone) was used in order to perform photogrammetric measurements and mapping. The use of small civil drone is quick, which enable to take the maximum advantage of the best lighting condition without hampering archaeological work. This high-resolution aerial surveying, for which more than 7000 images were shot, have a three main goals. The first is to provide daily mapping of archaeological excavation sectors in order to help the post-excavation work of archeologists and to serve as permanent documentation. The second goal is to describe the complete archeologic sites and their surroundings, by means of ortho-photo images and photogrammetrically computed relief. Eventually, the integration of all geographic information in a geographic information system (GIS) ensure an optimal use of old and new observations, mainly devoted at the detection and localization of buildings and others human-built entities such as streets and channels.

Materials and Methods

The small unmanned aerial vehicle used is a Mavic Air 2 pro from Chinese company DJI. A pack of six batteries enables an extensive use in a single day, considering the flight endurance of 20 minutes. Although a spare drone is available in case of crash of the first one, this multi-copter has given us entire satisfaction and fortunately, crash did not happen. The ground control station is made up of the remote controller plus a rugged smartphone with two flight applications on it. DJI GO 4 app is used for manual flights, generally at low altitude. Pix4DCapture is used for automatic flight, occurring at high altitude. Image processing are realized in Structure-from-Motion Agisoft Photoscan software (version 1.26). Geo-referencing and camera calibration are handled with ground control points (GCP), which are materialized on the field by stones and bricks (Fig. 1). Absolute planimetric positions of these GCPs are determined with an Emlid Reach RS+ GPS by recording raw Global Navigation SaTellite System (GNSS) observations during a minimum of 45 minutes. Relative 3D position are measured with a great precision by topographic surveying.

Daily mapping of excavation sectors

During the fall campaign, low-altitude flights were manually performed above archeological trenches in order to help the post-excavation work. Ortho-photomosaic were daily printed and

provided to archeologists at the 1:100 scale. Sixteen mapping were realized for B50 excavation trench. The same number for B48 and eight ortho-images were collected for 'Uwaili.

Global mapping of Larsa and 'Uwaili

The first objective was to generate an ortho-photomosaic of aerial images of the best resolution possible (+5cm of ground sample distance) which should have a geo-referencing of quality. Considering our material (drone, GPS and topographic station), an ortho-image of sub-meter geo-referencing with an accuracy of a few centimeters was achievable. We have performed a series of flights at 200 meters above ground level, which were undertaken maximum 1h30 after sunset, in order to benefit from the shadowing that emphasizes the micro-relief. The images bloc was precisely georeferenced with the Ground Control Points surveyed by GPS and topography.

Although the resulting ortho-photo is geometrically accurate, changes of lighting conditions have hampered the consistency of radiometry through the vast site of Larsa. This is why we have undertaken two other aerial surveys at a higher altitude (500 meters). Flying at higher altitude have the advantage of reducing the number of flights, and so the time during which the acquisition is done, at the expense of resolution but with the benefit of higher radiometric consistency. The first new ortho-photo was captured during a cloudy morning after a rainy night (24/10/2019). The absence of shadow combined with the differential drying of unfired bricks and sand showed some buildings that were otherwise invisibles. The second new acquisition, the 31/10/2019, turned out to have a very good radiometric consistency, with a good trade-off of shadowing and differential drying that gave insight on both micro relief and building made of unfired bricks (Fig. 2).

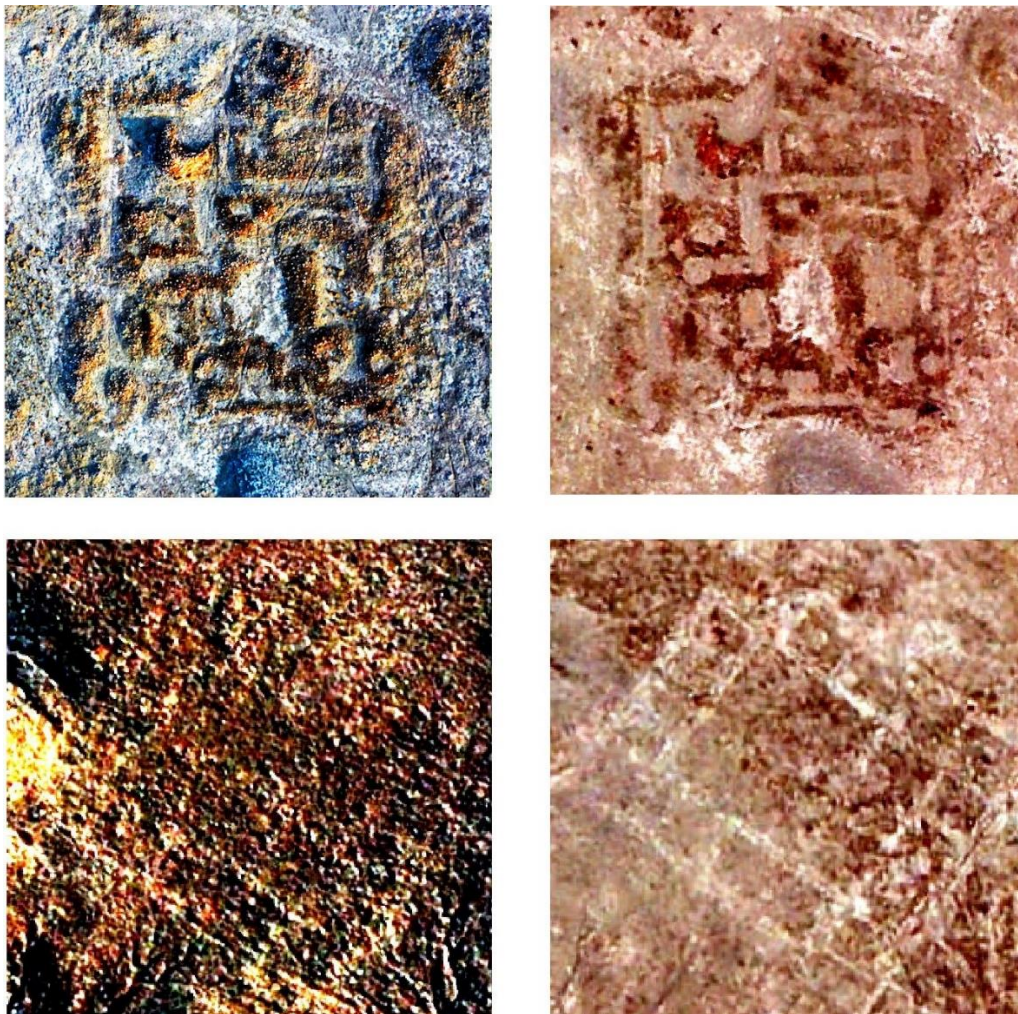


Fig. 2 – Ortho-photos under diverse illumination conditions enable to distinguish different objects. Top: building B9 visible with shadows (left) and differential drying after a rain (right). Bottom: a newly discovered building almost totally invisible under normal conditions (left) but revealed after a rainfall (right).

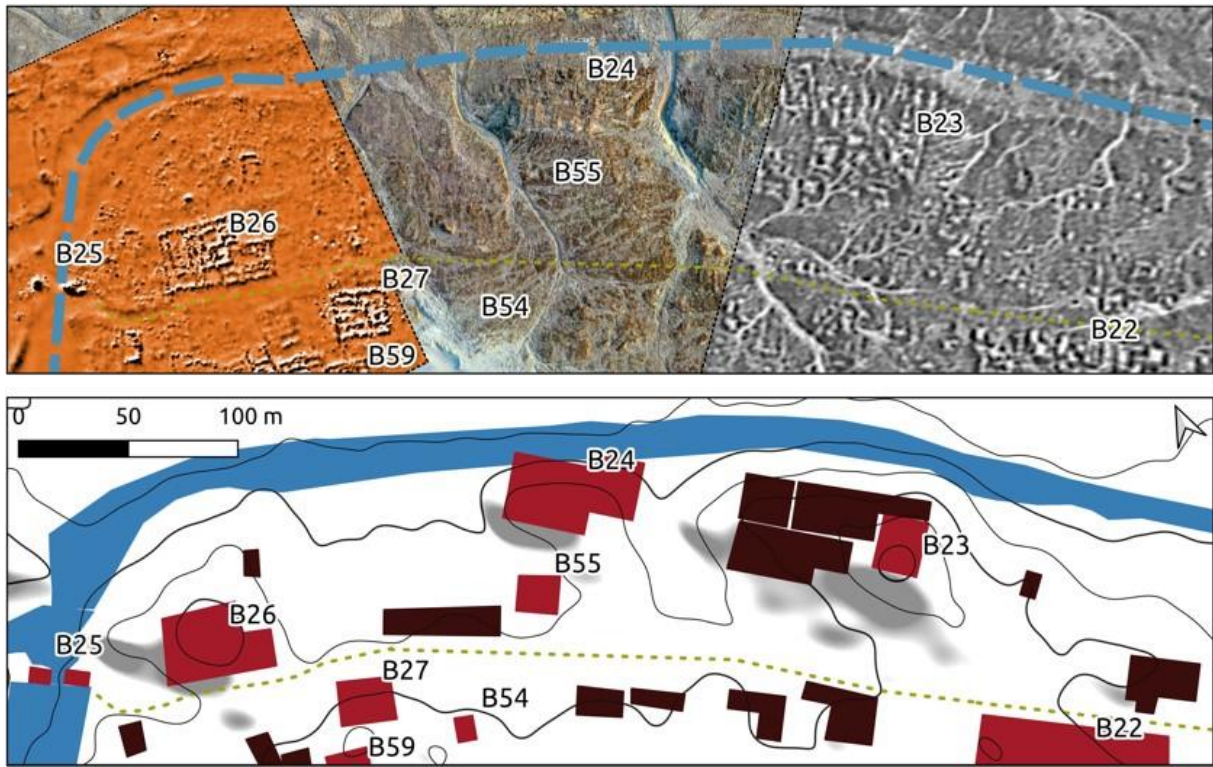


Fig. 3 – Integration of the Larsa set of multi-modal and multi-temporal imageries in a Geographic Information System followed by the digitalization of buildings, streets and canals. Top: in orange coloration the geophysical prospecting (left), a drone ortho-photo (middle) and a black and white aerial view of 1974 (right). Bottom: digitalized buildings, streets and canals of the same area.

Setting up of a GIS database for Larsa

We have gathered numerous new and old information that deserved to be integrated in a Geographic Information System for adequate comparison and combined used. All the drone ortho-photos are properly georeferenced by means of the use of ground control points, as well as the photogrammetric Digital Elevation Model computed during the campaign of June 2019. Imagery from the geophysical survey is also already available in a GIS. However, the old topographic maps and drawings from 1985 and 1987 were not georeferenced and we have handled their proper integration in the GIS database. Finally yet importantly, the aerial views of 1974 that have extensively been used during previous archeological campaigns were rectified in order to remove their lens and perspective distortions. Then, the complete set of buildings and others items visible on the surface from this multi-modal and multi-temporal dataset were digitalized (Fig. 3).

In order to summarize the SIG database we have compiled, a table (Table I) presents a list of the diverse imagery that are available.

Type	name or number	date	altitude	extend	resolution	comment
Ancien oblique aerial view	6 georeferenced views	1974		variable	variable	oldest images
geophysical prospecting		2019	on the surface	small area		
digital elevation model	MNT_larsa_50cm.tif	06/2019	400 meters	the whole Larsa site	50cm/pixels	relief of Larsa
digital elevation model	20191030_MNT.tif	10/2019	200 meters	Oueili	50cm/pixels	relief of Oueili
drone imagery	20191023_Larsa_7.5cm.tif	10/2019	200 meters	the whole Larsa site	7,5cm/pixels	best resolution
drone imagery	20191024_Larsa500.tif	10/2019	500 meters	80 % of larsa site	10cm/pixels	not very sharp but good differential drying
drone imagery	Larsa_RGBIconem_10cm.tif	04/2019		the whole Larsa site	10cm/pixels	no shadow but canals very visible
drone imagery	201906-larsa-Glob2-GSD10cmB.tif	06/2019	400 meters	the whole Larsa site	10cm/pixels	central part of Larsa shows very well the relief
drone imagery	201906_LarsaEtUweili_25cmGSD	06/2019	400 meters	Larsa and Oueili sites	25cm/pixels	
drone imagery	20191031_Larsa500.tif	10/2019	500 meters	the whole Larsa site	10cm/pixels	some sadow + differential drying effect
drone imagery	20191030_ortho10cmGSD.tif	10/2019	200 meters	Oueili	10cm/pixels	

Table I – List of GIS information compiled in the database.

II – LARSA: PRELIMINARY NOTE ON EROSIVE PHENOMENA AND LOOTING

Mathilde Mura

OBJECTIVES

As part of the Larsa intra-site survey conducted in June 2019 (Giraud, this volume), an analysis of the state of the site after thirty years of absence was carried out in order to better understand the extent of looting and erosive phenomena. As the latter may impact future excavation work and the choice of areas to be excavated, it was necessary to undertake it during this first campaign.

The objectives were twofold: (a) to understand the impacts of erosion and looting on the surface and first stratigraphic levels of the site, (b) to know the biases associated with these two elements in terms of survey work: deeper material brought to the surface in the case of looting and higher concentration of material, drainage of material from sectors at the highest elevation and accumulation at the bottom of the slopes in the case of erosion.

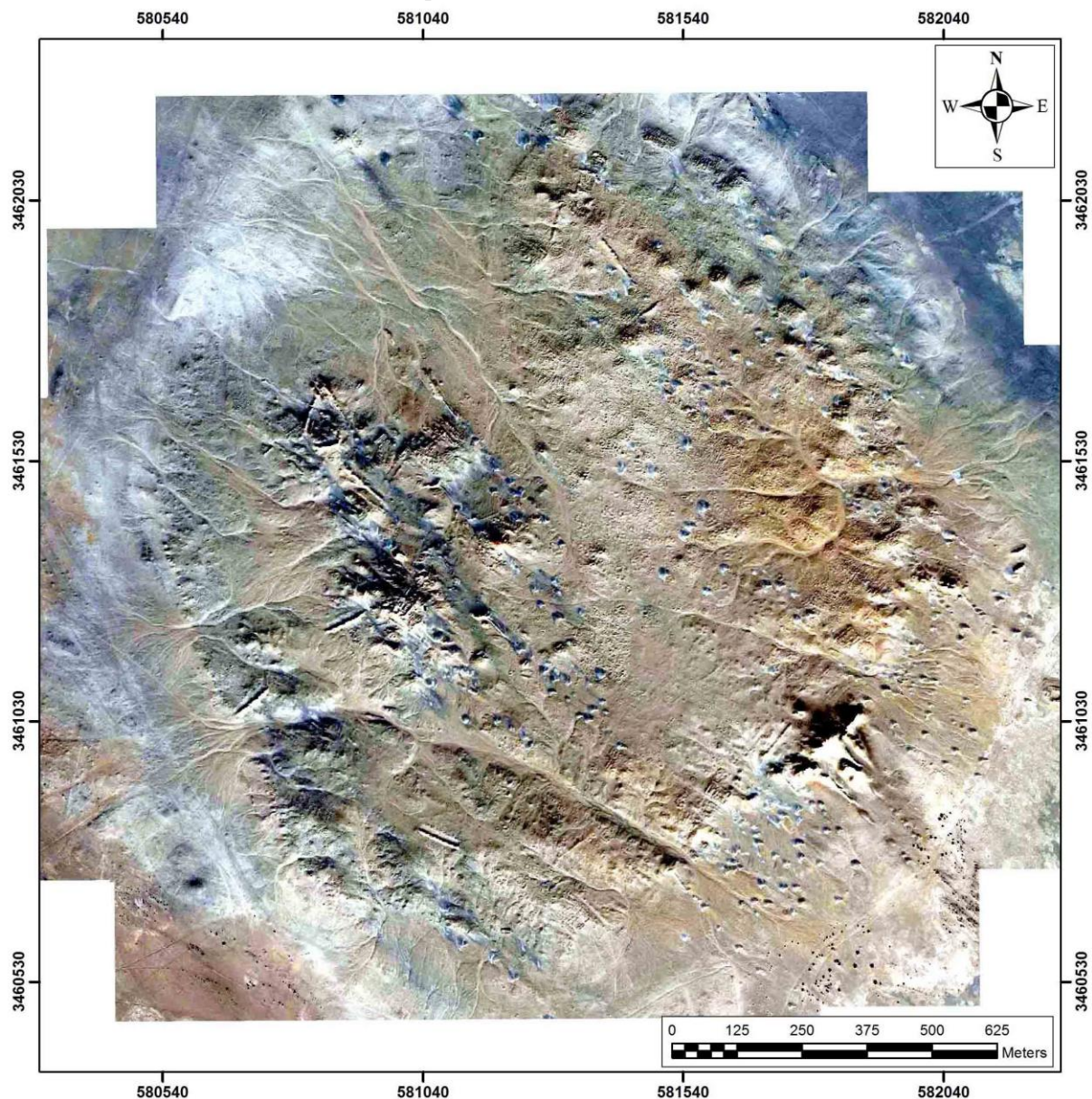


Fig. 1 – Geoeye image from December 2010, ©BingImagery.

METHODOLOGY

Traditionally, the study of looting is carried out by remote sensing. In the context of our study, we used two supports. A GeoEye image from December 2010 (Fig.1) and a drone flight performed in June 2019 by Jonathan Lisein (Fig.2). This work reports 1841 visible pits in 2010 (Fig.3) and 2298 visible pits in 2019 (Fig.4). In order to complete this information and compare the data collected in zenithal view, a ground count per surveyed square was carried out. 1404 pits were detected over

the surveyed area (representing roughly half of the site). Their description includes: (a) their amount, (b) their attribution to a morphological type, (c) the observed spatial distribution by square.

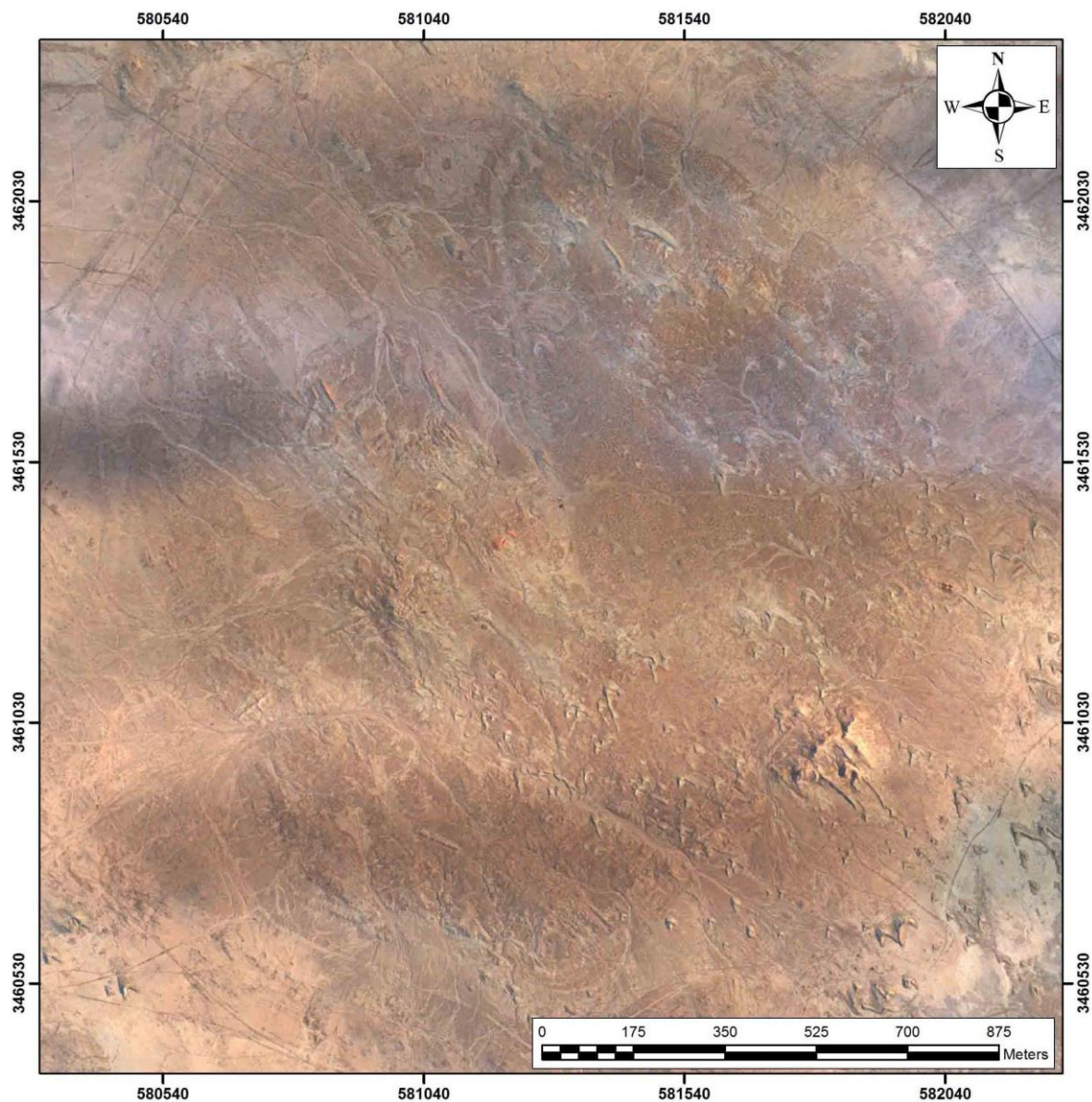


Fig. 2 – Drone Imagery from June 2019, ©J. Lisein (Certus Visio).

Similarly, erosive phenomena (gullies, wadis, solifluction cones and dunes) were remotely detected on one hand and recorded by surveyed squares on the other. The reading of the terrain showing the different types of silting, wadis and gullies. By remote sensing 40 major wadis were traced, 546 main gullies were identified, 53 of which ended in solifluction cones, and 252 dunes were identified.

PRELIMINARY RESULTS

Looting

Four morphological types of looting have been identified on the site:

- DMnInd1 : Shallow individual manual pit
- DMnInd2 : Deep individual manual pit
- DMnFS : Manual depression in a large pit, performed by a group of individuals
- DMc: Mechanical cut

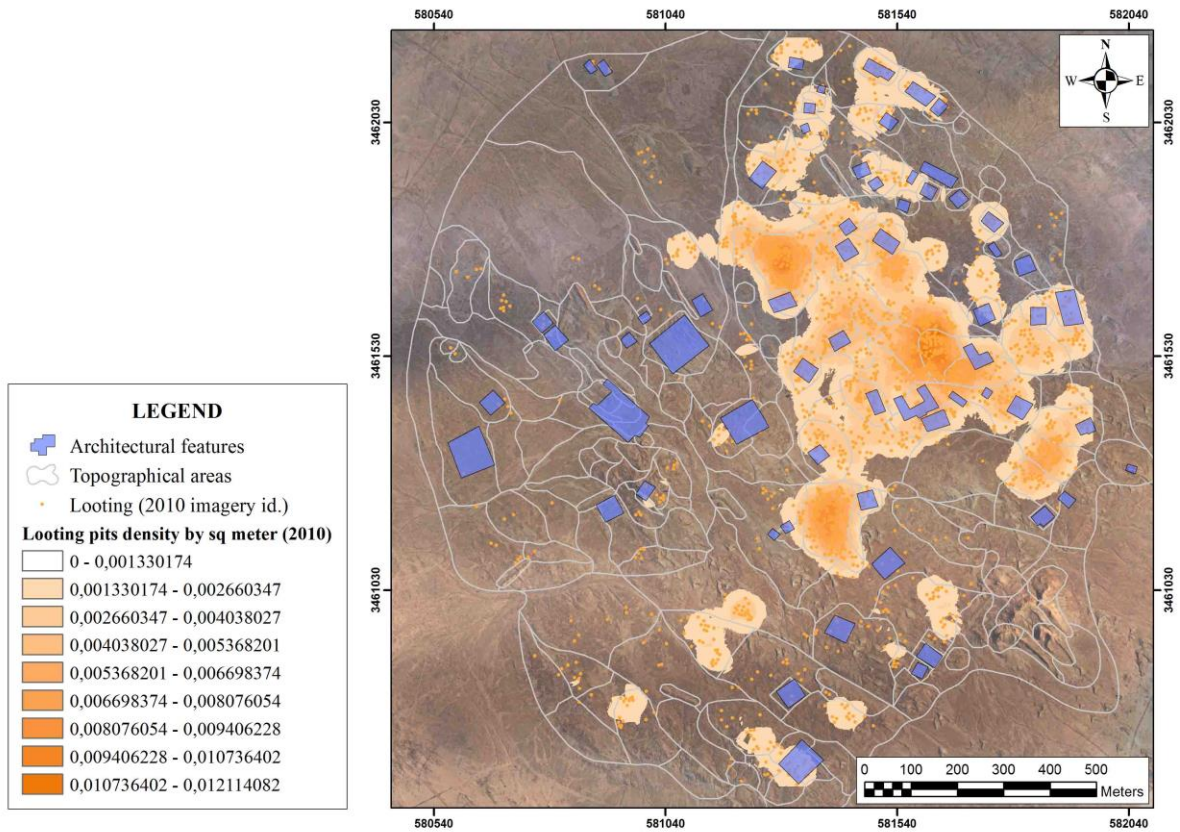


Fig. 3 – Remote sensing of the lootings visible pits in 2010 ©Mathilde Mura (Archaïos).

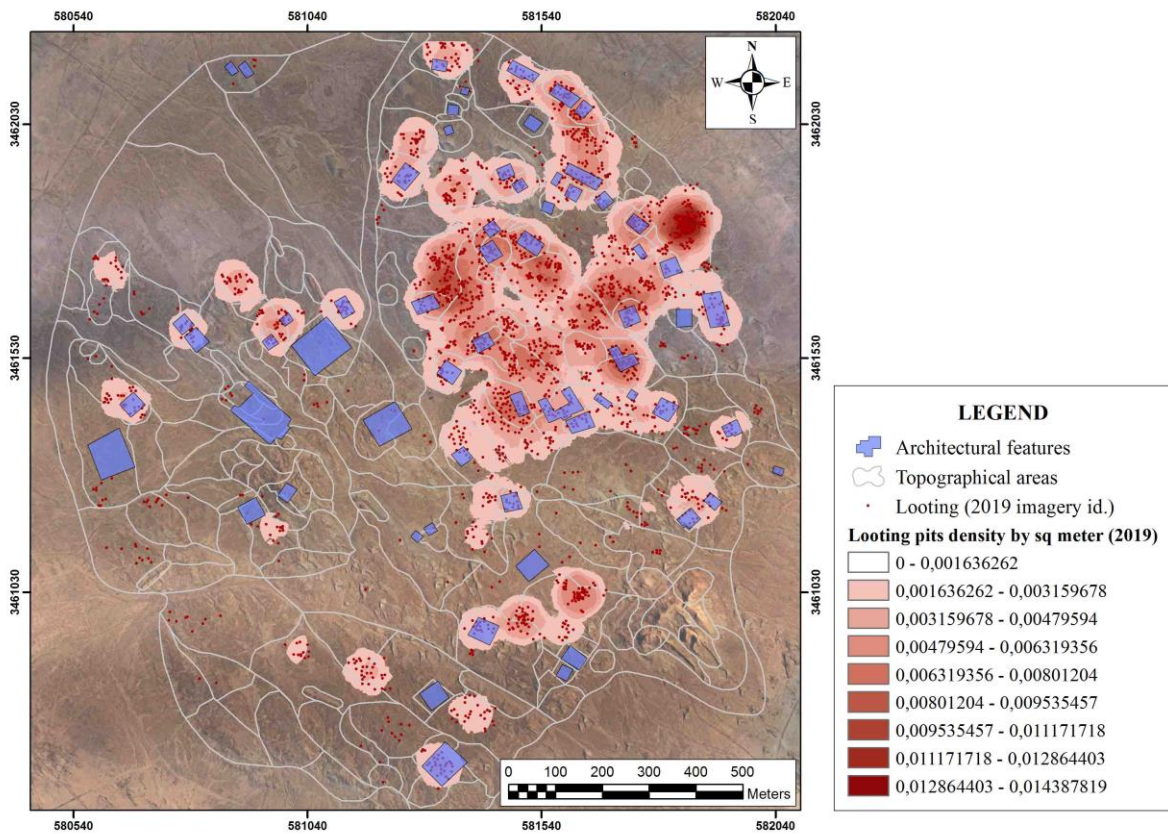


Fig. 4 – Remote sensing of the lootings visible pits in 2019 ©Mathilde Mura (Archaïos).

No looting in the form of tunnel is to be deplored. The number of each type decreases as the type becomes more invasive. As such, there is a large majority of DMnInd1 type pit. The larger manual types (DMnInd2 and DMnFS) are concentrated in the area northeast of the ziggurat and also include a particular form: looting pits per room of the buildings in a square or rectangular shape instead of the traditional ovoid shape (Fig.5 and Fig.6 left). Mechanized DMc looting is not very common on the site. The most significant notch is the one made on the ziggurat (Fig. 6 right) using a 4m wide bucket. The other notches are smaller and made with a 2m wide bucket, often over a distance of about 10m. However, occurrences of the DMc type remain very isolated.

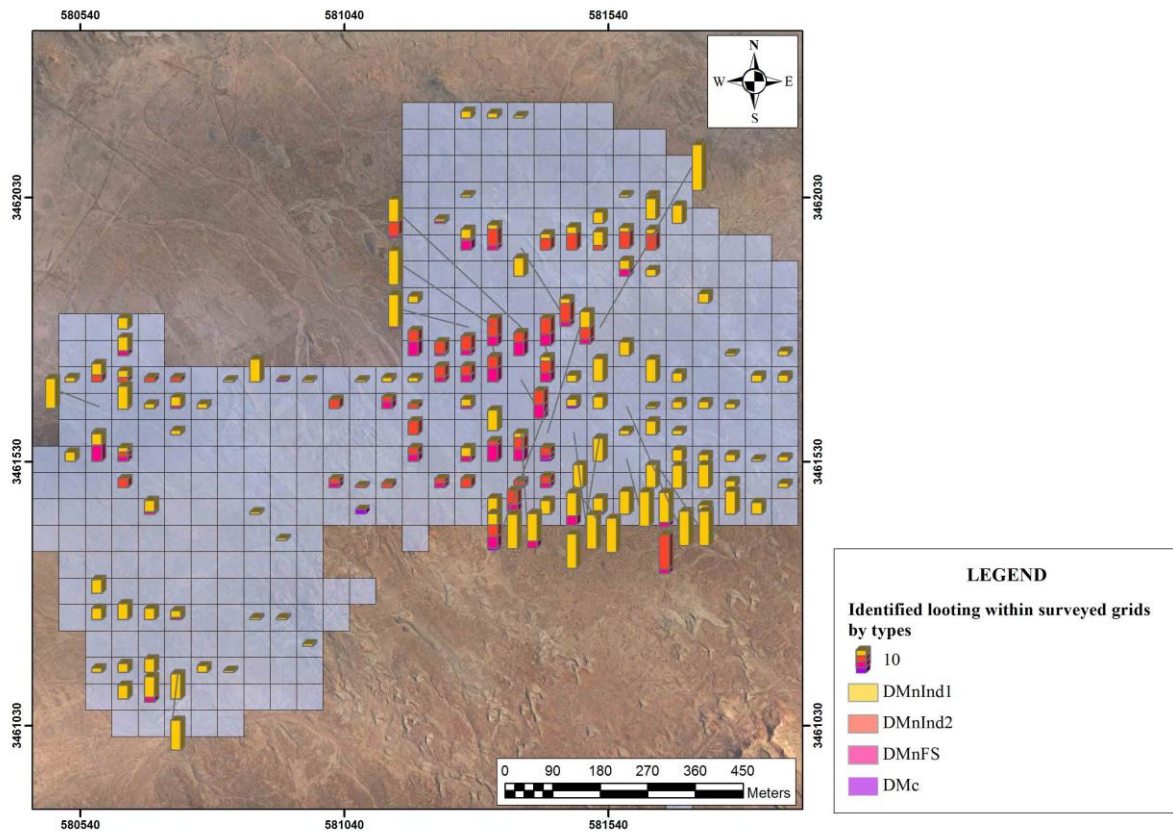


Fig. 5 – Spatial repartition of the looting by morphological type ©Mathilde Mura (Archaïos).



Fig. 6 – left: DMnFS pits in a square or rectangular shape corresponding to the building's room ©Joël Suire, right: view of the notch to the Ziggurat made with a mechanical shovel ©Mathilde Mura (Archaïos).

The three types of spatial distributions related to looting have been identified on the site:

- Isolated looting: one to three pits
- Targeted looting: more than three grouped pits carried out side by side
- Intense looting: more than five grouped and overlapping pits

It appears that the looters' strategy was to attack as a priority the buildings visible in elevation or partially cleared by erosion. The 2010 image shows effective, relentless and concentrated looting in densely built areas (north-eastern sector of elite housing). When targeted, it corresponds to a large, clearly identifiable building, such as one south of the site: B57. Comparing looting carried out before 2010 and between 2010 and 2019, there is a decrease in activity and continued interest in the elite housing area. In addition, there are isolated looting phenomena in areas previously left intact (south-western boundary of the site). The distribution reflects unsuccessful looting in the west and the discovery of new artefact-rich buildings in the east (identifiable due to a slight shift from previously looted areas to new ones nearby).

Erosion

In terms of erosion, gullies, produced by a combination of chemical (water) and mechanical (wind) erosion, originate at the top of the elevated elements. The crack, in the axis of the slope, drains down the sediment and possibly the archaeological artefacts. In some cases, the gullies stop and produce a clear sediment cone, clearly identifiable in the drone images. When the ravines are more numerous and stop at a channel in the landscape, they amplify the depression in their path and thus produce the bed of the wadis that cross the site. Finally, the dunes adhere to the small relief elements. Around the sites, *nekbha* dunes form on the bushy shrubs. On the site it is mainly *barkhane* type dunes which have a concavity facing the wind.

Erosion of looting

On the site, it can be seen that, apart from the relief elements associated with the remains, the main adherent elements for the dunes are the looting pits. South of the ziggurat, an intensively looted area detected in the 2010 images is thus covered by the dunes in 2019. The looters have resumed activities by moving to the west. Finally, more generally, all the pits associated with looting are silted up, producing a repetitive pattern of brown halo filled with sand and very distinctively visible on the imagery (Fig.7).



*Fig. 7 – Looting pit (DMnFS type) with a characteristic brown halo filled with sand
©Mathilde Mura (Archaïos).*

CONCLUSION

Concerning the areas foreseen for the excavations:

- The most intensively looted area covers the northeast quarter of the site and continues in a decreasing southward direction. Only one excavation is planned in this area in future seasons, Building B33. Partially covered with spoils it does not appear to be the most intensively emptied.
- The Grand Canal area shows almost no pits linked to the looting, but the adjacent buildings have been largely emptied, leaving part of their plan visible on the imagery.
- Building B50 was heavily emptied by the looters, with long and wide (10 x 4m) trenches 3.5m deep, but this was only seen by the excavations, due to the general filling with sand of the ruins. Only a few depressions were identified by the survey, mainly in the northwest corner.
- B48 / B49: the very visible remains of these two buildings testify to an intensive excavation of the rooms.

The continued survey and counting of depressions linked to ground looting will eventually make it possible to produce an unprecedented study of the surface of an archaeological site of this size. However, it can already be pointed out that looting (unlike erosion) does not produce a bias in the volume of ceramics or objects collected. Yet the distribution maps show no direct correlation between looting and the quantity of material found on the surface. In some cases a lower density of diagnostic ceramics were kept in the looted areas. This could be explain by the theft of diagnostic material, leaving behind only discarded sherds. Nevertheless, the archaeological survey do not particularly need complete pottery to determine typology or chronology, whereas looters are looking for complete object in order to sell them on the market. The size of the characteristic assemblages therefore does not seem to be affected by clandestine excavations.

On the other hand, an overlap of the map of erosive stigmas with the survey maps makes it possible to explain some high concentrations at the bottom of slopes, for example. The small quantity of material found in the buildings themselves when they are implanted on a small hill can be explained by both the facts they were emptied by looters and the spoils were left on the top of the slopes. Discarded artefacts are then drained down the hill, creating a bias of concentration at the bottom of the slopes.

Finally, to accurately assess the in-depth impact of the looting according to different factors (depending on whether they are isolated, targeted, intensive, individual or collective), conducting, once the pedestrian survey completed, the excavation of a looted area at Larsa would be useful. It would make it possible to develop a method of excavation adapted to the damaged area of sites in southern Iraq that have suffered the same type of damage.

III - GEOPHYSICAL SURVEY ON THE SITE OF LARSA

Lionel Darras

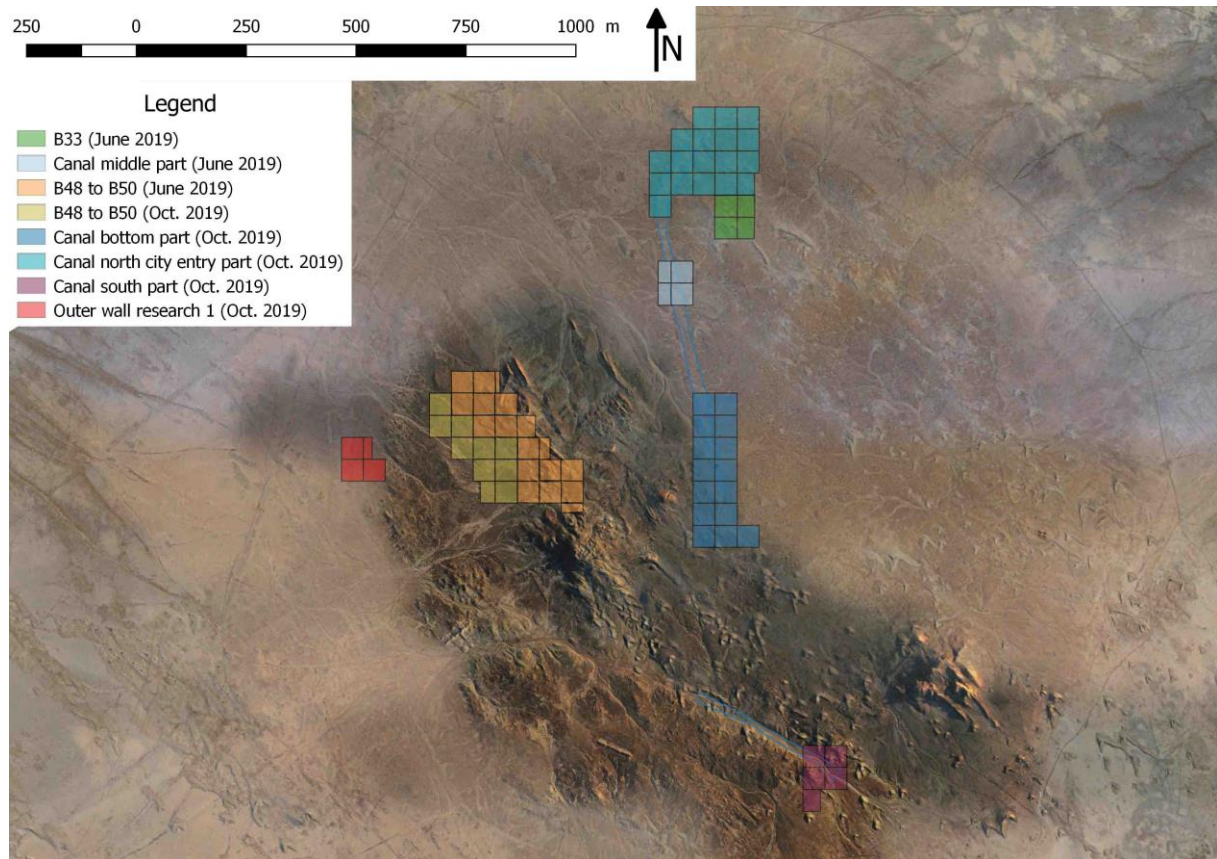


Fig. 1 – 2019 magnetic prospection areas.

In June and October 2019, geophysical surveys were carried out on the site of Larsa as part of the archaeological campaigns (Fig. 1). The geophysical method used in these campaigns is magnetic prospecting which is a fast and effective method for a first approach of an archaeological site. The principle of the magnetic method is to measure local variations in the Earth's magnetic field due to the presence of iron oxides in soil and archaeological structures (Aspinall, Gaffney and Schmidt 2008). Magnetic survey was carried out with a G858 caesium vapour gradiometer (Geometrics Inc) on an 18ha area distributed with squares of 50m x 50m and a survey following profiles spaced 1 meter apart and measurements every 10 cm along the profiles. The measurements were then interpolated to 50 cm. These first geophysical campaigns on the site had two objectives: (a) to make a magnetic map of a large area north-west of the E-babbar to get more information on buildings B48-B49, B50, and other structures around prior to their excavations, (b) to get information on the route of suspected canals crossing the site.

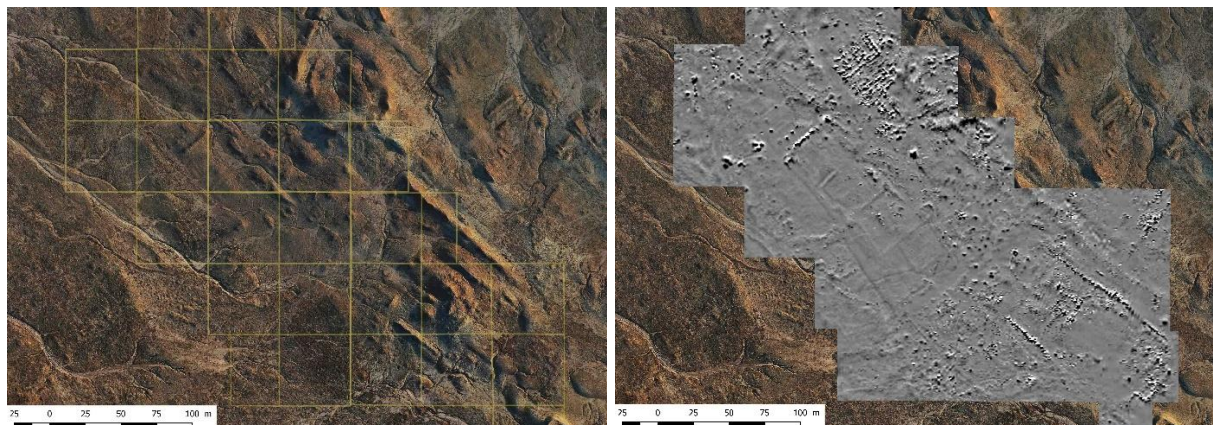


Fig. 2 – left: B48 to B50 magnetic prospection area, right: georeferenced raw gradient map ($-20nT/+20nT$).

RESULTS OF SURVEYS NORTH-WEST OF THE E. BABBAR

On the magnetic map obtained, three areas with linear magnetic anomalies are interesting and will be treated separately (Fig. 2): an area to the north with buildings B48 and B49 already identified on the surface; a building to the southeast, referenced B50 but visible on the surface only in some places; west of these two areas, possible agricultural plots.

Area B48-B49

In this surveyed area (Fig. 3a), many wide (2m) linear positive magnetic anomalies of high intensity (30 to 100 nT) are visible on the gradient magnetic map (Fig. 3b). It is interesting to make the correlation between the characteristics of the walls later found in the excavations (wall of a width of 1m consisting of four rows of baked bricks) and their magnetic signature. Thanks to the magnetic map and its strong linear anomalies, it was possible to make a preliminary sketch of the building plan (Fig. 3c) with mainly thick walls (purple lines). The superimposition of the magnetic map with an aerial view of the excavation at the end of the campaign confirms the correlation between the magnetic traces detected and the walls discovered by the excavations (Fig. 3d).

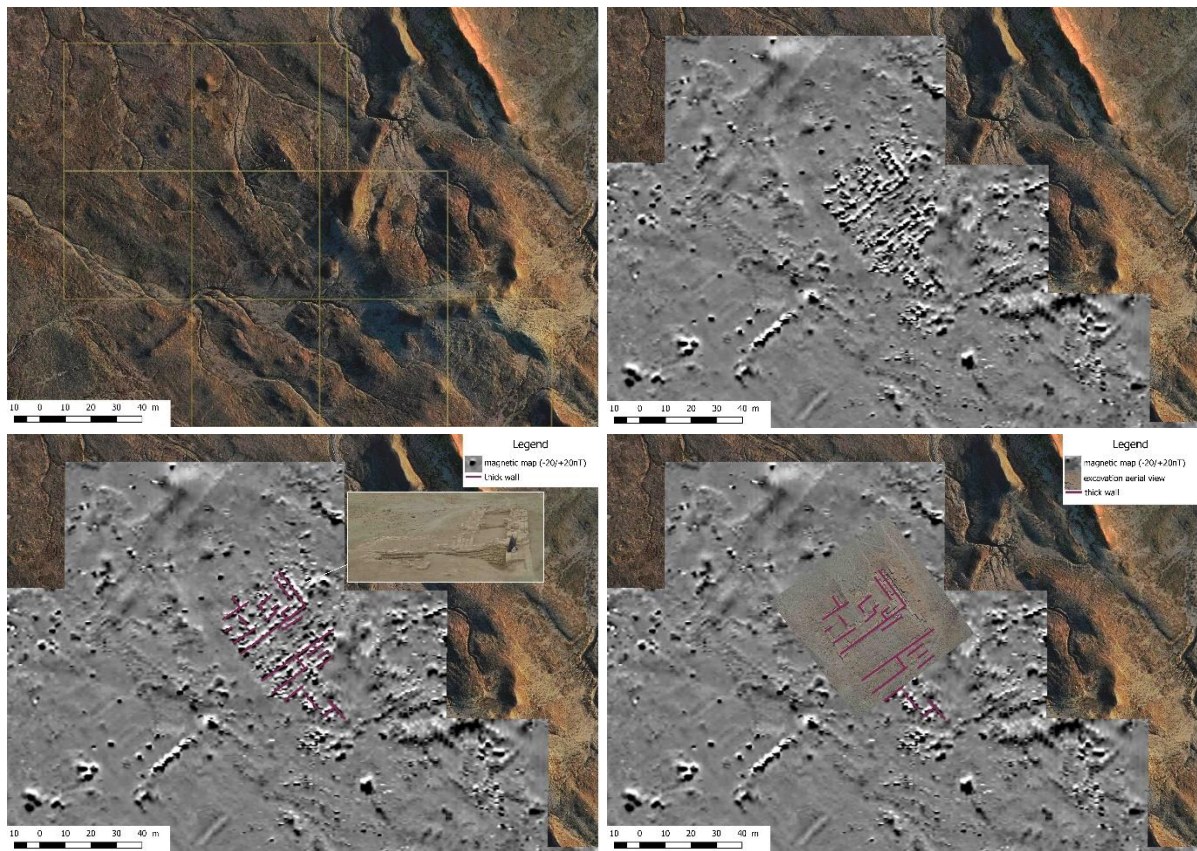


Fig. 3 – (a) top left: B48 magnetic prospecting area, (b) top right: georeferenced B48 raw gradient map (-20/+20nT), (c) bottom left: B48 raw gradient map with thick walls, (d) bottom right: B48 raw gradient map with excavations aerial view.

Area B50

In this area (Fig. 4a), the gradient magnetic map (Fig. 4b) revealed remarkable linear anomalies. On the magnetic map of the total field measured by the bottom sensor (Fig. 4c), homogeneous areas are also visible. The combination of these information made it possible to draft, before the excavations, a preliminary plan (Fig. 4d) including: (a) Thick walls of baked brick (purple lines), well identified and characterized by positive linear magnetic anomalies of high intensity (30 to 100 nT and 2m wide); (b) Some small (1 to 5nT) and fine positive linear anomalies; (c) Heterogeneous areas that seem to indicate built areas (green rectangles), without detail about their internal organization; (d) a remarkable area on the total field measured, where the intensity is stronger than in its environment.

This plan revealed a large built compound of 120m by 60m, containing at least one very magnetically homogeneous area of 30 x 30m (Fig. 4d, blue area), which corresponds to one of the courtyards found later in the excavations (Fig. 4e). Other alignments of the massive mudbrick building excavated (probably an old-Babylonian temple, see below) can now be guessed on the geomagnetic map, in particular two parallel backrooms to the north-west, that appears in the form of two thin lines (orange on Fig. 4d-e).

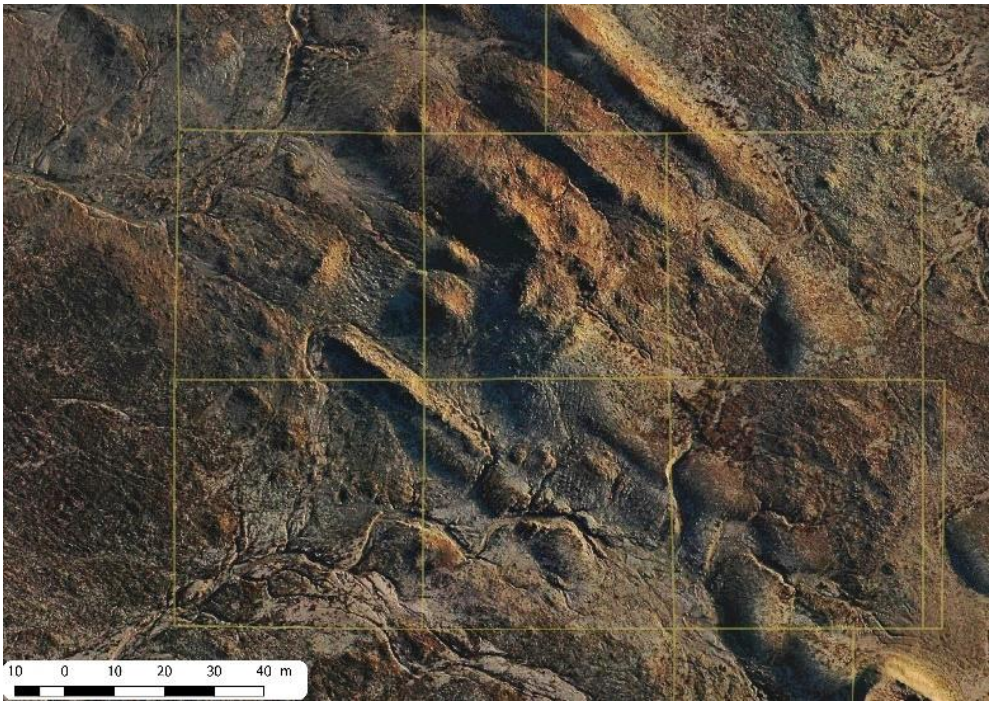


Fig. 4a – B50 magnetic prospection area.

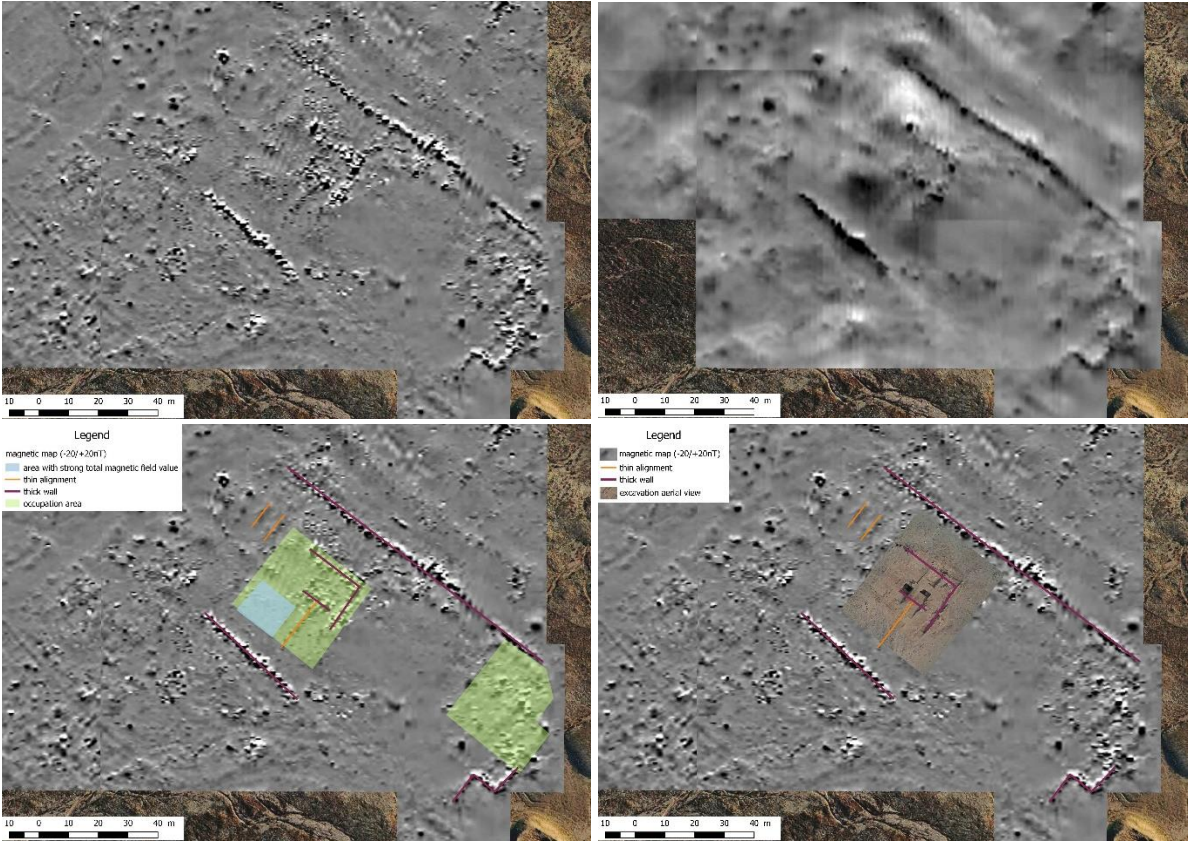


Fig. 4b (top left): georeferenced B50 raw gradient map (-20/+20nT), 4c (top right): georeferenced B50 raw total field magnetic map (-20/+20nT), 4d (bottom left): B50 raw gradient map interpreted, 4e (bottom right): B50 raw gradient map with excavations aerial view.

Possible agricultural plots

West of buildings B48-B49 and B50, interesting magnetic anomalies are visible (Fig. 5a-c). To the east, an area gathers approximately twenty dots of positive magnetic anomalies (intensity of 20 to 30 nT and diameter of 1.5 to 2 m), that could correspond to pits (Fig. 5c, red circle). To the west, linear anomalies of varying thickness and intensity surround homogeneous spaces. In the north-west part of this area, linear anomalies of 2 m wide and of high intensity, between 30 and 100 nT (Fig. 5c, purple lines), are comparable to the alignments already observed on buildings B48-B49 and B50. They correspond to a 1-meter-wide wall made of 4 rows of baked bricks, partly visible on the surface (Fig. 5c, photo). A 20m long alignment corresponding to such a wall is clearly visible. South of this wall, a 6m linear magnetic anomaly, of a lower intensity (10 to 25 nT), appears to cut a 5m wide track delineated by fine linear positive magnetic anomalies of low intensity (1 to 5 nT) (Fig. 5c, yellow lines). Several other linear anomalies, of low (yellow lines) or medium (green lines) intensity (5 to 10 nT) are visible on the magnetic map (but not visible on the surface). They could correspond to ditches and delimit homogeneous areas (Fig. 5c, orange areas) that could correspond to cultivated plots or gardens. A negative magnetic intensity anomaly (of -3 to -7 nT), 1m50 wide and 15 m long (Fig. 5c, pink line) surrounded by two positive linear anomalies of medium intensity (channels or ditches), could be an access road for some of the plots, perpendicular to another possible road to the west. The plots seems to be organized in a NW/SE row, parallel to Buildings 48-49 to the east. A street (excavated in trench B48, see below) that seems to be joining a wider perpendicular street to the north, separates the two sectors. If contemporary, they seem to be part of a large planned neighbourhood, with homes to the east and gardens to the west.

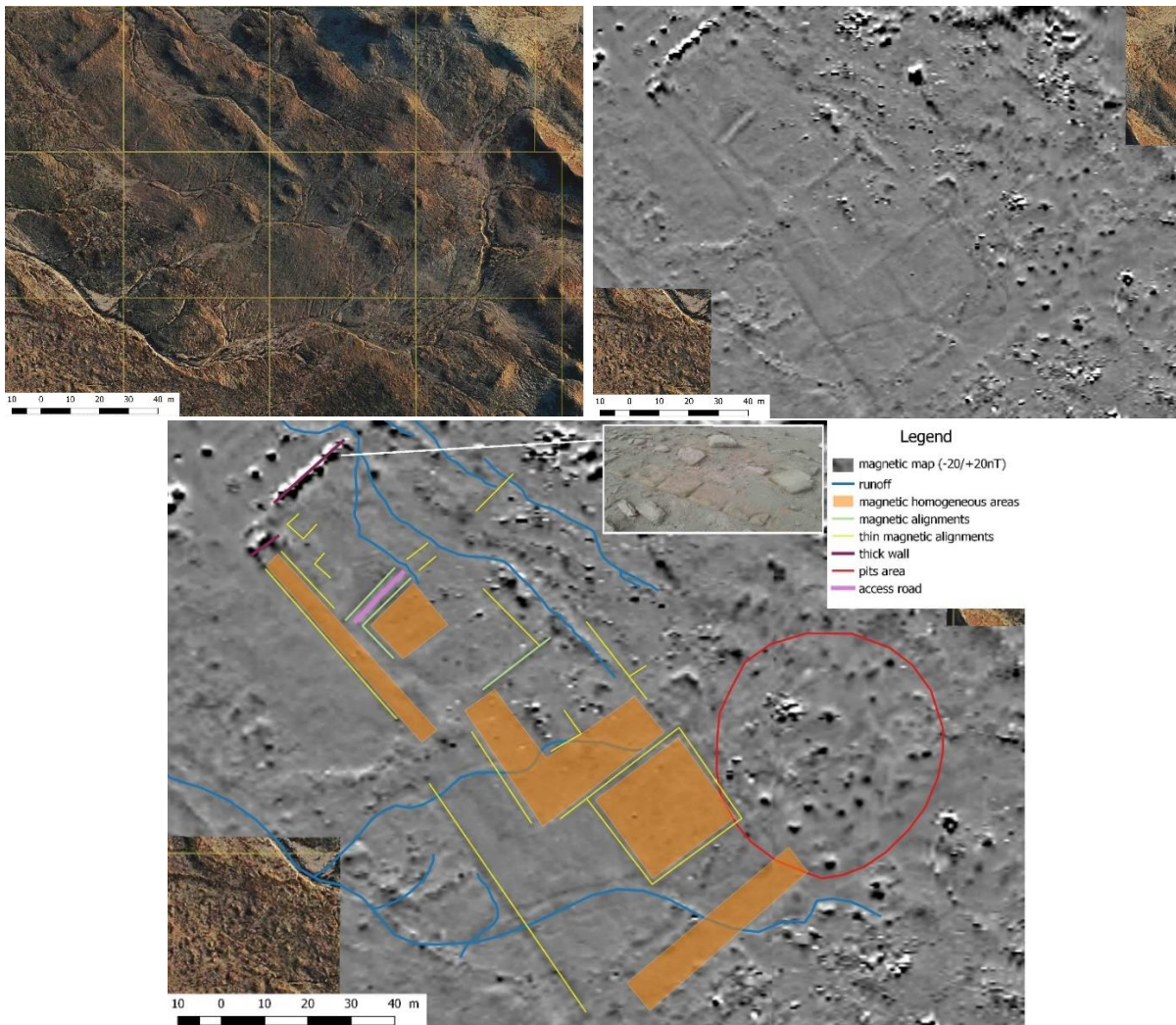


Fig. 5 – (a) top left: land plots magnetic prospection area, (b) top right: land plots raw magnetic map (-20/+20nT) georeferenced, (c) bottom: land plots raw magnetic map interpreted.

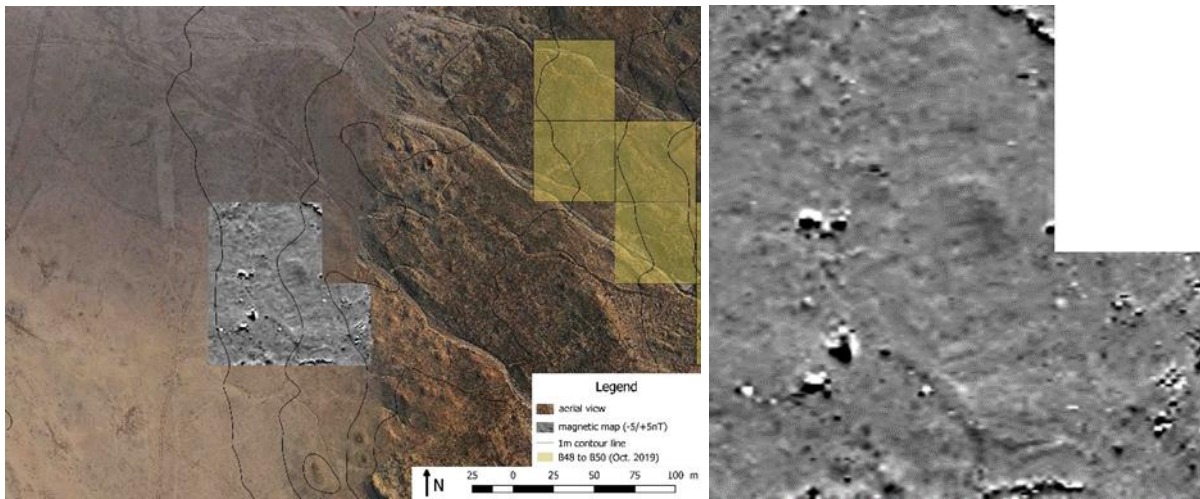


Fig. 6 – left: georeferenced west city wall survey area, right: west city wall raw magnetic map (-5/+5nT).

A section of the western ramparts

150 m west of the plots area, a limited magnetic prospection has been done to try to find a trace of the western rampart of the city (Fig. 6). On the surface, a 20m wide strip was indeed visible. The geomagnetic survey confirms that the structure has some deepness and could very well correspond to the city wall. Its magnetic signature is quite similar to the southern section of the rampart (see below).

RESULTS OF MAGNETIC PROSPECTING ON CANAL ROUTINGS

According to the aerial view of the site (Fig. 1), a long strip of homogeneous colour and a width of about 20m is visible crossing the city from north to south, down to the ziggurat. For long archaeologists were wondering if the structure could correspond to an ancient canal. Geophysical surveys were therefore planned in order to confirm this interpretation and better characterize the possible canal(s) crossing the city. A first survey area was positioned in the middle section of this long strip, at a location where its limits were particularly clear (Fig. 1, light blue area). A second area was positioned to the north, at the entry of the strip into the city (Fig. 1, green area), especially to clear its relation with another pale wide strip of land along the northeast edge of the city (therefore interpreted until now as a trace of the town wall). A third section of the strip was surveyed further south, at the centre of the site, where it seemed to disappear on the aerial view (blue zone). Finally, a fourth area was surveyed at the southern end of the city, where another strip at the bottom of a topographic depression, that could have been another important canal, enters the site (Fig. 1, purple zone).

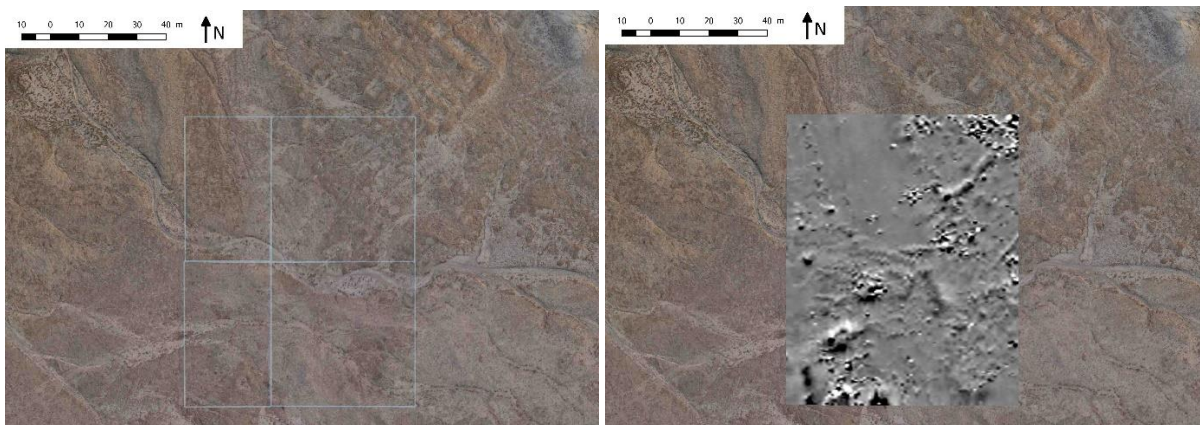


Fig. 7 – (a) left: magnetic prospection area of the middle part of the Grand Canal, (b) right: georeferenced raw magnetic map (-20/+20nT) of the same area.

The middle part of the Grand Canal

An area of less than one hectare was thus surveyed in the middle of the visible strip (Fig. 7a), a place where vast amount of ceramics had been found by the archaeological survey. The raw magnetic map reveals some interesting anomalies (Fig. 7b). As in the other areas, it is definitely possible to visualize a wide canal, but in the centre of this section, it is deflected and shrinks, to come back 40m further south in its initial width and direction (Fig. 7c, blue zone). This could correspond to a lock. Two areas of high anomalies (Fig. 7c, orange area), with a diameter of approximately 10m, surround the narrow portion of the channel and could correspond to control towers (or bridge piers, but see below for clearer bridge vestiges). Around the west tower or pillar, linear positive magnetic anomalies of medium intensity (5 to 10 nT) are visible (Fig. 7c, orange lines). Other low-intensity linear positive anomalies (1 to 5nT) are also visible to the southeast. Another dense area of high anomalies (Fig. 7c, green) is visible in the south western part of this area, but it is impossible to know what this area may correspond to at this time. Finally, wide (2 m) and very strong (between 30 and 100 nT) positive linear magnetic anomalies in the northeast part of the area (Fig. 7c, purple lines) correspond to a building, provided with walls of a thickness of four baked bricks, already identified as building B28. Did this very important building had any functional relation with the probable nearby lock? Only excavation would make it possible to better identify the function of these various magnetic detected structures.

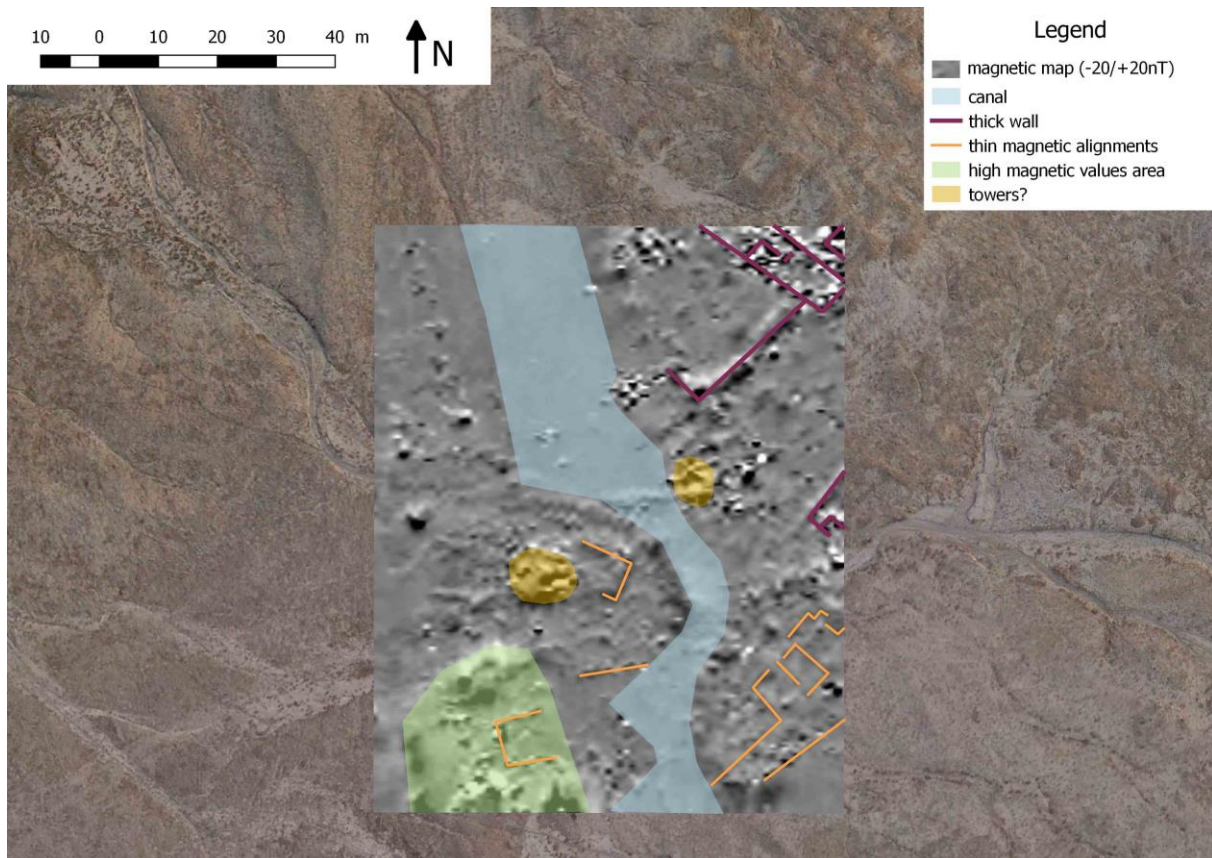


Fig. 7c – middle part of the Grand Canal raw magnetic map interpreted.

The northern part of the Grand Canal and the Peripheral Canal

An area of 5.5 ha has been surveyed north of the city, where the magnetic image clearly shows that the Grand Canal of the city and a peripheral canal meet (Fig. 8a). The magnetic map makes it possible to visualize very interesting anomalies (Fig. 8b). First, one can see that the Grand Canal is an extension of the Peripheral Canal (Fig. 8c, blue zone) and enters the city under a bridge (Fig. 8c, pink circle). Wide magnetic anomalies of an intensity between 30 and 50 nT and a diameter of about 5 m correspond to its pillars, already identified as structure B25. The canal also appears to have a westward diversion before it entered the city, to supply a large body of water that could correspond to a harbour, more to the west (not yet surveyed but visible on the aerial views). On

the west side of the Grand Canal, strong positive magnetic anomalies of an intensity between 70 and 100 nT and a thickness of 2 to 3 m could correspond to dykes, giving way to a landing zone south of the bridge. On the other side of the canal, several buildings (most of them already identified as B33, B26 and B27) are visible, delimited by strong positive magnetic linear anomalies of the same type as those delineating B48 and B50, corresponding therefore to thick walls of four rows of baked bricks. Between these buildings, a long magnetically homogeneous east-west strip of a width of about 10 m (Fig. 8c, yellow zone) correspond to a road, already partly known, joining the bridge. South of these buildings, seven large positive magnetic anomalies of a diameter of 1 to 2 m (Fig. 8c, orange circle) could be pits (or kilns?).

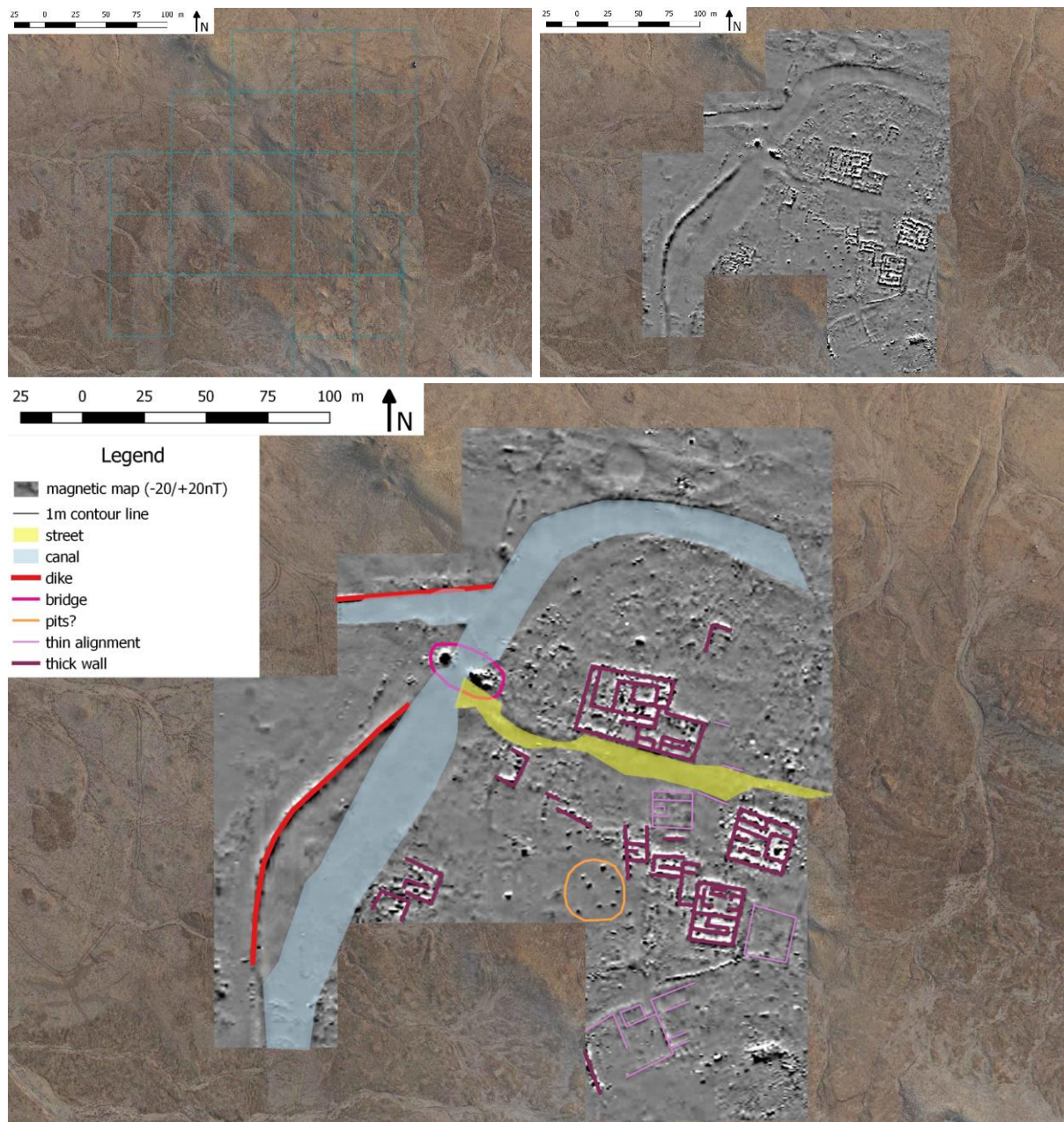


Fig. 8 – (a) top left: north part of the Grand Canal prospection area, (b) top right: raw magnetic map (-20/+20nT), (c) bottom: raw magnetic map interpreted.

The lower part of the Grand Canal

East of the Ziggurat, an area of 3.75 ha has been surveyed, at a location where the traces of the canal are visible but disappear to the south. The magnetic map (Fig. 9a) clearly shows the route of the canal (Fig. 9b, blue zone) that passes under a bridge, marked by two well-circumscribed magnetic anomalies, 4m wide and 6m apart, of an intensity greater than 50nT. To the south, the

Grand Canal turns to the east. On the eastern side of the canal, the start of a narrow secondary canal (reused by a modern wadi) can be seen, through a densely occupied area (Fig. 9b, yellow zone). Several positive linear magnetic anomalies are visible there. Some of a width of 2m and an intensity of the order of 30 to 100 nT seem to correspond to walls of four rows of baked bricks (Fig. 9b, purple lines). Other finer, medium-intensity (around 10nT), linear positive magnetic anomalies are visible (Fig. 9b, pink lines). West of the Grand Canal, some 15 to 25 m diameter zones of localized high magnetic intensity (20 to 50 nT) are clearly visible but their nature is still conjectural.

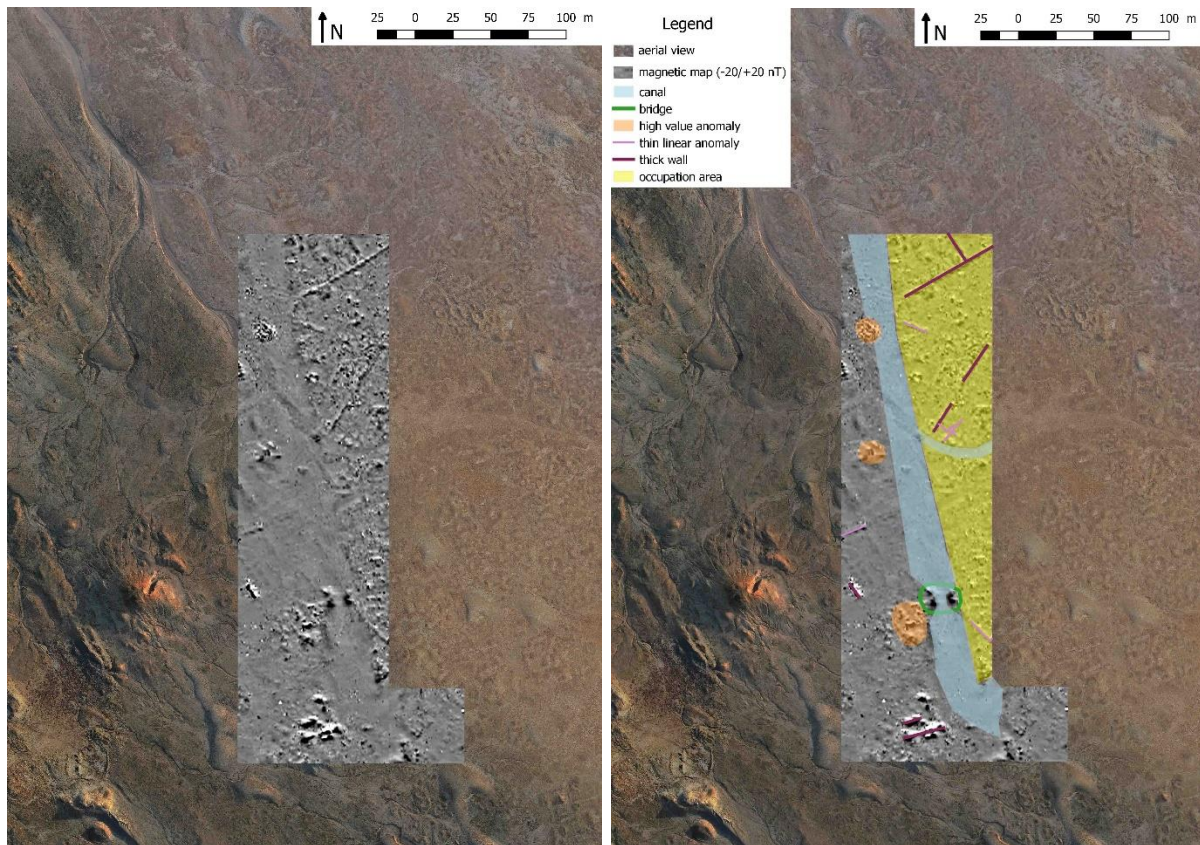


Fig. 9 – (a) left: lower part of the Grand Canal raw magnetic map (-20/+20nT), (b) right: interpreted map.

The South Canal and the city walls

Finally, at the extreme south of the city, another magnetic survey was carried out for about 1ha (Fig. 10a). Its aim was to characterize the articulation between a probable canal coming out of the city and the city wall. The magnetic map obtained (Fig. 10a) provided valuable information: a canal coming out of the city and wide of 10m is actually visible (Fig. 10b, blue zone). It crosses a peripheral structure (Fig. 10b, purple zone) 25m wide. At the connection between the two are two large magnetic anomalies of a size of 10m x 25m, 10m apart, of an intensity greater than 30nT. This peripheral structure (Fig. 10b, green line), already identified on the 1985 plan (structure B17), is certainly not a junction between two canals but corresponds probably to the city wall crossed by the South Canal, very similar to a configuration attested in Uruk (Fassbinder, Ostner, Scheiblecker and van Ess 2018). This seems all the more likely since immediately to the north, a land gate across the rampart had already been identified since 1985, the structure B36 (Fig. 10b, pink lines). However, it is necessary to carry out more geophysical survey on the city walls, to obtain more information on the variability of their magnetic signature, all around the site.

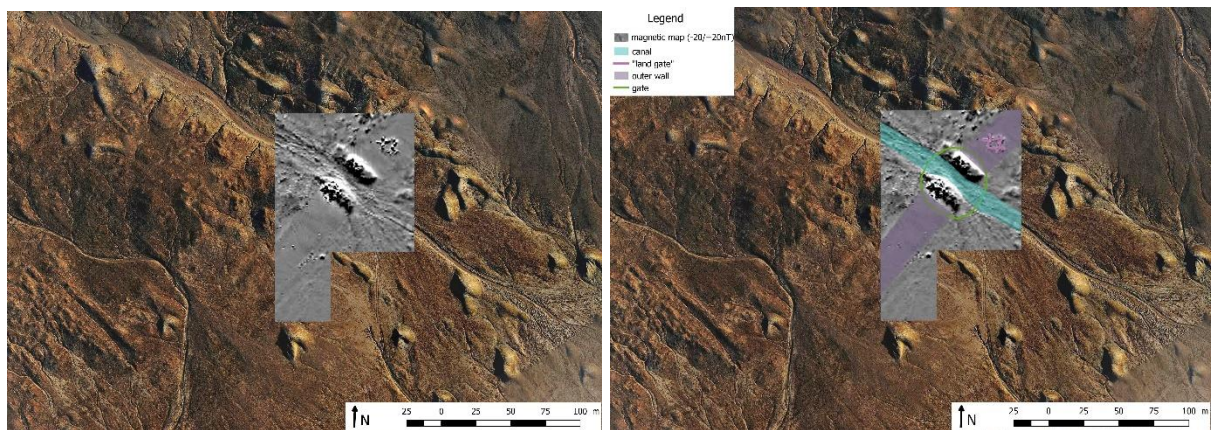
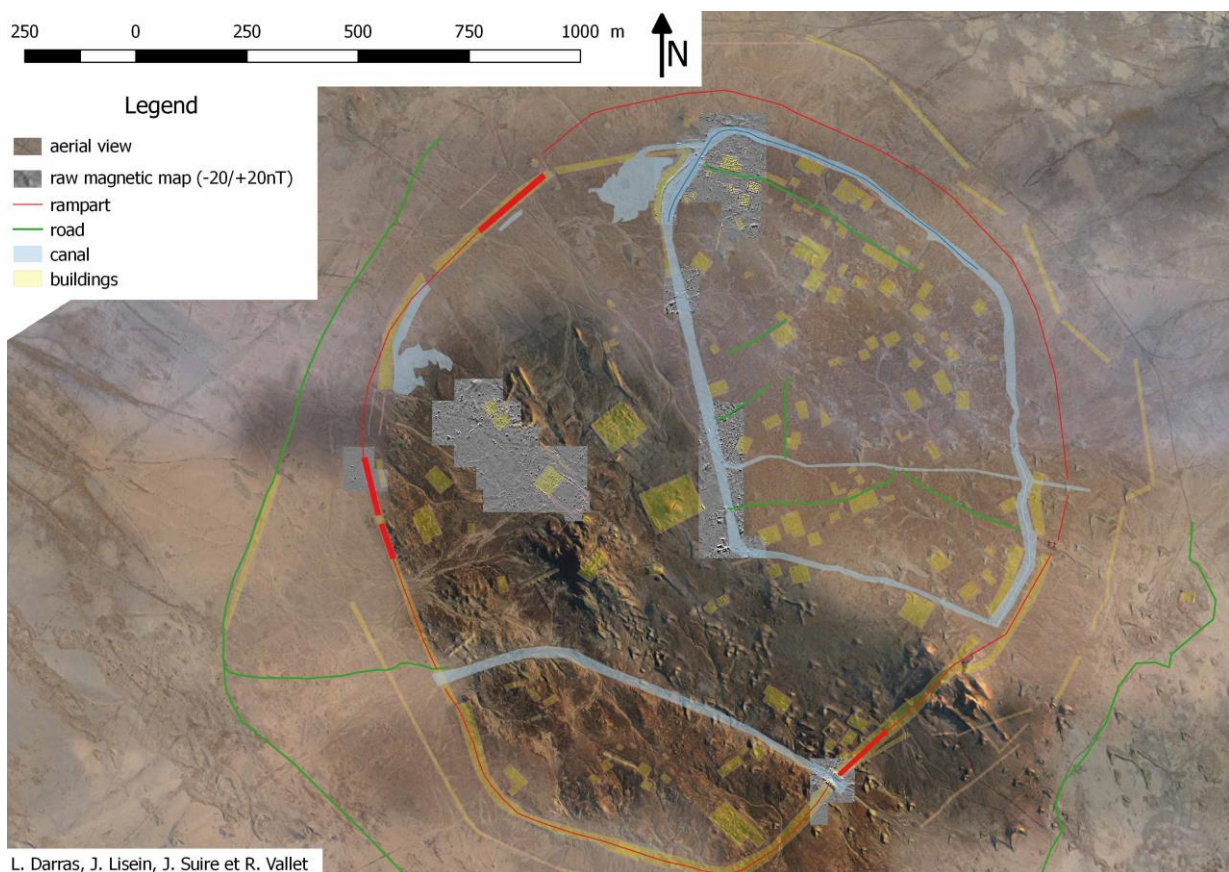


Fig. 10a (left): South Canal raw magnetic map (-20/+20nT), 10b (right): magnetic map interpreted.

CONCLUSION

The geophysical maps obtained from the prospectings carried out in 2019 provided a lot of information and combined with others maps allowed to deeply renewing the plan of the city (Fig. 11). In the areas north of the E.Babbar, they have uncovered regular house plots (B48-49) possibly associated to agricultural plots nearby, while building B50 appears to be a major temple of the city. Concerning the hydraulic urban network, huge progress in our knowledge have been done in few weeks thanks to geophysics, if one compares with the previous situation when the mere existence of canals was discussed for decades – and without any factual evidence. Nevertheless, this is just the beginning of a new field program and much work remains to be done. Only 18ha out of 200ha have been surveyed and most of the canal system, including its connection to the regional network supplying the city, remains to be discovered. A specific attention to the city walls (around the ‘Parrot’ and the north-west city gates in particular) and their relations with the canal system would also be essential to understand the structure of the site.



L. Darras, J. Lisein, J. Suire et R. Vallet

Fig. 11 – Sketch map of Larsa with 2019 raw gradient maps (-20nT/+20nT).

IV- REPORT ON LARSA INTRA-SITE SURVEY

Jessica Giraud

During four weeks, from 24 May to 23 June 2019, Archaïos (Fig. 1) established a surveying methodology to study a 200-hectare Mesopotamian urban site and a strategy for collecting geographical, edaphic and archaeological data that responded to the intrinsic (type of site, natural and anthropogenic destruction of the site) and extrinsic (climatic, financial and human conditions) constraints of the terrain.



Fig. 1 – The Archaïos surveying team in Larsa ©Mathilde Mura (Archaïos).

Because of the tough general conditions of the mission, the survey could not be completed. However, the preliminary results are particularly abundant. In concrete terms, most of the northern half of the site has been explored, studied, mapped and collected. This represents precisely 46% of the site (795 collection units - 394 squares), 9,000 ceramic sherds collected and thousands of artefacts and ecofacts, including 306 objects. The large amount of material did not allow the dating of all the material collected, only 33% of the material collected could be dated (Fig. 2).

Despite the fact that we were not able to finish the survey, the analysis of satellite images and the confirmation of certain elements in the field in spring and again during fall season (excavations and geophysical survey, this volume) allowed us to have a more complete and global image of the general layout of the site. At a time still undefined, but certainly at its apogee (early second millennium BC), the *intra muros* city of Larsa covered a maximum of 200 ha. Sub-circular in shape, it was surrounded by a large wall and probably a canal. A wide canal crossed the city from north to south. To the south, however, it remains difficult to follow. Within this enclosure, the city's urban network is just beginning to be apprehended, with the highlighting of neighbourhoods that differ in terms of density of structures visible on the surface, richness in terms of quantity and type of artefacts and urban arrangement.

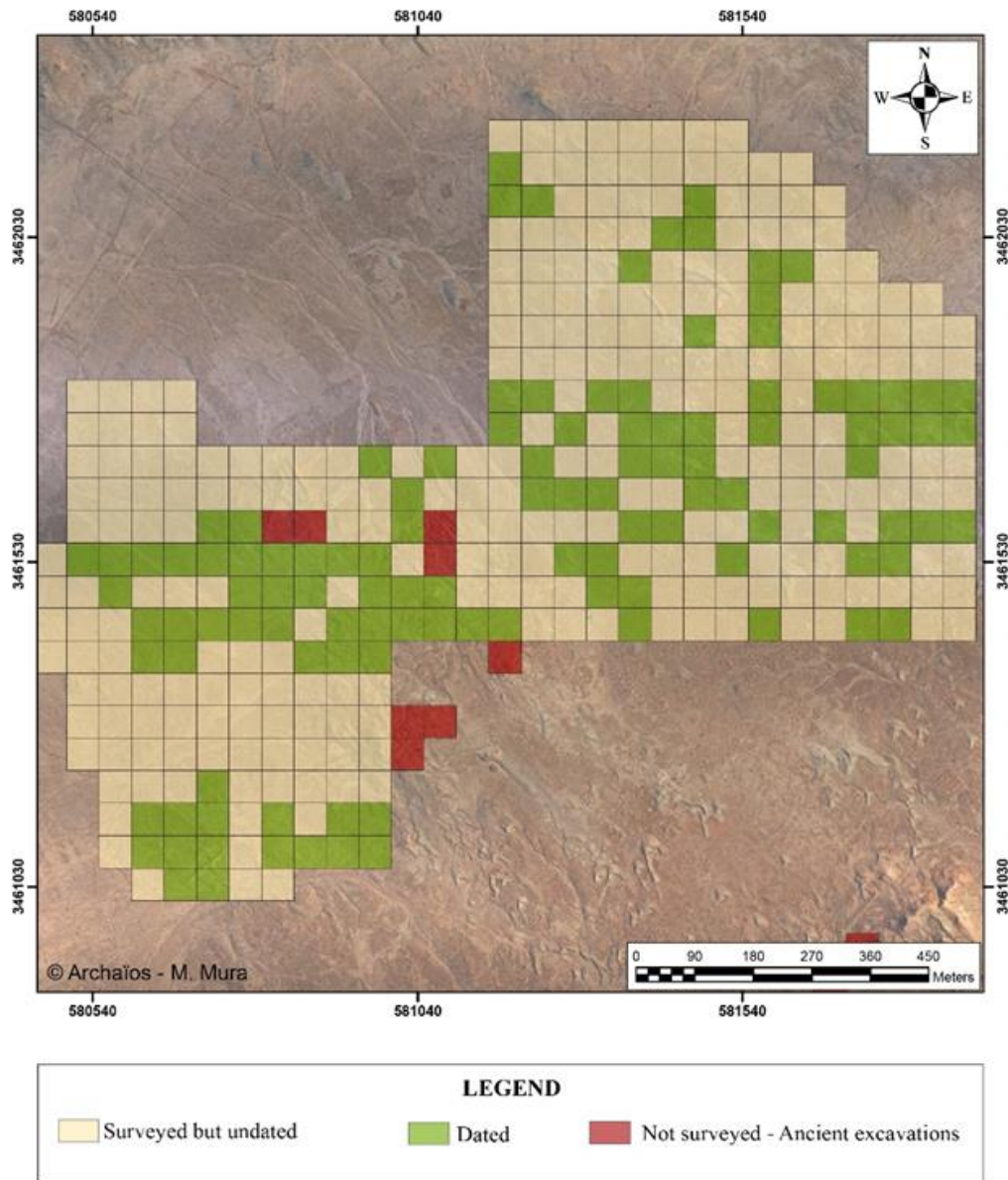


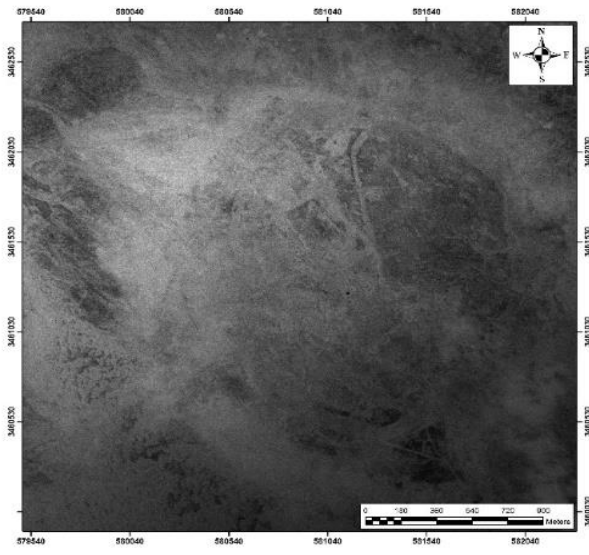
Fig. 2 – State of progress of survey and dating.

OBJECTIVES

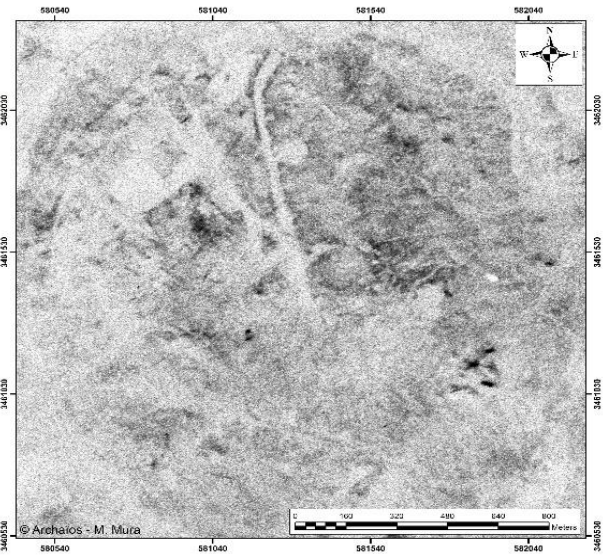
The archaeological site of Larsa had never been subject to a systematic and intensive survey. The site is therefore only partially known through punctual excavations. Members of the previous team led by Jean-Louis Huot (Joël Suire and Axelle Rougeulle in particular) carried out in the 80's a random architectural survey of the site, helped by the discovery of aerial views. A systematic study of the layout of the site was then planned by Régis Vallet, but could not be realized due to the stoppage of work in 1990. Current survey therefore has two main objectives, that of capturing the site as a whole in order to help define its internal structure, and that of understanding the evolution of this structure over time. At the same time, survey will also help define priority interest excavation areas in the future.

METHODS

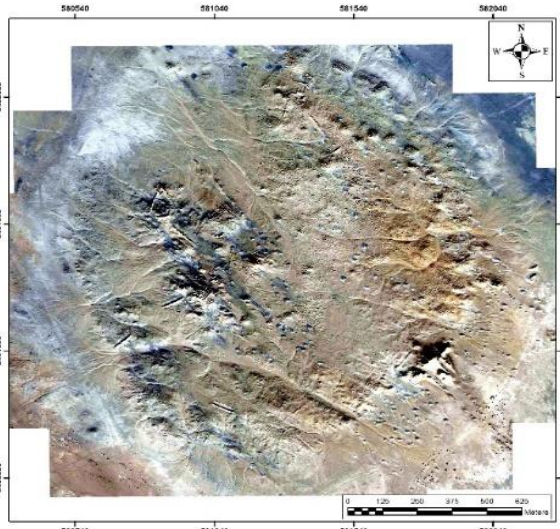
The usual methodology for intrasite survey is generally based on a grid division of the site and a 100% collection of visible material from the surface of each square. However, the weak topography of Larsa, its size (200 ha) and the abundance of material on the surface led us to establish a new methodology. This methodology cross-references data from the analysis of aerial and satellite imagery with data collected on the field. This cross-referencing of data is possible using a GIS (Geographic Information System).



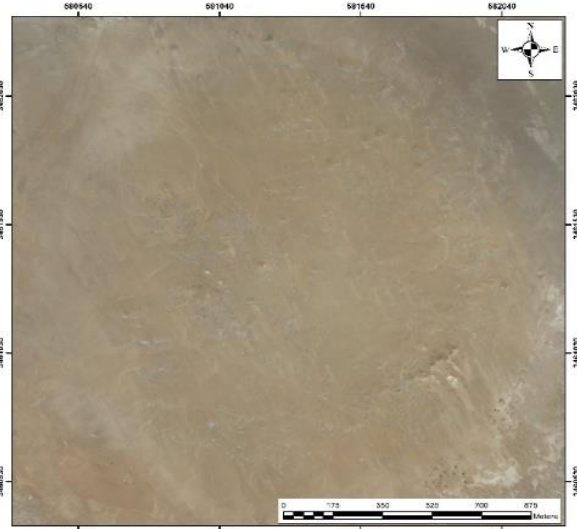
Larsa, CORONA image, May 1968



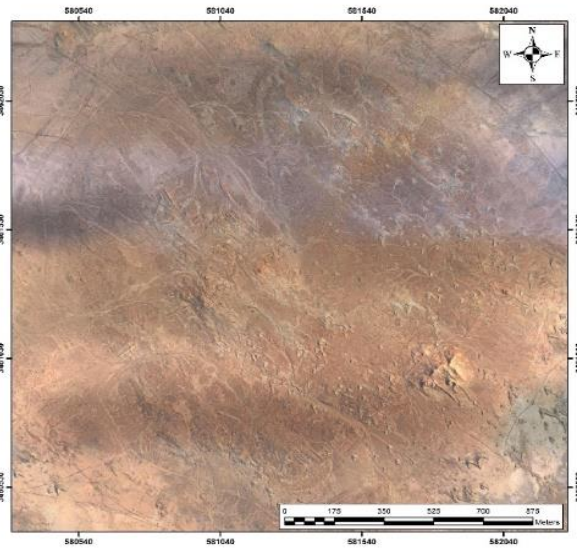
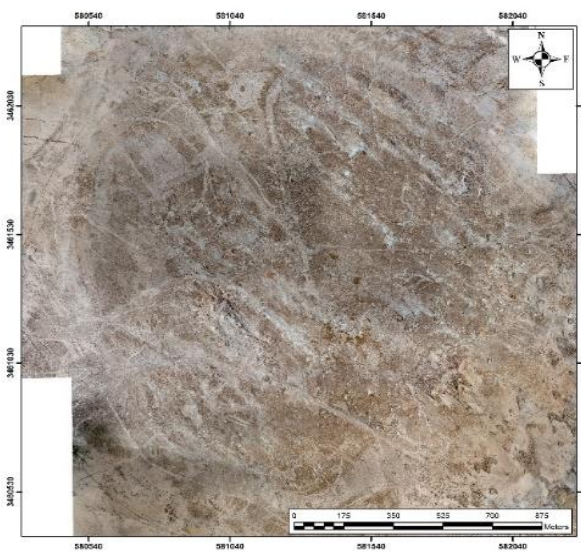
Larsa, CORONA image, January 1967



Larsa, Bing, GeoEyes mosaic, December 2010



Larsa, WorldView image, 2 July 2015



Larsa, ICONEM (left) and Jonathan Lisein (Certus Visio, right) captures

Fig. 3 – Larsa in the different images used.

1- Method of data collection via the analysis of aerial imagery under GIS

Survey is based in part on a preliminary study of aerial and satellite images that will later constitute our map bases. Each new element detected by photo-interpretation and collected during the survey will be digitized and stored in a file by type.

a- The projection system

For this project, we chose to use a metric projected geographic system, the UTM, because it allows more accurate location in the field than the geographic coordinates, Latitude Longitude (WGS 84) in degrees. For Larsa we are therefore in the UTM section 38S.

b- Images used (Fig. 3)

All the images selected for the study of Larsa are “vertical aerial images”. These are shots taken with the lens in the vertical position. Each type of image provides different types of information during photo-interpretation.

- Corona, May 1968 and January 1967, these old images were downloaded from the USGC website.
- GeoEyes December 2010. Images from GeoEyes satellites - 1 and 2 for which Google has purchased the right to use images for Google Maps. These images were assembled and georeferenced by Mathilde Mura from captures on the Bing server.
- Worldview, July 2015, January 2018 and June 2018. Imagery from DigitalGlobe’s WorldView-1 and 2 commercial satellites. Some of these images were obtained thanks to the collaboration of K. Hanson (Smithsonian Institute).
- Drone images from a UAV flight by ICONEM, and another one by Jonathan Lisein (Certus Visio).

The images thus collected made it possible to anticipate the work prior to the field by doing the photo-interpretation of the site. During June 2019 mission and in the winter of 2020, initial visual analyses of the images yielded many results. Based on this reading, several geographical or anthropic elements were recorded and digitized.

c- Geographic and archaeological data digitized by photo-interpretation

The photo-interpretation allows us to have information on the taphonomy of the site but also on its structural layout.

- *Data Natural Taphonomics*

The study of the images has enabled us to digitize 4 types of geographical elements that will allow us to carry out an in-depth study of the morphogenetic dynamics of the site (Fig. 4): (a) the gullies, (b) the wadis, (c) colluvium cones and (d) the dunes. These data provide a map of the areas where sedimentation or alluvium is burying archaeological structures, but also of the areas where the archaeological material has been removed. This allows the taphonomical analysis of Larsa.

- *Anthropogenic Taphonomics Data: Looting*

The study of images has also made it possible to digitize the looting pits, allowing a reflection on the taphonomy of the site (Mathilde Mura, this volume).

- *Archaeological Data*

The study of the images has made it possible to digitize archaeological data such as: (a) Buildings, (b) Streets and (c) Hydraulic networks. This data gives us the layout of the old city, districts and streets (Fig. 5).

The study of these images has also allowed us to define the collection units for survey, combining a grid and topographical/morphological elements of the site.

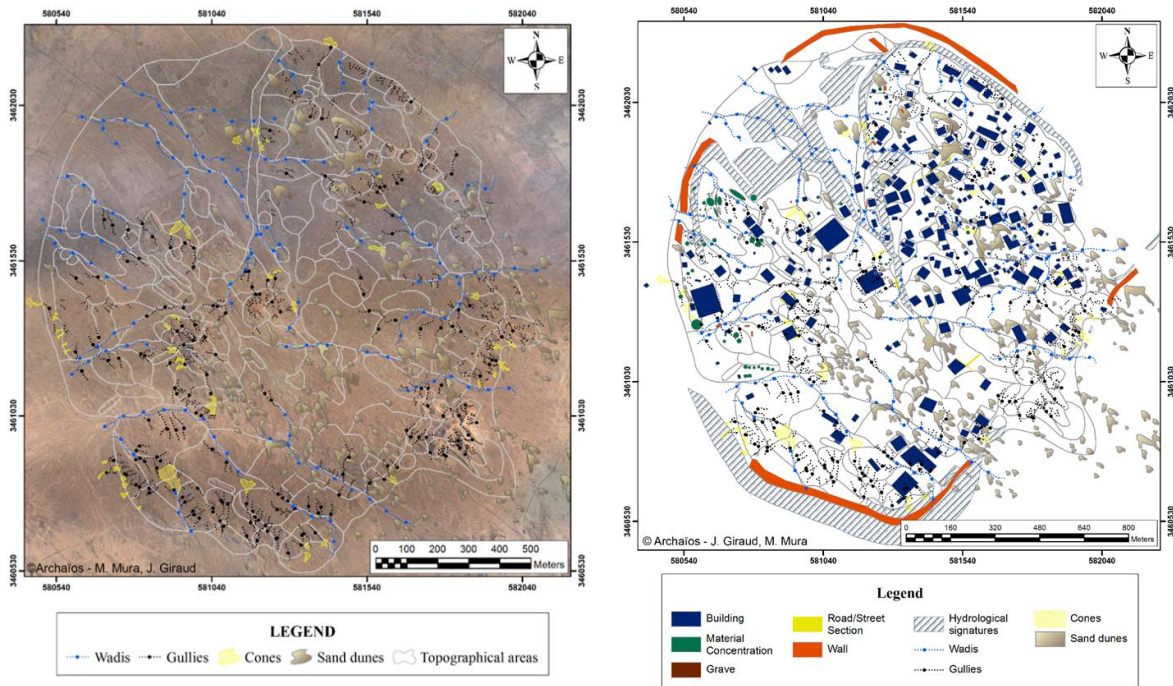


Fig. 4 (left) and 5 (right) – Geographical elements of the morphogenetic dynamics of Larsa (left); Archaeological and geographical remote sensed (right).

2- Field data collection method

a- Definitions of collection units

The collection method is based on a collection unit derived from the intersection of two different grids: a morphological grid and a metric grid (Fig. 6).

- *The morphological grid*

Larsa is a site with little topography, so each micro-relief has its importance, each mound or depression corresponds to an archaeological ensemble (buildings, street and canal). Isolating these micro-topographical elements means isolating areas of different anthropogenic activities and therefore allows for an archaeologically coherent data collection. This zoning was first identified by photo-interpretation of CORONA images associated with Worlview images. These images have the particularity of showing different signatures depending on the moisture content of the soil, which is a very relevant indicator for delineating different areas of archaeological activity that do not necessarily show a marked morphology on the surface. Using this method, the site was divided into different morphological zones, each of which was checked in the field to see if they corresponded to a reality (micro-topography, soil differences, etc.). Then each area was named by the abbreviation TP followed by a number (e.g. TP179 is topographic area 179). A total of 204 topographical areas were identified. The boundaries of these areas are drawn on the GIS.



Fig. 6 – Metric and morphological grid.

- The metric grid

After the topographic grid was established, a second grid was set up to systematically and homogeneously divide the site into 849 squares of 50 m x 50 m. These squares are named by a letter followed by a number that designates the east-west and north-south axes of these areas (e.g. square J23 is in row J and is in column 23).

- The Collection Units

The metric grid is superimposed on the morphological/topographic grid. From there we have squares of 50 x 50 m within which several topographical areas can be found (*Fig. 7*). Similarly, a topographic area can also be distributed over several squares.

Our collection units are established by the intersection of these two grids under GIS. For this purpose, we used the 50 m by 50 m survey grid to *scoop out* the topographic areas and thus obtain the 2 094 separate collection areas. These units are presented using the square and the topographic area in which we are located (e.g., pickup unit "J23 TP35" presents the part of the TP35 topographic area located in square J23).

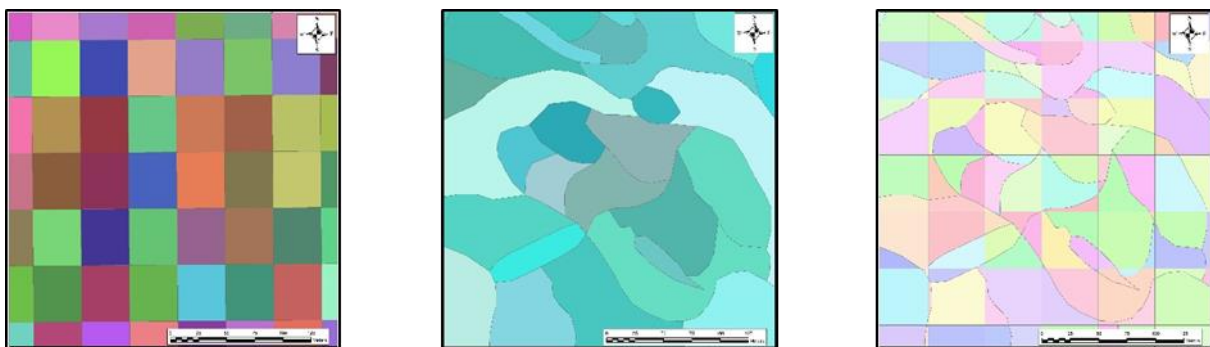


Fig. 7 – Method of creating the pick-up unit: on the left the metric grid, in the centre the topographic areas, on the right the pick-up units, topographic areas cut out.

In practice, the four corners of each square are marked with red sticks (Fig. 8). A team, consisting of one archaeologist and 2 to 3 workers, takes charge of a square, locates the boundaries of the various morphological zones and collects the artefacts visible on the surface by morphological units.

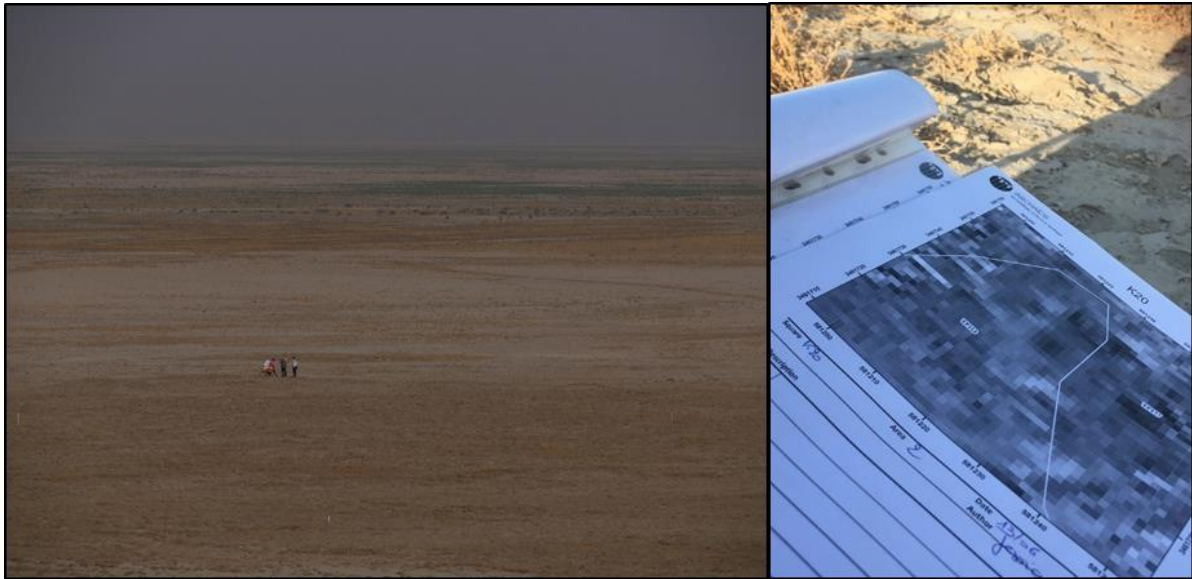


Fig. 8 – Topographical zoning on the Larsa site and the registration form ©Archaios.

b- Definition of the strategy for the collection and processing of material in the field

Collecting the artefacts is an important step because it is this step that will then make it possible to define according to the areas, activities and periods of occupation. It is therefore a question of getting as much information as possible from the field.

- Sampling the collection of material

After several exhaustive collection tests on certain areas, the ceramic sherds being particularly numerous, it was decided to select them as soon as they were collected. Only the diagnostic shapes and sherds were collected, thus the bases, the rim but also the handle or beak elements, and the decorated body sherds. At the same time, all other items, in smaller numbers, were collected in full. These are mainly all available artefacts and ecofacts: metal objects, lithics, production waste, but also possible raw materials exogenous to the site, and shells. Bricks and other immovable elements (such as grinding material) are left in place after their presence has been recorded. If necessary, a photo is taken. The few inscribed bricks, which require further study, are collected.

- Treatment at the collection site

Once all the material has been collected, an initial processing of the data is carried out on site (Fig. 9). It is a sorting, followed by a quick recording, mainly in the form of presence/absence of the different categories with a first counting and weighing. The counts and weights of each category is registered on one card, each card corresponding to a collection unit.



Fig. 9 – Material treatment at the collection site (©Archaios)

3- Method of treating material

After their collection, the ceramics go through a series of stages:

1/ Washing and drying.

2/ Marking: on each sherd, the number corresponds to the square number, followed by the topographic unit number, then a continuous numbering within the collection area. Over 55% of the objects reached this stage, i.e. 5,122 shards. On each object, the number usually corresponds only to the number of the collection area. In the few cases where several objects have been collected in the same area, the numbering is A, B, etc. to avoid confusion with the numbering of the ceramics.

3/ Recording of ceramics: the recording has been reduced to the essentials. It includes the context of discovery (collection unit, square and sector), the diameter of the base and/or opening, the class of form, function, dating and a brief description of the ceramics (inclusions, colour of the walls) as well as other remarks related to particularities such as decorative elements.

3Bis / Object Recording: the treatment of the objects was much differentiated according to the groups. All the lithic, metal, shells and raw materials have not undergone any treatment and are awaiting for the arrival of specialists. On the other hand, the various other objects as well as the macroliths could be washed and then recorded. The registration includes technical information such as dimensions and material, and functional information with object identification and a short description. Some may also be dated.

4/ Dating of ceramics: it is based on morphological comparisons with pottery discovered in stratigraphic context. We therefore used reference works such as the excavation reports published by the various archaeological projects (Larsa, Uruk, Nippur, Northern Akkad Project, Ur, etc.).

5/Drawings: 700 sherds and complete shapes were selected to be drawn from a corpus of 2,800 dated individuals. This selection responds to two imperatives: on the one hand the quality of preservation of the object and on the other hand the representativeness of a form or fragment.

6/ Photography: all of the objects have been photographed as well as the most diagnostic ceramics of each periods.

PRELIMINARY RESULTS

1- Larsa layout via imageries

a- Morphogenetic dynamics

The photo-interpretation of aerial and satellite images has made it possible to apprehend the morphogenetic dynamics of the site through natural and anthropogenic phenomena (cf. Fig. 4 *supra*). Various natural phenomena of erosion and sedimentation were detected. The main cause of erosion on the site is the wind, which is difficult to map, and also water circulation. The water action is visible on the images via numerous (546) ravines and incised wadi (40) detected. Similarly, on the site, sedimentation in some areas may be more important than erosion. It can be colluvial (53 colluvial cones), aeolian (252 dunes) but also alluvial, especially in the north of the site with large flat areas.

These natural phenomena are amplified by anthropic action, particularly those of looting. Looting pits have been counted and digitized: in the 2010 image, 1 841 pits and in the 2019 image, 2 298 pits were identified. Out of the 92 hectares surveyed (almost half of the site's surface area) 1,073 depressions have been recognized on the ground. These elements therefore also indicate strong man-made erosion and sedimentation (see Mura, this volume).

b- Interpreted archaeological data

The archaeological elements visible in the images show architectural structures and signatures of hydraulic structures (Fig. 10).

– *Architectural elements*

For the architectural elements, buildings formerly identified and mapped by J. Suire have been reported in the GIS. Then, the reading of recent images revealed other as yet unidentified structures. The total of these elements, now digitalized under GIS consist of 389 architectural elements: single wall, entire building, street or concentration of building materials in an undefined form. For the surveyed northern part, these concentrations were identified in the field to complete the interpretation of the images.

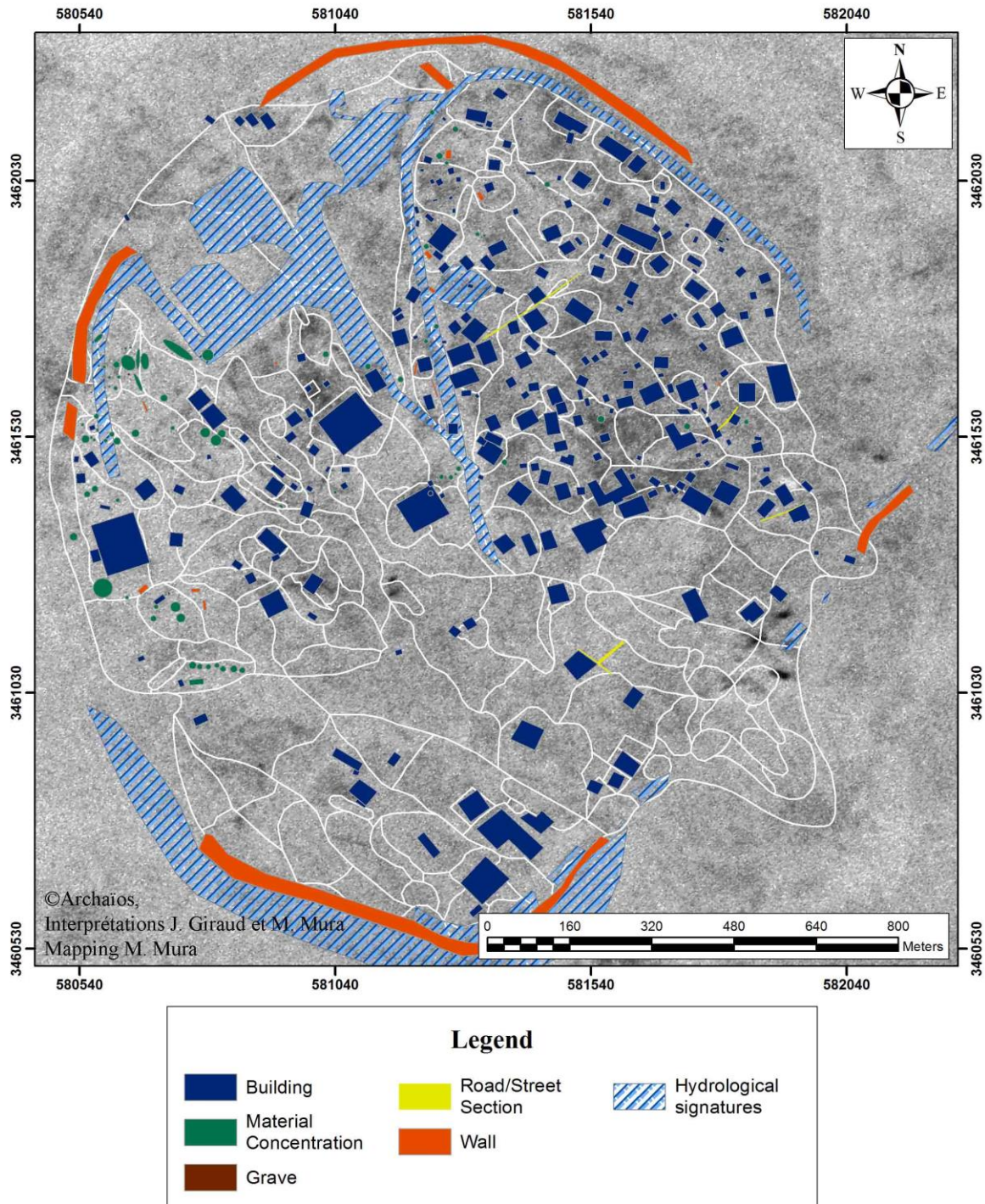


Fig. 10 – Preliminary sketch plan of Larsa (2019).

– *Hydraulic elements*

The hydraulic signatures on the Corona images, on the other hand, consist of a very smooth and homogeneous light grey signature. The first signature from which we worked to identify the others is the one already discussed in the literature (Huot, Rougeulle and Suire 1989, Margueron 2013) as corresponding to a possible canal. Starting from the north of the site and oriented almost exactly along a north-south axis, this line joins, in the centre, the Ziggurat. The geophysical surveys carried out by Lionel Darras (*supra*, this volume) along the line in question, confirms the presence of a canal (henceforth now known as the ‘Grand Canal’), as well as the existence of other canals across the site. As for our survey, eleven such lines have been identified, most of them already known since the 80’s, as well as what appears as large water retention basins of very different sizes, especially in the northwest quarter of the site. If not modern and natural (due to erosion, fine clay filling brought by wadis etc...) the use of these latter structures could be very different depending on each case: detention, port, arsenal, etc... At least one of these basin, immediately west of the Grand Canal and served by the northern peripheral canal, was most certainly a harbour (see Darras, *supra*).

Preliminary conclusions

All these data allow to put forward new proposals on the structure of Larsa, in coordination with the other components of the Larsa project (geophysics, topography, archaeological excavations) and their own observations. The city must have been sub-circular in shape, surrounded by a wall coupled with an inner (at least to the north) and possibly an outer (at least to the south) canal. The inner channel is visible over long stretches in most corona images and is now proven by geophysical survey (Darras, this volume) to the north of the site. This canal would run along an enclosing wall which is only visible on small sections. The outer channel is one interpretation that may explain the large, smooth, grey areas visible in the two Corona images. These can be seen all around the site. We have shown it on the map only in its southern part (Fig. 10), because it is the only place where the channel can be defined in its width, on the rest of the circumference we lose its outer limit. East of the city perimeter, a wall (dyke ?) and a canal are visible on the images, perhaps one of the canals is linking the town to the larger irrigation systems of the former irrigated fields of Larsa. Inside the city, the Grand Canal is only the continuity of the inside enclosure channel. It runs down to the south of the Ziggurat. North of the Ziggurat, a line with a hydrological signature seems to link the Grand Canal to the possible large water reservoirs already mentioned northwest of the city. But a wadi follows this route, so the presence of a junction channel at this location remains hypothetical.

In terms of urban network, we have three areas that stand out. Especially the one in the north-east, which has a very dense architecture of rectangular buildings, some streets are visible. The density of looting and objects spotted during survey show a vast area of rich habitat. The north-western district, on the other hand, has larger and wider buildings. It is in this area that the Nur Adad Palace, the Ziggurat, B50 Temple and B48, a large building, were located. This less densely built-up area therefore presents a central organization of importance, with different functions such as religious, palatial and administrative. The whole southern part of the site shows some large buildings but with a much lower density, at least on the surface. Survey should give us a better understanding of the function of this immense area. This remotely sensed data shows us a picture of the city of Larsa on a condensed time scale. These surface data show the site of Larsa at different periods. The dating of the collected ceramics should allow a better identification of the structure of Larsa for more precise periods, which will allow later on to show the evolution of the structure of the city.

2- Larsa in the light of the data prospected.

The survey made it possible to associate the field data with the GIS, allowing preliminary analyses.

a- Analysis under GIS: method

For each unit, all data collected in the field were entered daily. Thus each polygon can be queried on the following data:

- The number and weight of ceramics collected
- The number and weight of lithic objects
- The number and weight of semi-precious stone fragments
- The number and weight of shells
- The number of stone tableware fragment
- The number of fragments of ivory or mother-of-pearl elements
- The number of small objects that do not belong to the previous categories (figurines, wheels or miniature elements, inscribed brick, etc.).
- The number and weight of ceramics kept
- The number and weight of lithic fragments
- The number and weight of metal elements
- The number of macro-lithic elements
- The number of slag

Once the data are entered, we can query the data by squares and/or topographical areas. When the collection areas were merged, a query was performed to sum each field and obtain the field value of the newly created polygon. In this way, we can query all the data collected according to the classic intra-site method by squaring and according to the morphological grid adapted to Larsa for a more precise vision of the topographic areas (Fig. 11). The fields will be queried individually or cross-referenced as necessary. In this way, it will be possible to extract the distribution maps of the collected elements according to their weight or number. It will be possible to define zones of relative concentration or to highlight the absence of certain materials in some sectors of the site. The production of complete histograms of the collections carried out will also make it possible to consider not only the proportion by zone, but to compare the zones between them.

- *Density of ceramic material*

Looking at the density maps of ceramic material below (Fig. 11-12), the distribution by square shows a higher density of ceramic material on the western part of the site and on the central part. On the density map per square meter associated with the morphology zone, distinctions appear clearly. Some of them are particularly rich in ceramics, such as the west, i.e. the areas where we have imposing buildings with representative functions of administrative, religious and/or palatial type. Other areas show average densities, especially in the east, where the densest habitat was observed in the images. This area is punctuated by morphological zones with denser repartition of material. These areas correspond to large groups of buildings that have been identified by imagery; dating these groups of ceramics should make it possible to date the archaeological structures. Finally, there are areas with lower densities, areas that we have interpreted as canals, especially the eastern and central areas of the city. Resumed survey around the perimeter of the site, to the northwest and to the south should provide a clearer picture of the density of the material and define an accurate mapping of the entire site.

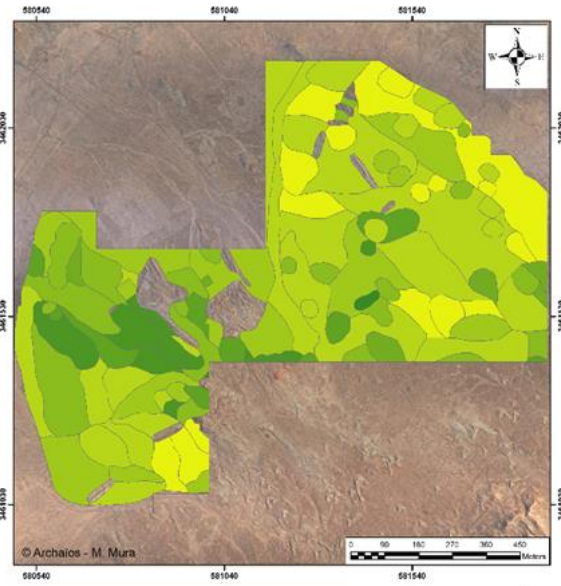
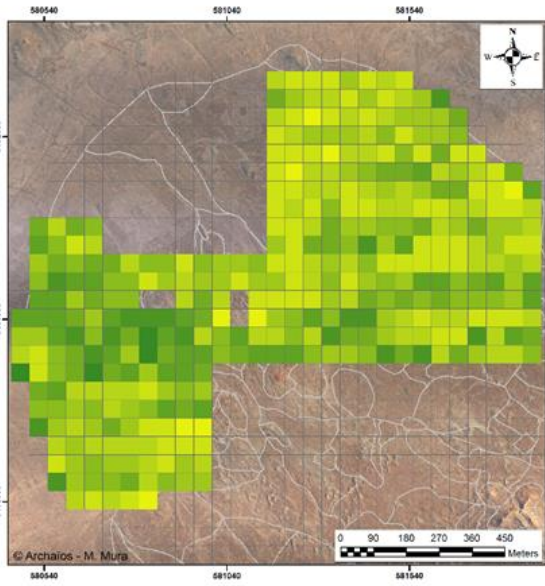


Fig. 11 – Number of ceramics collected by sq. meter according to the square and morphological grids.

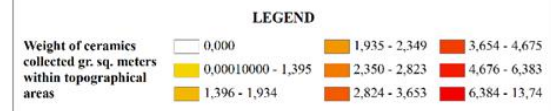
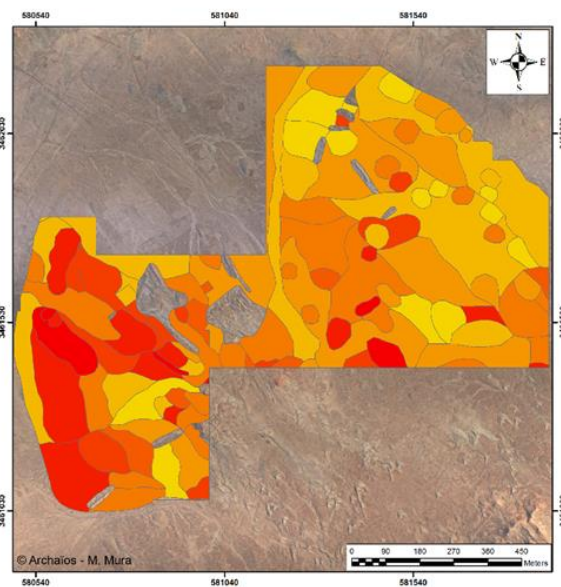
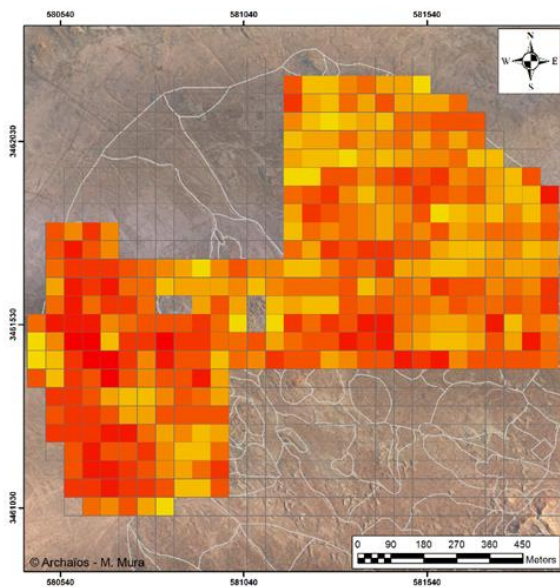


Fig. 12 – Density of weight of ceramic collected by sq. meter.

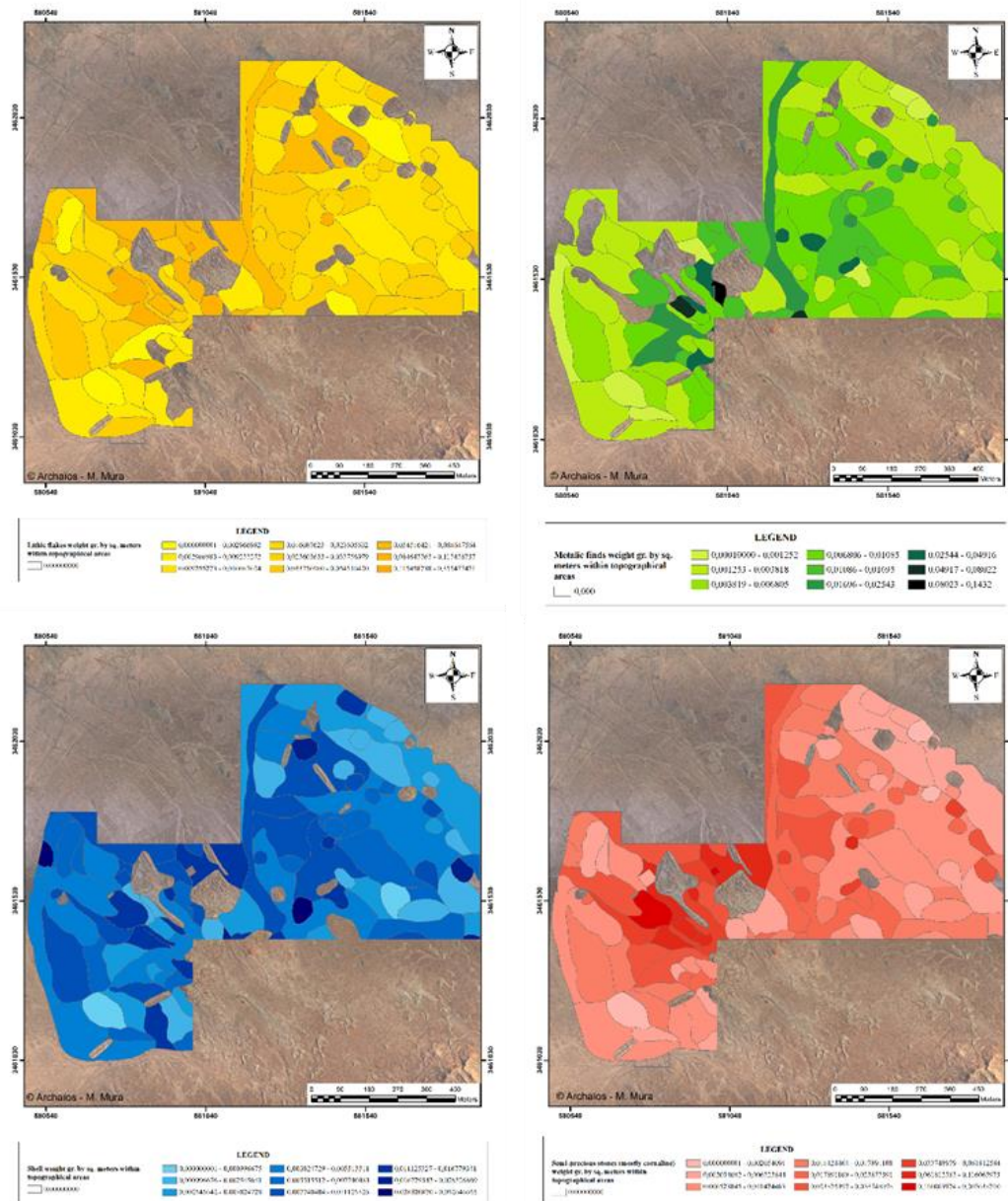


Fig. 13 – Distribution of material by morphological area.

- Miscellaneous material density.

Survey also shows a different organization depending on the material (Fig. 13). The small lithic (flake, scraper, blades, lamellae) was found mainly in the north-east of the site, beyond B48 but also in the centre of the site. These are the areas where few archaeological structures have been identified through image analysis. Metallic material (object fragment) was found in large proportion in very small areas. It would be interesting to couple this result with the few slags that we could find to see if these objects are associated with metal workshops or particular buildings. The shells were found mainly in the northern part of the site as well as on the location of the canals. This density in the north would again support the idea that we have a large reservoir of water in this area. Surveying the north western part should confirm or disprove this hypothesis. The location of the highest densities of semi-precious raw materials (mainly cornelian) overlap the western zones of the site, the 'representation' area, that of temple B50, Nur Adad Palace and the Ziggurat. This spatial association is quite logical, as one can think that these neighbourhoods by virtue of their function could bring a greater wealth.

- *Distribution of objects*

Of all the objects found, if we take only a few types, it is interesting to note that the beads and rings in shells and semi-precious material were found more particularly in the administrative area (Fig. 14). The model of wheels and cartwheels were found rather in the habitat area. This distribution further corroborates with the functions determined from the analysis of the urban layout.

The inscribed bricks are mainly located in the centre of the site, along the canal. Either these bricks belong to the canal or to massive buildings that are built around it.

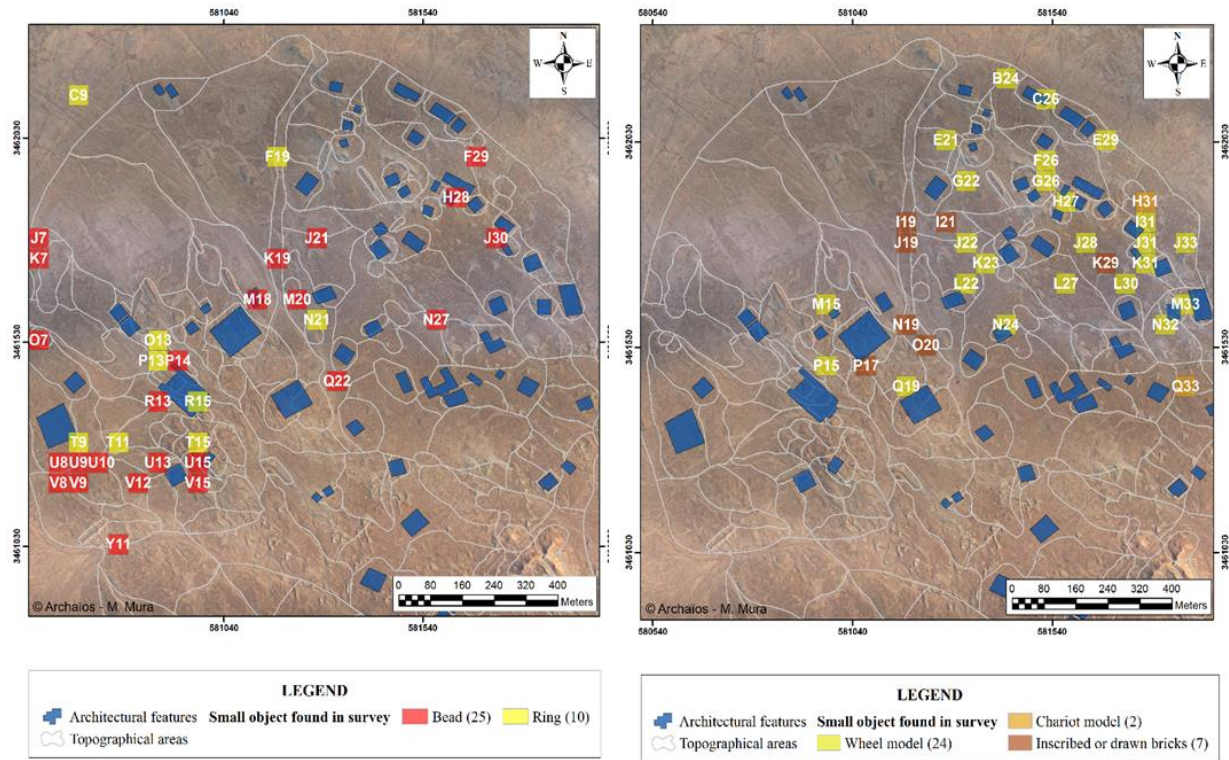


Fig. 14 – *Distribution of the objects collected.*

- *Preliminary analysis by period*

Concerning ceramics, the dating table made by ceramologists (V. Ossellini, J.- J. Herr, M. Zingarello and J. S. Baldi, see their contributions in this volume) is connected *a posteriori* by the collection area, to the GIS. One can thus envisage the distribution of the types and periods recognized (Fig. 15). Only 33% of the 46% of the site has been dated, so the data are still very incomplete and does not allow yet a precise study of the general evolution of the main areas of the site. However, some areas may have shown more or less distinct periods of time. The fourth millennium, Uruk and Djemdet Nasr periods, are poorly represented, on the northern part of the site, and no Ubaid was found. The 3rd millennium is a little better represented, everywhere on the site but preferably in the central-west part. The Isin-Larsa period is the most represented on the whole site and more particularly on its eastern part. The Kassite period is rather represented on the western part of the site and to the south of the prospected area. The Neo-Babylonian and Seleucid periods are represented to the west of the site and to the south of the prospected zone.

There are still many ceramics that remain unknown to us. Excavations will certainly make it possible to clarify these. Ceramic analysis is not advanced enough to be able to give precise dates to the established morphological zones yet. Nevertheless, by square and on a selected area we can notice some tendencies. For instance with the example of Buildings B48, B49 and B50, surveyed and dated (Fig.16). This area shows a clear predominance of the Isin-Larsa period on B50, with occurrences of 3rd Millennium sherds. B48 has both 3rd Millennium and Isin-Larsa ceramic represented in high percentage, where B49 has a more complex surface collection, with mixed 3rd millennium, Isin-Larsa and Kassite occupation. The Kassite material furthermore, is the most

represented in between buildings (B49 and B50). Excavation should allow clarifying the situation of those buildings/areas apparently occupied over a long period. The Old-Babylonian occupations are already confirmed (see B48 and B50 excavation reports, this volume), probably covering deeper 3rd millennium levels, but interestingly the Hellenistic occupations found by the excavations on surface of both areas were totally invisible in prospection in B48, attested by very little material in B50. A fact that calls for caution on historical inferences based on surface data.

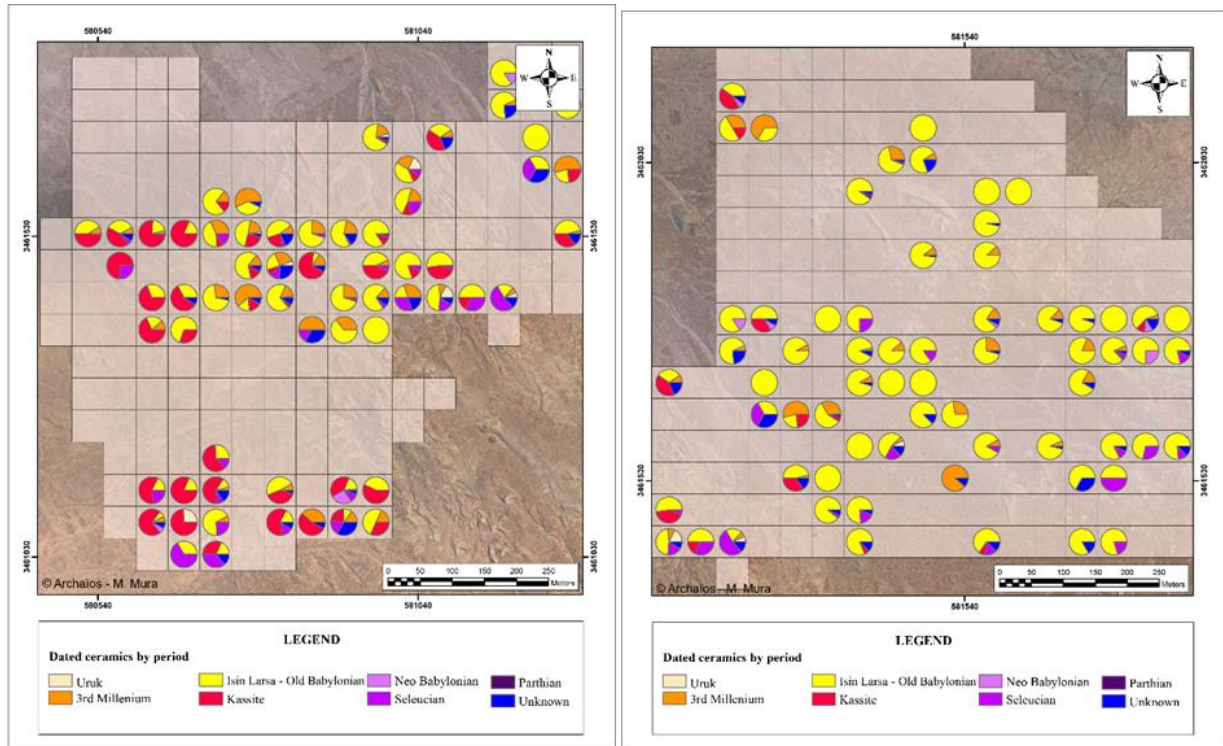


Fig. 15 – Distribution of different surface dates in Larsa.

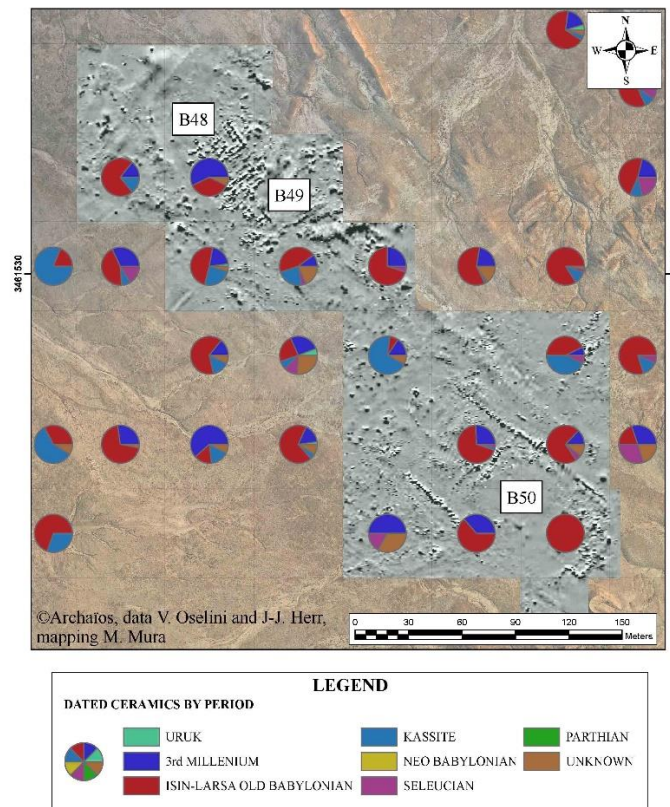


Fig. 16 – Date ceramics by period around buildings B48, B49 and B50.

V – PRELIMINARY REPORT ON THE POTTERY FROM THE SURVEY OF LARSA

Valentina Oselini and Jean-Jacques Herr

METHODOLOGY OF RECORDING AND DATING

The contexts

The survey collection consists of a selection of the diagnostic sherds, which was primarily made directly on the field. The selection was washed at the expedition house, and then, a first quick analysis of each context has been realised by dividing the materials per functional categories and chronology. Considering the entire surface assemblage, we preliminary identified four functional categories, which correspond to the approximate first use of the vessels, by considering their shape, surface traits and the types of fabric. They are: the table ware (i.e. platters, bowls, cups and goblets), the storage ware (i.e. bottles, jars and *pitthoi*), the ceramic used in food processing and preparation (i.e., platter-bowls, trays, strainers, vats) and finally the cooking ware (mainly related to the cooking pots). An additional category consists of several types of a peculiar shape including potsherds related to large storage vessels, top-drains or coffins. All the other shapes, i.e. the lids or the stands have been considered separately. This distinction allows us to have a preliminary assessment of the distribution of the different shapes on the site and to possibly identify significant clusters for the interpretation of the structures below the surface. The chronological subdivision follows the classic Southern Mesopotamian periodization (see below) and all the typical shapes characterizing each period have been selected for the later more detailed analysis. According to their chronology and their function the potsherds were counted, finally they were separated into different bags per period to facilitate further investigations for each specialist.

Dating

For dating of our materials, we used the traditional classification of the Mesopotamian historical periodization and we prefer relating to the relative and not absolute chronology (when mentioned, it refers to the conventional “Middle Chronology”). We inserted the materials into a long time-span, since a new stratigraphic sequence has not yet been elaborated based on radiocarbon analysis or dated by epigraphic documents.

The dating of the 2019 survey collection at Larsa is mainly based on morphological comparisons with the stratified pottery materials excavated during the past years at Larsa and Tell el’Uwaili and published in the preliminary reports of the 1978-1985 archaeological campaigns (1983-1991) and in the final report edited by J. L. Huot (2003) (Table 1). Moreover, the stratified materials from the other southern Mesopotamian sites, i.e. Uruk or Nippur have been considered as parallelisms. Therefore, the Larsa survey collection consists of potsherds dating to the Uruk Period (4th millennium BC), to the ‘transitional’ Jemdet Nasr period (end of the 4th - early 3rd millennium BC), to the Early Dynastic, Akkadian and Ur III periods (since 2900 BC to the late 3rd millennium BC), to the Isin Larsa/Old Babylonian period (early 2nd millennium BC), to the Kassite period (late 2nd millennium BC), to the Neo-Babylonian, Seleucid and early Parthian periods (6th - 2th/1st centuries BC).

The closest reference for the ceramic possibly dating to the Uruk period at Larsa is the assemblage found within the sounding excavated in 1985 on the eastern mound at Tell el’Uwaili (Calvet 1991). The Late Uruk period, indeed, is well represented in levels A and B. Further comparisons can be found considering several southern Mesopotamian contexts and the sites located in Khuzestân, i.e. Uruk (Haller 1932), Abu Salabikh (Pollock 1987, 1990), Tell Uqair (Lloyd and Safar 1943), Susa (Le Brun 1971, 1978; Wright 1981, 1985) and Choga Mish (Alizadeh 2008).¹

¹ We wish to thank J. S. Baldi, who developed the preliminary evaluations on 4th- early 3rd millennium pottery.

Datating	Periodization	LARSA						QUEILI	
CONTEXTS		E.BABBAR	B.33	B.59 B.27	Sounding JVIII	Sounding HXI	JN grave	N-E sounding	E sounding
4th mill. BC	<i>Uruk</i>					↑			B A
3100-2900 BC	<i>Uruk-JN</i>					X		X	
2900-2350 BC	<i>Early Dynastic</i>		X			X	X	X	
2350-2100 BC	<i>Akkad</i>								
2100-2000 BC	<i>Ur III</i>					X			
2000-1790 BC	<i>Isin-Larsa</i>			X	3 2				
1790-1595 BC	<i>Old Babylonian</i>				1	X			
1595-1050 BC	<i>Kassite-Isin II</i>					X			
1050-4th C. BC	<i>Neo Babylonian-Achaemenid</i>	X							
4th- 1st C. BC	<i>Hellenistic/ Seleucid Parthian</i>	X							

Table 1 – Chronological references from the excavated stratigraphic sequences at Larsa and Tell el’Uwaili.

The pottery materials found in 1967 in sounding HXI at Larsa were used during the oldest fieldworks as the first significant chronological reference for all the periods since the Jemdet Nasr to the Kassites. The sounding, indeed, was about 12 m deep and revealed that the site was possibly founded in the 5th millennium BC, with a consistent occupation in the first half of the 2nd millennium BC (Parrot 1968). More precisely, Jemdet Nasr pottery materials at the site of Larsa were found in a collective grave excavated at the north-western periphery of the site (David 2003). The 3rd millennium BC materials are comparable with the assemblages found during the excavations of the small soundings in the north-eastern part of the site of Larsa (Calvet 2003a) and in the Building B 33, which lies in the north-eastern sector of the residential area (Thalman 2003). For what regards the early 2nd millennium BC pottery, the diagnostic types for the Isin-Larsa and Old Babylonian periods perfectly fit with the pottery assemblage excavated at Larsa during the previous archaeological campaigns, which has been found within the so called “Old Babylonian houses” (B 27, B 54 and B 59, see Calvet 2003b) and in the JVIII sounding, carried out in 1970

(see Calvet, Huot and Minsaer 2003). The diagnostic morphological types of the Kassite period find comparisons in the materials found into the uppermost levels excavated in sounding HXI at Larsa and published by A. Parrot (1968). Moreover, there are other references for the Southern Mesopotamian pottery dated to the second half of the 2nd millennium BC in the levels I-III of area WC at Nippur (Zettler 1993), in the recent excavation at Tell Khaiber (Campbell et al. 2017) and in the Kassite levels at Isin (Kaniuth 2017). Furthermore, the volume edited by Armstrong and Gasche in 2014, which includes several data on types and shapes from the entire Mesopotamian area dating from the Ur III to the late Kassite periods, was also used as reference. The ceramic materials collected in the field and dating to the later periods were identified thanks to the comparisons with the entire shapes and the potsherds from the E.Babbar area, excavated in 1983 (Lecomte 1989, Huot 1989). Other references are the Neo-Babylonian levels at Ur (Woolley 1962), at Nippur (Mac Cown, Haines and Hansen 1967), and the materials published in the NAPR 1989. The pottery dating to the 6th-5th centuries BC finds comparisons with the materials found into the later graves excavated at Uruk (Salje 1992). Finally, the Hellenistic and Seleucid-Parthian pottery previously excavated at Larsa was used as term of comparison for the few potsherds possibly dating to these periods collected on the field.

The single sherds

Beyond the first rough selection, each potsherd recorded has individual description into an Excel spreadsheet which includes information about original context (collection unit, square and area), diameter, shape, function, dating and finally a short account of the type of inclusions, of the colour of the former clay and of other specific peculiarities, such as the decorative patterns. This dataset forms the basis for further studies on the distribution on the field, when completed and related to the GIS system (managed by J. Giraud and M. Mura), and for the more extensive analysis on the ceramic materials (typological, technological and functional studies).

Drawings selection

About 850 potsherds on about 2800 dated have been drawn during the two campaigns of 2019, by A. Othman and L. Munduteguy, then digitalized by Adobe Illustrator by V. Oselini and L. Munduteguy. This assortment was based on different criteria. First, we have carefully chosen all the entire or nearly entire vessels, then, we selected at least one specimen for all the different types found, both diagnostic for each period or peculiar. If possibly, we also represented the different varieties of each type recognised. Finally, we draw enough shapes to show all the typologies of vessels for all the periods identified.

Samples selection for further analyses

About 100 samples among the potsherds dating to the Isin-Larsa, Old Babylonian and Kassite period and collected in different areas of the site have been selected for further analysis by V. Oselini (in charge of the study of the 2nd millennium BC pottery). The selection was realised in order to make macroscopic observations of the surface technique and fabrics, and finally to possibly carry out archaeometric analysis to define the characteristics of raw materials chosen by the potters during the 2nd millennium BC. The samples have been previously drawn and photographed and have been approved by the Ministry of Culture, State Board of Antiquity and Heritage, Department of Museums, Directorate General Office of the Republic of Iraq for exportation to Europe. Although the ceramic materials from Larsa come from the surface and not from stratified contexts, their quality and quantity and their unequivocal chronological attribution, due to precise parallels with previous excavated and stratified materials, make them reliable for further analysis.

RESULTS OF THE PRELIMINARY ANALYSIS

The total amount of ceramics collected consists of about 9000 potsherds and 2800 of them have been dated and recorded during the first campaign of 2019, in June. The 56% of the pottery analysed dated to the beginning of the 2nd millennium BC (traditionally known as “Isin-Larsa” and “Old Babylonian” period), the 17% dated to the second half of the 2nd millennium BC (“Sealand Dynasty” or “Kassite” period). The 11% of potsherds dated to the 3rd millennium, while 7% could be ascribed to the general Neo-Babylonian, Seleucid and early Parthian Period (6th-2th/1st c. BC). For the second half of the 4th and the beginning of the 3rd millennium (Uruk and Jemdet Nasr periods) we have found only few potsherds, corresponding to the 1% on the total, and finally we have 8% of undetermined shapes (Fig. 1).

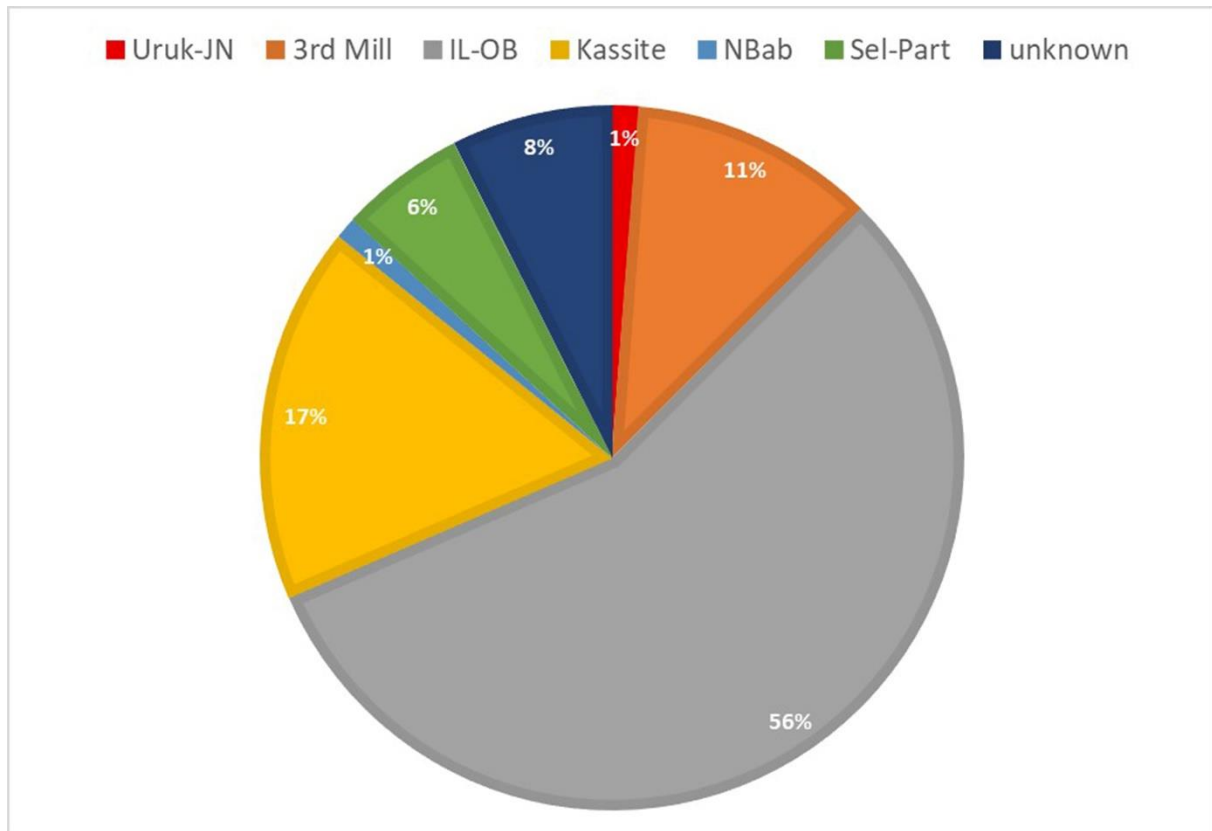


Fig. 1 – Percentage of potsherds per period (total number of sherds considered: 2804).

Isin-Larsa and Old Babylonian Period Pottery

During the survey, many diagnostic shapes dating to the first half of the second millennium BC have been identified (Fig. 2, Plates I and II). Among the table ware, the goblets with sinuous profile and ring base (O13.TP5.15, J33.TP29.2) or convex base (M21.TP172.1, K25.TP17.4, K25.TP174.5), are the most common and representative shapes dating to the 18th century BC. The wide platters with inward bevelled and thickened rim (O14.TP46.3, H25.TP30.6), the conical bowl with inward rim (J29.TP35.7, J31.TP35.1) or profiled rim (R9.TP13.11) are well attested. Among the table ware typical of this period, are the wide trays with short, thick and vertical walls and rounded rim (O5.TP16.17). One of the most diagnostic types of early 2nd millennium southern Mesopotamian ceramic assemblage is the small, deep bowl with a low carination and steeply inclined sides, that we found without the typical painted decoration (J25.TP35.8).

Many sherds of casseroles or bowls with straight sides, thickened and protruding rims are frequent within the Larsa survey collection (Q15.TP4.5). Various sherds of deep vats with thickened and outwardly bevelled rims have been also found (J29.TP35.1).

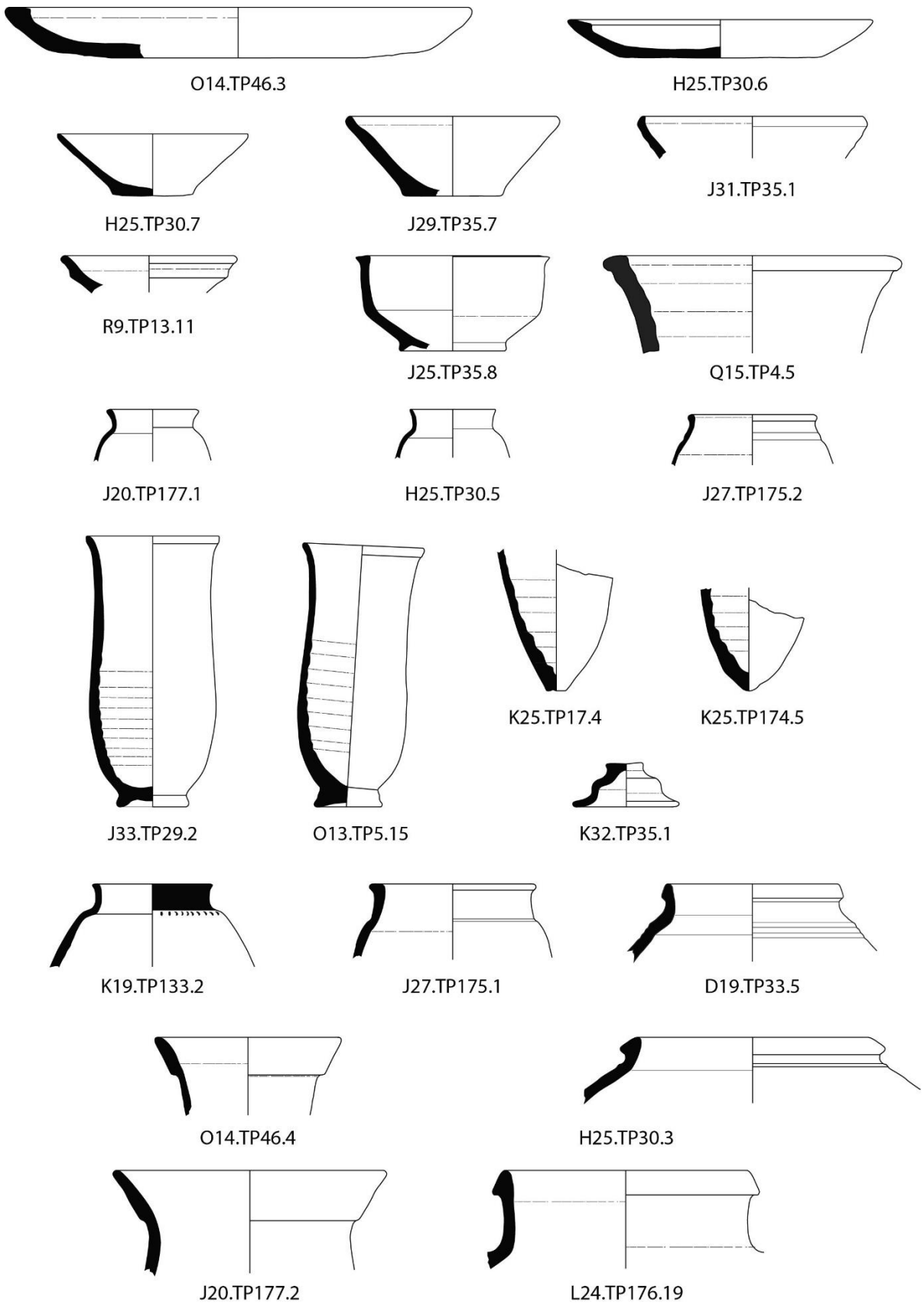


Fig. 2 – Selection of IL-OB pottery from the survey, left to right:

First line: O13.TP15.15, M21.TP172.1 and J25.TP35.8 – Second line: K19.TP133.2 and O5.TP16.1

Third line: IL-OB pottery assemblage from Topographic Area K21.TP177.

Among the closed shapes, chronological indicators of the beginning of the 2nd millennium BC have been found. Small jars with ovoid body and disk base are very frequent, and the black painted decoration on the neck with short segments on the shoulder is clearly diagnostic of the period (K19.TP133.2). Necked jars with ovoid body, convex or ring base and thickened elongated rim (O14.TP46.4, J20.TP177.2) are typical of the Larsa repertoire dating to the second half of the 19th to the beginning of the 17th century BC (Calvet 2003b, Calvet, Huot and Minsaer 2003). Typical of the Mesopotamian area in the Isin-Larsa and Old Babylonian period is the jar characterized by a rim with a concave upper edge, body decorated with horizontal grooves, applied rope decorations and wavy line incisions, with pierced walls, which were pierced before firing (O5.TP16.1). Globular pots with vertical, short and rounded rim are also frequent (O15.TP23.12). Finally, big vessels with thick walls and protruding applied rims have been found on the field and they are usually dating to the end of the Isin-Larsa/Old Babylonian period (O6.TP14.1). Most of the vessels is characterized by a compact matrix made of levigated clay and sand with organic inclusions, which can be both very fine and rare or fine and abundant. In many cases, we also identified small clay and mineral clasts. The range of colours is between pale yellow (Munsell Chart of Color code: 5Y7/3), pale brown (2.5Y7/3) and pink (5YR7/4).

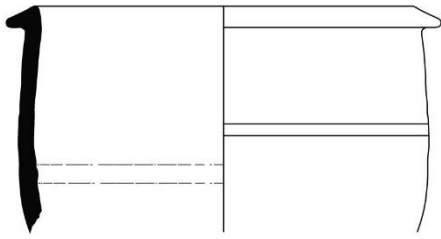


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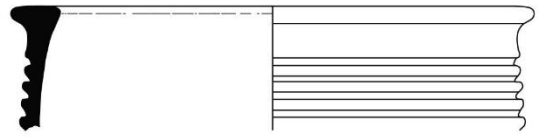
Plate I – IL-OB table ware and small/medium size containers.



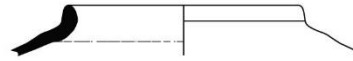
O5.TP16.17



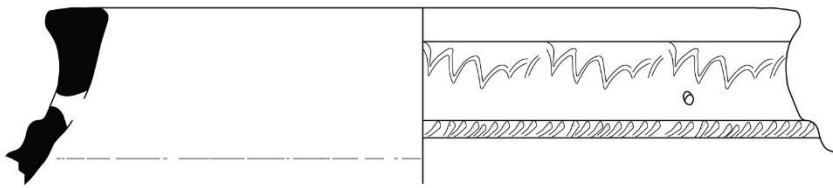
J29.TP35.1



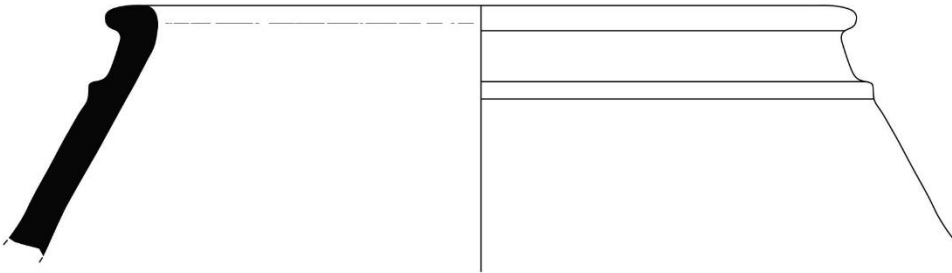
O14.TP46.5



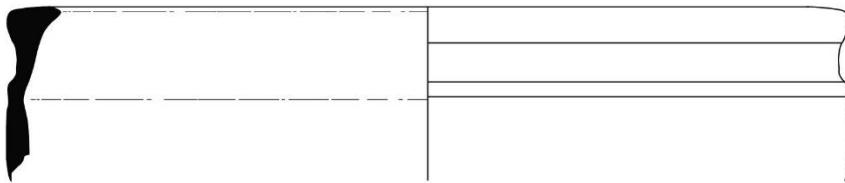
O15.TP23.12



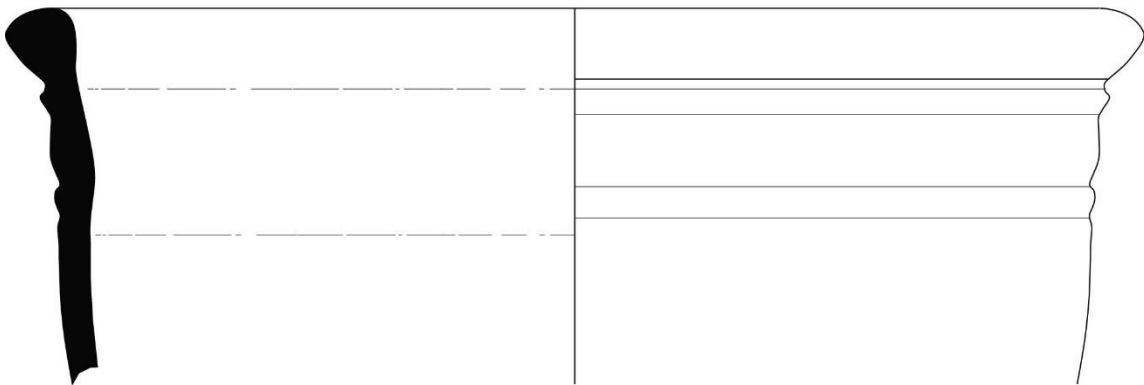
O5.TP16.1



H25.TP30.2



X8.TP40.24

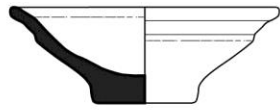


O6.TP14.1



1:4

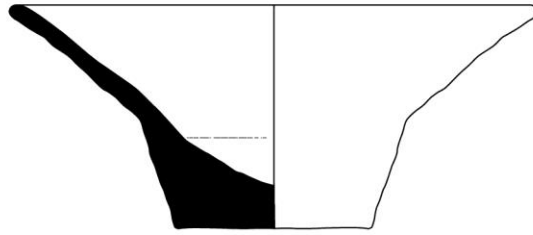
Plate II – IL-OB food processing, preparation ware and big size containers.



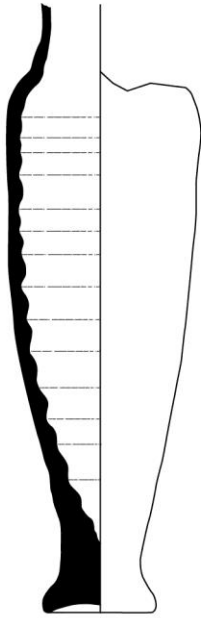
X9.TP40.13



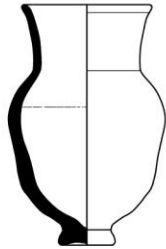
O12.TP6.12



O7.TP12.4



R8.TP15.12+18



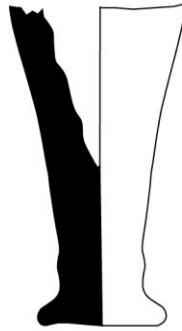
O6.TP14.33



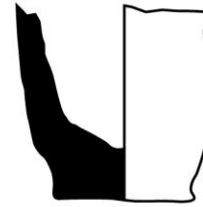
O8.TP17.15



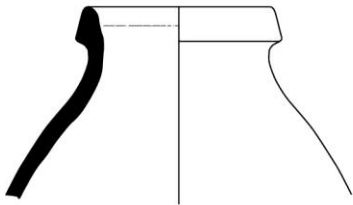
R7.TP15.15



W8.TP40.17



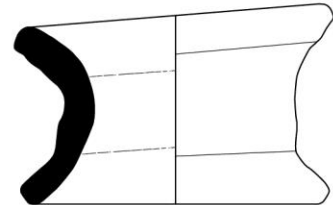
O8.TP14.11



R9.TP13.3



X8.TP40.26



X8.TP40.28



1:4

Plate III – Kassite pottery.

Kassite Period Pottery

Pottery dated to the Kassite period (second half of the 2nd millennium BC) is widely represented within the repertoire collected during the survey at Larsa (Plate III and Fig. 3).

Wide conical bowls with thick base (O7.TP21.4), profiled bowls (O12.TP6.12, X9.TP40.13), ovoid and globular goblets with narrow and tall base (R8.TP15.12+18; R7.TP15.15), globular cups with button base (O6.TP14.33), necked jars with thickened rim (R9.TP13.13), wide vats with thickened rim (O7.TP12.1) and biconical stands (X8.TP40.28, X8.TP40.26) are the most representative shapes dated to this period.

Our preliminary macroscopic observation of the traces of manufacturing technique allow us to assume that the bulk of potsherds analysed has possibly been made using the wheel-coiling technique, and many of the bowls and goblets have “plugged” or “filled-in” base. The fabric is generally organic tempered with tiny mineral inclusions, with a range of colours between pale yellow (5Y7/3), pale brown (2.5Y7/3) and pink (5YR7/4).



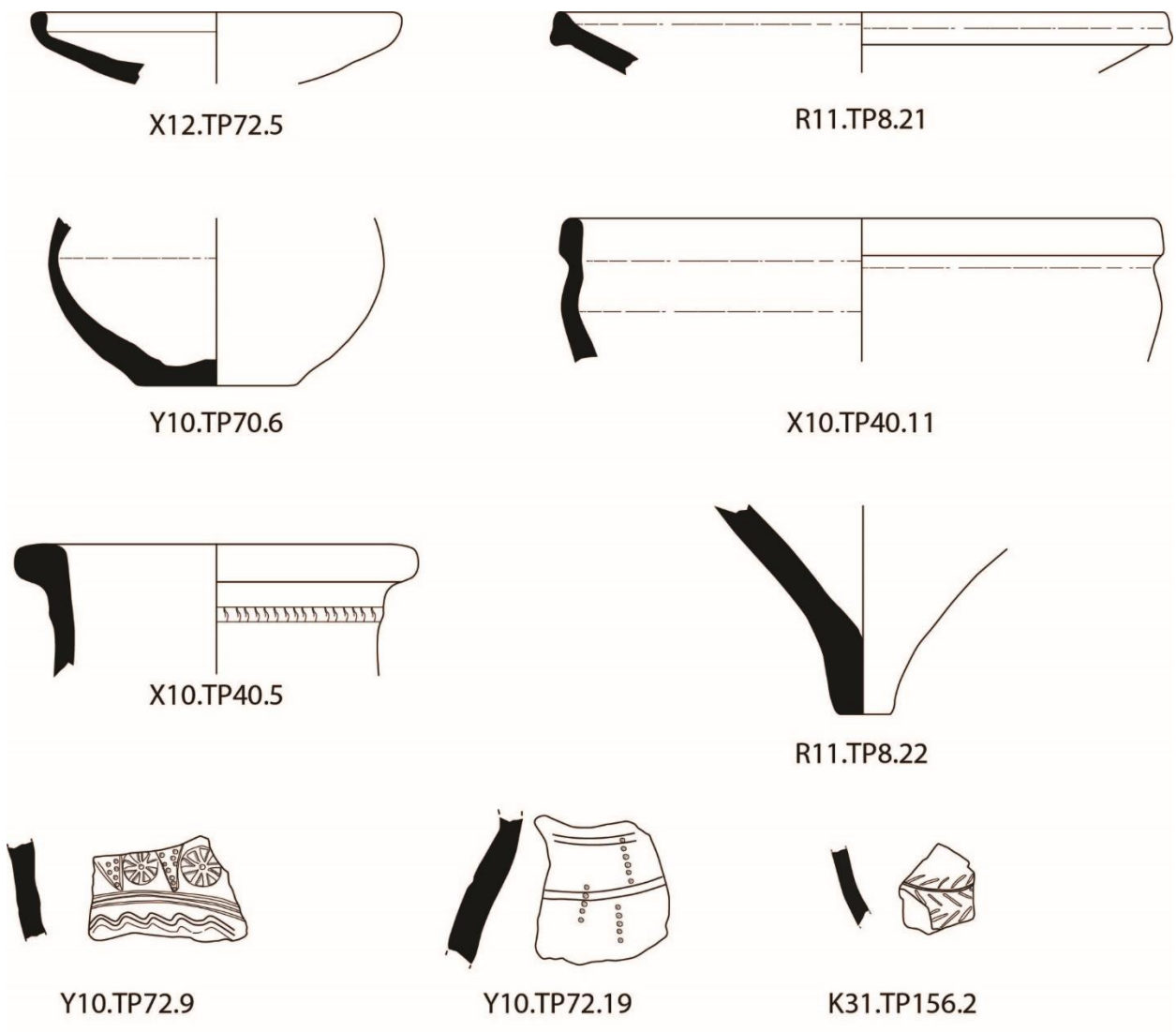
*Fig. 3 – Selection of Kassite pottery from the survey, left to right:
First line: O7.TP21.4, R8.TP15.12, O6.TP14.33, R9.TP13.13; Second line: O12.TP6.12, R7.TP15.15,
O7.TP12.1 Third line: X8.TP40.28.*

Neo-Babylonian Period Pottery

Very few Neo Babylonian Period potteries have been identified among the potsherds collected during the survey. The materials dating to this period, indeed, are similar and not easily distinguishable from the pottery dating to the Seleucid period. Hemispherical bowls with triangular rims and cylindrical necked jars with rounded rim might be diagnostic for this epoch.

Hellenistic, Seleucid and Parthian Period Pottery

The diagnostic morphological types for the Seleucid and Parthian period (Plate IV and Fig. 4) have strong comparisons with the materials published in the reports by O. Lecomte (1983-1989), coming from the later phases of occupation of the E.Babbar. The team has recovered stamped decorations (Y10.TP72.9 and L13.TP38.16) which can be also associated to the end of the Neo Babylonian period (for the stamped tool made in ceramic see Warburton, NAPR 1991). Incised, combed and *roulette* decorations are also diagnostic of the pottery dated to the Seleucid period at Larsa. They might have been on the necked jars (X10.TP40.5, X10.TP40.6, and Y10TP72.19).



1:3

Plate IV – Seleucid pottery.



*Fig. 4 – Selection of Seleucid pottery from the survey, left to right:
 First line: Y10.TP72.9, X10.TP40.14, R11.TP8.21 and X10.TP40.11
 Second line: R11.TP8.22, L13.TP38.16 and X10.TP40.5.*

We found also typical button base jars with bitumen inside (R11.TP8.22). Among the other types of closed shaped found in the survey we can mention the jars with globular body and the flat base (Y10.TP72.6).

For the open shapes, we found the typical carinated bowls with thickened rim on the outside (X10.TP40.11) and the “fish-plate type” coated with green glaze dated to the 2nd century BC (R11.TP8.21). Bowls with rounded rim with remains of white slip inside have also been associated to the Seleucid and Parthian period (X12.TP72.5).

A ring made with a coil with triangular profile (P15.TP10.8) characterizes the majority of the bases dated to the Seleucid period. Cylindrical jugs with such a base have been also dated to the Seleucid period by comparisons with Lecomte (1983).

For the fabric, we have found very few organic materials in the temper (10-5% of organic voids 3-4 mm long), that consists mainly of small minerals (20% grey and dark well sorted) and levigated clay, with a range of colours between pale brown (2.5Y7/3) and pink (5YR7/4). Traces of fluid thin sub parallels striations have been noticed on the walls of the pottery, indicating the use of the Rotative Kinetic Energy (RKE). This shaping technique might have been combined with the coiling technique since horizontal preferential fractures and voids in the profiles have been noticed.

VI- ARCHITECTURAL SURVEY AT LARSA

Régis Vallet and Joël Suire

In June 2019, brief and geographically limited architectural surveys were done at Larsa, with the objectives to recognize the feasibility of excavations on several places and buildings of interest, one already excavated in the 80's, B33 (Thalmann 2003), and three others known since the survey done by Joël Suire in 1985-87 but never excavated, B48-49, B50 and B57. All these locations have been carefully surveyed on the field, after geomagnetic (except B57), topographic (on the ground and by drone) and archaeological (except B57) surveys.

B33, in the NE quadrant of the site (Fig. 1), is still visible on the surface, although partly covered by sand dunes. We had feared that it would be too looted and buried below the old excavated material and the sand dunes to be excavated again, but most of the building is accessible, to the west, east and even south (Fig. 2). This Sumerian small palace is of the utmost interest and we plan to resume its excavation in a near future.



Fig. 1 – B33 site in June 2019 (J. Suire)



Fig. 2 – B33, eastern part of the northern façade (left) and south backrooms (right) in June 2019.

B57, to the south edge of the site, an official construction attributed to Sin Iddinam (it delivered two inscribed bricks of that king, Huot, Rougeulle and Suire 1989, 50), covers more than 6000 sq.m. Although intensely looted, most of its plan is clearly visible on the surface and has been drawn (Fig. 3). It is a very specific building, displaying many rows of small rooms, a medium size courtyard in the middle of the plan, and a large open area to the south, towards the outside of the city but apparently still within the compound, whose southern façade is abutting the city wall (or an inner canal ?). The plan does not seem to be that of a palace and we would think rather to a very large urban storage facility. To the east, a vast outside open space flanking the compound is intensely burnt (Fig. 4). It is possible that the building continues to the north beyond its apparent limit.



Fig. 3 – B57 site and visible alignments in June 2019 (J. Suire)

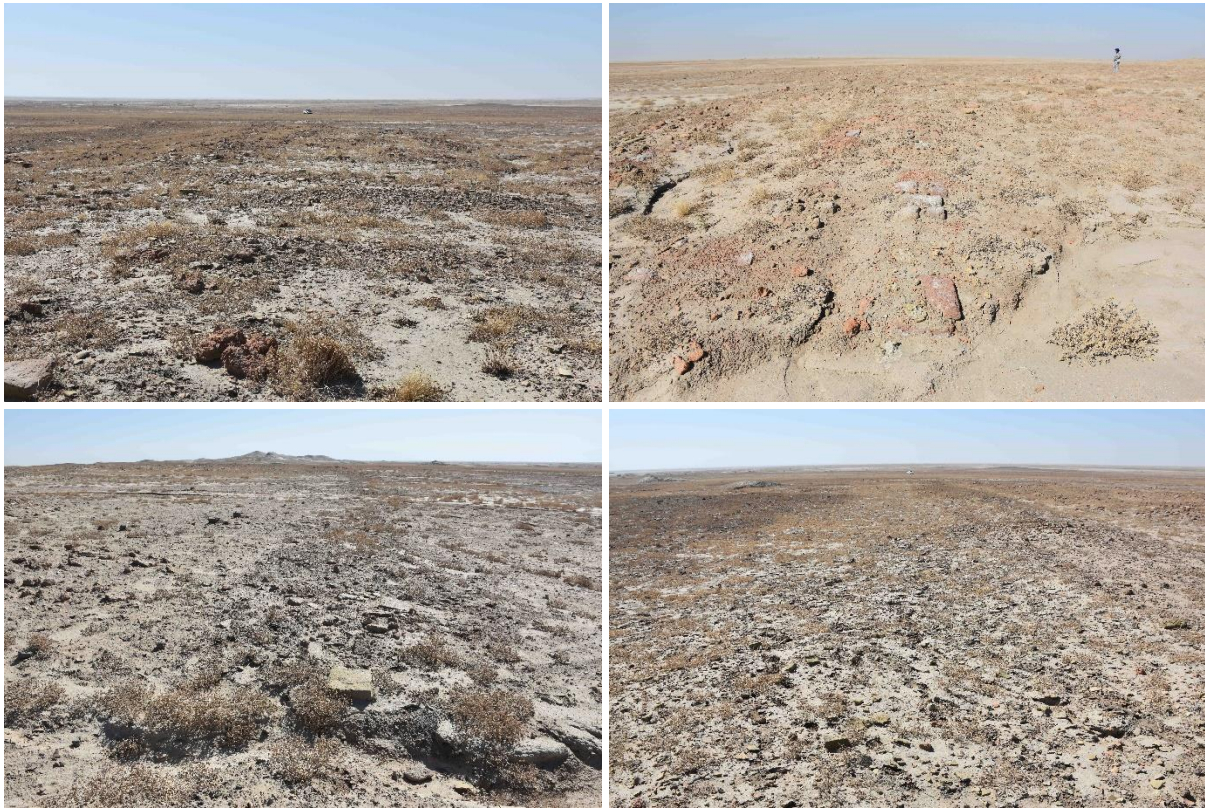


Fig. 4 – B57 site in June 2019: seen from the north (top left), from the east (top right), the long southern façade from the east, with the ‘Chameau’ in the background (bottom left) and the eastern façade from the north, with the burnt area on the left (bottom right).

We have mostly concentrated our attention north of the E.Babbar, in the area of B48-49 and B50, in a straight line from the E.Babbar to the north of the city. A succession of interesting features lies indeed in this segment of the city, which could give information on several periods of occupation due to the erosion on the NW part of the site. To the south, B50 was already known but very partly. The surveys has revealed a much more important building than expected (Fig. 5), covering a long rectangular area extending from the E.Babbar towards the north on more than 100 meters (110m x 60m) and covering 6600 sq. m. It seems that the entrance of this compound was to the south, were a recessed façade is visible on the geomagnetic plan (Darras, this volume), and followed by a courtyard and the core building of the compound to the north, constituting a high mound, with several close alignments (Fig. 6). In fact, the overall shape of the plan suggest a temple, of the 2nd millennium BC according to the pottery, which would considerably enlarge the religious core of the city to the north.

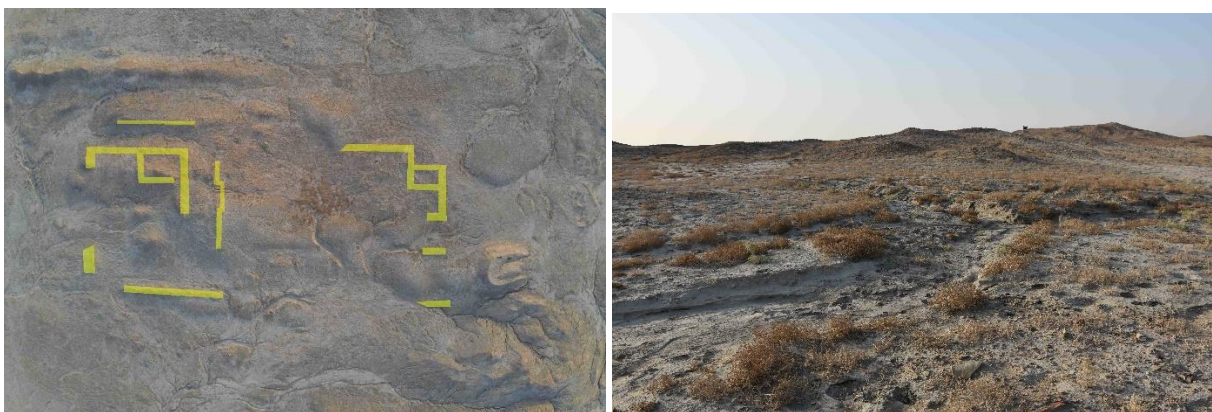


Fig. 5 – Left: B50 site and visible alignments (J. Suire), Right: general view of the high mound of B50, from the NW, with the E.Babbar in the background on the right.



Fig. 6 – Left: detail view of the high mound of B50, from the east; Right: eastern façade of the B50 compound, from the north, with the mound of its main building on the right, the ziggurat (left) and the E. Babbar (right) in the background.

Immediately north of B50, we recognised what could be a rectangular open public square, followed by a long mudbrick terrace leading to B48-49 more to the north. Buildings B48-49 are two close and vast baked brick dwelling compounds whose plan was partly drawn in the 80's. But sand dunes that once recovered it has since disappeared, letting us recognize now more precisely its plan, including the interspace between the two buildings, probably built on a terrace. Another interest of this area is that it seems to be built nearby other topographic structures of the site, i. e. other (lower) terraces, in all directions. Excavation trenches through this area could give valuable information on the buildings themselves but also on all the surrounding areas. Finally, it has to be noted that important built alignments compatible with the orientation of B48-49 exist in the lower plain more to the west, where we found also, 150m NW of B48, a small concentration of 4th millennium material, including Late Uruk (or Djemdet Nasr) BRBs (Fig. 7).

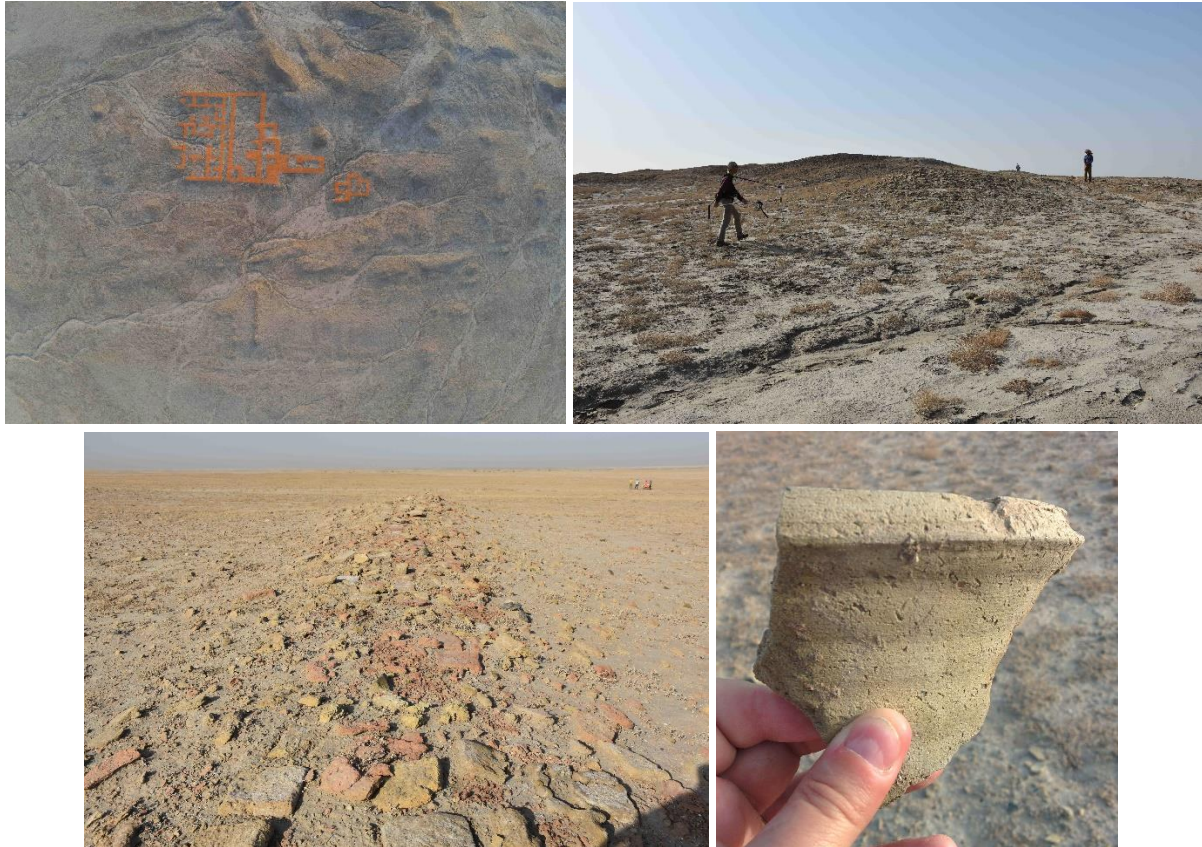


Fig. 7 – B48-49 site and visible alignments in June 2019 (top left); NE angle of B48 terrace under geomagnetic surveying, from the NE (top right); Long wall in the plain west of B48, from the east (bottom left); Late Uruk or Djemdet Nasr BRB found nearby (bottom right).

VII - PRELIMINARY EXPLORATION OF AN AREA OF HABITAT AT LARSA: HOUSE B48

Luc Bachelot, Dominique Charpin, Ali Murad and Jamal Abd-el-Ali

During the spring 2019 campaign, prospecting over the entire site has enabled a significant proportion of ceramic material dating from the Paleo-Babylonian period to be collected in the area located approximately 400m north of the E.Babbar. In this sector, moreover, the outline of two large houses (B48 and B49) had been located on the surface as early as the 1980s (Huot, Rougeulle and Suire 1989: 44), revealing plans very comparable to those of buildings from the Paleo-Babylonian period then being excavated (Calvet 2003b), but in a much more remote area to the north of the site. In order to get as complete a picture as possible of Larsa in the Paleo-Babylonian period, it was therefore decided to explore building B48 and its immediate surroundings during the autumn campaign of 2019 (Fig. 1).



Fig. 1 – Aerial view of the trench around Building B48.

After the removal of 20 to 50 cm of the surface layer, we were able to clear the almost complete plan of a large house (B48), thanks to the well-preserved cooked brick basement of its walls (Fig. 2). The upper part of the walls, made of mud bricks, had completely disappeared. This house covers an area of at least 650 square meters (32.50 x 21m). However, if the space occupied by all the walls is subtracted from the whole surface, the living space is only two hundred square meters. It comprises about twenty rooms distributed around a courtyard (n°1548) of 60 sq. meter (8x7.50m). The main room (1517) of 47.25 m² (10.5 x 4.5m) is in the north-eastern part of the building. All the other rooms distributed around the courtyard and the main room, on the four sides of the

house, are small, with the exception of room 1527, which is long enough to have perhaps housed a built grave in its basement, as in the large Babylonian houses in the northeastern sector of Larsa. These relatively small spaces were probably mainly devoted, as is usual in Near Eastern domestic architecture, to storage, tidying up and cooking activities. Those in the north-western part of the house are slightly more spacious than those in the south-eastern part. The former are 3.50 m wide and 5 to 7 m long, while the latter are not of the same proportions and are significantly narrower (1.50 m to 2.5 m). The presence of a long narrow room n°1524 (with an especially narrow entrance at the very end of the room), accessible from the main room 1517, indicates the possible location of a staircase giving access to the terraces. Also noteworthy is the presence of a few square meters of tiled floor in room 1539 and the passage between courtyard 1548 and room 1527.

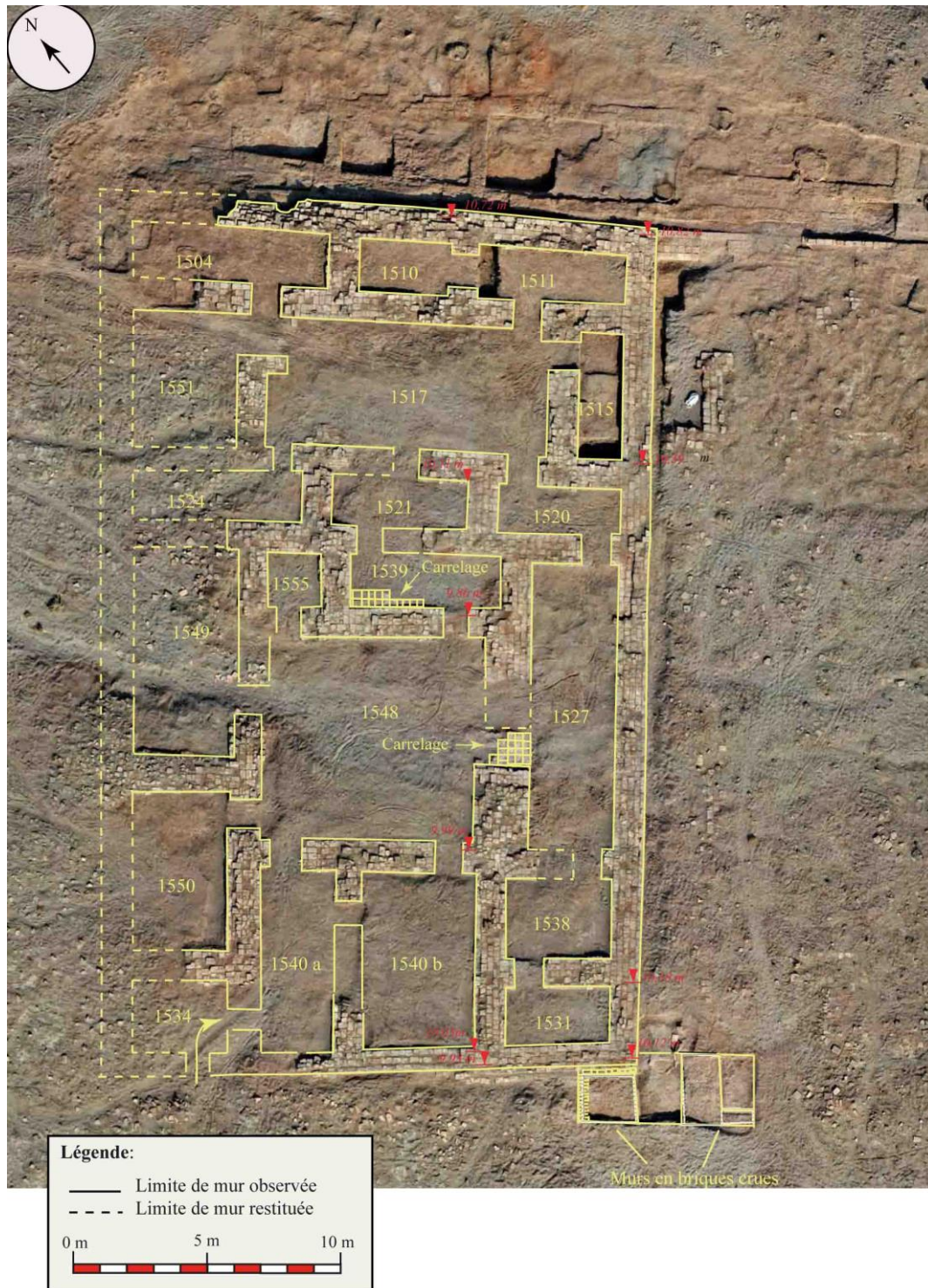


Fig: 2 – Preliminary sketch plan of Building B48, with a proposal of entrance through room 1534.

The entrance to the house, of which no trace remains due to the erosion of the entire north-western end of the building, must have been near the west corner of the house, most probably through room 1534 on the south-west façade bordered by a street, but alternative locations are possible (through rooms 1549 or 1550).

From the first observation of the remains of this building, one impression is striking, the contrast between its imposing dimensions, as well as the very elaborate character of its plan, and the very sloppy implementation of the construction. In fact, the brickwork is very irregular and often only fragments of brick were used and sometimes even over-fired, almost melted bricks. For reasons of economy, no doubt, the recycled bricks bases are laid on clay beds as thick as the bricks themselves. Obviously, this construction is carried out with little means.



Fig. 3 – Building B48, room 1515 in excavation (ashy floor 1017), from the north-east.

The dating of B48

In order to get the elements for dating the building, a complete excavation (down to the level of the occupation floor) was carried out in a room (1515), located near the western corner of the house and leading into the main room 1517 (Fig. 3). The small size (7sq.meter: 5 x 1.5m) of this room was decisive in the choice of the area to be excavated. Obtaining, in a short time, all the material present in a room obviously required the choice of a restricted space. At 0.80m below the present surface of the site, approximately at the level of the first course of baked brick, the floors of the room was reached and explored over three quarters of its surface, the rest having disappeared during the looting of the 20th century.

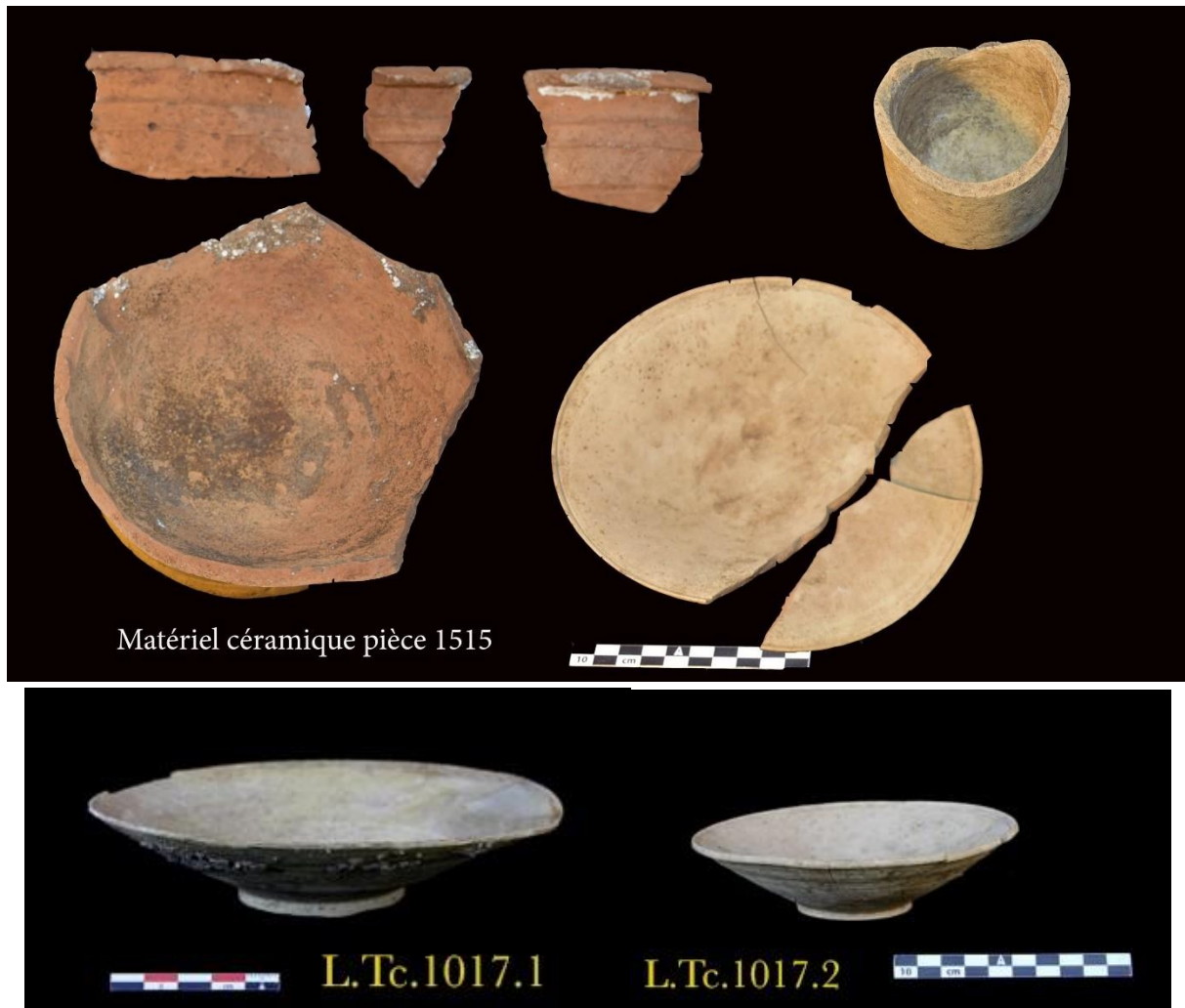


Fig. 4 – Part of the pottery set found in situ in room 1515, among which several ‘fishplates’.

The ceramic material collected, made largely of coarse and storage ceramics and several ‘fish plates’ (Fig. 4), among many pieces of charcoal clearly indicates that we were dealing with a space intended for cooking. If the fishplates date back to the first millennium (the most frequent attestations are from the Hellenistic period, see Oselini and Herr, this volume), the coarser crockery could be much older. Similar shapes are even commonly attested to the Paleo-Babylonian period. Such heterogeneity of ceramic assemblage, however embarrassing it may be for dating the occupation, is not uncommon in the domestic context of the ancient Near East.

This may involve, for example, the use of old equipment found on site by new occupants who also use their own production. To explain these mixtures, one could also refer to the disturbances in stratigraphy caused by the intervention of the clandestine excavators. However, in the specific context of room 1515, this was not the case. The part of the ground that was excavated had not

been disturbed in any way and the material found was in a good stratigraphic position. To propose a more precise dating, therefore, it is necessary to examine other data, particularly architectural data.

The similarity of the plans of B48 and the Paleo-Babylonian houses in the northeastern sector of the site naturally invites dating it to the same period. Nevertheless, if the plans of all these buildings are comparable, the materials used are not. The excavator has dated the Paleo-Babylonian houses excavated in 1987 and 1989, to a period from the middle of the reign of Rîm-Sîn (1822-1763 BC), around 1738, to that of Samsu-iluna (1749-1712 BC) (Calvet 2003b, Charpin 2003). The fired bricks used for the basement of these large houses are rectangular. They measure 27 x 17 (or 18.5) cm. Those of B48 are also rectangular, but of different sizes: 30 x 20 x 6/8 cm. In Larsa, this brick format is characteristic of the only palace of Nûr-Adad (1865-1850).

In 1969 and 1970, when Jean-Claude Margueron restarted the excavation of this monument (discovered and partially excavated by André Parrot in 1933), he noticed that the bricks of the monument had been removed in an orderly and systematic manner (Margueron 1970), which, according to him, could not be confused with the looting of clandestine excavations. However, due to a lack of dating information, he was unable to determine precisely when this operation had been carried out and logically hypothesized that it must have taken place during antiquity. We know from the work carried out during this campaign in the autumn of 2019 that this recovery was used for the construction of B48 (and B49).

These observations, as well as the differences in brick sizes between the houses in the northeast sector of Larsa and B48, therefore suggest that the two sets of buildings are not contemporary. It would be difficult to understand why, when B48 was built, the bricks from the palace of Nûr-Adad had to be picked up, while at the same time the builders of the large houses in the northeastern sector of Larsa had all the means at their disposal to make bricks specifically for their undertaking. For the construction of B48, the recuperation of material from an ancient monument clearly demonstrates a strategy of low cost; by contrast, this evokes the advantageous conditions that the builders of the houses in the northern sector obviously enjoyed. At the time of building B48, there was probably no longer the means to manufacture, as in the past, the necessary quantity of fired bricks.

Due to the amount of second millennium ceramic material collected in building B48 and its surroundings (cf. Oselini and Herr, *infra*), it would be tempting to envisage a first construction during this period, but at a time when the prosperity that the city had known under the reigns of Rîm Sîn and Hammurabi was replaced to a period of great difficulty, after the destruction of the city in 1738, during the reign of Sansu-Iluna. But the limited assemblage collected *in situ* so far is definitely heterogeneous and contains late shapes, i. e. first millennium material and in particular several Hellenistic (possibly Achaemenid at the earliest) fish plates. So for now and pending more evidence from future excavations, a dating of B48 and its associate level to the 4th c. BC seems the more reasonable, but containing earlier material possibly recovered from lower levels during the rebuilding of the neighborhood.

Indeed, we were able to observe that the exposed baked brick basements of B48 were built on top of an older mud brick building. When they were placed on top of the old walls, they had a stable foundation and retained a good horizontal stability. On the contrary, they collapsed when resting on more loose ground, for example on the filling of rooms or open spaces (Fig. 5). In order to determine the plan of this old building, which served as a foundation for B48, all the basement of B48 would have had to be removed, which was not possible. The dating of this old building is probably from the Paleo-Babylonian period, as can be seen from the sounding carried out in the southern corner, below the level of the fired brick foundations of B48. Perhaps this building, though in mud brick and not baked brick, had the same qualities as those in the northeastern sector.



Fondation des assises de briques cuites sur le sommet de murs anciens



Fig. 5 – Baked brick structures of B48 founded on the summit of earlier mudbrick walls,

The small sounding south of B48

Outside the corner of B48, a sounding of approximately 12 sq. meter was therefore carried out to a depth of 1m (Fig. 2). Below a very evanescent floor on the surface, associated to B48, two mud-brick walls passing under the fired brick base of B48, delimit part of a room in the filling of which was found Old-Babylonian material, including a fragmentary cylinder seal impression displaying a presentation scene (Fig. 6). It shows a deity seated on her throne, facing left, before whom a small figure is kneeling. Behind the deity, a fragmentary three-line inscription is still legible.



Fig. 6 – Seal impression from the paleo-Babylonian level below B48.

The occupation northeast of B48

In the opposite sector, outside the NE wing of B48, a series of small rooms was superficially cleared (Fig. 7). These rooms were delimited by thin mud-brick walls, preserved on only a few courses. There, we found remains of domestic ovens (of the *tannour* type), with relatively abundant storage material and forms which are clearly Hellenistic (Fig. 8), but here again mixed with second millennium material. In any case, the whole area seems to have been used for storage. To the NW, south of room 1544, the storage building passed under the baked brick basement of B48, showing that only part of it could have been contemporaneous with B48, clearly built later. The slope of the land caused by erosion favored the rapid access to another level, immediately to the north, at the base of the slope, where another row of fragmentary mudbrick small rooms appeared, which passed under the upper level. This older level, pierced by various late pits and graves (not excavated), contained Old-Babylonian material. Thus, the presence in this sector of an important Old-Babylonian occupation is well documented, even if the work carried out during this campaign allowed only very limited exploration.

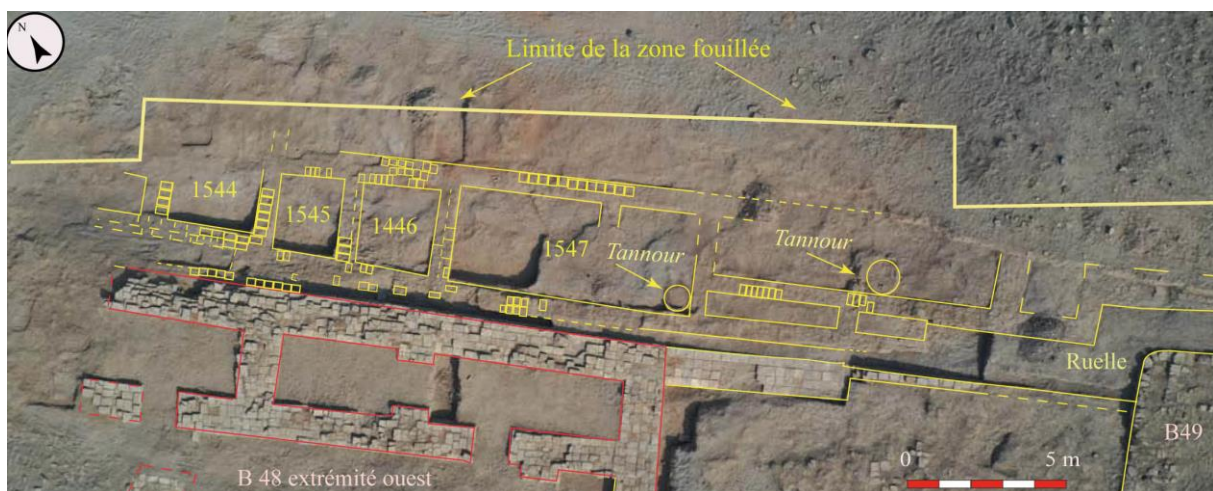


Fig. 7 – The storage building NE of B48.



Fig. 8 – Fishplate found in the northern building.

Between B48 and B49

Southeast of the large house B48, there is an apparently empty construction area of about 375 m² (Fig.1), strongly disturbed by numerous looting holes. The first observations made on the ceramic material found in this area reveal a high proportion of shards from recent periods (Hellenistic). Only a few fragments of baked brick elements were visible on the surface or subsurface, in particular a facade to the NE, in continuation of that of B48. They obviously do not allow any coherent architectural reconstruction without a proper archaeological dig, but the area was once built and we could observe some of its relations with the surrounding constructions. Indeed, east of this presumably open space, another large dwelling (B49) was developed. Only a few rooms of this house, with proportions comparable (possibly larger) to those of B48, have been demarcated. No

sounding have been made, but the visible fired brick basements have the same characteristics as those of B48. To the northeast, a 2m wide lane (Fig. 7) characterized by a series of very ashy floors, at least 30 centimeters thick but continuing further down, flanked B49 (equipped with a round NE corner). On the other side of this alley, the same storage (mudbrick) building that flanked B48 developed, bypassing B49 so that the two (the storage and B49) were clearly contemporary. Between B48 and B49, a small sounding revealed that the highest ashy soils of the alley, abutting B49, covered the facade of the 'intermediate' building, while deeper floors were associated to it and even deeper floors passed below. In addition, the 'intermediate' building clearly reused the facades of B48 and B49 for its own use, showing that it was built later (and prematurely destroyed). Overall, the observations done show that the Hellenistic reoccupation of the area, sealing the underlying paleo-Babylonian levels, displays at least four successive phases (from earliest to latest):

I: construction of building B49 and the north storage building

II: construction of building B48 and modification of the storage building; B49 continues

III: addition of the 'intermediate' building (probably a smaller house) between B48 and B49

IV: destruction of the 'intermediate' building

Needless to say that this scenario has to be supported by more evidence, but the available data point in this direction.

Finally, it should be noted that all the remains of B48 and B49, as observed during this campaign, are very comparable to the state of the E.Babbar in the neo-Babylonian and Hellenistic periods explored during the campaigns of 1981 to 1985. To the extent of the great works carried out by the Babylonian kings (Rîm-Sîn especially then Hammurabi) followed periods of repairs, reoccupations, until the Hellenistic period always more modest. The textual documentation (see Charpin, this volume) largely testifies to this. Since Nabonides explains in the inscriptions on the fired bricks of the podium of the temple located at the foot of the ziggurat, he had to undertake excavations to find the great temple of his predecessors and restore it to its entire past splendor.

VIII – PRELIMINARY ASSESSMENT ON THE POTTERY RECOVERED IN TRENCH B48

Valentina Oselini and Jean-Jacques Herr

Having not being able to participate to the excavation campaign at Larsa in fall 2019, we studied the ceramic materials of trench B48 on the photos and drawings made by L. Monduteguy and A. Othman, shared with us by R. Vallet and L. Bachelot. The collections of potsherds and complete profiles found in B48 have been studied according to morphological criteria and occasionally to the identification of the type of fabric when observations were possible on the photos. Data from B48 consists of the sherd collections coming from room 1515, locus 1545, locus 1547 and LTC 1570.1 (burnt ashy soil). They have been recorded by using the n.v. ("Numéro Vert") 1018, 1017, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029 and 1030.

In the following sections, we present only the types of vessels for which we were able to find comparisons. The first section (V. Oselini) lists and assesses the different ceramic items dated to the early 2nd Millennium BC, whereas the second section (J.-J. Herr) deals with the material dated to the 2nd half of the 1st Millennium BC.

EARLY 2ND MILLENNIUM BC POTTERY FROM B48

The first analysis on pottery materials from the excavation carried out at Larsa in October 2019 reveal that many deposits have yielded potsherds dated to the early 2nd millennium BC. The bulk of shapes come from floor 1027 in room 1515, while other typical Isin-Larsa materials were found in "Numéro Vert" 1001, 1014, 1024, 1025, 1026, 1027, 1028, 1029 and in locus 1537 (n. v. 1030, 1545 and 1547 - assessment made by photos and not from drawings).

Conical bowls with profiled rim

Conical bowls with profiled rim (Fig.1: 1, 5; Fig.2: 4, 5, 6) and simple and triangular lip are usually dating since the end of the 3rd millennium BC to the mid-18th century BC from the southern and central Mesopotamia. The sherd found in room 1515, in floor 1027 belongs to a very common shape among the pottery assemblage dating to this period (Fig.2: 4). Parallels for the two potsherds belonging to this type (Fig.2: 4, 5) can be found at Lagash, Nippur and Uruk (Armstrong and Gasche 2014, pl. 34: 20, 28; Van Ess 1988, Abb 3: 35, 39). The type represented in Fig.2: 6 is like bowls from Tell ed Der and Nippur (Armstrong and Gasche 2014, pl. 33: 40; pl. 40: 27). Finally, the type consisting in the bowls from n. v. 1014 (Fig.1: 5, 8) finds comparisons in levels 2 and 1 of sounding JVIII excavated in 1970 at Larsa (Calvet, Huot, Minsaer, 2003, fig. 11).

Bowls with straight sides

The unique exemplar (Fig.2: 7) from B48 (room 1515, floor 1027) seems corresponding to the type of bowls with straight sides and outwardly bevelled rim found in levels 3 and 2 of the sounding JVIII at Larsa (Calvet, Huot, Minsaer, 2003, fig. 7: a, l) and is also typical, but not very frequent, of many other contexts dating from the 19th to the end of 18th centuries BC at Tell ed Der, Nippur and Uruk (Armstrong and Gasche 2014, Pl. 18: 1, 4, 9).

Deep bowls

Deep bowls with curved sides and outwardly beveled rim (Fig.2: 8) are also well represented in sounding JVIII levels 2 and 3 (Calvet, Huot, Minsaer, 2003, fig. 9: c; fig. 10: b, d, e, j). The small size of the fragment found on floor 1027 does not allow us to say if it is belonging to the type of deep bowls with curved sides mainly spread in central Mesopotamia (see Armstrong and Gasche type 15H2, pl. 27: 2, 3, 6; pl. 28: 2, 3), or, rather to the deep vessels with outward flaring sides, with short spout just below the rim which can be un-painted or painted decorated (Armstrong and Gasche 2014, pl. 48; Van Ess 1988 Abb 10-11). Both these types are usually dating from the 19th to the 17th centuries BC covering a time-span including the Isin-Larsa and Old Babylonian periods.

Jar with narrow shoulder

The jar with narrow shoulder (Fig.2: 9), short conical neck and thickened rim is also a typical shape usually referred to the Isin-Larsa period. Comparisons can be found in level 3 of the sounding JVIII at Larsa, dating from the mid-19th to the 18th centuries BC (Calvet, Huot, Minsaer, 2003, fig. 9: c; fig. 10: b, d, e, j), at Uruk (Van Ess 1988, Abb 16) and in many other context of the southern Mesopotamia, i.e. Tell ed Der, Lagash, Nippur (Armstrong and Gasche 2014, pl. 68).

Necked jars with outwardly bevelled rim

Two small fragments of necked jar with triangular outwardly bevelled rim (Fig.1: 6; Fig.2: 10) were discovered on floor 1027 and in n. v. 1014 and they possibly pertain to very common types also dating to the beginning of the 2nd millennium BC (comparisons referring to the 1st millennium BC are discussed by Herr, below). The size of the potsherds and the lack of first hand observation do not allow us to more precisely date this assemblage. Comparanda for the Isin-Larsa period of the potsherds from floor 1027 can be found at Larsa, sounding JVIII, level 3 (Calvet, Huot, Minsaer, 2003, fig. 28: l) and for the potsherds in n.v. 1014, at Larsa, sounding JVIII, levels 2 and 3 (Calvet, Huot, Minsaer, 2003, fig. 28: e, f, i).

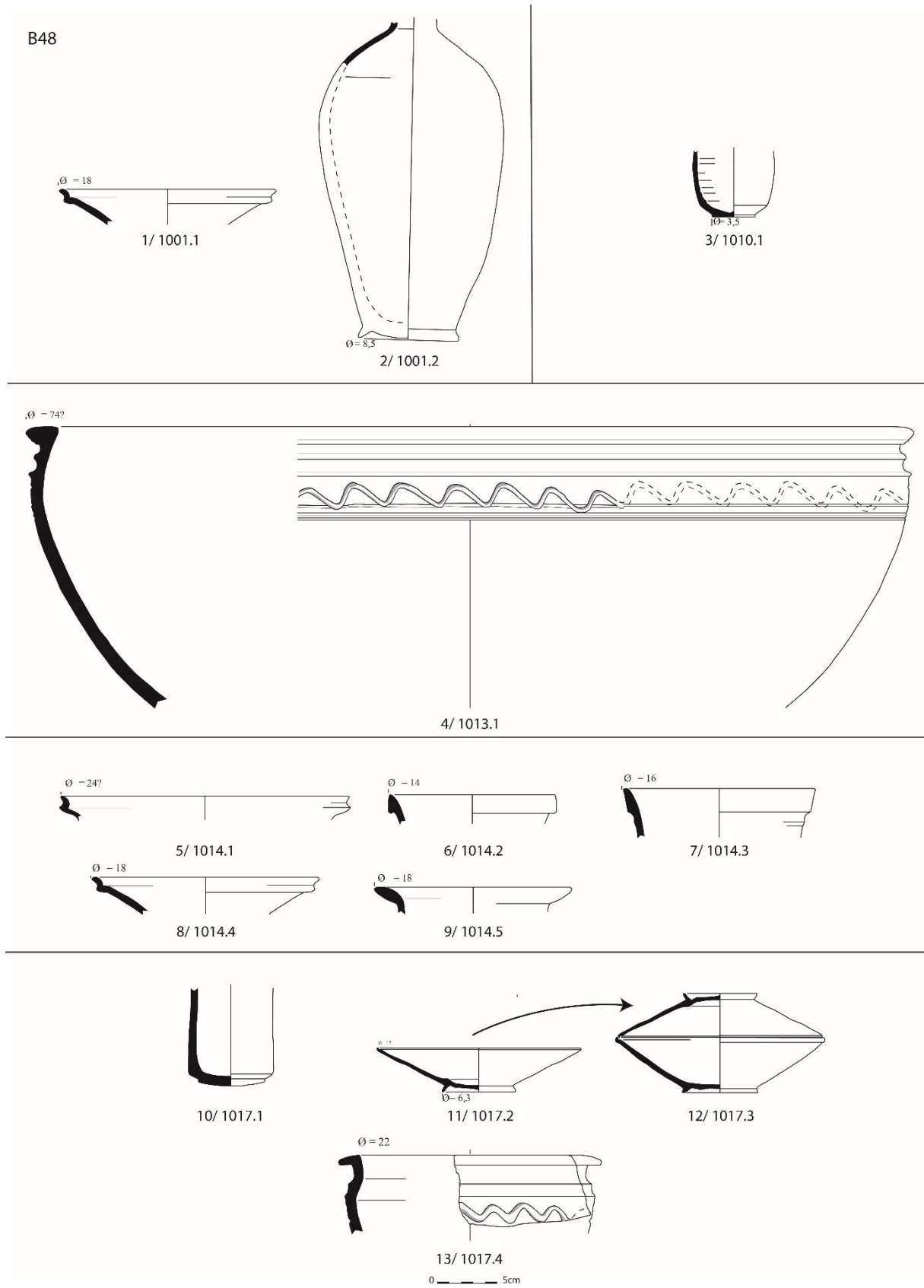


Fig. 1 – Ceramic material from trench B48.

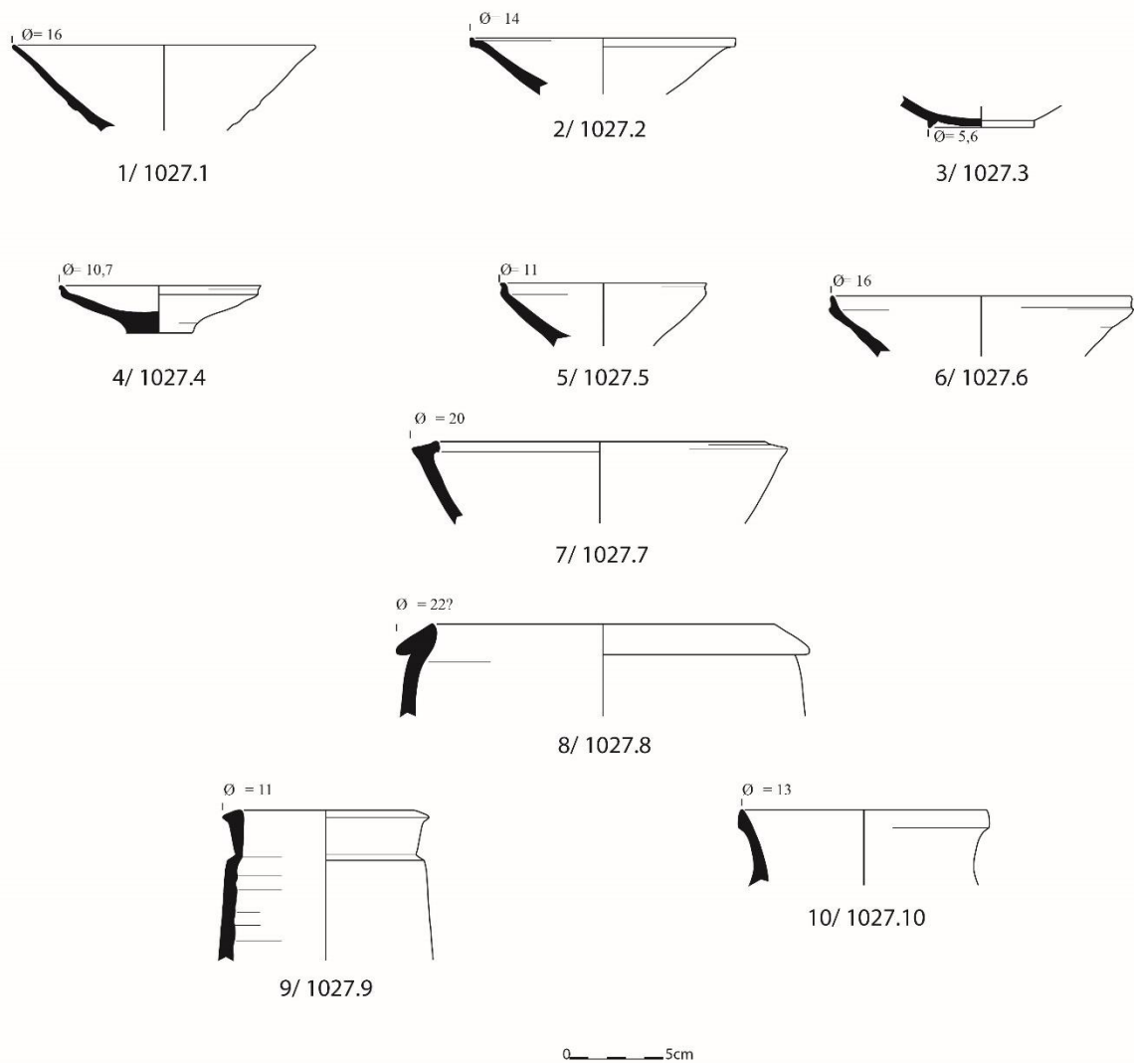


Fig. 2 – Sample of the ‘mixed’ assemblage found in situ in room 1515.

Necked jars with elongated rim

The necked jars with ovoid body, convex or ring base, thickened elongated (Fig.1: 7) or triangular rim are very typical of the southern Mesopotamian repertoire dating to the 19th-mid 18th centuries BC. They have been found very frequently at Larsa in sounding JVIII (levels 3-1; see Calvet, Huot, Minsaer, 2003, figs 29, 30) and in house B 27 (Calvet 2003, fig. 53:27.128; fig.55: 27.510). Comparisons can be found at Uruk (Van Ess 1988, Abb 21: 148, 152), at Tell ed Der and Nippur (Armstrong and Gasche 2014, pl. 111).

Tall ovoid bottle

The singular and nearly entire shape of tall ovoid bottle with narrow neck and ring base found in n. v. 1001 (Fig.1: 2) finds a perfect comparison with a sample from Larsa, excavated by Parrot in 1933 and published by Armstrong and Gasche, 2014, pl. 104: 10.

Jars with thickened rim

A small fragment of thickened and outwardly rim have been found in n.v. 1014 (Fig.1: 9), it can be possibly related to a typical very early 2nd millennium BC shape found at Nippur (Armstrong and Gasche 2014, pl. 109: 7, 9).



Fig. 3 – Sample of Isin-Larsa materiels from trench B48 (NV 1024).



Fig. 4 – Isin-Larsa materials from the filling of room 1537 (NV 1030).

LATE 1ST MILLENNIUM BC POTTERY FROM B48

Few drawn potsherds might be ascribed to a time-span ranging from the Hellenistic period up to the Parthian period (4th c. BC-2nd c. AD).

The research question has been focused on the identification of a Neo-Babylonian or Achaemenian period pottery. Few stratified contexts have yielded collection of pottery dated to the 6th or 5th c. BC in Mesopotamia. The sealed stratigraphic contexts that have provided some pottery dated by cuneiform inscriptions are not that many. They consist namely to the “Red House” of Tell Sheikh Hamad in the Khabur valley (“Fundeinheit 4”) and the long wall in central Mesopotamia (Druc and Gasche 1989) dated to the first half of the 6th c. BC. A large amount of pottery has been found in the graves underneath the houses in the later settlement of Uruk’s Eanna (Salje 1992). Finally, the contexts of discovery at Nippur, Scribal Quarter, and the graves at Ur are difficult to assess for really understanding the provenience of any finds to the middle of the 1st millennium BC, even if an “Achaemenian” date has been proposed. Later studies have emphasized the strong continuity in Mesopotamia with the 8th and 7th c. BC productions (Kreppner 2006; Katzy 2015; Herr 2018).

However, the pictures might be clearer for the last 4th c. BC and 2nd c. AD, namely the Hellenistic and Parthian period. The previous work in Larsa, in the E.Babbar area, have provided valuable referential collection of pottery for dating to the Hellenistic period. The pottery found in B48 in room 1515 might be related to this period.

We present below a list of shapes for which we have been able to find parallels for dating the collection. All of the dating hypothesis presented below must be taken with caution since we have not been able to make clear direct macroscopic observation on the material.

“Fishplate”

The most diagnostic shapes, easily recognizable consist with the plates found in room 1515, in the floor 1017 (Fig.1.11-12) and 1027 (Fig.2.2-3). They have already been recovered by Huot’s team and have thoroughly been studied by O. Lecomte (Lecomte 1983, Bachelot and Lecomte 1984).

These plates are opened conical shapes with a thin round rim marked by one or two thin grooves functioning as lid-seat on the inside. The base is convex (Fig.1.11) or concave (Fig.1.12, lower plate) and stands on a thin ring. The inside wall is marked by a depression in the center and a circular ridge (Fig.1.11). The wall is very thin approx. 5 mm. This type is broadly spread in lower and upper Mesopotamia during the Hellenistic period. (Katzy 2015, Strommenger 1967, Debevoise 1934, Jackson and Tidmarsh 2011 Pl. 12 fig 18.15). We can noticed on the photo of the convex base with a thin ring (Fig.2.3) no organic voids and wheel throwing marks. This base can be associated to the same type of “fishplate”.

“Eggshell bowl”

Found also in the room 1515 in the floor 1027, the sherd of a conical bowl marked on its lower part by an undulated profile (Fig.2.1) could be related to a collection of opened shapes so-called “eggshell ware”. Indeed, the wall seems to be very thin, less than 5 mm thick. We cannot rely on Woolley’s Achaemenian assumption for dating this fragment of pottery, since the context of discovery at Ur are not securely dated (Fleming 1989, Pl. 32, fig. 2-8).

This sherd with a straight wall could be better associated to a later period, namely Late Hellenistic-Parthian period (Haerinck stated that there are diagnostics for the late Parthian period. Haerinck and Boucharlat 2011, p. 69) whose parallels have been recovered at Nippur (Penn Museum, number B5773 and MacCown and Haines 1967, Pl. 103.13), Seleucia on the Tigris (Debevoise 1934, p. 43, 2, 3 and 5) and in the Parthian cemetery at Susa (Haerinck and Boucharlat 2011, Pl. 7 GS-603h). A better observation of manufacturing technique and temper might help to better identify this material. Finally, it is important to note that O. Lecomte identified this category of ceramic in the levels of the E.babbar, in courtyard 7, floor 1, room 23, floor 5 and in room 24, in

floor 34, dated to the 2nd c. BC (Lecomte 1987, Pl. 4, Pl. 17, 9-10; Pl. 20, 15-16; Pl. 29, 3-7. See also Bachelot and Lecomte 1984, p. 14, p. 18 fig.2.16).

Large Vat and pot decorated with undulations

The vessel found in “Numéro vert 1013 (JG 7-8)” is a large vat or basin Fig.1.4 (about 74 cm diameter!) with a hemispherical body and an incurved rim thickened on the outside, triangular in section. Below the rim, the surface is decorated with protruding ridges below which an undulating line runs around the vessel horizontally. Three grooves runs parallel below this band.

The decoration of a band with undulating lines made probably by finger on wet surface of the large basin or vats has been noticed so far in the Middle Euphrates and Khabur area for contexts dated to the 8-6th c. BC (Tell Sheikh Hamad, Fundbereich 4, Kreppner 2006 Taf 36.3 and Taf37.1-8). In Tell Sheikh Hamad, scholars call it the “Tell Sheikh Hamad surface treatment” but it seems that such surface treatment was shared in the fluvial area of the Euphrates for large vessels, pots and jars. The fragment of pot Fig.1.13 decorated with this same surface treatment could be associated to this same collection of containers.

However, this type of decoration may be possibly interpreted also as typical of the early 2nd millennium BC, characterizing the deep vats usually related to beverage preparation. Comparanda from Southern Mesopotamia are Tell ed Der and Nippur (Armstrong and Gasche 2014: pl. 122; Van Ess 1988, Abb 7), from central Mesopotamia are Tell Asmar and Tell Yelkhi (Delougaz 1952, D.044.510; Gabutti 2002-2003, tavv 46, 47, 50; Oselini 2019, p. 700, fig. 4: 13).

Cylindrical beaker

The cylindrical beaker (Fig.1.10) found in room 1515 within the floor 1017 has a convex base resting on a convex disc of 5 cm diameter. These beakers occurred already in the known assemblage of the 8th c. BC in northern Mesopotamia (Middle tigridian, Khabur and Euphrates regions. Kreppner 2006, Hausleiter 2010, Herr 2018 and in lower Euphrates plain Nippur (McCown and Haines 1967, Pl.103.24 from TA 14 II) and might be attested also in the Neo-Babylonian period. A similar “convex base” has also been noticed at Uruk, probably dating to the Achamaenian period (?) (Strommenger 1967, Taf. 14, Abb. 10).

S-shape beaker (?) or small bottle

The profile (Fig.1.3) might be from a fragment of a S-shaped beaker or a bottle with a flat disc base recovered in room 1515 in the floor 1010.

Necked jar with outwardly beveled rim

Two sherds of short-necked jars (Fig.1.6; Fig.2.10) have been recovered in n.v 1014 and in the room 1515, floor 1027. The triangular profile, the dimension of the opening ranging around 13-14 cm and concave neck are common features recovered with the jars since the beginning of the 2nd millennium BC (see Oselini), Neo-Assyrian period up to the Hellenistic period (Katzky 2015, Taf. 41-42). The small size of the potsherds and the lack of first hand observation do not allow us to more precisely date this assemblage.

CONCLUSION

The “fishplates” (Fig.1.11-12, Fig.2.2-3) are the main diagnostic shapes which give a hint to hypothesize the occupation of the room 1515, floors 1017 and 1027 to the Hellenistic period (4th to 1st c. AD). So far, we are lacking good hallmarks for identifying an “Achaemenian period” pottery in the area. The rest of the material such as the carinated bowl, the large vat, and the necked jar found parallels in more ancient level in Mesopotamia (8-6th c. BC) and the later periods (7th c. BC to 2nd c. A.D) as with “eggshell bowl”.

Concerning the finds on the floor 1027, they come from different periods namely Isin-Larsa/Old Babylonian and Hellenistic/Parthian. Indeed, the conical bowls with profiled rim, the bowls with

straight sides and outwardly bevelled rim, the deep bowl with curved sides and outwardly bevelled rim, the small fragment of jar with narrow shoulder, short conical neck and thickened rim and the fragment of neck of a jar with outwardly bevelled rim found on the floor 1027 of room 1515 are typical early 2nd millennium shapes, dating from the 19th to the mid-late 18th centuries BC (Isin-Larsa period). Parallels can be found in levels 2 and 3 of sounding JVIII (Calvet Huot, Minsaer, 2003).

Compelling materials dating to the Isin-Larsa period excavated in B 48 are the conical bowls with profiled rims (n.v. 1014, 1001), the sherds belonging to the necked jars with ovoid body, convex or ring base, thickened elongated or triangular rim (n.v. 1014), the tall ovoid bottle with narrow neck and ring base (n.v. 1001), and finally the big vat with engraved and incised decoration, outwardly rim, usually related to beverages preparation (n.v. 1013).

Therefore, the deposits n.v.1001, 1014, 1027, 1024 (Fig. 3) and 1030 (Fig. 4) have yielded potsherds dated to the Isin-Larsa Period and n.v 1010, 1017 and 1027 contain potsherds and complete vessels dated to the second half of the 1st Millennium BC. We still doubt about a univocal dating for the potsherds found in n.v. 1013.

IX - LARSA AUX EPOQUES NEO-BABYLONIENNE ET ACHEMENIDE

Dominique Charpin

Il faut commencer une remarque de fond : alors que les tablettes paléo-babyloniennes issues des fouilles clandestines se comptent par centaines, on ne possède rien de comparable pour les époques postérieures, en particulier pour le premier millénaire. Les inscriptions commémoratives de Nabuchodonosor et de Nabonide nous informent sur les grands travaux entrepris par ces deux rois sur l'Ebabbar et la ziggourat. La ville semble avoir été quasi déserte lorsque les travaux commencèrent, sans doute pas avant le milieu du règne de Nabuchodonosor¹. À partir de ce moment, et jusqu'à l'époque achéménide tardive², Larsa se présente comme une « ville saTellite » d'Uruk³.

Cette dépendance se voit très clairement dans les archives du temple Eanna à Uruk, où une centaine de tablettes concernent Larsa⁴. Une vingtaine sont des lettres envoyées par les administrateurs de l'Ebabbar aux responsables de l'Eanna d'Uruk, demandant généralement l'envoi à Larsa de biens pour les besoins du culte : animaux (moutons, bovins, oiseaux), denrées (vin, raisin, dattes, figues, miel, beurre, huile aromatisée), ou encore des produits transformés (textiles, cuir, laine teinte, cordes, outils en argent et bronze, et même une lyre). Un exemple (datant de la fin du règne de Cyrus ou de la première moitié du règne de Cambysé⁵) :

« Lettre de Šamaš-idri et Itti-enši-Nabu à l'administrateur-šatammu et à Nabu-ah-iddin nos pères. Que Šamaš et Bunene décrètent santé et bien-être pour nos pères ! Ainsi parle Itti-enši-Nabu : « La tunique de la Dame-de-Larsa est usée jusqu'à la corde et il nous manque des turbans d'étoffe rouge

¹ P.-A. Beaulieu, « Prébendiers d'Uruk à Larsa », *Revue d'assyriologie et d'archéologie orientale* 87, 1993, p. 137-152 (p. 151).

² M. W. Stolper, « Late Achaemenid Legal Texts from Uruk and Larsa », *BaM* 21, 1990, p. 559-625.

³ Selon l'expression de M. Jursa et al., *Aspects of the Economic History of Babylonia in the First Millennium BC. Economic Geography, Economic Mentalities, Agriculture, the Use of Money and the Problem of Economic Growth. Veröffentlichungen zur Wirtschaftsgeschichte Babyloniens im 1. Jahrtausend v. Chr. Band 4*, Alter Orient und Altes Testament 377, Münster, 2010, p. 105. On trouvera dans ce livre la synthèse la plus récente sur Larsa à l'époque néo-babylonienne et achéménide (p. 105-108).

⁴ P.-A. Beaulieu, « Neo-Babylonian Larsa: a Preliminary Study », *Orientalia* 60, 1991, p. 58-81.

⁵ BIN 1 10, traduction Beaulieu, *RA* 87, p. 138.

et d'étoffe bleue pour (accomplir) nos devoirs culturels. Mettez-vous dans une position favorable auprès de Šamaš ! Que les seigneurs nous envoient deux turbans, (un) d'étoffe rouge et (un d'étoffe) bleue.” »

On possède aussi des comptes dressés par l'administration de l'Eanna qui montrent que ces requêtes étaient suivies par l'envoi de ce qui était demandé. La dépendance de l'Ebabbar à l'égard du temple d'Uruk ne concernait pas les biens de première nécessité, comme l'orge et le sésame dont avaient besoin les boulangers et brasseurs de l'Ebabbar. La coopération concernait surtout les produits de l'artisanat : de l'or était donné à des artisans d'Uruk par les responsables de Larsa qui voulaient orner les statues de leurs divinités. On note aussi l'envoi de travailleurs et d'outils de l'Eanna à Larsa. Certains Urukéens étaient même impliqués dans le culte à Larsa, puisqu'on en connaît qui étaient détenteurs de prébendes de brasseurs et de boulangers dans l'Ebabbar de Larsa.

À Larsa même, on ne dispose que d'un seul lot d'archives, ayant appartenu à Itti-Šamaš-balaṭu et son fils Arad-Šamaš¹. Il s'agit d'un lot d'environ 200 tablettes, qui permettent de retracer les activités économiques de ces deux individus, entre l'an 22 de Nabuchodonosor et l'an 8 de Cyrus, soit pendant 52 ans (583 à 531 av. J.-C.). On n'a curieusement pas retrouvé de titres de propriété. Cela peut indiquer que les tablettes qui ont été retrouvées avaient été mises au rebut lorsqu'elles ont perdu tout intérêt, l'histoire de la famille se poursuivant : on notera qu'Arad-Šamaš est encore attesté 7 ans plus tard, comme témoin dans un contrat de mariage datant de l'an 6 de Cambyse (524 av. J.-C.).

P.-A. Beaulieu a noté que ces tablettes avaient été façonnées avec de l'argile de mauvaise qualité ; elles sont de plus grande taille que les équivalents d'Uruk et les signes d'écriture sont plus grands. Tout ceci donne l'impression qu'elles ont été écrites par des scribes provinciaux qui n'avaient pas été à l'école d'Uruk. Au milieu du lot figurent quelques tablettes manifestement écrites par l'administration de l'Ebabbar².

On notera que la moitié des tablettes se trouve au British Museum et l'autre moitié dans différentes collections d'Amérique du Nord³. On sait qu'elles proviennent du pillage de Senkereh antérieur à 1911. La question est de savoir où elles ont pu être trouvées. Le bâtiment B.48 est un bon candidat, d'autant que la céramique retrouvée sur le sol le plus récent de la pièce 1515 est datable de l'époque achéménide. Il suffirait de trouver ici ou là une ou deux tablettes négligées par les clandestins pour transformer cette hypothèse en certitude.

Collection	Nombre de tablettes	Remarques
British Museum	ca. 100	Inventoriées en 1911
Yale Babylonian Collection	32	
Horn Archaeological Museum, Berrien Springs	plus de 60	Cf. thèse de Wright ⁴
Royal Ontario Museum, Toronto	1	
Free Library, Philadelphie	1	
Princeton Theological Seminary	1	
Oriental Institute University of Chicago	2	
Musée de Berlin	1	

¹ Comme l'a indiqué Beaulieu, il est très vraisemblable que les débris d'archives formés de deux ou trois tablettes rédigées à Larsa qu'on peut regrouper ça et là ont en fait été trouvées à Uruk (RA 87, p. 145).

² M. Jursa, *Neo-Babylonian Legal and Administrative Documents. Typology, Contents and Archives*, Guides to the Mesopotamian Textual Record 1, Münster, 2005, p. 108-109 § 7.9.1 (p. 108 n. 799).

³ Le tableau ci-dessous est fait d'après les indications de Jursa, GMTR 1 § 7.9.1. L'ensemble doit être publié par P.-A. Beaulieu.

⁴ P. H. Wright, *The City of Larsa in the Neo-Babylonian and Achaemenid Periods: A Study of Urban and Intercity Relations in Antiquity*, PhD Dissertation, Hebrew Union College, Cincinnati, 1994.

“COLD CASE”

Comme l'a immédiatement vu L. Bachelot, la qualité de construction de B48 n'a rien de comparable avec les grandes demeures de l'époque paléo-babylonienne : la mise en œuvre des briques est hâtive, avec emploi de fragments de briques cassés, l'épaisseur des lits d'argile considérable. On a l'impression d'un travail fait rapidement et à l'économie, ce qui contraste avec la superficie du bâtiment et le nombre de pièces. La question se pose donc de savoir de quelles ressources disposaient les bâtisseurs, pour avoir ainsi pu utiliser des briques cuites dans les soubassements de la construction.

L. Bachelot a remarqué que le seul bâtiment de Larsa où l'on retrouvait des briques cuites rectangulaires de mêmes dimensions qu'en B48 était le palais de Nur-Adad¹. Or la fouille de ce bâtiment a permis à J. Margueron de faire une remarque très intéressante² :

« Après l'écroulement de l'édifice, les habitants de la cité ont, à *un moment qu'il est impossible de fixer*, procédé à la récupération des briques cuites de certains murs encore en place qui, sans doute, affleuraient à la surface ; ces murs ont ainsi entièrement ou partiellement disparu, mais à leur place on retrouve du sable jaune qui s'était accumulé sous l'effet du vent de sable entre les deux montants de terre à briques constitués par les superstructures effondrées et qui avaient conservé la forme exacte du mur ; cette solidité montre que *ce démontage n'a été réalisé que longtemps après l'abandon*. Enfin, on rencontre aussi par endroits de grandes poches de sable gris identique à celui qu'ont laissé actuellement sur le site les vents de sable ; il y a tout lieu de croire que ces poches sont les marques laissées par les fouilleurs clandestins du début du siècle. »

Les coupables du pillage des briques du palais de Nur-Adad peuvent maintenant être identifiés : ce sont les individus qui ont bâti B48, situé à environ 200 m seulement. Si l'on admet que la construction du bâtiment B48 date du règne de Nabuchodonosor (605-562)³, on voit qu'il s'était écoulé plus de 12 siècles depuis la construction du bâtiment par le roi de Larsa Nur-Adad (1865-1850). Il faudrait calculer le volume de briques pillées dans le palais de Nur-Adad et voir s'il correspond à la totalité des briques de B48 ou à davantage encore. Quoi qu'il en soit, l'image d'individus soucieux de maintenir une certaine apparence mais disposant de moyens limités, cadre très bien avec ce que révèlent pour l'époque néo-babylonienne les textes de Larsa, ou ceux d'Uruk qui concernent Larsa.

¹ D'après M. Sauvage, *La Brique et sa mise en œuvre en Mésopotamie des origines à l'époque achéménide*, Paris, 1998, p. 284.

² J. Margueron, « Larsa rapport préliminaire sur la quatrième campagne », *Syria* 47, 1970, p. 261-277 et pl. xv-vi (p. 270 ; les italiques sont de moi).

³ Voire de deux siècles plus tard, cf. Osellini et Herr, ce volume.

X - THE EXCAVATIONS OF BUILDING B50 AT LARSA

Sidonia Obreja, Rateb al Debs, Régis Vallet and Chamel Ibrahim



Fig. 1 – Aerial view of the excavated area of B 50, from the east.

The Larsa field excavation concentrated on two large buildings in the western sector of the site, known from 1985-1987 field surveys and reinvestigated during the spring 2019 geo-physical, topographical and archaeological surveys. These previous investigations have revealed the existence north of the E.Babbar, the temple of the Sun-God Shamash, of a large rectangular building 110 m x 60 m, whose highest part only, forming a small Tell, was known as building B50. The excavation of this building began in this year's fall campaign and was carried out during 25 working days, from 15 October until 16 November. The team working on the sector was composed of four archaeologists and ten workers, assisted by two topography and GIS specialists.

Situated north of the E.Babbar and northeast of the Ziggurat, and only one to three hundred meters in distance of both these sacred edifices, B50 building may also have had a religious character. We believe it to be a temple because of its significant size and the dimensions and disposition of the walls, of considerable width and entirely made of mudbrick. Inscriptions found on the site show that other sanctuaries were connected to Shamash temple (Arnaud 1976, 78), the patron deity of the city, and it is possible that they have been near the E. Babbar.

The plan outlined by the geomagnetic survey obtained during the spring campaign presents the B50 building as consisting of a large courtyard accessed by a recessed façade in the southern part, followed by the main body of the building to the north (see Darras, this volume). Due to its great extent, about 6600 sq. m., the method chosen for the excavation of B50 was not by laying trenches but by starting to dig the main structures and walls noticeable on the high ground in the northern part of the compound. We then continued to clear the spaces between them, while progressively extending the area being excavated to expose as much as possible of the plan of the building. By the end of the season, a surface of around 625 m² was exposed (Fig. 1 and 2).



Fig. 2 – B50, orthostatic view.

However, from the first days in the field it became clear that we had not one, but two buildings: a later one, with narrow baked brick walls that lies upon an earlier one with large mudbrick walls. Both buildings were greatly damaged by ancient and modern large pits, and parts of them, especially of the later building were eroded away (Fig. 3).

The more recent building had narrow walls made of only one or two rows of badly preserved baked bricks, associated with red mudbricks placed on top of a reed bedding in what seems to be a large courtyard in the center, and remains of what may have been other rooms to the northeast. It appears that the square baked bricks used for its construction were not intended for this edifice (many bricks show inconsistent traces of bitumen), but were instead recuperated from older structures still visible on the site at that time. The dimensions of the baked bricks, 34-36 x 34-36 x 7-9 cm, correspond to those employed in the constructions of the beginning of the IInd millennium, like the Nur-Adad Palace, or in some of the rooms of the E.Babbar or on the Ziggurat¹. The late building did not provide any *in situ* material, its few tiled floor vestiges being immediately under the dusty and sandy present-day surface of the site. A fragmentary baked brick, probably reused as all the others, inscribed with a text of Adad-Apla-Iddina (1067–1046 BC) of the IInd dynasty of Isin

¹ Sauvage 1998, p. 284-285, 294 ; Huot 1985 ; Huot et al. 1976, p. 8.

was found in the western sector (see Mourad, this volume) and give a *terminus post quem* for the construction of the building in middle of the 11th century B.C. However, the inscribed baked brick comes certainly from the E.Babbar, and the most probable dating of the late building is that it is part of the Hellenistic reoccupation of the neighborhood. It presents a similar sequence as that of the B48-49 sector, 120m to the north, where poorly constructed albeit important buildings immediately cover the Old-Babylonian levels of the site. A date also in accordance with the material found in surveying B50 and its surroundings (Giraud, this volume).



Fig. 3 – Plans the Earlier and Later Buildings in B 50.

Of the recent building, which lay just under the sand of the surface, only the eastern part is partly preserved. A large courtyard paved with red mud-bricks, approximately 28 meters long and 14 meters wide, occupies the center of the front of the building. Of its internal organization, only isolated stretches of baked brick pavements and walls appear in the southern and north-eastern areas of the compound.

The fragment of a tiled floor, a parvis (3014), precedes the recessed entrance (3m wide) in the south-eastern part of the building, giving access to the courtyard. In the center of the courtyard, the red mud-brick floor 3052 borders a portion of baked brick tiled floor 3051 that surrounds what may have been a platform or podium 3001 in front of the entrance. The red mud-brick floor 3052 probably continued in all directions, but it was destroyed by large pits, particularly 3021 to the north, more than ten meters long, a looter's trench made probably after the first fieldwork on the site (Fig. 4). This assumption is based on the fact that pit 3021 is immediately east of one of Parrot's topographical landmarks (through mud-brick floor 3052) from the 1933 campaign. Judging by the number of baked bricks scattered in the large pit 3021, it probably crossed and destroyed a second

podium, north of the previous one. The red mud-bricks of the floor of the courtyard, preserved only in two small areas, 3012 and 3052 (on the top of the wall 3017 of the ancient building and northeast of the platform 3001 –few traces were noticed elsewhere, to the south and east), are set on a bedding of reeds, forming a dark-ashy layer (Fig. 5).



Fig. 4 – The modern pit 3021, seen from the north.



Fig. 5 – The red mudbrick floor of the Late building next to the 3001 platform, seen from the northwest.



Fig. 6 – Room 3004, from the SE, with the two bitumen canalizations through its walls.

In the north eastern part, a baked brick tiled small room, 3004, is bounded by the walls 3006, 3048 and 3049 of which the north-western and south-eastern ones are each traversed by a bitumen canalization, 3003 (Fig. 6). Another large oval pit, 3045, destroyed the mud-brick floor of the courtyard in front of the tiled recessed room 3004. The eastern section of the facade (3005) connects the entrance area with the eastern sector. It presents a recess, and it is almost entirely preserved for a distance of about 20 meters. Its limits to the east are not known, for it continued beyond the preserved part of the northeastern sector. The area between the eastern facade and the room 3004, probably another room, was disturbed by erosion due to its proximity to the surface, and by the large pit 3055.

Only three limited areas of the later building survived in the northern and western sectors. A small baked brick area may indicate the existence of another small room 3051 at about three and a half meters to the north of the room 3004. Portions of its southern wall 3011 and a small fragment of tiled floor 3051 were cleared. Remnants of the red mud-brick floor, here 3012, were again found on top of the 3017 wall, running NE-SW. Next to it, a small baked brick area, 3010, may be the only surviving part of the wall delimiting the courtyard to the NW. Nothing more of the recent building has survived west of the small remains of the wall 3010. Here, the surface of the Tell slopes gently to the west, where small wadis are formed in the rainy seasons.

In the northern part of the compound, the later building is posed directly on the mudbrick walls of the earlier one. Such is the case with the mud-brick floor 3012/3052, where only the reed bedding separates the two buildings (Fig. 7). Some of the walls of the later building are founded directly on the filling of the rooms of the earlier building, having as foundation a layer of earth and one of mortar. However, the north-western preserved limit of the wall 3050 (and a dividing wall running northeast) descends as much as five courses of bricks into the filling of the room 3033 of the earlier building (Fig. 8). In the same way wall 3010, posed on wall 3031 of the ancient building, is supported by a pile of baked bricks in the filling of room 3019. The entrance and the eastern façade are not superposed on the walls of the earlier building but are set one meter away to the south-east. Here, the later building's wall is supported by a succession of three different layers, the

first one composed of two courses of mudbricks, followed by a mortar layer and one layer of earth. This substructure abuts and rises on the razed level of the buttresses and bays of the façade of the ancient building.



Fig. 7 – The reed bedding separating the two building on the wall 3012, with Parrot’s landmark point (top right) from the 1933 campaign.



Fig. 8 – Substructure of wall 3006 and a dividing wall of the recent building, descending into the fill of room 3033 of the ancient building.

Underneath the later building, the earlier building is a more massive construction that develops on a more extended area. The pottery and small artefacts retrieved inside, as well as the format of the mudbricks 34-36 x 34-36 x 7-8 cm, indicate a Middle Bronze Age date for the construction of the ancient building. By the end of the excavation, at least eight rooms/areas of this earlier building have been identified, and some of them partially cleared. For now, we do not know its complete layout, but by the massive south-eastern wall it seems that it may have been oriented towards the south, to the E.Babbar. We suppose that, considering the great extent of the edifice, we have outlined only a fraction, perhaps 10% of the whole building, in the north-western part of the compound.



Fig. 9 – The buttress of the southeastern façade of the ancient building, two meters away from the baked brick facade of the recent building.

A massive mudbrick wall, 3044, represents the southern boundary of the earlier building more than 5 m thick (5.6m the maximum preserved) provided with a buttressed façade (Fig. 9). Three rectangular rooms, a bigger one in the middle, 3032, flanked by two smaller ones to the east, 3033, and west, 3041, run along the interior of the massive wall. Walls 3009 and 3038, 2.3 m thick separate the two smaller rooms from the bigger one, 3032, in the middle. Of the south-western room, 3041, only the eastern part was cleared. It represents a narrow space, less than 2.5 m wide, delimited by massive mudbrick walls. Its counterpart to the north, 3033, for which we were able to trace the whole perimeter, is also a narrow long space 7.35 m x 2.10 m. Part of the substructure of a wall of the later building, 3050, was intruding in its filling, as were three large pits that have equally disturbed the filling as well as the massive walls of the room. Between these two spaces, 3033 and 3041, lies the biggest room yet exposed, 3032. This rectangular room in the heart of the excavated area is 12.3 m long and only 3.9 m wide. The large modern pit 3021, that has destroyed parts of the pavement of the recent building, has also cut deep inside the filling and across almost all the length of room 3032 western wall. A sounding was made in its northern corner, reaching almost 3 m deep, but no floor was reached (Fig. 10). The pottery fragments retrieved from the sounding corresponds to material dated from the first centuries of the IInd millennium, the Isin-Larsa and Old-Babylonian periods.



Fig. 10 – Sounding in the northern corner of room 3032 of the ancient building, seen from the southeast.

More to the north, the remaining excavated area is constituted by a room 3019, parallel to 3032, followed by two perpendicular narrow rooms, 3027 and 3029. These two incompletely excavated rooms, only 2.15 m wide, are flanked by two large areas to the northeast and southwest, *loci* 3039 and 3040 that may correspond to two large courtyards. Another deep sounding was done inside room 3019, which reached the foundations of the building in the NE corner of the room, at a depth of more than 4.5 m from the top of the walls (Fig. 11). No elaborated tiled or plastered floor was found, only what appeared to be a rudimentary clay floor, 3053, adjoining a 30 cm high ‘plinth’ along the base of the north and eastern walls of the room.

The filling of this room, as that of the bigger one, 3032 to the east was composed of layers of packed earth alternating with layers of broken mudbricks, probably coming from the destruction and leveling of the remains of the walls and floors of the earlier building. However, the filling of the room 3019 was particular, because of the presence inside its upper part of what looked like two fallen mudbrick walls, or collapsed piles of bricks, aligned with the northeastern and southeastern walls of the room (Fig. 12). These structures indicate different phases in the filling of the building, or maybe some secondary occupation of parts of the edifice, after an initial period of abandonment of the sector. In addition, inside the filling of the room 3019, at a somewhat deeper level and next to the northwestern wall we found two fragments of an Old-Babylonian tablet, representing an economic text (Fig. 13). Most of the ceramic material retrieved from the ancient building dates to the same period, which may indicate that the destruction and (partial) leveling of the edifice, at least the part excavated this year, date equally from the first half of the IInd millennium B.C.



Fig. 11 – Deep sounding in room 3019 of the ancient building, seen from the west.



Fig. 12 – Collapsed mudbrick masonry in the filling of room 3019. At the top left, the horizontal baked brick foundations of wall 3010 of the recent building.

No passageway between the rooms of the earlier building was yet discovered. We believe that the summit of the preserved walls corresponds to the base of the first storey of the building. This is clearly shown by the 20cm wide shift in the faces of the upper part of the walls (see Fig. 10, 11 and 12), where the wooden beams of the floors of the storey were laid. Thus, the passageways of the first storey have been eroded while those of the ground floor are still deeply buried.

The next year's campaign will concentrate on revealing as much of the plan of this ancient building, while trying to elucidate the mystery of its deeply buried floors and passageways.



Fig. 13 – B50, Old Babylonian tablet and Larsa goblet coming from the filling of Room 3019 (not at the same scale).

XI – PRELIMINARY CONSIDERATIONS ON THE POTTERY FROM B50 AT LARSA

Valentina Oselini

As for B48 material and for the same reasons, the preliminary considerations on pottery from B50 have been realized principally by observing the morphological criteria from the available drawings and by verifying the type of fabrics on photos, shared with me by R. Vallet and S. Obreja. Moreover, most of the shapes excavated in B50 were potsherds and not entire vessels, thus the evaluations about chronological attribution should be considered as preliminary. The assemblage from B50 consists in materials from loci 3019, 3032, 3035, 3034, 3037, 3033, 3040, 3021, 3039 recording by using the “numéro vert” (n.v.) 2000-2099; 3000-3022.

Drawings have been made for n.v. 2022, 2033, 2040 (locus 3019); 2009 (locus 3007); 2019 (locus 3016); 2014, 2017 (locus 3013); 2032, 2041 (locus 3018); 2034 (locus 3021); 2000, 2042, 2030 (surface and sub-surface). Data from the other contexts consist of general photos.

A selection of the most diagnostic sherds, for which was possible to find precise comparisons and to evaluate a chronological attribution, is presented in the following section. The two plates related to the following description show the typological subdivision of the pottery materials which were represented by both, drawings and photos. As a first impression, all of them can be related to the early 2nd millennium BC, covering a timespan from the 20th to the end of the 18th centuries BC (Isin-Larsa and Old Babylonian periods). Some of the most typical shapes dating to this period are shown on compositional photos with materials from n.v. 3003 and 3004 (figs 3 and 4). Dating references are belonging to the “Middle Chronology”.

THE EARLY 2ND MILLENNIUM BC POTTERY ASSEMBLAGE FROM B50

(Isin-Larsa and Old Babylonian)

Platters

The platters (Fig. 1: 1-3) are low and wide open vessels with usually flat base, inwardly bevelled and thickened rim. The three potsherds from n.v. 2042 are very similar to samples found in B27, B59 and in level 2 of the sounding JVIII at Larsa (Calvet 2003, fig. 48: 27.109; fig. 52: 27.277; fig.56: 27.556; fig.63: 59.28; fig. 69: 59.64; Calvet, Huot, Minsaer 2003, fig. 5: a, c, d). According to Armstrong and Gasche, this shape was most widely spread in the entire Mesopotamian area during the 18th century BC, however it is attested in context also dated to the 17th century BC (Armstrong and Gasche 2014, p. 16), thus it can be considered typical of the late Isin-Larsa and, mainly, Old Babylonian period.

Conical bowls

The conical bowls with simple rim (Fig. 1: 4, 5) are one of the most common types within the Mesopotamian assemblage from the 3rd millennium (Early Dynastic period, see Thalmann 2003, figs 27-29) to the mid-2nd millennium BC. The two potsherds from n.v. 2023 and 2031 have the same size and can be compared to the samples found at Larsa in B27, B59 and in level 2 of the sounding JVIII, which are dating to the 18th century BC (Calvet 2003, fig. 52: 27.276; fig. 54: 27.30; fig. 63: 59.27; fig. 56: 59.79; fig.66: 59.53; Calvet, Huot, Minsaer 2003, fig. 6: j).

Conical bowls with profiled rim

Conical bowls with profiled rim (Fig. 1: 6-8) and simple rounded lip are usually dating since the end of the 3rd millennium BC to the mid-18th century BC from the southern and central Mesopotamia. The same shape has been found also in B48 (see Oselini and Herr, this volume). The three potsherds found in n.v. 2000, 2014 and 2023 are belonging to the same type and find comparisons in levels 2 and 1 of sounding JVIII excavated in 1970 at Larsa (Calvet, Huot, Minsaer 2003, fig. 11), dating to the 18th century BC.

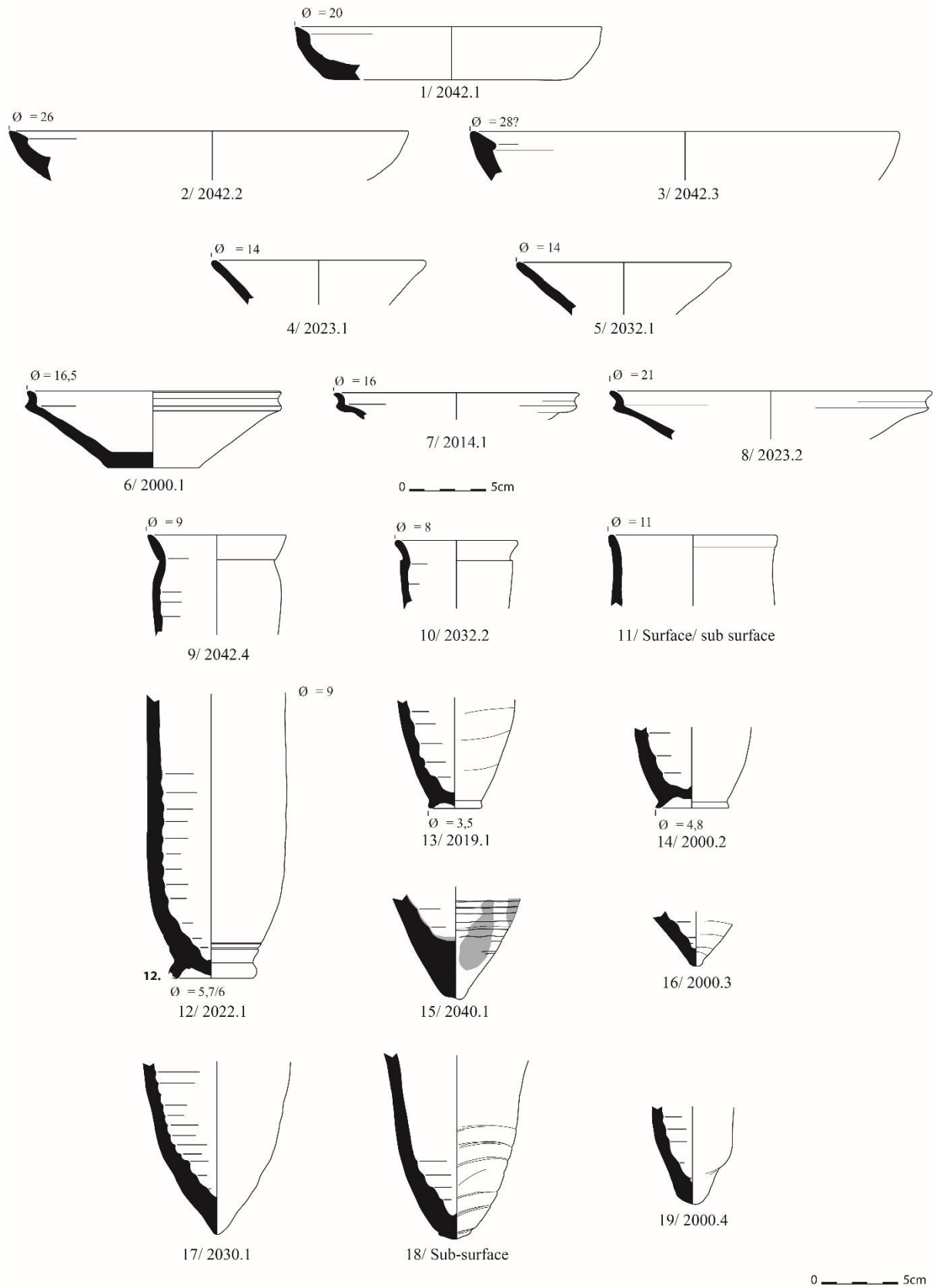


Fig. 1 – Ceramic materials from B50.

Cups

The two potsherds found in n.v. 2024 and 2032 (Fig. 1: 9, 10) are possibly belonging to the type of tall cups, with cylindrical body, short everted rim set off from the body by an abrupt thinning of the vessel wall. The vessel from Larsa, from the excavations carried out in 1967 (Calvet, Huot, Minsaer 2003, fig. 31, j) and the potsherd from levels 1-2 of sounding JVIII (Calvet, Huot, Minsaer 2003, fig. 17: a, c, e) can be considered as the best comparisons. Similar shapes have been found also at Nippur and Isin (Armstrong and Gasche 2014, pl. 57: 8, 11). The mentioned references for these two potsherds are dating to the 18th-17th century BC, corresponding to the late Isin-Larsa and Old Babylonian periods.

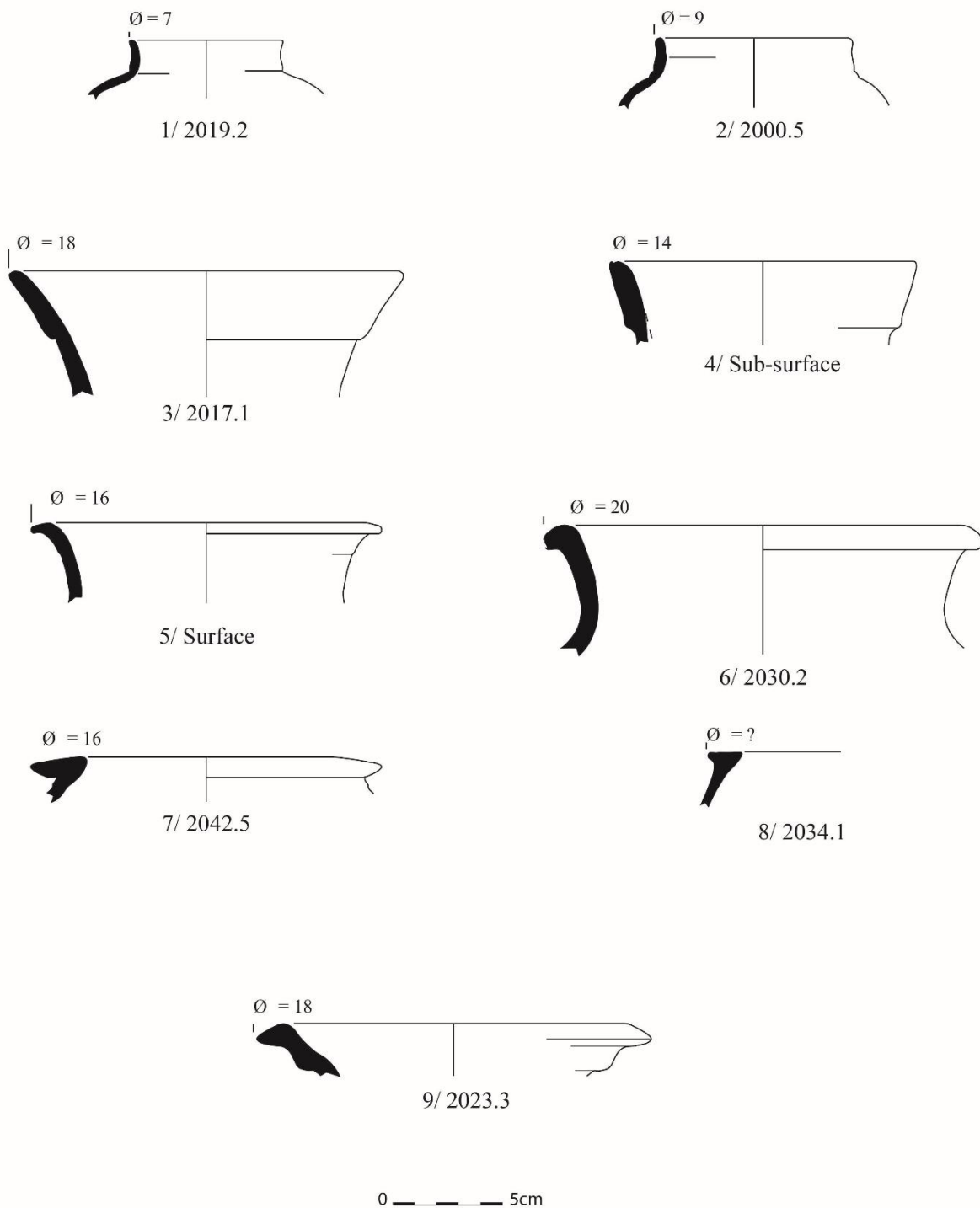


Fig. 2 – Ceramic materials from B50.



Fig. 3 – Isin-Larsa / Old Babylonia ceramic assemblage from B50, nv. 3003 (conical bowls, “Larsa goblets”, small jars).

“Larsa Goblets”

Several potsherds belonging to the typical so called “Larsa Goblet” (Fig. 1: 11-19) have been discovered within n.v. 2000, 2019, 2022, 2040, 2000, 2030 and 3007. The goblets with sinuous profile and ring base, convex base or button base are the most common and representative shapes dating from the mid/late 19th to the 18th centuries BC in southern Mesopotamian contexts. Parallels can be found at Larsa in B27, B59, in soundings JVIII (1970) and HXI (1967). *Comparanda*: Calvet 2003, fig. 46:27.160, 27.49; fig. 48: 27.118; Fig. 51: 27.526; Fig. 52: 27.241, 27.248; fig. 55: 27.503, 27.501; fig. 57; fig. 64: 59.43, 59.42; fig. 67: 59.52, 59.55; fig. 70: 59.24. Calvet, Huot, Minsaeer 2003, figs 12-14; fig. 31: a-1; fig. 32: a, b, d. Further comparisons from Uruk, Lagash and Telloh (Armstrong and Gasche 2014, pl. 58).

Small Jars

Small globular jars (Fig. 2: 1, 2) with short conical or cylindrical neck and rounded or outwardly profiled rim are usually quite rare in the southern Mesopotamian assemblages, so far. They have been recovered in n.v. 2019 and 2000 and are like the small globular jar found at Larsa in B 27 (Calvet 2003, fig. 46: 27.51). More precise comparisons for the two potsherd from B50 can be found within the central Mesopotamian contexts: i.e. at Tell Yelkhi in the Hamrin (Gabutti 2002-2003, tavv 72, 90; Oselini 2019, fig. 3: 6), and in the Middle Euphrates, at Haradum (Armstrong and Gasche 2014, pl. 82: 3, 4). In the aforementioned contexts, this type is usually dating to the 19th and 18th centuries BC, corresponding to the Isin-Larsa and early Old Babylonian period.

Necked jars with elongated rim

The necked jars with ovoid body, convex or ring base, thickened elongated or triangular rim (Fig. 2: 3, 4) are very typical of the southern Mesopotamian repertoire dating to the 19th-mid 18th

centuries BC. They have been found in n.v. 2017 and on the sub-surface in B50, and in B48 (see Oselini and Herr, this volume). They are very frequent at Larsa in sounding JVIII (levels 3-1; see Calvet, Huot, Minsaer 2003, figs 29, 30) and in the house B27 (Calvet 2003, fig. 53:27.128; fig.55: 27.510). Comparisons can be found at Uruk (Van Ess 1988, Abb 21: 148, 152), at Tell ed Der and Nippur (Armstrong and Gasche 2014, pl. 111).



Fig. 4 – Isin-Larsa / Old Babylonia ceramic assemblage from B50, nv. 3004 (platters, conical bowls, cups and fragments of necked jars with elongated rim).

Necked jars with thickened rim

Jars with short conical neck and outwardly thickened and rounded rim (Fig. 2: 3, 4) are quite common within the early 2nd millennium BC repertoire from Larsa. They have been found during the excavations of sounding JVIII, level 2 (Calvet, Huot, Minsaer 2003, fig. 25: h-m). Two potsherds belonging to this shape were discovered on the surface of locus 3000 and in the n.v. 2030.

Pots

N.V. 2042 and 2034 yielded two potsherds belonging to the type of pots (Fig. 2: 3, 4) with curved sides and thickened, outwardly bevelled rim. This shape is comparable to the vessels found in levels 1-3 of sounding JVIII at Larsa covering a timespan between the mid-19th to the late 18th century BC. (Calvet, Huot, Minsaer 2003, fig. 25: b, d, e, h, i).

Piriform Jar?

The potsherd found in locus 3019, n. v. 2023 (fig 2: 9) is peculiar because it might be associated to a typical shape dating from the Akkadian to the Ur III period (second half of the 3rd millennium BC) and known as “the piriform jar”. The morphology of the rim and the inclination of the sherd are very similar to the Akkadian vessel from Nippur represented in McMahon 2006, pl. 106: 1, or to the Ur III shape from Nippur shown in McMahon 2006, pl. 127: 1. Due to the small size of the potsherd from B50 and the absence of photos, this chronological attribution should be considered with caution.

CONCLUSION

The bulk of pottery materials from B50 is dating to the 19th to the 18th centuries BC. The presence of “Larsa Goblets”, of platters with inwardly bevelled and thickened rim, of the tall cups with everted rim, of necked jars with elongated or thickened and rounded rim is significant for the attribution of this assemblage to the Isin-Larsa and early Old Babylonian period. However, some of the shapes discovered during the 2019 excavation might be also related to earlier periods. Conical bowls with simple or profiled rim, are, indeed, lingering types, which can be dated to the later phases of the 3rd millennium BC as well.

XII – QUELQUES FRAGMENTS DE BRIQUES INSCRITES DE LARSA

Ali Murad

Lors la prospection de mai-juin 2019, sept fragments de briques inscrites ont été recueillis, provenant des secteurs nord et nord-est du site (Fig. 1). A l’automne 2019, quatre fragments supplémentaires ont été ramassés, dont deux dans le secteur de B50 alors en cours de fouille.

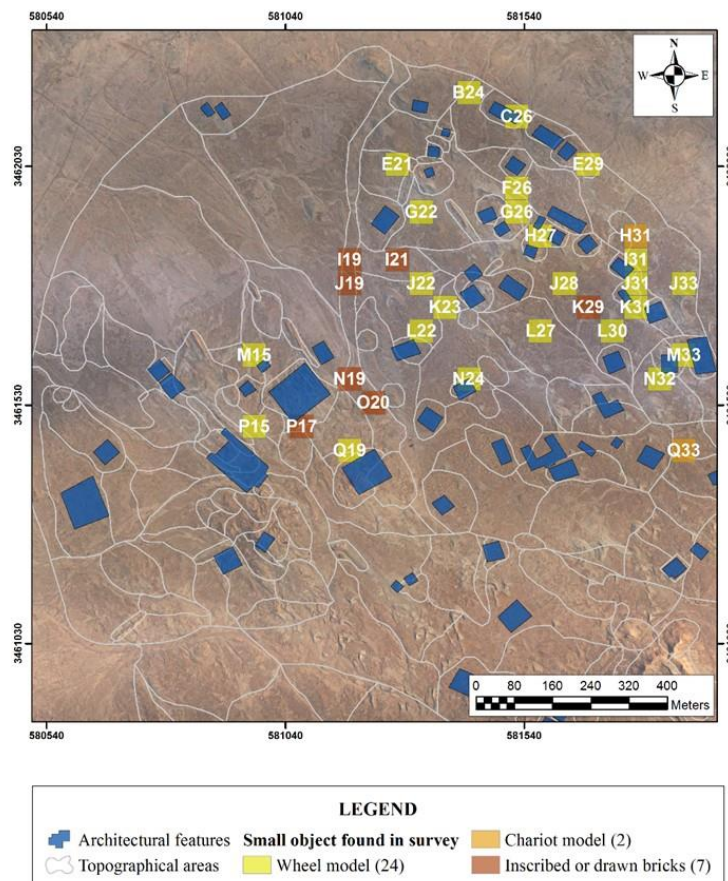


Fig. 1 – Lieux de provenance des briques inscrites trouvées au printemps 2019 © Mathilde Mura (Archaïos).

En raison d'un contexte de surface, les inscriptions de nature royale sur ces fragments de briques sont le plus souvent partielles et en partie érodées. Parmi les sept pièces récoltées au printemps, il est possible d'identifier trois textes déjà documentés par d'autres briques et référencés par le RIME 4 :

- **K29.TP35** = RIME 4.2.5.3 qui commémore la construction du rempart de Larsa par Gungunum.
- **I19.TP178** et **J19.TP177** = RIME 4.2.9.3 qui commémore la construction de l'E. Babbar par Sîn-Iddinam.
- Le fragment de brique **P17.TP47** présente seulement la partie droite des trois premières lignes dont la première livre la fin du nom du roi Gungunum. Selon les textes sur briques déjà connus et attribués à Gungunum, seul le texte RIME.4.2.5.3 débute par le NP du roi.
- Le fragment **I19.TP?** expose l'ensemble de l'inscription estampée mais celle-ci est très érodée. En raison de la taille de l'estampe, du nombre de ligne du texte (10 lignes) et du format de la brique, il est envisageable que le texte sur cette brique soit un nouvel exemplaire de RIME 4.2.5.3 qui commémore la construction du rempart de la ville de Larsa.
- Le texte sur le fragment de brique **N19.TP53** est partiellement perdu et en partie érodé. La fin du texte, plus claire, suggère qu'il s'agisse d'un nouvel exemplaire du texte d'Abi-sarê en akkadien (*i-pu-us*) commémorant la (re)construction du rempart RIME 4.2.6.2.
- Enfin, le fragment de brique **O20.TP53** présente la fin de 6 lignes de texte assez érodées qui ne permet d'identifier de parallèle connu.

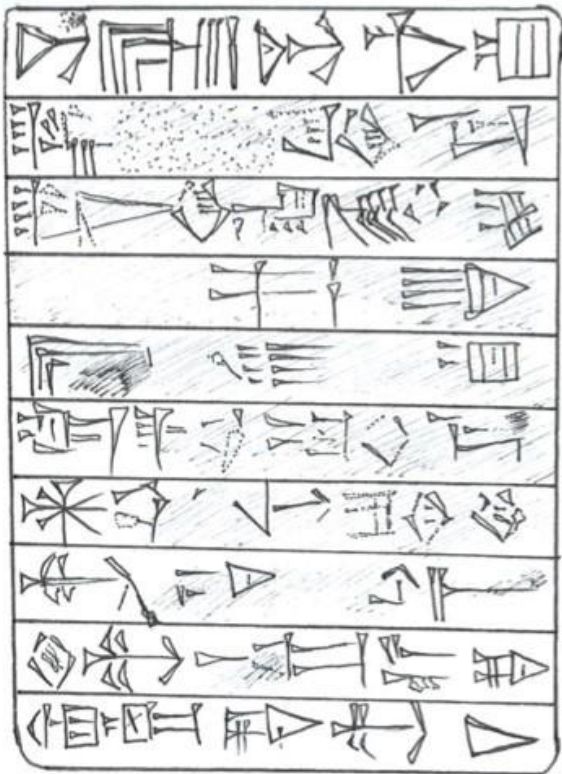
Le tableau résume les informations sur les inscriptions :

Provenance	Carré	TP	Dimensions	Conservation du texte	Roi	N° RIME	Période
Larsa	K29	TP35	31 × 25 ⁺ cm	complet, 10 lignes, lisible	Gungunum	RIME 4.2.5.3	OB
Larsa	I19	TP ?	30 × 26 ⁺ cm	complet, 10 lignes, illisible	Gungunum ?	RIME 4.2.5.3 ?	OB
Larsa	I19	TP178	28 ⁺ × 24 ⁺ cm	début du texte, 6 lignes très fragmentaire, lisible	Sîn-iddinam	RIME 4.2.9.3	OB
Larsa	J19	TP177	4 ⁺ × 4 ⁺ cm	fin du texte, 4 lignes très fragmentaire, lisible	Sîn-iddinam	RIME 4.2.9.3	OB
Larsa	P17	TP47	5 ⁺ × 15 ⁺ cm	début du texte très fragmentaire, 3 lignes, lisible	Gungunum	RIME 4.2.5.3 ?	OB
Larsa	N19	TP53	17 ⁺ × 16 cm	début du texte cassé, 1 ou 2 lignes perdues, 9 lignes partiellement lisible	Abi-sarê ?	RIME 4.2.6.2 ?	OB
Larsa	O20	TP53	5 ⁺ × 6 ⁺ cm	6 lignes, très fragmentaire	?	?	?

LE CONTENU TEXTUEL

K29.TP35 (= RIME 4.02.05.03)

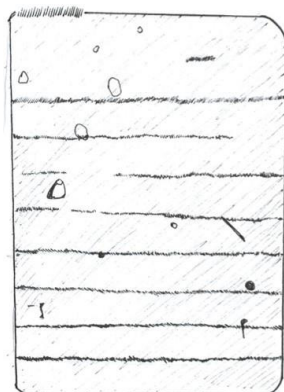
Texte de fondation de Gungunum, cinquième roi amorite de Larsa (1923-1906 av. J.-C). Le texte commémore la construction de la muraille de Larsa par le roi.



- | | |
|---|-----------------------------------|
| 1. gu-un-gu-nu-um | Gungunum, |
| 2. lugal larsa ^{ki} -ma | king of Larsa, |
| 3. lugal ki-en-gi ki-uri | king of Sumer and Akkad, |
| 4. ʾibila ¹ kal-ga | mighty heir |
| 5. sa-mi-um | of Samium, |
| 6. bad ₃ gal larsa ^{ki} -ma | the great city wall of Larsa, |
| 7. ʾutu ki-bala-e sa ₂ -di | “Utu overtakes the rebel land” |
| 8. mu-be ₂ -em | being its name, |
| 9. ša ₃ mu 1(aš)-ka šeg ₁₂ -be ₂ | within (only) one year its bricks |
| 10. u ₃ bad ₃ -be ₂ mu-du ₃ | and that wall he built. |

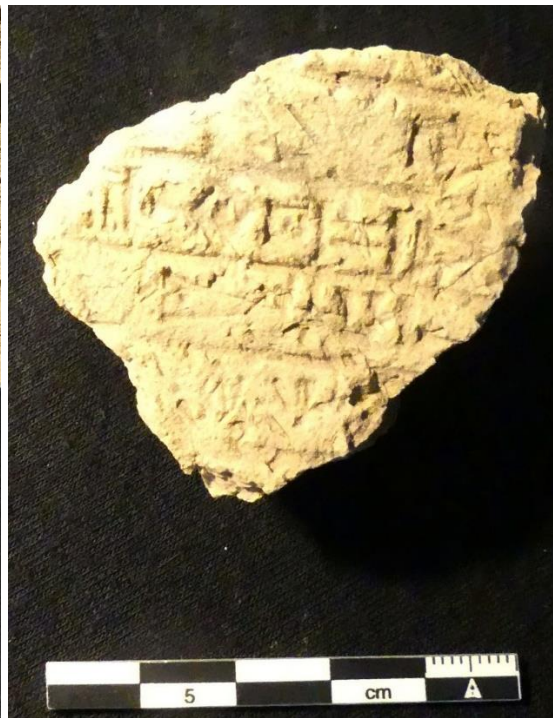
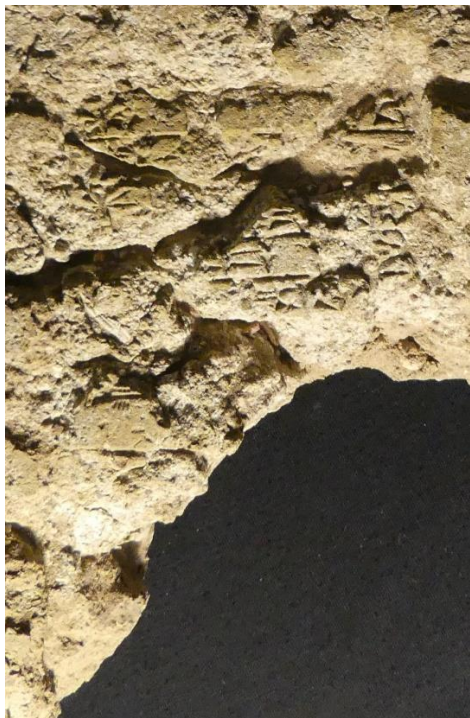
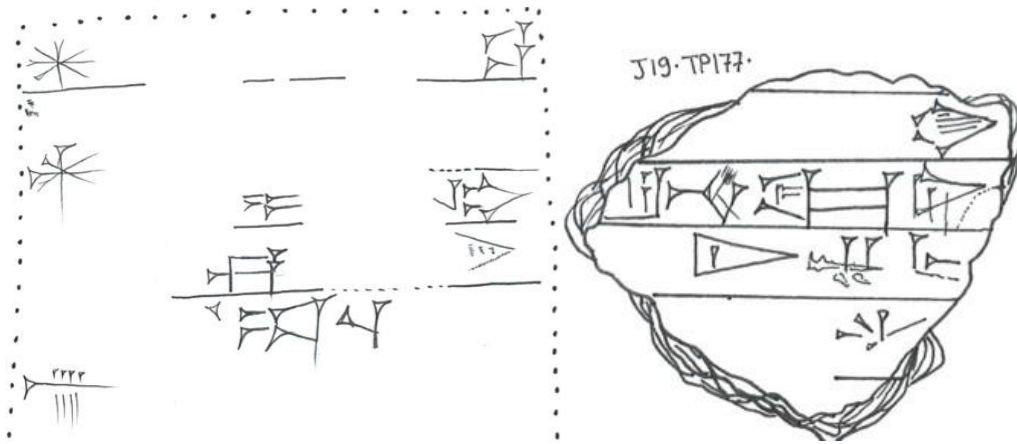
I19.TP?

Texte complètement érodé. Probablement le même que K29.TP35.



I19.TP178 et J19.TP177 (= RIME 4.02.09.03)

Texte de fondation de Sin-Iddinam, neuvième roi amorite de Larsa (1849-1843 av. J.-C.). Le texte commémore la construction de l'E.Babbar de Larsa par le roi.



I19.TP178

- | | |
|---|-----------------------------|
| 1. ^d utu | For Utu |
| 2. [lugal-a-ne ₂ -e]r | his master, |
| 3. ^d [EN.ZU]-i-din-na-am | Sîn-iddinam |
| 4. [nita] kal-[g]a | the provider of Ur |
| 5. [u ₂ -a] ^r uri ^{ki} -[ma] | the mighty man |
| 6. lugal [...] | king of Larsa |
| [.....] broken | and king of Sumer and Akkad |
| | the Ebabbar, |
| | his beloved temple |

J19.TP177

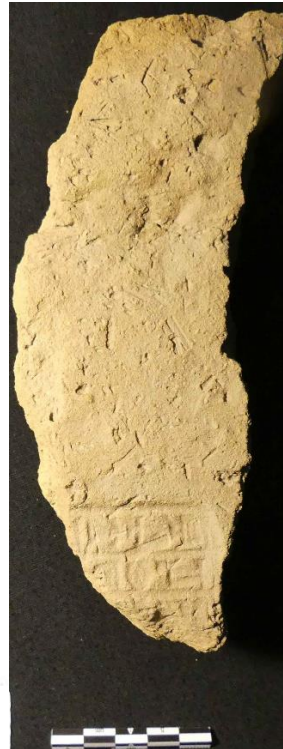
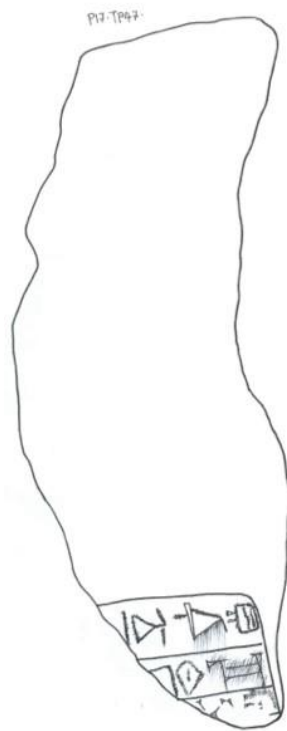
- | | |
|---|--|
| [.....] broken | for his life |
| 12. [me geš]- ^h ur | he built for him. |
| 13. [nam-e]n-na-ka-ne ₂ | The divine attributes and divine plans |
| 14. [u ₄ ul]-li ₂ -a-aš | of the office of en priest |
| 15. [pa gal mu-na]-an-[e ₃] | for all future days |
| | he made greatly resplendent for him. |

RIME 4.02.09.03

- | |
|--|
| 1. ^d utu |
| 2. lugal-a-ne ₂ -er |
| 3. ^d EN.ZU-i-din-na-am |
| 4. nita kal-ga |
| 5. u ₂ -a uri ^{ki} -ma |
| 6. lugal larsa ^{ki} -ma |
| 7. lugal ki-en-ge ki-uri |
| 8. e ₂ -babbar |
| 9. e ₂ ki-ag ₂ -ga ₂ -ne ₂ |
| 10. nam-ti-la-ni-še ₃ |
| 11. mu-na-ni-in-du ₃ |
| 12. me geš- ^h ur |
| 13. nam-en-na-ka-ne ₂ |
| 14. u ₄ ul-li ₂ -a-aš |
| 15. pa gal mu-na-an-e ₃ |

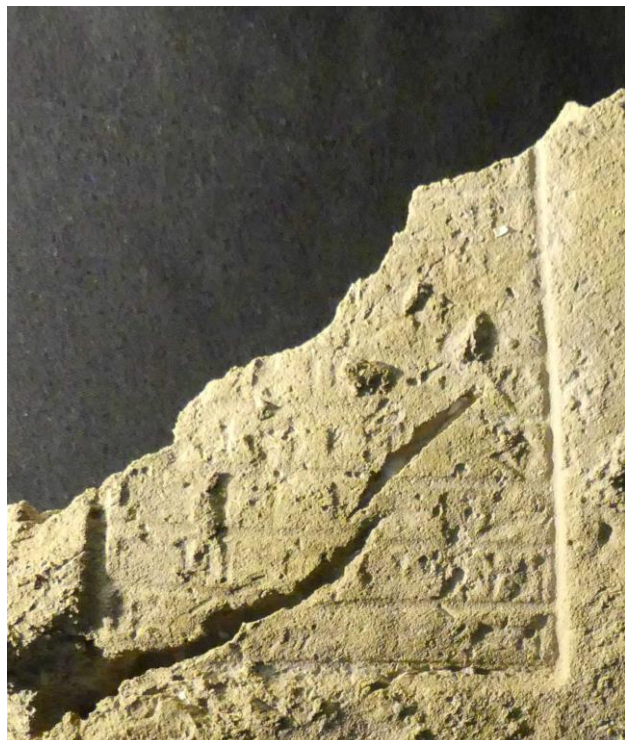
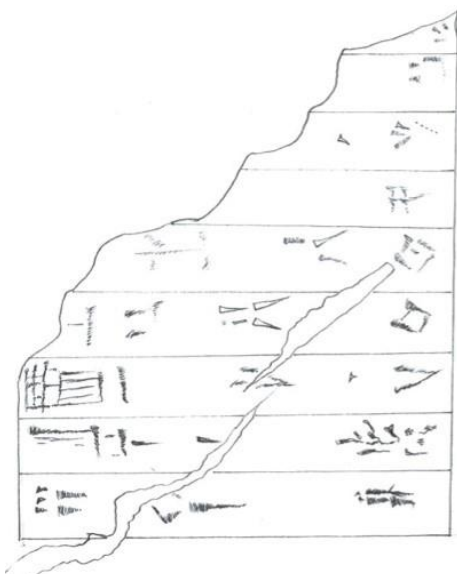
P17.TP47 (peut-être = RIME 4.02.05.03)

Fragment des trois premières lignes d'un texte de fondation de Gungunum. Nom de Gungunum et ses titres: roi de Larsa, roi de Sumer et d'Akkad.



- | | |
|------------------------------------|--------------------------|
| 1. [gu-u]n-gu-nu-um | Gungunum, |
| 2. [lugal lar]sa ^{ki} -ma | king of Larsa, |
| 3. [lugal ki-en-gi] 'ki-uri' | king of Sumer and Akkad, |
| [...] broken | |

N19.TP53 (peut-être = RIME 4.2.6.2)



[...]?

1'. [...].....x

2'. [...].....x

3'. [...].....x

4'. [...].....x

5'. [...] x x DI? (may be : [...] BALA.E SA₂.DI)

6'. 'BAD₃ GAL larsa^{ki}

7'. 'u₂-da-ni-in¹

8'. E₂.GAL x x x-e-š_u

9'. i-pu-uš

RIME 4.2.6.2 (Birot M., 1968, Syria 45):

1. a-bi₂-sa-re-e

2. da-an-nu-um

3. LUGAL larsa^{ki}

4. e-li ša [...]

5. e-li ša [...]

6. i-na MU 1(diš)-KAM-MA

7. BAD₃ ^d[UTU KI]-BALA-E SA₂-[DI]

8. BAD₃ GAL larsa^{ki}

9. u₂-da-an-ni-in

10. E₂.GAL <da>-ad-me-e-š_u

11. i-pu-uš

Abi-sare

the mighty,

king of Larsa,

more than ... ,

and more than ... ,

within one year

the city wall (named) "Utu

overtakes the rebel land",

the great wall of Larsa,

he strengthened,

and the palace of his habitation

he built.

O20.TP53



A l'automne 2019, quatre autres fragments de briques inscrites, très mal conservées, ont été ramassés. Le premier remonte à la période d'Ur III (2112-2004 av. J.-C.)¹. Il a été trouvé par moi en surface du carré R11 (100m à l'ouest du bâtiment B50) du carroyage général du site. La brique est de couleur gris vert à l'extérieur et gris foncé à l'intérieur. Le fragment mesure 7 cm de long x 5 cm de large pour 4,5 cm d'épaisseur (Fig. 2 et 3). Comme sur beaucoup des briques inscrites de cette époque, le texte est estampillé sur le côté (sur 1 mm de profondeur), et porte l'inscription :

1-[d]amar-Suena

2-[d]en-líl-le.

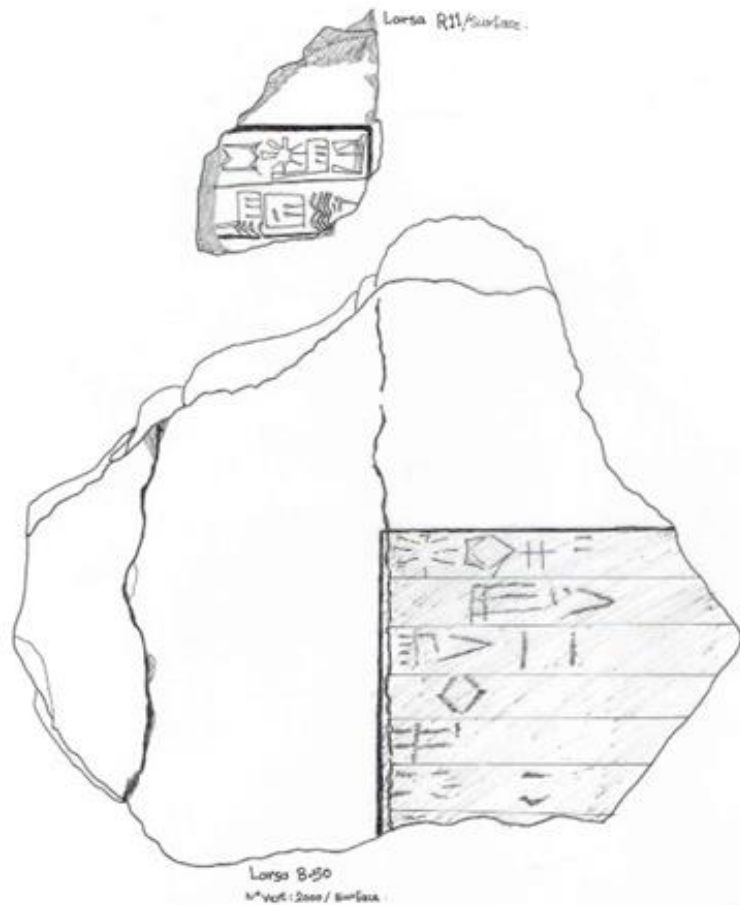


Fig. 2 – Copie des fragments d'Amar Suen (en haut) et d'Adad Apla Iddina (en bas).



Fig. 3 – Fragment de brique d'Amar Suen (à gauche) et d'Adad Apla Iddina (à droite).

¹ Douglas R. Frayne, 'Ur III Period (2112-2004 BC)', *JAO* 120/2, Apr.-Jun. 2000, p. 247.

Les noms d'années d'Amar Suen ne mentionnent pas que ce roi ait fait des travaux à Larsa, comme ses inscriptions nous l'apprennent¹. En revanche, les données disponibles indiquent qu'Ur-Nammu a été le seul roi d'Ur ayant restauré l'E.Babbar de Larsa².

Le second fragment de brique (LB2000.1), de couleur beige, possède encore six lignes de texte (1 mm de profondeur) et un bout de la septième ligne (Fig. 2 et 3). Il provient du secteur ouest du bâtiment B50, où la brique a probablement été utilisée en remploi. L'inscription fragmentaire mesure 8 cm de longueur x 9 cm de largeur. C'est une brique du roi Adad-apla-iddina (1067–1046 av. J.-C.) de la seconde dynastie d'Isin, commémorant ses travaux dans l'E.Babbar de Larsa. Un exemplaire similaire vient d'être publiée par Lecompte et Vallet³ auquel nous renvoyons le lecteur.

Enfin, deux autres fragments de briques estampées ont été ramassés en surface du site dans les derniers jours de la campagne, après que Dominique Charpin et moi-même ayons quittés la mission. Ils n'ont donc fait l'objet que d'un rapide examen sur photo (Fig. 4). La première (LB2000.2 ; 19 x 7.4cm) est une brique du roi kassite Burnaburiash. La seconde, très érodée (LB3005.1 ; 11 x 8.5cm), mentionne le dieu Marduk.



Fig. 4 – Fragments de brique inscrite de Burnaburiash (à g.) et mentionnant le dieu Marduk (à dr.).

¹ Douglas R. Frayne, 'Ur III Period (2112-2004 BC)', *RIME* 3/2, 1997, p. 235-284.

² A. R. George, 'House Most Hight, The Temples of Ancient Mesopotamia', *MC* 5, 1993, p.70, n° 98.

³ Lecompte C. et Vallet R. 2019, « Une brique inscrite d'Adad-apla-iddina provenant de Larsa », in : Abrahams P. et Battini L.(eds.) *Ina dmarri u qan duppi. Par la bêche et le stylet ! Mélanges offerts à Olivier Rouault*, Archeopress, Oxford, pp. 77-80.

XIII – REPORT ON THE VIIITH AND IXTH CAMPAIGNS AT TELL EL ‘UWAILI

Johnny Samuele Baldi, Claire Padovani and Rafat Abd-el-Kadim



Fig. 1 – Aerial view of Tell el ‘Uwaili, from the northwest (June 2019).

Archaeological activities at ‘Uwaili (Fig. 1) in 2019 were carried out during two brief fieldwork seasons, from June 1st to 10th, for an actual working week, then from October 21st to November 7th, for actual 12 working days. The purpose of the fieldwork campaigns was to open a wide trench in the northeastern sector of the Tell. Three archaeologists and nine workers have been on the ground, assisted by two topography and GIS experts. During the spring season, a trench of 10m x 10m has been implanted in order to incorporate a part (on a length of 5 m) of the vestiges already brought to light at the end of the 1980s, but also in order to extend the ancient excavated areas further southwest (of other 5 m). This decision has made it necessary to move a significant amount of earth coming from excavations of thirty years ago. Nevertheless, it was part of a coherent strategy allowing to extend the investigated area on a surface never previously excavated on the northern slopes of the Tell. In this sector, the erosion due to exposure to the prevailing winds has allowed already in the 80s to identify very ancient architectural remains at a rather limited depth. Square T 34 represented the center of this strategy. The re-excavation of a part of this square has allowed us to connect our new investigations to the remains of the already excavated hypostyle house known as “Building 37” (Vallet 1990, 1996). Despite the accumulation of a thick (20 to 50 cm) layer of sandy deposits, the structures already brought to light by the old excavations were very well preserved.

In October, the vestiges identified during the spring campaign were still in good condition, so it has been immediately possible to expand considerably the excavations (Fig. 2). A trench of 10m x 10m has been opened southwest of the area excavated in June, and another 10m x 10m square has been placed further southeast, on top of the Tell, with the aim of obtaining a stratigraphic sequence as complete as possible between the most recent phases on top and the Ubaid 0 levels downwards. Between the squares dug at the base of the Tell (northern sector) and the one open on the top (southern sector), an area of about 5m x 10m was also included in the trench but not excavated. In the next campaigns, it will be included in our field activities. Now, the trench is very large and “L”-shaped with the long arm facing south (towards the top of the Tell) and the short arm facing north-

east (base of the site). In the coming seasons the excavation area will be further enlarged in order to incorporate the whole hypostyle house known as “Building 37”.



Fig. 2 – L shape implantation of the excavation squares, north/south oriented.

STRATIGRAPHY AND ARCHITECTURE

A consistent portion of this hypostyle house (Building 37) was therefore exposed once again over several square meters (Fig. 3), with its perimeter defined by double-row brick walls reinforced with internal pilasters and three internal longitudinal compartments separated by brick piles used to support wooden columns. The piles were not in perfect condition, but four of them were recognized. In the middle of them, a brick installation set in the ground and equipped with a large central hole was also brought to light (Fig. 4).

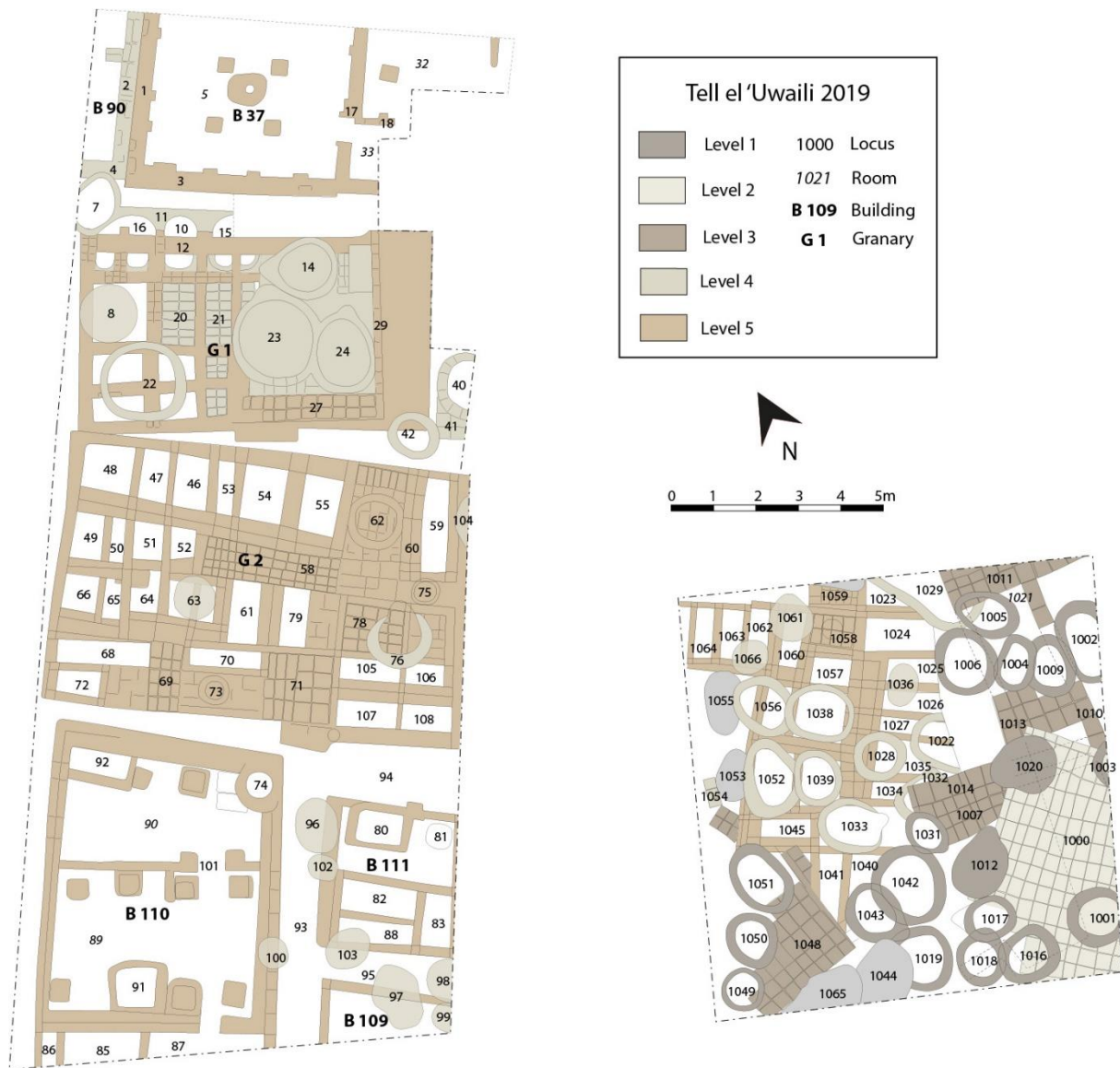


Fig. 3 – Plan of the excavated structures.

Further east, the large fireplace that heated the central hall of the dwelling was easily re-discovered because of its excellent state of preservation. All the internal installations lie on a very regular and smooth floor made of hardened clay. South-west of Building 37, a narrow street separates it from a granary. Although the surface of the granary was exposed during the spring fieldwork, the structures in this sector (Building 37 and part of the perimeter wall of Granary 1) had already been identified in the 80s. The choice of starting current excavations from these installations allowed us to establish both an ideal and an archaeological continuity with the results of thirty years ago. These structures were in fact our first stratigraphic reference (both Building 37 and Granary 1 belong to our 'Level 5' – see below), from which it was easier to reconstruct the sequence. Even if the intermediate area between the square at the top of the Tell and the square at the base has not yet been excavated (cf. Fig.2), it has nevertheless been possible to establish a continuous stratigraphy throughout the sounding. Five levels have been identified.



Fig. 4 – Piles and pierced platform of Building 37 (2019).

Level 1

It is represented by several potter's kilns (1001, 1002, 1003, 1017, 1018, 1016, 1042, 1049 etc.) cut through the previous levels 2-3 (Fig. 5). The very limited preservation of these firing structures made it possible to recognize just the bottom of the combustion chambers, the mudbrick walls that delimited them and, in most cases, the openings through which the fuel was introduced. All these furnaces have medium dimensions (always less than 1.5m wide) and a pyriform or elongated-ovoid morphology, with a small praefurnium to allow the lower chamber to be filled with fuel (for instance Kiln 1012) that is not attested in the previous levels. They all yielded a limited but extremely interesting Ubaid 5 ceramic assemblage (this volume, *infra*).



Fig. 5 – Kiln's limit 1012 with his east oriented praefurnium cutting the platform-terrace 1000.



Fig. 6 – Aerial view of the platform-terrace 1000 on the top of the Tell, south-east oriented.

Level 2

It is represented by a mudbrick platform or terrace (1000) identified in the southwestern sector of the excavation square on the top of the Tell (Fig. 6). This tiled surface is bordered by a strip of smaller mudbricks, but it is very poorly preserved: all the structures associated with it have been washed away due to weathering erosion, which is particularly severe on the top of the Tell. Nevertheless, it is certain that the platform-terrace was not associated with the ceramic kilns of Level 1: the dimensions of their bricks are different, and the respective rows of bricks never overlap according with some kind of regularity or architectural logic. In addition, some Level 1 kilns have also been identified outside the Level 2 terrace-platform, cut through the previous structures of Level 3 buildings. Furthermore, no firing structure has so far been associated with Level 2. Therefore, this one seems rather to be interpreted as a phase of domestic or public architecture in the northern sector of the Tell.

Level 3

The same consideration can be made, for the time being, for Level 3, from which no craft facilities come, but, again, remains of domestic or public buildings. The Level 2 platform-terrace is superimposed on some buildings (1010-1111-1007-1014), which are perturbed both by some Level 1 kilns and by erosion due to the slope of the Tell. As a result, Level 3 structures have been identified in the south-eastern portion of the square and close to its south-western limit, in the highest area of the Tell (Fig. 7).

An analogous structure (probably the remains of a terrace – locus 1048) has been identified in the western corner of the sounding: it is tiled with bricks of the same size, roughly parallel to structures 1013-1010-1007 and perturbed by some Level 1 kilns (1049, 1050, 1051) (Fig. 8). Between the vestiges of the Level 3 constructions identified on both (eastern and western) sides of the sounding, there are some dispersed remains of bricks and tiled surfaces badly perturbed by later kilns and almost obliterated by weathering erosion. The plan of these structures, probably inherent to buildings respecting a roughly north-south oriented regular plan, includes a possibly tripartite structure (around Room 1021) with thick walls (two rows of bricks). Portions of three rooms are

visible: the narrow and long central room was tiled with bricks, while the side ones, with plastered walls, had hardened clay floors.



Fig. 7 – Structures of Level 3, cut by Level 1 kilns.



Fig. 8 – Level 3 Terrace 1048 south of the Tell, cut by Level 1 kilns.

In the coming campaigns, we plan to enlarge the excavated area at the top of the Tell (to the southeast), to bring to light a larger portion of Levels 2 and 3. Even if they actually seem to be composed of dwellings and domestic buildings, it is clear that the presence of brick terraces to support the structures, tiled floors and plastered walls suggests a certain care in planning and construction. Levels 2 and 3 have yielded very few ceramic materials, coming from filling layers too

close to the surface to be attributed with certainty to these occupations. However, a chronological attribution of these levels respectively to the Ubaid 4 and 3 phases seems to be plausible. It is possible that our Level 3 correspond to the Ubaid 3 terrace excavated in the 80's a little bit more to the east. Further work should clarify this point.

Level 4

It is represented by several potter's kilns (1022, 1036, 1028, 1039, 1033, 1052, 1038, 1061, 40, 42, 76, 84, etc.) identified in both the excavated sectors and belonging to a very large workshop for the manufacture and firing of ceramics. The fact that manufacturing activities have been carried out on the spot is demonstrated by the presence of many potter's tools (stone hammers and scrapers, as well as ceramic fragments reused for modelling, as evidenced by their traces of wear). Medium and large sized (up to 1.8m wide) pottery kilns are the most characteristic structures of this level. They were disseminated both in the upper portion of the Tell (under the terrace of Level 3, Fig. 9) and at its base (where the presence of a level devoted to ceramic activities was known since 1987-89).



Fig. 9 – Level 4 Kilns 1029, 1022, 1028, 1038, 1039 implanted on Level 5 granary, under Level 3 stratum visible at south.

All the firing installations were built directly on the remains of the previous stratum, without leveling the earlier vestiges. This implied the construction of Level 4 kilns upon the mud-bricks platforms and the thin walls of Level 5 granaries. It is possible to observe this stratigraphic overlapping in the northern sector (in Granaries 1 and 2 at the base of the Tell), as well as in the southern square (Kilns 1038, 1039, 1052, 1056 in the central and northern portion of the sounding on the top of the Tell). In particular, in the lower (northern) sector, some of the internal cells along the alley separating Building 37 and Granary 1 were used to surround circular firing structures stuck in these quadrangular compartments (Kilns 10, 15, 16), while south and east of Granary 1, larger furnaces were built with heating (lower) chambers cut through the vestiges of the previous level. In fact, kilns also occupied the alley between Building 37 and Granary 1, even if they were built according with a completely different method of construction. Rather than filling the alley to

level the crafts area upon Granary 1, some kilns were built by digging their heating chambers into the floor of the street, at a lower level than the furnaces built above the barn (Fig. 10).



Fig. 10 – Section of Level 4 Kiln 14 in the alley between Building 37 and Granary 1.

A 1.5 x 2 m test sounding conducted in the eastern portion of the alley in 1989 (and brought to light in June) allows us to observe the brick structure of the stepped furnaces arranged in this area, partly reusing the bricks of the previous walls on both sides of the alley to isolate the firing chambers of the kilns. It is also possible to observe the huge (about 2.5 m thick) stratification of clay and ashy layers accumulated in this sector (Fig. 11). The same kind of construction system and arrangement of kilns has been observed in the alley separating Level 5 Buildings B 110 and B 111, in the southwestern sector of the trench. The lower chambers of some potter's kilns were cut through the floor of the alley, using the walls of previous adjacent edifices to isolate the firing structure. Other kilns (for instance Kiln 96, 102 and 103) were cut through the perimeter walls of Building B 111, and the whole alley was progressively filled by a massive amount of ashes (Fig. 12).

In the southern sector of the trench, towards the upper part of the Tell, all kilns identified in Level 4 were stuck into the cells (1038, 1039, 1033, 1052) or build across the walls of a Level 5 granary (1028, 1061, 1032). The firing structures of the entire workshop were used over a span of time that may not have been very long, as none of them shows clear traces of reconstruction. However, especially in the alleys between buildings of Level 5, furnaces and waste ashes show very thick accumulations, up to 2.2 meters. Certainly, all the firing installations were used in an extremely intense way. Clues in this direction are offered not only by the impressive amounts of slags produced by the furnaces, but also by several coats of fire-hardened and burnt clay (applied to restore damages caused by high temperatures) forming the bottoms of the kilns. All these kilns have yielded an Ubaid 1 ceramic assemblage composed of sherds and pots deformed or broken during the firing cycles. Further evidence of the functional connection between firing structures and waste ashes stratified in the pits and alleys of the previous level comes from 18 vessels: some of their fragments were found both inside some furnaces and in the ash. This corroborates the hypothesis that chambers of the kilns were systematically emptied in the surrounding area, offering an

additional attestation that the workshop was used for a limited period of time but in a very intensive way.



Fig. 11 – Accumulation of clay and ashy layers in the south of the alley between Building 37 and Granary 1.



Fig. 12 – South-east oriented aerial view of Level 5 Building 111 surrounded by the alleys 93, 94 and 95. Its peripheral walls are cut by Level 4 kilns 96, 102 and 103.

Level 5

The kilns of Level 4 cover or are cut through the cells of Level 5 granaries and warehouses. The presence of very large granaries was already recognized during the spring fieldwork season in June, and the northern façade of Granary 1 known since 1989 (Vallet 1996).

Indeed, south-west of the house known as Building 37, a narrow (about 1.2 – 1.5 m large) street separates the dwelling from a granary whose northern limit was defined by a wall similar to that of the hypostyle room of Building 37. The walls delimiting Building 37 and the granary were similar both because of their thickness (three rows of mudbrick) and because of their small regularly spaced buttresses. The edifice close to Building 37 seems to be a granary or storehouse mainly because of its internal structure, articulated in an almost modular way by little quadrangular cells. This same type of internal structure has been recognized as typical of granaries basements at several other trenches in the early Ubaid phases of ‘Uwaili (Forest 1991; Forest, Vallet and Breniquet 1996). Since the parallel walls and the spaces in between were often irregular and considerably narrow (up to 60 cm), they were most likely covered with, for example, wooden planks. Further, the spaces appear to have been empty, this indicates, that they were not at living level, but functioned as a basement. The intention was to raise the floor of the granary, in order to keep the grain dry and clear of rodents.

The barn and the hypostyle house belong to the same level, not only because their perimeter walls are perfectly aligned, but also because both these perimeter walls lie on the same external floor in the alley that separates them. According with the general architectural plan of this level, Building 37 and Granary 1 seem to constitute a single integrated unit, despite the alley separating them. All other Level 5 buildings are also contemporary to Granary 1 and Building 37, but they were not built as part of a single complex: they were rather progressively juxtaposed, as demonstrated by the southwestern limit of Granary 1. In fact, this wall has an irregular profile, thickened by other walls that have been placed next to it and that delimit another storehouse (Granary 2).



Fig. 13 – Granary 2 with juxtaposed Granary 1 and Building 37 visible at the back of the picture.

This one has been built side by side to Granary 1 by thickening their respective adjacent perimeter walls, whose slightly different orientations suggest some kind of separation between Granaries 1 and 2. This does not mean that each of these storehouses has been constructed as a single architectural structure. Indeed, internal thin walls (one row of bricks) partitioning both the warehouses are often characterized by slightly divergent orientations, which suggest different vicissitudes, restorations, repairs and renewals in the internal pigeon-hole structure of the storehouses. Nevertheless, Granaries 1 and 2 represent two coherent buildings. They are distinct, but not separate (Fig. 13).

Probably, their architectural juxtaposition does not depend just on their shared function to stock cereals and crops. In fact, it is possible that the southern sector of Granary 2, with platforms (58, 57, 78, and 71) carefully tiled in mudbricks and supporting medium-size tandoors (73, 75) and large size ovens (62, 63), allowed a passage between Granaries 1 and 2 and constituted a shared work area to cook foodstuffs (Fig. 14).

Towards the upper part of the Tell, in the eastern portion of the southern trench, two platforms and a little oven (1058, 1059) could offer an example of analogous working and cooking areas shared between two warehouses. In any case, the functional juxtaposition and probable operative connection between distinct granaries goes with the association between each storehouse and a specific dwelling. The same kind of correlation observed between Building 37 and Granary 1 seems to exist also between Granary 2 and Building B 110, in the western corner of the lower sector. Building B 110 is a domestic tripartite structure, superficially cleared except its southwestern wing partly caught in the berm (Fig. 15). If an intermediate alley divides Building 37 and Granary 1, a narrow passage separates this dwelling from Granary 2. Likewise, other alleys separate Granary 2 and Building B 110 from Building B 111, another partially excavated storehouse.



Fig. 14 – Level 5 oven 62 in a shared cooking area in Granary 2.



Fig. 15 – Aerial view of the central hall and northwestern wing of the domestic building B110.

Thin walls of one row of mudbricks, whose function was to define the different rooms, delineated the internal organization of Building B 110. The roof was supported by roughly quadrangular (45 x 45 cm) mudbricks pilasters arranged in rows close to the thin walls. The lines of pilasters were sometimes interrupted by the presence of domestic installations, as rectangular mudbrick cubicles or large fireplaces (in the northeastern wing and central hall, connected by a passage provided with little pillars). As already observed in 1989 in Building 41 (a reconstruction of Building 37), also provided with single-row brick walls, the supports that actually sustain the roofing of the house are the pillars or columns, while the walls essentially constitute the building perimeter and the divisions between the rooms (Vallet 1996: 114-115, pl. 2 and 6). Although B 110 is a small house, its layout underlines the prominence of the central hall. The walls of the latter are the only ones carefully plastered (on the internal surface) in the entire house and flanked by pillars arranged at a regular distance from each other. In addition, the access to the central hall was through two doors facing each other. One of these two doors was flanked by two half-pillars of brick, which reinforced the thin inner wall, also highlighting the access to the main hall in a tiny but elegant way.

CONCLUSION (with R. Vallet)

The structures brought to light in Levels 4 and 5 are among the most promising results of the 2019 campaigns and raise questions for years to come. The numerous kilns of Level 4 (Ubaid 1) constitute one of the oldest ceramic workshops of the whole Mesopotamia. Workshops dating from 7th and early 6th millennia BC come only from northern and central Mesopotamia. The first up-draught kiln – the type identified in Level 4 at ‘Uwaili – is documented in Level 10 at Yarim Tepe I, in a context characterized by an Archaic Hassuna assemblage (Merpert and Munchaev 1993: 104). Later, in Levels 5 and 4 at Yarim Tepe I, 13 up-draught furnaces occupy the same production area. Probably, they did not work all at the same time, but they appear concentrated in a specific area, within a yard at the periphery of the dwellings (Merpert and Munchaev 1973: 96-97, pl. 36). The three kilns discovered in a courtyard at Tell es-Sawwan Level IIIB and associated with the production of Samarra pottery (Abu al Soof 1971: 4, pl. 1, 5-7, 12-13) share these features. The same spatial organization can be observed at Tell Abada 3, in a context dating from the Choga Mami Transitional phase, with three firing structures located in open areas near a house (Jasim 1989: 85-86). Did the large workshop of ‘Uwaili Level 4 obey the same criterion of segregation from the inhabited areas of the site? Therefore, in Level 4, are houses, if any, located far from the furnaces? Alternatively, did the open area where the kilns were located have an internal organization somehow corresponding to the layout of the houses? Consequently, were dwellings at a short distance and had kilns associated with each of them, as is largely documented for the Ubaid 3 period? (Jasim 1985). This raises the question of the stratigraphic relation between our Level 4 and the Ubaid 1 vestiges excavated in the 80’s. Indeed, we know that at least two large tripartite Ubaid 1 houses, Building 90 just above Building 37-41 and Building 34 more to the NE, existed nearby (Forest, Vallet and Breniquet 1996: 45, pl. 44-45; Vallet 1996: 116-117, pl. 4 and 7). The extension of the trench should allow finding answers.

Another very interesting result is the first perspective on the organization of the Ubaid 0 village. Grill structures with a design somehow similar to those of ‘Uwaili Level 5 date back into the PPNB, with examples at Çayönü radiocarbon dated to the late 9th and 8th millennium BC (Özdoğan 1999: 41; Redman 1983). Even if they are already attested in a Halaf context at Yarim Tepe I (Yoffee and Clarke 1996: 96), these constructions are mostly considered a hallmark of the Ubaid because of their large diffusion starting from the second half of the 6th millennium BC. Therefore, it is not surprising to observe their large occurrence in an Ubaid 0 level, as already stressed in the 80s (Forest 1991: 95-96, 101; Forest, Vallet and Breniquet 1996: 42-44). However, until now there was a tendency to assume that these grill structures, located in the middle of the inhabited area, served as common storage areas (Huot 1996: 146-147), replaced by smaller granaries attached to specific

houses during the Ubaid 1 period (Forest, Vallet and Breniquet 1996: 43). Current results from Level 5 at 'Uwaili suggest that this trend began earlier than imagined, each (small) barn being already associated to a specific house at the end of the Ubaid 0 period. The layout of the Ubaid 0 village includes juxtaposed granaries probably connected by shared working areas and, in the same time, belonging to distinct integrated units composed of a dwelling and a storehouse across little alleys. If confirmed in the next campaigns, this type of organization would seem to imply a far from "communal" management of resources and might suggest an incipient complexity based on an emerging social competition between family groups. Moreover, Level 5 structures are not only much better preserved than expected (even in the upper sector of the Tell), but also relatively easy to reach on a large surface. In the next campaigns, this could allow to excavate a wide portion of the Ubaid 0 village.

XIV – PRELIMINARY REPORT ON THE CERAMIC MATERIALS FROM TELL EL 'UWAILI Johnny Samuele Baldi

Methods and aims

The assemblage collected at Tell el 'Uwaili during the 2019 fieldwork seasons is quite heterogeneous because it dates from the middle of the 7th millennium BC up to the mid-5th millennium BC, depending on the levels. Current knowledge for these phases in southern Mesopotamia is extremely limited and parallels that can be found from a typological point of view are rare and often from distant sites. As a result, these parallels are sometimes not entirely reliable, since geographical distance can be a problem in assessing the simultaneity of typological similarities. On the other hand, internal parallels from stratified contexts excavated at 'Uwaili between the end of the 70s and the 80s are definitely trustworthy, but they may lead to circular arguments, if the validity of local data is not also reflected in other sites.

This makes it clear that one of the main objectives of the ceramic studies is (now and in the years to come) the definition of a chrono-typology surely anchored to stratigraphy, so as to establish which types distinctively characterize the various periods of late prehistory in southern Mesopotamia. On the other hand, since these first campaigns, pottery has been studied according with the *chaîne opératoire* approach, in order to identify different ways of producing ceramics and their evolution over millennia. *Chaînes opératoires* – namely the culturally based series of actions transforming raw materials into finished products – are a valuable instrument to recognize the way of doing and thinking of local and foreign communities, in order to understand their specific mechanisms of internal organization and reciprocal interactions. The analysis of the distinctive traits of ceramic traditions through a technical study (involving the identification of shaping methods and petrography associated with their various typological declinations) appears crucial also because some of the excavated contexts are workshops intended for ceramic production. Eventually, the choice of conducting technical studies on ceramics was also about being part of a tradition. In fact, unlike almost all the sites in southern Mesopotamia, Tell el 'Uwaili has been the subject of many technological studies on ceramic assemblages (Courtois and Velde 1983, 1984, 1985-1986, 1987, 1991). This bulk of data provides a unique basis for further analysis and integration in accordance with recent methods. For instance, the study of manufacturing techniques was largely neglected thirty years ago, which precluded the analysis of the *chaînes opératoires* (Roux 2019a, 2019 b). However, several observations made at the time may be extremely useful for the study of the materials coming from ongoing excavations (Courtois and Velde 1983: 149). Likewise, although laboratory analyses of the 80s focused mainly on the chemical composition of the materials used for painted decorations (Courtois and Velde 1983: 151-161), microscopic observations on the composition of ceramic pastes are very detailed (Courtois and Velde 1983:

148). The analysis of the ceramic *chaînes opératoires* in their spatial contexts allows encompassing the stylistic approach in a more comprehensive procedure, aiming at recognizing distinct technical traditions and, therefore, the underlying groups of producers, with their specificities and reciprocal relations.

Therefore, the study of ceramics from Tell el ‘Uwaili aims to answer three questions:

- 1- When were the various assemblages produced? (to be assessed on the basis of a reliable typology verified by intra- and extra-site parallels)
- 2- How they were produced? (to be studied by identifying the various production techniques)
- 3- By whom these assemblages were produced? (to be evaluated by reconstructing the distinctive *chaînes opératoires* of the different groups of producers).



Fig. 1 – Ceramic sherd TO1019.1

Chrono-typological analyses

Level 1 kilns have yielded an interesting “Ubaid 5” assemblage (north-Mesopotamian LC1, or “Terminal Ubaid” according with the definition of Calvet 1991). Some specimens are deformed by the high temperature of the firing cycles (Fig. 1; Pl. I.2).

The simplified Ubaid painted motifs are quite rare and occur along with plain flattened rim bowls and basins (Pl. I.7), flaring rim jars (Pl. I.3), cannon spouts (Pl. I.4), sporadic “proto”-bevelled-rim bowls (Pl. I.8) and vegetal-tempered wares very similar to the north-Mesopotamian “chaff-faced” wares. Nevertheless, some traces of Ubaid-related material culture (as fragments of mullers) also come from Level 1 kilns, suggesting for these firing structures a date around the middle of the 5th millennium BC (contemporary with Levels C-B of Sounding X 36 carried out at ‘Uwaili by Y. Calvet (1991). Whether it is based on intra- or extra-site parallels, the main typological significance of the pottery for this period is about breaks or caesurae in the development of the material culture, be it by the disappearance or by the first appearance of formal elements. In Lower Mesopotamia, this same question has already been asked for this period for the site of Uruk, where some chrono-typological discontinuities (Eanna XIX-XVII as Ubaid 4 and starting from Eanna XII Early Uruk) are consensually accepted (Wright 2014).

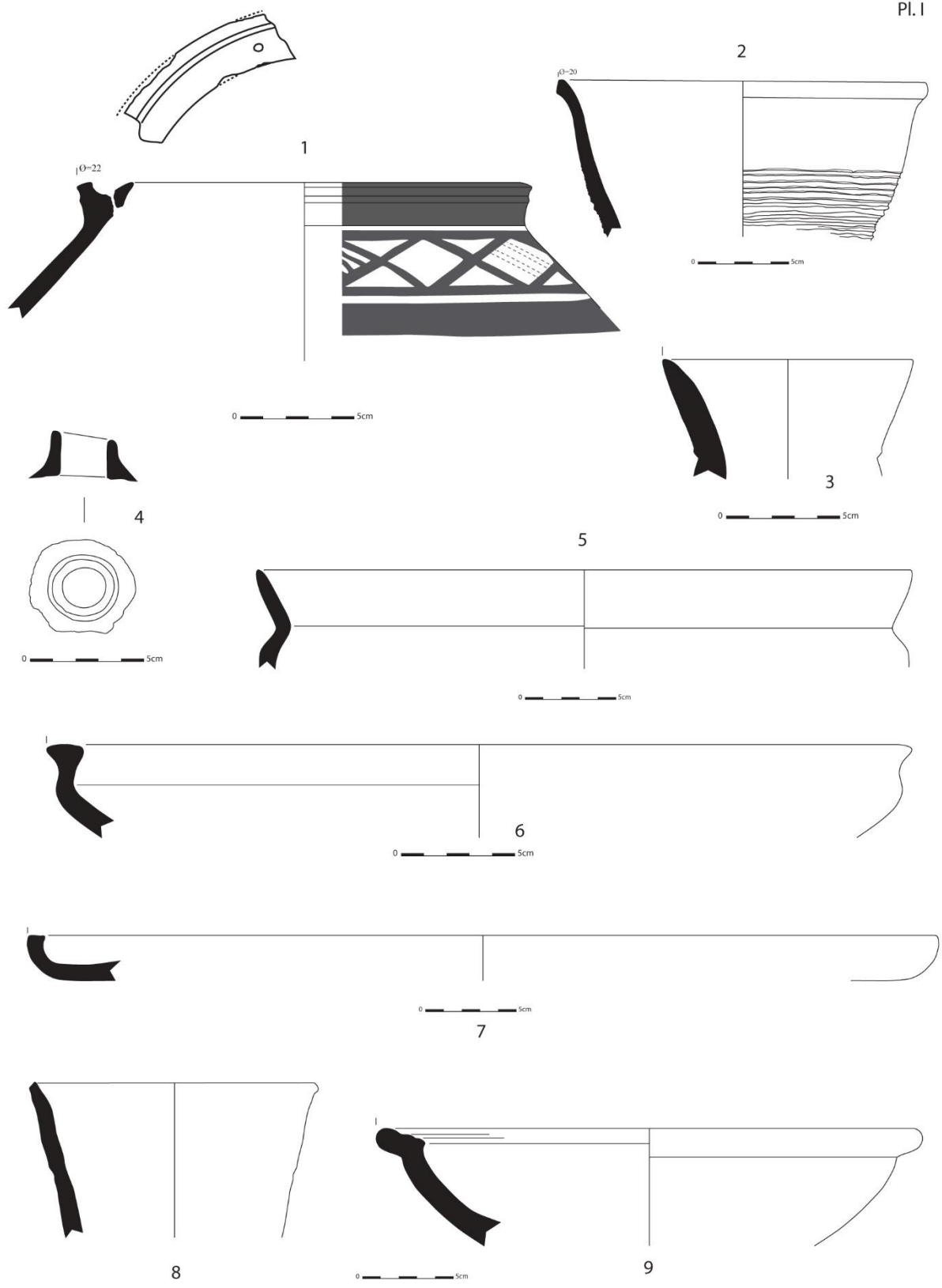


Plate I – Ubaid 5 ceramics

The assemblage from Level 1 at Tell el ‘Uwaili seems to coincide with Levels XVI-XIII at Uruk, on whose attribution a long debate has developed (Haller 1932; Hermansen 1990; Huot 1994; Sürenhagen 1986; Finkbeiner 2001). At Uruk, these levels present the latest fading version of Ubaid traditions. Still, starting from Levels XIV-XIII, the appearance of in-turned rim bowls (with pinched rather than inwardly bevelled rims and without any painted band, as it was the case for the similar Ubaid type), and carinated bowls with flattened rim (Pl. I.6, 9) creates a clear rupture. Therefore, the presence of these types at ‘Uwaili Level 1 seem to be culturally meaningful. Moreover, the first appearance of “proto-bevelled”-rim bowls seems to confirm the “proto-Uruk” nature (according with the terminology developed by Sürenhagen 1986 and Wright 2014 – with the understanding that, here, Uruk elements asserted themselves for the first time) of Level 1 at ‘Uwaili. On the other hand, at ‘Uwaili, the scarcity of black decorations on buff pastes, the presence of some scattered fragments with extremely simplified red painted motifs, the appearance of types not dissimilar from north-Mesopotamian LC2 “cannon-spouts” and double rim jars (Pl. I.1) and the absence of distinctive Ubaid types, make the terminology of Ubaid 5 phase certainly valid on a chronological plan, but by now not completely justified from a cultural point of view.

The large majority of the sherds collected during the 2019 fieldwork seasons come from Levels 4 and 5.

The ceramic workshop of Level 4 has yielded Ubaid 1 ceramics (Breniquet 1996). Ubaid 1 tradition differs from previous Obeid 0 by various features and even if some techno-stylistic attributes persists since the Ubaid 0, Ubaid 1 (also known as “Eridu Phase”) marks a clear discontinuity. Pastes are generally fine, yellow-beige and hard-fired. Surfaces are frequently decorated by matt black painted motifs. Shapes present a much larger variability than during the Ubaid 0. Decorations are essentially geometric. Compared to the decorations of the Ubaid 0 phase, the Ubaid 1 motifs, are more complex, but also more structured and follow rules that do not seem occasional: a genuine visual grammar seems to appear for the first time. Painted motifs usually underline the general shape of the ceramic containers both on the external and the internal surfaces. There are frequent lines of paint on the lip (Pl. II.1), on the carinations or at the inflection points, designed patterns are common at the centre of the plates (Fig. 2) or on the shoulders of the jars, while large single or multiple broken lines are often applied on the outside of the open shapes (Pl. II.3, 4, 8 – Hole 1974: fig. 11.a-I, fig. 12).



Fig. 2 – Internal bottom of plate with black painted motifs.

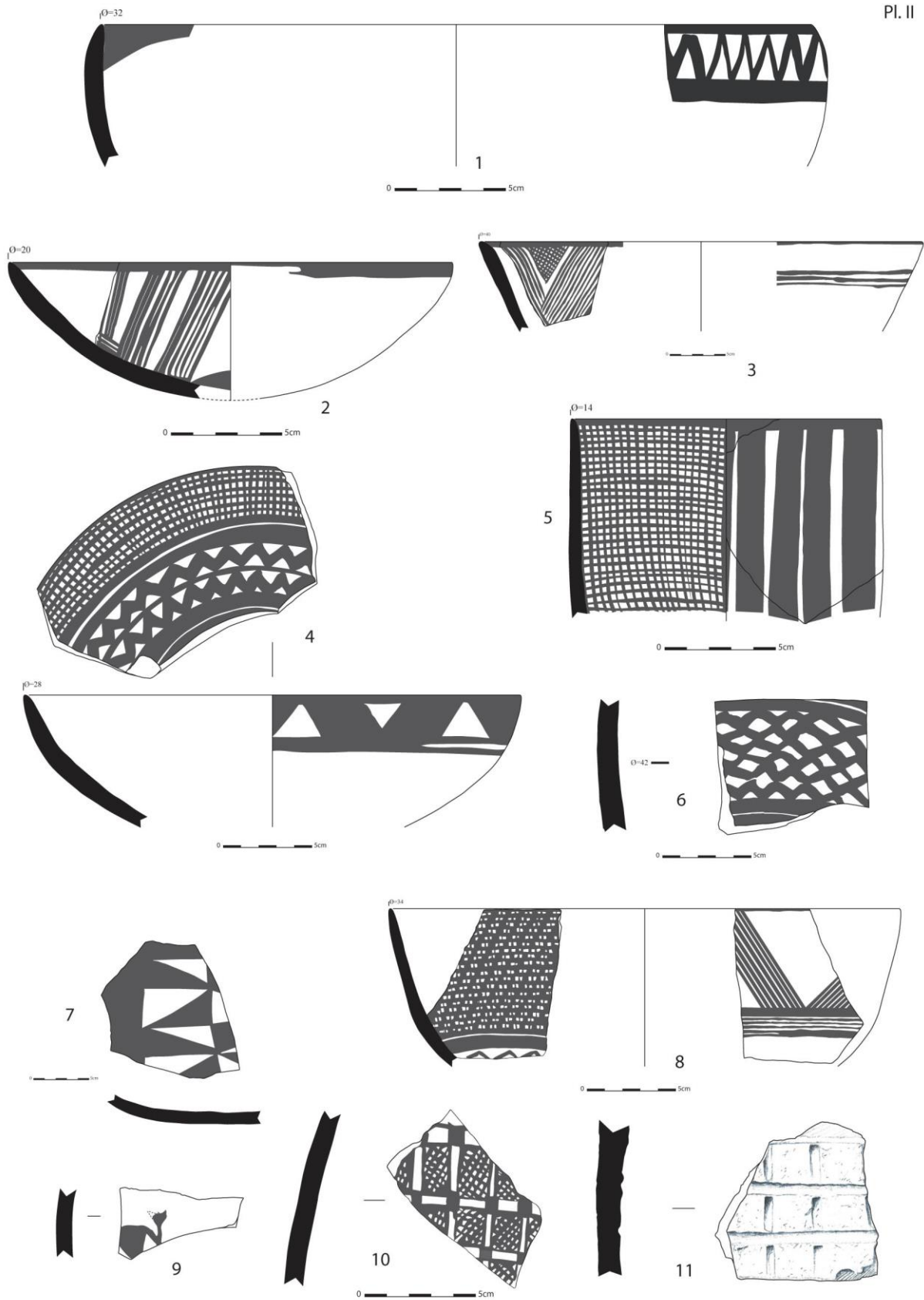


Plate II – Ubaid 1 ceramics

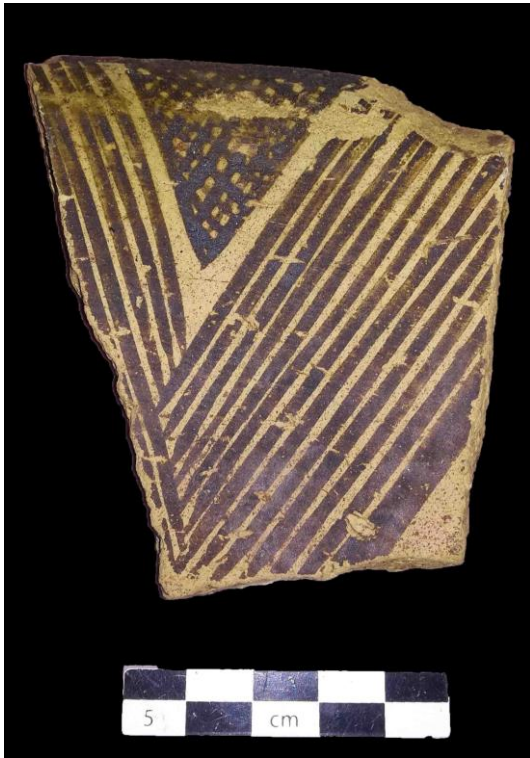


Fig. 3 – Ceramic sherd TO62.10

Animal motifs are very rare and sometimes extremely stylized and simplified (Pl. II.9), but they appear for the first time. Compared to the previous phase, painted motifs sometimes reproduce vertical or oblique-oriented Samarra-like linear motifs (Pl. I.2 – Fig. 3– Ippoltoni 1971). Nevertheless, geometrical patterns are often very dense and complex, with horizontal or concentric strips combining parallel lines, zigzags, triangles, lozenges, or sometimes leaving spaces in reserve and creating checkers (Pl. II.4-6, 8, 10 – Fig. 4).

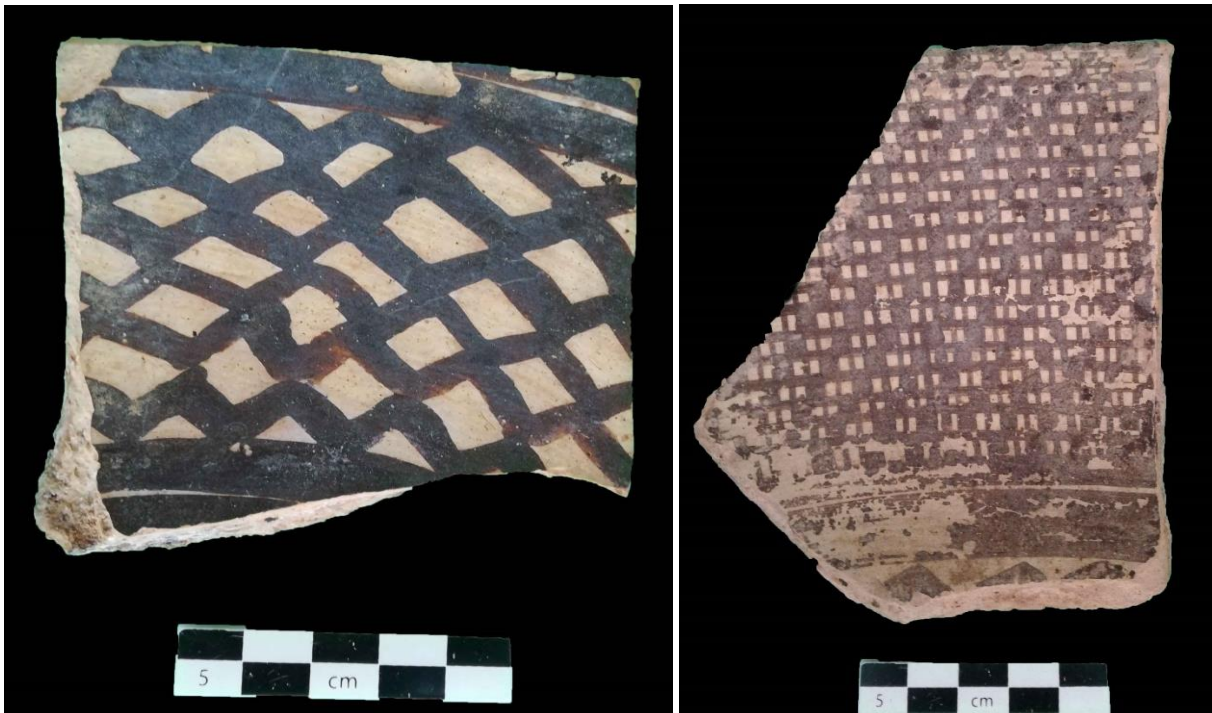


Fig. 4 – Ceramics sherds 1013.1 (left) and 1013.3 (right).

Cruciform interior motifs (Pl. II.7 – Hole 1974: fig. 13.c) appear for the first time to decorate inner surfaces of some plates and bowls. On the other hand, amongst plain and utilitarian wares, some specimens of vegetal tempered husking trays incised on the interior side (Pl. II.11) have parallels in Northern Mesopotamia. Morpho-stylistic parallels are evident with south-western Iranian sites in Kurdistan, in the Deh Luran and in the Zagros range, as Jaffarabad, Choga Sefid and Tepe Tülâ'i (Dollfus 1975; Hole et al. 1969; Hole 1974). However, as is quite normal for a period called “Eridu phase”, the parallels are numerous and particularly clear with the Ubaid 1 occupation at Eridu (Levels XVIII-XV – Safar, Mustafa and Lloyd 1981; Oates 1960a). Likewise, it is not surprising to observe close similarities with the so-called “Choga Mami Transitional” style, corresponding with the interaction phase between Samarra and Ubaid 1 in Central Iraq (Oates 1960b, 1969). In general, the Ubaid 1 appears to be a phase of considerable formal development (new painted motifs, more and more complex decorations, disappearance of particularly archaic shapes) and at the same time a phase characterized by the stabilization of some properly Ubaid features (wide diffusion of beige and greenish fabrics, tendency to homogenize the dimensions of the various shapes, as well as to thin the walls of fine containers).

Level 5 (hypostyles Buildings 37 and B 110, the alleys and pigeon-hole cells partitioned Granaries 1-2 and B 111, as well as the grill structured granaries towards the upper sector of the Tell) are characterized by an Ubaid 0 ceramic horizon (Lebeau 1987; Thissen 1992). The most surprising feature of the Ubaid 0 pottery is probably its fabric. If the Ubaid is generally associated with a “black-on-buff painted” ceramic tradition, the majority of Ubaid 0 pastes are rose, reddish or brownish, and the black painted decoration is applied on a white slip. Fabrics often appear quite porous, fine in texture but irregular. Sandy mineral temper is ubiquitous, but some vegetal inclusions (probably voluntarily added to the paste) are documented in mixed vegetal-mineral pastes. As far as decorations, it is remarkable the absence of incised motifs, attested at contemporary sites in both norther-central Mesopotamia and Susiana (Mesnil du Buisson 1948, Merpert and Munchaev 1973, 1993; Dollfus 1975, 1983). The surfaces of the sherds are frequently covered by a matt paint, which, in some rare cases, is surprisingly red (Fig. 5).



Fig. 5 – Level 5 decorated jar.

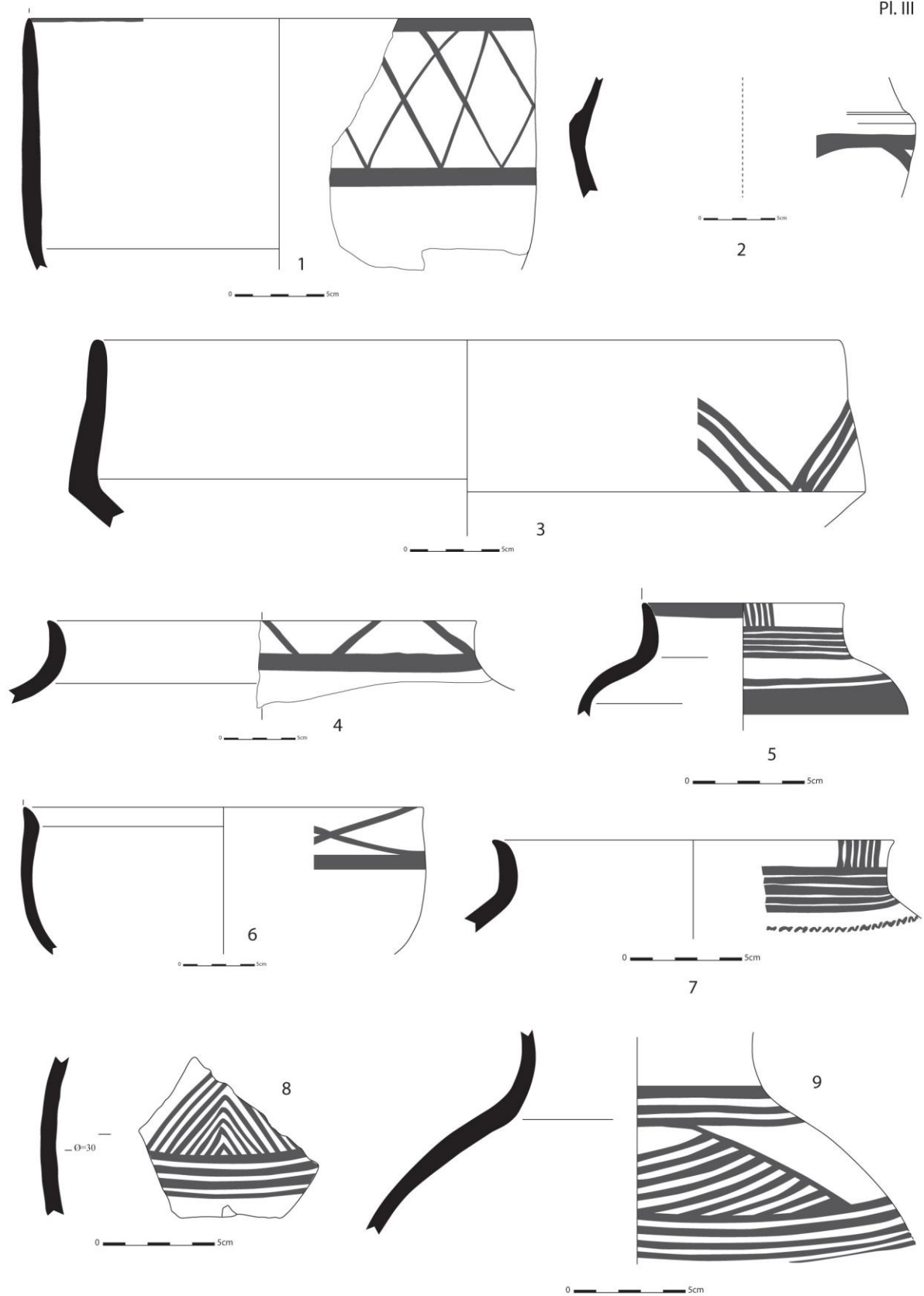


Plate III – Ubaid 0 ceramics.

Blackish-brown decorations are more frequent, but they tend to flake off and thus disappear gradually, leaving only some traces (unfortunately not very visible) on the surface. The visibility of the decorations is also often disturbed by frequent saline concretions. Therefore, even if several sherds appear plain, it is advisable to remain cautious in interpreting the proportion between painted and unpainted ceramics. In any case, painted ceramics with geometric linear or oblique motifs constitute the large majority of the decorations. These patterns clearly represent the precursors of the oblique-lines and geometric designs of the Ubaid 1 repertoire (Pl. III.3, 5, 7-8). Nevertheless, the visual language and semiotic system expressed by Ubaid 0 painted ceramics is much more concise (Fig. 6).



Fig. 6 – Ceramic sherd TO64.1.

Nothing suggest that this was a matter of skills. Variability in pastes and in association between fabrics and decorations could rather suggest that Ubaid 0 was a phase of progressive development of a shared figurative language based on divergent symbolic and technical idioms. For the time being, given the scarcity of contemporary ceramic data, it is difficult to assess the reliability of typological parallels. Since there are no well-published contemporary assemblages, the risk is that, looking for particularly close similarities, one ends up emphasizing the differences compared to other sites. Therefore, the consequence would be to surreptitiously outline a unique character that, in reality, the Ubaid 0 phase at 'Uwaili certainly never had. Links existing with ceramics of the Choga Mami Transitional style are indeed quite evident from a morphological and decorative point of view, especially with the early phases analysed by Oates (1969). However, these links do not allow us to consider that the assemblage from Level 5 represents a local variant of Choga Mami Transitional repertoire (Pl. III.1-3). This same observation can be done about comparisons with the Samarra tradition (Mesnil du Buisson 1948; Abu al-Soof 1971): at 'Uwaili, Ubaid 0 decorations are much less sophisticated, less dense, less focused on geometric consistency, but several parallels are clear (Lebeau 1987: 100). An example of in this sense is represented by Ubaid 0 footed cups from Level 5, documented both in the Samarra and in the Choga Mami Transitional traditions. On the other hand, typological resemblances exist also with south-western Iranian sites, as Jaffarabad, Choga Sefid and Tepe Tülâ'i (Pl. III.4-5, 7 – Dollfus 1975; Hole et al. 1969; Hole 1974), but they are never decisive, as they are for later Ubaid 1 ceramics. If shapes are often comparable, decorations obey most of time to different criteria: so, it seems that all these sites are more recent. As far as southern Mesopotamia, it is interesting to observe that relationships between Ubaid 0 ceramics from 'Uwaili Level 5 and the repertoire from the early levels (XVIII-XV) of Eridu

are the same as those existing between Ubaid 0 and Ubaid 1 pottery from 'Uwaili itself. It clearly confirms that the so-called "Eridu phase" is later than Ubaid 0. Nevertheless, the majority of the sherds from Eridu Level XIX (unfortunately poorly illustrated – Oates 1960; Safar, Mustafa and Lloyd 1981) seems to belong to a phase earlier than Ubaid 1: their close similarities with Level 5 at 'Uwaili (Pl. III.1, 6, 9) could justify a new dating for Eridu XIX, contemporary with the most recent layers of the Obeid 0.

Preliminary technical analyses

Technological and petrographic studies carried out during the 80s are all explicitly aimed at improving the understanding of the *savoir-faire* of late prehistoric craftspeople (Courtois and Velde 1991: 289). Nevertheless, they often underline the substantial homogeneity of the local technical landscape, to the point of expressing some scepticism about the possibility of highlighting technological interactions within the prehistoric community of 'Uwaili, as well as towards other villages or regions (Courtois and Velde 1991: 298). The set of these analyses offers, however, a very detailed picture of the interactions that ceramic production implied with the natural environment in terms of exploitation of raw materials and their treatment. Current technical studies focus, therefore, on recognizing, within this technical panorama, peculiarities defining specific traditions associated with distinct groups of artisans. For this reason, during the 2019 fieldwork seasons the petrographic features of a large sample of Ubaid 0 and 1 fragments have been classified by analysing them at the Dino-Lite Digital microscope (model AM4113T, with up to 200x magnification). Further microscopic analyses are ongoing and, starting from the next seasons, microscopic observations and thin sections petrographic analyses are also planned in France.

Fabrics have a very homogeneous mineralogical composition and they differ essentially on the base of their granulometry. It is often difficult to establish whether mineral or vegetal non-plastic inclusions are voluntarily added to the fine mass because of the little size of the large majority of these components. Indeed, raw materials for the ceramic pastes come from the area of the site itself. Therefore, Ubaid ceramics are a sort of "marsh pottery" (as often stressed by Courtois and Velde 1987: 129, note 10; 139, Table VIII; 1991: 286, 293). This means that the large majority of mineral inclusions are actually clastic transported from the rivers to southern Iraq, as also demonstrated by recent geological maps (Fouad and Sissaskian 2012). Likewise, fine vegetal inclusions (preserved as pyrobitumens in the ceramic pastes) are generally un-calcined fragments of peat or lignite deposits of former local marshes. However, if the coarsest fraction of these components had not been added voluntarily, it was at least ignored, since there are samples of extremely purified pastes, which demonstrate since the 7th millennium BC the ability of local craftspeople to reach quasi-industrial purification levels by decanting and treating clays. Amongst silicates, it is possible to recognize some dispersed micas (translucid black micas and translucid grey-rose muscovite). Calcium carbonate is not very abundant and often voluntarily added by crushing and grinding shells very finely. The most frequent and recognizable silicate is quartz, with grey-whitish inclusions sometimes reaching 0.5 mm. Magnetite dark (or most of time red after the firing process) ferruginous inclusions are not uncommon. Black manganese rich minerals (generally pyrolusite) are also quite frequent. Since all these compositional characteristics are shared by all pastes, the 4 categories identified (A, B, B.I and C) are based on two additional distinctions: the degree of metamorphism of some minerals (a low degree for A and B pastes, and a high degree for C pastes), and the presence of some plant remains and quantity of quartz for B and B.I. In fact, all ceramics contain fragments of rocks at different stages of metamorphism. Alongside metamorphic rocks, several samples also contain shale. Metamorphic rocks are foliated slate, muscovite phyllite, and muscovite schist. Therefore, a first group (A and B fabrics) was defined based on the presence of low-grade metamorphic rocks as phyllite and slate in addition to shale, while a second category (C fabrics) was recognized on the basis of the presence of medium grade metamorphic rocks, essentially schist. Then a second rather conspicuous distinction appeared within the first macro-

group, characterized by components with a low degree of metamorphism: some pastes (A) are only sand-tempered, while others (B and B.I) also contain plant remains. Finally, among the pastes of type B, some have a relatively negligible amount of quartz (and in any case completely comparable to pastes A and C), while others (B.I) have inclusions of quartz of small size, but definitely more abundant than all the other pastes (up to 20%). To summarize, therefore, the assemblage of Levels 5 and 4 at 'Uwaili (Ubaid 0 and 1) is composed of 4 groups of pastes:

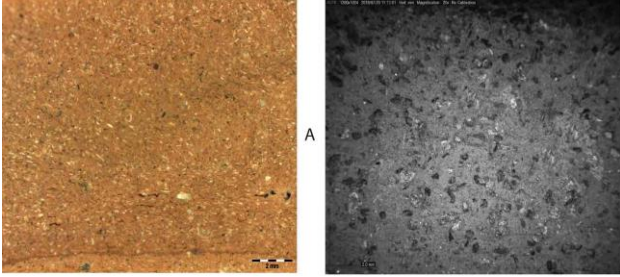
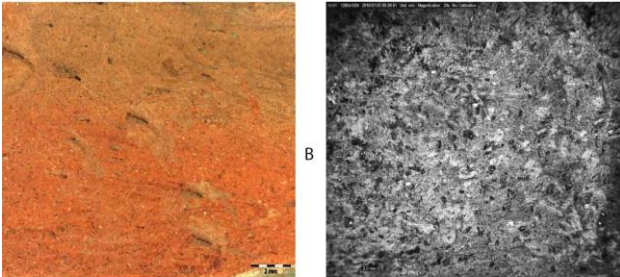
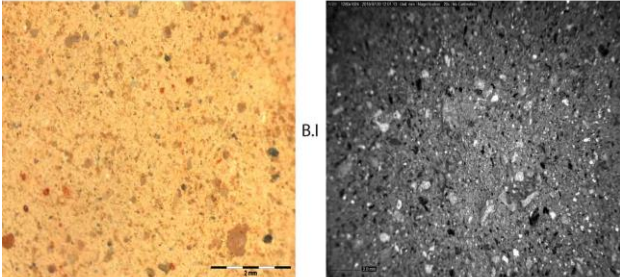
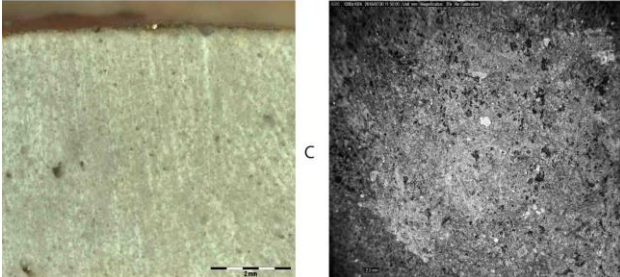
Ceramic fabrics observed with digital microscope	
	<p>A-Orange-brownish slightly porous fabrics with a low quantity of carbonate, clastic quartz, magnetite and biotite. The main specificity of this group is the presence of clastic fine inclusions of shale and phyllite (10- 15% of the matrix). This one is primarily composed of fine unidentified silt-sized brown/beige foliated minerals, with occurrence of muscovite.</p>
	<p>B-Beige-orange moderately porous fabrics with the same basic composition of A pastes (shale and phyllite around 7-10% of the matrix), with scattered quartz and occasional presence of pyrolusite and microscopic crushed shells. The main feature of this group is the presence of vegetal inclusions (3- 10% of the matrix).</p>
	<p>B.I-Rose-orange moderately porous fabrics sharing the same composition of B pastes (shale and phyllite – 5-20% of the matrix, and vegetal inclusions – 3-7% of the matrix), with quite frequent black and red magnetite inclusions. However, the specificity of this group is the high presence of quartz (10-20% of the matrix).</p>
	<p>C-Beige-greenish fabrics with scattered round pores. Despite a mineralogical composition largely shared with the other groups (occasional presence of crushed shells and biotite, low quantities of monocrystalline quartz, magnetite, muscovite and pyrolusite), these pastes do not contain plant remains and are the only group characterized by medium grade metamorphic mineral (essentially schist).</p>

Table I – Tell el 'Uwaili 2019: Ceramic fabrics observed with digital microscope (J.S. Baldi).

The origin of these mineral components is very difficult to determine, since these fragments were transported along the course of the Euphrates to the vicinity of its mouth. However, the mineral combination found in samples analysed at 'Uwaili occurs across a wide zone of the arch of the Zagros and Taurus Mountains (Göncüoğlu and Turhan 1984).

Colours of the fabrics range from brownish red, brick red to rose, beige and greenish. This is a result of firing in an oxidizing atmosphere. This deduction is somewhat supported by the high

firing temperatures that could be ascertained from some physical features of the analysed samples. Firing temperature have probably been around 850-950°C. Clay matrices seem to have lost birefringence (even if thin sections analyses are needed to confirm it). This indicate that the firing temperature did exceed 800-850°C (Quinn 2013: 191). Moreover, in samples containing calcite, there does seem to be an alteration to this mineral, which is indicative that temperatures reached at least 900°C. Likewise, several greenish samples in C pastes show traces of incipient vitrification, which occurs once exceeded 900°C.

Shaping methods

Ubaid 0 and 1 ceramics from Levels 5 and 4 were built by two distinct techniques, and one of them presents two variants:

- I – Vessels were shaped by hollowing-out a lump of clay and pinching and stretching the walls. Both the internal and external surface of the walls were then scraped by hand to bring the clay upwards, to build the upper part of the container. As far as closed containers with a neck, both the neck and the rim were made up of ring coils of variable width and thickness and horizontal joints, while open shapes had only the mouth made up of a coil, shaped according to the profile to be attributed to the rim. Both interior and exterior surfaces were smoothed horizontally by hand or by means of a shell.
- II – The second shaping method was a variant of the first one. The roughout was modelled by hollowing-out a lump, then the walls were built-up by pinching, stretching and scraping the clay and, eventually, one or two thick ring coils were added to shape the rim (for open vessels) or the neck and the rim (for closed shapes). As was it the case for Group I, the neck and rim coils were arranged horizontally across the wall. However, the surfaces (even the interior one) were roughly hand smoothed without any specific orientation. In fact, the specificity of this shaping method was represented by the careful application of a very fine, thin and regular slip (light in colour or bright white after the firing) on the whole exterior surface. The slip was made of the same clay used for the thin fraction of the fabric, but extremely purified, with a very fine and regular grain size, and was applied on both surfaces by dipping the pot in a liquid preparation.
- III – Vessels were built by superposing little 2-2.5 cm thick coils with internally oriented joints starting from a base prepared by pinching and modelling a little quantity of clay. Then, a fine white slip was applied by the same method used for Group II.

In the coming years, ceramic studies on 'Uwaili will focus on offering more precise answers to when and how pottery was produced, and above all on who produced it.

XV - PRELIMINARY ARCHAEOBOTANICAL DATA FROM LARSA-‘UWAILI

Carolyne Douché

In parallel to fieldwork, new archaeobotanical investigations have started at the archaeological sites of Larsa and ‘Uwaili. While several archaeobotanical studies have been led in Southern Iraq such as at Khafajah (Schiemann 1940), Jemdet Nasr (Field 1932), Kish, Eridu (Gillet 1976) and Ur (Ellison et al. 1978), most of them were very short, based on hand-picked remains. Despite the low number of remains, cereal taxa are represented by barley (*Hordeum vulgare*), glume wheat (mostly einkorn wheat, *Triticum monococcum*) and free-threshing wheat (*Triticum aestivum/durum*). Pulses are represented by chickpea (*Cicer arietinum*), lentil (*Lens esculenta*), pea (*Pisum sativum*) and vetch (*Vicia sativa*). Fruits are dominated by date (*Phoenix dactylifera*) and crab apple (*Pyrus malus*). Other edible taxa such as flax (*Linum usitatissimum*), mustard (*Brassica/Sinapis*), cartham (*Carthamus sp.*) and coriander (*Coriandrum sativum*) have been identified.

At ‘Uwaili and Larsa, previous study has been led by R. Neef, which joined the excavation team (supervised by J.-L. Huot) in 1985. Preliminary results from ‘Uwaili and Larsa were respectively published in 1989 and 1991. At that time, samples from ‘Uwaili were recovered from all Ubaid levels while at Larsa, samples were taken from the ziggurat (dated to the Neo-Babylonian period) and from the E-Babbar (dated to the Hellenistic-Parthian period for its last phase of occupation). R. Neef noticed the paucity of the archaeobotanical samples at both sites, due to environmental conditions but also as a consequence of archaeological contexts sampled. Indeed, at ‘Uwaili hard crusts of gypsum resulting from extensive irrigation - that are still visible nowadays - were already present during the 1980’s. Their presence is dramatic for the preservation and particularly for archaeobotanical remains.



Fig. 1 – Example of secured burnt layer sampled on the field.

METHOD

According to new fieldwork strategy, archaeobotanical sampling have been led in sectors 1 and 2 at ‘Uwaili and in B.48 and B.50 at Larsa. The aim was to sample soil as much as possible, from all excavated areas in order to provide new and further data from other contexts and different occupation periods (i.e. the 2nd millennium BC at Larsa for example).

Bulk samples were taken from various contexts such as fireplaces, middens, fill above floors, granaries and kilns, concentrating sampling efforts on secure deposits and burnt/ashy layers (Fig. 1). A limited volume of 30 litres per stratigraphic unit has been decided. Nonetheless, in some case, a bigger amount of soil has been collected. This situation has been applied in the room 1515 of the sector B48 at Larsa for example. Deep ashy deposits, corresponding to posterior fill of the building,

have been excavated. The room has been divided into zones and several archaeological samples have been collected from the same unit.

Samples were processed for charred plant remains, using a machine-assisted York style machine consisting in three tanks with a water closed system (Fig. 2). A 1 mm mesh bottom was set up in the first tank and a 0.3 mm mesh was set up between tanks 1 and 2. The volume of the sampled sediment was primary measured and then poured in the first tank. The non-floating material retained in the first mesh (1 mm) was called 'Heavy Residue' (HR) whereas the floating material, collected in the small mesh (0,3 mm) was called 'Light Residue' (LR) (Fig. 3). Both fractions were dried under the shadow to limit the breakness due to extreme temperature changes. Heavy residue will be sorted by eyes whereas 'Light residue' have already partly been sorted under a low-power microscope at the excavation house of Nasriyah. Some samples have been exported to France to make further analysis such as ¹⁴C-dating.



Fig. 2 – Flotation machine.

PRELIMINARY RESULTS

At 'Uwaili, 26 samples have been collected, 15 from sector 1 and 11 from sector 2. This corresponds to a total amount of 230 litres. At Larsa, 23 samples have been collected, 9 from B48 and 14 from B50. As previously noted by R. Neef, and despite intensive efforts to recover plant macrobotanical remains, samples were very poor. Remains were mostly preserved by charring but it should be mentioned that some were preserved by mineralization. This is the case of reed culms, which have been found in fine white film on the sediment and particularly inside mudbrick walls construction. Similar preservation state has been observed for straw fragments.



Fig. 3 – Left: Heavy residue (HR) containing non-floating material such as animal bones, pottery sherds, bitumen fragments, etc.–Right: Light residue (LR) containing charred macro botanical remains sorted under the microscope.

Tell el 'Uwaili

At 'Uwaili, a total of 367 charred remains have been recovered, including floral parts, indeterminate and indeterminable remains. They almost exclusively come from sector 2 and were concentrated in the Locus 1025 (level 5). Cereals are dominant among the assemblages dating from the beginning of the Ubaid period (Fig. 4 and Plate 1). A few caryopsis have been identified among which barley (*Hordeum vulgare*) has been recognized. Based on morphological aspects of the grains, barley appears to be of hulled type and both, 2 and 6 rows morphotypes have been identified. Concerning wheat, only two grains (one indeterminate and one einkorn wheat) have been recovered. However, assemblages delivered a large quantity of chaff remains. Most of them have been identified as glume wheat thanks to the analysis of spikelet bases and glume bases. An important part of the determinate wheat chaff remains correspond to einkorn wheat (*Triticum monococcum subsp. monococcum*).

The main discovery of einkorn wheat glume bases come from a granary compartment located in sector 2 (Locus 1025). Contrary to other compartments, the sediment recovered in this structure was partly burnt due to the later installing of a kiln. Thus, charred macrobotanical remains have been recovered in the kiln ('green' N°1010) settled in the granary compartment but also next to it, properly in the granary compartment containing a small, complete and painted jar¹ ('green' N°1015). Nonetheless, charred plant remains from the granary likely correspond to some 'escapes' from the kiln and probably refer to fuel.

Moreover, a single and very small lentil seed (wild?), small legumes and *Poaceae culmnodes* complete the assemblage. Indeterminable remains (too fragmented, too badly preserved) constitute the largest proportions of remains from 'Uwaili, representing 61% of the assemblage (n=225).

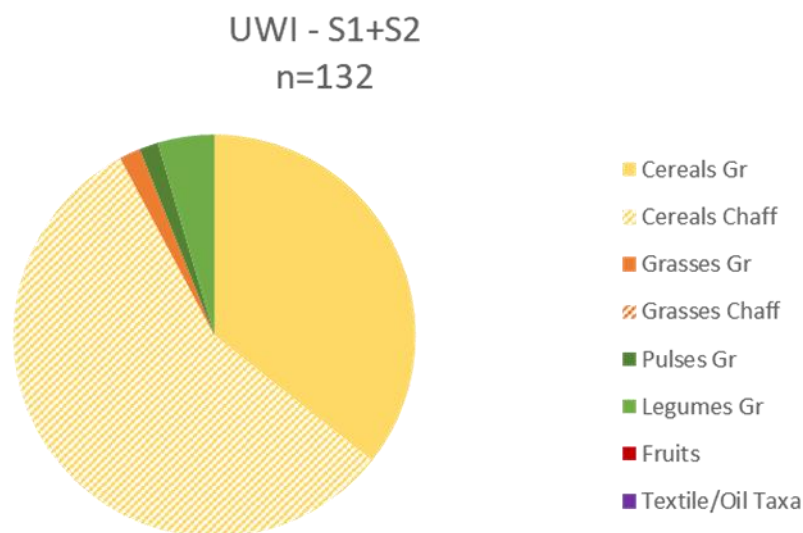


Fig. 4 – Graph presenting the preliminary archaeobotanical results from 'Uwaili.

¹ This small jar comes from level 5 of the new trench (= Ubaid 0 level I of the former phasing), last level of the Ubaid 0 phase, c. 6000 BC.



*Plate 1 – Macrobotanical remains recovered from 'Uwaili. a) Cereal grains very badly preserved b) Barley-type grain (*Hordeum vulgare*) c) Einkorn wheat type grain (*Triticum monococcum*) d) Einkorn wheat glume bases e) Straw fragments.*

Larsa

At Larsa, a total of 871 charred remains have been recovered (including floral part, indeterminate and indeterminable) from B48 and B50, respectively 356 and 515 from each sector. Assemblage compositions are very similar, with a large predominance of cereal grains (Fig. 5-6 and Plate 2), mostly hulled barley but two grains of possible naked barley have been recovered from B50. Some chaff remains have been identified and confirm the presence of domestic barley but also the identification of emmer wheat at B50 and possibly free-threshing wheat. Additionally, three lentil seeds have been recognized – its presence is attested in both sector.

The wild/weed taxa are represented by small grasses such as *Bromus* and *Phalaris sp.* (likely *P. paradoxa* as it has previously been identified by R. Neef), small legumes (*Trifolium sp.*), *Apiaceae*, *Brassicaceae*, *Chenopodiaceae* (including *Salsola sp.*) and *Scirpus sp.* Finally, without any surprise, date stones have been recovered from B48 and B50.

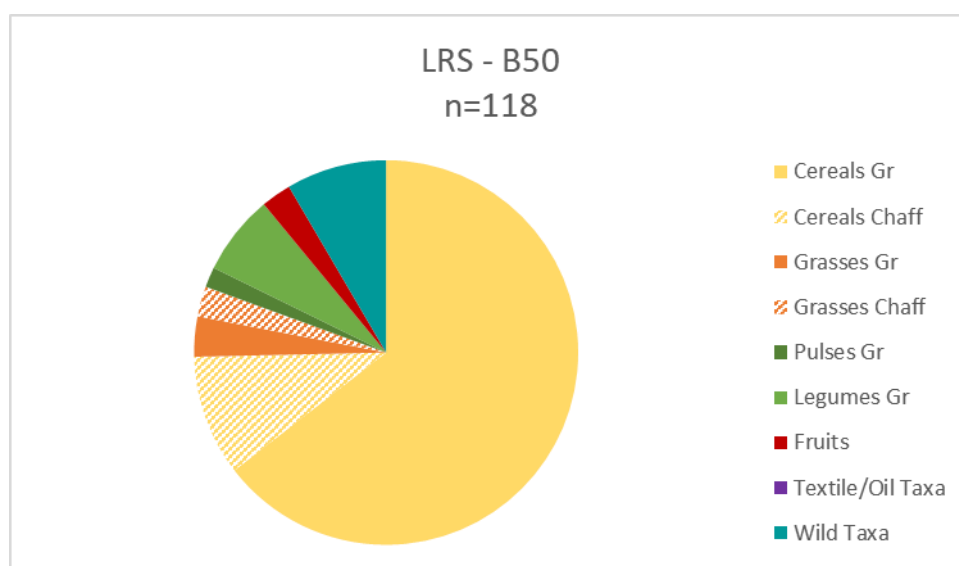


Fig. 5 – Graph presenting the preliminary archaeobotanical results from Larsa, sector B50.

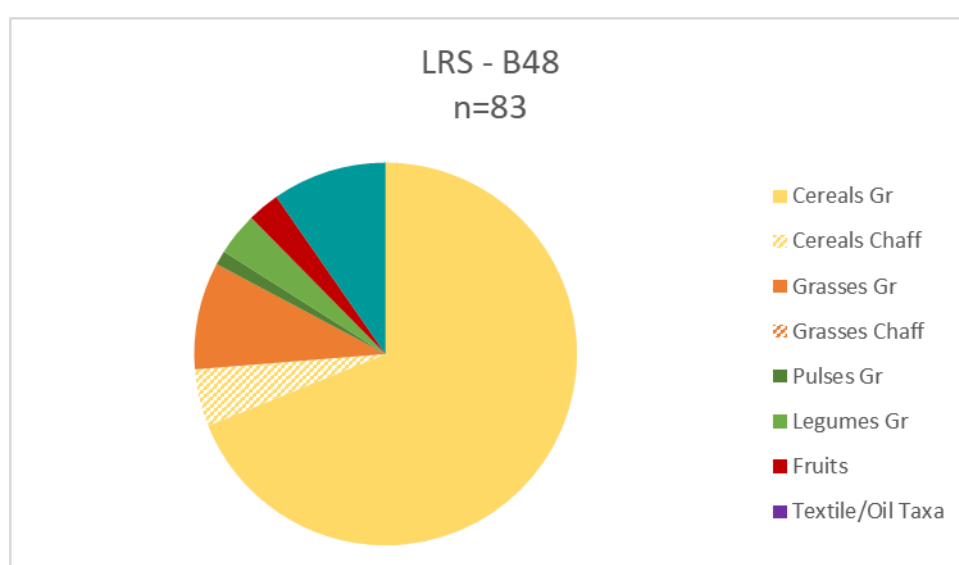


Fig. 6 – Graph presenting the preliminary archaeobotanical results from Larsa, sector B48.

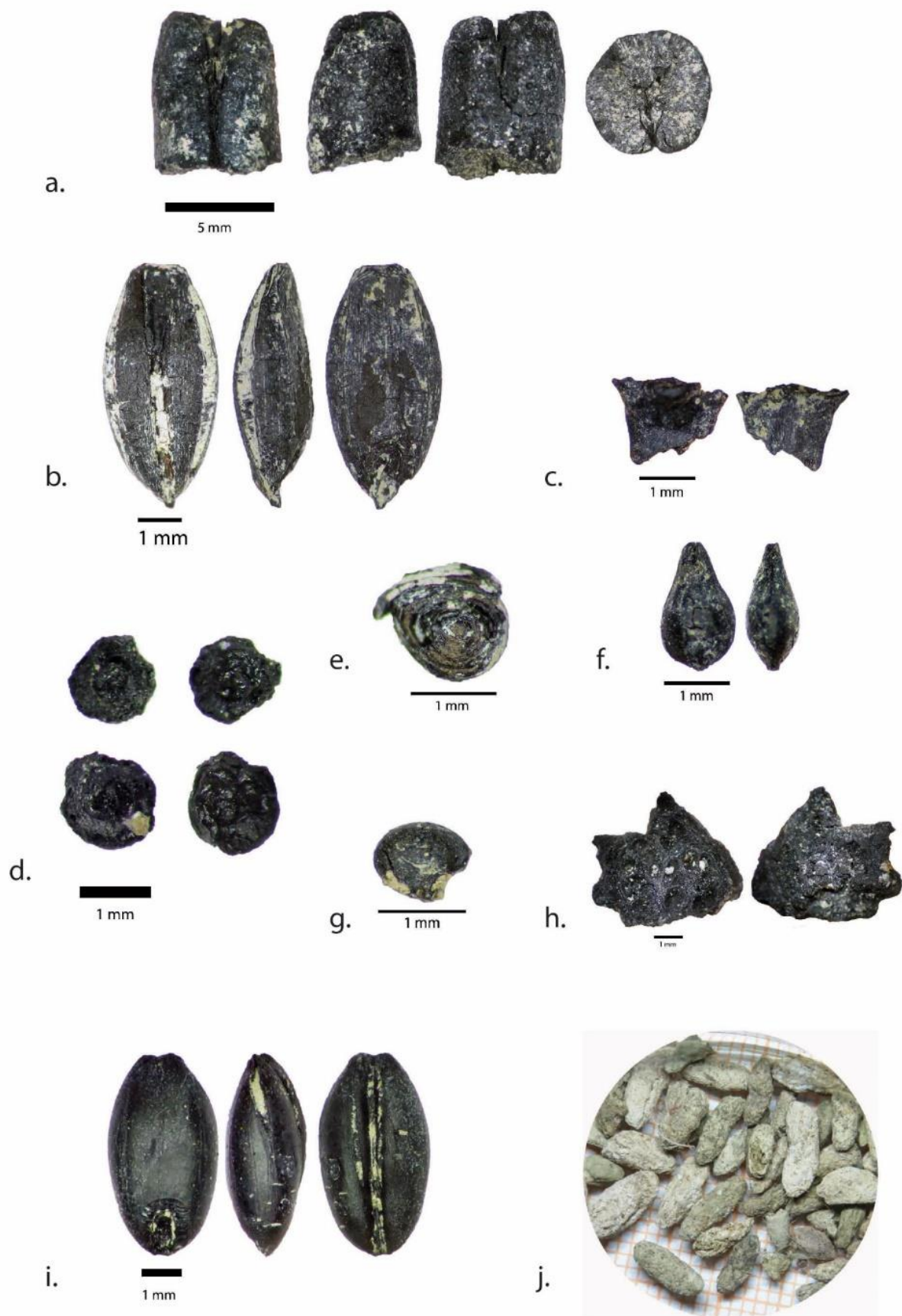


Plate 2 – Macrobotanical remains recovered from Larsa. A) Date stone fragment (Phoenix dactylifera) b) Hulled barley, 2 rows (Hordeum vulgare subsp. distichum) c) Barley rachis, domestic type (Hordeum vulgare) d) Indetermined– Possible small crab apple e) Salsola sp. Seed f) Scirpus sp. g) Trifolium sp. h) Indetermined i) Naked barley type grain (Hordeum type nudum) j) Rodent pellet, modern ?

Discussion

While few archaeobotanical remains have been yet recovered, presence and absence led to conclusions and raise some questions.

(a) The absence of plant remains in structures interpreted as ‘granary compartments’ at ‘Uwaili is likely related to the absence of *in-situ* burning. Indeed, in Iraq and more widely in Southwest Asia, preservation of macrobotanical remains is mostly possible thanks to voluntary or accidental fire. If any plant were stored in these structures, they probably disappeared due to their perishable nature. The absence of botanical remains may also be the result of the excavation since this is not properly the ‘granary compartments’ that have been excavated but the substructure, located below and aiming to support the real storage part. One may then wonder what was stored in these structures and why are there so many in a relatively restricted area?

(b) The presence of chaff remains in the kiln settled in one of the granary compartment from sector 2 may refer to the use of dung as fuel. In Southwest Asia, the use of dung from sheeps/goats and cows has frequently been mentioned in ethnographic studies (Miller and Smart 1984, Anderson and Ertug-Yaras 1998, Valamoti and Charles 2005, Spengler 2019). The scarcity of trees in the surrounding environment of sites often appears as the main reason for the use of dung as fuel. This would be consistent with the modern landscape of ‘Uwaili. Despite the presence of shrubs, the landscape is treeless and supports a very poor vegetation, mostly represented by drought-tolerant taxa adapted to soil with a high salinity rate, such as *Tamarix* sp. and *Haloxylon salicornicum*. Chaff remains - including wheat glume bases - are robust elements that are usually better preserved after the digestive process than other remains such as grains (Charles 1998, Valamoti and Charles 2005). Chaff and small legumes may represent animal fodder or grazed plants. Their presence preserved by charring together with the absence of charcoal may likely be interpreted as the use of dung as fuel.

(c) Based on morphological aspects of the glume bases recovered in this kiln, einkorn wheat (*Triticum monococcum*) has been identified in one of the earliest Ubaid occupation levels at ‘Uwaili (level 5). Was this glume wheat wild or domestic? The status of this cereal is not determinable without spikelet bases. Despite its wide distribution, wild einkorn (*Triticum monococcum* subsp. *boeoticum*) doesn't seem to be present in Southern Iraq (Zohary et al. 2012). In Southwest Asia it is mostly found growing in forest and steppe forest environments, on basaltic soils, marls, clays and limestones and do not succeed under hot and dry climates. Was einkorn gathered, cultivated locally or imported? Soils around ‘Uwaili are favourable to its cultivation but not the climate. Low mean annual rainfall (100-150 mm/year) and high temperatures are not suitable for the development of this cereal. Thus, the cultivation of einkorn at ‘Uwaili would have been possible if climate conditions were different (cooler and wetter) and/or if agricultural practices included artificial management to compensate natural conditions. Considering the natural distribution of wild einkorn, it may have been imported from the east (Zagros Mountains, Iran), the north (Northern Iraq and Upper Tigris valley) and the northwest regions (Middle/Upper Euphrates valley). Nonetheless, the low amount of archaeobotanical remains recovered during this first campaign is insufficient to define an agricultural model at ‘Uwaili. It should be remind that while the previous study led by R. Neef (1989) has shown the presence of einkorn, the Ubaid assemblage was dominated by the two-row barley (*Hordeum vulgare* subsp. *distichum*). These grains came from a pure find and may not be representative of the importance of this taxa. Thus, one of the main aim of future archaeobotanical investigations at ‘Uwaili will consist in defining the economic importance of wheat and barley at one of the earliest settlement in Southern Iraq.

(d) At Larsa, the identification of sedge (*Scirpus* sp.) achenes and reed culms and culmnodes in large quantities is consistent with previous archaeobotanical studies. Indeed, R. Neef (1989, 1991) reported the presence of achenes of *Scirpus maritimus* and stems impressions of *Phragmites australis*

in the Hellenistic occupation at Larsa and the Ubaid phase at 'Uwaili. Moreover, he observed tuber fragments of *Cyperus rotundus* at 'Uwaili. The identification of these taxa characteristic of the marshy/riparian vegetation on both sites probably reflects the proximity and the exploitation of the wetland. The consumption of *cyperaceae* has been suggested on several sites in Southwest Asia as earliest as the Epipalaeolithic period (Wollstonecroft 2009, Arranz *et al.* 2018). But since some *cyperaceae* also grow as weed taxa, their presence in archaeobotanical assemblages can reflect the exploitation of the surrounding humid ecosystem for agricultural purposes. Thanks to this strategy, the low precipitations and the drought may have been offset. While the possibility of a drier climate at the end of the 3rd-beginning of the 2nd millennium BC has been questioned, clear indicators are missing. To provide a better overview of this possible climate change (and its impacts), it would be interesting to get further archaeobotanical data to observe the evolution of the vegetation on a longer scale. The combined study of 'Uwaili and Larsa partly offers such opportunity but the analysis of proxies older than the 2nd millennium BC are required.

(e) The discovery of date stones (*Phoenix dactylifera*) in both sectors of Larsa (B48 and B50) is not surprising considering that the local climate conditions (mild winters and warm-dry summers) are perfectly adapted to the development of this palm tree. While the earliest evidence of date palm consist of wood charcoals identified at the epipalaeolithic site of Ohalo II (Sea of Galilee) (Liphschitz and Nadel 1997), DNA analysis suggest the Mesopotamia as the origin of date-palm domestication. However, surprisingly very few archaeobotanical remains (wood charcoal and fruits) have been found in this area. The earliest attestation of domestic date stones come from the Ubaid site of Eridu, located 55 kilometers to the south of 'Uwaili and Larsa. Here 'buckets of date stones' were apparently uncovered, indicating its importance in the local economy. Did the fruit was also present at 'Uwaili and did it has similar importance? Was it wild or domesticated? Further archaeobotanical investigations are required and may change the knowledge of this emblematic fruit of southern Mesopotamia.

CONCLUSION

During this first archaeological fieldwork at 'Uwaili and Larsa, an intensive sampling strategy has been implemented. However, despite our efforts, few archaeobotanical remains have been recovered until now. This is likely partly due to the nature of the soil (presence of gypsum) that is not favourable to the preservation of the material, but also due to the absence of fire or firing activities such as cooking. Further sampling is required to fill the gap of the Ubaid plant economy at 'Uwaili that is almost unknown south Mesopotamia. Considering that the site is the earliest settlement in the region, subsistence economy likely played an important role. The presence of numerous granaries structures on the site suggest the storage of large amount of grains. But which one? Did the inhabitants only stored cereals? Was the agricultural surplus produced in the local environment or imported? What was the process of storing? Did they cleaned the harvest before storing it? Another archaeobotanical campaign will be necessary to answer those questions. At Larsa, ashy deposits in buildings, corresponding to midden/waste refilling, delivered remains dated to later period (2nd half of the 1st millennium BC). If, thanks to future work, the occupation layers dated to earlier period (beginning of the 2nd mill. BC) can be reached, data obtained this year may provide material for chronological comparison. The excavation of a domestic quarter of the city would be very profitable in terms of archaeobotanical data but also to provide information on daily life activities.

APPENDIX: SHORT PRESENTATION OF A BEDOUIN FAMILY

During the archaeological fieldwork at 'Uwaili, several Bedouin families settled in the surrounding area. We got the opportunity to interview the guardian of the archaeological site, Ghalib Abd el-Hussein, of which the living camp was located next to it (Fig. 7).



Fig. 7 – Ghalib Abd el-Hussein in front of his tent, located next to the archaeological site of 'Uwaili.

This short work cannot and should not be directly compare to archaeological data. It aims to present the daily way of life of a local community, living, moving and exploiting the particular environment. How do they combine mobility and economy, what do they need and what do they use, how characterize the human-animal-territory relationship? This study may also bring some information about their mentality and behaviour leading to certain modes of organization and activities. In that sense, it can't directly be related to the archaeological and archaeobotanical study but may complete and/or nuance interpretations.

The camp is composed by the living tent and by a round fence for sheeps (Fig. 7). The man is living with his nuclear family composed by his wife, their 2 daughters and 4 sons.



Fig. 8 – Bedouin tent (view from the south) built with various textile pieces.

The tent is large, rectangular and partly open, supported by twelve wood posts (Fig. 8-9). The cover resembles a patchwork since it is made with different pieces of hessian, linen, cotton textiles and plastic bags. The floor is not built, it is a simple earthen floor on which, when necessary (for some activities such as eating or sleeping), the family put carpets on reed mats. Except basic equipment including an oven, cooking pots, mats and blankets, the tent do not contains much material. It should be mentioned that lamps were kept tethered in the tent with their own feeder (Fig. 9). Close to the 'entrance', a round oven dig in the ground, is used to cook and to make bread (Fig. 10-11). As evidenced by charcoals and ashes, the hole is filled by fuel (mostly twigs and wood but also wastes), fired and then, the steel cooking pot is placed on it. Sometimes camel dung and sheep pellets are collected, dried and added to wood in the fire. But the man says that due to the smoke and smell produced by this type of fuel, they mostly use it for external ovens/fireplaces (here, one was located along the eastern wall of the tent). But in any case, cooking activities always take place in the tent, never outside. A small container used to make ewe cheese and butter is also suspended in the tent (Fig. 12). The collected milk is put in the metallic pot and is hand-shacked to obtain the 'laban' and/or the 'butter milk'.

As all of the modern Bedouins in Southern Iraq, Ghalib Abd el-Hussein and his family buy most of food in the *souk*. Approximately half of it is represented by fish and chicken, while the other part is represented by vegetables such as potatoes, tomatoes, eggplants and onions. They also buy bread wheat or flour to prepare the typical flat bread. However, the man is the owner of a cultivated field (c. 1.25 ha) where, due to the extreme salinity of the soil, only barley can grow (Fig. 13).



Fig. 9 – Internal space of the tent. While the floor is not built a large amount of reed mats and carpets are stored and reserved to specific activities or daily moments. To the right, lamps are kept tethered to prevent any loose.



Fig. 10 – Location of the domestic oven (covered by a cooking pot), close to the opening of the tent.



Fig. 11 – Domestic oven buried in the ground floor and full of wood charcoals and ashes.



Fig. 12 – Pot suspended in the tent, used to make cheese and butter.



Fig. 13 – Aerial view of the Bedouin camp. In the bottom, the tent and the sheeps and goats fence. In the background, the red arrow shows donkeys grazing in the cultivated field (highlighted by the red dash line).



Fig. 14 – Wood collected in the surrounding environment of the tent.

The family has 8 camels, 5 donkeys, 8 sheep and ewes (plus lambs) and 3 dogs. Moreover, when we visited the camp, there were also several chickens, bought in the market to be eaten the following days¹. Donkeys are used as beasts of burden, mostly to bring wood and twigs collected around the camp (Fig. 14). The Bedouin also take care of his brother's animals (camels and sheep), which is living few meters away. The location of the camp is preliminary defined according animal needs (wild plants and water). Once the temporary camp is established, sheep and donkeys usually stay around but camels are daily take away (maximum distance of 3km) to graze.

The family moves every 3-4 months, to a distance of c. 30-50 km. The mobility depends of two factors related to the Bedouin's main activities: herding and cultivation. Thus, relocation is mainly based on animal feeding but also partly based on agricultural activities. Wherever they might be (less than 50 km away), in January, the man come to the field in order to sow barley grains without any land preparation. In April or June, he comes back to harvest the cereal with a modern machine. During summertime – usually July – after having choose an ideal place nearby the harvested field to let animals eat the leftovers (grains and stubbles), the family set up the camp.

¹ It is interesting to note that while camels, donkeys, sheep and dogs are considered as animals, chickens are not. They are only considered as meat or food.

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APPENDIX A – MUSEUM LIST SPRING 2019




Picture	Museum n°	Field n°	Dimensions	Material	Description	List n°
 <p>LO19 : 1 L.O13.TP5.15</p>		L.O13. TP5.15	opening diameter 10, base diameter 5	clay	"typical Larsa goblet", 75 ml capacity, Middle Bronze Age I-II	1
 <p>LO19 : 2 L.R7.TP15.12</p>		L.R7. TP15. 12	diameter 16	clay	conical bowl with ring cur base, Late Bronze Age	2
 <p>LO19 : 3 L.R8.TP15.12</p>		L.R8. TP15. 12	base diameter 6	clay	"Kassite goblet", Late Bronze Age	3
 <p>LO19 : 4 L.O6.TP14.33</p>		L.O6. TP14. 33	opening diameter 6, base diameter 3, high 13	clay	globular cup, Late Bronze Age	4






	L.X8. TP40. 28	diameter 18	clay	potstand dated to the Kassite period, Late Bronze Age	5
<p>LO19 : 5 L.X8.TP40.28</p>					
	L.P7. TP14. 30	diameter 14	clay	bowl with profiled walls, string cut base, Late Bronze Age	6
<p>LO19 : 6 L.P7.TP14.30</p>					
	L.R9. TP14. 18	diameter 17	clay	conical bowl, string cut base (very rough), Late Bronze Age	7
<p>LO19 : 7 L.R9.TP14.18</p>					
	L.Q8. TP14. 16	diameter 16	clay	conical bowl with flat and string cut base, Middle Bronze Age	8
<p>LO19 : 8 L.Q8.TP14.16</p>					
	L.R20. TP57. 1	diameter 12	clay	small conical bowl with slightly inward rim, string cut base, Middle Bronze Age I-II	9
<p>LO19 : 9 L.R20.TP57.1</p>					






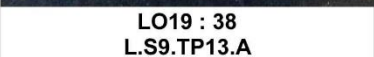
		L.M14. TP38. 1	diameter 11,8	clay	globular pot with out flaring rim, scraped, cooking pot?, Middle Bronze Age I	
<p>LO19 : 10 L.M14.TP38.1</p>						
		L.M21. TP172. 1	diameter 7,2	clay	typical Larsa vessel, tall ovoid body and convex base, capacity 55ml, Middle Bronze Age I-II	11
<p>LO19 : 11 L.M21.TP172.1</p>						
		L.Q8. TP14. 17	base diameter 6,5	clay	"Kassite goblet", Late Bronze Age	12
<p>LO19 : 12 L.Q8.TP14.17</p>						
		L.R9. TP14. 2	base diameter 6,8	clay	"Kassite goblet", Late Bronze Age	13
<p>LO19 : 13 L.R9.TP14.2</p>						






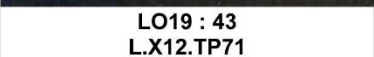
			L.Unk- nown	diameter 10,5	clay	Larsa gobelet, Middle Bronze Age I-II	14
<p>LO19 : 14 L.Unknown</p>							
		L.L18.T P37	length 3,9 diameter 2,6 ; hole diameter 1,4	clay	cylinder with a deep dot at one end	15	
<p>LO19 : 15 L.L18.TP37</p>							
		L.G26. TP30	length 6,9, width 2,3-3,9, high 0,8-1,8 ; hole diameter 1	clay	elongated shape, with one curved side and one flat side, perforated	16	
<p>LO19 : 16 L.G26.TP30</p>							
		L.O23. TP180. A	length 3,7, diameter 2,4-4,3 ; hole diameter 2,8	clay	empty conical shape with a small applied dot covered by incised vertical lines	17	
<p>LO19 : 17 L.O23.TP180.A</p>							
		L.C25. TP138	length 6,6, width 6,1, high 2,2 ; hole diameter 1,5	clay	half cylindrical shape with a hole	18	
<p>LO19 : 18 L.C25.TP138</p>							

		L.T11. TP9.A	length 8,3, diameter 1,7	clay	curved cylinder	19
<p>LO19 : 19 L.T11.TP9.A</p>						
		L.S13. TP62	length 9, diameter 2,9, end high 0,6	clay	cylinder flatened at one end	20
<p>LO19 : 20 L.S13.TP62</p>						
		L.R7. TP15	diameter 2,5	clay	ball	21
<p>LO19 : 21 L.R7.TP15</p>						
		L.H28. TP153	length 0,8, diameter 0,4	lapis- lazuli	long bead	22
<p>LO19 : 22 L.H28.TP153</p>						
		L.K7. TP21	length 1, diameter 0,7	marble	long bead	23
<p>LO19 : 23 L.K7.TP21</p>						






 <p data-bbox="193 551 568 600">LO19 : 24 L.R13.TP8</p>		L.R13. TP8	length 1,1, diameter 0,6 max	carneol	long bead	24
 <p data-bbox="193 853 568 902">LO19 : 25 L.J30.TP156</p>		L.J30. TP156	length 1,3, diameter 0,6-1,1	shell	long bead	25
 <p data-bbox="193 1155 568 1205">LO19 : 26 L.N27.TP183</p>		L.N27. TP183	length 0,3, diameter 0,4	carneol	round bead	26
 <p data-bbox="193 1458 568 1507">LO19 : 27 L.U10.TP74</p>		L.U10. TP74	length 0,5, diameter 0,7	clay	round bead	27
 <p data-bbox="193 1760 568 1809">LO19 : 28 L.U13.TP66</p>		L.U13. TP66	length 0,5, diameter 0,7	clay	round bead	28






 <p>LO19 : 29 L.U8.TP15</p>	L.U8. TP15	length 0,5, diameter 0,6	clay	round bead	29
 <p>LO19 : 30 L.V15.TP60</p>	L.V15. TP60	length 0,6, diameter 0,6	clay	round bead	30
 <p>LO19 : 31 L.V9.TP40</p>	L.V9. TP40	length 0,8, diameter 1,2	clay	round bead	31
 <p>LO19 : 32 L.F29.TP137</p>	L.F29.T P137	length 0,2, diameter 0,6	carneol	short bead	32
 <p>LO19 : 33 L.J7.TP21</p>	L.J7. TP21	length 0,3, diameter 0,7	carneol	short bead	33






	L.K6. TP21	length 0,2, diameter 0,5	carneol	short bead	34
<p>LO19 : 34 L.K6.TP21</p> 	L.O7. TP14	length 0,4, diameter 0,9	agate	short bead	35
<p>LO19 : 35 L.O7.TP14</p> 	L.Q22. TP113	length 0,4, diameter 0,8	limestone	short bead	36
<p>LO19 : 36 L.Q22.TP113</p> 	L.S7. TP15.A	length 0,4, diameter 0,7	carneol	short bead	37
<p>LO19 : 37 L.S7.TP15.A</p> 	L.S9. TP13.A	length 0,4, diameter 0,8	carneol	short bead	38
<p>LO19 : 38 L.S9.TP13.A</p> 					






	L.U15. TP60.A	length 0,2, diameter 0,6	red limestone	short bead	39
<p>LO19 : 39 L.U15.TP60.A</p> 	L.U15. TP60.B	length 0,4, diameter 0,6	carneol	short bead	40
<p>LO19 : 40 L.U15.TP60.B</p> 	L.U9. TP15	length 0,4, diameter 0,7	marble	short bead	41
<p>LO19 : 41 L.U9.TP15</p> 	L.V12. TP73	length 0,3, diameter 0,6	marble	short bead	42
<p>LO19 : 42 L.V12.TP73</p> 	L.X12. TP71	length 0,3, diameter 0,6	limestone	short bead	43
<p>LO19 : 43 L.X12.TP71</p> 					

 <p>LO19 : 44 L.Y11.TP72</p>	L.Y11. TP72	length 0,2, diameter 0,5	carneol	short bead	44
 <p>LO19 : 45 L.K21.TP177</p>	L.K21. TP177	length 7,1, width 6,6, high 3,5	clay	bed model with lattice pattern on top	45
 <p>LO19 : 46 L.Q14.TP1</p>	L.Q14. TP1	length 11,2, width 5,5, high 4,3	clay	boat model	46
 <p>LO19 : 47 L.I21.TP178</p>	L.I21. TP178	high 24, width 20, high 6,5	clay	brick with drawing, probably a board game	47
 <p>LO19 : 48 L.L15.TP37</p>	L.L15.T P37	diameter 24, high 17	clay	canalisation	48






		L.K33. TP29	length 9,1, width 7,1, high 5	clay	chariot model : two wheeled chariot	49
		L.H31. TP29	length 8, width 8,9, high 5,2	clay	chariot model : probably part for the reins	50
		L.O23. TP180. B	length 8,6, width 9, high 5,2	clay	chariot model : probably part for the reins	51
		L.Q33. TP162	length 6,6, width 7,4, high 4,3	clay	chariot model : probably part for the reins	52
		L.M22. TP172	length 7,8, width 5,7, high 1,4	clay	chariot model : screen part, decorated with greek crosses	53

	L.O10. TP6	length 4,1, diameter 2,4	clay	cylinder	54
<p>LO19 : 54 L.O10.TP6</p> 	L.Q10. TP12.A	length 6, diameter 2,4	clay	cylinder	55
<p>LO19 : 55 L.Q10.TP12.A</p> 	L.N19. TP37	length 7,8, width 4,3, high 1,5	clay	figurin : lower part of a man wearing an open skirt	56
<p>LO19 : 56 L.N19.TP37</p> 	L.L28.T P35	high 6,4, diameter 5,9 (4 min)	clay	filter : three perforations at the end of the fragment	57
<p>LO19 : 57 L.L28.TP35</p> 	L.I19	length 30, width 26	clay	inscribed brick	58
<p>LO19 : 58 L.I19</p>					

		L.I19. TP178	length 28,5, width 24	clay	inscribed brick	59
		L.K29. TP58	length 31, width 25	clay	inscribed brick	60
		L.N19. TP53	length 17, width 15, high 8	clay	inscribed brick	61
		L.P17. TP47	length 15,5, width 5,5, high 6	clay	inscribed brick	62
		L.J19. TP177	length 4, width 4	clay	inscribed brick, very fragmentary	63






	L.O20. TP53	length 7, width 5,5	clay	inscribed brick, very fragmentary	64
	L.J23. TP179	length 5,5, width 2,4, high 1,6, width at the end 4,1	clay	Shape of a knife handle : crescent shape at the end with 2 impressed lines	65
	L. AE17. TP82	length 16, diameter 6 (9,1 max)	clay	knob	66
	L.P12. TP6.A	opening diameter 0,6, base diameter 0,6, high 2,3 ; wall 0,1	clay	miniature vessel with a jar shape	67
	L.S9. TP13.B	length 10,1, diameter 1-3,1	clay	nail wall	68







		L.K19. TP53	length 5,5, diameter 1,5	clay	nail wall, bitumen trace at one end	69
<p data-bbox="316 595 443 645">LO19 : 69 L.K19.TP53</p> 		L.M22. TP177	diameter 4 (8 max), high 4,1	clay	nail wall	70
<p data-bbox="316 898 443 947">LO19 : 70 L.M22.TP177</p> 		L.L8. TP20	diameter 5,2, high 1,2 ; hole diameter 0,8	clay	pierced token	71
<p data-bbox="316 1200 443 1249">LO19 : 71 L.L8.TP20</p> 		L.Q18. TP48	diameter 5,1, high 1,1 ; hole diameter 0,7	clay	pierced token	72
<p data-bbox="316 1503 443 1552">LO19 : 72 L.Q18.TP48</p> 		L.S7. TP15.B	diameter 6,2, high 1,1 ; hole diameter 0,8	clay	pierced token	73
<p data-bbox="316 1805 443 1854">LO19 : 73 L.S7.TP15.B</p>						

 <p>LO19 : 74 L.S8.TP15</p>	L.S8. TP15	diameter 5,4, high 1,3 ; hole diameter 0,7	clay	pierced token	74
 <p>LO19 : 75 L.S9.TP13.C</p>	L.S9. TP13.C	diameter 5,5, high 1,4 ; hole diameter 1	clay	pierced token	75
 <p>LO19 : 76 L.V7.TP40</p>	L.V7. TP40	diameter 6,6, high 1,3 ; hole diameter 1,2	clay	pierced token	76
 <p>LO19 : 77 L.W10.TP40</p>	L.W10. TP40	diameter 5, high 1,1 ; hole diameter 0,7	clay	pierced token	77
 <p>LO19 : 78 L.X12.TP72</p>	L.X12. TP72	diameter 7, high 2 ; hole diameter 1,4	clay	pierced token	78

		L.T11. TP9.B	diameter 4,6, high 1	clay	plain token	79
<p>LO19 : 79 L.T11.TP9.B</p>						
		L.J23. TP177	length 8,6, width 5,4, high 0,7	clay	plaque : bearded heros facing left with frontal head and curled hair, holding an overflowing vessel	80
<p>LO19 : 80 L.J23.TP177</p>						
		L.Q10. TP12.B	length 10,7, width 4,5, high 0,5	clay	plaque : bearded man facing right, with joint hands and long fringed garment	81
<p>LO19 : 81 L.Q10.TP12.B</p>						
		L.G27. TP35	length 6,2, width 6,3, high 1,4	clay	plaque : frontal goddess with joint hands under the chest	82
<p>LO19 : 82 L.G27.TP35</p>						
		L.P12. TP6.B	length 2,6, width 5,6, high 1,2	clay	plaque : human facing left, wearing a long garment ; incised triangles under it ; applied	83
<p>LO19 : 83 L.P12.TP6.B</p>						


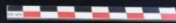







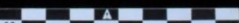



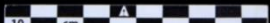
		L.G31. TP150	length 6,5, width 6,2, high 1,4	clay	plaque : man facing right and wearing a fringed skirt, holding 3 fishes in both hands	84
<p>LO19 : 84 L.G31.TP150</p>						
		L.Q24. TP165	diameter 7,7, high 4,9 ; hole diameter 0,5	clay	rattle : perforated ball with one face incised in a cross shape, small semi-circular elements on the side	85
<p>LO19 : 85 L.Q24.TP165</p>						
		L.O13. TP10	diameter 3, high 0,4	shell	ring	86
<p>LO19 : 86 L.O13.TP10</p>						
		L.P25. TP113	diameter 0,6, length 2,9+2,4	rope	rope in two fragments	87
<p>LO19 : 87 L.P25.TP113</p>						
		L.T26. TP175	length 6,3, width 5,5, high 1,7	clay	table model : square table or seat, on 4 short legs, curved traces above	88
<p>LO19 : 88 L.T26.TP175</p>						





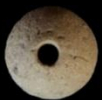





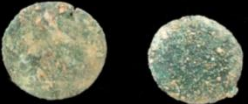

 <p>LO19 : 89 L.G28.TP137</p>		L.G28. TP137	length 16, width 7,7, high 3,3 ; hole diameter 2,1	granit	weight, flat, perforated	89
 <p>LO19 : 90 L.C23.TP34</p>		L.C23. TP34	length 7,5, width 7,1, high 1,5 ; hole diameter 1,2	clay	weight in a diamond shape, perforated at the angle	90
 <p>LO19 : 91 L.P13.TP6</p>		L.P13. TP6	diameter 5,3, high 1,9 ; hole diameter 2	clay	weight in a large ring shape	91
 <p>LO19 : 92 L.I28.TP35</p>		L.I28. TP35	diameter 10,3, high 0,7 (3,1 max) ; hole diameter 1	clay	wheel with dots around the axle on one side	92
 <p>LO19 : 93 L.J33.TP29</p>		L.J33. TP29	diameter 22, high 2,5 (7,1 max) ; hole diameter 5,2	clay	wheel	93


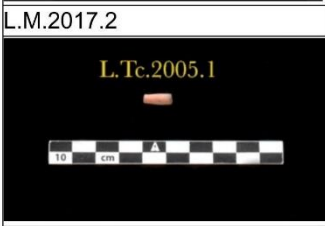
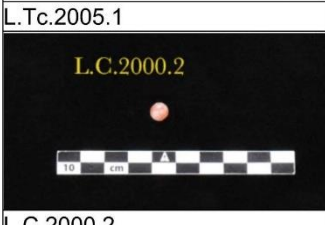
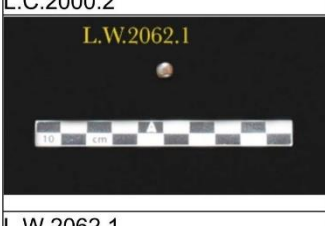
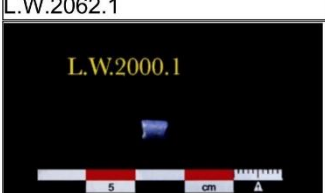



			L.Q19. TP49	diameter 10,1, high 0,7 (3,3 max) ; hole diameter 1,3	clay	wheel	94
<p>LO19 : 94 L.Q19.TP49</p>							
			O.32.1	diameter 3,7cm, thick 1cm	clay	Raw clay labret, completely preserved, found on the surface	95
<p>LO19 : 95 O.32.1</p>							
			O.25.2	diameter 2,3, length 2,3	clay	Raw clay cork, very well preserved, found in the filling of a kiln	96
<p>LO19 : 96 O.25.2</p>							
			O.32.3	diameter 8, thick 2,5	clay	ceramic weight, well preserved, found on the surface	97
<p>LO19 : 97 O.32.3</p>							
			O.3.4	diameter 3,1, thick 1,3	clay	Raw clay labret, completely preserved, found in the filling of a kiln	98
<p>LO19 : 98 O.3.4</p>							
			O.32.5	length 34, width 11, thick 4	clay	Small ceramic basin, painted inside, partially broken, found on the surface	99
<p>LO19 : 99 O.32.5</p>							

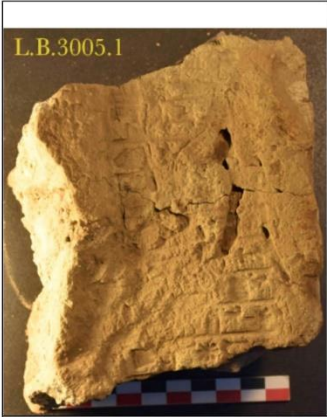



APPENDIX B – MUSEUM LIST FALL 2019

Picture	Museum n°	Field n°	Dimensions	Material	Description	List n°
 <p>TO.Tc.1010.1</p>		TO.Tc.1010.1	opening diameter 10,2 base diameter 7,5 height 22	Clay	Globular jar, Obeid 0 Red band on the lower part of the body and three diamond shaped red motifs on the upper part	100
 <p>L.Tc.1011.1</p>		L.Tc.1011.1	opening diameter 2,6 base diameter 8 height 23	Clay	Juglet with ring base, neck and rim are missing	101
 <p>L.Tc.2022.1</p>		L.Tc.2022.1	opening diameter 9 base diameter 6 height 18,5	Clay	"Typical Larsa goblet", Middle Bronze Age I-II Upper part is missing	102
 <p>L.Tc.1017.1</p>		L.Tc.1017.1	opening diameter 17 base diameter 6,3 height 3,7	Clay	"Fish plate", Achaemenid period	103
 <p>L.Tc.1017.2</p>		L.Tc.1017.2	opening diameter 17,3 base diameter 6,3 height 4,7	Clay	"Fish plate", Achaemenid period	104

 <p>L.Tc.1021.1</p> 	L.Tc.1021.1	opening diameter 17 base diameter 5 height 5	Clay	"Fish plate", Achaemenid period	105
L.Tc.1021.1					
 <p>L.Tc.101.3</p> 	L.Tc.101.3	length 5,7 width 5 high 1,3	Clay	Plaque depicting a nude female Fragmentary	106
L.Tc.101.3					
 <p>L.Tc.1023.1</p> 	L.Tc.1023.1	length 3,3 width 1,2 high 0,5	Clay	Plaque depicting a nude female Fragmentary	107
L.Tc.1023.1					
 <p>L.Tc.2000.2</p> 	L.Tc.2000.2	length 8,6 width 6,6 high 1,5	Clay	Plaque depicting a man in long garment laboring a field? Fragmentary	108
L.Tc.2000.2					
 <p>TO.Tc.65.1</p> 	TO.Tc.65.1	length 5 width 5,7 high 0,7	Clay	Plaque depicting a sexual scene	109
TO.Tc.65.1					
 <p>TO.Tc.65.2</p> 	TO.Tc.65.1	length 3,5 width 4,3 high 1,1	Clay	Plaque depicting a nude kneeling prisoner, attached by the neck with a rope	110
TO.Tc.65.2					
 <p>L.Tc.2000.5</p> 	L.Tc.2000.5	length 6,3 width 3, high 1,4	Clay	Model bed, fragmentary	111
L.Tc.2000.5					

 <p>L.Tc.2000.3</p> 		L.Tc.2000.3	length 3,5 width 5	Clay	Model boat, fragmentary	112
L.Tc.2000.3						
 <p>L.Tc.2000.1</p> 		L.Tc.2000.1	diameter 10 height 3 hole diameter 1,6	Clay	Wheel of a chariot model	113
L.Tc.2000.1						
 <p>L.Tc.2000.4</p> 		L.Tc.2000.4	diameter 3,7 high 1,5 hole diameter 1	Clay	Loom weight	114
L.Tc.2000.4						
 <p>L.P.2000.1</p> 		L.P.2000.1	diameter 4,1 height 0,6 hole diameter 0,6	Greenish Stone	Spindle whorl	115
L.P.2000.1						
 <p>L.V.2000.1</p> 		L.V.2000.1	height 1,8 diameter 3,7	Glass	Glass fragmentary object	116
L.V.2000.1						
 <p>L.M.2001.1</p> 		L.M.2001.1	diameter1 5,3 deight1 3,2 diameter2 5 height2 1,7	Bronze	Door nails?	117
L.M.2001.1						

 <p>L.M.2017.2</p>		L.M.2017.2	length 4,5 head diameter 0,9	Iron	Nail	118
L.M.2017.2						
 <p>L.Tc.2005.1</p>		L.Tc.2005.1	length 1,2 diameter 0,5	Clay	Cylindrical bead	119
L.Tc.2005.1						
 <p>L.C.2000.2</p>		L.C.2000.2	diameter 0,7	Carnelian	Round bead	120
L.C.2000.2						
 <p>L.W.2062.1</p>		L.W.2062.1	length 0,4 diameter 0,5	Brown stone	Cylindrical bead	121
L.W.2062.1						
 <p>L.W.2000.1</p>		L.W.2000.1	length 0,5 diameter 0,4	Lapis-lazuli	Cylindrical bead	122
L.W.2000.1						
 <p>L.B.2000.1</p>		L.B.2000.1	length 16 width 5,4	Clay	Inscribed brick Iddi-Apla-Iddina, 2 nd Isin Dynasty	123
L.B.2000.1						
 <p>L.B.2000.2</p>		L.B.2000.2	length 19 width 7,4	Clay	Inscribed brick, Burnaburiash, Kassite period	124
L.B.2000.2						
 <p>L.T. 2085.1</p>		L.T.2085.1	Length 5 Width 5,5	Clay	Paleo-Babylonian tablet	125

 <p>L.B.3005.1</p>		L.B. 3005.1	Length 11 Width 8,5	Clay	Inscribed brick of Marduk God	126
 <p>L.Tc.3009.1</p>		L.Tc.3009.1	Length 7 Width 2,6	Clay	Votive phallus	127
 <p>L.P. 1023.1</p>		L.P.1023.1	Length 2 Width 1,1	Stone	Pearl	128
 <p>LA.1025.1</p>		L.A.1025.1	Length 2,3 Width 2,6	Clay	Sealing representing a seated divinity	129

APPENDIX C – EXPORT SAMPLE LIST SPRING 2019

Sample N.	Material	Square	Area	N.
1	Pottery	O8	TP14	15
2	Pottery	X8	TP40	1
3	Pottery	X8	TP40	26
4	Pottery	X15	TP70	12
5	Pottery	X15	TP70	13
6	Pottery	W9	TP40	2
7	Pottery	W9	TP40	11
8	Pottery	W8	TP40	3
9	Pottery	W8	TP40	5
10	Pottery	W8	TP40	17
11	Pottery	W8	TP40	13
12	Pottery	O8	TP12	15
13	Pottery	W9	TP40	6
14	Pottery	O5	TP16	34
15	Pottery	O12	TP70	25
16	Pottery	O12	TP70	26
17	Pottery	O5	TP16	31
18	Pottery	O14	TP46	3
19	Pottery	O7	TP21	4
20	Pottery	O12	TP6	1
21	Pottery	O8	TP44	1
22	Pottery	O11	TP6	40
23	Pottery	O12	TP6	5
24	Pottery	W9	TP40	11
25	Pottery	O14	TP46	4
26	Pottery	Q12	TP8	12
27	Pottery	Q15	TP4	5
28	Pottery	O15	TP23	18
29	Pottery	O12	TP6	12
30	Pottery	Q15	TP4	7
31	Pottery	O14	TP45	5
32	Pottery	O5	TP16	1
33	Pottery	W9	TP40	9
34	Pottery	O13	TP10	1
35	Pottery	W9	TP40	14
36	Pottery	O7	TP17	14
37	Pottery	O13	TP10	2
38	Pottery	O8	TP14	8
39	Pottery	O7	TP17	13
40	Pottery	O5	TP16	17
41	Pottery	W9	TP40	1
42	Pottery	O7	TP17	3
43	Pottery	O8	TP12	3









44	Pottery	O8	TP14	8
45	Pottery	O8	TP12	2
46	Pottery	O7	TP12	1
47	Pottery	Q15	TP4	22
48	Pottery	K19	TP133	2
49	Pottery	W8	TP40	3
50	Pottery	O13	TP10	5
51	Pottery	O5	TP16	2
52	Pottery	O8	TP12	13
53	Pottery	O15	TP23	12
54	Pottery	O12	TP7	6
55	Pottery	O15	TP23	4
56	Pottery	O5	TP16	4
57	Pottery	O13	TP10	7
58	Pottery	O7	TP17	5
59	Pottery	O15	TP23	13
60	Pottery	O13	TP10	19
61	Pottery	O15	TP23	20
62	Pottery	W8	TP40	17
63	Pottery	W8	TP40	5
64	Pottery	O8	TP44	4
65	Pottery	R9	TP15	6
66	Pottery	P15	TP10	3
67	Pottery	X15	TP70	12
68	Pottery	R9	TP133	3
69	Pottery	X8	TP40	24
70	Pottery	J29	TP35	1
71	Pottery	P12	TP6	70
72	Pottery	R8	TP15	22
73	Pottery	O6	TP14	4
74	Pottery	J29	TP35	8
75	Pottery	L10	TP38	12
76	Pottery	R8	TP15	21
77	Pottery	R9	TP15	18
78	Pottery	R7	TP15	15
79	Pottery	O6	TP14	5
80	Pottery	P12	TP6	78
81	Pottery	R8	TP15	12
82	Pottery	R9	TP13	11
83	Pottery	J29	TP35	7
84	Pottery	O7	TP44	4
85	Pottery	R7	TP15	10
86	Pottery	R8	TP15	6
87	Pottery	R8	TP15	3
88	Pottery	Q8	TP14	9















89	Pottery	Q8	TP14	8
90	Pottery	R9	TP13	20
91	Pottery	O6	TP14	29
92	Pottery			
93	Pottery	R7	TP15	12
94	Pottery	O6	TP14	25
95	Pottery	O6	TP14	27
96	Pottery	R8	TP14	12+18
97	Pottery	X8	TP40	28
98	Pottery	Q8	TP14	1
99	Pottery	O6	TP14	1

APPENDIX D – EXPORT SAMPLE LIST FALL 2019

BAG n°1				
Qty	Description	Sample no.	Origin	Photo
2 bags – 12 tubes	Archaeobotanical Sample	#FL.1	Larsa B.48	
1 bag - 8 tubes	Archaeobotanical Sample	#FL.2	Larsa B.48	
1 bag - 12 tubes	Archaeobotanical Sample	#FL.3	Larsa B.48	
1 bag - 9 tubes	Archaeobotanical Sample	#FL.4	Larsa B.48	
2 bags - 3 tubes	Archaeobotanical Sample	#FL.5	Larsa B.50	
1 bag - 5 tubes	Archaeobotanical Sample	#FL.6	Larsa B.50	

1 bag - 20 tubes	Archaeobotanical Sample	#FL.7	Larsa B.50	
1 bag - 7 tubes	Archaeobotanical Sample	#FL.8	Larsa B.50	
1 bag - 9 tubes	Archaeobotanical Sample	#FL.9	Larsa B.50	
1 bag - 4 tubes	Archaeobotanical Sample	#FL.10	Larsa B.50	
1 bag - 2 tubes	Archaeobotanical Sample	#FL.11	Larsa B.50	
1 bag - 7 tubes	Archaeobotanical Sample	#FL.12	Larsa B.50	
1 bag - 5 tubes	Archaeobotanical Sample	#FL.13	Larsa B.50	

1 bag - 8 tubes	Archaeobotanical Sample	#FL.14	Larsa B.50	
1 bag - 1 tube	Archaeobotanical Sample	#FL.15	Larsa B.50	
1 bag	Archaeobotanical Sample	#FL.16	Larsa B.50	
1 bag	Archaeobotanical Sample	#FL.17	Larsa B.48	
1 bag	Archaeobotanical Sample	#FL.18	Larsa B.48	
1 bag - 8 tubes	Archaeobotanical Sample	#FL.20	Larsa B.50	
1 bag	Phytolith Sample	#PH.1	Larsa B.48	

1 bag	Charcoal Sample	#CH.1	Larsa B.50	
1 bag	Charcoal Sample	#CH.2	Larsa B.50	
1 bag	Charcoal Sample	#CH.3	Larsa B.50	
BAG n°2				
Qty	Description	Sample no.	Origin	Photo
1 bag -7 tubes	Archaeobotanical Sample	#FL.5	Oueili S.2	
1 bag - 10 tubes	Archaeobotanical Sample	#FL.6	Oueili S.2	
1 bag - 7 tubes	Archaeobotanical Sample	#FL.7	Oueili S.2	
1 bag - 4 tubes	Archaeobotanical Sample	#FL.8	Oueili S.2	

1 bag	Archaeobotanical Sample	#FL.12	Oueili S.2	
1 bag	Archaeobotanical Sample	#FL.13	Oueili S.2	
1 bag	Archaeobotanical Sample	#FL.15	Oueili S.2	
1 bag	Phytolith Sample	#PH.1	Oueili S.2	