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Report on the 2018 and 2019 Seasons of the Madâ'in Sâlih Archaeological Project

Laïla Nehmé, Charlène Bouchaud, Nathalie Delhopital, Caroline Durand,
Florent Égal, Zbigniew T. Fiema, Pierre-Louis Gatier, Damien Gazagne,
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Report on the 2018 and 2019 Seasons of the **Madâ'in Sâlih** **Archaeological Project**

Edited by Laïla Nehmé

With contributions by

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And the drawings of Ariadni ILOGLOU and Jean HUMBERT



May 2020

Cover page photograph, L. Nehmé, *Area 64 during the 2019 season.*

Next page photograph, L. Nehmé: *Ariadni Ilioglou digging a fully preserved pot which became visible after the rains.*

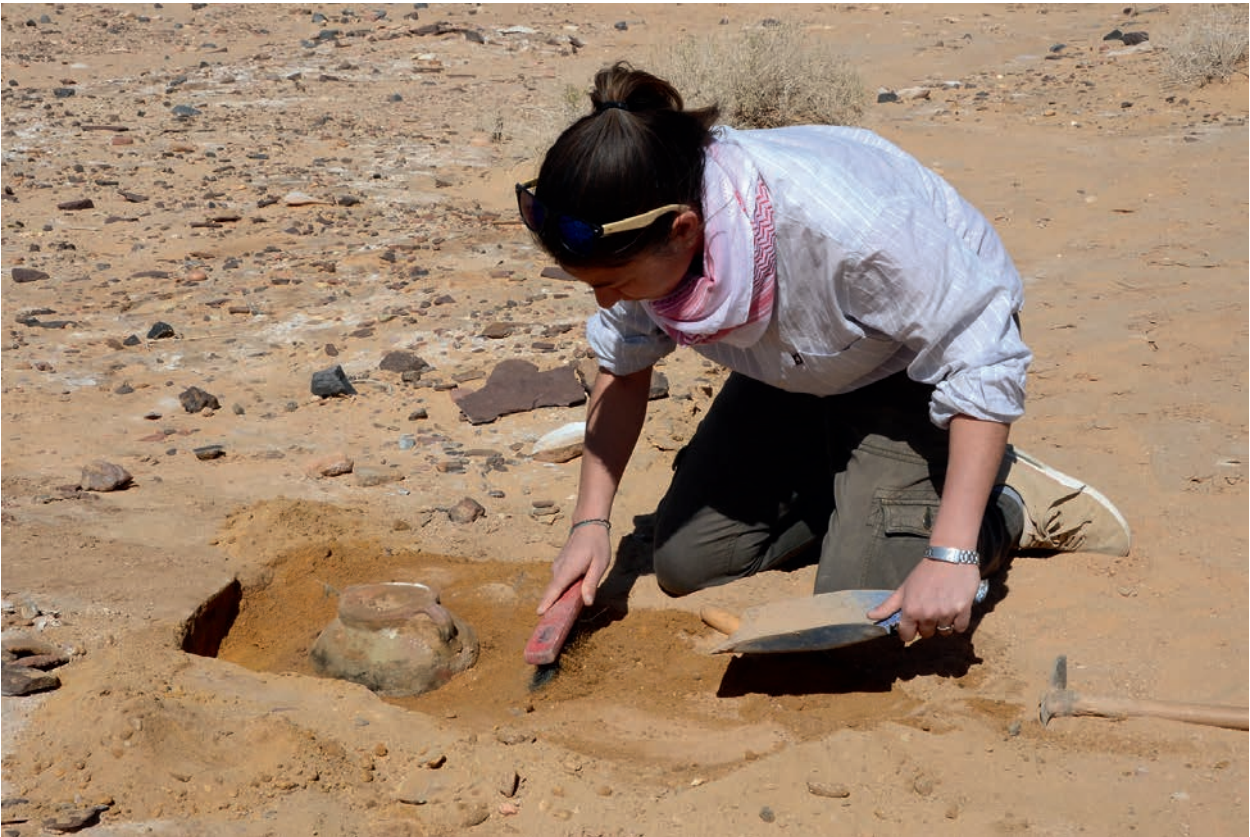
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Report on the 2018 and 2019 Seasons

of the **Madâ'in Sâlih**

Archaeological Project



May 2020

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Years 2018 and 2019, Introduction and Summary of Actions

Laïla NEHMÉ (CNRS, UMR 8167, Orient & Méditerranée)

The decision to produce a volume combining the reports of the 2018 and 2019 seasons of the Madā'in Šāliḥ Archaeological Project was taken in order to make all the contributions available in English, which is the project's working language. Indeed, some important contributions included in these two reports, which offer syntheses on particular kinds of material (Greek inscriptions, leather) or on the excavation of an important monument (the Nabataean temple in the residential area, IGN 132, **fig. 1**), had been initially written in French and were therefore not easily accessible to colleagues from Arabic countries. Some of the contributions were also updated in 2020.

It should be noted that the 2018 season was a study season while the 2019 one was both an excavation and a study season. One of the tasks of the Project in 2018 was to help the Saudi and

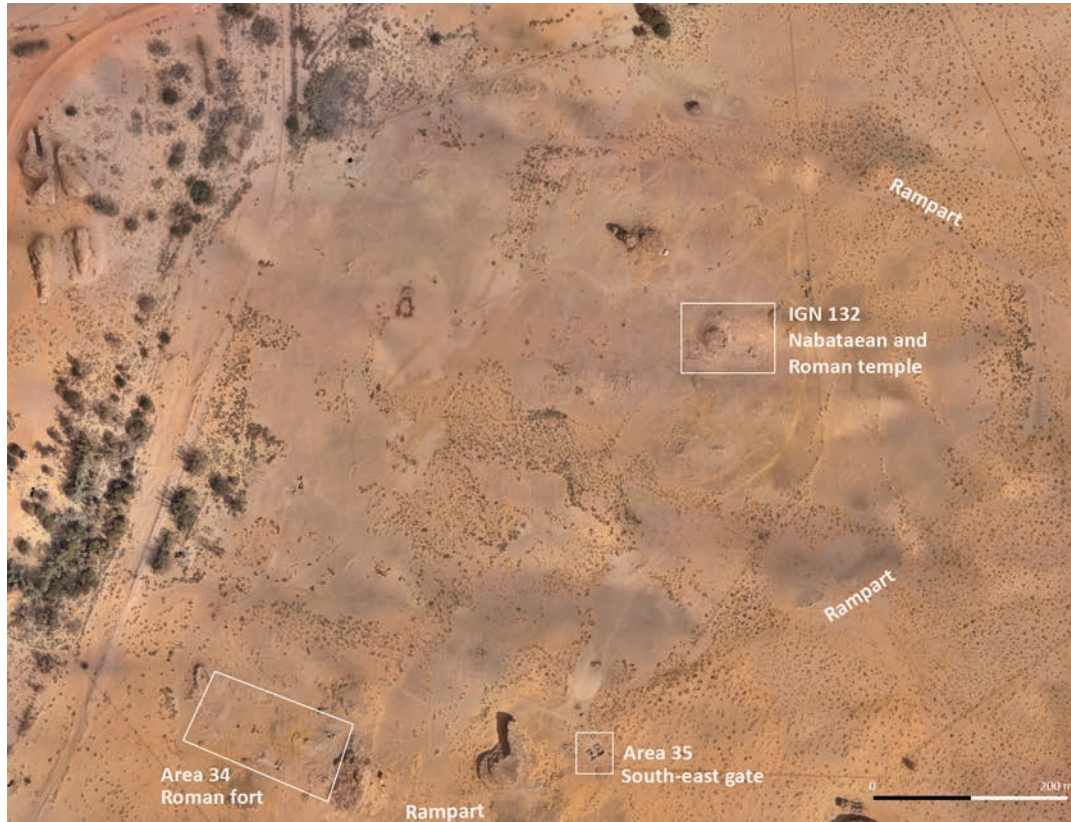


Fig. 1. Aerial view of the residential area showing the location of the excavations mentioned in the text (Falconviz for the Madā'in Šāliḥ Archaeological Project).



Fig. 2. Aerial view of the South-east gate after restoration.

French authorities after the former decided, in the framework of the 'Vision 2030' project, to make AlUla (and hence Madā'in Šāliḥ) a major touristic destination. These authorities are now represented by two bodies, the Royal Commission for AlUla (RCU, created in July 2017) and the French Agency for the Development of AlUla (Afalula, created in July 2018). The Madā'in Šāliḥ Archaeological Project helps with all the topics in which its worldly recognised expertise, gained over the years since 2002, can be useful. These include networking, preservation and management of archaeological sites, tourism, training of students and guides, to which should of course be added all the scientific issues related to the excavations or to the material studied by the project's members.

Among the achievements which are not mentioned elsewhere in this volume are the publication of a guide of Hegra and the participation of the project's director, as co-curator, in the 'AlUla Wonder of Arabia' exhibition which took place at the Arab World Institute in Paris from October 2019 to March 2020.¹ Several members of the project were involved in the preparation of the exhibition and about sixty objects from Madā'in Šāliḥ were selected for display.

As for the guide of Hegra, first published in French in October 2019,² it contains both a general and detailed introduction on the Nabataeans, their history, religion, language, architecture, funerary rituals, etc., and a complete visit of the site with practical recommendations, itineraries and maps. The English version of the same will be ready before the end of 2020 and the Arabic version, the most difficult to achieve, in preparation in early 2020, will follow.

In 2018 and 2019, the team undertook various actions which are mentioned briefly here because they are not the object of a specific contribution in this volume. The first is the restoration of an important monument of the residential area of ancient Hegra, the so-called South-east gate of the rampart, Area 35, the excavation of which was completed in 2017 (fig. 2). Fifteen Greek and

1. Catalogue: L. Nehmé L. and A. Alsuhaibani (eds) 2019: *AlUla, Wonder of Arabia*. Paris: Gallimard (French and Arabic versions also available).

2. L. Nehmé 2019. *Archéologie au pays des Nabatéens d'Arabie. Guide de Hégra*. Paris: Maisonneuve & Larose Nouvelles éditions / Hémisphères. English title: *Archaeology in the land of the Nabataeans of Arabia. Guide to Hegra*.

Latin inscriptions, some carved *in situ* and some carved or painted on blocks reused in the masonry of the walls and towers which flank the passage, were put to light during the excavations. Their publication has come out (fig. 3).³ The South-east gate being a monumental structure, one may think of integrating it in touristic tours, especially if the inscriptions are made visible.

Among the surveys undertaken inside Madā'in Šāliḥ, one should mention the systematic examination, by Pierre-Louis Gatier and Laïla Nehmé,⁴ in 2018 and 2020, of the epigraphic points which include Greek (and more rarely Latin) graffiti carved by Roman Auxiliary troops. A preliminary publication is presented in this volume by Pierre-Louis Gatier.⁵

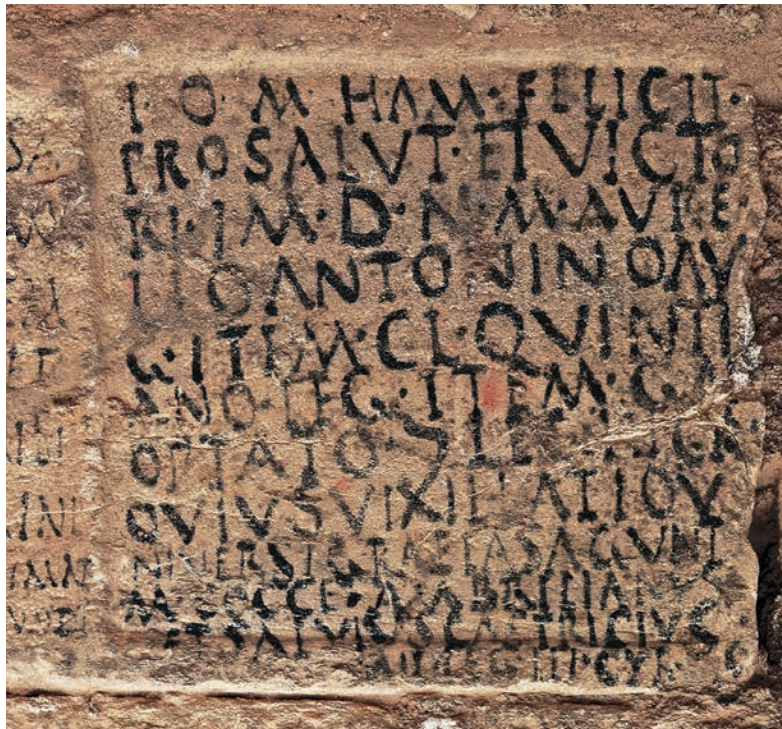


Fig. 3. Painted Latin inscription 35004_i09 reused in the foundations of the South-east gate. Dedication to Jupiter Hammon by two soldiers of legio III Cyrenaica (between AD 169 and 177?).

The Arabic inscriptions from the Jabal Ithlib were recorded in 2018 by Maher al-Mûsa. He identified and copied almost a hundred texts, and it is hoped that he will be able to produce a catalogue with reading, commentary and photograph(s). Several texts are dated to the first two centuries of the Hijra.

Laïla Nehmé took the opportunity of the 2018 study season to check all the Nabataean inscriptions associated with religious monuments, in the Jabal Ithlib and elsewhere, in view of their publication in the medium term.

Also in 2018, Laïla Nehmé and Marie Peillet took in charge the removal of all the petrous bones (*pars petrosa*) from the human remains put to light during the excavations of the tombs made between 2008 and 2015. This was done following a request by Olivia Munoz (funerary anthropologist, CNRS) in the framework of the project 'Paleogenetics from Arabia' led by the American geneticist David Reich at Harvard university. Forty-one petrous bones were sent to Harvard in the fall of 2018. Unfortunately, no ancient DNA was found in the first ten bones tested.

3. See now Z.T. Fiema, F. Villeneuve, and T. Bauzou. "New Latin and Greek Inscriptions from Ancient Hegra", *Zeitschrift für Papyrologie und Epigraphik* 214, 2020: 179–202.

4. The latter mainly as a guide.

5. To the graffiti recorded in 2018 should now be added the ones Pierre-Louis Gatier recorded in early 2020, two of which come from the excavations of the Roman phase of the Nabataean temple in and around IGN 132, while the others were carved either on cliffs within the site of Madā'in Šāliḥ or at Mabrak an-Nāqah, a high cliff 16 km further to the north-west. All this material—Greek and Latin graffiti related or not to auxiliary troops, and inscriptions from the excavations—will be published by Pierre-Louis Gatier in two articles, one of which will be devoted to the material from Mabrak an-Nāqah, which seems to be much later than all the other texts.

Finally, in the framework of the project of facial restitution of a Nabataean family, launched by RCU in 2019, Nathalie Delhopital, the project's anthropologist, took the opportunity of her presence in Madā'in Šāliḥ to select three skulls among those which have been put to light during the excavations of the Nabataean tombs by the team: one male, one female and one immature (under 19 years old). The restitution of the female, a woman aged about 50, is under process and the first results are quite astonishing.

Following the 2018 study season, the excavations resumed in 2019, only in the residential area within the ancient rampart of the city. One can indeed consider that most of the work on the tombs is now done, unless one finds in the future new unlooted ones. The team focused therefore on two monuments, the Roman fort (Area 34) and the Nabataean sanctuary (IGN 132, Area 6), for both of which see the reports in this volume.

2019 was also the first season of the Al-'Ulā-Medina survey, with the aim to determine the ancient itinerary between the two. The survey first concentrated on the road as described by Drs Abdallah an-Nasif, Ali al-Ghabban (2011), and A. De Maigret (1997), along Wadi al-Jizl and Wadi al-Ḥamd. It then visited the site of Šuwaydirah, east–north-east of Medina. The inscriptions from this site have



Fig. 4. Nabataean inscription from Šuwaydirah published by S. al-Rashid in 2009 (“May Damasī son of Hani’at the governor be safe”).

been published by Saad al-Rashid in 2009. Among them is a Nabataean inscription mentioning a *strategos*, i.e. a ‘governor’ (fig. 4). A second Nabataean inscription mentioning a governor, previously unpublished, was discovered in 2019 alongside other new Nabataean inscriptions. On the last day of the survey, the team moved to another road, east of the Hijâz railway and going east–south-east from Madā'in Šāliḥ. Finding an ancient road in a landscape which is not suitable for carving inscriptions is not an easy task, and the results have so far

been disappointing. The survey resumed in 2020 and will be presented in the 2020 report.

The excavation reports are presented first, and are followed by studies on the material.

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The Roman Fort in Hegra. Summary of the First Four Seasons of Fieldwork, 2015–2019

Zbigniew T. FIEMA (University of Helsinki)

The Saudi-French Mission which, since 2008, investigates the Nabataean-Roman town of Hegra (modern Madā'in Šāliḥ), provided significant information on the nature of the Roman military presence there. This information includes epigraphic data collected at the so-called south-east gate, in Area 35, and the archaeological data retrieved through the excavations of a Roman fort in Area 34 (Fiema and Villeneuve 2018). During the four seasons (2015, 2016, 2017, and 2019), the excavations at the site of the fort were carried out in five large trenches (A–E) and the entire interior of the fort was subjected to surface clearance and material collection. The following text provides a convenient summary of the data recovered during the fieldwork.

Short description and finds

The landscape of the archaeological site at Madā'in Šāliḥ is generally featureless but two hills, A and B, at the southern limits of the site, are significant landmarks. The Roman fort is located directly west of Hill B. On the top of that hill there was once a large citadel but its use as a quarry in the 20th century has obliterated any meaningful remains (**fig. 1**). The fort, located on the stony plateau extending westward from Hill B, is ca. 85 m (E-W) and over 65 m (N-S) and is limited by three perimeter walls and the slope of the hill (**fig. 2**).

The complex is a quadrangle consisting of the perimeter walls and series of rooms surrounding an irregular central courtyard (**fig. 3**). The bedrock rises everywhere to the central point in the fort where poorly preserved remains (including some column drums) have been found. The best preserved structural element of the fort is the southern perimeter wall, ca. 65 m long and running the WNW-ESE course, which joins on the eastern end with remains of a poorly preserved stone wall, ca. 18 m long. That wall runs the ENE-WSW direction and it represents pre-Roman (Nabataean) remains in Area 34 (*infra*). At the western end of the southern perimeter wall there is the SW corner tower integrated in the corner formed by the main southern and western walls. While the plateau ends in the area of that tower, another wall continues beyond the tower and westwards, on the same line as the southern perimeter wall, to the place where yet another square corner tower with projecting sides was excavated.

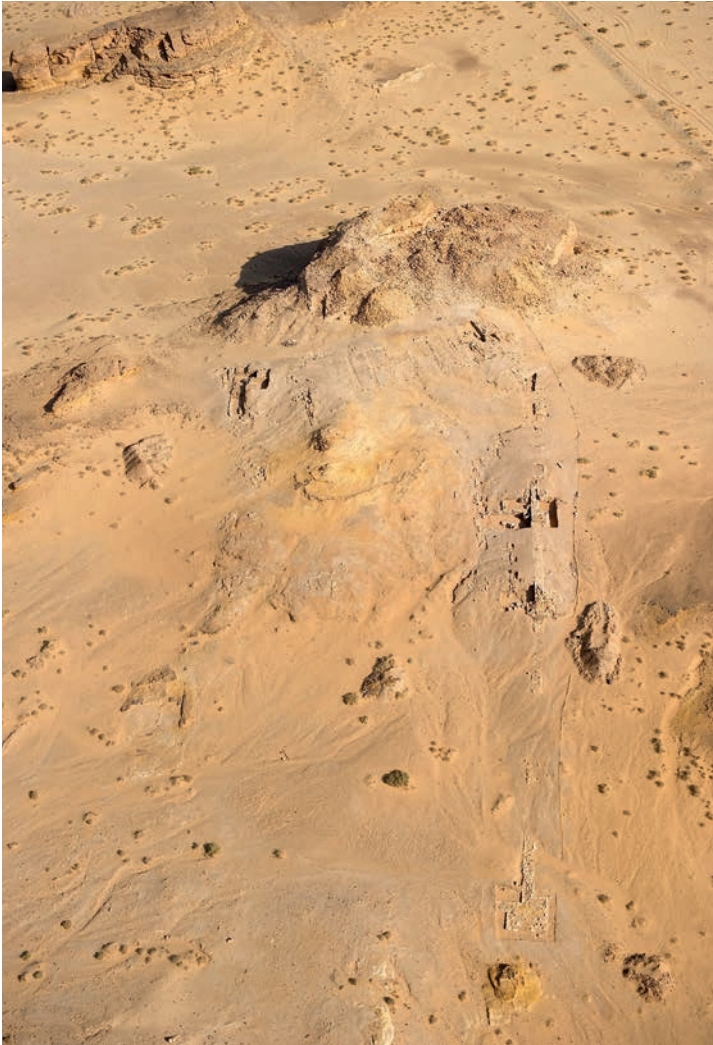


Fig. 1. Area 34. The fort and the citadel in 2018 (by D. Kennedy/APAAME).



Fig. 2. The Roman fort in Madā'in Šāliḥ in 2017 (by FalconViz).

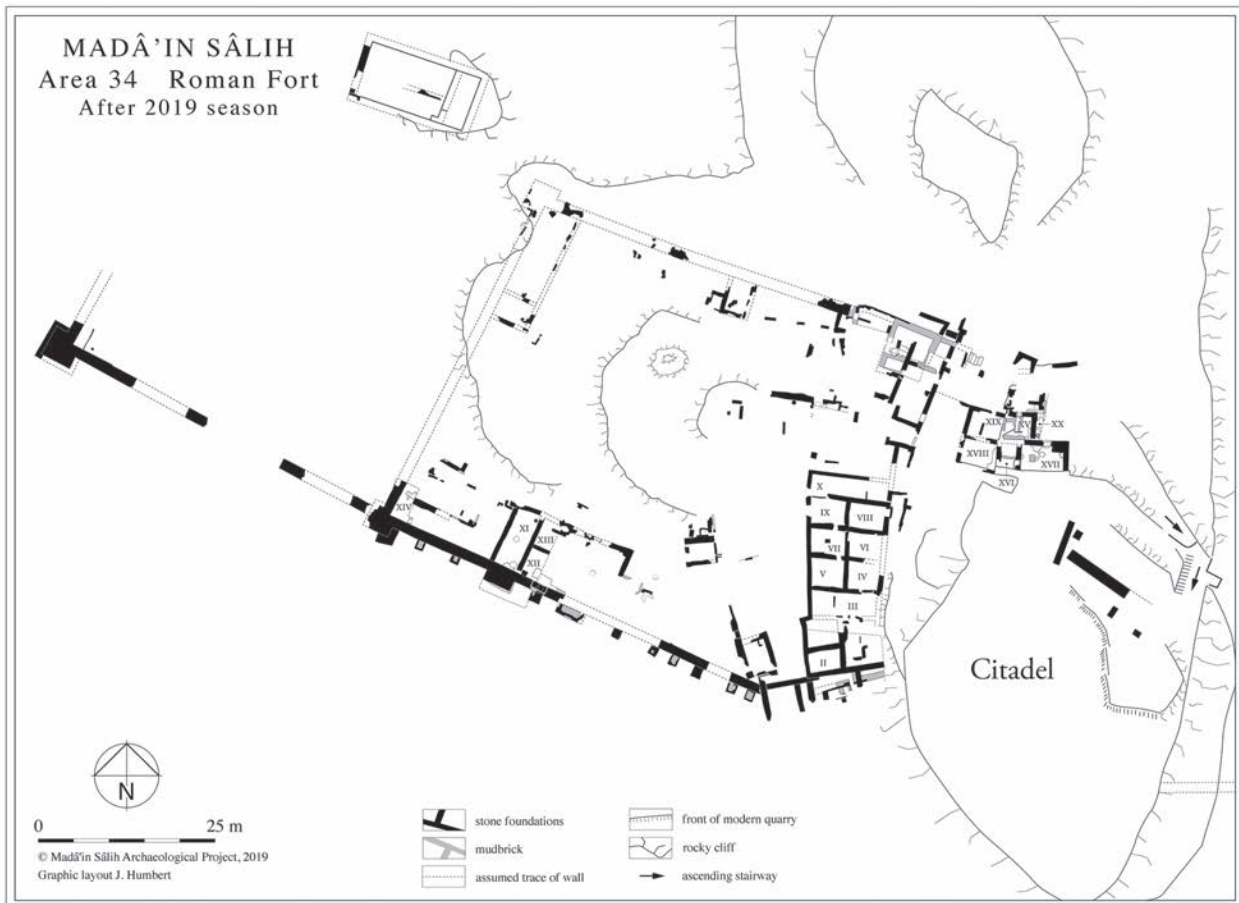


Fig. 3. The plan of the fort in Madā'in Sālih following the 2019 fieldwork season (by J. Humbert).

Ca. 23 m east of the SW tower is a small gate, ca. 2.10 m wide, flanked by two solid, rectangular towers or large buttresses ca. 4.00 x 1.70 m each (**fig. 4**). The foundation deposit of the gate-flanking towers yielded late 1st-early 2nd century–dated sherds. A room (No. XI) adjacent to the gate on the NW side was occupied in the 2nd–3rd centuries, but by the mid-3rd, most of the floor's flagstones were removed, the gate was blocked by inserting two stone basins and the stacks of flagstones, and a small buttress was built outside, in front of the blocking. This buttress is one of nine small buttresses, roughly square, varying from ca. 1.30 x to ca. 1.60 m, which must be later in date than the southern perimeter wall (see fig. 2 and 3).

Some internal walls, perpendicular to the perimeter walls, imply the presence of rooms but the interior of the fort is currently relatively empty. The exception is the eastern part, located at the foot of Hill B, where a wing of rooms has been found. (see fig. 2 and 3). Apparently, the walls of these rooms followed the contours of the terrain there as well as the orientation of pre-existent structures incorporated into the Roman fort. The wing features units which are two-room deep (Rooms III–X), 3.6 m wide and 5 m deep, resembling *contubernia* in Roman forts.

The excavations provided very large quantities of ceramics, mostly of the 1st BC/AD–3rd centuries date but 4th century types were also present. Imported material included Kapitän II amphoras, Eastern *terra sigillata* and African Red Slip ware. More than 150 coins, including Nabataean, Roman and probably local (the so-called "Athena/owl" type) were found. Numerous bronze objects included fragmentary hooks, binders, plates, metal straps/bands, buckle rings and faste-

ners, and strap-junctions and terminals, many presumably parts of specialized military horse harness. For example, of interest is the openwork baldric fastener of sword belt (fig. 5), which finds good 2nd–3rd century parallels from Dura Europos (James 2004: 52, 62, 74–75, nos 18–20). Several bronze plates feature series of punched holes, perhaps scales of *lorica squamata* but since none have patterned holes for vertical and horizontal stitching, these might be local repairs,



Fig. 4. The southern gate and the flanking towers (by Z.T. Fiema).



Fig. 5. The openwork baldric fastener of sword belt (Madā'in Šāliḥ Archaeological Project).

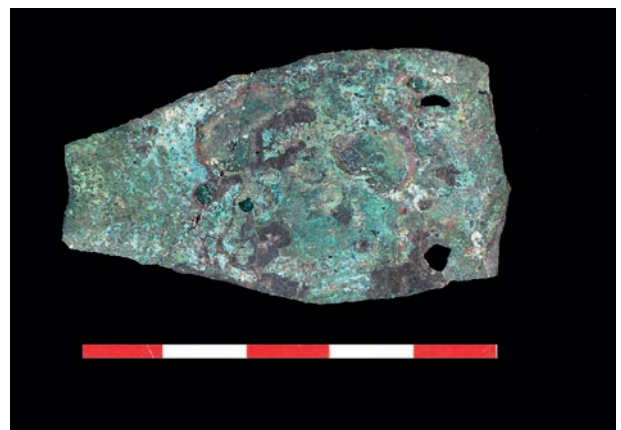


Fig. 6. Possible bronze armor scale (Madā'in Šāliḥ Archaeological Project).



Fig. 7. Bronze objects from Room XI (Madā'in Šāliḥ Archaeological Project).

replacements, or segments of horse armor (fig. 6). Other bronze objects include a female head which is part of a vessel's handle, a Roman fibula, an oversized finger of a statue, a hind leg of a bull statuette and a small figurine of the Egyptian deity Bes. Iron objects were rare but included an axe or pickaxe of type often found in Roman contexts. Of interest was the deposit of bronze figurines found under the overturned bottom of a basin in Room XI, which included a figurine of domestic male goat, a tree-trunk-shaped lamp-stand, a male figurine of Satyr emerging from a flower, and a figurine probably representing the Greek-Egyptian deity Harpocrates (fig. 7). The dating of this deposit—end of the 3rd/early 4th c.—may imply a ritual burial of artifacts either at the end of the military use of the fort or at the beginning of the subsequent civilian re-occupation of the space. Additionally, the excavations provided one inscription written in Ancient South Arabian script and one written in Ancient North Arabian script (see the 2017 report, <https://hal.archives-ouvertes.fr/hal-01804965>). A Latin inscription, also found in the fort and dated to AD 213–217, mentions an imperial freedman (Fiema, Villeneuve and Bauzou 2020).

The area of the fort also provided large number of broken basalt millstones, including large Pompeian-type hourglass mills (both *catilli* and *metae*) as well as smaller querns and rotary hand-mills. Finally, the archaeozoological evidence indicates that the nature of habitation in the fort is clearly different from that attested in other excavated areas in Madā'in Šāliḥ. Consumed species included large mammals—cattle, camel, donkey, horse. Sheep and goat, while more common elsewhere in Hegra, were also present although represented by adults only and with no extremities preserved. These aspects reflect a overall policy of wholesale purchase, butchering and redistribution, just like in the context governed by a military commissariat.



Fig. 8. The NW sector of the fort. The tower in Trench D, the northern gate, the passage, and the rooms excavated on the northern slope of Hill B (by Z.T. Fiema).

The 2019 fieldwork Season

The 2019 fieldwork season yielded very large quantities of material, including pottery and coins, which will require further studies. Therefore, full report will be provided at a later date. Here, only a short summary of results is presented. The work concentrated on the northern slope of Hill B, which continues northwards as a stony spur. This sector, which topographically may appear somewhat external to the fort, was definitely a part of it from the functional standpoint. The uncovered spaces included a large, well constructed room (No. XVII) which abuts the cliff of Hill B, and other rooms located further north and west of Room XVII (**fig. 8**, see **fig. 3**). Large quantities of ceramics, some of which probably originated from the citadel, were found there. The finds also included two water pipes, two large rectangular *suspensura* tiles as well as few square *pilae* used in hypocaust system. Quantities of ash found in this sector imply the existence of some kind of heating installation. To the NW of Room XVII, remains of what appears to be a “post-bath” phase of a small heated room (No. XV) were uncovered (**fig. 9**). The *prae-furnium* is well preserved, and the clear depressions in the bedrock indicate the bottom of heated air ducts but all other elements had been removed already in antiquity. What currently remains is a long ceramic pipe which provided water/air (?) to the center of the room, apparently no longer related to the original function of the room (**fig. 10**).



Fig. 9. ROOM XV, the heated room (by Z.T. Fiema).



Fig. 10. The disassembled ceramic pipe from Room XV (by Z.T. Fiema).



Fig. 11. *The remains of the northern gate of the fort (by Z.T. Fiema).*

Directly west of the complex of rooms on the northern slope of Hill B, there is a long and narrow area, flanked by N-S walls (see fig. 3 and 8). It was long suspected that there was a way leading from the fort into the town of Hegra. During the 2019 season, remains of a broad gate have been uncovered. Large slabs there represent the pavement of the passageway, surrounded by the remains of the gate's structure (**fig. 11**). The gate was flanked on the western side by a massive tower-like structure. Apparently, the ground there rapidly slopes northwards and the construction of the tower flanking the gate required the presence of a massive levelling substructure made of mudbrick walls with spaces in-between filled in.

Phases of occupation

By the 1st century AD, the Nabataean town of Hegra was surrounded by the mudbrick-built rampart (Villeneuve 2014). The circuit was continuous, including Area 34 where a stone wall was built on the steep western slope of Hill B. The lowermost deposits in Room I, which is adjacent to the Nabataean stone wall, yielded 1st century AD ceramics and a double burial (male and female). That Nabataean stone wall could have continued westwards in the form of a mudbrick-built rampart but if so, it would have been completely demolished by the Romans when the fort was constructed. Generally, the nature of the Nabataean-period occupation in Area 34, while attested, is not clear but it is highly probable that the top of Hill B was already utilized then as a citadel.

During the early period, following the annexation of the Nabataean Kingdom by Trajan in AD 106, major cities, such as Bostra, Gerasa, Gadara and Philadelphia were garrisoned by the army units (e.g., Freeman 1996: 101, 105–107). Some urban garrisons might have utilized civilian billeting but in the Nabataean settlement of Hawara/Hauarra (Humayma in southern Jordan), a fort was constructed in the early 2nd century (Oleson 2009). Probably soon after the annexation the army base was also established in Hegra. The presence of Roman army units or their personnel, including *legio III Cyrenaica*—the main military unit in Roman Arabia, *ala I Ulpia drome(dariorum) Palmyr(enorum) (milliaria)* and *ala Gaetulorum veterana* is attested by several inscriptions and graffiti found in the environs of the town (Speidel 1977: 703–706; al-Talhi and al-Daire 2005; Gatier 2018). Area 34, including the citadel on top of Hill B, occupies a superb tactical location with all-round visibility and offers an excellent vantage observation point, particularly suitable for monitoring the town. Such dominance of Area 34 must have been easily recognized by the Roman occupation forces tasked with overseeing of activities in the conquered town and defending it from a potential external foe. The use of the modular system based on Roman feet, well attested in Humayma (Oleson 2017), is also evidenced in Hegra, clearly implying the planning by Roman engineers. Admittedly, and as opposed to the traditional layout of Roman forts, the eastern part of the fort at Hegra was irregular because the integration with Hill B offered definite tactical advantage, and thus the incorporation of the Nabataean stone wall and its adjacent structures was inevitable. The central and western parts of the plateau allowed the imposition of a more regular quadrangular plan, featuring all three perimeter walls and corner towers (see fig. 2 and 3).

The fort in Area 34 should be dated to the early–mid-2nd century and thus it is probably one of the earliest military structures in Roman Arabia. The fort at Humayma provides the closest temporal and the meaningful structural parallels for the Hegra fort, especially with regard to the corner and curtain towers and the squared-off angles. In addition to the gates, flanking and corner towers, the earliest phase of the Hegra fort presumably also included inner structures, such as the presumed small bathhouse, and the eastern barracks. While other barracks or service rooms might have been built against the inner faces of the perimeter walls. Good parallels exist for barracks built against fort’s circuit wall in smaller fortifications located in Africa and the East in the 2nd–3rd centuries (see Fiema and Villeneuve 2018: 710) as well as in Roman *praesidia* of the Eastern desert of Egypt, dated to the later 1st–3rd century (see Reddé 2006: 244–247 for presentation).

Sometime in the later 2nd century AD, the Nabataean wall was substantially reinforced by the addition of the casemate space, the mudbrick wall with the stone revetment, the cross-walls, and the “*glacis*”. That activity reflects perhaps the information from the Latin inscription of AD 175–177 found in Hegra (al-Talhi and al-Daire 2005) which implies the restoration of an “old wall” with the technical assistance of Roman officers. Whether or not in response to a potential threat, this reinforcement was probably a practical measure applied to a relatively weak and “ageing” Nabataean wall. It also might have been an element in a major overall bolstering of Hegra’s fortifications in the later 2nd century. For example, the towers along the town circuit are later in date than the Nabataean mudbrick rampart. Since the distance between the towers is ca. 35 m, undoubtedly 120 p.M. was intended, equalling one *actus*, a standard module in use by Roman engineers.

These defences were apparently meant as a formidable deterrent and to strengthen the Roman prestige in the region. Yet, sometime by the mid-3rd century, the southern gate of the fort was blocked and nine small buttresses were built against the curtain wall. A massive robbing out of convenient reinforcement material (mainly large flagstones) from everywhere at the site indicates somewhat desperate measures in response to some kind of potential threat. The later 3rd century occupation was probably still military. But the abandonment of the fort in Hegra must have happened by the end of that century. Subsequently, the fort seems to have been reoccupied by civilian population of Hegra, and that occupation might have continued throughout the 4th century.

Function and Significance

With the dominant location of Area 34 in Hegra and the towering citadel which, according to the ceramics, must have been occupied throughout the Roman period, it is reasonable to assume that the complex consisting of the citadel and the adjacent fort functioned as the headquarters of all Roman military units in the area. Evidently, the fort in Hegra is too small (only a little over half a hectare in size) to accommodate any army unit larger than infantry *centuria* or cavalry *turma*. Thus, the soldiers of the two cavalry *alae*, who left inscriptions in the environs of Hegra were either billeted in the town or elsewhere in the environs of Hegra.

Further information on the function of the fort in Hegra is provided through the corpus of 14 Latin and Greek inscriptions found in Area 35 and mainly reused in the structure of the south-east gate of Hegra located there (Villeneuve 2014; Fiema, Villeneuve, and Bauzou, forthcoming). Five from among seven Latin inscriptions mention personnel from *legio III Cyrenaica* and two other mention soldiers who were probably legionaries. Additionally, one inscription mentions a *vexillatio* of the same legion. The dedicants, usually in pairs, often describe themselves as *stationarii (ad portam)*. Generally, *stationarii* were soldiers detached for this duty from their parental units, who monitored travellers' traffic, maintained road security and occasionally served as law enforcers in cities. They were also charged with verifying travel documents either at city gates or during the road patrols (see Petraccia 2001; and contributions in France and Nelis Clément 2014). Thanksgiving testimonies of *stationarii* at Hegra indicate satisfaction with a mission accomplished or return from a difficult patrol. One can infer from the presence of *stationarii* in Hegra that the town was a *statio* i.e., a road stop related to the imperial postal and transport system. But *statio* may also refer to urban army barracks with soldiers specifically charged with the protection of the population from any criminal activity (Petraccia 2015). At any rate, the fort in Hegra would make an excellent base for small detachments of *stationarii* posted at the nearby gate of the town.

The function of the fort in Hegra must also relate to the history of Hegra in the 2nd–4th centuries since it is reasonable to assume that the actual limit of Roman Arabia, i.e., the furthest extent of direct Roman administration ends just south of Hegra. It has been argued that the political-military and economic hegemony of Rome over the Red Sea region during the 1st and the 2nd centuries was effective through the network of dependent kings and allies on both sides of the Red Sea, the activities of the Roman fleet, and the presence of military outposts in strategic locations (for discussion, see e.g., Speidel 2007). Some Hijâz oases within Roman Arabia, such as al-Bad', Hegra and Dûmat al-Jandal would have been such bases of direct Roman military control.

Material culture remains recovered in Madā'in Šāliḥ imply stronger links with the Mediterranean than with South Arabia. Yet, besides the fort, the architectural remains of the Roman period are relatively modest (for discussion, see Villeneuve 2011). A revival of the Roman interest in the region dates to the Antonine period, exemplified by the Roman remains and inscriptions from the Farasan Islands (Villeneuve, Phillips, Facey 2004). As far as the currently available evidence indicates, which, however, may be selective and accidental, a revival was also briefly felt in Hegra between the reign of Marcus Aurelius and Caracalla, where the inscriptions imply various activities of Roman army personnel and archaeological record indicates the strengthening of the fort's defences. Yet the evidence related to the 3rd century indicates some unknown emergency marked by hastily undertaken further reinforcement of the fort. The military occupation of the fort is not attested beyond the end of the 3rd century. This may well correspond with the lack of historical information confirming the presence of Roman garrisons in NW Hijāz after the 3rd century (Fiema and Nehmé 2015). Nevertheless, the fort and the epigraphic material firmly establish the important position of Hegra in the Roman military history.

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Excavation of the Sanctuary IGN 132, 2019

Damien GAZAGNE (EVEHA) and Maha AL-JUHANY (King Saud University)

Recent excavations (in 2016 and 2017) around the sanctuary were undertaken under the supervision of Laïla Nehmé and Damien Gazagne. The results of these two seasons enabled us to uncover a large part of the temenos wall and thus determine the total area of the sanctuary. At the same time, several trenches were opened in order to define an initial chrono-stratigraphic sequence of the cultic structure. The 2019 excavation season is a continuation of this extensive fieldwork. The project had three objectives:

1/ **Excavation of the temenos wall:** extensive surface scraping of the temenos wall having been completed, more detailed cleaning and scraping needed to be done in areas where the outline of the wall is uncertain. At least two problematic locations were identified: first, in the north-west, where the temenos wall adjoins rock IGN 132; second, in the south, where the central part of the wall, probably of mud brick, has yet to be uncovered.

2/ **Excavation on the north-west gate:** trench no. 7 was extended northwards in order to uncover the complete entrance system. A NNW–SSE stratigraphic section was opened in the gate in order to complete the chrono-stratigraphic sequence.

3/ **Excavation on the lower terrace of the sanctuary:** as the perimeter of the sanctuary is now known, extensive excavations must be undertaken in order to understand the architecture and the internal layout of the lower terrace. As it is occupied by two levels of mud-brick construction, it was decided to implement a 5 m-grid intercut with baulks, with the aim of establishing a general chrono-stratigraphic sequence of the lower terrace.

In order to reach these objectives, the area north-west of rock IGN 132 was cleaned (objective 1) and excavation of the north-west gate was undertaken (objective 2). Furthermore, two individual trenches were opened in the rooms surrounding the temenos wall and two large trenches were opened on the eastern end of the lower terrace (objective 3) (**fig. 1**).

1. Surface scraping

1.1. Course of the temenos wall

Cleaning of the area situated north-west of rock IGN 132 has uncovered faint traces of the temenos wall (*locus* 60882, **fig. 2**). Its course to the east is indicated by a ditch that surrounds the base of the sandstone plinth (**fig. 3A**). Part of this ditch is natural. The wall joins up with the north-western end of rock IGN 132 (**fig. 3B**). The niche with the two betyls IGN 132c would thus

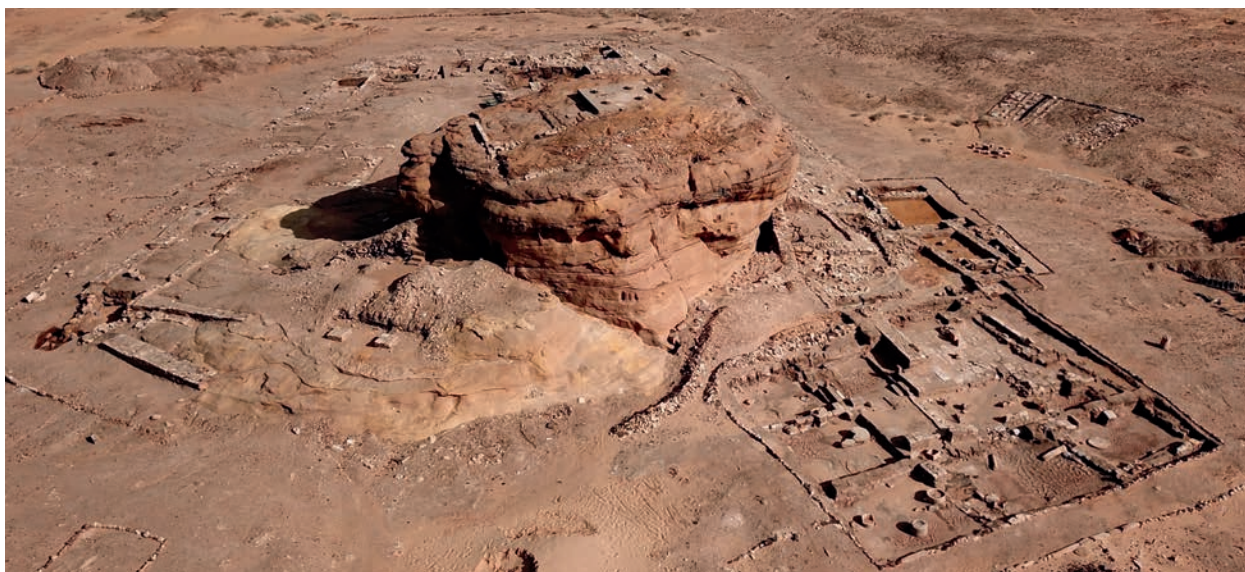


Fig. 1. General view of the sanctuary from the north-west (J. Bervillié, 2019).

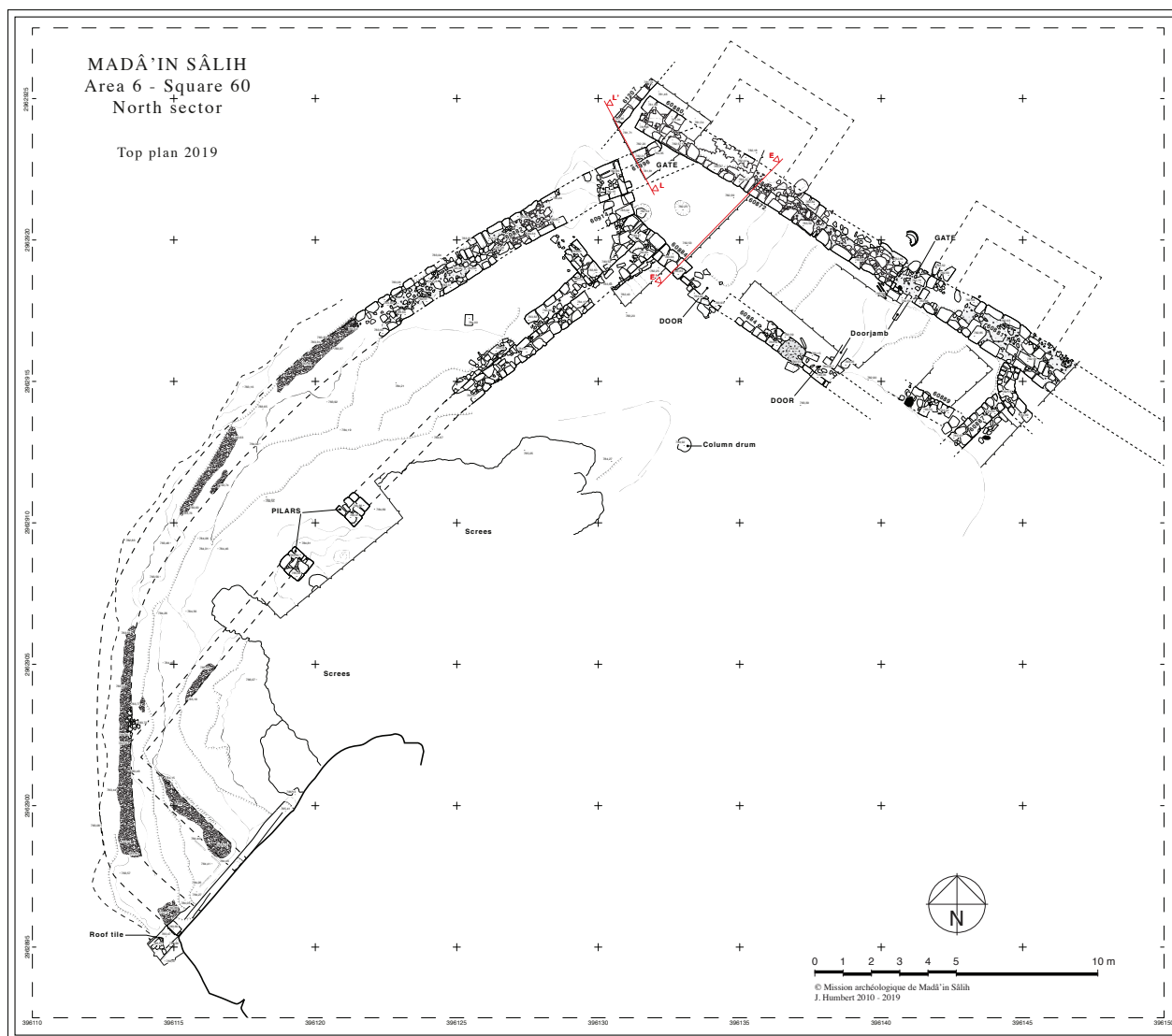


Fig. 2. Plan of the area located north-west of rock IGN 132.

have been situated inside the sacred space, which is to be expected. Excavation of the natural fissure located at the foot of IGN 132 has uncovered a block *in situ* belonging to the outer face of wall 60882 (**fig. 3C–3D**). Wall 60882 stops at the foot of rock IGN 132, the rest of the wall being completed by the rock itself.

1.2. *New walls situated north-east of IGN 132: the entrance to the sanctuary?*

In the area north-east of rock IGN 132, three new walls were surface scraped (**fig. 4**), allowing a better understanding of the architecture of the area: walls 61044 and 61990 form a corridor enabling circulation between the temenos wall and the centre of the lower terrace (**fig. 5A**). Within this corridor, the discovery of a fallen lintel indicates the presence of a doorway. To the south, the corridor opens onto the north-east abutment of rock IGN 132. The yellow sandstone rock on the slope is bare, although it still bears the marks of a heavily worn track, 2 m wide and 10 cm deep (**fig. 5B–5C**). This groove in the sandstone was probably caused by the constant trampling of pilgrims to reach the earthen access ramp leading to the top of IGN 132. Wall 61992, which blocks the access to rock IGN 132, was built after this system of circulation. Built and orientated differently from pre-existing constructions (walls 61044, 61990, and 61991), it might indicate the late division of the sanctuary into two distinct sections.¹ Excluding the late wall 61992, the features uncovered in this area form part of a system of access to the top of IGN 132 (**fig. 5D**). It can be assumed that it is linked to the entrance to the sanctuary, which would have been located in the centre of the northern temenos wall.

2. The north-west gate

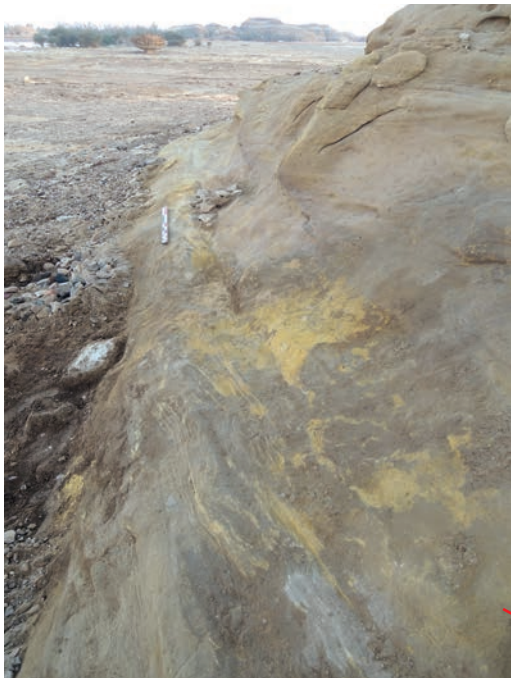
Trench no. 7 was slightly extended north-west (2.5 x 3 m) in order to reveal the gate in its entirety (**fig. 6**). The depth of the preserved levels (0.7 m) is not very substantial (**fig. 7–8A**).

The temenos wall 60880 covers almost the whole surface of the trench. Oriented NNW–SSE, it measures 1.2 m, only one course of which is preserved (**fig. 8C**). During excavation in 2017, it was dated to the Nabataean period (first century AD). It is associated with level 61206 and possibly 61205 (?). These two levels, which lie over the yellow-coloured sandstone substrate, contain a large amount of stone flakes. These can be interpreted as coming from the level of contemporaneous construction works for the building of wall 60880.

Wall 60880 is then cut at its northern end by wall 61207 (**fig. 8D**). At right angles to the temenos wall 60880, it is oriented NNE–SSW and was partly uncovered. Its foundation trench (61211), visible in the north-east section, is 0.8 m wide (**fig. 8F**). It is not known to what architectural state it is attached or what its course is.

Installation of the gate in the north-west corner of the sanctuary was made by razing wall 60880 along 1.2 m in order to open a passage into the sanctuary. It can be assumed that wall 61207 was razed at a time contemporaneous with this phase, although this would need to be confirmed by further excavation (**fig. 8E**). This stage is characterized by recovery trench 61208 which runs through levels 61201 and 61200. Trench 61208 contains stone flakes which are characteristic of salvage activity.

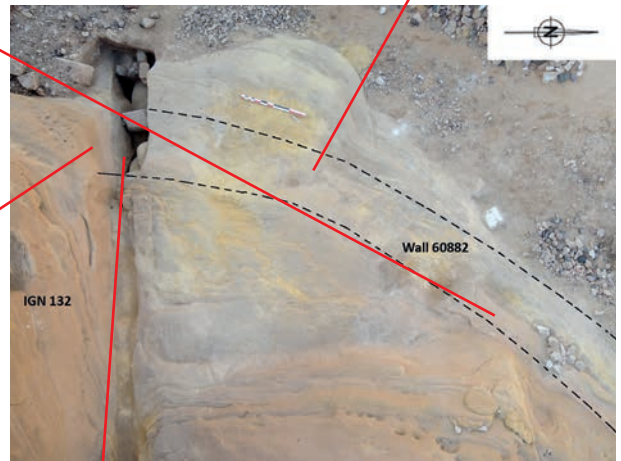
1. See below.



A. Course of wall 60882, view from the south.



B. Join of wall 60882 with rock IGN 132, view from the north.



E. Photograph showing the location of 3A to 3D.



C. Block of wall 60882 in situ, view from the west.



D. Wall 60882: detail of the block in situ, view from the west.

Fig. 3. Traces of the join of wall 60882 with rock IGN 132.

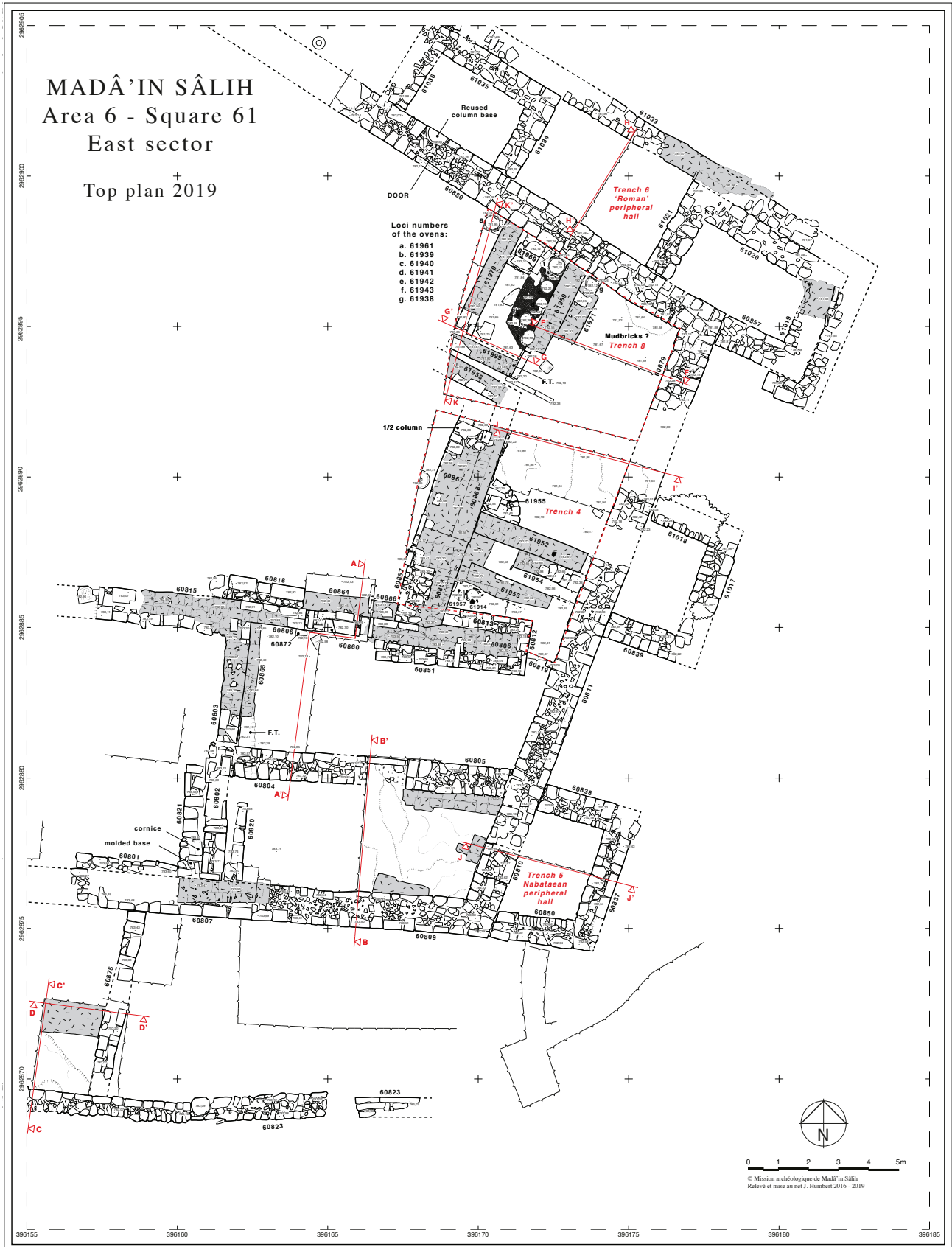


Fig. 4. Plan of the area east of IGN 132.



A. Walls 61044, 61990, 61991, and 61992.



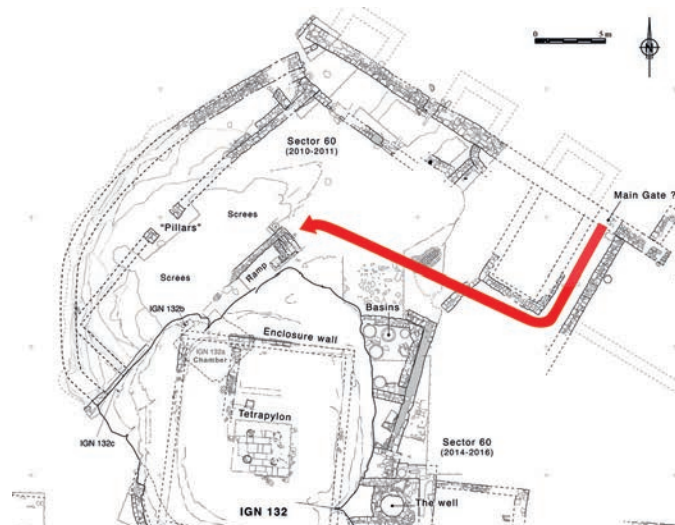
B. North-eastern slope of IGN 132: bird's-eye view of the access ramp. View from the east.



C. North-eastern slope of IGN 132: oblique view of the access ramp. View from the east.



E. Aerial view of the western part of the sanctuary (J. Bervillié, 2019).



D. Main entrance to the sanctuary and access ramp to IGN 132.

Fig. 5. Views of the area north-east of IGN 132.

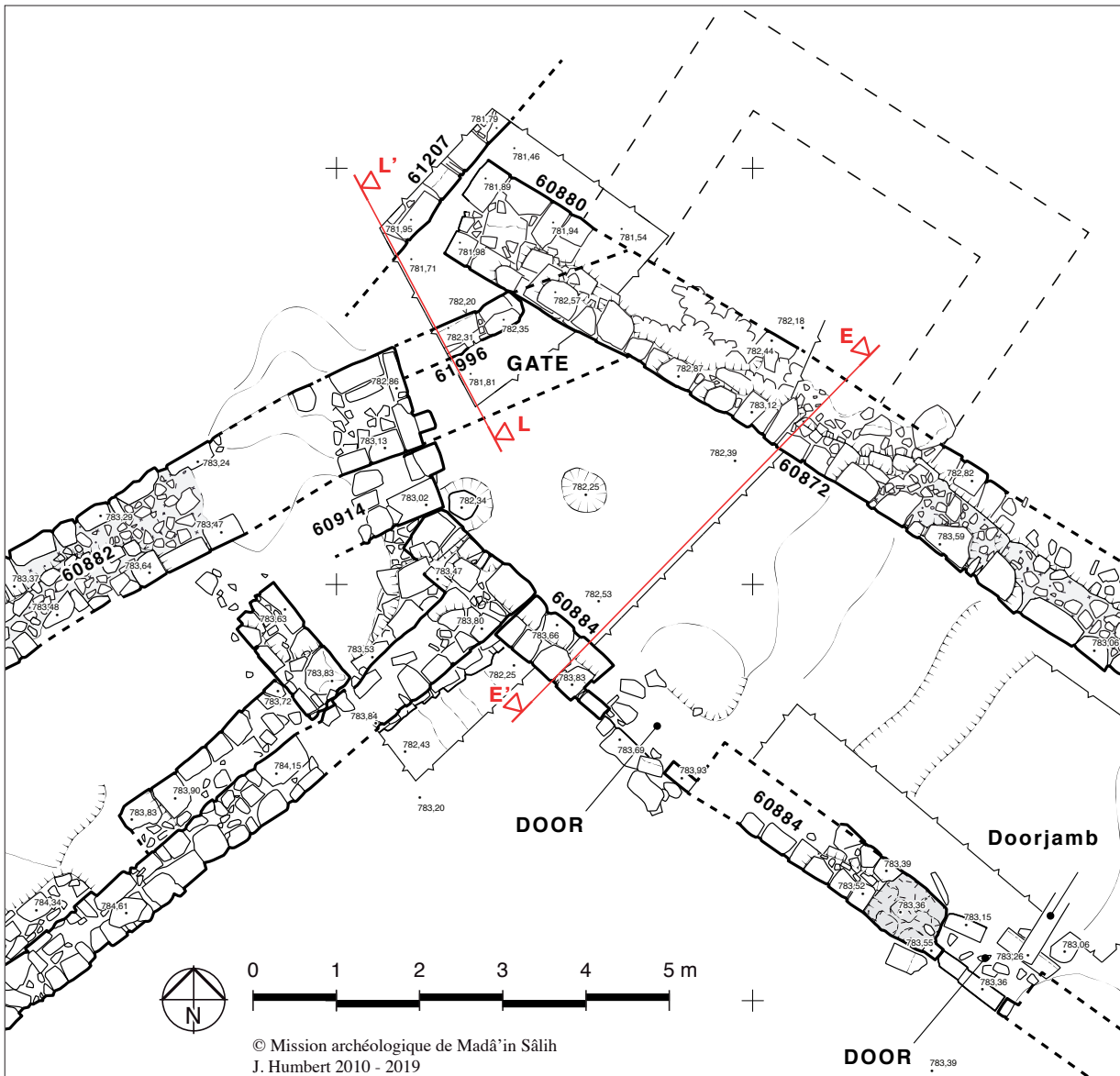


Fig. 6. Plan of trench no. 7, north of the sanctuary.

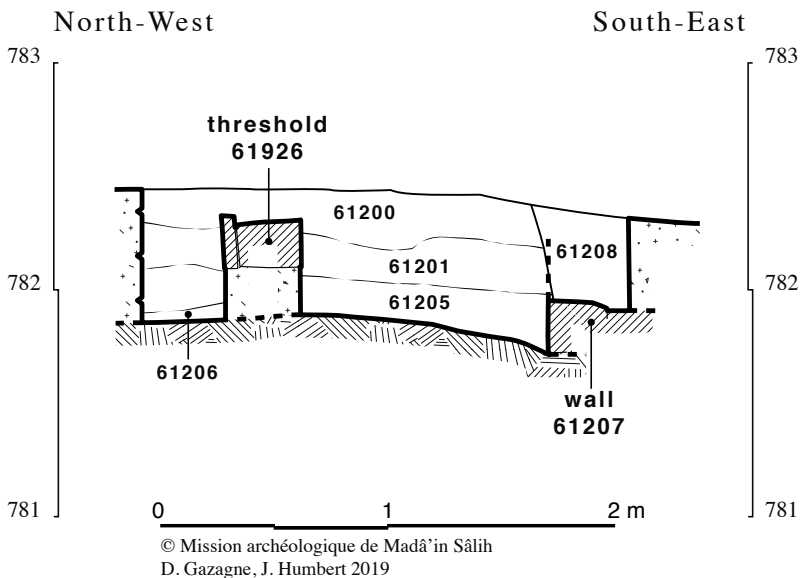


Fig. 7. Stratigraphic section L-L' of trench 7.



A. Aerial view of the north-west gate (J. Bervillié, 2019).



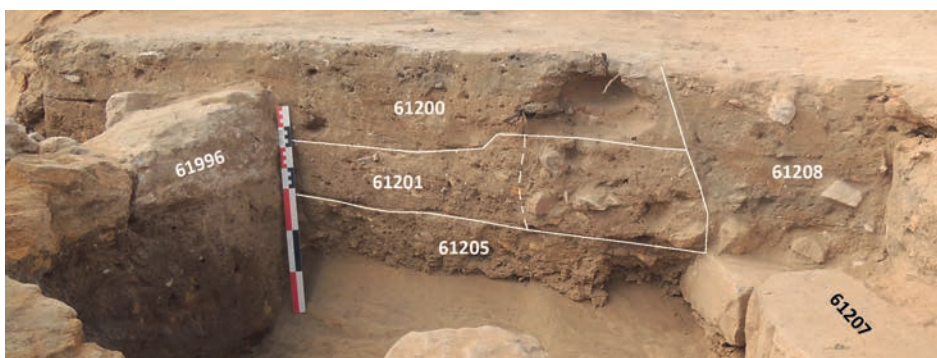
B. Circulation level associated with the door.



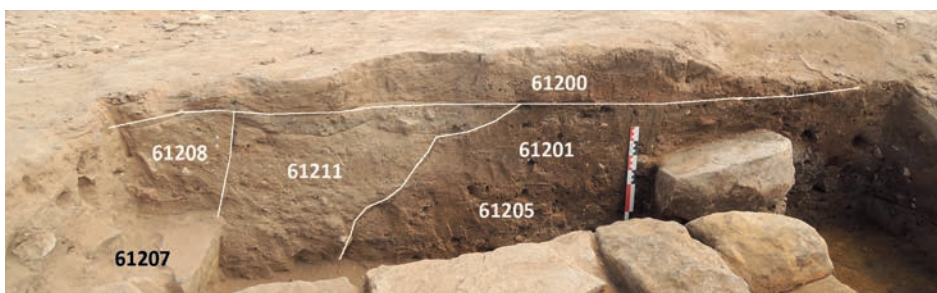
C. Temenos wall 60880 and threshold 61996. View from the west.



D. Temenos wall 60880, wall 61207 and threshold 61996. View from the south.



E. Southern section of trench 7.



F. Northern section of trench 7.

Fig. 8. Views of trench 7.

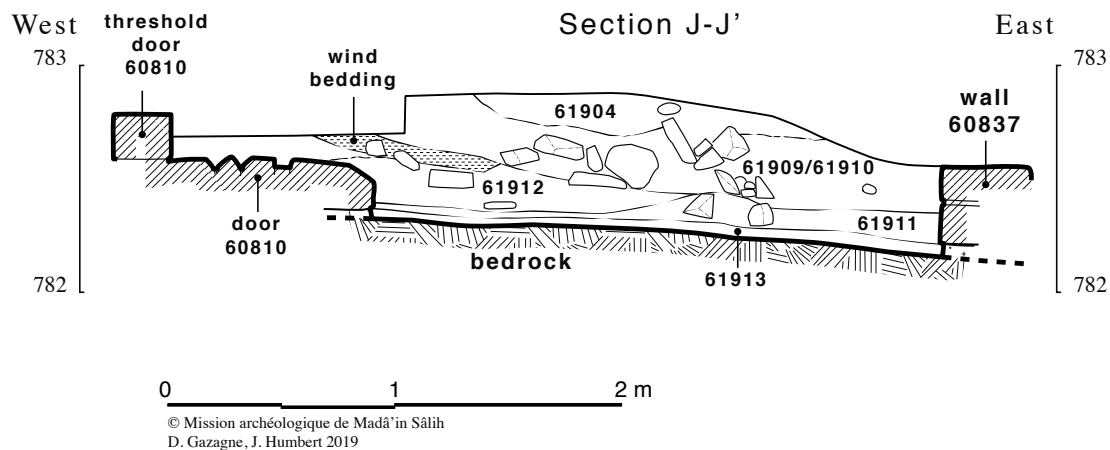


Fig. 9. Trench no. 5: stratigraphic section of the Nabatean peripheral hall (section J-J', see fig. 4).

The gate itself only exists in the form of threshold 61996, which functions with floor or circulation level 61201, itself possibly of an earlier date than the threshold (**fig. 8B**).² From the point of view of height, the razing of walls 60880 and 61207 coincided with the functional level of gate 61996 and with circulation level 61207. The remains linked to the restoration of the gate, excavated in 2017, were swept away by torrential rains. This second state involved raising the threshold and narrowing the width of the gate. The stones belonging to this state were preserved for potential restoration.

3. The eastern end of the lower terrace

3.1. Trench no. 5: the Nabataean peripheral hall

Fifty percent of the peripheral hall, surrounded by walls 60850, 60837, 60838, and 60810, was excavated (2.5 x 2 m) (see fig. 4). A section was opened in the doorway which connects it with the interior of the sanctuary (**fig. 9**). The stratigraphy inside the room is 0.6 m deep (**fig. 10G**). The upper fill consists of a level of abandonment 0.4 m thick (levels 61904, 61909, and 61210). The layers comprise a mixture of sand and clay resulting from disintegrated mud bricks and attest to the lengthy process of the building's gradual ruin. They contain scree 61906 which occupies the south-western half of the room (**fig. 10B**). The scree consists in large part of hewn blocks that come from the collapse of walls 60810 and 60850. Scree 61906 in turn contains levels 61912 and 61911. They are 0.1 to 0.15 m thick and consist of a mixture of sand and clay, light brown in colour. The upper part of 61912 contains fine sandy layers resulting from aeolian deposits. One can conclude that the area was abandoned at that time. It is difficult to interpret levels 61911 and 61912. From the point of view of height, they function with the threshold of the door of wall 61810 (**fig. 9**). It is therefore possible that they are the remains of later floors corresponding to the final function of the building. Lower down is construction level 61913. It forms a layer 5 to

2. ¹⁴C dating of level 61201/61205 should be undertaken in order to date the functional levels that are contemporaneous with the gate.



A. Bird's-eye view of trench 5.



B. Pile of stones in the peripheral hall.



C. Trench 5 at the end of excavation.



D. North facing of wall 60850.



E. Bird's-eye view of wall 60850.



F. Corner of walls 60850 and 60810.



G. Section view of trench 5.

Fig. 10. Trench no. 5: various views of the Nabataean peripheral hall.



Fig. 11. Trench no. 5: fragment of carving found in the corner of the recovery trenches of walls 60837 and 60838.

15 cm thick which rests directly on the yellow sandstone substrate and runs under walls 60810 and 60850 (**fig. 10F**). This is a levelling backfill which was used to fill in the natural irregularities in the rocky plinth and slightly reduce the slope towards the east. It is composed of local sand and gravels. The sherds found in this layer—which could have been brought in with the backfill—are very eroded and very fragmented. This layer actually corresponds to *loci* 61041 and 61025, dated to the first century AD and excavated during the 2017 season (**fig. 10C**). The walls of the room, 60850 and 60838, abut the temenos wall 60810, but the three walls probably belong to the same construction phase. Besides, the room is accessible from inside the sanctuary via a 2 m-wide doorway originally installed in the temenos wall 60810 (**fig. 10A**). Few internal facilities were found inside the room, although one can point to the puzzling presence of small blocks laid at an angle on the third course of the internal face of wall 60850 (**fig. 10D–10E**). Because of the wall's low height, it is difficult to establish whether these blocks represent a construction method or were used to block a niche.

A sculpted block was found in the corner of the recovery trench of walls 60837 and 60838 (**fig. 11**). It is a decoration depicting hairlocks and a cable moulding. It is doubtful that this is a piece reused in 60837/60838, and is more likely to be a later reject from the recovery trench.

3.2. Trench no. 6: the 'Roman' peripheral hall

The peripheral hall consists of walls 61034 and 61021 (see **fig. 4**), which belong to the previous, Nabataean, architectural phase (first century AD). Subsequently, wall 61033 was added on the north side, creating a room measuring 5 x 3.2 m. Although wall 61033 was not cleared in its entirety (it is currently 21 m long), it was noted that it belongs to the sanctuary's second great architectural phase. The latter consists of the addition, on the north and east sides, of a wall parallel to the Nabataean temenos wall in order to double the number of peripheral halls. Excavation of 50% of the room was undertaken (2.5 x 3.2 m). An east–west stratigraphical section was opened (**fig. 12**). The stratigraphy is 0.5 to 0.9 m deep inside the room. It is entirely composed of a homogeneous succession of floor levels of beaten earth associated with small hearths, attesting to a continuous human occupation.

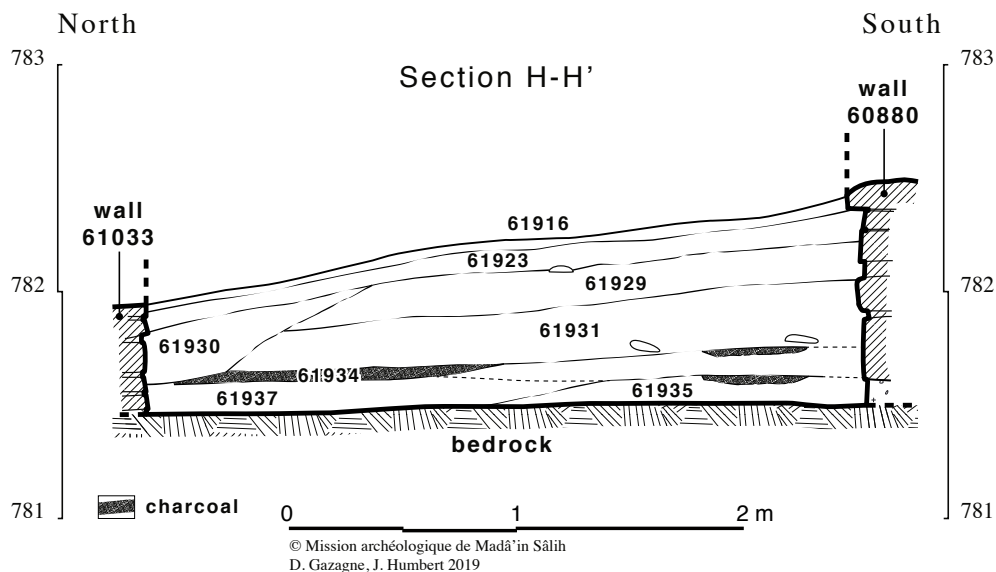


Fig. 12. Trench no. 6: stratigraphic section of the 'Roman' peripheral hall (section H-H', see fig. 4).

The upper fill of the room (contexts 61916 and 61923) is a layer of abandonment and natural silting (fig. 12–13E). It is composed of a sandy matrix sediment, light brown in colour, containing a few flakes of sandstone and limestone. The stratigraphic sequence continued with the digging of 61930 along wall 61033. It is 0.4 m deep and cuts through levels 61929 and 61931 as well as the charcoal layer 61934. It is not very likely to be the foundation trench of wall 61033, as it would be abnormally large (0.9 m) and does not reach the first courses of the wall. A small hearth (61920), found in the south-west corner of the room, attests to a sporadic occupation (fig. 13B). A sample of charcoal was taken for ¹⁴C dating.³

Level 61929 consists of a mixture of sand and silt in a sandy matrix, dark beige in colour. It is 15 cm thick and is associated with a layer of charcoal (level 61926) which is not hearth-shaped. Level 61931 is a 20 cm-thick fill. Beige in colour, it is composed of a compact sediment in a clay matrix. This level contains hearths 61934 and 61212 (fig. 13D–13E). As these are the first traces of occupation of the room, a sample of charcoal was taken in hearth 61934 for ¹⁴C dating.⁴ In the southern half of the trench, level 61935 is a works embankment onto which the temenos wall 60880 was built. In the centre of the room, the embankment tapers off and makes room for level 61937 which abuts wall 61033.

The masonry is coarse: the blocks are laid in irregular courses and a large number have been used for wedging (fig. 14A–14C). There is a reused doorjamb in the southern face of wall 61033, which was built at a later date (fig. 14A) and abuts wall 61034 (fig. 14D). The masonry of 61034 abuts wall 60880 but both these constructions belong to the same phase (fig. 14E).

3. 61920: calibrated date (95.4%), obtained in 2020, AD 332–534.

4. 61934: Calibrated date (95.4%), obtained in 2020, AD 258–425.



A. Aerial view of trench 6 (J. Bervillié, 2019).



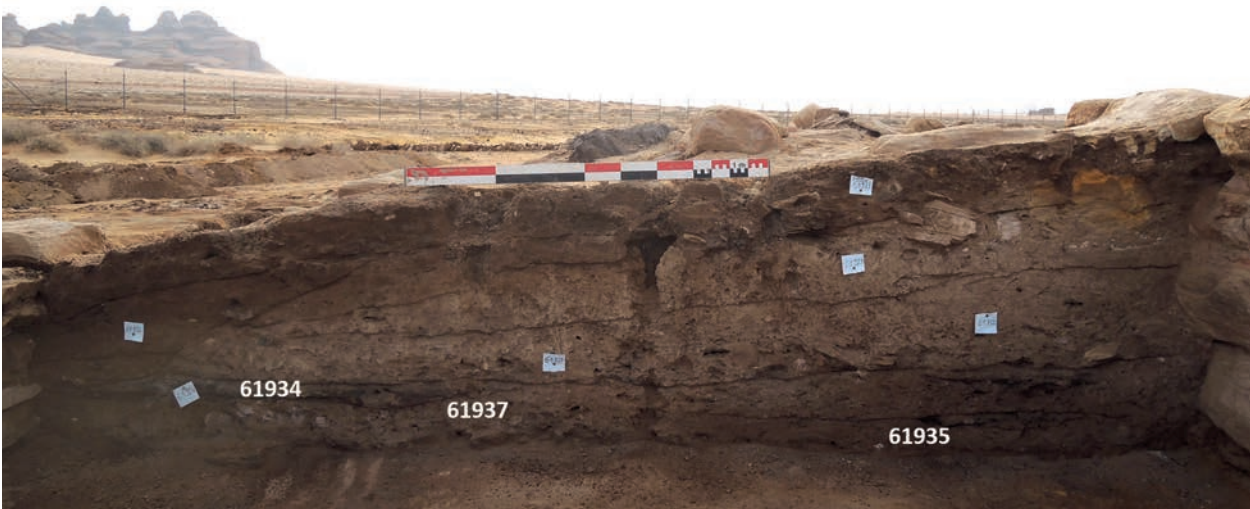
B. Hearth 61920.



C. Hearth 61926



D. Hearth 61934 and level 61933.



E. Section of trench 6.

Fig. 13. Trench 6: various views of the 'Roman' peripheral hall during excavation.



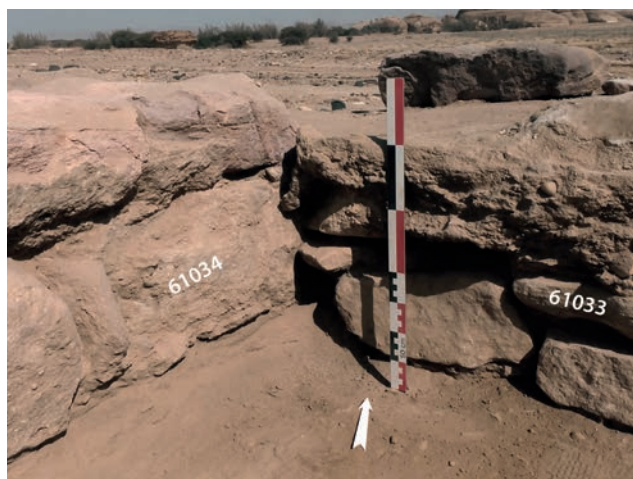
A. Southern facing of wall 61033.



B. Eastern facing of wall 61034.



C. Northern facing of wall 60880.



D. Corner of walls 61034 and 61033.



E. Corner of walls 60880 and 61034.

Fig. 14. Trench 6: walls of the 'Roman' peripheral hall.

3.3. Trench no. 4

Trench 4 measures 7.5 x 7 m. It was opened along the temenos wall 60811/60879 in order to uncover the mud-brick masonry in this section (**fig. 15**). The levels excavated reach a depth of 1.2 m (**fig. 16**).

The levels of abandonment reach a maximum depth of 0.4 m. Numbered 61907, 61921, 61922, and 61924 according to the area of excavation, they all share the same characteristics. Beige to light brown in colour, they are composed of a homogeneous and hardened sediment in a sandy-

clay matrix, attesting to disintegrated mud bricks. These levels are evidence of the long process of destruction of the building after the area was abandoned.

They seal a later phase, dated to the fourth century AD, which occupies the majority of the trench. Trench 4 is divided into two distinct parts: the southern half is occupied by the rear part of a later house consisting of a corridor, a space for cooking, and a staircase. This house is delimited by walls 60811, 60868, and 61952. Inside this space, the adjoining rooms are connected to the two main rooms (located further south and excavated in 2016 and 2017) by doorway 60819 (**fig. 19E**). The space in the house is then compartmented into two small, distinct areas (**fig. 17C–E**). The door first provides access, in the west, to a small elongated room measuring 2.5 x 0.9 m, at the back of which tannurs 61914 and 61957 are located. The first tannur, 61957, was built against walls 60868, 61953, and 60813 (**fig. 18E**). It was then partially destroyed by the installation of a new tannur, 61914, measuring 0.35 m in diameter. Charcoal samples were taken inside the latter for ¹⁴C dating.⁵ The mud-brick wall, 61953, separates this small kitchen from another room located just to the north. This room principally houses a staircase, 61954, which leads to the upper storey of the house (**fig. 17E**). The staircase rests on a mud-brick platform measuring 2 x 0.5 m. The first four stone steps that constitute the base of the staircase lie on its eastern side (**fig. 18A**). The other part of the staircase, now gone, was made of wood. The staircase abuts mud-brick wall 61952, which marks the northern limit of the later house.

It was probably at this later date that wall 60813 was built (**fig. 18C**). One can assume that the installation of doorway 60819 in wall 60806 increased the latter's fragility. It was consequently flanked on its northern side by wall 60813 in order to stabilize it.

The level of the contemporary floor in the later house is very homogeneous (contexts 61908, 61915, and 61983). This floor of beaten earth, dark brown in colour with shades of ochre, has yielded a group of important artefacts (pottery and faunal remains) attesting to an intense domestic activity.

The northern half of trench 4 has yielded remains from a later date of another nature. The area has been the object of substantial terracing in order to position a new access to the lower terrace of the former sanctuary from the east. The older walls (60811, 60868, and 60867) were razed at various levels in order to allow access to the lower terrace. This explains why the temenos wall 60811 is less well-preserved in this area than in the south-east corner of the sanctuary. It is only preserved on two courses and in some places was entirely reused (recovery trench 61950) (**fig. 15 and 18D**). Access from the east to the lower terrace was thus via a small quarter-turn staircase (*locus* 61955) constructed against walls 60868 and 61952 (**fig. 17F and 18B**). This structure was built entirely with reused blocks. Walls 60867 and 60868 were both also razed, but to a lesser extent than the temenos wall 60811 (a difference of 0.4 m) in order to ensure a gradual access to the lower terrace. It is still difficult to estimate the length over which walls 60868 and 60867 were razed. On the other hand, on the southern side these walls were not razed as they belong to the later house. The situation in the north is not yet known.

The exposed levels contain only faint traces of human activity (*locus* 61948), strongly contrasting with the contemporaneous level exposed in the southern half of trench 4 (later house) and in

5. 61914: calibrated date (95.4%), obtained in 2020, AD 251–397.



A. Aerial view of trenches 4 and 8 (J. Bervillié, 2019).



B. View of trench 4 at the end of excavation. View from the north-east.



C. Bird's-eye view of trench 4. View from the west.



D. Interpretation of trench 4.



E. Mud-brick house. View from the south.



17F. Staircase 61955. View from the north-east.

Fig. 17. General views of trench 4.



A. View of staircase 61954 from the south-east.



B. View of staircase 61955 from the north-east.



C. Walls 60806 and 60813. View from the north-east.



D. Wall 60811. View from the north.

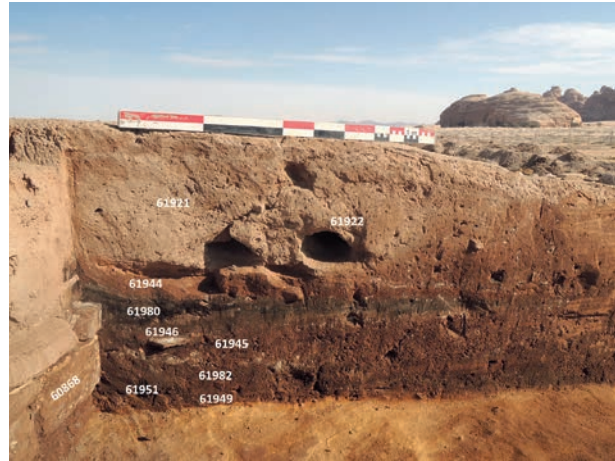


E. Tannurs 61914 and 61957. View from the north.



F. Reused half-column in wall 60867.

Fig. 18. Features in trench 4.



A. East–west section of trench 4. View from the south.

B. Detail of the east–west section of trench 4.



C. Eastern facing of wall 60868.

D. Section under staircase 61955



E. Doorway 60819. View from the north.

Fig. 19. Trench no. 4: sections and masonry.

trench 8, which suggests that this area could be viewed as an external passageway and probably an access to the lower terrace (provisional interpretation).

Part of the stone base was preserved at the northern end of walls 60868/60867, including a reused half-column fragment (**fig. 18F**) which belongs to an earlier monumental architectural phase.

A stratigraphic sounding was undertaken in the northern quarter of trench 4 as it does not contain later buildings and thus enabled us to document the whole stratigraphic sequence. The oldest levels are preserved along wall 60868, the rest having been destroyed by late modifications related to the temenos wall (context 61948 and trench 61950) (**fig. 16 and 19A**). There are two charcoal levels of occupation (**fig. 19B–C**): level 61951 is the first level of occupation associated with wall 61968. A sample of charcoal was taken for ¹⁴C dating.⁶ It is followed by a refill of earth (context 61946) and by a new charcoal level of occupation (*locus* 61980) which abuts the top of the stone foundation of wall 60868. This level was then sealed by the construction of the quarter-turn staircase 61955 (**fig. 19D**).

3.4. Trench no. 8

Trench 8 (**fig. 20**), located just to the north of trench 4, is rectangular and measures 7 x 6 m. The complete stratigraphic sequence reaches a depth of 1.2 m (**fig. 21**). The late levels of occupation are covered by a deposit of sandy-clay sediments, 0.2 to 0.3 m thick. These contexts (*loci* 61985 and 61927), depending on their location, comprise either sandy deposits or hardened clay deposits resulting from disintegrated mud bricks.

This is followed by the levels of abandonment 61932 and 61936. They consist of a very soft sandy layer, brown–ochre in colour, and mark the transition between the levels of natural fill (61985 and 61924) and the ovens' final phase of use. They therefore contain the remains of numerous artefacts belonging to the earlier phase, when the ovens were still functioning (**fig. 22A**). It is within these contexts that numerous pieces associated with grinding and milling (**fig. 25**) were found, as well as elements from collapsed doors (**fig. 22D, 24A, B, E, G**).

The previous phase is related to the use of the ovens proper, characterized by three successive levels, totalling 0.3 m thick (contexts 61947, 61963, and 61964). Added to this phase are charcoal levels 61209, 61988, 61987, and 61210 located in the north-west corner of trench 8 and associated with oven 61961. These ash levels constitute the final phase of utilization of the ovens because they were not cleaned out. About ten 10-litre samples were taken from the ovens and from the oven discards for botanical analysis (fruits and seeds). A charcoal sample was also taken from oven 61939 for ¹⁴C dating.⁷

The ovens were partly installed in mud-brick wall 61959, which was re-dug for this purpose (**fig. 22E**). Five ovens were installed on its western side (61939, 61940, 61941, 61942, and 61943) and one on its southern flank (61938). A seventh oven was found along the temenos wall 60880. Some of them are lined in poor-quality ceramic and belong to the traditional class of tannurs (61938, 61939, and 61961). The others are more coarsely constructed (61940, 61941, 61942, and 61943), their walls are made of clay sediment hardened by the heat produced by the fire. The

6. 61951: calibrated date (95.4%), obtained in 2020, AD 85–239.

7. 61939: calibrated date (95.4%), obtained in 2020, AD 240–385.

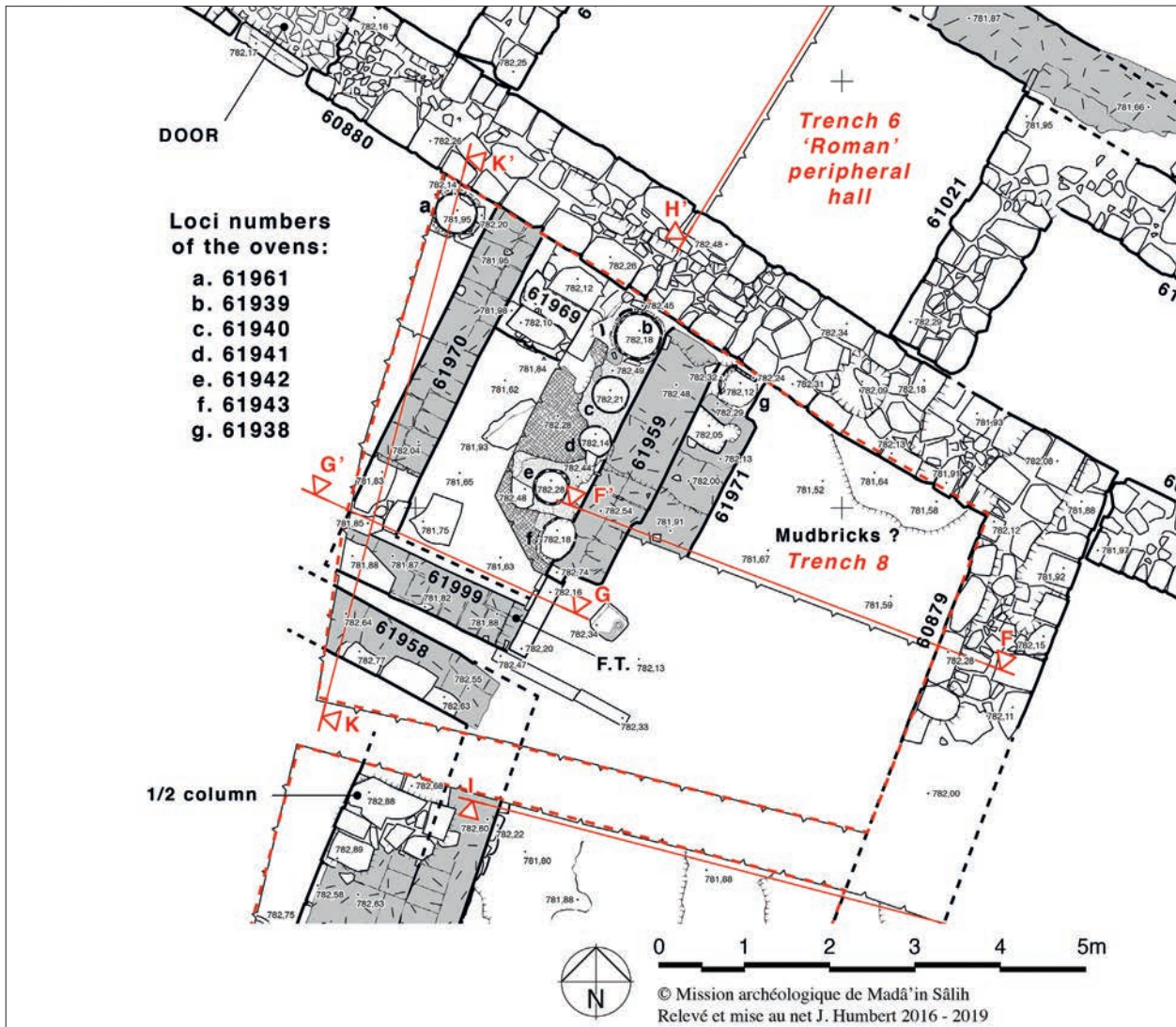


Fig. 20. Plan of trench no. 8.

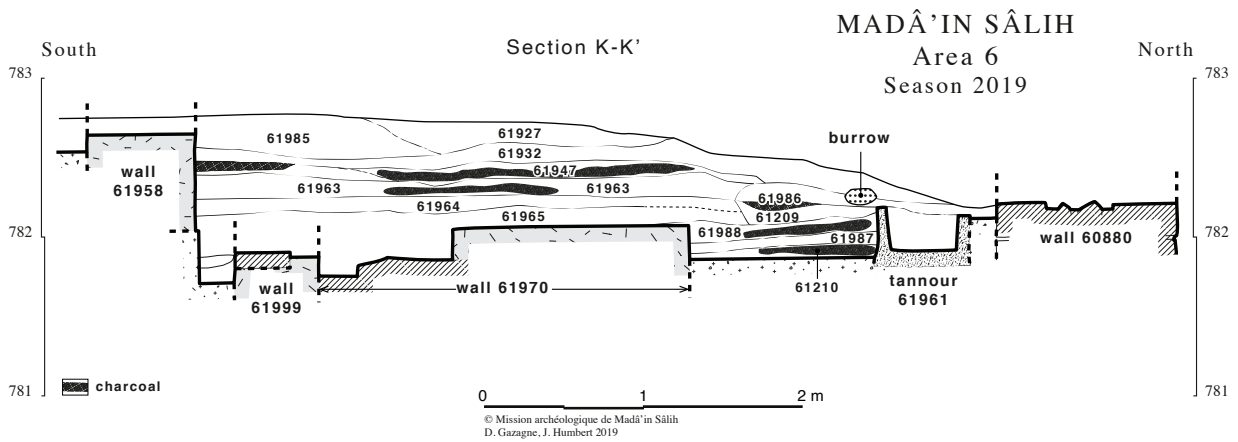


Fig. 21. Stratigraphic section K-K', see fig. 20.



A. Hearths being cleared.



B. Hearths and their final level of operation.



C. Bird's-eye view of the hearths.



D. View from the east.



E. Western part of trench 8.



F. Trench 8: hearth 61977 on the bedrock.

Fig. 22. Views of trench 8.

diameter of the hearths varies between 0.35 and 0.5 m and they are about 0.2 m deep. In the northern end, the ground is covered by paving 61969 consisting of long paving stones of white limestone. To the south, the room is delimited by wall 61958 which functions with wall 61959.

The following stratigraphic sequence, comprising levels 61965, 61972, and 61973, is a transitional stage marking the modification of the area (**fig. 23E**). Level 61965 is a fill, 10 to 15 cm thick, principally composed of disintegrated mud bricks. It can be assumed that this constitutes the levelling backfill after the razing of walls 61970 and 61999.

Locus 61972 is a level of collapse containing numerous fallen stone blocks mixed with pieces of mud brick. Above it is level 61973, brown in colour and 3 cm thick.

The first stratigraphic sequence comprises level 61976 and hearth 61977 to which walls 61970 and 61999 are associated (**fig. 22F**). A sample of charcoal was taken from hearth 61977 for ¹⁴C dating.⁸

Apart from oven 61938 (**fig. 23B**), the eastern half of trench 8 did not yield notable features. The east–west section opened in the centre of the room revealed a stratigraphic sequence analogous to that described for the western half of the trench, although it was less complex and less well-defined (**fig. 23D**).

Underneath the level of abandonment 61936 lies floor level 61962, which is contemporaneous with the use of the ovens and the door. This sequence is followed by the levels of backfill 61979 and 61966, then by floor level 61968 and ash reject 61967, which correspond stratigraphically to levels 61976 and 61977. A fallen doorjamb was found on level 61967 (**fig. 24C**).

4. Conclusion

The layout of the sanctuary as it is beginning to reveal itself allows comparisons with other sites excavated in the Arabian Peninsula. A comparison can, for example, be made with the so-called Almaqah sanctuary at Şirwāḥ which has several points in common with the sanctuary at Hegra (**fig. 26**): an oval-shaped temenos wall, adjoining rooms on the periphery of the temenos wall, as well as a second enclosure wall.

According to Solène Marion de Procé:⁹

‘Several features whose function is unknown adjoin the temple: towers (defensive and probably later than the use of the building as a cultic place), residential buildings for the temple staff? Areas of food production? One feature built against the north side of the temple enclosure was possibly used as a repository for the temple treasure. North of the bench area, a room containing an altar, and used for burning offerings, was exposed...’

For the Nabataean period (first century AD), data on the sanctuary have evolved: the north-west gate (trench 7) is a late installation from the Roman period. The continuation of the temenos wall to the west and the discovery of a new wall (61207) raise further questions on the architecture of the northwestern corner of the sanctuary. Trench 7 should therefore be extended in order to answer these questions.

8. 61977: calibrated date (95.4%), obtained in 2020, AD 240–385.

9. S. Marion de Procé 2016: *Le phénomène culturel en Arabie du Sud-Ouest du VIII^e s. av. J.-C. au IV^e s. apr. J.-C.* PhD dissertation, Université Paris 1 Panthéon-Sorbonne.



A. Bird's-eye view of the western part of trench 8 at the end of excavation.



B. Bird's-eye view of the eastern part of trench 8 at the end of excavation.



C. General view of trench 8 at the end of excavation. View from the south-west.

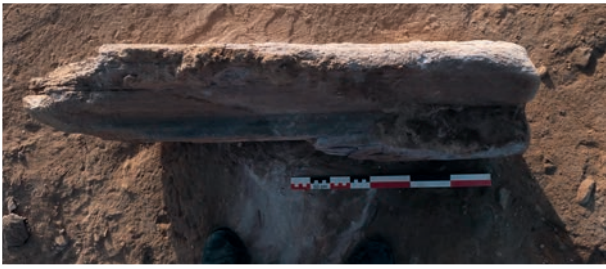


D. Section A-A'.



E. Section B-B'.

Fig. 23. Trench no. 8: sections views and view of the trench at the end of excavation.



A. Lintel.



B. Doorjamb.



C. Doorjamb.



D. Stone plate.



E. Doorjamb.



F. Stone vessel.



G. Threshold with engraved game.



H. Stone block with preparatory drawing.

Fig. 24. Stone features found in trench 8.

Several tenuous clues argue in favour of a gate installed on the northern side of the sanctuary, in the middle of the temenos wall 60880 (**fig. 27A**), which would enable access to both the high temple and the lower terrace.

In the fourth century, the sanctuary appears to have been divided into two distinct sections (**fig. 27B**). The separation seems to be located to the east of IGN 132, at the level of wall 61992. In the west, the high temple probably remained a sacred area, reached via the north-west gate which was opened in the Roman period. The lower terrace was entirely devoted to lay activities: in the south-east corner, part of the sanctuary was reused to build a house. In the north-east corner, the discovery of numerous ovens and a sizeable number of millstones and grinders suggests craft activity involving the production of foodstuffs, possibly a bakery (?). To the east, at the foot of rock IGN 132, an array of stone basins attests to a craft activity which is yet to be defined.

Between these two long phases, the Roman period (second-third century AD) is difficult to identify. Especially problematic is the status of the lower terrace. Did it maintain a cultic function or was it involved in lay activities, either domestic or artisanal in nature? At the current state of knowledge, it is too early to give a definitive answer to this question.

On the lower terrace, the depth of the stratigraphic sequence (1.5 m) and the presence of two superimposed mud-brick masonry levels would indicate altering the excavation strategy. Extensive surface scraping associated with individual trenches has so far produced good results and has now reached its limits. A regular 5 m-grid, intercut with 1 m-baulks, will be laid in the lower terrace of the sanctuary (**fig. 28**). The aim is not necessarily to excavate everything, but rather to preserve some of the baulks in order to obtain the longest possible north-south and east-west stratigraphic sections inside the sanctuary. The layout of the grid has yet to be defined.



A. Column part reused as a grinder.



B. Basalt mortar.



C. Manual grinding mill.



D. Manual grinding mill.



E. Manual grinding mill.



F. Manual grinding mill.

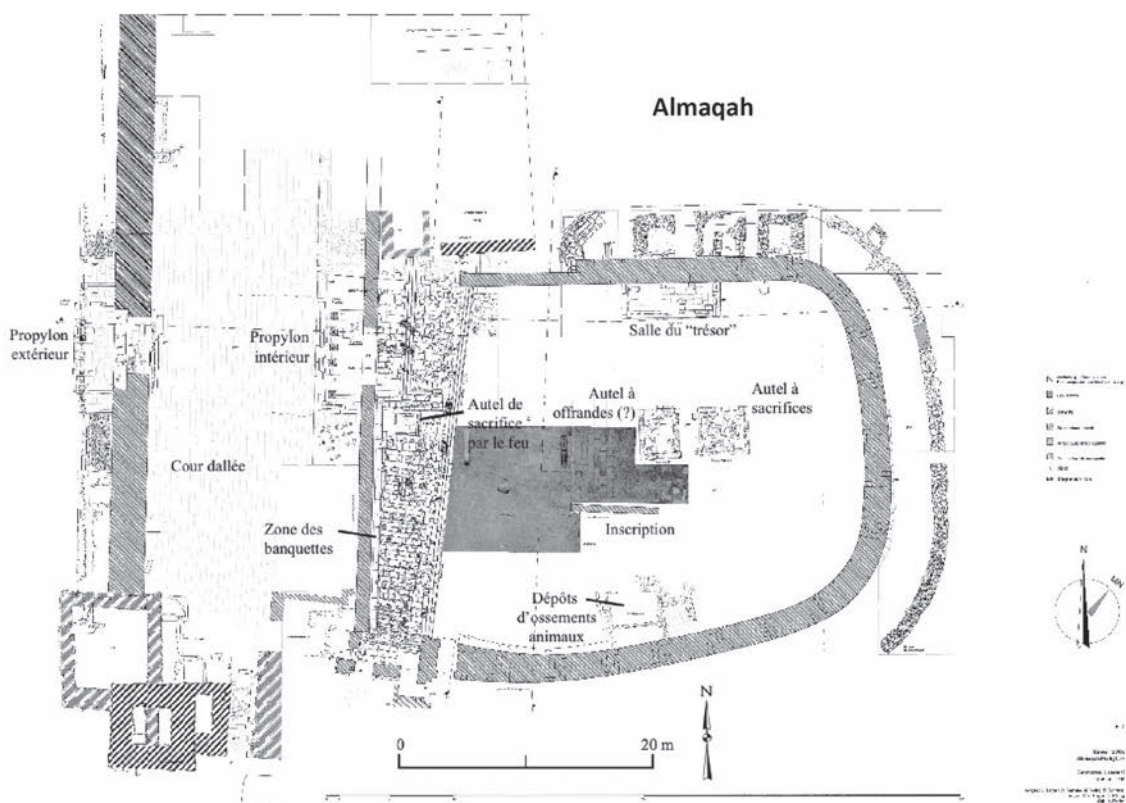


G. Fragment of grinding mill.



H. Fragment of grinding mill.

Fig. 25. Grinding and milling tools found in trench 8.



MADĀ'IN SĀLIH
IGN 132 & AREA 6
Top plan 2019

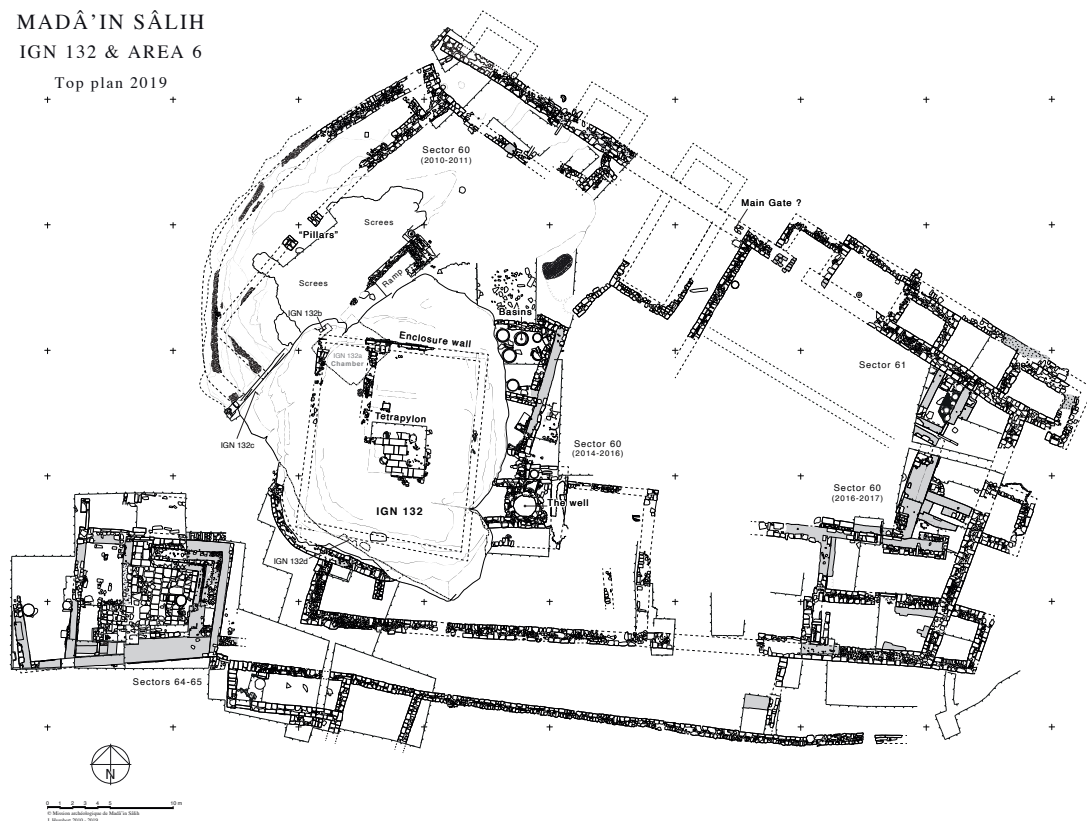
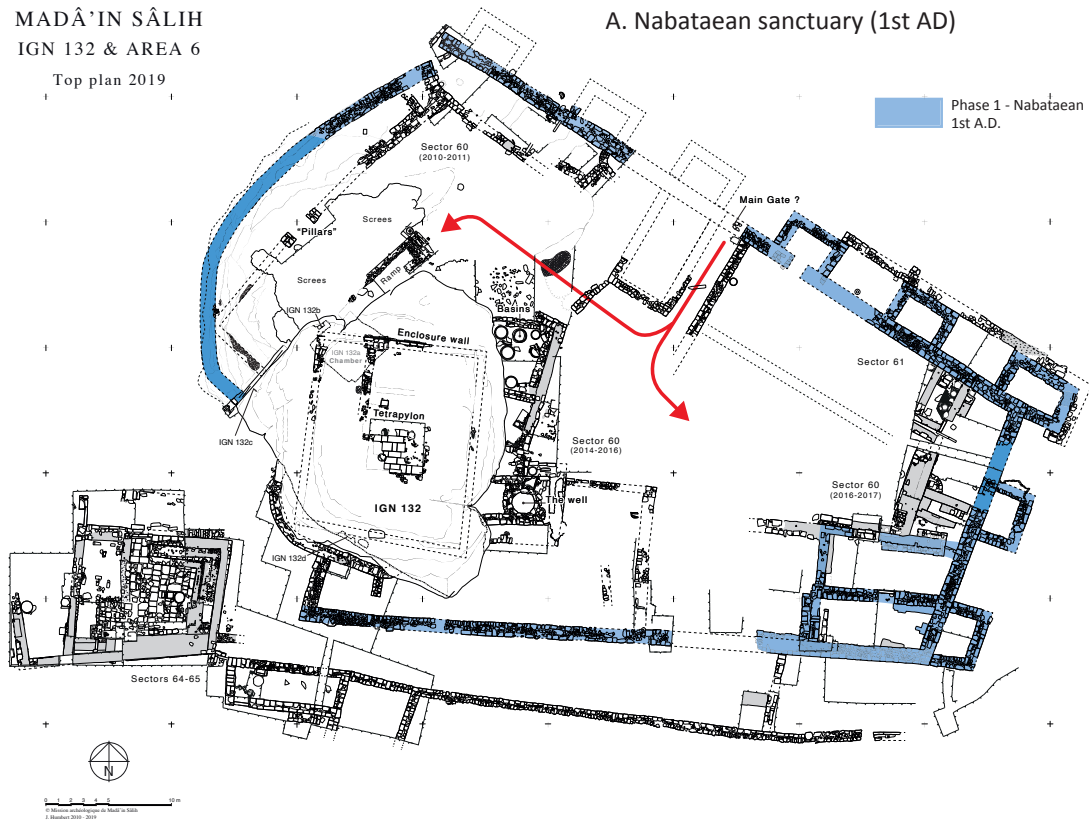


Fig. 26. Comparison of the plans of the sanctuaries at Almaqah (Şirwāḥ) (after Röring 2007*, pl. 5) and Hegra (*N. Röring, Bauhistorische Untersuchungen am Almaqah-Heiligtum von Sirwah. Im Land der Königin von Saba. Vom Kultplatz zum Heiligtum, PhD thesis, Brandenburgischen Technischen Universität Cottbus).

MADĀ'IN SĀLIH
IGN 132 & AREA 6
Top plan 2019

A. Nabataean sanctuary (1st AD)



MADĀ'IN SĀLIH
IGN 132 & AREA 6
Top plan 2019

B. Later stage of the sanctuary (4th AD)

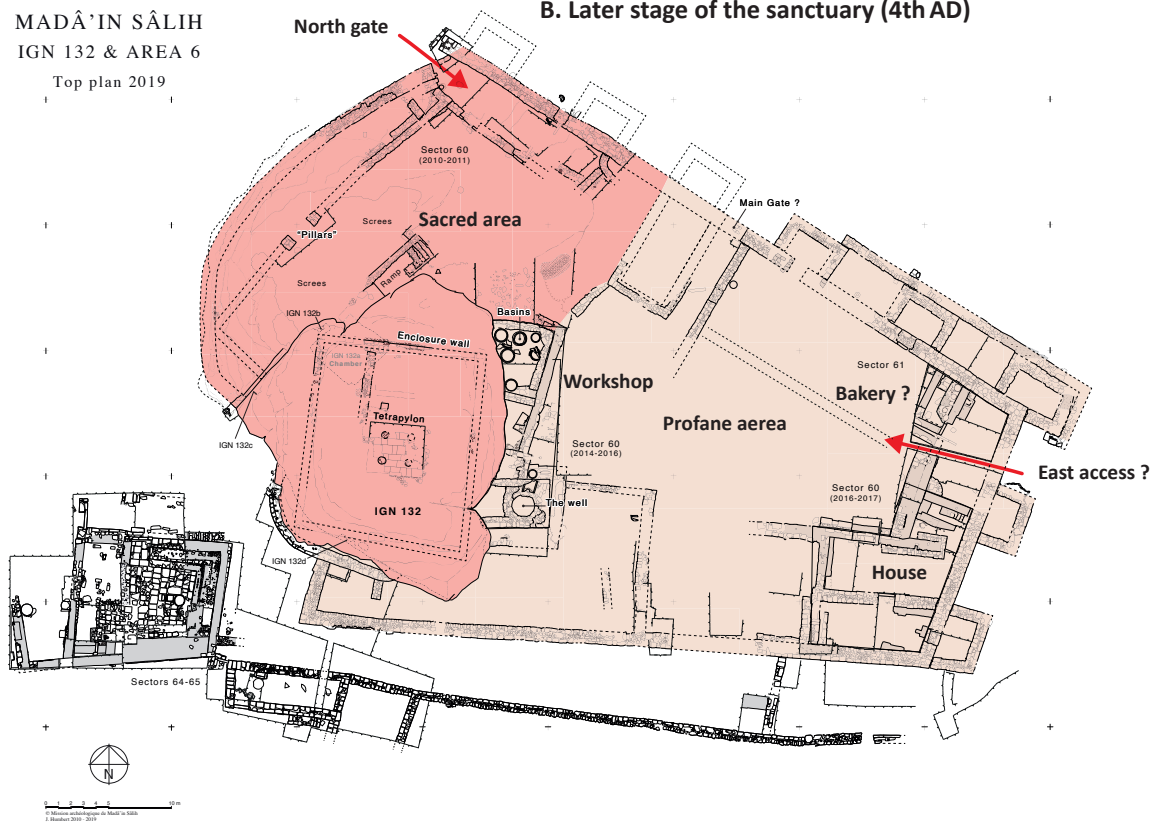


Fig. 27. The sanctuary in the first to fourth century AD.

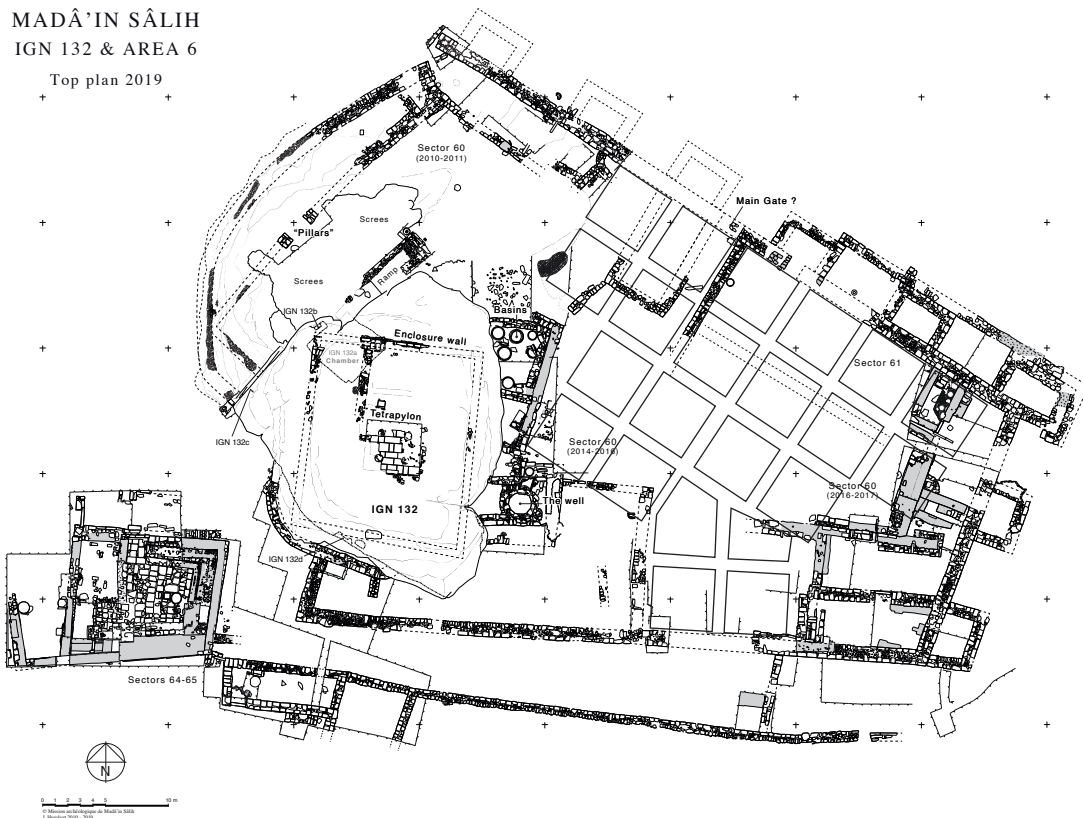


Fig. 28. Proposed grid layout on the lower terrace: 5 m-squares and 1 m baulks.

Preliminary Report on Areas 64300 and 64400, South of IGN 132, 2019

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Introduction

Areas 64300 and 64400 lay at the foot of the southern flank of hill IGN 132 and the so-called Nabataean temple. Their northern limit borders areas 64200 and 63000, while area 60000 borders them on the east, and area 64100 borders them on the west. The excavation of Areas 64300 and 64400 during the 2019 season is a continuation of the archaeological operations undertaken in the area of IGN 132. Its preliminary results complement what has been uncovered in the area since 2003 CE.

Excavation in areas 64300 and 64400 has been decided in order to reach three main objectives:

1/ The position of these areas, set between areas excavated during previous seasons, makes their uncovering a continuation of archaeological work and completes the studies accomplished therein;

2/ Excavating there gave a chance to uncover the architectural features uncovered in area 64100, namely walls 64120 and 64129, identified in 2016 and 2017. It would also allow to continue exposing features such as E-W wall 60823, check whether it continues west and whether it connects with wall 64129. It would finally allow to check the relationship of this part of the temple with area 63000 excavated immediately north by Laurent Tholbecq in 2015.

3/ Connect this area with what was uncovered since 2003 in order to try to precise the function and chronology of the structures.

This report is a collective work pertaining to all archaeological activities in areas 64300 and 64400. They are grouped together because they form one single space united by contiguities and by the resemblance of most of their architectural and archaeological characteristics, which allows interpreting them altogether (**fig. 1**).

1. PhD candidate at King Saud University, specializing in pottery studies, who joined the Saudi-French expedition to Madâ'in Şāliḥ in 2019 as part of her training.



Fig. 1. Drone view of excavation area south of IGN 132 (J. Bervillié).

Archaeological work in both areas

Area 64300

The dimensions of trench 64300 are irregular because it lays between areas 64100 and 64200 to the north–north-west, area 63000 to the north and area 64400 to the east. The north baulk is 7.80 m long, the south baulk is 5.20 m, the east baulk is 6.30 m long, and the west baulk is 7.20 m. In a later phase of the work, the excavated zone has been enlarged to reach 7.80 m for the north baulk, 7.20 m for the south baulk, 8.30 m for the east baulk and 8.25 m for the west baulk. This was done in order to uncover completely *loci* 64304, 64306, 64310 and 64322 in the southern part of the square as well as the the connection between walls 64304 and 64308 with walls 64120 and 64129 the latter two uncovered during the 2016 season.

The excavations uncovered twenty-three features, among which eight architectural elements, the uncovering of which went through fifteen layers which include: the surface layer, three layers of backfill containing architectural elements and clayish earth, five layers of clayish earth which vary in depth and composition according to their location in the square, two layers of ash and charcoal, finally four different places where the underlying bedrock (virgin soil) is visible.

Area 64400

The dimensions of area 64400 vary because of its position between areas 60000 and 63000. Its north baulk borders the southern flank of IGN 132, where is to be found a thick scree of

architectural stones fallen from architectural elements located in areas 60000 and 63000. To that must be added the extension in the southeastern corner of the trench (2.10 x 1.65 m), which was decided in order to uncover the whole of wall 64404 and staircase 64414. The actual dimensions of the trench are 8.50 m on the north, 8.10 m on the south, 5.65 m on the east and 7 m on the west.

The excavation operations uncovered nineteen features, among which nine architectural elements, the uncovering of which went through ten layers which include: the surface layer, a layer of fallen stones, seven layers of clayish earth, and finally the bedrock (**fig. 2**)

Architectural Phases in both areas

The architectural features present in areas 64300 and 64400 belong to two main architectural phases. These are determined by the building techniques of their architectural elements, by the way the latter are connected to each other and to the other parts of IGN 132 and by their function. These features are listed below, presented from the earliest to the latest:

1. The first phase

This phase dates back to the Nabatean Period. Its architectural features stand on the bedrock (numbered this year 64309, 64318, 64319 in area 64300 and 64418 in area 64400). The bedrock's surface slopes from west to east. Its highest point above sea level is at 783.04 m, west of *locus* 64312 in area 64300, while its lowest point is at 782.37m east of *locus* 64402 in area 64400.

This phase is represented by the following architectural features:

- *Loci* 64404/64304

East-west sandstone wall which runs through both areas. It was uncovered after the removal of surface layers 64401/64300. The wall comprises two courses. It is 0.80 m high and 7.40 m long. The lower course contains thirteen stones while the upper course contains fourteen. Its northern face is partly covered with plaster (**fig. 3**).

Wall 64404/64304 connects with wall 64412 to form the northeastern corner of a unit which extends beyond the south baulk and the plan of which is therefore not determined yet. The staircase 64414/64306 is built against the eastern end of 64404/64304's southern face. At the west end of the wall one finds door 64310 which was used as the southern entrance to the architectural unit made of walls 64404/64304, 64409, 64120, and 64308/64129 (**fig. 2, 4**).

- *Locus* 64412

North-south sandstone wall, in the southwestern corner of area 64400, connected to wall 64404/64304 to form with it the northeastern corner of a unit which extends beyond the south baulk and the plan of which is therefore not determined yet. The wall has been uncovered after the removal of the surface layer 64401 in area 64400. Its clearance continued southwards for 0.50 m only in order to uncover it a bit more. The wall is made of two courses of stone, each one containing three stones. The wall is 1 m long, 0.50 high and 0.60 m wide (**fig. 5**)

- *Loci* 64414/64306

These two *loci* correspond to the base of a staircase built against wall 64404/64304 at the eastern end of its southern face. The staircase led probably to the first floor of the architectural unit which extended beyond the southern baulk (see above). The staircase is 2.85 m long, 0.55 m high and 0.75 m wide. It includes three steps which reach the maximal height of the feature, each step being made of two stones, a square one on the north and a rectangular one on the south. On the



Fig. 3. *Remains of plaster on wall 64304.*



Fig. 4. *South face of wall 64304.*



Fig. 5. *Walls 64412, 64304 and 64404 with the staircase 64414.*



Fig. 6. The staircase 64414 south of wall 64304/64404.

bedrock, there is a single stone, possibly fallen because it is different, in form and dimensions, from the other stones of the staircase. The average length of the steps is 0.64 m, and both their width and height 0.20 m (**fig. 6**)

- **Locus 64101**

Locus 64101 belongs to area 64100, excavated in 2016. We supposed that the feature was the entrance to an architectural unit which originally extended to the west. Considering the objectives of the 2019 excavation season, the necessity to link architectural features to each other, and taking into consideration their phase and function, this locus was cleaned and a stratigraphic section was drawn in order to understand its structure and its relation to other features discovered around it. It became clear that the course of stones is laid upon a layer of clayish earth and that it is connected with wall 64114. One of its stones bears a Nabatean inscription and it dates probably to the Nabatean Period because. Some of the stones belonging to this locus may have fallen from other structures, especially the stones found on wall 64129 during the same season. Therefore, considering these indications and the results of this year's season, the space between *loci* 64101 and 64129 was interpreted as passage pertaining to the Nabatean Period and connecting architectural units which functioned at that time. It has been in use until the Roman Period (**fig. 2**).

2. Second Phase

This phase is dated to the Roman Period and its features are related to wall 60823, which runs around the temple *temenos*. It is represented by the following features:

- **Walls 64409, 64410/64308/64129), 64120:**

These three walls, along with wall 64404/64304 which has been assigned to this phase, form a complete architectural unit with clearly identified characteristics. North-south wall 64409 is the east wall of the unit. It clearly abuts wall 64304/64404 and both form the southeast corner of the unit. The three walls belong to one single building phase, as shown by the fact that their



Fig. 7. General view of areas 64300 and 64400.

masonry is interconnected. Together, they form three sides of a rectangle. Wall 64409 is 2.50 m long, 0.23 m high and 0.70 m wide. It is made of one single course.

Loci 64410/64308/64129² form the north wall of the unit, the west end of which, made of two courses, started to appear during the 2016 season. It was then believed that it formed a single feature with wall 64120. In area 64400, wall 64410/64308/64129 is made of two courses, it is 1.75 m long, between 0.75 m and 0.35 m high, and 0.65 m wide. In area 64300, the wall is made of one single course of stones. It is 5.75 m long, between 0.25 and 0.30 m high and 0.65 m wide. The entire length of the wall in all three areas (64100, 64300, and 64400) reaches 9.75 m.

Wall 64120 was put to light during the 2016 season. It represents the western wall of the unit. The southern end of this wall was cleared in 2019, when the trench was extended on this side in order to reveal its southern end. However, all that appeared at the southern end is a single large sandstone block laid upon a clayish layer. It is thus clearly different from the rest of the wall, which is made of two courses of stone. Wall 64120 forms, together with wall 64129, the northwest corner of the architectural unit, and it forms, with door 64310, the southwest corner of the unit. Wall 64120 is 3 m long, 0.35 m high and 0.65 m wide (**fig. 7**)

• *Locus* 64310

The door leading into the unit formed by walls 64409, 64129/64308/64410, 64120, 64304/64404, located in the southwest corner of the unit, is made of a single well cut sandstone ashlar threshold. Its upper surface is slightly curved and traces left by stone cutting tools, possibly a spindle, are still visible. South of wall 64304, and therefore not far from door 64310, a group of white rectangular sandstones were possibly used as doorjambs. At both ends of the threshold, traces attest the former presence of door panels. The threshold is 1.25 m long, 0.24 m high, 0.23 m thick (**fig. 8**)

2. The numbers given to the wall depend on the season and the area. 64129 is the number for the wall in area 64100 during season 2017; 64410 is the number for the wall in area 64400 in 2019, as 64308 is the number in area 64300 in 2019 as well.



Fig. 8. Door 64310.

• *Loci* and Architectural features inside the unit

Some features were put to light inside the architectural unit, laid on the unit's floor which is numbered 64417/64321. The unit's floor was uncovered after the removal of *locus* 64303 in the east part of trench 64300, between walls 64304 and 64308, and after the removal of surface layer 64401 in trench 64400. The floor layer is marked sandstone blocks laid flat at the same level. The level of the bedrock is different in both areas. It changes between 783.16 m, 783.04 m and 782.32 m above sea level.

The archaeological layers were removed but the stones forming the floor were left *in situ*, in particular in order to be able to get a section clarifying the sequence of layers in area 64300. Starting from the bedrock 64318, it is as follows : it starts with a stratum of friable clayish earth containing some ashes (*locus* 64315), followed by the floor of the architectural unit (*locus* 64321), followed by a consistent clayish layer mixed with a backfill of medium and large building stones (*locus* 64303), followed lastly by the surface layer (*locus* 64300).

In the stratigraphic section of area 64400, obtained from the the baulk which separates areas 64300 and 64400, the stratigraphic sequence begins with the bedrock (*locus* 64418), followed by a layer of medium resistance clayish earth mixed with small gravel (*locus* 64419), followed by a layer of friable clayish earth (*locus* 64416), then by the floor of the architectural unit (*locus* 64417), followed finally by the surface layer (*locus* 64401) (fig. 9-10).

In area 64300, standing on floor 64321, the following architectural elements were uncovered:

- Fragments of a circular basin (*locus* 64302), put to light in the southwest part of the area. They belong to the same stone basin parts of which were uncovered during the 2017 season in the south-east corner of area 64100. They had then been numbered 64128.
- Near *locus* 64302, the basis of a stone basin (*locus* 64307) was uncovered. Its diameter is 0.75 m. Close to its northern edge, there is a small circular opening, 0.07 m in diameter.
- North of the stone basin's base, an architectural element made of three stones was put to light (*locus* 64312). Two of these stones face each other, their northern ends abutting the southern face of wall 64308, while the third stone is laid between the two facing ones and abuts their southern ends. All three form a rectangular structure, the upper side of which remains open. The structure is 1 m long, its width varies between 0.45 and 0.50 m and it is 0.26 m high. We supposed that it was used as a receptacle for ashes because there is no trace of fire on its inner stone surfaces. Indeed, inside was found a thick layer of ashes mixed with clayish earth and a backfill of building stones, some stones with traces of fire (fig. 11).

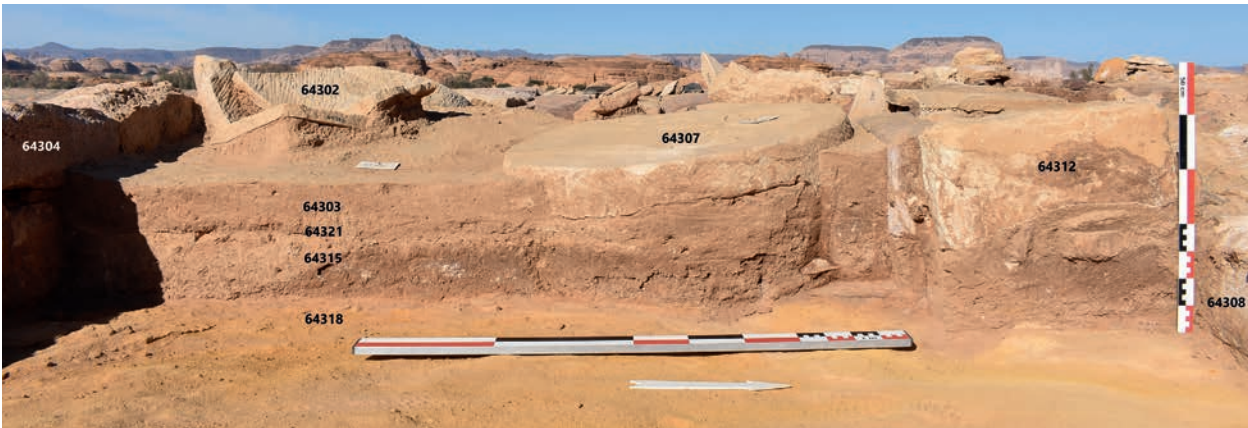


Fig. 9. North-south section of area 64300.

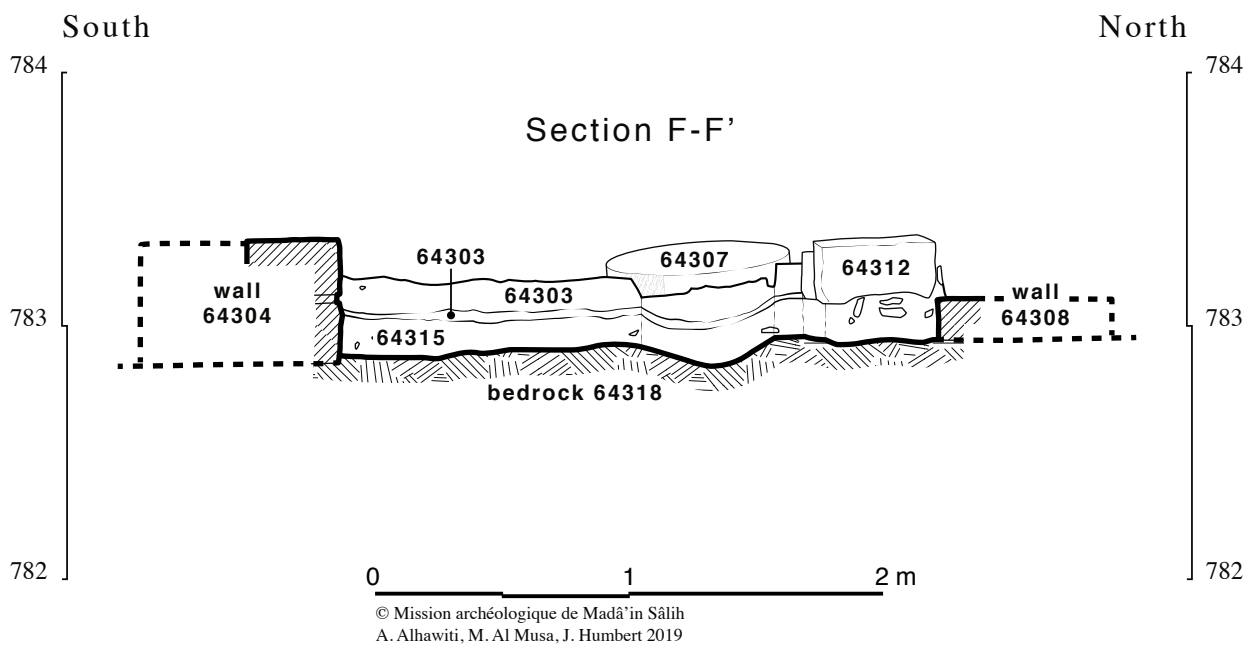


Fig. 10. Drawing of north-south of area 64300.



Fig. 11. Structure 64312 south of wall 64308.

- **Wall 64402**

North-south sandstone wall located in the east part of area 64400. Its northern end forms an L shape with the western end of wall 64411. It seems to extend beyond the south baulk. The wall is two courses high. It is 4.35 m long, its height varies between 0.30 m on its east face and 0.43 m at its west face. Its thickness is 0.75 m (fig. 2, 7)

- **Wall 64411**

East-west sandstone wall located in the northeast part of area 64400. Its western end forms an L shape with the northern end of wall 64402. The eastern end of this wall was uncovered during the 2016 season in area 60000, east of trench 64400, and a sounding was made along it in 2017. It is clearly an extension of wall 60823, which represents simply a 2nd or 3rd century AD enclosure which thus postdates the temenos of the Nabataean phase (see the contribution of D. Gazagne in the report of the 2017 season). Wall 64411 is made of two courses of stones. It is 0.70 m long, 0.78 m high, and 0.70 m wide (fig. 2, 7).

- **Wall 64406**

East-west sandstone wall the ends of which abut the corners formed by walls 64410-64409 on the west and by walls 64402-64411 on the east. 64406 is therefore clearly later than the architectural units formed by the walls described above and its *terminus post quem* is the date of wall 64411/60823, i.e. 2nd/3rd century AD (all we can say for the moment is that it is probably Roman, and probably not late Roman). Note that it contains some reused Nabataean stones. Concerning its function, it seems that this wall aims at closing, in the north, the passage formed by walls 64402 and 64409, which was most likely a street. Wall 64406 is made of two courses of stones. It is 5.10 m long, 0.50 m high and 0.70 wide (fig. 2, 7).

Findings

The findings of areas 64300 and 64400 show similarities with the material uncovered in the neighbouring trenches. They include:

– Pottery: the excavations yielded a lot of pottery, and the dominant ware is both coarse and semi-coarse, with colors ranging from dark brown to light brown, dark green, light green, and grey. The majority of the sherds are body sherds. A quick examination of the pottery, which was not thoroughly studied yet, shows that *loci* 64301 and 64403 can be paralleled, from the pottery perspective, with *loci* 63041, 63051, and 63056 (from area 63000 to the north of the 2019 trenches).



Fig. 12. Roman coin.



Fig. 13. Fragment of decorated pottery lamp.



Fig. 14. Fragment of Latin inscription showing three letters.



Fig. 15. Lid of a stone vessel.

Considering that most layers are made of backfill materials, where later period elements are mixed with earlier period ones, the majority of pottery pertains to the period between the first century BC and the fifth century CE.

– Coins and metal objects: some Nabatean and Roman coins were discovered, as well as many bronze and copper objects (**fig. 12**)

– Other artefacts:

- a fragment of pottery oil lamp dating back to the Roman Period (**fig. 13**) ;
- fragment of a stone bearing Latin characters where letters LE can be read (possibly with A before) (**fig. 14**) ;
- the circular lid of a stone vessel (**Fig. 15**)
- many other findings, including glass, sea shells, ostrich eggshells, bones.

Conclusion

As previously stated, the architectural features identified in areas 64300 and 64400 belong to two building phases. The results of the 2019 season complement what was uncovered during the previous seasons, establish the connection between several architectural elements, and confirm the existence of parallels between the stratigraphic sequences obtained in various areas around IGN 132. They also shed light on the function of the various structures put to light.

The first architectural phase, which dates back to the Nabatean period, is represented by the following features: wall 64404/64304, wall 64412, staircase 64414/64306. They belong to an architectural unit which extends beyond the south baulk, the function of which is still undetermined. Wall 64404/64304 was definitely used during the subsequent periods. This can be clearly observed through floor 64321, which is Roman in date, and which is laid over the gypsous plaster covering the north face of wall 64404/64304. This indicates that the wall is earlier than the preparation of the floor, and of course earlier than the architectural elements which go with it. The passageway 64101, uncovered in 2016, belongs also to this phase, as well as wall 64114. The latter contains a block bearing a Nabataean inscription, probably reused. Some of the stones of this feature may have fallen, especially considering what was found on top of wall 64129, also in 2016. Therefore, considering the above, we consider the space between 64101 and 64129 as being a passage dating back to the Nabatean Period. It connected architectural units pertaining to the same phase and was in use until the Roman Period.

The second architectural phase, dating to the Roman Period, is represented by the following architectural features: walls 64409, 64410/64308/64129, 64120, with wall 64404/64304 which dates back to the Nabataean period but which was reused in the Roman phase as the southern wall of an architectural unit, with the addition of door 64310. It seems that this door did not



Fig. 16. The south flank of IGN 132 showing the row of rock-cut holes (before excavation).

exist initially in the Nabataean wall 64304 and was added later to provide access to the room created in the Roman period. It is even possible that the threshold is a reused stone. The structures put to light inside this unit (64302 = 64128, 64307, 64312), point to it having been used either for domestic or craft activities. The space between walls 64402 and 64411—that have an L shape on the east—and walls 64409, 64308/64410—that have an L shape on the west, was clearly a street/passageway which may have

existed already in the Nabataean period but which functioned certainly as such in the Roman period. At some point during the Roman period as well (although it is difficult to be more precise for the moment), the street was closed by wall 64406, either in order to close the outer perimeter wall 60823, of which 64411 is the continuation, or it was built in association with the row of rock-cut holes which were cut high up on the southern flank of IGN 132, exactly above 64411 (fig. 2, 7). The stratigraphic sequence in the street differs from the stratigraphic sequence elsewhere in the area (fig. 16, compare with fig. 10). In the street, the sequence is the following from bottom to top: bedrock 64418, overlaid with a thick layer of clayish earth of medium consistence mixed with some ash and fallen stones (64413), followed by a layer of consistent clayish earth mixed with some building stones (64405), and at the top the surface layer (64401) made of a thin layer of clayish earth mixed with small stones and pottery sherds.

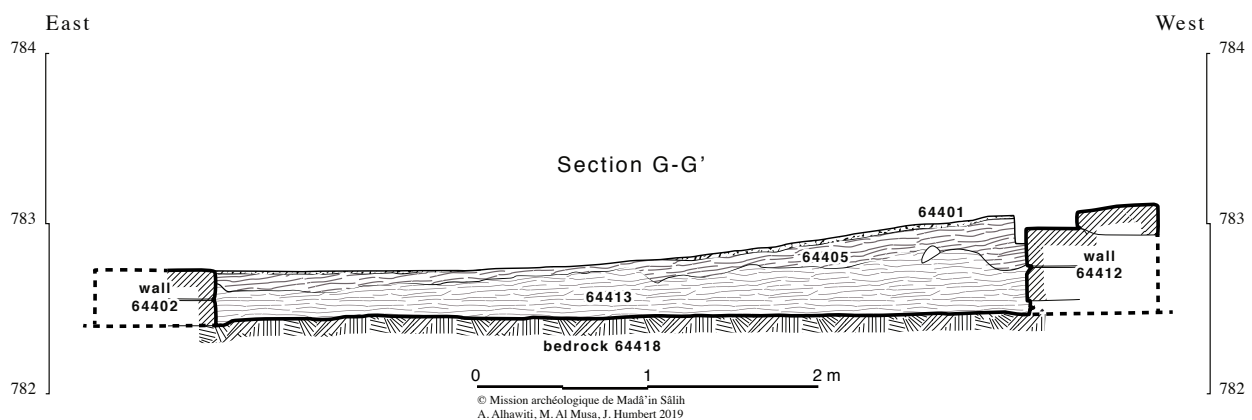


Fig. 17. East-west section of area 64400.

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Pottery Report, with an Appendix on Alabaster Vessels, 2018

Caroline DURAND (HiSoMa, Lyon) & Yvonne GERBER (University of Basel)

The 11th study season of the pottery material from ancient Hegra took place from the 28th February to the 22nd March 2018. This year, only Caroline Durand was on the field but Yvonne Gerber was in charge of the technical maintenance and update of the pottery database on File-maker. Rozenn Douaud and Ariadni Ilioglou carried out the pottery drawings, Alain Pierre took the photographs and Marie Peillet was in charge of the conservation. The objectives for 2018 were to complete the reading of the pottery put to light during previous excavation seasons, in particular in Areas 34 (Roman camp), 35 (south-east gate) and 92 (one of the residential quarters). The final publication of the pottery from the Saudi-French excavations is currently in preparation. Therefore, at this point, only a short report follows about what has been studied during the 2018 season.

Pottery from the Roman camp (Area 34)

Some complete or almost complete as well as a few large vessels coming from the surface of the Roman camp (Area 34), excavated in 2016 and 2017, were restored, drawn and recorded in the database. Among these vessels were several globular cooking pots with a short vertical or inverted neck and a bevelled rim, characterised by a red fabric which includes many small mineral black, white, and red inclusions (**fig. 1**, 34301_P02, P03 and P04). They are relatively common in the pottery material from the Roman camp while they are rather scarce in other areas. It is not clear yet whether they were imported or were produced locally. Another type of cooking pot, this one produced locally, with incised decoration on the shoulder (**fig. 1**, 34301_P05) was found. It shows a similar fabric to the common carinated cooking pot from the last occupation phase of the site, dated to the late 4th to the early 5th century AD (Charloux *et al.* 2018: 54, fig. 6-A), but it has a different profile; it might therefore be slightly earlier. The surface pottery contains also several storage vessels/*pithoi* (**fig. 1**, 34301_P10; 34420_P08) as well as a few large jars with a characteristic piriform profile, ribbed body, two vertical handles attached on the shoulder, long vertical neck and slightly thickened rim with pointed lip (**fig. 1**, 34301_P01; 34303_P07).

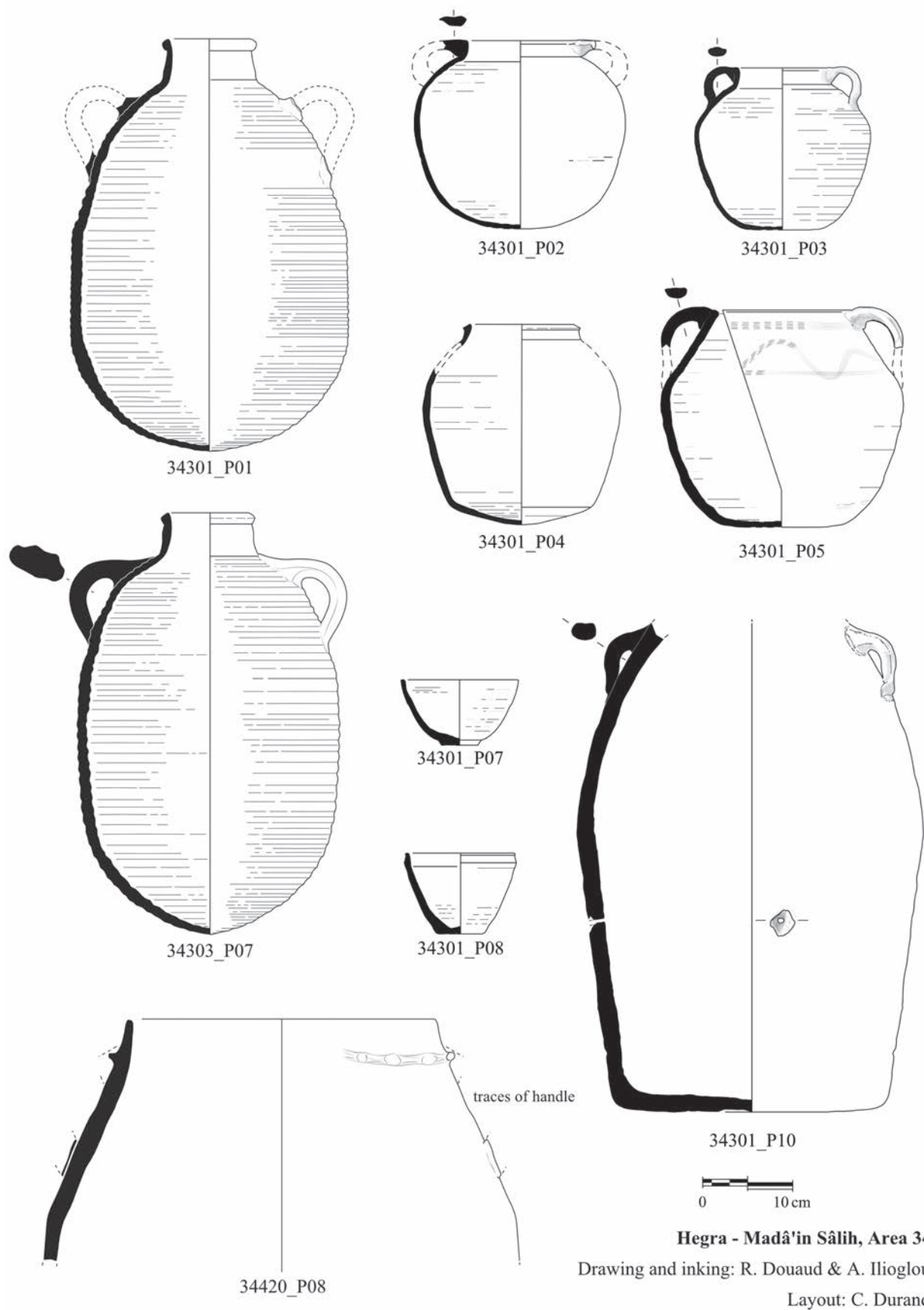


Fig. 1. Pottery from the Roman camp (surface), late 3rd–4th century AD?

Pottery from the south-east gate (Area 35)

In Area 35, the focus was put on an interesting assemblage corresponding to a dump in the foundation backfill of the Roman gate. According to the excavator, this dump is contemporary with the construction of the gate which occurred probably around AD 180–200. The assemblage is composed mainly of cooking vessels: cooking pots with a short convex neck and a slightly thickened, rounded rim (**fig. 2**, 35381_P05 to P08; 35387_P01; 35408_P01 and P02), lids (**fig. 2**, 35381_P01) and bowls or casseroles with horizontal handles (**fig. 2**, 35381_P03; 35387_P05). We also noticed the presence of several jars characterised by a reddish-brown fabric covered by a thick whitish slip, a very short neck, an outcurved or everted rim with flat lip and a ribbed body (**fig. 2**, 35381_P10 and P11; 35408_P03). This assemblage gives a good glimpse of the common ware in use in Hegra around the end of the 2nd century/first half of the 3rd century AD. Based on its location close to the gate and on the function of the types represented, this pottery may correspond to the waste left by the soldiers stationed at the gate.

Pottery from Area 9

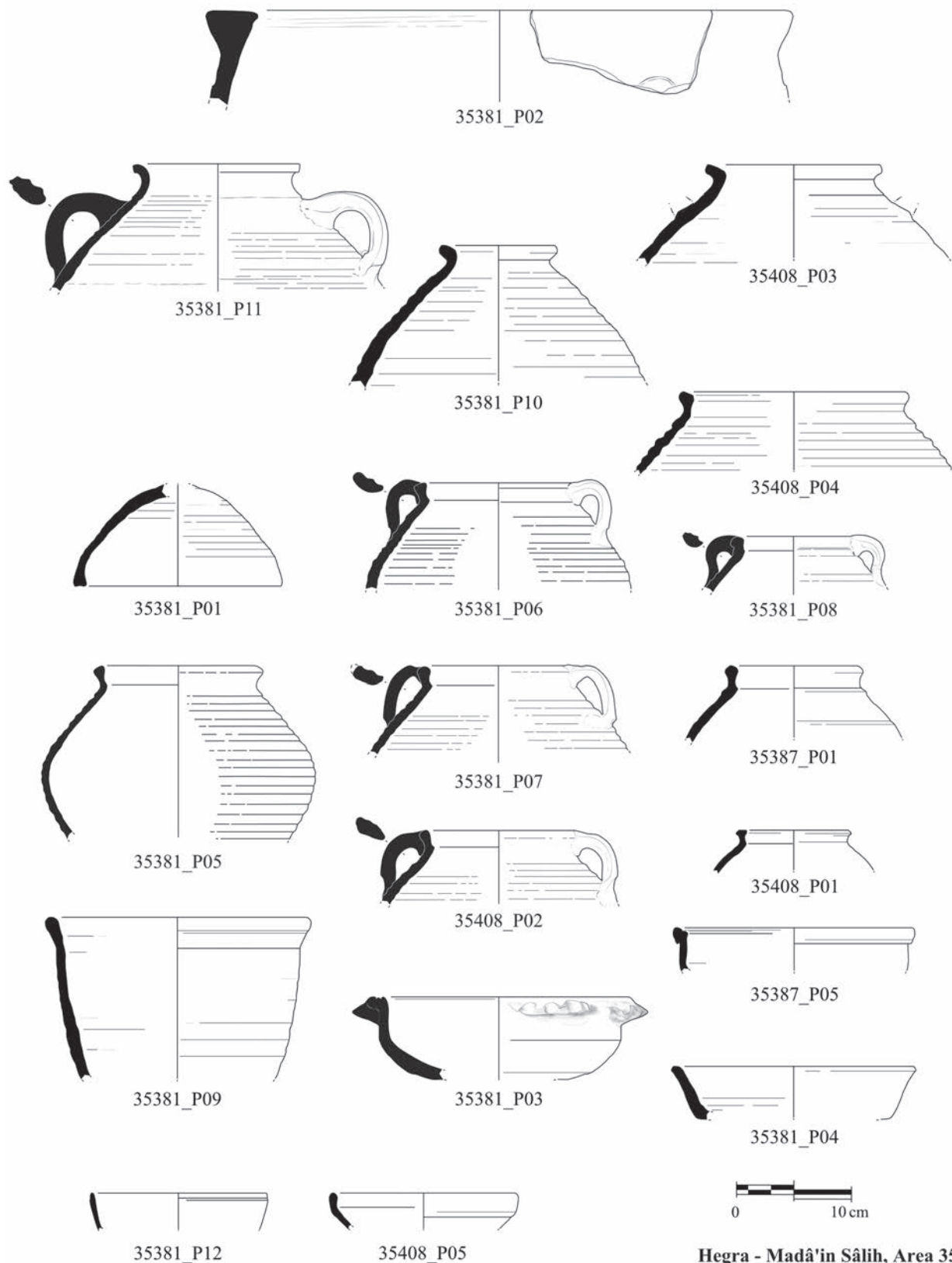
The pottery reading of Area 9 was also completed in 2018. Two boxes of pottery which came from the 2017 excavations, corresponding to *loci* 92314, 92316, 92317, 92318 and 92324, were studied and recorded. These *loci* are all dated between the 2nd and the 3rd century AD. They correspond to the occupation phase established after the Nabataean occupation and before the last occupation phase of the site. Among the distinctive elements, we can mention the presence of many casseroles with horizontal “pinched” handles and an imported bag-shaped amphora (exact type and provenience to be determined).

Umm Daraj pottery

Finally, with the agreement of the excavator, Dr. Hussein Abu al-Hassan, we had the opportunity to examine the pottery material discovered during the excavations of the Lihyanite sanctuary of Umm Daraj, stored in the al-‘Ulā Museum. This rapid overview of the pottery was extremely promising. It will contribute to our understanding of the transition between the Lihyanites and the Nabataeans in the region of al-‘Ulā in the second half of the 1st millennium BC. A full report on Umm Daraj pottery will be sent to Dr. Abu al-Hassan and a joint publication is considered.

Appendix: alabaster vessels

In addition to the pottery study, a complete review of the alabaster fragments discovered since 2008 was carried out for a forthcoming publication by C. Durand, with the assistance of R. Douaud and A. Ilioglou who completed the graphic documentation. Six alabaster pot fragments (**fig. 3**) were sampled and exported for residue analysis. These analyses will be carried out in 2019 in cooperation with Barbara Huber (DAI, Berlin) currently conducting a research on aromatic residues in archaeological objects from Taymâ’.

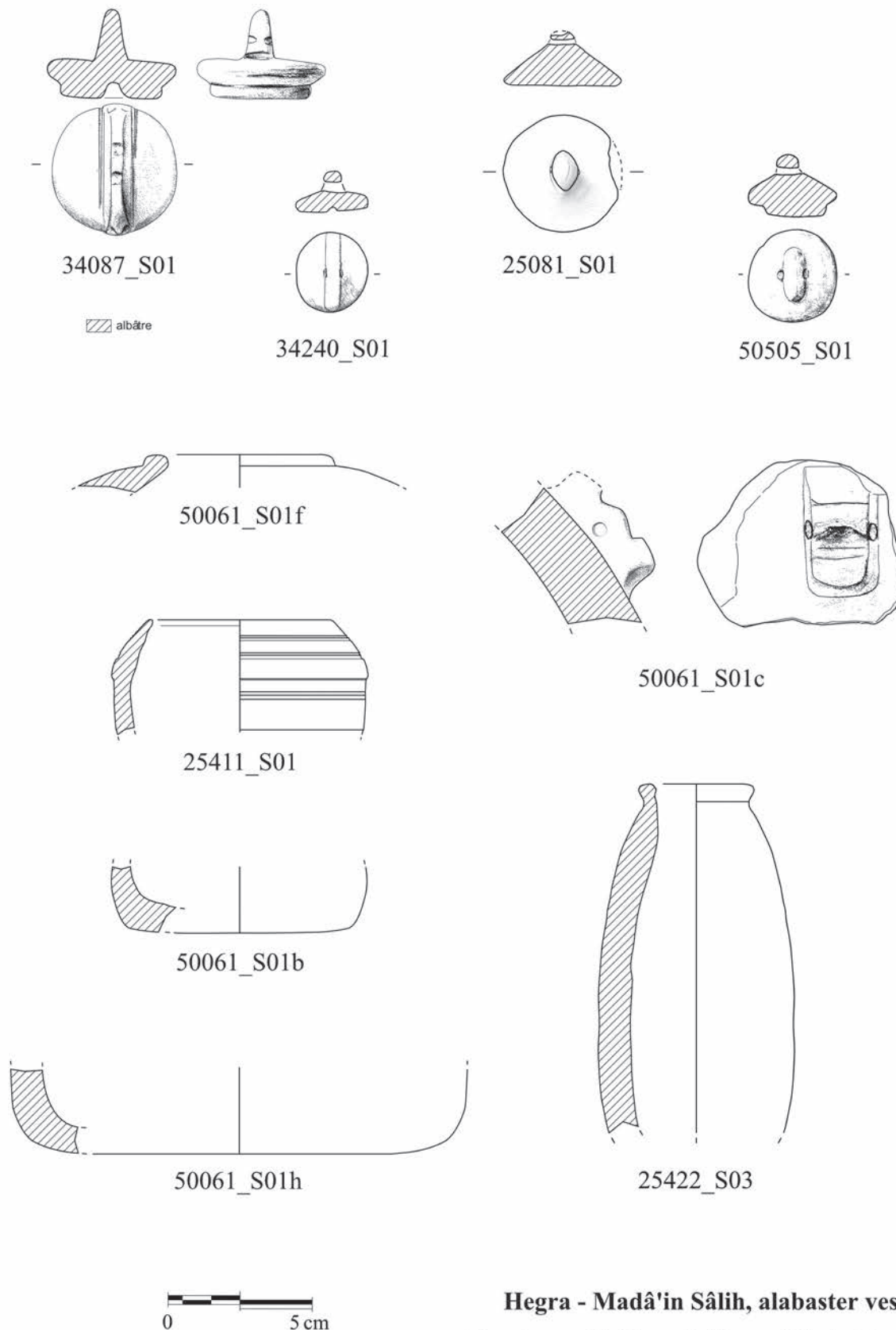


Hegra - Madâ'in Sâlih, Area 35

Drawing and inking: R. Douaud & A. Ilioglou

Layout: C. Durand

Fig. 2. Pottery from the dump of the south-east gate (loci 35381, 35387 and 35408), late 2nd–first half of the 3rd century AD.



Hegra - Madâ'in Sâlih, alabaster vessels
 Drawing and inking: R. Douaud & A. Ilioglou
 Layout: C. Durand

Fig. 3. Selection of alabaster vessels fragments.

List of exported alabaster samples:

Excavation year	Inventory	Type	Area	Date
MS 2016	34015_S01	Body fragment	Roman camp (surface)	2nd to 4th c. AD?
MS 2017	35395_S01	Body fragment	Rampart gate	2nd c. AD?
MS 2008	50067_S01	Base	Tomb	1st-3rd c. AD
MS 2010	60688_S01	Body fragment	Jabal Ithlib	1st c. AD
MS 2014	60713_S02	Base	Sanctuary	Prob. 1st c. AD but could be later
MS 2017	92336_S01	Body fragment	Area 9	Pre-Nabataean

ANR-DFG Research Project

Finally, apart from the reading of the pottery, C. Durand spent part of her time producing and writing the application for a French-German/ANR-DFG research project entitled: HEJAZ – *North-West Arabian networks: Material culture on the “Incense Route”, from the late 2nd millennium BC to the eve of Islam*. This project was elaborated with our colleagues working at Taymâ’, Arnulf Hausleiter, Ricardo Eichmann, Francelin Tourtet, and Andrea Intilia, all based in the DAI in Berlin. Combining the results from Taymâ’ and Hegra with those from recent investigations at other sites in North-West Arabia, the project aims at supporting the development of a research network and to move from a site-based perspective to a regional one, presenting an up-to-date synthesis on the as yet little-known material culture, exchange networks and economy of ancient North-West Arabia. The application was submitted in due time [update 2020: unfortunately, the project did not pass].

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Pottery Report, 2019

Caroline DURAND (HiSoMa, Lyon)

In 2019, the pottery reading took place from February 2nd to February 21st. Three areas were excavated during this season: the Roman fort (Area 34, *loci* 34500), the sanctuary IGN 132 (Area 61, *loci* 61900) and the outskirts of this same sanctuary, Area 64 (*loci* 64300 & 64400). Besides, an epigraphical and archaeological survey between al-'Ulā and Medina (UM 2019) was undertaken by Laïla Nehmé and two other team members, during which some pottery sherds were collected. The pottery material from Areas 61 and 64 was only partly studied. In Area 61, the material associated to the kilns/tannurs which were put to light in Sounding 4 (see the report by D. Gazagne and M. al-Juhany) is composed mainly of jars and cooking-pots and can be dated to the last occupation phase of the site (probably late 4th–early 5th century AD). This is also the case in the upper layers (*loci* 61910–61913) in Sounding 5. The pottery from Soundings 6, 7 and 8 will be recorded in priority in 2020. In Area 64, the important *loci* 64305, 64314, 64315, and 64316 contained a mix of Nabataean pottery and later material from the last occupation phase (not many diagnostic sherds).

The main part of the study season was devoted to the study of the pottery material from the Roman fort and from the al-'Ulā–Medina survey. Preliminary results are presented below.

Pottery from the Roman fort (Area 34500)

The Roman fort area yielded a huge quantity of pottery. The material from the upper layers (*loci* 34505, 34506, 34508, and 34509) can be dated to the last occupation phase of the site (late 4th to early 5th century AD). The very important amount of pottery unearthed from these layers suggests that this area was used as a dump during this period. It seems that the same observation was made regarding the archeozoological remains, to be confirmed when the study of the latter is finished. The main part of the pottery from this dump belongs to the local common ware category. It includes *pithoi*/storage jars, four-handled jars (**fig. 1**, 34509_P20), as well as numerous cooking-pots, especially many carinated cooking-pots, sometimes decorated on the shoulder. These cooking-pots show the typical fabric and profile of the last phase of Hegra (see a selection fig. 1). Many imports were also recorded, including fine wares such as African sigillata (34505_P07), Eastern Sigillata (34508_P07, residual?) and Mesopotamian green glazed ware (34505_P08; 34506_P01). Several fragments of Mediterranean amphorae were also identified: amphora type Kapitän 2 (34505_P12; 34508_P09 & 34509_P26), probably from the Aegean area and mainly diffused in the 3rd–4th century AD; other Aegean types which may belong to earlier

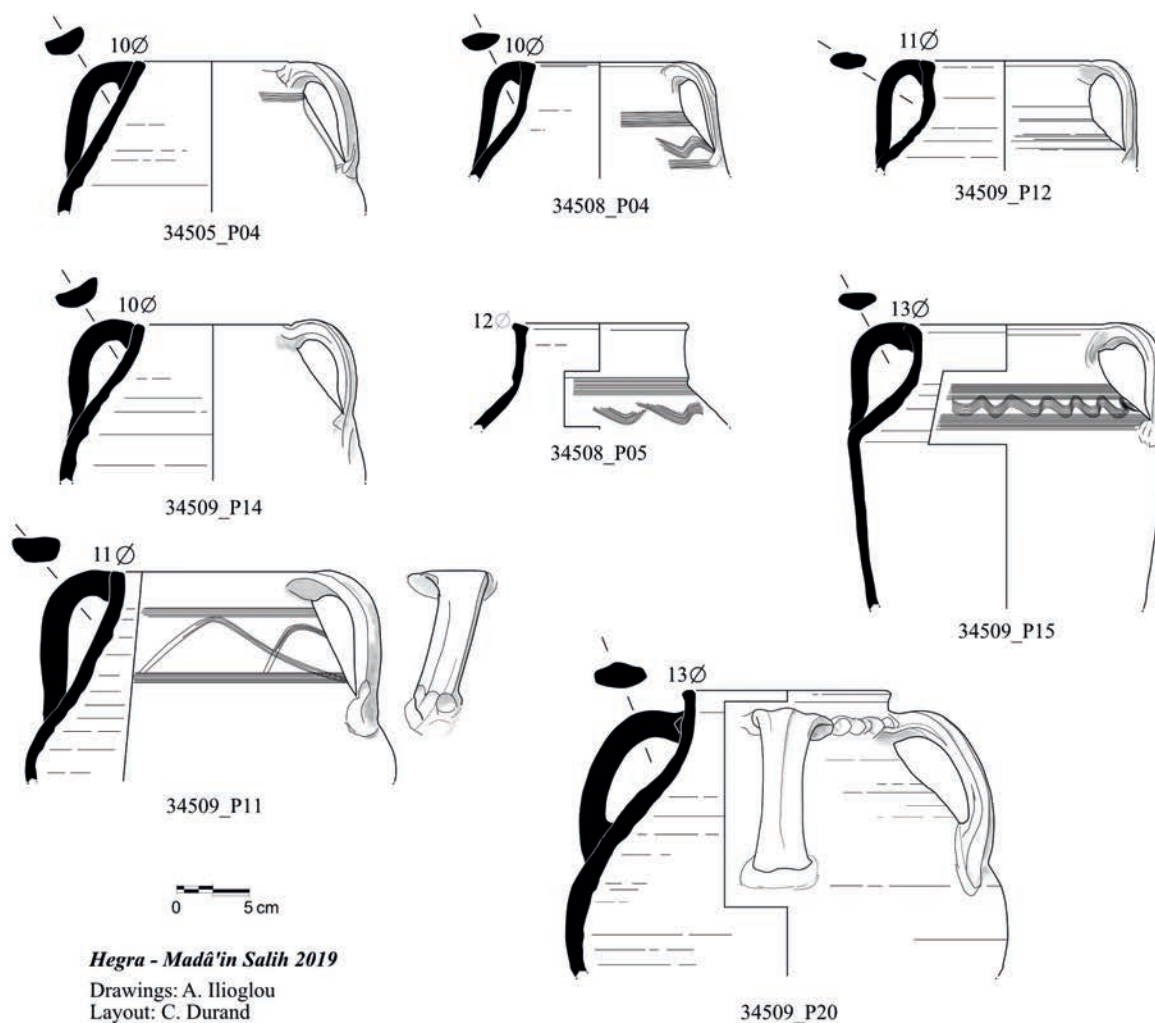


Fig. 1. Area 34, selection of pottery from the late dump.

periods (34505_P13; 34508_P08, possibly Rhodian), as well as a possible sherd of Dressel 2–4 (34505_P11), produced in Campania and widely diffused during the Roman period.

A complete lamp, most probably residual, was found in *locus* 34519 (fig. 2, 34519_P01). It has exact parallels in Petra and Khirbat Dharih which can be dated to the end of the 1st century AD (see Durand 2011: 47 & fig. 1-D, no. 11 with bibliography). *Locus* 34530 (not illustrated) can probably be dated to the 3rd–early 4th century AD. It contained several fragments of green glazed ware (34530_P01; 34530_P02), as well as a *tubulus* fragment with remains of plaster on the exterior (34530_P03). This fragment suggests the presence in the immediate vicinity (or in the building itself?) of a Roman bath with a heating system (hypocaust), this hypothesis being strengthened by the architecture (see the report by Z. Fiema). Below these upper disturbed layers, several occupation layers were found (*loci* 34531, 34533, and 34544), possibly dating from the



Fig. 2. Lamp 34519_P01.

Roman/Late Roman period, ca. 2nd–3rd century AD (**fig. 3**). An unusual pottery type, bearing a decoration in relief, was discovered in *locus* 34531 (**fig. 3**, 34531_P01). The pattern remains undetermined, possibly an animal figure (?). Among the significative finds, one can mention the presence of a decorated green glazed sherd (**fig. 3**, 34531_P08) and of a fragment of so-called “Nabataean painted common ware” probably imported from Petra (**fig. 3**, 34544_P07). In Petra, this type of painted pottery is clearly dated from the 2nd to the 3rd century AD (Gerber and Durand 2014: 275, 285–286, fig. 25–27). Lastly, in the lower layers, a Nabataean/1st century AD phase of occupation phase seems indicated by *locus* 34551 (not illustrated).

Pottery from the al-‘Ulā – Medina Survey (UM 2019)

Pottery sherds were sampled on sites visited during the survey undertaken between al-‘Ulā and Medina by Laïla Nehmé and other members of the team (see the report by L. Nehmé *et alii*) (**fig. 4–6**). The pottery from al-‘Amā’ir (AA 1–2), aḍ-Ḍulay’ah (AD), al-Khuraym (AK), al-Raḥba (AR), Khurayyīṭ Yanbu’ (KY), Qaşr Wādī Ḥarb (QWH) and Umm al-Ārāk (UA) suggests, as can be expected, that these sites are dated to the Islamic period. The majority of the pottery material presents a creamy/greenish fabric covered with a whitish slip, among which many fragments bear an incised decoration consisting most of the time of strips of horizontal lines alternating with strips of wavy lines, sometimes superimposed. Many large basins (**fig. 4**, AA2_P05, P06, P08; **fig. 5**, AD_P01; AR_P01, P02, P03; **fig. 6**, QWH_P01, P02) with incised decoration could be dated to the Umayyad period. Fine ware sherds with very thin wall and incised decoration (**fig. 4**, AA2_P17; **fig. 6**, KY_P04; QWH_P03) are comparable with the pottery from al-Ḥīra produced in the region of Baṣra in Southern Iraq (Rousset 2001, in particular 225, fig. 1). This pottery production is dated to the 8th–9th century AD (Umayyad/early Abbasid period). Lastly, we can mention the presence in these sites of a few small glazed pottery sherds (**fig. 4**, AA2_P18; **fig. 6**, UA_P09). It should however be remembered that the author of this report is not a specialist of the pottery from the Islamic period and the conclusions need therefore to be confirmed.

Two sites present a pottery material which differs strongly from that of the others and is clearly not dated to the Islamic period: al-Muṣanna’ah and Umm Hidim. Umm Hidim is located southwest of al-‘Ulā, close to the embranchment of Wadi Jizzl. The pottery from this site (not illustrated) is composed of many *pithoi*, among which one made in the fabric labelled “Hegra 9”, some large bowls and cooking-pots, but no fine ware. The fabrics, mainly reddish to reddish-brown with vegetal temper, as well as the profiles of the vessels, are very similar to the pottery observed at Umm Daraj, currently under study (Durand and Gerber 2018: 143). Therefore, it is possible that site was occupied from the Lihyanite to the early Nabataean period. The fort of al-Muṣanna’ah (AM 1 and 2) yielded unfortunately only nine small and very eroded body sherds. Without any information on the profile, we can only rely on the fabric in order to determine the chronology. The sherds present mostly a reddish-brown to brownish fabric and no cream/greenish fabric has been observed. One sherd corresponds to the fabric known as “Hegra 9”. These observations, as well as the location and plan of this fort (see Nehmé *et alii*) suggest that its date, thought to be Islamic, should be reassessed. It is possible that this fort was an earlier building, possibly from the (Late Nabataean?)/Roman period. Of course, this hypothesis should be checked through a proper study and excavation.

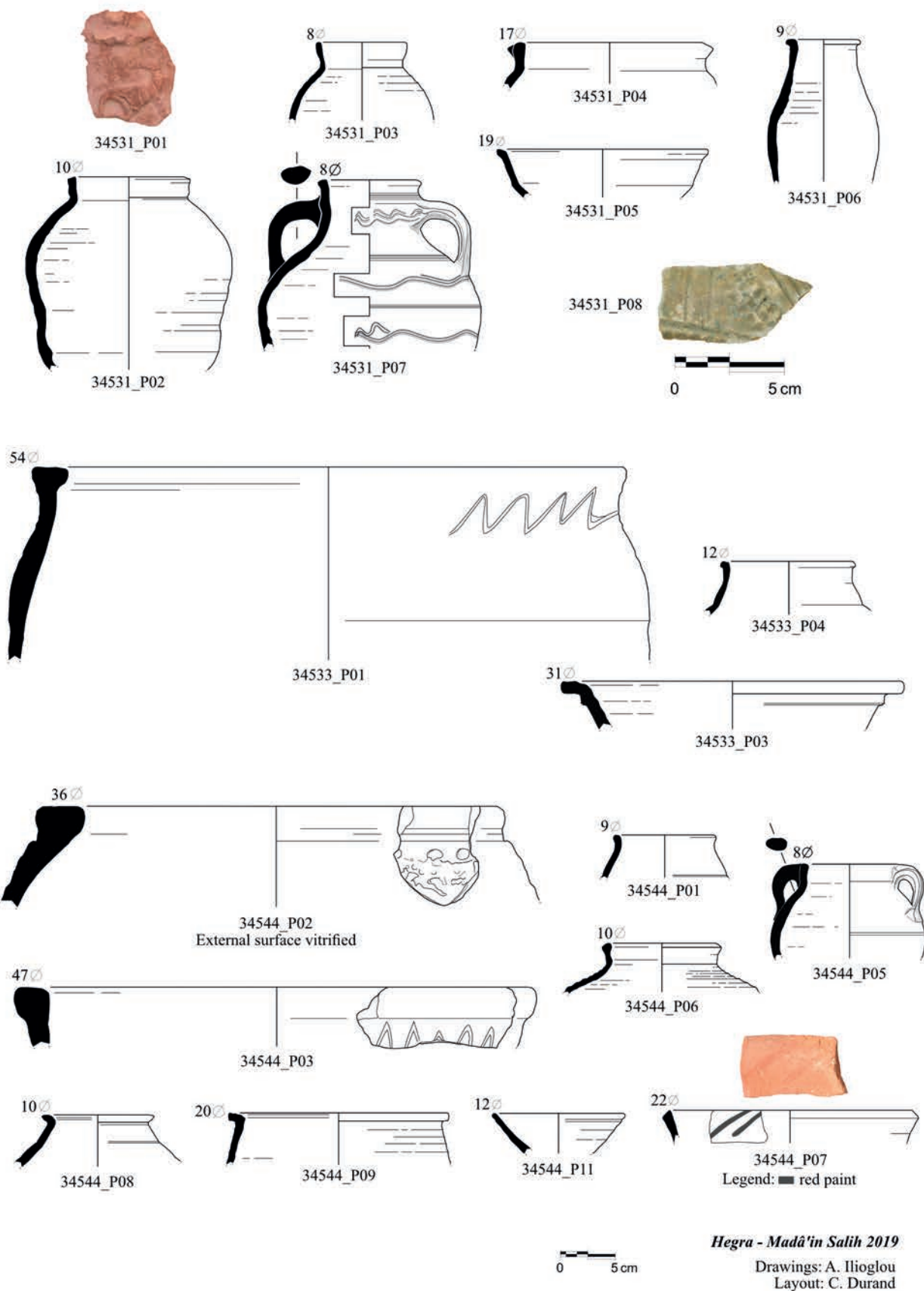


Fig. 3. Area 34, pottery from the Roman period.

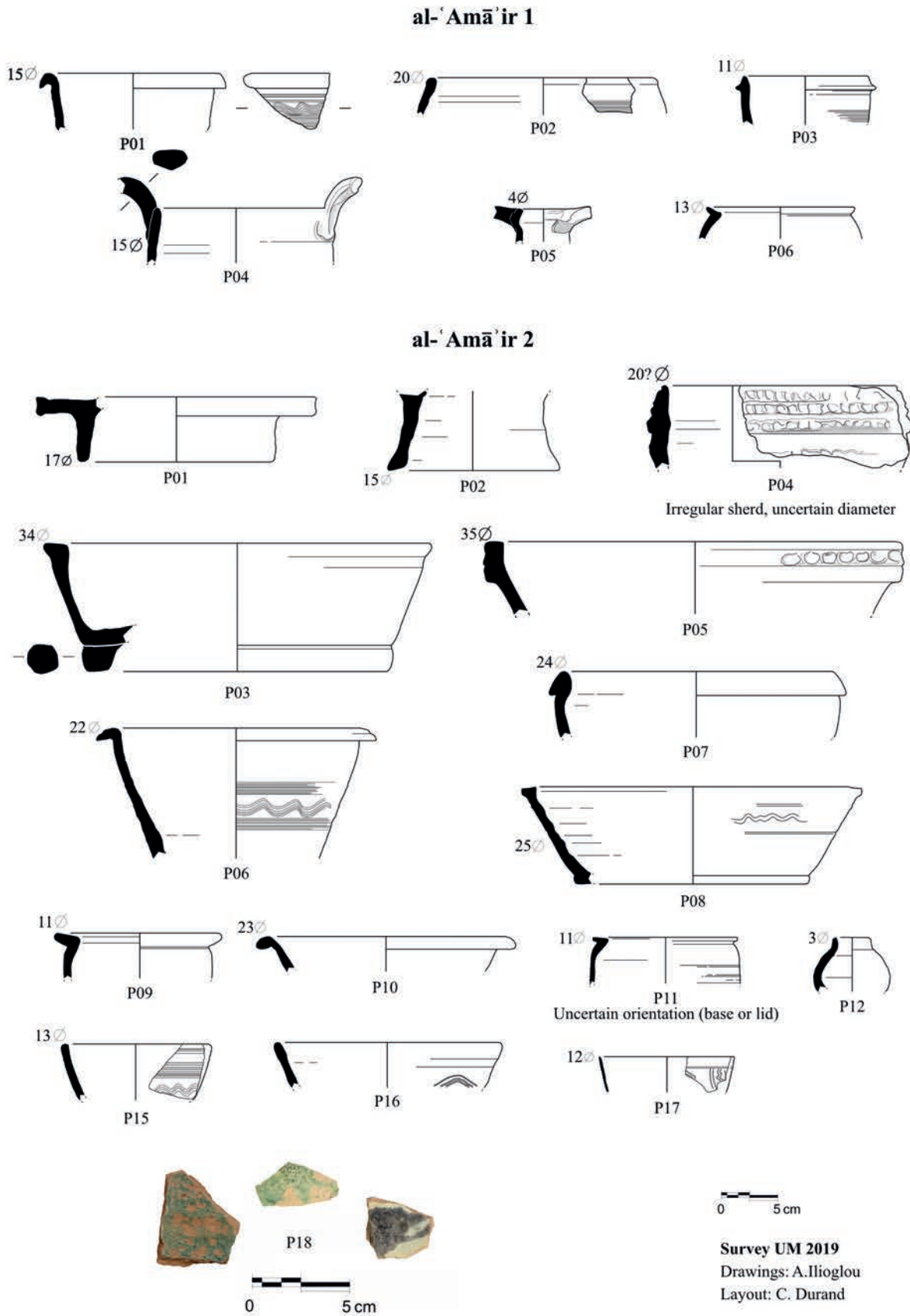
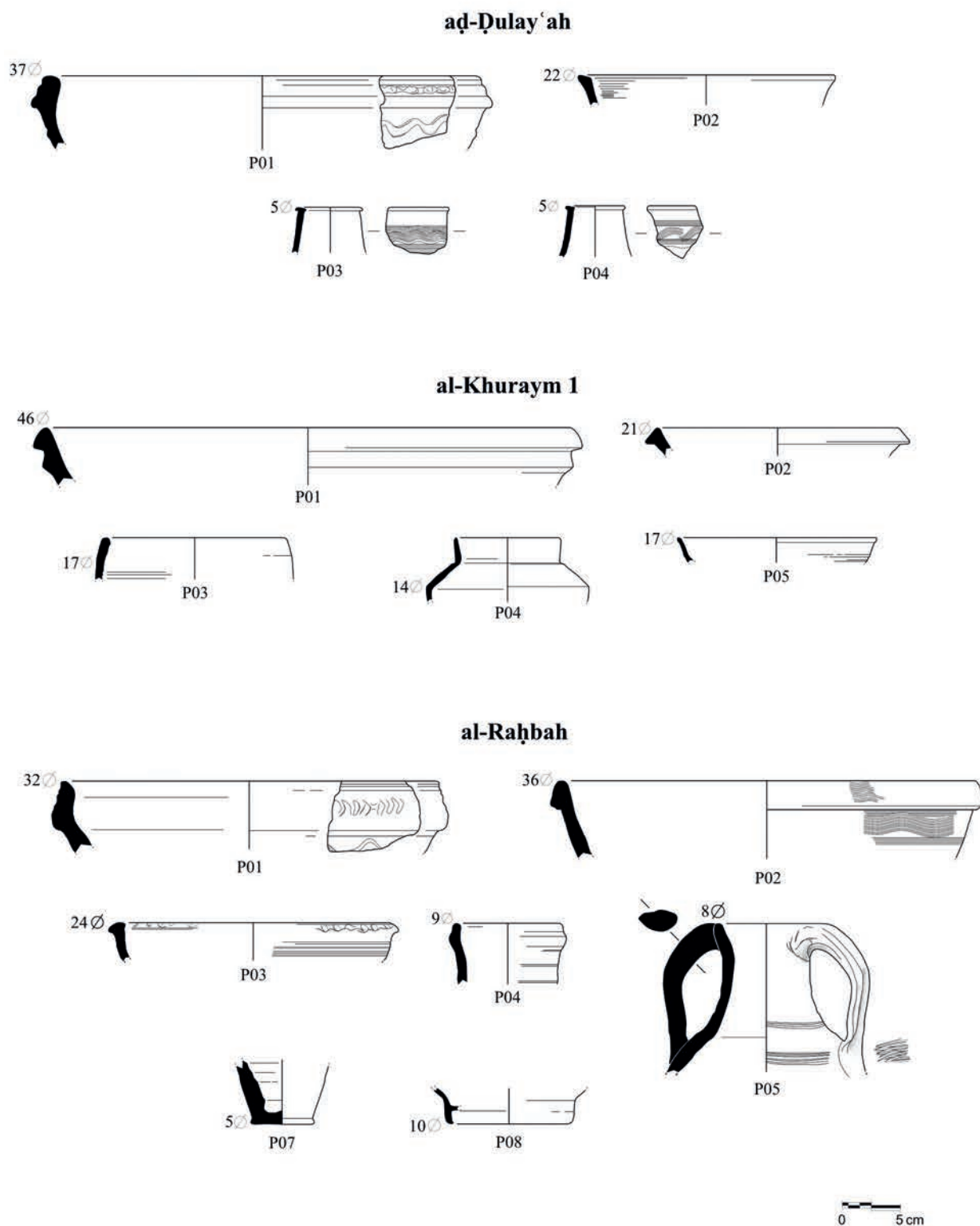


Fig. 4. Pottery from the UM Survey: al-'Amā'ir.



Survey UM 2019
Drawings: A. Ilioglou
Layout: C. Durand

Fig. 5. Pottery from the UM Survey: aḏ-Ḍulay'ah, al-Khuraym, al-Raḥbah.

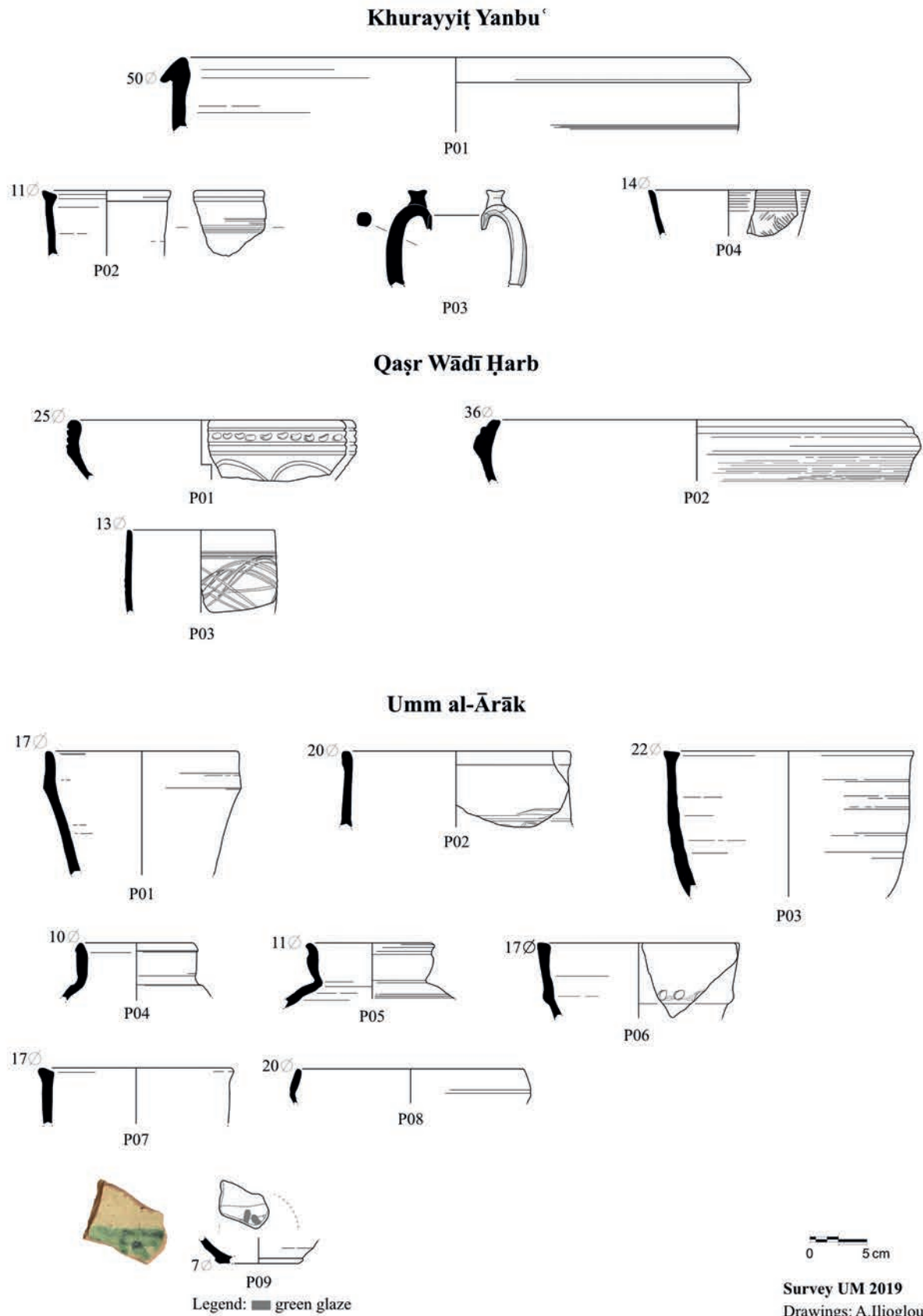


Fig. 6. Pottery from the UM Survey: *Khurayyīṭ Yanbuʿ*, *Qaşr Wādī Ḥarb* and *Umm al-Ārāk*.

Exports for residues analysis

A selection of base sherds from the jars found in 2015 in front of tomb IGN 116.1, as well as an alabaster fragment put to light during the 2019 season have been exported to France for the analysis of the residues of organic material they may contain. The aim of this analysis is to determine what was the contents of the characteristic 1st century AD local jars (so-called “jars with pinched rim”). Ten or so complete or almost complete jars of this type, which were probably part of the ritual deposits, were discovered in front of tomb IGN 116.1. The analysis will be carried out by the Laboratory Nicolas Garnier, with the financial support of the French Agency for the development of AIUla (Afalula), in collaboration with Elisabeth Dodinet.

List of samples exported:

- 34512_S01: small base of alabaster pot; provenance Roman fort;
- 50502_1: base sherd of jar; provenance tomb IGN 116.1;
- 50502_2: base sherd of jar; provenance tomb IGN 116.1;
- 50504_1: base sherd of jar; provenance tomb IGN 116.1;
- 50504_2: base sherd of jar; provenance tomb IGN 116.1 (taken from the jar 50504_P05);
- 50506_1: base sherd of jar; provenance tomb IGN 116.1 (taken from the jar 50506_P04);
- 50507_1: base sherd of jar; provenance tomb IGN 116.1.

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The Rock Graffiti Carved by Roman Auxiliary Troops at Hegra

Pierre-Louis GATIER (UMR 5189 HiSoMA, Maison de l’Orient et de la Méditerranée)

Abstract: The Greek and Latin rock graffiti of Hegra (Madā’in Šāliḥ), some of which have already been recorded since the end of the nineteenth century, were examined *in situ* in March 2018 when twenty-three unpublished graffiti were discovered, all of which are published here. These texts were carved by soldiers of two auxiliary Roman troops in the second century or the beginning of the third century AD: the *ala Gaetulorum* and the *ala dromedariorum*. They are important documents for the history of the province of Arabia to which Hegra belonged at the time.

Keywords: Hegra, (province of) Arabia, Roman army, camel troops, graffiti.

When I took part in the Madā’in Šāliḥ Archaeological fieldwork season on 1–8 March 2018, I was able to study the Greek and Latin rock graffiti that are spread over three different locations close to ancient Hegra.¹ Two of these sites, a few hundred metres east of the residential area, are in the form of low rocky mounds, close to each other and located respectively south of Jabal Ithlib West and south of Jabal Ithlib East (**fig. 30**).² The third site, located at Qubūr al-Jundī, about 7 km further south towards al-‘Ulā, essentially comprises a huge and fragmented mound. Added to these three groups is an isolated Greek graffito in another part of Jabal Ithlib. Other Greek and Latin texts from the site or from the area have been published by my colleagues or by our predecessors,³ or sometimes just located.

1. The project’s 2018 season was dedicated to study and research. During previous survey seasons, the project’s co-director, Laïla Nehmé, had located and registered all the epigraphic points that contained Greek inscriptions. She accompanied me at the beginning of my visit in order to show me their locations and provided me with information on the Nabataean graffiti mentioned in the commentaries below. My heartfelt thanks to Maurice Sartre, who was unable to join the 2018 fieldwork season and allowed me to publish the graffiti he had originally received for study. During the February 2020 season, I had the opportunity to supervise and occasionally modify some of the readings of the Jabal Ithlib inscriptions I had provided in the 2018 report.

2. Nehmé 2009: 46–48 and fig. 2 (here fig. 30).

3. Beaucamp and Robin (1981: 57–61) had created a valuable ‘Inventaire des inscriptions grecques et latines de la péninsule Arabique’ (Catalogue of Greek and Latin inscriptions in the Arabian Peninsula), including those of Madā’in Šāliḥ on p. 60. Following recent discoveries see, among others, the report and the published article on

Previous research

During his long sojourn in Arabia (1876–1878), the well-known English traveller, Charles Montagu Doughty, was the first European to copy a Greek inscription at Madā'in Šāliḥ, an unassuming isolated graffito next to the Dīwān of Jabal Ithlib (no. 42, below). Two other nineteenth-century travellers—the German Julius Euting and the Frenchman Charles Huber—both in search of Semitic inscriptions, published works of a more scholarly nature, in which Greek and Latin graffiti from Hegra appear beside inscriptions written in other languages. These publications were the result of explorations in Arabia which they partly undertook together in 1883–1884.⁴ Other scholars⁵—but not the authors of *CIS*—readily cite Charles Huber's posthumous publication, which came out in 1891, in preference to Julius Euting's, published in 1885. This partiality is probably due to Henri Seyrig's hasty judgement: 'I think Huber was the first to copy some of these graffiti, Euting merely recopied them'.⁶ Of Huber's facsimiles to be published, two were of Greek graffiti (nos. 29 and 39) and one of a Latin graffito (no. 40), at Qubūr al-Jundī. Although one of the Greek graffiti is common to both Huber and Euting (no. 39), as well as the Latin one (no. 40), each scholar copied a Greek text unknown to the other (Huber, no. 29; Euting, no. 36). The *Corpus inscriptionum Semiticarum* of the Académie des Inscriptions et Belles-Lettres refers—among Nabataean texts nearby—to the Latin graffito (no. 40) and two Greek graffiti (nos. 36 and 39), keeping closer to Euting than to Huber, although without fully understanding one of the former's facsimiles (no. 39). The Berlin Academy's *Corpus inscriptionum Latinarum* republishes the Latin graffito, also following Euting. The second volume of Euting's diary recounting his travels in inner Arabia was published in 1914 by Enno Littmann, one year after Euting's death. This is possibly the reason it received little attention from scholars, who seldom referred to it, despite the fact that it republished facsimiles of parts of two of the graffiti (nos. 39 and 40) and proposed a commentary on them.

During their first research mission in Arabia in 1907, the Dominican priests Antonin Jaussen and Raphaël Savignac,⁷ members of the Biblical School at Jerusalem, recorded a Greek graffito in Jabal Ithlib East (no. 8), which they promptly included in their 1909 publication. During the subsequent missions of 1909 and 1910, published in their 1914 volume, they increased the number of Greek graffiti from Qubūr al-Jundī, despite the fact that their principal interest lay in Semitic epigraphy. They found only one of the texts from this site written in Greek or Latin that had been published by their predecessors (no. 36), but recorded nine unpublished Greek texts (nos. 19, 25, 27, 30, 31, 32, 34, 35, and 41). On the isolated rocky mound which lies south of the area known as Jabal Ithlib East (east of the main fence enclosing the site), they also found four new Greek graffiti (nos. 7, 14a, 15, and 16). Their contribution in the context of the site's Greek epigraphy is considerable, all the more so as their records include the first transcriptions in lowercase, with translations, and commentaries.

the Greek and Latin texts found in the excavation of the south-east gate of the city wall at Hegra, F. Villeneuve in Nehmé 2015: 36–42 and 71–74; Fiema, Villeneuve & Bauzou 2020.

4. For details of these travels, their scientific results, and the death of Huber, murdered in 1884, see Sartre 1996: 544–545 and 549–551; Briquel-Chatonnet & Fauveaud-Brassaud 2008: 221, 226–227; Lozachmeur & Briquel-Chatonnet 2010.

5. Seyrig 1941; Sartre 1982.

6. Seyrig 1941: 219. It is true that Huber's facsimiles are far more precise than Euting's.

7. Sartre 1996.

In 1910 the first wave of fieldwork at Madā'in Šāliḥ, led by specialists in Semitic languages, Euting, Huber, and Jaussen and Savignac, came to an end. Thereafter, access to the site became very difficult. Without direct control of the documents and basing themselves on previous publications, historians and epigraphists of the Roman world—Henri Seyrig, Michael Speidel, and Maurice Sartre—concentrated mainly on the study of the military character of the Greek graffiti and the Latin graffito, on this occasion republishing the texts. In an article published in 1941, Seyrig brilliantly established that all these rock inscriptions, to which he added some of the nearby Nabataean graffiti, were not the result of 'soldiers going home after serving in the Roman armies', as Jaussen and Savignac had suggested.⁸ He identified the activity of soldiers from two guardhouses, one from the *ala Gaetulorum* (Gaetolian troop) at Jabal Ithlib and the other from the *ala dromedariorum* (camel troop) at Qubūr al-Jundī, thus arguing that Hegra was part of the Roman Empire after the conquest of the Nabataean kingdom under Trajan, which argument has prevailed ever since.⁹ Seyrig reproduced the texts of the graffiti, though in simpler form. Following this, Michael P. Speidel, a specialist in Roman military history, published a study of the Roman army in the province of Arabia,¹⁰ in which he selected only those graffiti that expressly mentioned soldiers or troops and suggested a few changes to the published texts. In a study of provincial borders, Maurice Sartre reviewed all the Greek and Latin graffiti and confirmed the texts based on the readings of the first editors.¹¹ Shortly afterwards, an article by Julian Bowsher summarized the documentation, contributing little else.¹²

In April 1984, more than seventy years after Jaussen and Savignac, David Graf was the first epigraphist to personally examine the graffiti of the site of Qubūr al-Jundī, unfortunately all too briefly and without seeing those at Jabal Ithlib. He found no new texts, and only rediscovered some of those already published (nos. 19, 25, 30, 31, 32, and 39 in Greek; no. 40 in Latin). He provided the first photographs of the graffiti¹³ and was also able to confirm some of the readings, especially of the Latin graffito. The authors of a collection of sources on the Nabataeans, published in 2003, reproduced the texts from Qubūr al-Jundī published by Graf, and followed Seyrig for those from Jabal Ithlib.¹⁴

For my part, in March 2018 I was able to study both the Greek and Latin rock graffiti, having searched for and checked through all my predecessors' texts, except for one from Qubūr al-Jundī, which to date is only attested from Jaussen and Savignac's records (no. 41). Unpublished graffiti were discovered on the same site, one in Latin (no. 38) and nine others in Greek (nos. 20–24, 26, 28, 33, and 37). In addition, east of the residential area of ancient Hegra, the rocky mound south of Jabal Ithlib West discovered by Laïla Nehmé has revealed six unpublished Greek texts (nos. 1–6); south of Jabal Ithlib East, three others were found in a previously identified area (nos. 13, 17,

8. Seyrig 1941: 220.

9. Nehmé 2009: 44–48 reports on the question of the southern extension of the province of Arabia and the arguments it provoked. See an important Latin inscription at Hegra in al-Talhi & al-Daire 2005 (*AE* 2004, 1620; *AE* 2007, 1639).

10. Speidel 1977.

11. Sartre 1982.

12. Bowsher 1986.

13. Only one photograph of the Greek graffiti had previously been published, by Jaussen and Savignac (1914: pl. 70, 3). This is graffito no. 7 from Jabal Ithlib.

14. Hackl, Jenni & Schneider 2003: 342–343 (Jabal Ithlib) and 349–351 (Qubūr al-Jundī).

and 18), and four on a rock detached from the mound (nos. 9–12). Twenty-three unpublished texts were added to the small corpus of Greek and Latin rock graffiti. I also revisited the isolated Greek graffito located near the Dīwān (no. 42).

Mound south of Jabal Ithlib West

Numbers 1–6. South of the western part of the mountainous area of Jabal Ithlib, on the eastern side of a small, isolated rocky mound (Ith77, epigraphic point no. 109),¹⁵ the so-called ‘Gaetulian Mound’,¹⁶ six Greek graffiti have been carved above two niches or notches, Ith75 and 76, whose shape recalls that of the basin-shaped niches found elsewhere at Hegra and Petra. Since the texts are written in a variety of layouts and writing styles, they do not appear to have been produced by the same hand. All previously unpublished, they are presented here from south to north.

No. 1 (fig. 1). Unpublished. Four lines carved inside a small dove-tailed cartouche (*tabula ansata*) located above niche Ith75. Thick and shallow lunate letters; alpha with horizontal bar. Dimensions:¹⁷ 13 x 22 cm; LH: 2–2.5 cm.

Μνησθῆ ΑΙ
CΩΛ[.]ΛC
Σαβεῖνος
4 καὶ Δ[ημή?]τρις.

‘May ..., Sabinus and Demetrios (?) be remembered.’

Critical remarks: at the end of the first line, I see a triangular letter followed by a letter stem, either an iota or a gamma; at the end of the second line, an alpha and sigma joined together, perhaps Σωα[δ]ας?



Fig. 1. No. 1 (photo P.-L. Gatier).

No. 2 (fig. 2). Unpublished. About 1 m north of the preceding graffito. Lunate letters, but the omicron is square; alpha with slightly broken bar; deep but eroded carving. Dimensions: 60 x 39 cm; LH 5–10 cm.

Μη-
 μνήσθη
 Μαίιορ
 4 [ὁ γρά?]φτας,
 μνησθῆ
 Α[...].C
 Ι [- -].

‘May Maior, the one who carved (?), be remembered, may ... be remembered’

Critical remarks: μηνμήσθη for μνήσθητι or μνησθῆ; see, in Egypt, Wagner 1987: 28, no. 7. L. 4, [γρά]φτας for γράψας?

No. 3 (fig. 3). Unpublished. North of the preceding graffito, above niche Ith76. Lunate letters, alpha with diagonal bar. Dimensions: 25 x 27 cm; LH 5–7 cm.

Μνησθῆ
 Γερμανός,
 Σαβεῖνο[ς]
 4 ἄλε.

‘May Germanus, Sabinus, (soldiers) of the *ala*, be remembered.’

Critical remarks: traditionally the Latin word *ala* (lit. wing) is translated as εἴλη in Greek (nos. 19 and 31, below), but here on line 4, it is transliterated (see nos. 6, 7a, 7b, 10, 14a, below). The form can be interpreted in two ways. Either, as I suggested recently for a graffito from the Jordanian desert,¹⁸ it is the undeclined word ἄλε, for ἄλη, a combination of the forms ἄλα and εἴλη; or it is the Latin genitive *alae* in which the ending is rendered by an epsilon, which seems to me less likely. Whatever the case, the term defines the words that precede it.



Fig. 2. No. 2 (photo P.-L. Gatier).

18. Gatier 2018: 279–281.



Fig. 3. No. 3 (photo P.-L. Gatier).

No. 4 (fig. 4). Unpublished. About 20 cm above the preceding graffito. To the right of a petroglyph depicting a horse and its rider, three carved lines are visible, the first of which (petroglyph or inscription?) does not appear to be in Greek. Dimensions: 40 x c.50 cm; LH 10 cm.

Χό[ρ(τη)].

Χόρ(τη).

‘The cohort. The cohort.’

No. 5 (fig. 5). Unpublished. About 2 m north of the preceding graffito, on a section of split rock. Letters finely carved and lunate; alpha with horizontal bar. Dimensions: 17 x 53 cm; LH 4–6 cm.

Μνησθῆ Οὐάλης

ἄλα Γετώρων

ὄ[π]ου ἄν [ῆ].

‘May Valens, (soldier) of the *ala Gaetulorum*, be remembered, wherever he may be.’

Critical remarks: Γετώρων for Γετούλων, with undeclined ἄλα. For the formula in line 3, see the following and no. 16.

No. 6 (fig. 6). Unpublished. About 3 m north of the preceding graffito, on a section of split rock. Thick lunate letters; alpha with horizontal bar. Dimensions: 53 x 73 cm; LH 4–8 cm.

Μνησθῆ Φιρ-

μεῖνος

ἄλε Γετού-

4 λων,

ὄπου

ἄν ῆ.

‘May Firminus, (soldier) of the *ala Gaetulorum*, be remembered, wherever he may be.’



Fig. 4. No. 4 (photo P.-L. Gatier).



Fig. 5. No. 5 (photo P.-L. Gatier).



Fig. 6. No. 6 (photo P.-L. Gatier).

The formula ‘may so-and-so be remembered, wherever he may be’ is found at Hegra in one of the texts of the south-east gate of the town.¹⁹ It is known occasionally in the Ḥawrān, where it does not appear to concern a soldier.²⁰ It does not seem to me to have any funerary significance. See previous graffito and no. 16.

19. F. Villeneuve in Nehmé 2015: 41 and 74; Fiema, Villeneuve & Bauzou 2020: 192–193, no. 10.

20. *IGLS* 13/2, 9612.

Mound south of Jabal Ithlib East

Numbers 7–18. In the mountainous eastern section of Jabal Ithlib, outside the modern fence that surrounds the protected area, stands a rocky mound situated about 200 m east of the previous mound and similarly clearly detached from the main massif. There are twelve Greek graffiti close to a large number of Semitic texts (Ith79, epigraphic point no. 106). The Greek texts can be divided into three categories according to their location. Graffiti nos. 7a, 7b, and 8, studied by Jaussen and Savignac, are all on the same section of rock, on the eastern side of the mound. The unpublished graffiti nos. 9–12 were discovered by L. Nehmé, carved on the southern face of a small rock hidden by a tree; it is detached from the mound but very close to it and slightly to the south of the former graffiti. Texts nos. 13–18, on the western face of the mound, belong to a group already identified by Jaussen and Savignac, but which contains a few unpublished graffiti.

Numbers 7–8. Positioned on the eastern side of the mound, at a height of about 3 m and at a point where the upper part sheltered by the rock projection at the top of the mound forms a smooth vertical surface.

Nos. 7a–7b (fig. 7). The letters carved on four lines can be divided into two or three inscriptions. The end of the first line, which to my mind does not constitute a separate graffito, runs up the rock face, probably due to previous splits in the rock. It seems to me that the second line can be divided in two parts—left and right—and the third line can be joined to the left-hand section. The fourth line should be treated separately; it is an unconnected inscription in a different writing style, notably angular omicrons, and is labelled 7b. Dimensions unknown.

Jaussen & Savignac 1914: 648–649, no. 16, photo pl. 70, 3, and facsimile pl. 153, by creating two texts, the second of which contains the end of the second line and the fourth line (Seyrig 1941: 219, no. 3, by shortening Jaussen and Savignac's first text, without bothering with the second one; Speidel 1977: 705, no. 3, in the same way; Sartre 1982: 31, nos. 3 and 4, going back to Jaussen & Savignac; Hackl, Jenni & Schneider 2003: 342, following Seyrig). Cf. Wuthnow 1930: 41, correction in line 4.



Fig. 7. No. 7a and b (photo P.-L. Gatier).

7a. Φουσκιανός Σεουῆρος
 ἐκύης δις [ἐ]ποίησεν ἐγ[ώ?].
 ἄλε Γετούλων.

‘Fuscianus Severus, cavalryman of the *ala Gaetulorum*; he made it twice; me (?)’

7b. Ραου ἄλεια, Θεμαλλου, Γοδαιου.
 ‘Of Raos, (soldier) of the *ala*, of Themallas, of Godaios.’

Critical remarks: on line 1, ligature of the second diphthong ou; the final epsilon is clearly visible: Σεουῆρος for Σεουῆρος. Jaussen and Savignac read Φολσκιανός, an unattested form which is nevertheless maintained by the other authors. On line 2 they also read ἐκύης δις, which they interpreted as ‘cavalryman, twice’ and ‘re-enlisted’, but the final three letters are now very faint. For the second text, they joined the end of line 2 (erroneously called line 3), Ἐποίησεν ἐγο...?, to line 4 which was read as ραου ἄλε ΙΘΕΜΑΜΟΥ Γοδλιου. Seyrig shortened their first text by merely citing the double name and the rank of cavalryman of the *ala Gaetulorum*, without bothering with the second text. Speidel did the same, but restored ἐκύης δις(πενσάτωρ?). Sartre gives Jaussen and Savignac’s two texts. In line 2, the final gamma is clear. In line 4, the first lambda is carved above the line. I take ἄλεια to be the Latin *ala*. In line 4, following a suggestion by Enno Littmann, Wuthnow corrected the last name to Γοδαιου, rather than Jaussen and Savignac’s Γοδλιου.

One can imagine a different configuration of the first three lines of the text, by treating Fuscianus and Severus as two separate individuals rather than one, Fuscianus Severus. The single name Severus in line 1 would be the subject of the verb: ‘Severus made it twice’. This hypothesis seems to me to be in contradiction with the graphic uniformity of line 1. In any case, the verb ‘to make’ should be understood in the sense of ‘to carve’ or ‘to write’, possibly even ‘to make a wish’ or ‘an offering’. Nevertheless, if the reading and amendment I propose for the end of line 2 are correct, there is certainly an error in the Greek, with the personal pronoun of the first person singular and a verb in the third person (instead of ἐποίησα). However, one should not be surprised by errors made by the military in the Greek language. In sum, my understanding is that the soldier Fuscianus Severus carved his text twice. The right-hand section of line 2, whose particular writing style had been noted by Jaussen and Savignac (with a slightly different configuration to mine), would constitute an addition. As for line 4, labelled 7b, my interpretation is completely different: it is a succession of proper names, implying information about the troop.

No. 8 (fig. 8). Slightly to the left of the preceding graffito. Two long-horned bovids are shown in profile, facing one another and surrounded by Dadanitic inscriptions and carvings of animals—camels and ostriches. A few Greek letters are carved under the body of the left-hand bovid. They overlap the image and appear to have been carved at a later date. Dimensions unknown.

Jaussen & Savignac 1909: 122.

Ὁ θεός.
 ‘The god.’

The god may be represented in the form of a bull, probably carved earlier than the Greek graffito. This text could also be read as an invocation, ‘oh god’, which would not require the identification of the god as an animal, and the two bovids could thus be interpreted as an offering.



Fig. 8. No. 8 (photo P.-L. Gatier).

Numbers 9–12. On the south face of a detached rock to the east of the mound and situated a little further south of the location of the two previous graffiti, are four unpublished texts discovered by L. Nehmé.

No. 9 (fig. 9). Unpublished. High on the rock face, on the left. Lunate letters, alpha with horizontal bar. The graffito closely follows the sloping line of a cleft in the stone. Dimensions unknown.

Μνησθῆ

Σεραπιακός.

‘May Serapiakos be remembered.’



Fig. 9. Nos 9–10 (photo P.-L. Gatier).



Fig. 10. No. 11 (photo P.-L. Gatier).

No. 10 (fig. 10). Unpublished. Slightly to the right of the preceding graffito. Same writing style. Dimensions unknown.

Μνησθῆ

Σαβεῖνος

ἄλε δρομεδαρ[ίων],

4 ὁ γράψας.

Μνησθῆ ὁ τόπος [- -].

‘May Sabinus, (soldier) of the *ala dromedariorum*, be remembered, the one who carved.

May the place ... be remembered.’

Critical remarks: there may be additional letters at the end of line 5, and possibly another line written underneath and very eroded.

The formula of line 5 is not very common, see no. 14a. I take it to be a variation of μνησθῆ or μνήσθητι ἐν τῷ τόπῳ, ‘may it be remembered in this place’, in Egypt, Wagner 1987: 38, no. 50. See, at Petra, graffito *IGLS* 21/4, 36, ἐν εἰορ(ῶ) τώπῳ [- -] μνη(σ)θῆ.

No. 11 (fig. 10). Unpublished. Left and below the preceding graffito. Thick and deep-set lunate letters, alpha with bar leaning to the right and nu with bar leaning to the left. Dimensions: 30 x 50 cm; LH 7–13 cm.

ΓΟΥΒΕC

ΤΕΜΑΙC

ΚΟΝΙΓΡΙΑ

Critical remarks: gamma or pi at the beginning of line 1; the third letter of line 1 is either a theta or a beta. The meaning of this text escapes me.

No. 12 (fig. 11). Unpublished. Below and to the right of the previous graffito. Dimensions: width 59 cm; LH 3–5 cm.

Μνησθῆ Ρουφε[ῖνος].

‘May Rufinus be remembered.’

Critical remarks: After epsilon, traces of three or four letters.



Fig. 11. No. 12 (photo P.-L. Gatier).

Numbers 13–18. In the western section of the mound, on a long vertical rock face forming a space sheltered by the projecting rock, and bordering the leaning platform that makes up the base of the mound, is a group of graffiti, nos. 13–18, presented here from north to south.



Fig. 12. No. 13 (photo P.-L. Gatier).

No. 13 (fig. 12). Unpublished. To the north and left of the group. Dimensions: width 75 cm; LH 7–17 cm.

Ἀμρίλος.
'Amrilos.'

Nos. 14a–14b (fig. 13).

No. 14a. A long text that takes up a good part of the carved face, a little to the right and south of the preceding graffito. Irregular lunate letters; alpha with horizontal bar. Dimensions: 29 x 253 cm; LH 8–14 cm.

Jaussen & Savignac 1914: 647–648, no. 14, and facsimile pl. 153 (Seyrig 1941: 219, no. 1; Speidel 1977: 705, no. 1; Sartre 1982: 30, no. 1; Hackl, Jenni & Schneider 2003: 342, following Seyrig).

Μνησθῆ Σαβῖνος [ca 3-4]ΤΙϚΑ
ἐκκύης ἄλα Γετούρω(ν). Μνησθῆ ὁ τόπος.

'May Sabinus, cavalryman of the *ala Gaetulorum*, be remembered. May the place be remembered.'

Critical remarks: in l. 1 Jaussen and Savignac decipher only the first word, but a few additional letters are visible on the facsimile; in l. 2, they read the final nu of Γετούρων, which I cannot make out and which is missing in their facsimile. On the final formula, see no. 10, above.



Fig. 13. No. 14
(photo P.-L. Gatier).

No. 14b. Unpublished. Below the preceding graffito. Faint letters. LH 5–6 cm.

[- - -] ΝΙΟΝ. Μνησ[θῆ - - -]



Fig. 14. Nos 15–17
(photo P.-L. Gatier).

No. 15 (fig. 14). To the right of the preceding graffiti, above the two graffiti that follow. Irregular lunate letters; angular theta. Dimensions: width 108 cm; LH 10–13 cm.

Jaussen & Savignac 1914: 649, no. 7, and facsimile pl. 153 (Seyrig 1941: 219, no. 4; Speidel 1977: 705, no. 4; Sartre 1982: 31, no. 5; Hackl, Jenni & Schneider 2003: 342, copying Seyrig).

Μνησθῆ Γερμαν[ός].

‘May Germanus be remembered.’

Critical remarks: Jaussen and Savignac (while showing the left letter stem of the nu on their facsimile) read Γερμα[νός]; Seyrig and Speidel, Γερμανός; Sartre, Γερμαν(ός).

No. 16 (see fig. 14). Below the preceding graffito. Close writing, lunate letters. Dimensions: width 223 cm; LH 6–8 cm.

Jaussen & Savignac 1914: 648, no. 15, and facsimile pl. 153 (Seyrig 1941: 219, no. 2; Speidel 1977: 705, no. 2; Sartre 1982: 30, no. 2; Hackl, Jenni & Schneider 2003: 342, following Seyrig).

Μνησθῆ Οὐρβανός, καὶ ὁ ἀναγινώσκων,
ὅπου ἂν ᾖ.

‘May Urbanus be remembered, and the one who reads it, wherever he may be.’

Critical remarks: for the formula, see nos. 5 and 6, above; the verb in the singular probably implies Urbanus alone, which was Jaussen and Savignac’s opinion.

No. 17 (see fig. 14). Unpublished. Below the preceding graffito, a few rather faded letters. Dimensions: LH 6–8 cm.

Ῥουφ[–].

‘Ruf..’

Critical remarks: probably someone’s name, such as Ῥοῦφος or Ῥουφῆνος, see no. 12, above, and no. 33, below.

No. 18 (fig. 15). Unpublished. To the right of the preceding graffito. Dimensions: width 172 cm; LH 8–13 cm.

Μνη[σθῆ] Ἀν[τω]νῖνος ἐ[κκ]ύης.

‘May Antoninus, cavalryman, be remembered.’



Fig. 15. No. 18
(photo P.-L. Gatier).

Qubūr al-Jundī

Numbers 19–41. The site of al-Jundī, also known as Qubūr al-Jundī or Maq‘ad al-Jundī (Makhzan El-Gindy, Huber; Qebour el-Ġindy, Jaussen & Savignac; Qebour el-djindy, and Maqad-djindy, Seyrig), c.7 km south of Madā’in Šālīḥ towards al-‘Ulā, is cut through by the road that links these two urban centres. The Greek, and one Latin, inscriptions are carved on the eastern faces of a fairly fragmented number of rocky mounds tightly grouped on the eastern side of the road. This location, bordering a highway, explains the previous discovery of these graffiti by Charles Huber and Julius Euting. Jaussen and Savignac later reviewed some of the Greek texts and added a few more. Subsequently, only David Graf was able to examine several of these graffiti, which he republished, though he did not find any unpublished ones. I was able to check almost all the readings of my predecessors *in situ* and discovered a few unpublished graffiti, but I did not find Jaussen and Savignac’s no. 4, which appears here as my no. 41.

No. 19 (fig. 16). On the southernmost carved face, at a height of c.2 m. Lunate letters, alpha with horizontal bar. Dimensions: 60 x 76 cm; LH 6–7 cm.

A Nabataean inscription, probably unpublished, is carved below the Greek text, visible on fig. 16. It reads ‘bgr and is probably unfinished.²¹

Jaussen & Savignac 1914: 646–647, no. 10, facsimile pl. 153 (Seyrig 1941: 219, no. 8; Speidel 1977: 704, no. 4; Sartre 1982: 32, no. 13); Graf 1988: 194, no. 5, photograph p. 209, (*SEG* 38, 1667; Hackl, Jenni & Schneider 2003: 350, following Graf).

Μνησθῆ
 Οὐλπις, Μά-
 γνος ἰππαῖς
 4 εἴλης δρομε-
 δαρί(ων).
 ‘May Ulpius, Magnus, cavalrymen of the *ala dromedariorum*, be remembered.’

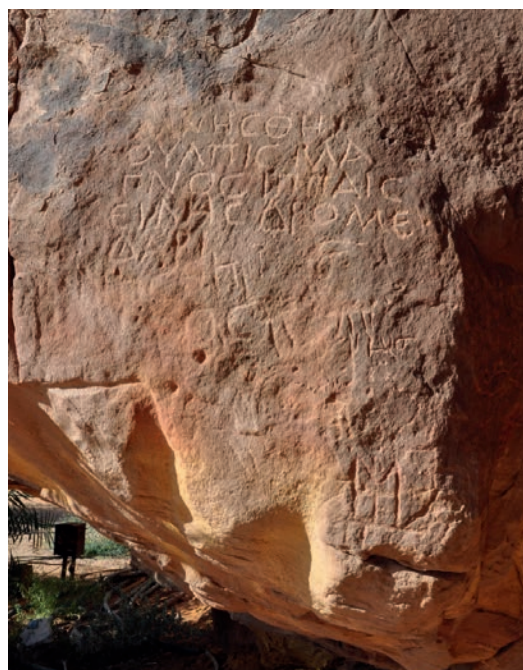


Fig. 16. Nos 19–20a and b (photo P.-L. Gatier).

21. L. Nehmé provided me with information on the Nabataean inscriptions. See note 1.

Critical remarks: ἰππαῖς for ἰππεῖς. In line 2, Graf restored (καὶ) between the two proper names. In line 5, Jaussen & Savignac, δρομεδάριος, adopted by Sartre; Seyrig, δρομεδάριος (= δρομεδαρί[ων]?), followed by Speidel; Graf, δρομεδαρί(ων); the pecked signs that Jaussen and Savignac read as omicron and sigma appear to me to belong to another graffito, which is not in Greek.

Nos. 20a–20b (see fig. 16). Unpublished (see photograph in Graf 1988: 209). On the same face as the preceding graffito, below: two lines start further to the left (20a) with a sign that resembles a monogram (20b) at the base of the rock face. Lunate letters, eta in the shape of an ‘h’. Dimensions: LH 7–10 cm.

20a.

Μνησθῆ
[Ρο]ῦφος.
‘May Rufus be remembered.’

20b. Monogram composed of a mu cut through by a vertical line and a horizontal line; perhaps for μνησθῆ?



Fig. 17. No. 21 (photo P.-L. Gatier).

No. 21 (fig. 17). Further to the right, on a transverse fault in the rock face, above the depiction of a scorpion. Lunate letters. Dimensions: 21 x 26 cm; LH 6–8 cm.

Μνησθῆ
Ραῖος.
‘May Raios (?) be remembered.’

Critical remarks: in line 1, the final two letters are carved on the right on jutting sections of the rock face, but it appears they were also sketched below the line; in line 2, is the circle over the first letter the loop of a rho, or could it be a scratch in the stone over the gamma for Γάιος, ‘Caius’?

No. 22. Unpublished. Slightly above the preceding graffito, on the right. Dimensions: width 11 cm; LH 4 cm.

[Μ]νησ[θῆ]
[---].



No. 23 (fig. 18). Unpublished. Further to the right, on a section of the rock face that is slightly set back, damaged surface. Finely carved lunate letters, almost pecked. Dimensions: 60 x 37 cm; LH 6–7 cm.

[M]νησ-
θῆ Κέλ-
ερ.

4 Μνησθ[ῆ]
NAN!H
[.]XIC.

‘May Celer be remembered; may ... be remembered.’

Critical remarks: in line 2, a kappa rather than a chi. In line 3, despite the damage to the stone, no other letters appear to be visible apart from the two isolated ones in the middle of the line. In lines 5–6, it is tempting to read Ἀντη[ο]χίς for Ἀντιοχίς, but the nu at the beginning of the line is clear and the anthroponym does not appear to be attested in this form.

Fig. 18. No. 23 (photo P.-L. Gatier).



Fig. 19. No. 24 (photo P.-L. Gatier).

No. 24 (fig. 19). Unpublished. On the same face, on the right. Pecked lunate letters, eta in the shape of an ‘h’. Dimensions: 23 x 70 cm; LH 6–10 cm.

Μνησθῆ
Μάξιμος.

‘May Maximus be remembered.’

No. 25 (fig. 20). On the same rock, to the right of the preceding graffito. Large, deeply carved letters, alpha with diagonal bar. Dimensions: 30 x 106 cm; LH 12–14 cm.

A Nabataean graffito which reads *whb'lh* ‘Wahb'allāhī’, is written in large letters above the Greek text. It is interesting for two reasons. First, the final *y* of the Nabataean name has clearly avoided overlapping with the *oc* of the Greek inscription no. 24. In this particular case, it shows that



Fig. 20. Nos 25–28 (photo P.-L. Gatier).

the Nabataean text was written *after* the Greek one and is therefore of a slightly later date. Second, the name Wahb'allāhī can be considered to be the exact equivalent of the Greek name Ouaballas.²² It is possible but not very likely that this is a coincidence, and it is therefore almost certainly an example of bilingualism, where only the name of the author of the texts is repeated. Jaussen & Savignac 1914: 646, no. 8, facsimile pl. 153 (Seyrig 1941: 220, no. 16; Sartre 1982: 32, no. 11); Graf 1988: 194, no. 4, photograph p. 208 (SEG 38, 1666; Hackl, Jenni & Schneider 2003: 350, following Graf).

Μνησθῆ
 Ουαβαλλας.
 'May Ouaballas be remembered.'

No. 26 (see fig. 20 and 21). Unpublished. Below and to the right of the preceding graffito. Very irregular letters. Dimensions: 18 x 48 cm; LH 4–7 cm.

Μνησθ[ῆ]
 Φαλελος.
 'May Phalelos be remembered.'

Critical remarks: the two triangular letters are definitely lambda, not delta or alpha.



Fig. 21. No. 26 (photo P.-L. Gatier).

22. For details, see Al-Jallad 2017: 107, no. 31, p. 132 and 168.

No. 27 (see fig. 20). Below and to the left of the preceding graffito. Irregular lunate letters; eta in the shape of an ‘h’. Dimensions: 20 x 97 cm; LH 7–10 cm.

Jausсен & Savignac 1914: 646, no. 9, facsimile pl. 153 (Seyrig 1941: 220, no. 15; Sartre 1982: 32, no. 12).

Μνησθῆ

Ἄντωνεῖνος.

‘May Antoninus be remembered.’

No. 28 (fig. 22). Unpublished. Below and to the left of the preceding graffito. Lunate letters; eta in the shape of an ‘h’. Two relatively well-preserved lines; the third is very faint. Dimensions: 36 x 107 cm; LH 8 cm.

Two Nabataean inscriptions are carved below this text. The top one, JSNab 239 (Jausсен & Savignac 1914: 296, no. 239), was carved *before* the Greek text because the sigma of Μνησθῆ overlaps the final *n* of the Nabataean text,



Fig. 22. No. 28 (photo P.-L. Gatier).

which reads as follows: šly br mlkywn. The bottom one, JSNab 238, reads šlm š’d’lhy br ’šdw.

Μνησθῆ

Ἀμριλις.

Μν[ησθῆ - -]

‘May Amrilios be remembered. May ... be remembered.’

Critical remarks: in line 2, it is not possible to read Αὐρήλις. The letters of the last line are very indistinct.

No. 29 (fig. 23). On the same rock, at the top and to the left of the five preceding graffiti. Lunate letters; alpha with horizontal bar, even writing style. Dimensions: 28 x 32 cm; LH 2.5–5 cm.

Huber 1891: 409, facsimile (Seyrig 1941: 219, no. 9; Speidel 1977: 704, no. 5; Sartre 1982: 32, no. 17).

Μν(η)σθῆ

Δημήτ-

ρις, Ζανν-

4 ίων δρομ(εδάριοι).

Πιπεράς.

‘May Demetrios, Zannion, *dromedarii*, be remembered. Piperas.’

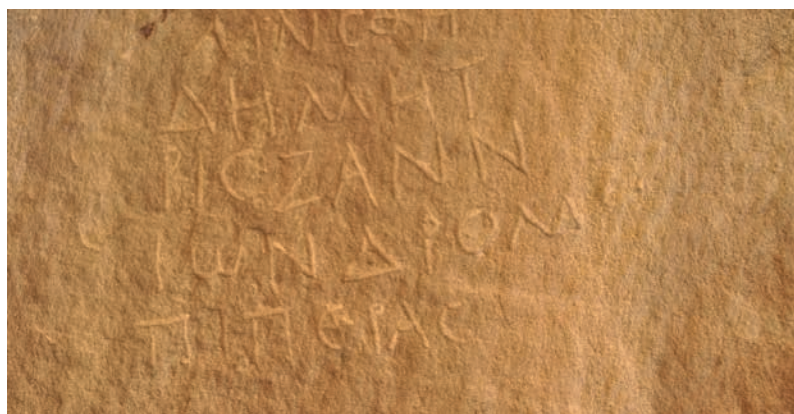


Fig. 23. No. 29 (photo P.-L. Gatier).

Critical remarks: in line 1, Huber copied it as MINCΘH, from which Seyrig has μινσθῆ, Speidel μινσθῆ, and Sartre μινσθῆ. It should be read MNCΘH, as for no. 30. Only Speidel completed the abbreviation in line 4, δρομ(εδάριος), probably thinking it refers to one soldier with a double name. In line 5, Huber copied a lunate sigma instead of the clearly visible epsilon; the other authors corrected Πιτ(ε)ρᾶς; the word should be understood as a nominative.

No. 30 (fig. 24). On the same rock face, to the right of the preceding graffito, bordering the break in the rock. Lunate letters; alpha with horizontal bar, even writing style. Dimensions: 15 x 74 cm; LH 6–8 cm.

Jaussen & Savignac 1914: 645, no. 5, facsimile pl. 153 (Seyrig 1941: 219, no. 14; Sartre 1982: 31, no. 8); Graf 1988: 192, no. 1, with photo p. 208 (*SEG* 38, 1663; Hackl, Jenni & Schneider 2003: 349, following Graf).



Fig. 24. Nos 30–32 (photo P.-L. Gatier).

Μν(η)σθῆ

Ἄντωνῖνος.

‘May Antoninus be remembered.’

Critical remarks: MNCΘH for μν(η)σθῆ, as for neighbouring no. 29, with a similar writing style.

No. 31 (see fig. 24). Bordering the break in the rock, above the preceding graffito and with the same writing style. Dimensions: 30 x 97 cm; LH 6–8 cm.

Jaussen & Savignac 1914: 645–646, no. 6, facsimile pl. 153 (Seyrig 1941: 219, no. 7; Speidel 1977: 704, no. 3; hence *CBI*, 729; Sartre 1982: 31, no. 8); Graf 1988: 193, no. 2, with photo p. 208 (*SEG* 38, 1664; Hackl, Jenni & Schneider 2003: 349, following Graf).

Μνησθῆ Σεουῆ-

ρος εἴλης δρο-

μιδαρίων{ρον}.

‘May Severus, (soldier) of the *ala dromedariorum*, be remembered.’

Critical remarks: in lines 2–3, Jaussen and Savignac read δρομιδάριος, followed first by initials in the shape of an inverted lunate sigma and a phi, Ϝ Φ, two signs understood to be the initial denoting the century (*centuria*) and the abbreviation of the name of the century (suggesting *Flavia*); second, to their eyes, the last two letters of line 3 are ΘΗ and belong to the graffito underneath (here no. 32) of which they completed the first line. Hence Seyrig, who nevertheless corrected δρομεδάριος, and Sartre, δρομιδάρις; Speidel, δρομεδάριος β(ενε)φ(ικιάριος), followed by *CBI*. At the end of line 3, Graf read an omega followed by a phi followed by the two letters ΘΗ of the next graffito; he restored δρομιδαρίω(ν) φ. I see an omega overlapped by the first nu of line 3, as if an incorrect form – ΔΡΟΜΙΔΑΡΙΩΡΟΝ, with a final nu in the shape of an ‘H’ – had been corrected by adding a nu to the omega. If, as Jaussen and Savignac thought, the last two letters of line 3 should ever be attached to the lower graffito, no. 32, this would have been due to a late modification which made them change the letters from ON to ΘΗ, at a cost of minor re-carving, but I doubt it for two reasons: on the one hand, one can clearly see the beginning of a theta at the

end of line 1 of graffito no. 32; on the other, there would have been enough space above line 1 to complete it without going up to the preceding graffito.

No. 32 (see fig. 24). Running along the break in the rock, below the preceding graffito and in the same writing style. Dimensions: 26 x 70 cm; LH 5–8 cm.

Jaussen & Savignac 1914: 646, no. 7, facsimile pl. 153 (Seyrig 1941: 219, no. 10; Speidel 1977: 704, no. 6; Sartre 1982: 31, no. 10); Graf 1988: 193, no. 3, with photo p. 208, (*SEG* 38, 1665; Hackl, Jenni & Schneider 2003: 349, following Graf).

Μνησθ[ῆ]
Ούλιανός
ἱπεύς.

‘May Ulpianus, cavalryman, be remembered.’

Critical remarks: Jaussen and Savignac read and understood μνησθῆ; on the subject of the end of line 1, see the critical remarks for no. 31, above. In line 3, ἱπεύς for ἱππεύς.

No. 33 (fig. 25). Unpublished. On another rock face, a few metres north-west of the preceding section, about 4 m above the ground, to the right of a carved camel and below a bovid. Lunate letters, eta in the shape of an ‘h’. Dimensions unknown.

Μνη(σ)θ[ῆ]
Ροῦφος.

‘May Rufus be remembered.’

Critical remarks: line 1, before the break, ΜΝΗΘ.

The image of a camel may be connected with a troop of camel riders unless, as for the bovid, it symbolizes an offering.

No. 34 (see fig. 25). On the same rock face as the preceding graffito and immediately below it, to the right of another carved camel. Lunate letters. Dimensions unknown.

Jaussen & Savignac 1914, p. 647, no. 12, et fac-similé pl. 153 (Seyrig 1941, p. 220, no. 19; Sartre 1982, p. 32, no. 15).

Μνησθῆ
Ραουα-
ος.

‘May Raouaos be remembered.’

Critical remarks: line 2 was read as .AOYA by the editors and their successors; line 3 had not been noticed.

No. 35 (fig. 26). On the right, to the north of the two preceding graffiti. Lunate letters, alpha with diagonal bar. Dimensions unknown.

Jaussen & Savignac 1914: 647, no. 11, facsimile pl. 153 (Seyrig 1941: 220, no. 17; Sartre 1982: 32, no. 14).

Μνεσθῆ
Ουαβαλλ-
ας.

‘May Ouaballas be remembered.’

Critical remarks: μνεσθῆ for μνησθῆ.



Fig. 25. Nos 33–34 (photo P.-L. Gatier).



Fig. 26. No. 35 (photo P.-L. Gatier).

No. 36 (fig. 27). On a collapsed rock, north of the preceding section, carvings of a Nabataean inscription, two Greek texts (nos. 36 and 37), and the image of a camel. No. 36 is located below the Nabataean text, JSNab 243, which reads š'd'lhy br 'šdw (Jaussen & Savignac 1914: 296, no. 243; Graf 1988, no. 16, p. 199–200). Lunate letters, alpha with diagonal bar, phi shaped like a cross-bow. Dimensions: width 77 cm; LH 4–7 cm.

Euting 1885: 13, fig. 8, facsimile no. 46 (*CIS* II, 1, 315, pl. 42); Jaussen & Savignac 1914: 647, no. 13, facsimile pl. 153 (Seyrig 1941: 220, no. 17; Sartre 1982: 32, no. 14).

Μνη(σ)θῆ {Α}Φλάϊος.

'May Flavius be remembered.'

Critical remarks: μνηθῆ for μνησθῆ. Euting copied ΜΝΗΘΗ ΑΦΗΟΥ, hence *CIS*. Jaussen and Savignac, who do not mention Euting, read Ἄφλος, not seeing either the first of the triangular letters that follow the phi, a narrow lambda, or the finally carved iota before the omicron; in addition, I have excluded from the text the triangular letter that precedes the phi, which they understood to be an alpha, because it has been hammered or scratched; I see the intermediate diagonal bar of the alpha, which they identified



Fig. 27. Nos 36–37 (photo P.-L. Gatier).

as a lambda. I do not deny the uncertainty of this proposition, based on the reading of the neighbouring text, no. 37, which contradicts the Nabataean graffito, also nearby (Graf: *tymw br 'fjs* 'Taymu son of 'Aflos').

No. 37 (see fig. 27). Unpublished. Above the preceding text. Dimensions: 27 x 80 cm; LH 7–8 cm.

Μνη{σθη}σθῆ

Φλάϊος.

'May Flavius be remembered.'

This could simply be a clumsy repetition of the preceding graffito by the same inexperienced carver. The writing styles are very similar.

No. 38 (fig. 28). Unpublished. On a rock face located north of the group. At a height of about 3 m, the graffito is the farthest left of a group of three (nos. 38–40); set apart from the other two and in a relatively low part of this section of the rock face. The letter ‘E’ is square, similar to the ‘E’s of the Latin graffito, no. 40. There are several Nabataean inscriptions, published by Jaussen and Savignac and by D. Graf, carved on the same face.

BE

This might be a practice carving of the Latin text of graffito no. 40.

No. 39 (see fig. 28). In the centre of the rock face in which the preceding graffito is located. This graffito is spread over two lines. In order to avoid the damaged parts of the rock face, the first line begins further to the right than the second line and its last five letters are shifted to the right. Lunate letters, alpha with horizontal bar. Dimensions unknown.

Euting 1885: 13, fig. 8, facsimile no. 49; Huber 1891: 407, facsimile on three lines (*CIS* II, 1, 311, commentary, p. 290, about the adjacent Nabataean inscription, and facsimile shared between nos. 310 and 311 in pl. 42; Seyrig 1941: 219, no. 5; Speidel 1977: 704, no. 1; Sartre 1982: 31, no. 6); Euting 1914: 250, facsimile of the beginning of the first line and discussion; Graf 1988: 194, no. 6, and photo p. 210 (*SEG* 38, 1668; Hackl, Jenni & Schneider 2003: 350, following Graf).

Cf. *CIL* III, Suppl., fasc. 1, no. 6637, where line 2 is cited.

Μνησθῆ Κάσσις δρομεδάρης
τόρμα Μαρίνι.

‘May Cassius, *dromedarius* in Marinus’ *turma*, be remembered.’

Critical remarks: Euting’s 1885 facsimile omits the final sigma of Κάσσις, hence Seyrig, Speidel, and Sartre’s Κάσσι(ς); Huber and Graf saw this letter. In *CIS*, the cut in line 1 is not understood and the last five letters are isolated, thus producing the following reading: μνησθῆ Κασσίδρομε. Surprisingly, this interpretation, which is perhaps the result of Enno Littmann’s subsequent role in the edition of Euting’s *Tagbuch*, can be found in the 1914 volume, where the beginning of the first line of the graffito is isolated and the anthroponym Kassidromos, in the vocative form, is identified.



Fig. 28. Nos 38–40
(photo P.-L. Gatier).

No. 40 (see fig. 28). On the right of the preceding graffito. The Latin graffito is spread over three lines, the last of which overlaps with a Nabataean graffito. The ‘S’s are lengthened, almost cursive, the ‘E’s are square. Dimensions unknown.

Euting 1885: 13, fig. 8, facsimile no. 498 ; Huber 1891: 408, facsimile (*CIS* II, 1, 310, commentary p. 290, facsimile pl. 42; *CIL* III, Suppl., fasc. 1, no. 6637; Seyrig 1941: 220, no. 20, in uppercase, and Seyrig 1946: vii, correction; Speidel 1977: 704, no. 10, in uppercase; Sartre 1982: 33, no. 21, in uppercase; *CBI*, 729, after Euting); Euting 1914: 250–251, facsimile of the two first lines and discussion; Graf 1988: 195, no. 7, photo p. 210 (*SEG* 38, 1668; Hackl, Jenni & Schneider 2003: 350, following Graf).

Cf. Nelis-Clément 2000: 374; Nehmé 2009: 45–46, with photo (*AE* 2009, 1619).

Bene sit

Titus.

A me.

‘May he, Titus, be well. By me.’

Critical remarks: line 1, Euting, BENETIT; Huber’s facsimile hesitates between an ‘S’ and a ‘T’ for the last two consonants; the *CIS* facsimile, pl. 42, is similar to Euting’s, and the commentary transcribes it as *Bene fit*. *CIL* follows Euting and cuts it—BENE TIT. Seyrig’s 1941 facsimile also resembles Euting’s and his commentary suggests a *beneficiarius* in line 1; hence Speidel’s transcription, followed and extended by *CBI*, *benefi(c)(iarius)*. Seyrig’s 1946 facsimile corrected it, disregarded the *beneficiarius*, and transcribed *benefit Titus a me*. Sartre gives BENEFIT. Graf reviewed the graffito and read *Bene sit* (hence Nelis-Clément who removed this text from the list of *beneficarii*; the photograph in Nehmé 2009: fig. 1, confirms this reading). In line 3, the first letter (understood in *CBI* to be a cursive lambda) has no horizontal bar and publications simply reproduce the line in facsimile; only *CIS* proposes *a me*, and *CIL* *ame(n)*; Graf saw an abbreviation for *a(la) m(iliaria) e(xploratorum)*. On this point I accept *CIS*.

The usual formula, as David Graf has emphasized, is made up of *bene sit* followed by a name or a pronoun in the dative, often *bene sit tibi*.²³ It can be translated as ‘Good wishes to you’ or ‘May everything go well for you’. Here the writer has got confused, probably because he was also the carver, which, it seems to me, makes sense of the last line, the meaning of which would be ‘(written) by me’.

No. 41. According to Jaussen and Savignac, located on the small hill of ‘Qebour el-Ġindy [...], among Nabataean graffiti’. Lunate letters. Dimensions unknown.

Jaussen & Savignac 1914: 645, no. 4, facsimile pl. 153 (Seyrig 1941: 219, no. 6; Speidel 1977: 704, no. 2; Sartre 1982: 31, no. 7). I have not been able to find this text.

Μνησθῆ Μάγνος τ(όρμα?) Κασσίου.

‘May Magnus, (soldier) in Cassius’ *turma* (?), be remembered.’

Critical remarks: Jaussen and Savignac considered the sign in the shape of a ‘T’ between two dots that precedes the kappa to be a *wasm* separating two graffiti. They treated it as the equivalent of a strong punctuation mark and divided the end of the text, Κασσίς δ(ρομεδάρις); hence Seyrig, who removed the ‘T’; Sartre reinstated it; Speidel understood it to be the abbreviation of *turma*, and removed the following Κάσσις. On Jaussen and Savignac’s facsimile, the penultimate sign, interpreted as a lunate sigma by the editors, could be an omicron, and the final sign, which is

23. E.g. *AE* 2007, 832; *CIL* III, 12484; *CIL* XIV, 1873.

damaged, is more like an epsilon than a delta; following Speidel for the sign in the shape of a 'T', I have reinstated a name in the genitive.

Isolated Greek graffito

In the mountainous area of Jabal Ithlib, at the southern entrance to the so-called Dīwān Pass, known for its cultic features and numerous inscriptions, I revisited a previously known Greek graffito.

No. 42 (fig. 29). On the rock face that faces the great triclinium called the Dīwān, but which looks out to the west, to the right of a decorated niche (Ith6, epigraphic point no. 58). Greek graffito above a small group of signs, a petroglyph or Semitic graffito. Dimensions unknown.

Doughty 1884: facsimile, pl. 6; Doughty 1936, vol. 1: 162.

ΕΥΤΥΧΟΣ.

'Eutychos.'

Critical remarks: Doughty's 1884 facsimile provides the first four letters, EYTY, as it does in the account of his travels. The last three letters of the Greek anthroponym are ligatured, with a chi that appears to have been added later.



Fig. 29. No. 42 (photo P.-L. Gatier).

Roman troops at Hegra

The graffiti and their formulae

The term 'graffito' used here for the rock inscriptions of Hegra is in no way pejorative. It describes an inscription carved without the intervention, or with the very limited intervention, of a professional artisan, quarrier, stone carver, stone polisher/engraver, or sculptor. The spontaneity of the actions of those who carved these texts on the rocks should not be exaggerated, especially when the texts are grouped within very limited spaces. However, errors, corrections, and revisions which are commonly found in the texts show that these graffiti were not carefully prepared well in advance. In some cases, as for nos. 29–33, the writing is so similar as to give the impression that the group of texts was carved at the same time by the same hand. Elsewhere, diversity prevails. Occasionally, the person who has written his name declares it himself (no. 2? nos. 7a, 10, and 40). In the case of the Greek texts, the very high number of rock graffiti written in other languages served as models or incentives. Thus, the association with petroglyphs, such as the images of camels (nos. 33–34), which is a rarity in Roman epigraphy of the Near East, is no doubt influenced by the multiple drawings, which, alongside the Semitic inscriptions, cover the rocks and cliffs of the region around Hegra.

The Greek and Latin graffiti were carved at heights that are not always easy to reach, but in such a way that they are all more or less readable, as illustrated by the evocation of the reader in graffito no. 16. In the texts which more or less express the voice of the soldiers, Latin is poorly

represented (nos. 38 and 40), and even less than in other Near Eastern sites containing military graffiti.²⁴ To be sure, although Latin was the language of the army and it was used in a minority of official texts and in some epitaphs, few soldiers in the auxiliary troops of the Eastern provinces knew how to write it. Its oral use must have been more widespread, which would explain why the Latin military technical vocabulary is here more often transliterated, rather than translated, into Greek (τόρμα, χόρπη, ἄλλα, ἐκκύης/ἐκύης).

At Hegra, the Greek and Latin graffiti all include the names of individuals, sometimes with an indication of their military rank. The formula μνησθῆναι, ‘may ... be remembered, may memory be made of..., may ... be commemorated’, often precedes the proper name(s). It should be noted that throughout the Eastern Roman world, there are very many inscriptions that contain this formula or one of its variants, and this also applies to the Christian texts of the protobyzantine period. These inscriptions, very often graffiti, are particularly numerous in the Near East, on rocks and cliffs in the Sinai and as far as Dura, where they are found in great numbers on the walls of numerous buildings. At Hegra, the anthroponym is sometimes followed by ὅπου ἂν ᾖ, ‘wherever he is, wherever he may be’. This expression appears to differ from another formula also known at Hegra, ‘may the place be remembered’, as though on the one hand expressing a commemoration linked to a precise location, and on the other, a far-reaching memory linked to the mobilization effected by military activity. There is, in any case, nothing to associate the Hegra graffiti with a burial context, despite the address to the reader in one of them, no. 16, which is also common in the epitaphs of the Roman world.

At Hegra, some of the Greek graffiti of this very specific type with μνησθῆναι, are concentrated in three sites, while the Semitic graffiti are much more numerous and widespread. This therefore begs the question about the characteristics and function of the rocky areas on which the Greek texts are carved. Should they be seen simply as places through which patrolling soldiers walked or at which they stopped, perhaps strategic locations, guard posts where the soldiers were stationed and camped for a considerable period of time? Or should one stress the religious aspect of the desire to group together names in specifically chosen places? These graffiti could thus be associated with *ex votos*, acts of devotion, and calling on divine protection, which are particularly prevalent in the Greek graffiti found in the Egyptian deserts. The monumentality of some of the groups—for example, on the elevated sections of Qubūr al-Jundī—the presence of rock niches on the mound south of Jabal Ithlib West, and the mention of a god in graffiti no. 8 all point, in my opinion, to the religious character of the sites containing Greek graffiti.

It seems to me that, from the grouping of the military graffiti in selected locations, one cannot draw any conclusions on the proximity of, or distance from, the barracks or guard posts of the relevant units. The sites would have been chosen because the soldiers had identified them as having a particular religious value, whether they were close to their troop’s encampment or not. In the south-eastern gate, the presence of Greek graffiti of nearly the same type as those studied here, does not seem to me to contradict this view,²⁵ considering the religious as much as defensive character of the circulation areas of the city gates. Add to this the fact that if the site of Qubūr

24. The site of Namārah (Nemara), east of the Ḥawrān, has revealed forty graffiti, ten of which are in Latin, though the latter very often mention the Legion III Cyrenaica, not auxiliary troops; Sartre 2016. See also the site of Bāyir in Jordan; Gatier 2018.

25. F. Villeneuve in Nehmé 2015: 36–42 and 71–74; Fiema, Villeneuve & Bauzou 2020: 184–185 and 192–195, nos. 3 and 10–14.

al-Jundī only contains graffiti by soldiers from the camel troop, those in Jabal Ithlib mention, apart from the *ala Gaetulorum*, one camel rider (no. 10) and one cohort (no. 4), showing that sites were frequented by a more diverse range of visitors than had previously been thought. The sites where the soldiers engraved their names were chosen for their religious significance, not for their strategic location.

Onomastics

It would appear that, except for no. 42, all the graffiti bear the name of (a) soldier(s). When the texts are not specific, their topographical grouping, the uniformity of their formulae, and the common characteristics of their proper names lean towards this conclusion.

Two separate groups of soldiers were identified. On the one hand the men of the *ala Gaetulorum*; on the other, those in the camel troop, the *dromedarii* (or *dromidarii*). Valens, Firminus, Fuscianus Severus (or Fuscianus and Severus), and Sabinus are clearly identified as soldiers of the former (nos. 5, 6, 7, and 14a). If we include in the *ala Gaetulorum* the anthroponyms that appear in the graffiti on the same rock faces, we can add Sabinus and possibly Demetrios, Maior, Germanus, Sabinus, Amrilos, Germanus, Urbanus, Rufus or Rufinus, and Antoninus (nos. 1, 2, 3, 13, 15, 16, 17, and 18), as well as the three names cited in no. 7b, Raos, Godaios, and Themallas. Similarly, several soldiers are specifically designated as belonging to the *dromedarii*, namely Sabinus, Ulpus, Magnus, Demetrios, Zannion, Piperas, Severus, Cassius, and Marinus (nos. 10, 19, 29, 31, and 39). Other names carved in the same locations can also be added to the troop of camel riders: possibly Serapiakos and Rufinus south of Jabal Ithlib East (nos. 9 and 12) and probably Rufus, Raios, Celer, Maximus, Ouaballas, Phalelos, Antoninus, Amrilios, Antoninus, Ulpianus, Rufus, Raouaos, Flaios/Flavius, Titus, Magnus, and Cassius (nos. 20, 21, 23, 24, 25, 26, 27, 28, 30, 32, 33, 34, 36–37, 40, and 41).

These two groups of proper names are not equal in number, one containing about seventeen names and the other twenty-eight, but they are fairly similar in composition. As Seyrig observed, Latin names greatly dominate in the *ala Gaetulorum*, with possibly one Greek name, Demetrios, and four Semitic names, Raos, Godaios, Amrilios, and Themallas (no. 7b). Among the camel riders, the Latin name is equally preponderant, but there is a small number of Semitic anthroponyms, such as Amrilios, Ouaballas, Phalelos, Raios and Raouaos, and Zannion; or Greek, such as Demetrios and Serapiakos. The latter, from the name of the god Serapis, is not attested in the Near East and could have been brought over from Egypt; as for Demetrios, it is very common throughout the East.²⁶ The name Piperas, on the other hand, derived from the word for pepper (*piper*), is of Latin origin.²⁷

Some Latin names represented in the groups studied above are known at Hegra through other texts located near the south-eastern gate, namely Maximus and Fuscianus.²⁸ Others, such as Antoninus, Cassius, Germanus, Rufus, and Sabinus, are found in two or three examples of rock graffiti. In neither case is it possible to know whether they refer to the same individuals. One should also resist making a link between the Latin names and the ethnic origin of those that bear

26. Sartre 1985: 198.

27. Seyrig 1941: 221, n. 1.

28. F. Villeneuve in Nehmé 2015: 41 and 74.

them. Most of the Latin names at Hegra were extremely popular in the province of Arabia and especially in the Ḥawrān, where, as Maurice Sartre has shown, names of Semitic origin—sometimes translated,²⁹ sometimes adapted from assonance³⁰—could be concealed behind the Latin-type anthroponyms. Other Latin names, such as Ulpianus, are common in Roman Arabia, though the reason is unknown, while Celer, Firminus, and Urbanus are rare or absent. Antoninus, which is quite frequent in Arabia, probably evokes one of the emperors, who, in the period spanning Antoninus Pius to Caracalla, bore this *cognomen*.

Table of names attested in the graffiti

Name	Unit	Inscription no.	Type	Name attested elsewhere at Hegra
Amrilos	<i>ala Gaetulorum?</i>	13	Latin	
Antoninus	<i>ala Gaetulorum?</i>	18	Latin	
Demetrios?	<i>ala Gaetulorum</i>	1	Greek	
Firminus	<i>ala Gaetulorum</i>	6	Latin	
Fuscianus Severus/ Fuscianus and Severus	<i>ala Gaetulorum</i>	7a	Latin	ZPE 2020, no. 13
Germanus	<i>ala Gaetulorum?</i>	3	Latin	
Germanus	<i>ala Gaetulorum?</i>	15	Latin	
Godaios	<i>ala Gaetulorum?</i>	7b	Semitic	
Maior	<i>ala Gaetulorum?</i>	2	Latin	
Raos	<i>ala Gaetulorum?</i>	7b	Semitic	
Rufinus/Rufus?	<i>ala Gaetulorum?</i>	17	Latin	
Sabinus	<i>ala Gaetulorum?</i>	1	Latin	
Sabinus	<i>ala Gaetulorum?</i>	3	Latin	
Sabinus	<i>ala Gaetulorum</i>	14a	Latin	
Themallas	<i>ala Gaetulorum?</i>	7b	Semitic	
Urbanus	<i>ala Gaetulorum?</i>	16	Latin	
Valens	<i>ala Gaetulorum</i>	5	Latin	
Amrilios	camel troop?	28	Semitic	
Antoninus	camel troop?	27	Latin	
Antoninus	camel troop?	30	Latin	
Cassius	camel troop	39	Latin	
Cassius	camel troop?	41	Latin	
Celer	camel troop?	23	Latin	
Demetrios	camel troop	29	Greek	
Flaios/Flavius	camel troop?	36 and 37	Latin	ZPE 2020, no. 1
Magnus	camel troop	19	Latin	ZPE 2020, no. 8
Magnus	camel troop?	41	Latin	ZPE 2020, no. 8
Marinus	camel troop	39	Latin	

29. E.g. Magnus; Sartre 1985: 213. The same could apply to Maximus, *pace* Sartre 1985: 214–215.

30. Sartre 1985: 193 (Germanus); 209 (Cassius); 225–226 (Valens); 233 (Rufus and Rufinus); 234 (Sabinus); 237 (Severus); Gatier 1998: 418 (Marinus).

Maximus	camel troop?	24	Latin	ZPE 2020, nos. 1 & 10
Ouaballas	camel troop?	25	Semitic	
Ouaballas	camel troop?	35	Semitic	
Phalelos	camel troop?	26	Semitic	
Piperas	camel troop	29	Latin	
Raios?	camel troop?	21	Semitic	
Raouaos	camel troop?	34	Semitic	
Rufinus	camel troop?	12	Latin	
Rufus	camel troop?	20a	Latin	
Rufus	camel troop?	33	Latin	
Sabinus	camel troop	10	Latin	
Serapiakos	camel troop?	9	Greek	
Severus	camel troop	31	Latin	
Titus	camel troop?	40	Latin	ZPE 2020, nos. 5 & 7
Ulpianus	camel troop?	32	Latin	
Ulpus	camel troop	19	Latin	
Zannion	camel troop	29	Semitic	
Eutychos		42	Greek	

In these graffiti, none of the soldiers indicates his filiation. For this reason, the question of double names arises since in most of the auxiliary troops, and before the *Constitutio antoniniana* of AD 212, the soldiers were not Roman citizens but foreigners, who did not have a *nomen* (or *nomen gentilicium* = Roman family name).³¹ Furthermore, the total lack of the *nomen* Aurelius appears to place these graffiti before the year 212, as Seyrig has already noted. Thus, one can explain the juxtaposing of two names in the nominative, not linked by a conjunction, in two different ways. Either it is a single person who bears a double name made up of two *cognomina*, or the names of two individuals follow one another in the graffiti, like a short list after the formula $\mu\eta\sigma\theta\tilde{\eta}$.

I consider the name of the soldier in no. 7a to be a double name formed of two single names joined together, the Latin *cognomina* Fuscianus and Severus, which are both very common in the Roman province of Arabia. The first is probably a throwback to one of the Roman governors of Arabia in the second half of the second century, either C. Allius Fuscianus, who occupied the post between AD 155 and 165, or M. Caecilius Fuscianus Crepereianus Floranus who was in the post before AD 198.³² The case of soldiers adopting the *cognomen* of a governor of the province in which they serve—possibly at the time they joined—is attested. As other authors have observed, the second name Severus (which also appears in no. 31), derives perhaps from the *cognomen* of an emperor of the Severan dynasty, preferably Septimus Severus. However, it could also have been adapted from a Semitic name or used to pay homage to a governor of Arabia, C. Claudius Severus—at the beginning of the second century—or one of his successors, C. Carbonius Statilius

31. In no. 19, I consider Ulpus to be a single name or *cognomen* derived from a gentilic; two different soldiers are named, Ulpus and Magnus.

32. On the governor, see Sartre 1982: 83 and 85; see also *IGLS* 13/2, 9489. On the name Fuscianus, see Gatier 1998: 420.

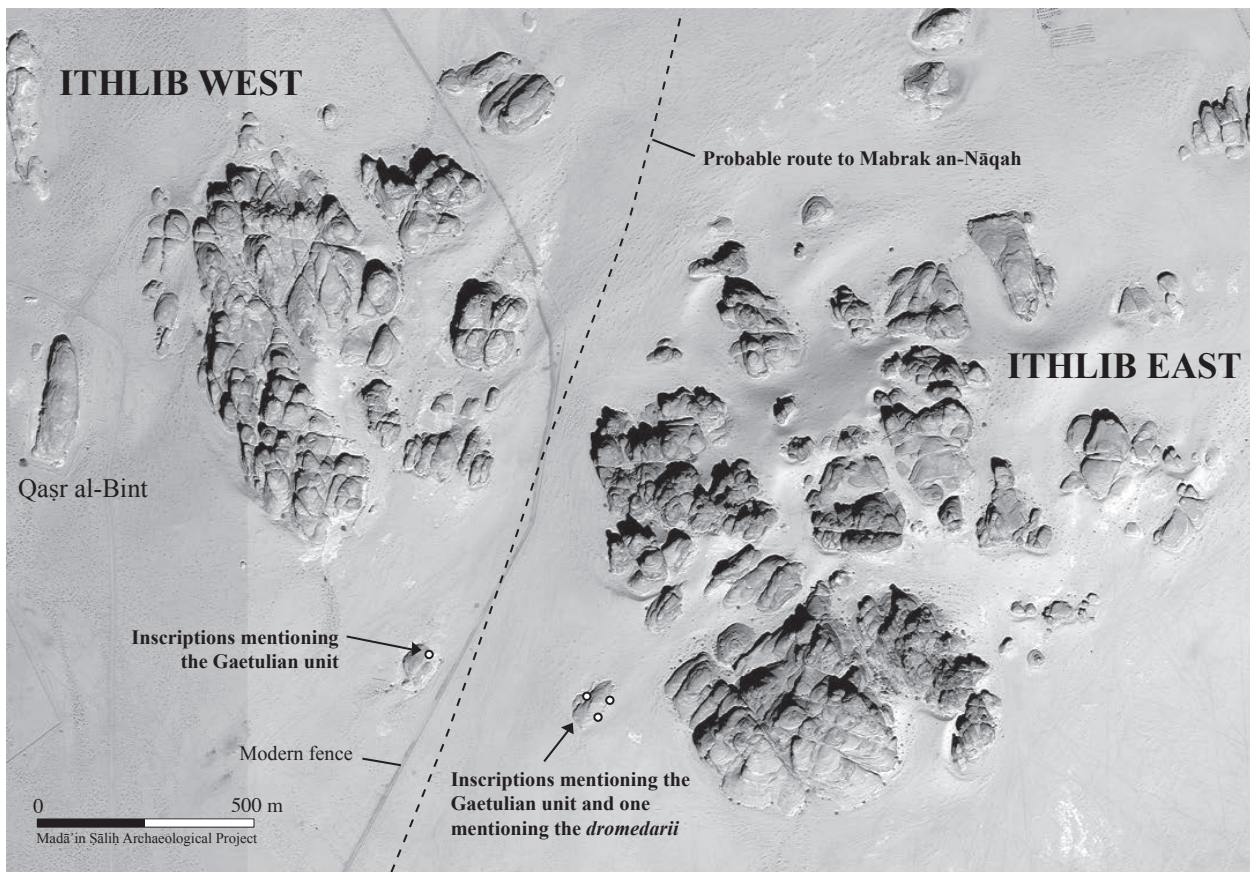


Fig. 30. Ithlib West and Ithlib East, location of the inscriptions (after Nehmé 2009: fig. 2).

Severus Hadrianus, possibly at the end of the second century.³³ On the other hand, it seems to me that the other graffiti in which the issue of the double name arises, are more likely the juxtaposition of the names of two or three soldiers (nos. 3, 7b, 19, and 29).³⁴

A Latin-type name might be more complex than commonly thought. *Flavius*, the gentilic of three emperors of the Flavian dynasty (AD 69–96), Vespasian, Titus, and Domitian, is normally transcribed in Greek as Φλάουιος, Φλάυιος, Φλάβιος, or Φλάϊος, although Φλάις, Φλάεις, Φλάειος, and Φλάιεύς are also found. In proper names of Roman Arabia, Flavius occasionally appears as a gentilic,³⁵ but the Roman citizenship that it attests to cannot creditably have been conferred by the Flavians because the province was only created in AD 106, ten years after the death of the last representative of this dynasty. In Arabia, many bearers of the gentilic Flavius evidently received the name of an emperor of the Constantinian dynasty in the fourth century, leading to a late antique dating for the inscriptions containing the name *Flavius*, for example, in some of the graffiti from Namārah (Nemara) and Bāyir.³⁶ Furthermore, as for the other gentilics, the use of Flavius as a single name or *cognomen* has been noted without firm dates, but before the fourth

33. Sartre 1985: 237. See also Sartre 1982: 78–80 and 84–85; *AE* 1996, 1601.

34. Fiema, Villeneuve & Bauzou 2020: 184–185, no. 10, is translated ‘Remember Chasetos Baris!’; two names seem likely, Chasetos (and) Baris. *Eid.*: 194–195, no. 13, ‘Remember Setis (?) Foskianos!’ or Setis (?) (and) Foskianos?

35. E.g. *IGLS* 13, 9013, in Bostra; *IGLS* 14, 557, in Batanea.

36. Sartre 2016: 54–55, nos. 16–17; Gatier 2018: 279.

century.³⁷ In the case of graffiti nos. 36–37, a late antique hypothesis must make room for other possibilities: the single name of Flavius could come from the gentilic of a governor of Arabia, Q. Flavius Iulius Fronto, c.181–189, rather than Q. Flavius Balbus, c.213–220 or Flavius Iulianus, c.219;³⁸ it is also possible that the Latin appearance of the name Flavius could be concealing a Semitic name. The Latin *praenomen* Titus is used as a single name in the Latin graffiti (no. 40). In our texts, the Semitic names are found mainly in the *dromedarii*, where one finds Amrilios, Ouaballas, Phalelos, Raios, Raouaos, and Zannion. However, graffiti no. 7b contains three personal names, Raos, Themallas, and Godaios, unusually in the genitive, alongside graffiti by soldiers of the *ala Gaetulorum* and which must be associated with them. The name Amrilios/Amrilos, found in both troops, is as common in Roman Arabia as Ouaballas/Ouabalas.³⁹ One can establish a closer link between Raouaos, Raios, and possibly Raos (Ραουαος, Ραιος, Ραος) and a series of names, similarly common in Roman Arabia, such as Ραειος, Ραουαος, Ροεος, and Ροηος.⁴⁰ Zannion is probably attached to the same root as Zannos and Zanneos (Ζαννος, Ζαννεος) which are more common;⁴¹ similarly, Phalelos can be linked to Φαλλαιος, Φαλεος, and Φαλλιων.⁴² In graffiti no. 7b, the genitive Γοδαιου leads to the nominative Godaios, attested especially at Umm al-Jimāl and Zoora,⁴³ while the genitive Θεμαλλου belongs to Themallas, also present on the same sites.⁴⁴ The fact that the largest quantity of Semitic names is found among the camel troop is an indication either of a more rural recruitment than for the *ala Gaetulorum*, or of slightly different micro-regional origins in each of these two troops.

In sum, it should be noted that the proper names of the soldiers named in the rock graffiti are regional, in as much as the Latin names that largely dominate are mainly those that appear in the epigraphy of the province of Arabia, allowing for the fact that these names were sometimes chosen in order to Latinize indigenous names. Moreover, the Semitic names, especially in the camel troop, are undoubtedly regional. I conclude that recruitment of the two relevant regiments was principally undertaken in Arabia (rather than in Egypt, Palmyra, or Palestine, among other possibilities) and that therefore, the rock graffiti were not carved at the beginning of annexation but during a period when these units were already well settled in the province, c. AD 130 at the earliest.

Military presence

There is no need to review the evidence that Hegra formed part of the Roman province of Arabia. The town, surrounded by a wall, became an important military centre in the south of the province with a permanent fort *intra muros* for the soldiers, built abutting the southern city wall. It is not known precisely which troops were barracked there. Apart from the soldiers of the two auxiliary

37. At Rihab, Φλάεις, Gatier 1998: no. 131; at Kerak near Bostra, Φλάουιος, *IGLS* 13, 9802; in Batanea, *IGLS* 14, 357 and 522, Φλάειος and Φλάειος.

38. Sartre 1982: 85 and 88–89. See also *AE* 1991, 1585.

39. Sartre 1985: 176. For Ουαβαλας and Ουαβαλλας, see e.g. at Umm al-Jimāl, *IGLS* 21/5, fasc. 1, 423–424 and 572. For Amrilios, see *I. Pal. Tertia* 1a, p. 187.

40. E.g. at Umm al-Jimāl, *IGLS* 21/5, fasc. 1, 140, 153, 214, 228, etc.; *IGLS* 15, 62a, 124a.

41. *I. Pal. Tertia* 1a, p. 170.

42. *IGLS* 15, 68. See also perhaps Φολεος/Φολεως; Gatier 1998: nos. 51, 80, 83, and p. 420.

43. *IGLS* 21/5, fasc. 1, 587, Γοδαιος, and 583, 590, and 592, Γοδεος. *I. Pal. Tertia* 1a, p. 153–154.

44. *IGLS* 25/5, fasc. 1, 59, 307, and 335, Θεμαλλας and Θεμαλας; *I. Pal. Tertia* 1a, p. 202–203.

troops attested in the graffiti, epigraphic documentation from the town attests to the presence of a detachment of the Third Legion Cyrenaica (*legio Tertia Cyrenaica*). One of the graffiti outside the city, in Jabal Ithlib (no. 4), mentions a cohort, which could be a cohort of the Third Legion Cyrenaica or, less likely, a cohort of auxiliary soldiers. Similarly, only one of the Greek inscriptions found in the town refers to an auxiliary troop, since a person there is defined as a *dro(medarius)*.⁴⁵ The *Gaetuli* and *dromedarii* units (*alae*) are easily distinguishable one from the other thanks to a recent discovery of military diplomas dated AD 126, 142, and 145, in which they appear among the troops of the province of Arabia.⁴⁶ At Hegra, the rock graffiti whose dating based purely on onomastics remains imprecise, could not, however, have been carved outside the period AD 106–c.212. In my opinion, it is not possible to establish whether the men from the two different regiments came in succession or whether they were there at the same time. And it is not known which sections of the two units were settled at Hegra: were they simple detachments or did they form the main part of the named regiments? Nevertheless, a graffito from Bāyir in Jordan, most probably from the fourth century AD, shows the joint presence on this site of soldiers from both units, suggesting they were accustomed to work together and therefore allowing for the possibility that they might have cohabited at Hegra.

The two units, which are cavalry regiments (*alae*), were either quingenary, theoretically numbering 500 men, or milliary, with double the number. They were divided into platoons or *turmae*, which two of the graffiti (nos. 39 and 41) define by the name of the commander, normally a decurion. Apart from this piece of information, the graffiti do not mention any officer and only supply the names of simple soldiers, occasionally defined by the term ‘cavalryman’ ἔκκῦς/ἔκῦς or ἰππεύς/ἰπεύς (nos. 7a, 14, 18; and 19 and 32). In the *ala Gaetulorum*, a classic cavalry unit on horseback, only the form transliterated from the Latin *eques* is used: ἔκκῦς/ἔκῦς. In the camel troop, the *dromedarii*, we find either *hippeus*, ἰππεύς/ἰπεύς, the usual Greek word for a cavalryman, or *dromedarius*, δρομεδάρης/δρομεδάριος (nos. 29 and 39).⁴⁷ It is possible that these two words had a general meaning—one ‘mounted soldier, either on a horse or on a camel’ and the other ‘soldier of the regiment of camel riders’—or that they acquired a more precise technical meaning, one (*hippeus*) ‘soldier mounted on a horse’ and the other (*dromedarius*) ‘soldier mounted on a camel; strictly speaking a camel rider’. If, as I have suggested,⁴⁸ a regiment of *dromedarii* did not consist only of camel riders mounted on light and fast camels (*dromades*⁴⁹), but also of men mounted on horses, this would support my proposition. A graffito from Namārah (Nemara) mentioning two soldiers, one ἰππεύς, the other δρομεδάρης, would lean towards this hypothesis, although their—unnamed—regiment is not necessarily that of the camel riders, but

45. Fiema, Villeneuve & Bauzou 2020: 193–194, no. 12.

46. Gatier 2018: 283–284, and n. 44. One should bear in mind that the ethnic terms used to name auxiliary military units refer to the time of their creation. Thus, the Gaetolian *ala*, a wing originally formed by soldiers recruited from the *Gaetuli*, a people or ethnic group in North Africa, most probably did not include any Gaetolian in the second century AD.

47. Note that at Bāyir a soldier in the camel troops is called ἔκκῦς; at Qaşr al-Abyaḍ the same soldier is called δρομεδάρης; Gatier 2018: 279–282. I had thought that camel troops consisted of soldiers mounted on camels with others mounted on horses, but that the word δρομεδάρης applied to all the men in the regiment. I am now less sure and the man from Qaşr al-Abyaḍ may have transferred from one mount to the other.

48. Gatier 2018.

49. It is important to distinguish between riding camels (*dromades*) from transport camels, both with only one hump. On camel riders of the Roman army, see Dąbrowa 1991.

could be one of the mounted cohorts, in which horsemen and camel riders co-existed without the name of the unit specifying this.⁵⁰

One can establish a chronological list of evidence on both regiments, the *ala Gaetulorum* and the camel troop, both in Arabia and Palaestina Tertia. The military diplomas are the earliest dated documents (AD 126, 142, and 145). The Hegra graffiti, which are not necessarily all contemporaneous with each other, can be placed in the period between AD 130 and 212; finally, the Bāyir and Qaşr al-Abyaḍ graffiti belong to the fourth century. The documentation, however, remains incomplete and the documents do not provide any information about the movements of the troops or the length of time they stayed in Hegra.⁵¹

Conclusion

The three groups of graffiti presented here can be placed within a period probably spanning the years AD 130 to 212. They were carved by soldiers of the Roman army in sites, which, if not sacred, at least bore a religious significance, thus asserting their personal identity and professional solidarity within the group that makes up a regiment. This solidarity was probably reinforced by the soldiers' common origins, as it would appear they were all recruited in the province in which they served.

Abbreviations

AE = *L'Année épigraphique*, Paris.

CBI = Schallmayer E., Eibl K., Ott J., Preuss G. & Wittkopf E. 1990. *Der römische Weihebezirk von Osterburken, I, Corpus der griechischen und lateinischen Beneficiarier-Inschriften des Römischen Reiches*. Stuttgart: Konrad Theiss.

CIL = *Corpus inscriptionum Latinarum*. Berlin.

CIL III, Suppl., fasc. 1 = Mommsen T., Hirschfeld O. & von Domaszewski A. 1902. (eds), *Corpus inscriptionum Latinarum, Inscriptionum Orientis et Illyrici latinarum supplementum*, 1. Berlin: Georg Reimer.

CIS II, 1 = *Corpus inscriptionum Semiticarum, Pars secunda, Inscriptiones Aramaicas continens, Tomus I*. Paris: Imprimerie nationale, Klincksieck, 1889.

IGLS = *Inscriptions grecques et latines de la Syrie*.

I. Pal. Tertia Ia = Meimarīs Y.E. & Kritikakou-Nikolaropoulou K.I. 2005. *Inscriptions from Palaestina Tertia*, vol. Ia, *The Greek Inscriptions from Ghor es-Safi (Byzantine Zoora)*. (Meletēmata, 41). Athens/Paris: The National Hellenic Research Foundation.

SEG 38 = Pleket H.W., Stroud R.S. et al. (eds) 1991. *Supplementum epigraphicum graecum 38* (1988). Amsterdam: J.C. Gieben.

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50. Sartre 2016: 54, no. 13; see also Dąbrowa 1991, especially concerning the *Cohors XX Palmyrenorum* at Dura.

51. See Gatier 2018 for the history of these two military units.

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The Nabataean Burial Leathers of Hegra. Tombs IGN 88, IGN 97, and IGN 116.1

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1. Introduction: material and methodology

The 2018 study season concentrated on the analysis of leather objects discovered during archaeological fieldwork and the clearing of tombs IGN 88, IGN 97, and IGN 116.1 in 2014 and 2015. These leather items were in a satisfactory state of preservation despite substantial fragmentation: 393 fragments (NFrag) from seventy-seven groups containing objects or fragments of objects belonging to pieces associated with burials (minimum number of objects [MNO] = 13) and to intrusive objects (MNO = 6) from outside a burial context, which were probably abandoned *in situ* when the tombs were looted (**Table 1**). The precise nature of these finds, their appearance and dimensions, as well as the registration number of each photograph are listed in a descriptive catalogue organized by group at the end of this contribution.

Year	IGN	Burial	Type	NFrag	MNO	Weight (gr)
2014	88	50421	Carrying shroud	14	2	190
			Shroud	222		2210
			Twisted straps	29	2	94
			Flat straps	13		57
			Funerary masks	2	2	120
			Miscellaneous	2	2	
	Total in B 50421			282	8	2671
	50420	Carrying shroud	7	1	27	
		Shroud	59		693	
		Twisted straps	13	1	45	
		Flat straps	1		7	
		Miscellaneous	8	1		
Total in B 50420			88	3	772	
97	50432	Shroud	6	1		
		Twisted straps	2			
		Carrying shroud	2	1		
		Miscellaneous	9	3		
Total in B 50432			19	5		
2015	116.1	50521	Shroud	1	1	
		50535	Shroud	1	1	
		50564	Shroud	2	1	
		Total in IGN 116.1			4	3

Table 1. Grave-goods in IGN 88, 97, and 116.1

The largest number of pieces, 95% of the fragments, come from grave-goods deposited at the time of burial. Four distinct types of object were identified, all used for wrapping the bodies: carrying shrouds, funerary masks, body shrouds associated with binding straps. Objects from outside the burial context include shoes and straps. The latter could, however, have been used to transport bodies. Indeed, they are not specifically characterized, in the sense that they could have been used for different functions in a civilian, military, or burial context.

The items from outside the burial rites, shoes and straps in particular, are the only objects made partly from thicker skins, probably from bovids. The other leather pieces, used for wrapping the body, were made out of fine leather from the skin of small ruminants, either sheep or goats. Furthermore, these skins were treated and processed to prevent them from rotting and to render them flexible and smooth. Complementary chemical analyses will determine more precisely what products were used (mineral or vegetal tanning).

The items discovered in **IGN 88** come from two burials (B):

– B 50421: there are many items, divided up into thirty-six groups (**Table 2**). The fragments come from six burial items (two body shrouds, two carrying shrouds, and two funerary masks). They belong to two separate inhumations and are associated with two intrusive objects (a sandal and a strap). A new category of burial object—the funerary mask—was identified among the finds in B 50421. This category was absent from the finds of the previous years (burials in IGN 117) and is present only among the grave-goods of B 50421 in IGN 88.

– B 50420: the fragments from the twenty-four groups come from two burial objects (body shroud and carrying shroud) belonging to a single inhumation (**Table 2**) and from a strap.

The grave-goods from **IGN 97** belong to a single burial, B 50432, and consist of nineteen fragments divided into fourteen groups. These items come from a small number of objects. Two of them, the shroud proper and the carrying shroud (**Table 2**), were used for the ritual wrapping of the body. The other pieces are intrusive, comprising two shoes, from two separate pairs, and a strap, indicating that in antiquity regular visits were made to this location. From this point of view, burial B 50432 contains the greatest number of non-ritual/non-burial items.

In **IGN 116.1** three burials, B 50521, B 50535, and B 50564, were excavated during the 2015 season, and were found to contain a few leather items, all from body shrouds (**Table 2**).

Year	IGN	Burial	Cat. no.	NFrag	Observations	Photo(s)
2014	88	50421	50421_L01	1	Twisted strap and fragments of shroud and textile	MS2014o0615 to 0616
				2	Fragment of shroud, remains of stitching and textile	MS2014o1364 to 1368
			50421_L02	1	Inside of a shroud	MS2016o1336 to 1337
				1	Inside of a shroud	MS2014o0653 to 0654
			50421_L03	1	Stitching on handle with reinforced edging (fits with L06)	MS2014o0609 to 0610
			50421_L04	1	Fragment of shroud, remains of seam	MS2014o0655 to 0656
			50421_L05	1	Decorated border of carrying shroud	MS2014o0663 to 0664
			50421_L06	1	Stitching on handle with reinforced edging (fits with L03)	MS2014o0641 to 0642
			50421_L07	1	Right sandal, raw skin	MS2014o0639 to 0640
			50421_L08	1	Shroud, textile on the side	MS2014o0947 to 0948
50421_L09	1	Strap plaited with 8 strips of leather and end piece	MS2014o0617 to 0618			

Year	IGN	Burial	Cat. no.	NFrag	Observations	Photo(s)			
2014	88	50421	50421_L10	1	Fragment of shroud with remains of textile				
			50421_L11	5	Fragment of shroud, remains of stitching				
			50421_L12	1	Funerary mask	MS2018o0069 to 74			
			50421_L13	1	Plant stem sheathed with leather strap				
			50421_L14	26	Fragments of twisted straps	MS2018o0137 to 150			
			50421_L15	13	Fragments of flat straps	MS2018o0127 to 136			
			50421_L16	3	Fragments of twisted straps with knots	MS2018o0091 to 92			
			50421_L17	19	Fragments of various shrouds with sections of border	MS2018o0109 to 116			
			50421_L18	3	Fragments showing several panels stitched together	MS2018o0093 to 98			
			50421_L19	4	Fragments with remains of single stitching	MS2018o0060 to 64			
			50421_L20	9	Fragments with remains of double stitching	MS2018o0103 to 108			
			50421_L21	6	Fragments with elements of repair	MS2018o0065 to 68			
			50421_L22	15	Panel with border and remains of stitching	MS2018o0117 to 126			
			50421_L23	1	End piece of shroud	MS2018o0235 to 237			
			50421_L24	1	Inside of shroud and remains of single stitching	MS2018o0081 to 84			
			50421_L25	8	Inside of shroud	MS2018o0151 to 646			
			50421_L26	17	Outside of shrouds, imprints of straps	MS2018o0179 to 191			
			50421_L27	1	Funerary mask	MS2018o0225 to 228			
			50421_L28	90	Group containing several fragments of various shrouds				
			50421_L29	1	Large piece of leather with double stitching, with numerous folds	MS2018o0223 to 224			
			50421_L30	1	Large piece of leather with traces of double row of stitching	MS2018o0219 to 220			
			50421_L31	20	Fragment of shroud and remains of double row of stitching	MS2018o0192 to 213			
			50421_L32	10	Carrying shroud with border	MS2018o0165 to 178			
			50421_L33	9	Fragments of shroud, twisted strap, and repair				
			50421_L34	3	Fragments of shroud with traces of stitching and border	MS2018o0099 to 102			
			50421_L35	1	Fragments of shroud with border, stitching, and repair	MS2018o0221 to 222			
			50421_Sh01	1	Fragments of shroud on which is sewn a decoration made from small mollusc shells				
			NFrag in B 50421				282		

Year	IGN	Burial	Cat. no.	NFrag	Observations	Photo(s)	
2014	88	50420	50420_L01	1	Twisted strap	MS2014o0623 to 0624	
			50420_L02	1	Fine twisted strap	MS2014o0633 to 0634	
			50420_L03	1	Handle of carrying shroud, plaited strap, and appliqué decoration	MS2014o0612	
			50420_L04	1	Strap	MS2014o0629 to 0630	
			50420_L05	1	Plaited strap	MS2014o0625 to 0626	
			50420_L06	2	Plaited straps, between 16 and 8 strips of leather	MS2014o0353 to 0636	
				4	Plaited straps with 16 strips of leather	MS2018o0001 to 2	
			50420_L07	4	Shroud with seam joining two panels	MS2018o0044 to 59	
			50420_L08	30	Fragments of shroud		
			50420_L09	12	Fragments of twisted straps	MS2018o0003 to 13	
			50420_L10	2	Outside of shroud, supple light-coloured leather	MS2018o0040 to 43	
			50420_L11	1	Inside of shroud, leather soaked in resin	MS2018o0038 to 39	
			50420_L12-18	7	Fragments of various shrouds		
			50420_L19	5	Fragments of carrying shroud (?) and border on two of the sides	MS2018o0033 to 37	
			50420_L20	5	Fragments of shroud with border	MS2018o0018 to 23	
			50420_L21	6	Fragments of shroud with remains of stitching	MS2018o0024 to 27	
			50420_L22	2	Fragments of shroud with repair patches	MS2018o0030 to 31	
			50420_L23	2	Fragments of shroud, remains of stitching and repair	MS2018o0014 to 17	
			50420_L24	1	Carrying shroud (?), border, and decorative stitching		
	NFrag in B 50420			88			
	2014	97	50 432	50432_L01	1	Plaited cord with acorn-shaped end	MS2014o0906 to 0907
				50432_L02	1	Appliqué decoration	MS2014o0915 to 0916
				50432_L03	1	Right sandal	MS2014o0880 to 0881
				50432_L04	1	Left shoe	MS2014o0882 to 0883
				50432_L05	1	Fragments of two panels joined together with stitching	MS2014o0884 to 0885
				50432_L06	1	Fragment of two panels joined together with stitching	MS2014o0878 to 0879
50432_L07				1	Fragment of shroud with stitching	MS2014o0876 to 0877	
50432_L08				1	Fragment of shroud	MS2014o0904 to 0905	
50432_L09				1	Plaited strap made from 8 strips of leather and sheathed	MS2014o0898 to 0899	

Year	IGN	Burial	Cat. no.	NFrgs	Observations	Photo(s)
		50432	50432_L10	4	Fragments of plaited strap made from 10 strips of leather covered with a sheath	MS2014o0900 to 0901
			50432_L11	1	Twisted and knotted strap	MS2014o0908 to 0909
			50432_L12	2	Two handles from a carrying shroud	MS2014o0902 to 0903
			50432_L13	2	Fragments of shroud and remains of stitching	MS2014o0886 to 0887
			50432_L14	1	Twisted strap	MS2014o0890
NFrgs in B 50432				19		
2015	116.1	50521	50521_L01	1	Shroud, remains of seam joining panels	MS2016o1206 to 1207
		50535	50535_L01	1	Fragment of shroud and remains of stitching	MS2016o1211
		50564	50564_L01	1	Fragment of shroud	MS2016o1199
			50564_L02	1	Fragment of shroud	MS2016o1201
Total NFrgts IGN 88, 97, 116.1				393		

Table 2. Grave-goods by category: number of fragments (NFrgs) and minimum number of objects (MNO).

2. The tombs and their grave-goods

Four different types of objects were used to wrap a Nabataean mummy: the shroud proper (a leather cover in contact with a textile shroud), the binding straps, the carrying shroud, and the funerary mask (**Table 2**).

In order to determine the proportion of different types of burial object (body shroud, carrying shroud, straps, funerary mask), the fragments of all the items discovered in burials B 50420 and B 50421 (IGN 88) were weighed. The proportions obtained should enable a better estimation of the relation between the different items used during the ritual wrapping of the body.

According to number and weight, the different types are present in both burials in the same proportions (**fig. 1**), which suggests a routine use of the different items in the wrapping process, established according to precise rules.

2.1. The shrouds

The leather shrouds were placed directly over the final textile shroud. Fragments of this type are among the most numerous and best preserved (**fig. 1**). They are present in comparable proportions in the two burials (always according to the number of remains and the weight of the fragments): 79% of the total number in B 50421 and 67% in B 50420. They also represent the largest volume of grave-goods in both burials: 83% of the total weight of leather fragments in B 50421 and 90% in B 50420.

This over-representation of shroud fragments can be explained by the wrapping techniques used. The leather pieces were made by assembling several panels together to form large covers. It was not possible to determine the dimensions of the leather shroud, but it must have been quite large as it was intended to be wrapped several times around the body of the deceased.

Fragment 50421_L24, whose layers of wrapping were almost entirely preserved, enables a reconstruction of this technique. The first layers, in contact with the textile shrouds, formed numerous folds. They were often soaked in resin, giving them a dark colour and a rigid appearance (inside: **fig. 2**).

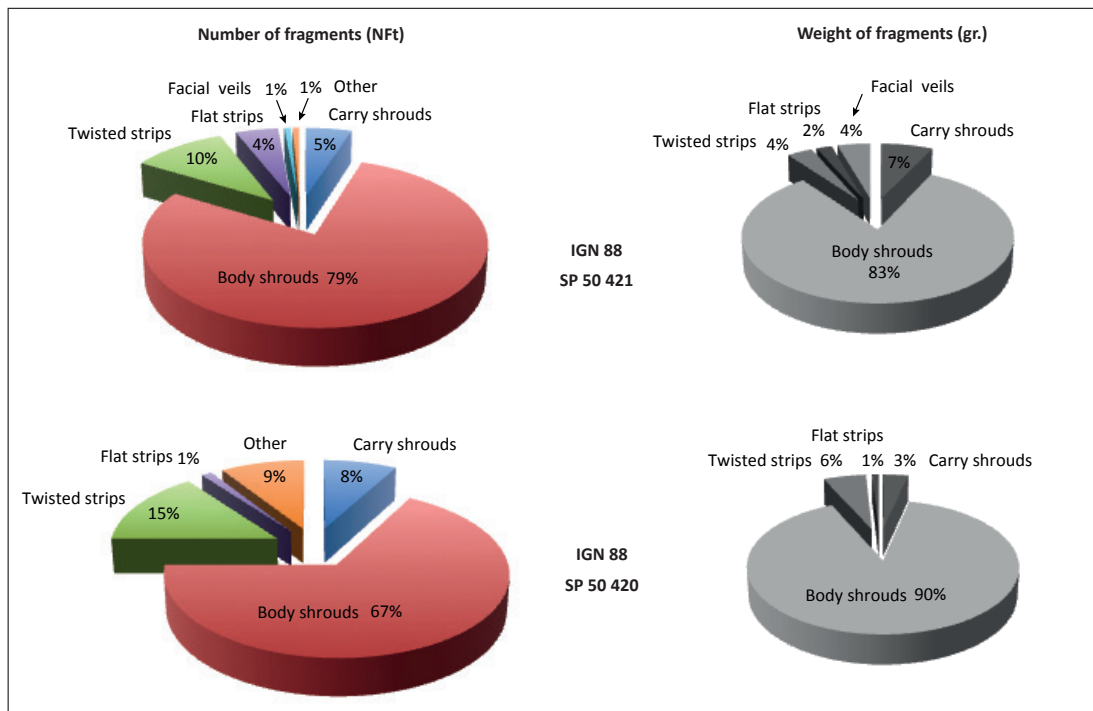


Fig. 1. Distribution of funerary objects in the two main burials, B 50420 and B 50421 (IGN 88): number of fragments (NFt) and weight of fragments by type of object.

When the leather shroud was wrapped around the body for the last time, it was stretched more tightly and supported the straps fixing the swaddling to the mummy. The twisted straps were placed over this final layer which covered the entire swaddling. The smooth surface of this type of shroud, often lighter in colour, frequently bears the imprint of these binding straps (outside: **fig. 3**).



Fig. 2. Inside of fragment of shroud, and imprint of ligature (B 50421_L24, IGN 88).



Fig. 3. Outside of fragment of shroud, (B 50421_L24, IGN 88). L: imprints left by the straps fixing the swaddling.

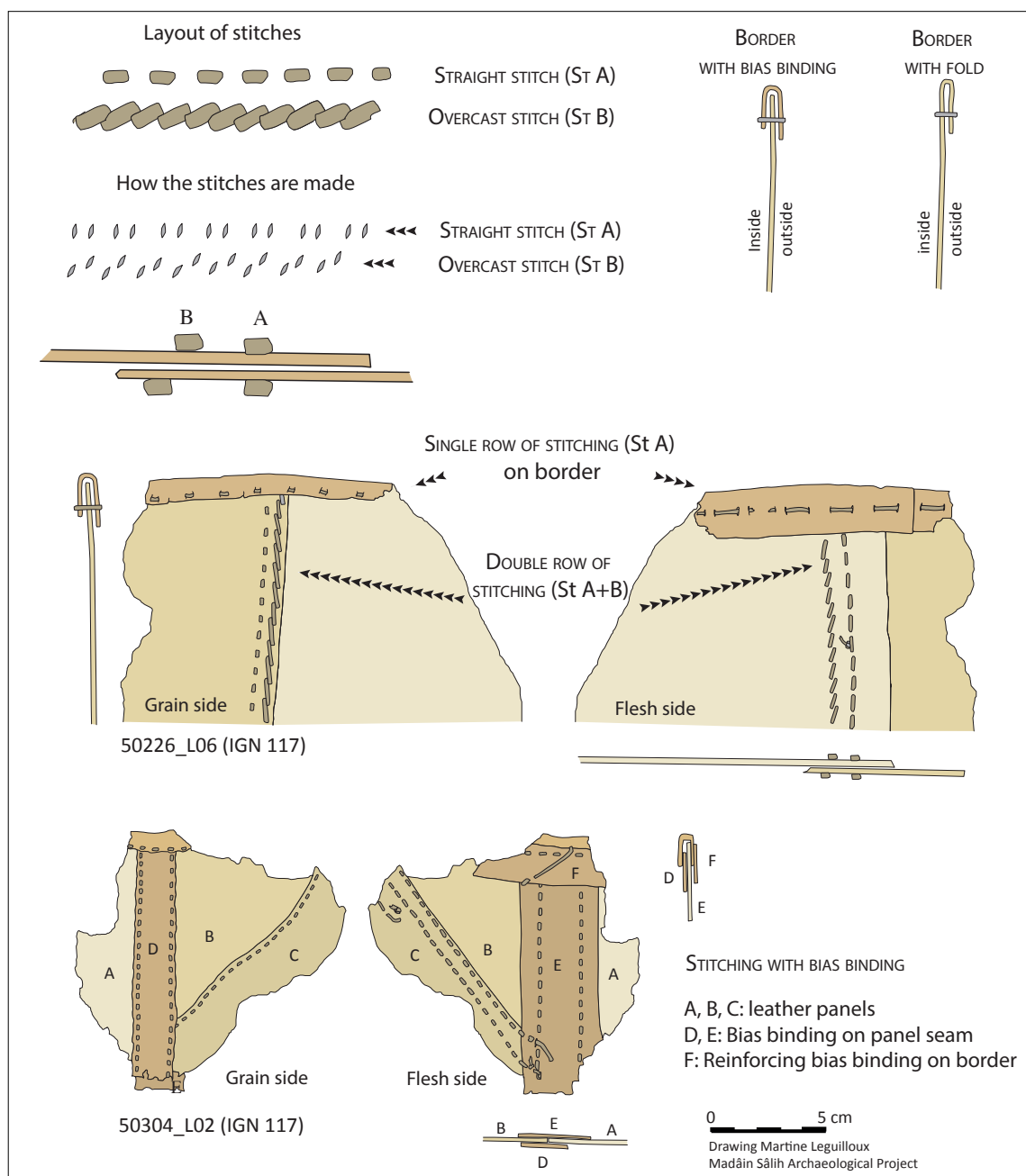


Fig. 4. The different seams used in the body shrouds and carrying shrouds.

The techniques used to assemble and stitch these body shrouds are now well established. They are similar to those observed for the leathers in the burials of IGN 117 (fig. 4). The shrouds were made by assembling together rectangular-shaped panels using strong stitching consisting of a double row of overcast and straight stitching (50420_L21: fig. 5) or, less frequently, a double seam made up of two rows of straight stitching associated with a bias binding (50420_L11).

The borders of the shrouds were simple and made either with a fold or with a bias binding, fixed with a single row of straight stitches (50420_L19.3: fig. 6). When assembled together, these panels formed large covers of fine leather obtained from the skin of small ruminants, neatly finished and with well-hemmed edges (50420_L19.2: fig. 7).

Several examples of shroud bear traces of repair (50420_L23.1) as some of the panels used in the production of the shrouds were damaged, either as a result of a fault in the leather or through



Fig. 5. Five fragments of shroud showing the remains of panel seams (B 50420_L21, IGN 88).



Fig. 6. Folded border of a shroud (B 50420_L19.3, IGN 88).



Fig. 7. Fragment of shroud comprising two panels and a border (B 50420_L19.2, IGN 88) as well as a repair patch on the panel, shown by an arrow.

wear and tear. In such cases, a patch was added to hide the imperfection (**fig. 7**). The presence of these patches indicates that great importance was attached to the appearance of the shroud even though it was to be buried. It also suggests that reused pieces of inferior quality were utilized for some of the deceased.

2.2. The binding straps

The different parts of the shroud are always associated with straps used to bind the mummies. These straps are made of twisted and intertwined strips of leather (50420_L09: **fig. 8**), a technique utilized in almost all cases for this type of strap. These twisted straps are found in all the burials explored so far at Madā'in Šālih¹ and in other sites occupied by the Nabataeans, for example at Khirbat adh-Dhaîh (Lenoble et al. 2001: **fig. 15**).

1. This is confirmed for all the grave-goods discovered in all the areas relating to finds in IGN 88, 97, 116.1, and 117.



Fig. 8. Twisted straps (B 50420_L09).



Fig. 9. Flat straps (B 50421_L15).

The proportion of straps within the leather group is constant from one burial to another: 16% and 14% in relation to the number of fragments, 7% and 6% in relation to their weight (**fig. 1**).

The techniques used to bind the leather shrouds during the wrapping of the bodies—the way the straps were laid and their quantity—probably followed identical principles. Several fragments have kept the imprint of these straps (50421_L24 and 50421_L08) and these will enable us to reconstruct the techniques used in the binding process.

A number of examples come in the form of simple flat strips, although they represent a minority of the grave-goods (50421_L15: **fig. 9**).

2.3. The funerary masks

Only two examples of funerary mask were identified. They both come from burial B 50421 and might belong to a female inhumation and a male inhumation. The one numbered 50421_L12 (**fig. 10**) is of modest size and probably belonged to a woman, while the one numbered 50421_L27 is larger and probably belonged to a man.²

These two examples have characteristics in common, which distinguishes them from other burial objects, in the way they were made and placed over the deceased. The leather mask covering the face was made in one piece. First laid over the eyes, it was then folded over several times on the



Fig. 10. Funerary mask B 50421_L12.



Fig. 11. Funerary mask B 50421_L27.

top of the face before being folded back over the neck. There were thus several layers specifically protecting the eyes and the forehead of the deceased, which parts of the body were treated differently from

the rest of the body as this area was free of any binding straps or resin. The method used to place the mask is the same for both samples in B 50421, 50421_L12 (**fig. 12**) and 50421_L27 (**fig. 13**). These features indicate that the face was not treated in the same way as the rest of the body, which is confirmed by observing the inside of sample 50421_L27: this side shows the remains of the border of a textile shroud in which the imprint of the chin is just visible (**fig. 13**). The border line, which is clearly delineated, shows that the face was not covered either by textile or resin.

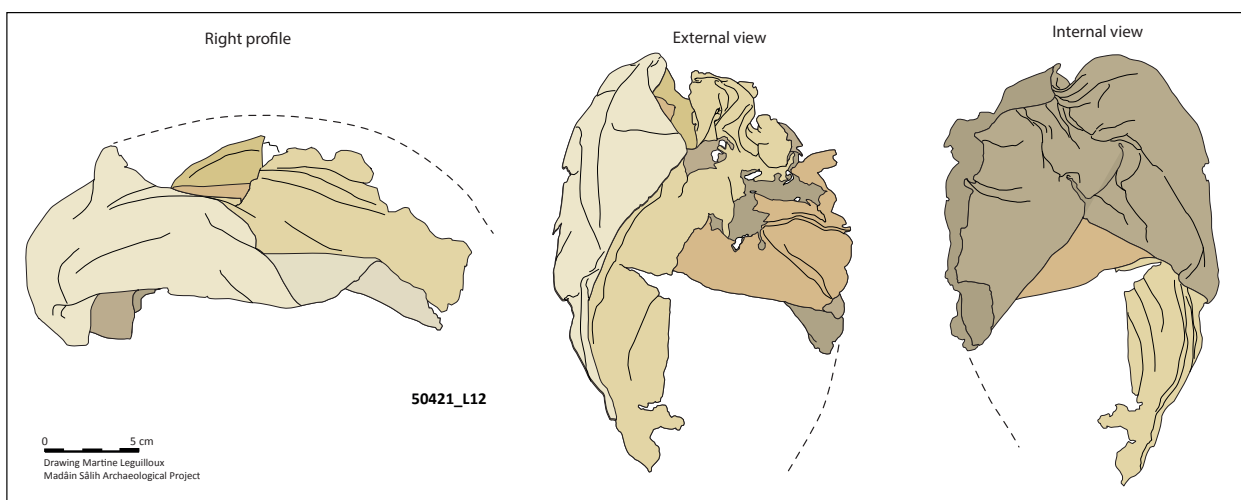


Fig. 12. Reconstruction of the folding of mask 50421_L12 (CAD: M. Leguilloux).

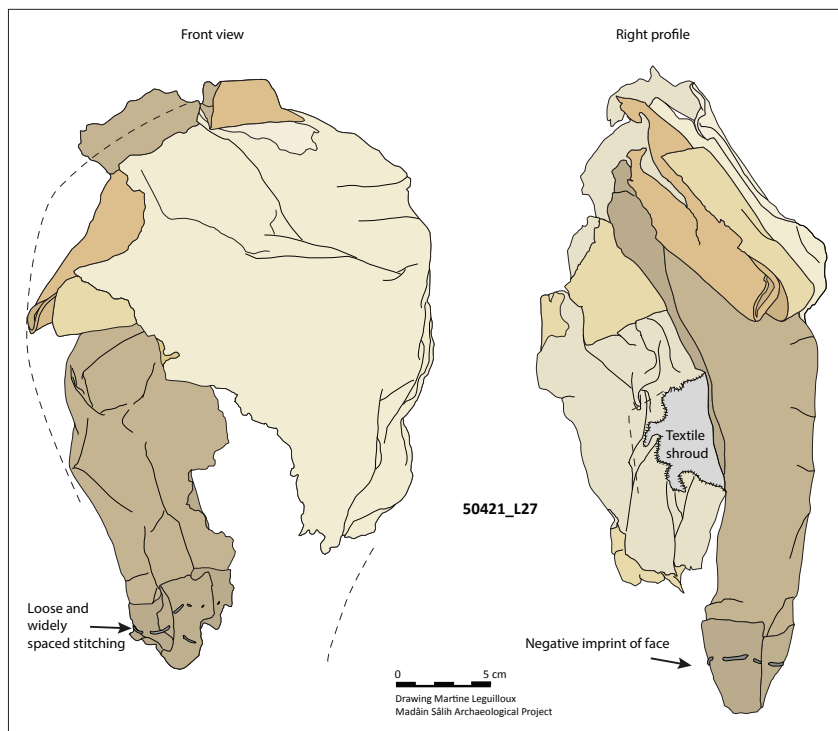


Fig. 13. Reconstruction of the folding of mask 50421_L27 (CAD: M. Leguilloux).

It is difficult to establish how the shrouds, which were tightly wrapped around the body of the deceased, were joined to the funerary masks, which were simply laid over the face and folded. The mask numbered 50421_L27, which has preserved some features from the shroud, provides a few clues. Ligatures on one edge indicate that the funerary masks were joined to the body shrouds with rows of stitches (**fig. 13**). These are very different from the stitches used in the shroud panels: they are very loose and stretched, large and widely spaced, and less meticulously executed. This perhaps indicates that the two different parts, the shroud on the one hand and the funerary mask on the other, were fixed directly onto the mummy only after the funerary mask had been placed.

These objects represent a very small fraction of the grave-goods. Their rarity among the finds is probably due to their fragility and to systematic destruction during looting. There are traces of impact in the centre of the lower part of object 50421_L27 (**fig. 11**), indicating that it was damaged, probably in order to check that there were no objects of value near the face or neck of the deceased.

2.4. The carrying shrouds

The proportion of this type of object (in terms of number of fragments and weight of the items identified) is very similar from one burial to another (see **fig. 1**). These items appear to have been used to transport the body (presence of suspension handles) and also served to cover the mummies that had been left in the tomb after the deposition of the bodies. As they required less raw material, fragments from this type of fixture are scarcer and represent a low weight in relation to the other items: 7% of the total volume in B 50421 and 3% in B 50420.

All the objects utilized in these rituals were made with care. Their manufacture required a certain amount of technical expertise from qualified craftsmen. Among the funerary equipment, the carrying shrouds are the most elaborate. Assembled together from panels according to methods

similar to those used for the ‘body’ shrouds, they differ in that they have straps or suspension rings attached to them and are sometimes decorated.

When they are present, the decorations are found on the borders and are made of stitches forming geometrical motifs (50421_L05). The presence of identical decorations on the shrouds from different burial areas (the decoration on piece 50296_L01 in IGN 117 is similar to that of 50421_L05: **fig. 14**) indicates some standardization in decoration. Some were more elaborate, with small mollusc shells (*Cypraea moneta* L.) sewn onto the outside to form geometric patterns—for example the square motif sewn onto piece 50421_Sh01 (catalogue no. 36, 50421_Sh01).

A few fragments bear handle-shaped straps to make it easier to carry the body. Two examples of this type of feature, 50421_L03 and 50421_L06 (**fig. 15**) and 50432_L12 (**fig. 14**) form part of the grave-goods examined in 2018. These handles were made using specific techniques to reinforce them.

Apart from the presence of these handles, their pliability can also help us identify the carrying shrouds: the leather has remained flexible, the fragments do not show any ligature marks on the

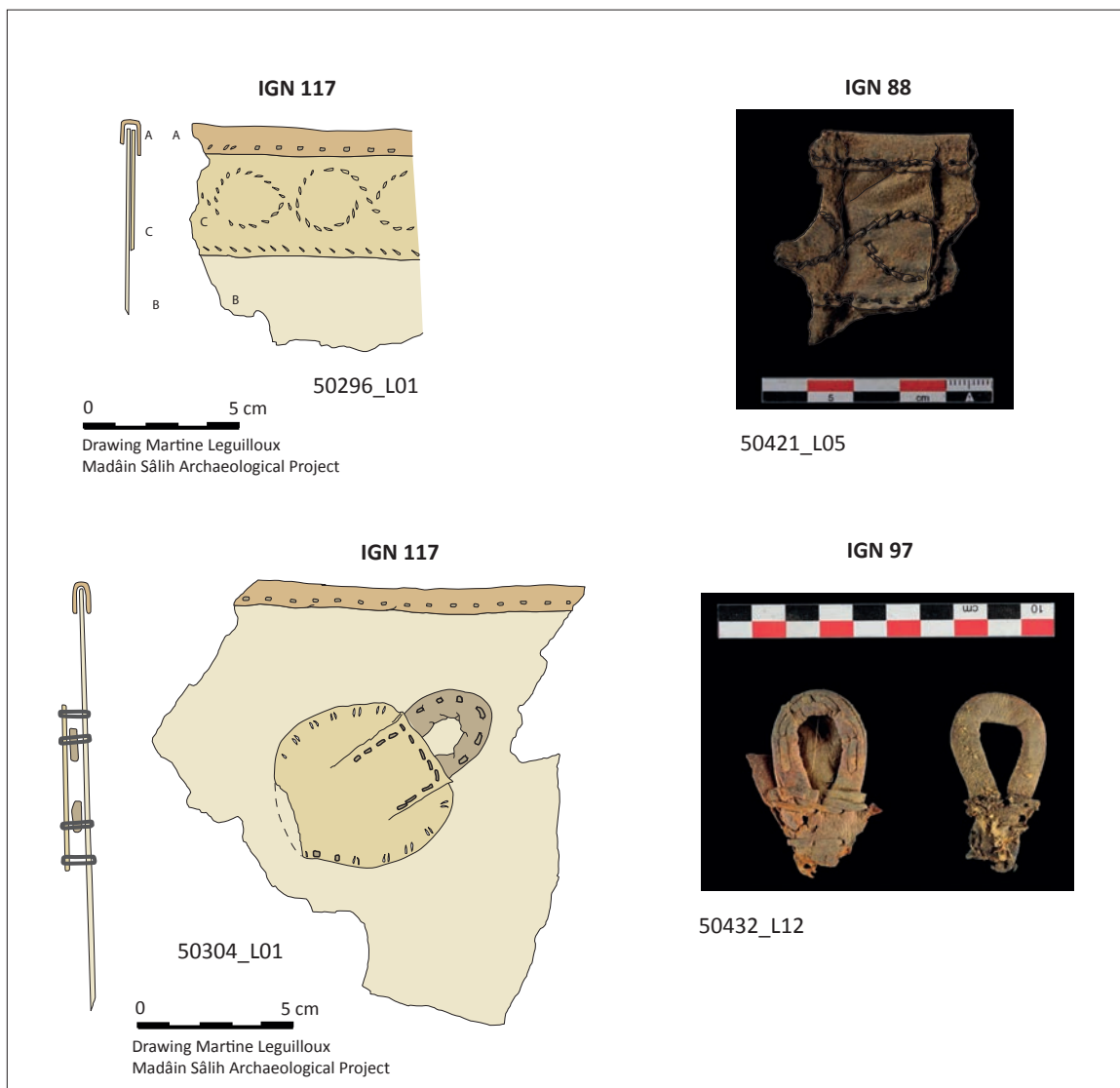


Fig. 14. Carrying shroud: decorations and fasteners from burials in IGN 117, 88, and 97.



Fig. 15. Carrying shroud:
handle 50421_L03 and 50421_L06.

outside because they were not used to wrap the mummies, and they bear no residual traces of pitch or textile.

2.5. Non-burial finds

Among the finds examined during this study, a number of objects do not come from ritual contexts. Non-burial pieces are in a minority. They are, however, present in all the burials studied in IGN 88 and IGN 97. They belong to two types of object, shoes and straps.

Burial B 50432 (tomb IGN 97) contained few leather items (nineteen fragments only) including, among them, objects not associated with burial practices ('miscellaneous' category, Table 2), shoes and possibly pieces of clothing. This tomb differs from IGN 88 and 116.1 with a higher proportion of non-burial objects, whose origin is difficult to define—remains after looting or items abandoned by the occasional visitor or during the funeral rites.

2.5.1. The shoes

Three samples belonging to three separate pairs (two sandals and one shoe), were discovered in IGN 88 and 97:

- 50421_L07 (IGN 88): right sandal, very coarsely made from raw leather (see photo in the catalogue, inventory no. 7);
- 50432_L03 (IGN 97): small right sandal, carefully made. The sole is made up of several layers of leather. A comfortable shoe, decorated on the outside (see photo in the catalogue, inventory no. 57);
- 50432_L04 (IGN 97): high left shoe, also of small size and very elaborately made (see photo in the catalogue, inventory no. 58).

These shoes, which were abandoned after the opening of the tomb, are the result either of looting or of a visit to the burials.

Other leather items, elaborate pieces with decorations, might come from the remains of clothing—a leather lace for a shoe or other piece of clothing (50421_L09; 50432_L01) or an appliqué decoration (50432_L02). These non-ritual items are proportionally more numerous (MNO 4) in the groups discovered in burial 50432 (IGN 97) although they are more fragmentary, having suffered greater damage from looting and deterioration.

2.5.2. The straps

Fragments of straps made from plaited bands were discovered in B 50420 (IGN 88, 50420_L04 to L06). These items were not used to bind the shrouds as no traces of this type of object were found on the leathers (which, nevertheless, bear clear negative imprints of leather straps, both twisted and flat, as well as imprints of bindings made from textile). Several twisted items were present in B 50432 (IGN 97), one which appears to be from the end of a piece (50432_L09) and several fragments of the rest of the same piece, 50432_L10 (**fig. 16**).

These straps were very elaborately made from interwoven bands, fastened together with crossing stitching and a sheath for added reinforcement, with the result that they were very strong. This design also meant they could be made in sizeable lengths. These straps might have been slipped through the rings fixed to the carrying shroud so the body could be carried more easily. The use of these straps for carrying the body during the burial rites in the tombs is suggested by their association with similar items found at the sites of road stations in the eastern Egyptian desert (the sites of *praesidia* on the Coptos/Berenice/Myos Hormos roads), where they have been interpreted as harness tethers or straps (Leguilloux 2006; in preparation).



Fig. 16. Plaited strap 50432_L10.

3. Conclusions

The first discoveries of leather burial objects had already uncovered some characteristics of Nabataean burial rites (Lenoble et al. 2001). The objects revealed at Hegra during the 2011 excavations of IGN 117 had contributed to the reconstruction of some of the details of the ritual of mummification and the deposition of the bodies in the tombs (Bouchaud et al. 2015).

The new discoveries made in IGN 88 and IGN 97 are interesting because they provide additional information on the use of the different items involved in the wrapping of mummies and complete the corpus of leather burial goods. With the addition of new items that appeared among the grave-goods of B 50421, namely the funerary masks, the list of items utilized to wrap the mummies is now complete. These discoveries have enabled a more complete reconstruction of Nabataean mummification during the ritual deposition of the body in the tomb (fig. 17).

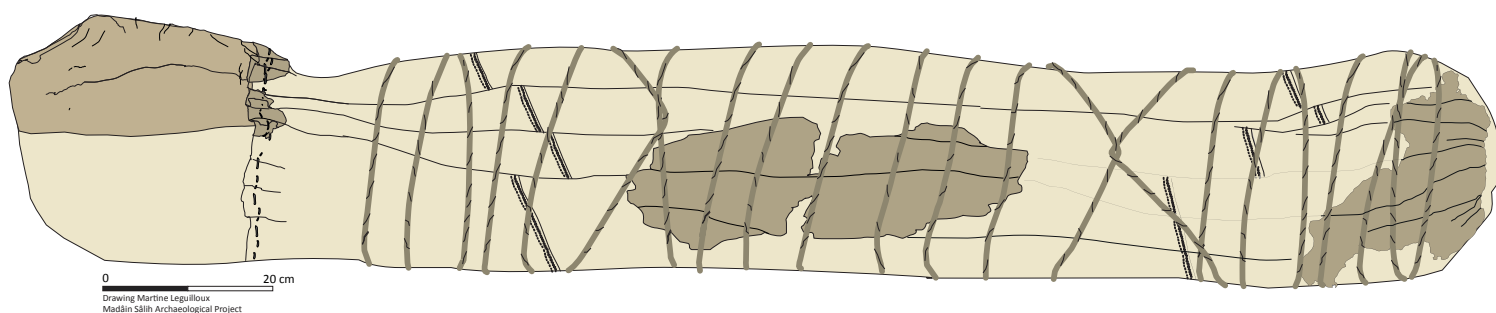


Fig. 17. Theoretical reconstruction of swaddling made from items (from left to right) 50421_L27, 50421_L02, and 50421_L24 (CAD: M. Leguilloux).

4. 2014–2015 catalogue of finds from IGN 88, IGN 97, and IGN 116.1

4.1. Grave-goods in IGN 88

4.1.1. Burial B 50421

No. 1. 50421_L01

Description. Twisted strap. Part preserved at the point where two straps join together.

[MS2014o0615 to 0616]

Item associated with a fragment of leather shroud and another of a textile shroud.

Dimensions. Length: 105 mm, average length: 6 mm.



No. 2. 50421_L02

Description. Two fragments from the inside of a shroud. The largest sample has numerous vertical folds.

The inside shows the preserved remains of two seams joining panels together and a plain folded border.

[MS2014o0653 to 654, MS2016o1336 to 1337].

Single row of stitching, consisting of straight, widely spaced stitches, measuring 6 to 3 mm in width, irregular spacing



(3 to 12 mm). A repair patch is visible in the central section.

Dimensions. Length: 290 mm, width: 120 to 50 mm.

No. 3. 50421_L03



Description. Two fragments from a single piece of carrying shroud. [MS2014o0609 to 0610]. They are made from two panels joined together with a seam consisting of a single row of straight stitches in leather thread; large, widely spaced stitches. The seam is identical to that observed on a sample that still

bears the handle of a carrying shroud. Same object as 50421_L06.

No. 4. 50421_L04

Description. Fragment of shroud that has been very lightly soaked in resin. [MS2014o0655 to 0656]. The seam joining the panels has been preserved and consists of a double row of straight stitches associated with a row of overcast stitches.



No. 5. 50421_L05



Description. Decorated border of a carrying shroud. [MS2014o0663 to 0664]. Panel applied to the edge of the shroud and fixed with decorative stitching forming a double spiral (length of stitch: 2.8 mm). The fragment includes the preserved border of the shroud, which was made by applying a bias binding sewn with straight stitch onto the

edge of the panel.

Dimensions. Length: 33 mm, height: 45 mm.

No. 6. 50421_L06

Description. Handle of carrying shroud made from a leather band folded in half. [MS2014o0641 to 0642] Width when unfolded: 20 mm, thickness of the

leather: 2 mm. Part of the strap is inserted into the seam joining the two panels. Visible length of the strap-handle: 44 mm, total reconstructed length: 60 mm, of which 20 mm is inserted into the seam joining the panels together. This seam was executed in the same way as fragment 50421_L03, i.e. from two panels and a border sewn with straight stitch and folded over onto the outside of the panels.



No. 7. 50421_L07

Description. Man's right sandal made from raw leathers. [MS2014o0639 to 0640] This object was made of coarse materials and of very basic manufacture.

Dimensions. Length: 280 mm, widths: 90 to 120 mm.



No. 8. 50421_L08

Description. Large piece of leather preserved with three layers of textile and a layer of resin on the inside [MS2014o0947 to 0948]. The preserved section appears to correspond to the outline of a foot. The piece is formed of three panels joined together with a seam consisting of a double-row of stitching (straight/overcast stitches). On the inside, two superimposed layers of leather are visible, together with a plain border folded over onto the inside and fixed with straight stitching.

On the outside, the surface of the shroud bears the imprints of leather straps: in the upper part, two imprints of twisted straps; in the lower part, two imprints of textile straps. The imprints are quite deep,

especially in the upper part of the piece, indicating that the straps were tightly wound.

Dimensions. Length: 280 mm, maximum width: 250 mm.



No. 9. 50421_L09

Description. End of a leather strap made of eight plaited leather strips [MS2014o0617 to 0618]. The end is finished with two small leather strips ligatured around the plaited strap.

Dimensions. Length: 65 mm, width: 10 to 18 mm.



No. 10. 50421_L10

Description. Group of objects consisting of a fragment of complete swaddling comprising the three layers of textile and the leather shroud. The leather shroud has a vertical and even fold 6 mm wide and 95 mm long, which must have continued beyond the preserved section. The imprint of a textile or leather strap, measuring 41 mm wide, is visible at one end.

Total dimensions (textile and leather shrouds). Length: 170 mm, maximum length: 120 mm.

Dimensions of leather shroud. Maximum length: 95 mm, maximum width: 70 mm, thickness of leather: 1 to 1.5 mm.

No. 11. 50421_L11

Description. Group of five fragments of shroud. Two fragments with double stitching, one fragment with trace of ligature, one fragment with single stitching, one fragment with repair patch.

No. 12. 50421_L12

Description. Funerary mask (see **fig. 10**) [MS2018o0074A, MS2018o0087 and MS2018o0089]. Fine leather panel placed around the face, then folded several times over the forehead. The two opposing sides were then folded over the eyes of the deceased. No trace of stitching. The piece is almost totally preserved, the left side is complete. Dark-coloured leather, varying from black to brown. It is associated with a light-coloured leather strap.

Dimensions. Total length: 200 mm, maximum width: 135 mm, reconstructed width at the base: 110 mm.



No. 13. 50421_L13

Description. Group of several fragments of different colour and texture, associated with a plant stem encased in a twisted strap.

Dimensions. Length: 58 mm, width: 12 mm, width of twisted strap: 2 mm.

No. 14. 50421_L14

Description. Group of twenty-six fragments of twisted straps [MS2018o0150]. The preserved items are often curved.

Dimensions. Lengths: between 155 to 30 mm, depending on the item, widths: from 4 to 14 mm, depending on the item.

**No. 15. 50421_L15**

Description. Group of thirteen fragments of flat straps [MS2018o0135]. Most of the straps are light-coloured with no visible grain.

Dimensions. Lengths: from 350 to 60 mm, depending on the item, widths: from 5 to 28 mm, depending on the item.

**No. 16. 50421_L16**

Description. Group of three straps with knots [MS2018o0091].

Dimensions. 1: 50 mm long and 15 mm wide; 2: 60 mm long and 5 mm wide; 3: 80 mm long and 5 mm wide.

**No. 17. 50421_L17**

Description. Group of nineteen fragments of leather shroud including the remains of stitching. Two different sizes of stitching enabling the reconstruction of two different objects: one with large, widely spaced stitches measuring 6 mm long; the other with smaller, tightly spaced stitches, 5 mm long [MS2018o0113 to 0114].

Dimensions. Preserved lengths of the fragments: 90 mm for the larger one, 20 mm for the smaller one.

**No. 18. 50421_L18**

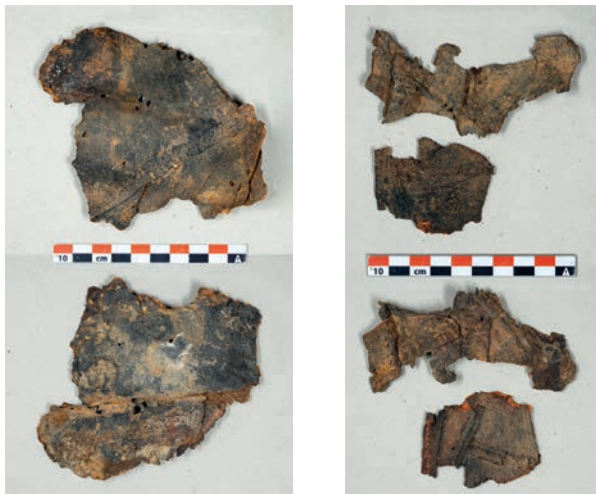
Description. Group of three fragments of shroud consisting of panel joins and seams [MS2018o0093 to 98].

50421_L18.1 [MS2018o0093A to 96]: fragment folded in half, the seam joining the two panels is on the inside.

50421_L18.2 [MS2018o0097 to 98, top]: fragments with seams joining three different panels together and a repair patch.

50421_L18.3 [MS2018o0097A to 98, bottom]: fragment consisting of three different panels joined together with a seam.

Dimensions. Item 1: 100 mm long by 120 mm wide; item 2: 100 mm long by 50 mm wide; item 3: 60 mm long by 50 mm wide.



No. 19. 50421_L19



Description. Group of four fragments of shroud with seams consisting of double rows of straight stitching [MS2018o0061 and 64].

The largest item (item 1) has a seam joining two panels, and a repair patch is visible.

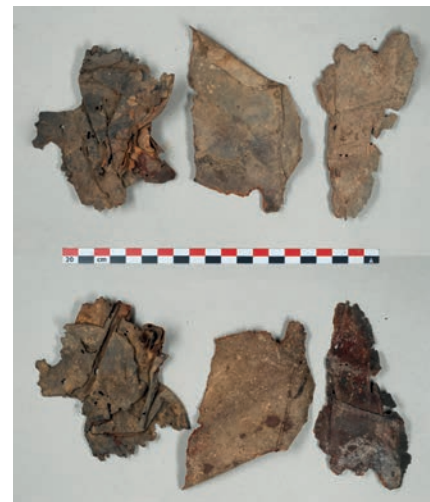
Dimensions. Item 1: 120 mm long by 50 mm wide; item 2: 100 mm long by

50 mm wide; item 3: 50 mm long by 30 mm wide; item 4: 30 mm long by 30 mm wide.

No. 20. 50421_L20

Description. Group of nine fragments of shroud with the remains of a plain seam [MS2018o0103 to 104]. The stitching consists of small, very tight (1/1/1 mm) straight stitches. On two of the items, stitching joining three different panels is visible.

Dimensions. Preserved lengths of the fragments: 90 mm for the largest, 20 mm for the smallest.



No. 21. 50421_L21

Description. Group of fragments of shroud containing repair patches [MS2018o0066 and 68].

Dimensions. Length of fragments: from 45 mm to 100 mm; length of repair patches: from 20 mm to 80 mm.



No. 22. 50421_L22

Description. Group of fifteen fragments of shroud containing a plain border and seams maintaining panels together [MS2018o0117 to 126]. The largest fragments come from four different pieces.

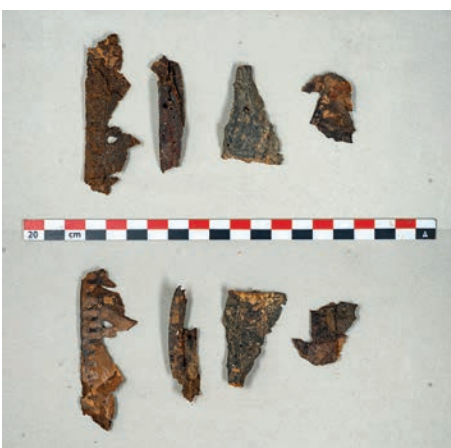
50421_L22.1 [MS2018o0117 to 118]: fragment folded over lengthwise, remains of a seam (type B) joining two panels, and hemmed border measuring 18 to 20 mm high.



50421_L22.2 [MS2018o0119 to 120]: fragment with plain border, 110 mm long and 12 mm high, sewn with wide and widely spaced straight stitching (5/2/5 mm).



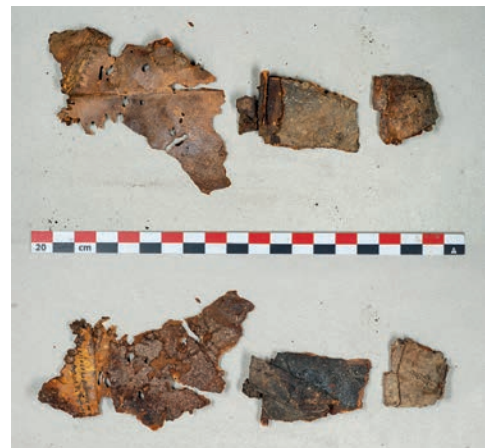
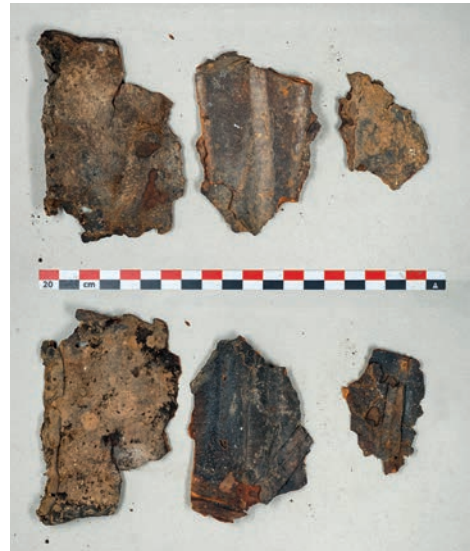
50421_L22.3 [MS2018o0125 to 126]: four fragments of a shroud border, plain border with fold measuring 12 mm high, smaller stitches (4/2/4 mm).



50421_L22.4 [MS2018o0121 to 124]: divided up into six fragments. Several items are lined with the remains of a border pressed against the inside, indicating a double layer of shroud. Additional

length of border: 290 mm, height of border: 9 to 12 mm.

Dimensions. Item 1: 150 mm long by 90 mm wide; item 2: 100 mm long by 70 mm wide; item 3: 90 mm of accumulated lengths by a maximum of 60 mm wide; item 4: 300 mm of accumulated lengths by 50 mm wide.



No. 23. 50421_L23

Description. End of a shroud, tightly pleated and knotted piece of leather [MS2018o0237].

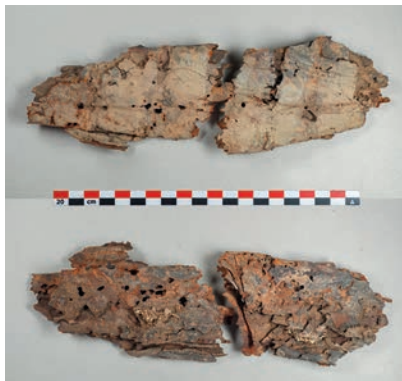
Dimensions. Preserved length: 130 mm, preserved width: 120 mm.



No. 24. 50421_L24

Description. Fragment of shroud, piece pleated lengthwise with the remains of seams joining three panels together [MS2018o0082 to 83].

Dimensions. Length: 230 mm, width: 60 to 70 mm, preserved length of seam: 115 mm.



No. 27. 50421_L27

Description. Funerary mask [MS2018o0225 to 227]. Panel of light-coloured leather, no traces of resin. The mask was laid around the outline of the face, then folded several times over the forehead, after which the two opposite sides were folded over the eyes of the deceased. Almost totally preserved. The base is sewn onto a panel of shroud; single row of stitching, stitches measuring 10 to 12 mm and spaced 5 mm apart.

Dimensions. Total length: 300 mm, maximum width: 220 mm, reconstructed width at the base: 130 mm.

No. 25. 50421_L25

Description. Group of eight fragments of shroud, pleated lengthwise; inside of shroud [MS2018o0151 to 152].

Dimensions. Lengths: varying between 210 and 50 mm depending on the item, widths: varying between 30 and 130 mm depending on the item.



No. 26. 50421_L26

Description. Group of seventeen fragments of shroud, outside characterized by a flat surface showing negative imprints of textile straps [MS2018o0179 to 180].

Dimensions. Lengths: varying between 100 and 200 mm depending on the item, widths: varying between 30 and 90 mm depending on the item.



No. 28. 50421_L28

Description. Group containing a large number of shroud fragments, about ninety small fragments. The pieces are light in colour, indicating they were lightly soaked in resin.

No. 29. 50421_L29

Description. Large piece of shroud with a large number of folds [MS2018o0224]. Traces of three seams joining panels together. Appearance of leather: light in colour and still fairly flexible.

Dimensions. Total length of the item: 200 mm.

**No. 30. 50421_L30**

Description. Large piece of shroud with a joining seam running along the whole length of the preserved fragment [MS2018o0219].

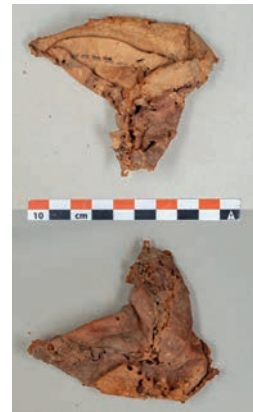
Dimensions. Length of the item: 300 mm, width of seam: 12 mm.

**No. 31. 50421_L31**

Description. Group of twenty fragments of shroud with some elements of seams joining panels together [MS2018o0195].

**No. 32. 50421_L32**

Description. Group of ten fragments of shroud with traces of border in places. One of the fragments has a folded border, 14 mm high, sewn with large (9 mm) straight stitches, spaced 5 mm apart. One fragment has a repair patch.

**No. 33. 50421_L33**

Description. Group consisting of eight fragments of shroud and a twisted strap.

Dimensions. Length of twisted strap: 70 mm, width of twisted strap: 10 mm.

No. 34. 50421_L34

Description. Group of three fragments of shroud [MS2018o0099 to 100]. Two fragments with seams joining panels together, one with a plain border.

Dimensions. Length of item 1: 240 mm, width: 140 mm. Length of item 2: 80 mm, width: 60 mm. Length of item 3: 60 mm, width 30 mm.

**No. 35. 50421_L35**

Description. Fragment of shroud with plain border, seam joining panels together and two repair patches.

Dimensions. Length: 175 mm, width: 150 mm.

**No. 36. 50421_Sh01**

Description. Two fragments of shroud with small mollusc shells (*Cypraea moneta* L.) sewn onto the surface of the fragments and forming a square.

Dimensions. Length: 175 mm, width: 150 mm.

4.1.2. Burial B 50420

No. 37. 50420_L01

Description. Twisted strap made of intertwined and twisted strips of leather [MS2014o0623].

Dimensions. Length: 120 mm, width: 8 mm, thickness of leather: 1.5 mm.



No. 38. 50420_L02

Description. Plain twisted strap.

Dimensions. Length: 250 mm, width: 3 to 4.5 mm, thickness of leather: 1.5 mm.



No. 39. 50420_L03



Description. Handle of a shroud [MS2014o0612]. Round plaited cord linking a leather disc and a lobed piece of appliqué decoration. The appliqué decoration consists of two pieces of the same shape and dimensions tightened round the braided cord, and a leather panel. Plain straight stitching fixed the pieces of

appliqué and the leather panel. The disc is decorated with overcast stitching around the edge, with a slit in the centre into which the plaited cord was inserted.

Dimensions of lobed appliqué decoration. Height: 24 mm, width: 32 mm, thickness of leather: 1.5 mm.

Dimensions of disc. Diameter: 23.24 mm, thickness of leather: 2.5 mm.

Dimensions of plaited cord. Length: 35 mm, width: 5 mm.

No. 40. 50420_L04

Description. Plaited strap made from three intertwined leather bands [MS2014o0629 to 0630].

Dimensions of straps. Length: 180 mm, width: 15 mm; total thickness of strap: 5 mm.



No. 41. 50420_L05

Description. Square plaited cord made from eight leather threads, very similar technique to that used for item 50421_L09 [MS2014o0625 to 0626].

Dimensions of cord. Preserved length: 120 mm, width: 5 mm, thickness of threads: 1 mm.



No. 42. 50420_L06

Description. Group of five fragments of straps belonging to two items. From top to bottom and left to right: frag. 1, item 50420_L06.1; frags. 2 to 4, item 50420_L06.2.

50420_L06.1 [MS2018o0001 to 0002]: group consisting of two fragments of a plaited strap made from eight intertwined leather bands forming a plait.

Dimensions. Preserved length of strap: 120 mm, width: 13 mm, thickness of strap: 7 mm, width of plaited bands: 5 mm, thickness of leather: 1 mm.



50420_L06.2: three fragments of a strap made from sixteen plaited leather strips, remains of stitching in the centre used for fixing a leather sheath.

Dimensions. Preserved length of strap: 600 mm, width: 18 mm, thickness of strap: 9 mm, width of plaited bands: 5 mm, thickness of leather: 1 mm.



No. 43. 50420_L07

Description. Group of four fragments of shroud. One of the items has imprints of textile straps, another shows part of a seam joining together two leather panels [MS2018o0048 to 49]. The join was executed with two parallel rows of plain straight stitches on a bias binding laid over the join of the two panels.

Dimensions of item with stitching. Preserved length: 180 mm, widths: 50 to 25 mm, width of seam: 15 to 16 mm, dimensions of stitches, on the inside: 2/5/2 mm, on the outside: 5/2/5 mm.

No. 44. 50420_L08



Description. Group consisting of a large number of fragments of shroud, thirty pieces of different dimensions.

No. 45. 50420_L09

Description. Group of twelve fragments of a twisted strap.

[MS2018o0003 to 0004]

One of the fragments is made from two straps tied together with a knot.

Dimensions. Total length of fragments: 98 mm, width: 3 to 8 mm, thickness of leather: 1.5 mm.



No. 46. 50420_L10

Description. Group of two fragments of shroud panel, tightly plaited.

Dimensions of 50420_L10.1.

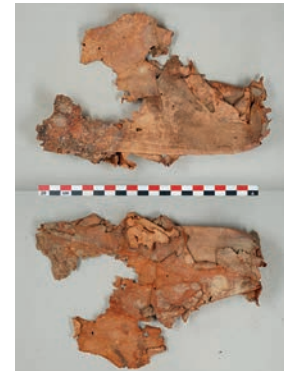
[MS2018o0040 to 41]

Length: 220 mm, width: 180 mm, thickness of leather: 1.5 mm.

Dimensions of _L10.2.

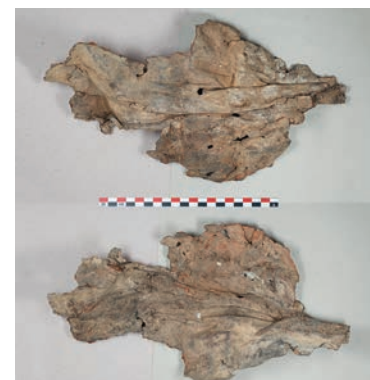
[MS2018o0042 to 43]

Length: 250 mm, width: 130 mm, thickness of leather: 1.5 mm.



No. 47. 50420_L11

Description. Group of two fragments of shroud panel: a large fragment forming folds and containing a joining seam (double row of straight stitches) associated with a fragment bearing a section of border. [MS2018o0038 to 39] The leather is very dark in colour and very stiff.



No. 48. 50420_L12 to 50420_L18

Description. Group of seven fragments of shroud without any distinctive characteristics (stitching or

border); the appearance and flexibility of these items appear to indicate that they belong to the various carrying shrouds found in B 50420.

No. 49. 50420_L19

Description. Group of five fragments of shroud. Two of the fragments, 50420_L19.1 [MS2018o0032 to 0033] and 50420_L19.2 [MS2018o0034 to 0035], bear the remains of a border (fold and wide straight stitching). Item L19.2 bears a preserved repair patch and a seam joining panels together.

Another fragment (50420_L19.3 [MS2018o0036 to 0037, left]) has preserved borders of bias binding on a corner. Item 50420_L19.4 [MS2018o0036 to 0037, right] is a fragment of border.

Dimensions of 50420_L19.1. Preserved length: 130 mm, width: 100 mm, thickness of leather: 1 to 2 mm.

Dimensions of 50420_L19.2. Preserved length: 100 mm, width: 100 mm, thickness of leather: 1 to 2 mm.

Dimensions of 50420_L19.3. Preserved length 40 mm, width: 40 mm, thickness of leather: 1 to 2 mm.

Dimensions of 50420_L19.4. Preserved length: 35 mm, width: 15 mm, thickness of leather: 1 to 2 mm.



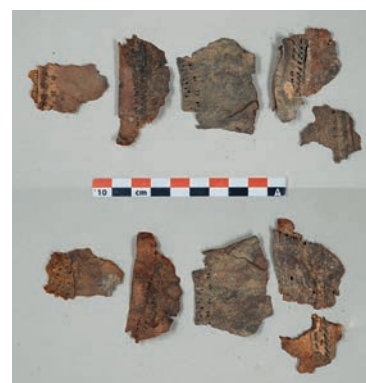
No. 50. 50420_L20

Description. Group of five fragments of shroud with sections of border [MS2018o0022].



No. 51. 50420_L21

Description. Group of six fragments of shroud with a seam consisting of a double row of stitches [MS2018o0026 to 27].



No. 52. 50420_L22

Description. Group comprising two fragments of shroud: a large fragment, 50420_L22.1 [MS2018o0030, right and 31], with joining seams, and a smaller fragment, 50420_L22.2 [MS2018o0030, left], bearing traces of repair.

Dimension of 50420_L22.1. Preserved length: 180 mm, preserved width: 170 mm, thickness of leather: 1 to 2 mm.

Dimensions of 50420_L22.2. Full length: 40 mm, full width: 30 mm, thickness of leather: 1 to 2 mm.



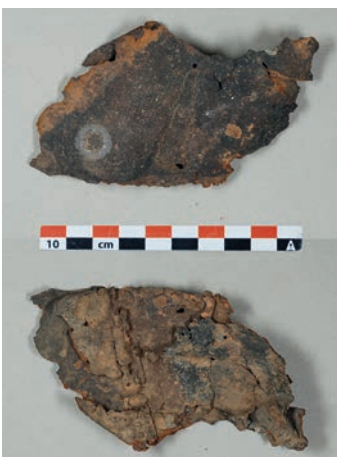
No. 53. 50420_L23

Description. Group of two fragments of shroud. One of the fragments, 50420_L23.1 [MS2018o0014 to 15], consists of several pieces assembled together with repairs on one of the panels to correct either a fault or wear and tear in the leather. The second fragment, 50420_L23.2 [MS2018o0016 to 17], consists of two panels assembled together, with the remains of stitching.

Dimensions of 50420_L23.1. Length: 100 mm, width: 60 mm, thickness of leather: 1.5 mm.

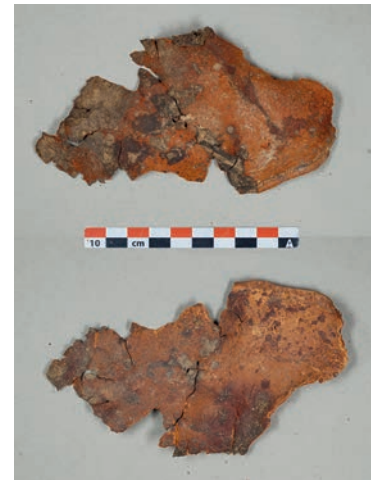


Dimensions of 50420_L23.2. Length: 110 mm, width: 100 mm, thickness of leather: 1.5 mm.

**No. 54. 50420_L24**

Description. Fragments of shroud showing the remains of a single row of stitches.

Dimensions. Preserved length: 140 mm, preserved width: 90 mm, thickness of leather: 1.5 mm.



4.2. Grave-goods in IGN 97: burial B 50432

Items from IGN 97 come from burial B 50432; they are also very fragmented and represent a small number of objects (MNO = 5) divided into fourteen groups.

No. 55. 50432_L01

Description. Decorative item in the shape of an acorn fixed onto the end of a small rope made from two threads of plaited leather [MS2014o0906].

The acorn was made from a rectangular piece of leather (65 mm by 50 mm) into which were cut fourteen 48 mm-long strips. A 2 mm border was left uncut. The cut piece of leather was then rolled up; the outside border of the last strip was held with a stitch.

Dimension of small cord. Preserved length: 20 mm, width: 2 mm.

Dimensions of acorn. Total height: 50 mm, width: 3 to 2.3 mm.

**No. 56. 50432_L02**

Description. Small, bilobate piece of leather on the end of a tongue [MS2014o0915 to 0916]. A decorative object that may have come from an item of clothing, possibly a shoe.



Dimensions. Length: 35 mm, width of end: 15 mm, width of tongue: 5 mm, thickness of leather: 1.5 mm.

No. 57. 50432_L03



Description. Small-sized right sandal. The shoe has been carefully constructed: the sole is made from several layers cut out of thick leather, probably from a bovid; a comfortable shoe, decorated on

the inside [MS2014o0880 to 0881].

No. 58. 50432_L04



Description. Small-sized, slightly high, left shoe, very elaborately made. Only the upper of the shoe has survived, the soles have disappeared. The upper opens widely over the foot; it was made from

several pieces of fine and supple leather from a small ruminant; the seams joining the pieces were sewn with vegetal threads (flax) and there is a decoration on the front [MS2014o0882 to 0883].

No. 59. 50432_L05

Description. Fragment consisting of two panels of shroud with the remains of a seam [MS2014o0884 to 0885].



No. 60. 50432_L06

Description. A fragment of shroud made from two panels and the remains of a seam [MS2014o0878 to 0879].



No. 61. 50432_L07

Description. A fragment of shroud and traces of stitching [MS2014o0876 to 0877].



No. 62. 50432_L08

Description. A fragment of shroud [MS2014o0904 to 0905].



No. 63. 50432_L09

Description. Fragment of a strap made from eight plaited strips of leather. Remains of a sheath fixed with two stitches [MS2014o0898 to 0899].

**No. 64. 50432_L10**

Description. Four fragments of a large plaited strap made from eight leather strips. There are fragments of leather on the surface of the strap indicating that it was covered with a fairly long sheath [MS2014o0900 to 0901].

**No. 65. 50432_L11**

Description. Fragment of twisted strap with a knot at one end [MS2014o0908 to 0909].

**No. 66. 50432_L12**

Description. Handle from carrying shroud made from a leather strip folded in half and reinforced with stitching of thick leather strips. The lower part of the leather strips was stitched on the outside of the leather panels with two rows of straight stitches [MS2014o0902 to 0903].

Dimensions. Length: 50 mm, width: 30 mm, thickness of leather: 2.5 mm.

**No. 67. 50432_L13**

Description. Group consisting of two fragments of shroud with the remains of a panel seam [MS2014o0886 to 0887].

**No. 68. 50432_L14**

Description. Fragment of twisted strap [MS2014o0890].



4.3. Grave-goods in IGN 116.1

Items from IGN 116.1 come from three burials: B 50421, B 50535, and B 50564, excavated during the 2015 season. The items are rare and very fragmented.

4.3.1. Burial B 50521

No. 69. 50421_L01

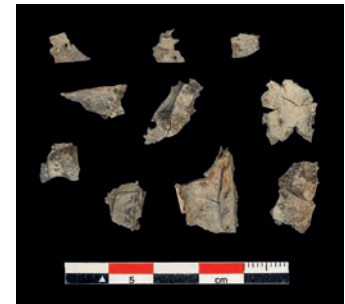
Description. Fragment of shroud with the remains of a panel seam [MS2016o1206 to 1207].



4.3.2. Burial B 50535

No. 70. 50535_L01

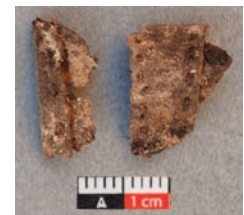
Description. Fragment of shroud.



4.3.3. Burial B 50564

No. 71. 50564_L01

Description. Fragment of shroud.



No. 72. 50564_L02

Description. Fragment of shroud.

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The Glass Objects from Madā'in Šāliḥ

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The glass was studied during the 2018 study season between the 9th and 15th of March. I thank Laïla Nehmé and the members of the team for their very kind welcome, especially Rozenn Douaud and Ariadni Ilioglou for drawing the glass fragments and Caroline Durand for the chronological information she gave me about the pottery.

This study is composed of two parts: a synthesis which gives an overview of the glass vessels and the objects discovered at Madā'in Šāliḥ (technique, chronology, function, provenance); a second part organised by excavation area. The latter is accompanied, when possible, by a small synthesis on the area, followed by a catalogue of all the sherds.

First, it should be noted that the glass material is not abundant but it is present in most of the excavation areas. During the eight excavation seasons, only 269 items have been recorded:¹ 182 glass vessel sherds, sixty-nine ornaments (beads, bangles and bezels), and three small objects (gaming pieces and toilet utensil).

1. Glass Vessels

Manufacturing techniques

In terms of technique for vessel glass, the bulk of the material is free blown (95.05%). Only one piece is a core-formed container (80000_G02, **fig. 7**). Among the moulded pieces, one should note one mosaic small bowl (34022_G01, **fig. 7**), one marble ribbed bowl (50432_G01)² and two linear-cut bowls (10214_G01, 50423_G01) all dating back to the Augustean–Tiberian period (30 BC–AD 40),³ as well as three moulded monochrome ribbed bowls (63002_G01, 70600_G01, 92313_G01)⁴ and two monochrome linear cut bowls (10124_G01 + 10130_G01; 64102_G02) produced in the second half of the 1st century BC and till AD 70.⁵ Only one piece is mould blown (50045_G02 and (?) 50036_G02 **fig. 7**).⁶

Chronology

In terms of chronology, the most ancient piece is a fragment of a core-formed alabastra or amphoriskos of a kind produced in the 1st century BC (80000_G02),⁷ the most recent glass vessels are dated to the 4th/beginning of the fifth century AD.

7. See for one example in Petra, Keller 2006: 34–35, fig. 9, no. 313 and p. 200, type VI.1

If we look at the pieces which can be identified and dated (around 100 objects) using external criteria combined with the data provided by the excavators in their reports, we can see that less than fifteen objects can be dated before AD 70 (**fig. 1**). To the pieces listed above by manufacturing technique should be added three small free blown bowls (34014_G01, 50533_G03),⁸ one of which bears a painted decoration (50066_G01 + 50045_G05, **fig. 7**).⁹

Around twenty objects belong to forms which started to be attested in AD 70 and lasted until the end of the second century AD (**fig. 2**). Three types of tall goblets in colourless glass are attested mainly in funerary contexts:

- facet cut beaker in colourless glass¹⁰ (50037_G01 +? 50076_G02; **fig. 7**);
- goblet with tooled depressions¹¹ (50061_G01; **fig. 7**);
- goblet with abraded and incised lines¹² (50045_G04, **fig. 7**; 35280_G01; 38044_G01_G02).

Another type of goblet should be added, one with a solid base in blue green or deep blue glass, retrieved from surface layers (70600_G2; Surface_G15).

It is also by AD 70 that small bowls with annular base made by glass folding and complex folded rim¹³ (25004_G01) as well as plates with folded base and rim and applied and tooled threa¹⁴ become frequent in the Levant and are attested in ancient Hegra (Surface_G01; 10120_G01; 10238_G01; 10240_G01; 64102_G01). The plates and bowls in moulded colourless glass with wide flat rim of a more luxury category, also appear at this period¹⁵ (38015_G01; 25108_G02a; 60618_G01). Typical of near eastern Mediterranean are the blue green closed vases with complex mushroom lip,¹⁶ equivalent of the square bottles of the western provinces. They are attested in tomb IGN 117 with at least two examples (50082_G01 +? 50111_G1; 50242_G01). Another jug in blue green glass is attested and is tentatively dated to this period (60631_G02).

To the toilet bottle category, belong one ampulla (60805_G01) and two spherical body small flasks (60806_G01; 50053_G02). Other larger series do exist by AD 70 but the fragments are too small to be sure of their early chronology. They are therefore treated in the next paragraph.

A little more than fifty objects belong to forms which appear during the second century and last until the end of the third. The drinking vessels in colourless glass are the most numerous ones (**fig. 3**). The bowls with cut rim show two main forms: hemispherical (34000_G01) and cylindrical. The engraved decoration is composed of engraved lines or engraved lines combined with facets:

- hemispherical bowl with everted and cut rim with engraved lines on the body (92309_G01);
- cylindrical bowl with everted and cut rim with engraved lines on the body¹⁷ (35408_G01, **fig. 7**).

8. Jennings 2004–2005: 61, fig. 3.4.1–11.

9. Nenna 2008.

10. Keller 2006: 45–50; fig. 12, no. 65; p. 194, Type II.10a.

11. Keller 2006: 45–50, fig. 12, nos. 895 and 901; p. 214, Type VII.25d.

12. Keller 2006: 45–50; fig. 12 nos 740 and 828; p. 214–215; type VII.22b and VII.25d.

13. Arveiller-Dulong and Nenna 2005: 27 et p. 36 no. 5.

14. Keller 2006: 51; fig. 15, no. 692; p. 210; Typ VII.19b; Arveiller-Dulong and Nenna 2005: 182 and p. 190–191, no. 522–525; pl. 36.

15. Keller 2006: 192; type II.9a.

16. Keller 2006: 49, fig. 13, no. 292; p. 199, type IV.4a; for the variety of the forms of the body, see Arveiller-Dulong and Nenna 2005: 184, no. 559.

17. Keller 2006: 57, fig. 18; no. 410; but in bluish glass; with a later chronology in the mid 4th century

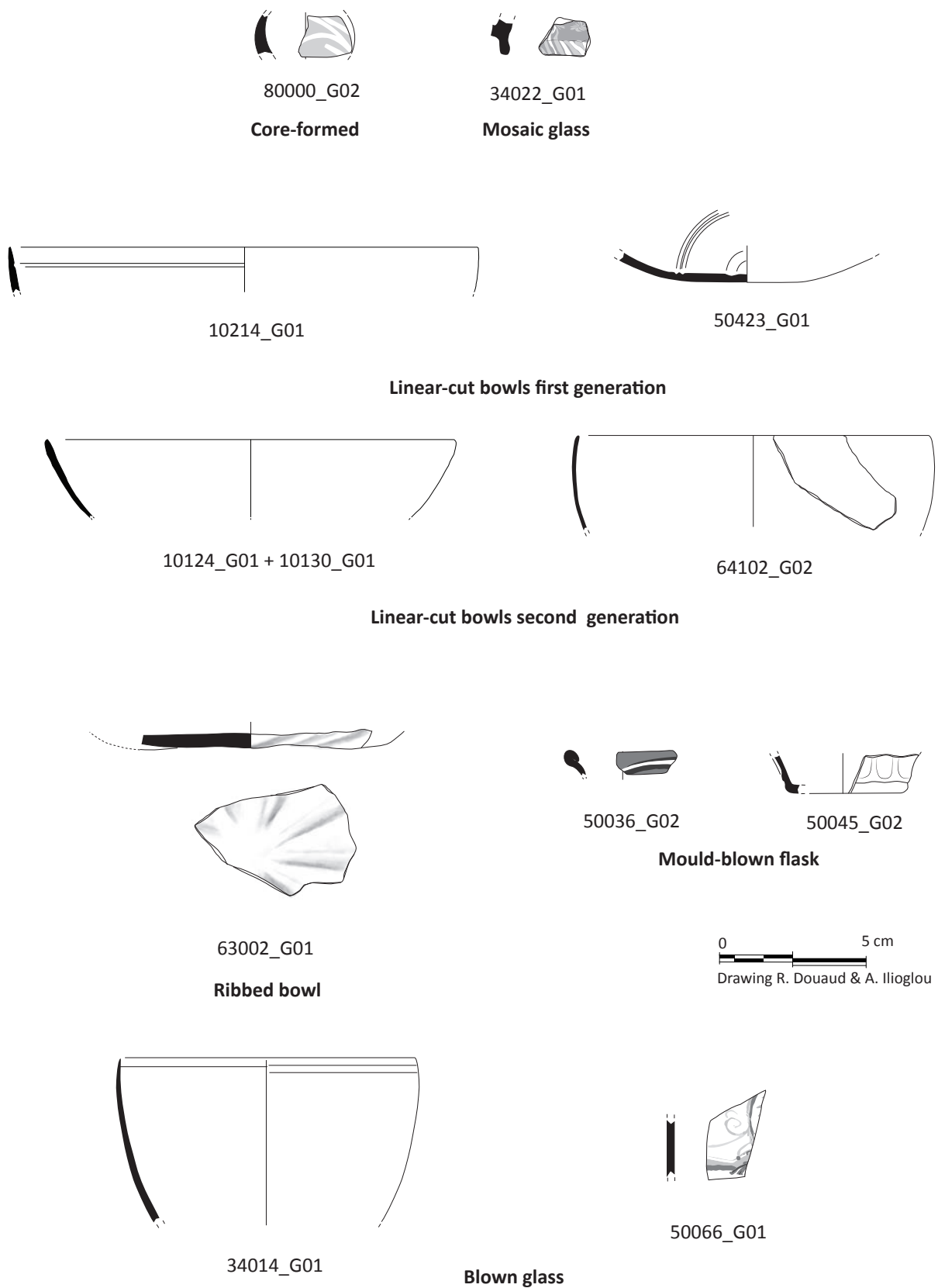


Fig. 1. Glass vessels attested between 50 BC and AD 70.

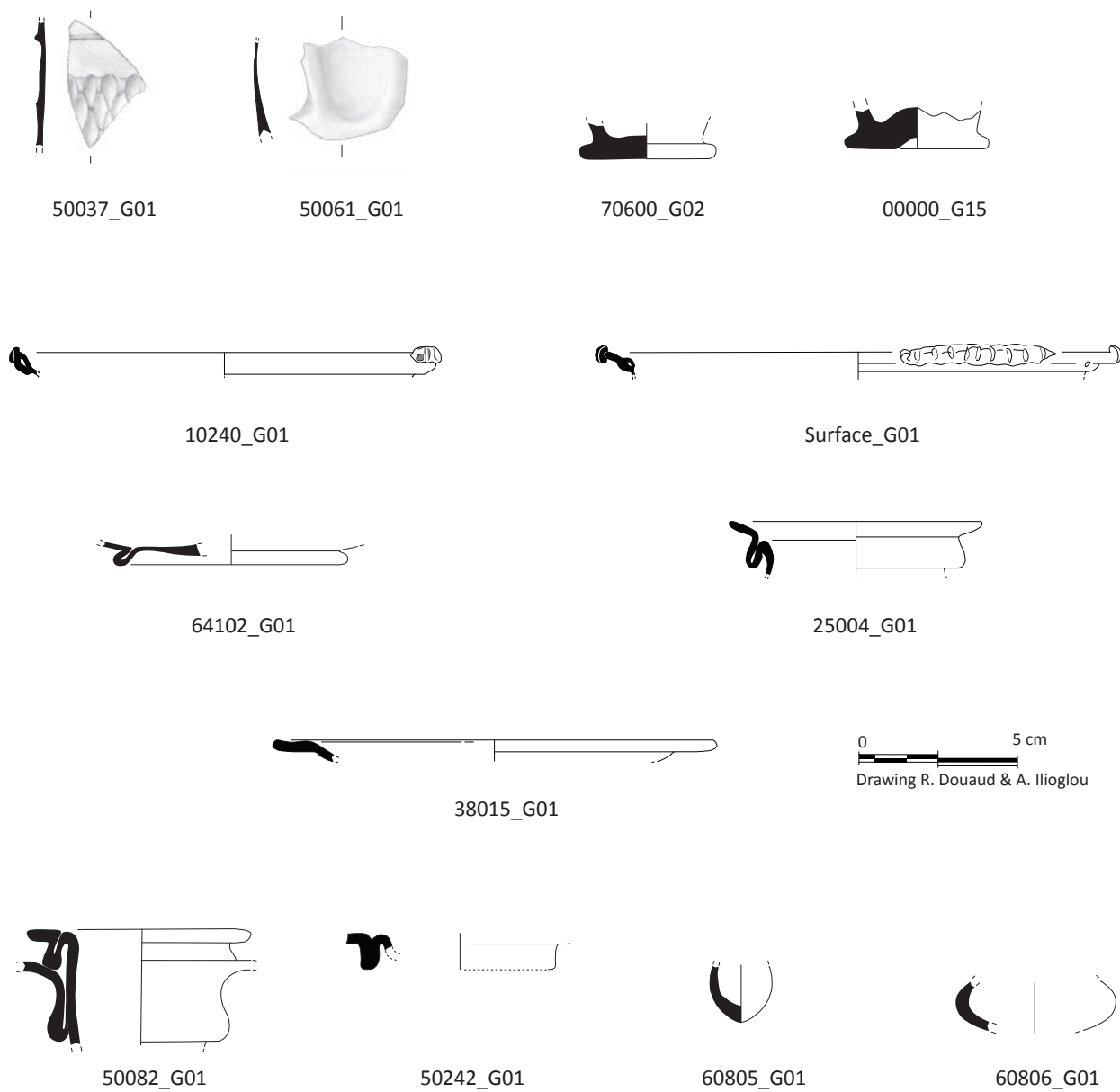


Fig. 2. Glass vessels attested from AD 70 AD and during 2nd century AD.

At the beginning of the second century, a new category of drinking vessel appears: thin colourless glass with rounded rim, applied thread under the rim and base with applied thread. It lasts until the third quarter of the 3rd century. Slender goblets are attested in Hegra (21010_G01, 25034_G01, 60101_G01); more numerous are the cylindrical bowls¹⁸ (21003_G01, 25130_G01, 25130_G02, 25413_G01, 25420_G01, 64008_G02, 80281_G01, 92005_G01, 92012_G01, 92013_G02). Some of these bowls receive an engraved decoration of rows of alternating thin rice grains (90010_G01).

Other engraved decoration of various techniques are attested on different kinds of bowls in contexts belonging to the same period:¹⁹

- hemispherical bowl with a band of vertical rice grain facets (26002_G01);
- wide shallow bowl with horizontal rice grain facet framed by thin engraved lines (34231_G01);
- spherical bowl with cut rim, engraved lines on the upper part of the body and a row of circular facets on the body (50036_G01 + 50045_G03 + 50054_G01 + 50077_G01, 63057_G01);
- spherical bowl with a flat bottom. On the lower part of the body, row of circular facets alternating with double short dashes ending up and down by a slender horizontal facet (50061_G02);
- spherical bowl with row of circular facets alternating with short vertical dashes (80230_G01).

Colourless jugs (**fig. 4**) are attested through rim fragments with an applied thread (50045_G01a, 80189_G02) as well as through neck fragments with applied thread (92307_G01) and big ribbed handles (25010_G01, 25108_G01, Surface_G08, 64008_G01). Few colourless flasks appear: one fragment belongs probably to a spherical flask with a cylindrical neck and a heat smoothed rim (25015_G01). Body and base fragments may be related to this category (34015_G02, 35500_G01). The lion applique (Surface_G05) in colourless glass may be dated either to the end of the third century or to the fourth century.²⁰

Toilet bottles (**fig. 4**) are split between blue-green unguentaria with folded rim, long neck and conical body and smaller size containers. Less than ten unguentaria were identified (32004_G01 [neck], 38010_G01, 50045_G01b, 50054_G02, 50055_G01, 50057_G01, 60631_G01, 92014_G01, Surface_G09). To this medium size containers should be added three aryballoi (80018_G01, Surface_G10?, Surface_G14). Smaller containers are attested mainly in tomb IGN 20 in blue-green (50045_G06, 50053_G02) or colourless glass (50053_G01a and b, 50039_G01 + 50061_G3, 90010_G02).

Five vases can be dated to the fourth century by external criteria or by their context (**fig. 5**):

- goblets with a wide thread base of the same greenish colour as the vase (10145_G01, 90014_G01);
- small bowl (80113_G01) with outfold rim in yellowish-green glass;
- body fragment of a conical goblet in yellowish glass with a blue drop (surface_G16);
- plate with annular base (10151_G01).

18. Brun 2011: 220, nos. 95–105; fig.

19. Nenna 2003.

20. Arveiller-Dulong and Nenna 2005: 429 and p. 439, nos 1223–1226.

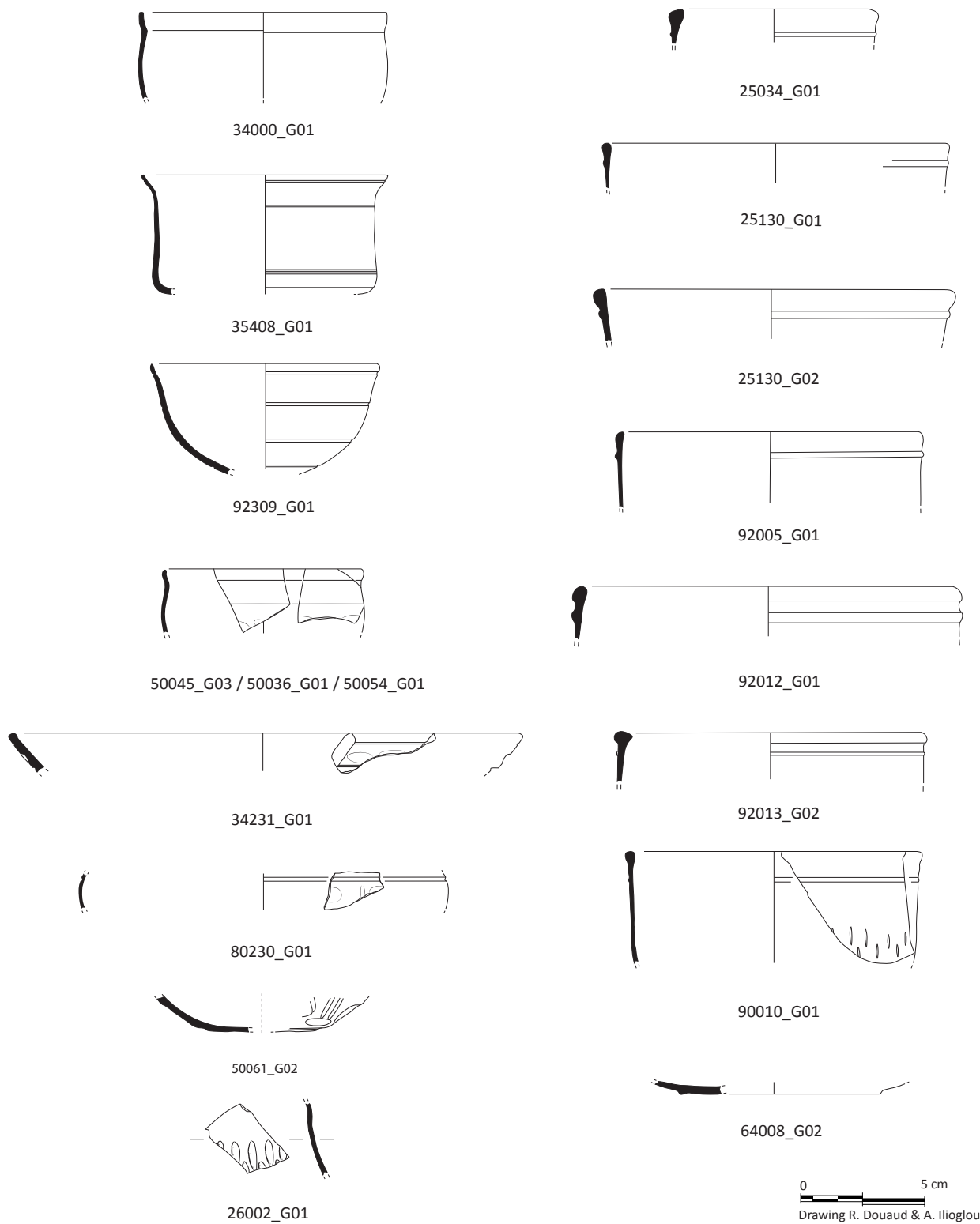


Fig. 3. Glass drinking vessels attested during the 2nd and 3rd centuries.

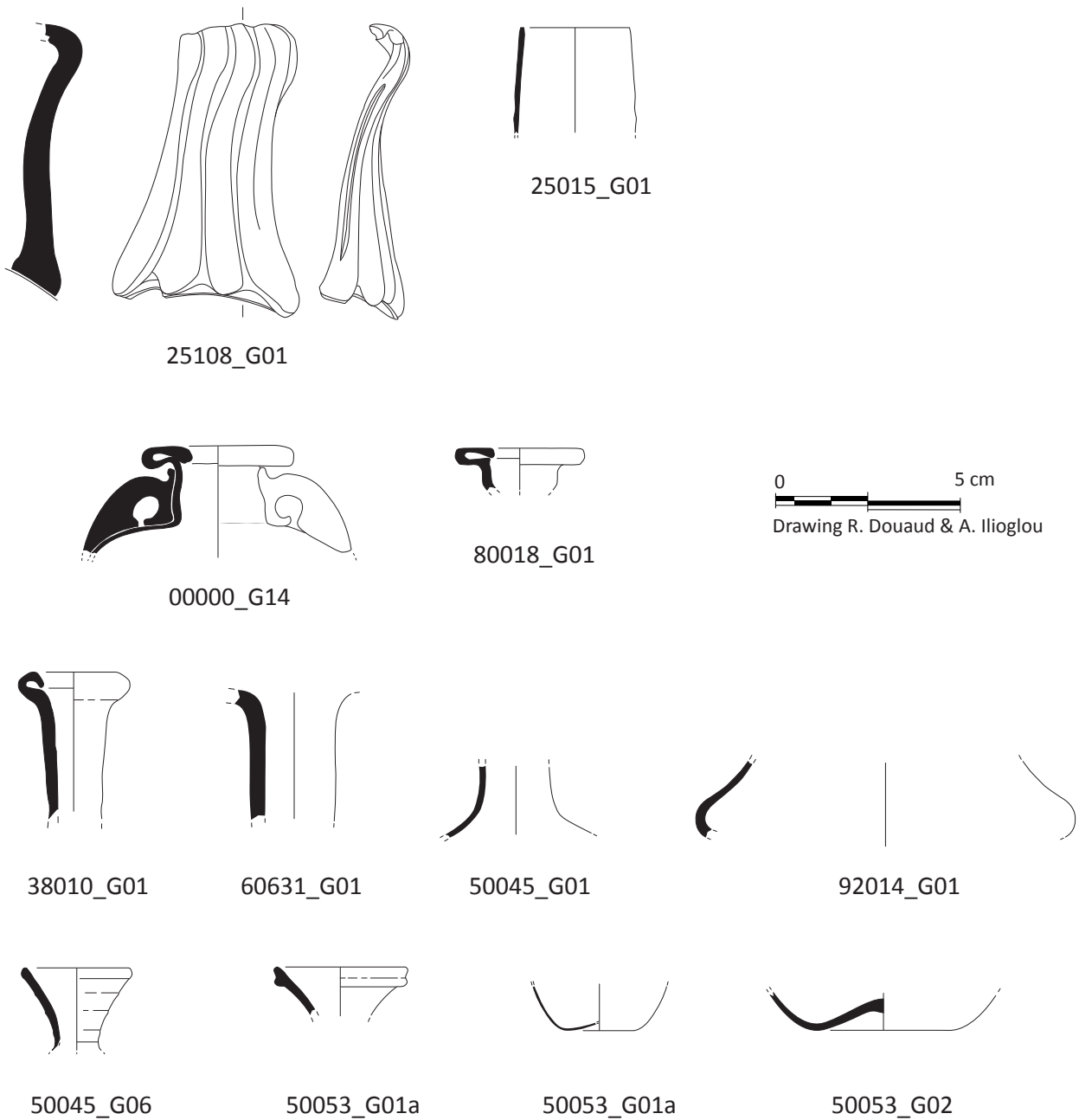


Fig. 4. Glass containers attested during the 2nd and the 3rd centuries.

Function

In terms of function, tableware, and more specifically vessels connected with drinking come first at all periods. Before AD 70, we counted twelve bowls, shallow moulded ones in the tradition of the Hellenistic period, as well as roughly cylindrical/spherical blown small bowls, and only two toilet small bottles were found. For the forms attested from AD 70 to the end of the second century, the pattern is slightly different, with high beakers (seven), small bowls (one) and jugs (three), but also tableware for presenting food (at least seven plates and only three toilet bottles). Tableware is also dominant for the pieces dated to the second and third centuries: eleven big



Fig. 5. Glass vessels attested during the 4th century.

jugs and flasks, fifteen beakers and cylindrical bowls with applied decoration and in one case an engraved decoration, six bowls with facet decoration. The toilet bottles are represented by six containers of small size in colourless or blue green glass, ten blue-green medium size unguentaria with high cylindrical neck, three aryballoi). To the 4th century can be assigned three beakers and bowls, one plate and a conical lamp.

Context

In terms of context, the toilet bottles are better represented in the tombs than in the residential units. Besides, in the residential units as well as in the funerary and religious contexts, the vessel glass is of upper quality in Hegra because of the absolute predominance of colourless glass from the end of the first to the end of the third century, except for the unguentaria in blue-green glass, which were brought to Hegra for their contents rather than for the glass itself.

Provenance

In terms of provenance, most of the sherds were imported to Hegra from the Syro-Palestine region and from Egypt. It is difficult to be more specific as the repertoire of tableware forms is common to the Levant and to the Mediterranean world. Nevertheless, some specific sherds can be assigned to Egyptian productions such as the painted glass bowl or the jug to which belong the lion head appliqué. Also, the colourless tableware and the engraved ware of the 2nd–3rd centuries may well be of Egyptian provenance. The mosaic small bowl, as well as the marbled ribbed bowl are probably imports from Rome.

2. Ornaments and small objects

The ornaments comprise eight bangles, fifty-seven beads and two necklaces, as well as three bezels, one of which is still in place in the iron ring.

Bangles

The bangles are in deep blue glass or glass appearing black, with no decoration or ribbed decoration, and are dated to the 4th century AD.²¹ They are resistant and most of them come from surface layers: 34015_G04 (plain), 80000_G01 (ribbed), 92013_G01 (plain), 10031_G01 (plain). In areas 1 and 6, however, they were found in occupation layers dated to the fourth century: 10017_G01 (ribbed), 10047_G01 (plain); 10196_G03 (plain); 60847_G02 (plain).

Bezels

The bezels and ring with bezel (34401_G01, 50533_M01, 80000_G01) belong to the early Roman Period (1st–2nd AD).

Beads and pendants

Fifty-seven isolated beads and pendants were found in the various excavation areas, very often in surface or mixed layers. To them should be added the necklace discovered in tomb IGN 103, composed of thirty-two miniature beads (50405_G01), and the necklace of tomb IGN 116.1 which is composed, apart from faience and stone beads, of fourteen glass beads (50533_G01–G02). These two necklaces are important because they are dated to the 1st century AD by their context and thus provide a good chronological marker.

As can be seen in **Table 1**, the bulk of the material comes from two periods: the first century AD—even if one does not take in account the two necklaces from the tombs—and the fourth century AD. Some types of beads (**fig. 6**) can be dated relatively precisely on the basis of internal and external criteria. This is the case of the mosaic beads²² and of the monochrome beads of special shapes (aryballos, flower, coffee bean, triangular) which belong to the 1st century AD and earlier. One type of bead—the big spherico-annular bead the extremities of which show a sharp cut—can be dated, thanks to stratigraphical contexts, to the fourth century (the presence of one of them in *locus* 10255 is surely accidental). One is struck by the lack of beads in the mid-second and third centuries contexts, which is the time when vessel glass is the most abundant in Hegra elsewhere.

Small objects

Small objects are represented by few pieces only. Two are gaming pieces: a glass ball (10151_G01, 4th century context) and a small glass disk (Surface_G19). One belong to a cosmetic stick or a spindle²³ (60777_G01) which can be dated, on external criteria, to the 1st century BC–1st century AD.

21. Arveiller-Dulong and Nenna 2011: 249-260.

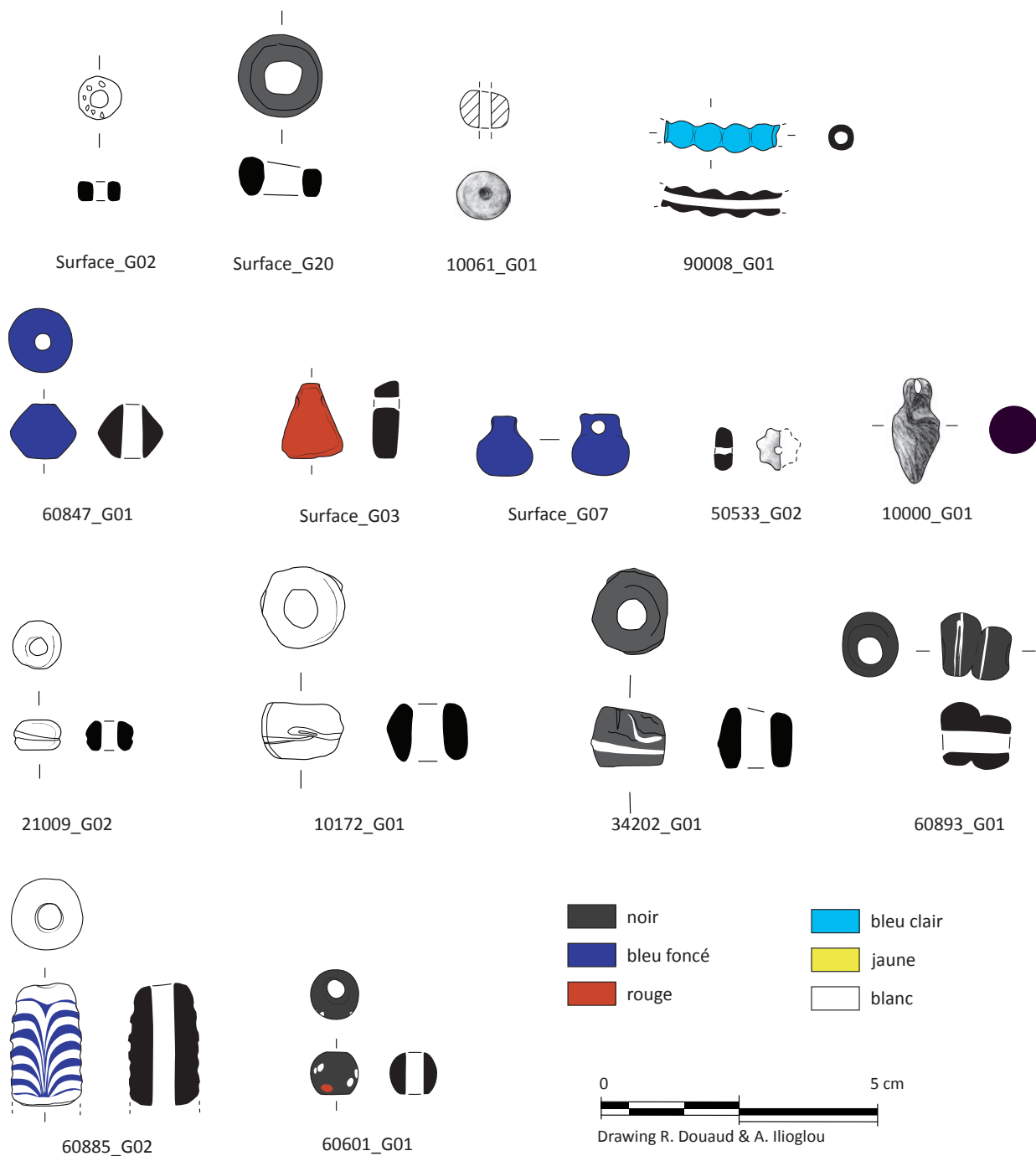
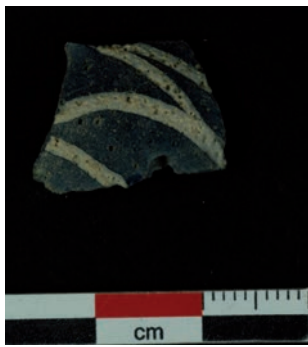
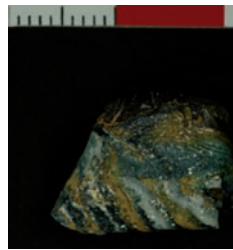


Fig. 6. Beads.



80000_G02



34022_G01



50036_G02



50045_G02



50037_G01



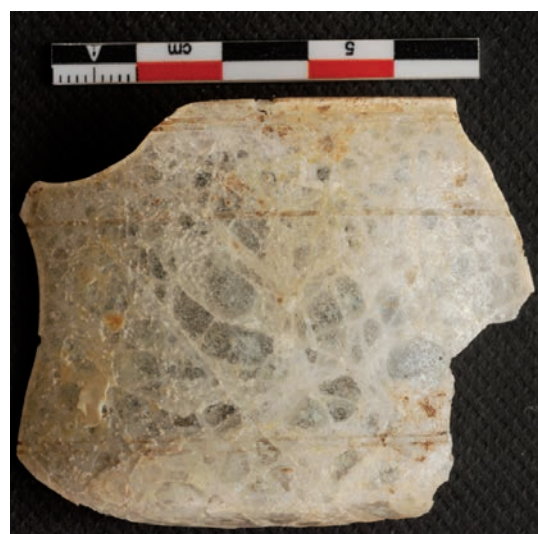
50061_G01



50045_G03



50066_G01



35408_G01

Fig. 7. Selection of photographs.

Table 1: Typochronology of the beads of Hegra. In orange, objects presented in fig. 6 and in plate 5

Type	Context chronology before AD 70	Context chronology 1st c.	Context chronology 2nd–3rd century	Context chronology 4th century	Surface or no stratigraphical indication, or mixed	Total by category	Chronology
Monochrome beads							
Spherical miniature 0.4		50405_G01a (14) 60822_G01			31027_G01 34015_G01 60636_G01 80000_G04 80106_G01 Surface_G04	21	1st BC to 4th AD
Spherical miniature row					90008_G01	1	
Spherical medium 0.8	10340_G01	10120_G02 32010_G01 50533_G01	25211_G01	10016_G2	25058_G01 34015_G03 63000_G01 Surface_G21 Surface_G22	11	From 1st BC to 4th AD
Spherical big > 1		50533_G01 (3)		10137_G01 10174_G01	25089_G01 60636_G02 60885_G01 80139_G01	9	From 1st BC to 4th AD
Annular medium					Surface_G02	1	
Annular big		60880_G01			Surface_G20	2	
Spherico-annular medium				10061_G01		1	4th AD
Ovoid	34013_G01					1	1st BC
Cylindrical miniature 0.4		50405_G01b (8)				8	1st AD
Cylindrical big		50533_G01 (3)				3	1st AD
Biconical medium	92340_G01				60885_G03	2	
Biconical big		50533_G01 (5)			33200_G01 60826_G01 60847_G01	8	
Triangular bead					Surface_G03	1	1st BC–1st AD
Aryballos bead					Surface_G07	1	1st BC–1st AD

Coffee bean miniature		50405_G01e (3)				3	1st AD
Flower bead		50533_G02				1	1st AD
Grape pendant					10000_G01	1	4th AD
Bichrome Bead with applied white thread							
Spherical miniature		50405_G01d (5)				5	1st AD
Spherical big		50533_G01				1	1st AD
Spherico-annular Medium					21009_G02	1	
Spherico-annular big				10017_G02 10172_G01		2	4th AD
Spherico-annular big cut on extremities	10255_G01			10174_G03 10181_G01 10194_G01 34202_G01 34207_G01		6	4th AD
Double-spherical				60693_G01	Surface_G011	2	4th AD
Feather bead							
Biconical big					60885_G02	1	1st BC–1st AD
Colour spot bead							
Spherical medium					60601_G01	1	
Mosaic beads							
Chequerboard cane		50533_G01 (2) 50089_G01				3	1st AD
Bichrome cane		50405_G01c (2)		10192_G01		3	1st AD
Polychrome cane		50533_G01 (2)				2	1st AD
Floral cane					Surface_G13	1	1st AD
Double core							
Double core ovoid					42006_G01	1	Medieval or later
TOTAL	4	52	1	13	31	103	

Catalogue of glass objects by excavation area

Area 1: residential complex

Area 1 was excavated between 2008 and 2011. The archaeological study²⁴ combined with the study of the pottery has shown that six phases of occupation could be reconstructed. Their date needs to be confirmed and we have relied here on the chronology provided by the pottery study of one stratigraphical sequence.²⁵

The excavations have revealed a very small number of glass vessels and objects: a total of thirty-six pieces were registered: nineteen fragments of vessel glass, seventeen small objects (four fragments of bangles, twelve beads and one glass ball). They come mainly from the residential complex, but five sherds (four vessel fragments and one bead) were unearthed in Trench H, north of the complex.

The distribution of the sherds in the various phases is as follows:

- most of the sherds were found in layers attributed to **phase 6**, the latest phase of use of the residential complex dated to the 4th–beginning of the 5th century AD;
- one was found in **phase 5**, dated to the mid-2nd–beginning of the 4th century AD (10194_G01);
- two were found in **phase 4**, dated to the end of the 1st AD–beginning of the 2nd century AD (10059_G01, 10238_G01);
- two were found in **phase 3**, dated to the end of the 1st BC–beginning of the 1st century AD (10240_G01–G02).

The very poor state of preservation of the vessel glass fragments and their very small size do not allow, most of the time, to recognise the original form to which they belong and thus the function of the vases. These fragments are just the testimony that blown glass vessels have been used by the inhabitants of the house during these three phases.

Four identifiable vessels only come from the residential complex:

- one flask fragment (10059_G01) is not datable;
- the bottom with applied thread of a gobelet (10145_G01) found in the courtyard 10184 can be dated to the 4th century;

– the fragments of a plate (10240_G01–G02) with thread applied to the rim and tooled, found in room 10296 belonging to phase 3 of the house, may lead to lengthen the chronology of phase 3 until at least the middle of the 1st century;

– the annular base (10238_G01) found in the heart of Room 10294 is not datable.

In trench H, the brown rim fragment of a bowl (10214_G01) can be assigned to the 1st century AD.²⁶

The proportion of beads and bangles is relatively important. Most of them come from layers assigned to phase 6. The bangles confirm the dating proposed for phase 6. All of them are of D section and they can be plain or bear a decoration of ribs. The deep blue glass or the glass appearing black in which they are manufactured is distinctive in the Near East at the end of fourth–fifth century and they are a hallmark of this period, both in Egypt and in the Levant. This black glass is also used to manufacture beads but, as can be seen in the beads unearthed in this area, other colours were used such as opaque green and red. White opaque is used for decoration under the form of a thin thread applied on the middle of the bead. The form and size of the beads (diam. 0.5, 0.8, 1.3 cm) as well as their manufacturing techniques – well formed in a sphere, annular and cylindrical – vary. In the first two cases (spherical and annular beads), after having been formed, the beads were marvered; in the last case (cylindrical beads), the cane was roughly cut and the extremities of the beads are sharp.

One should note the miniature bead manufactured from a bichrome white and blue cane (10192_G01), a type which appears also in the collar found in the structure numbered SF9 in tomb IGN 103 (50405_G01), dated to the 1st century AD.

Surface finds

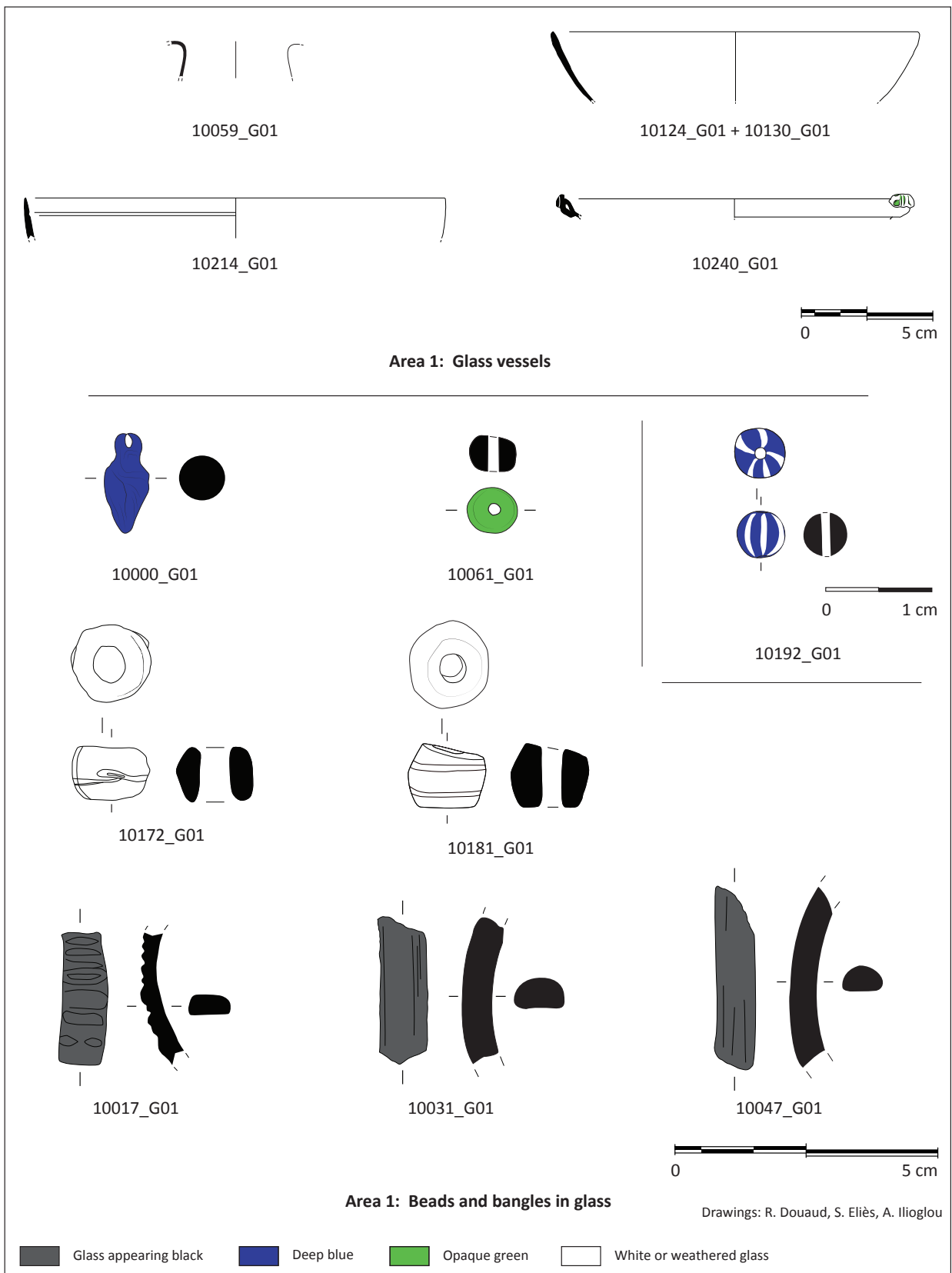
10000_G01. Pl. 1. Pendant in the form of a grape. Deep blue glass. H. 1.8.

House phase 6 (see Report 2011: 35, fig. 3)

Room 10110

Three fragments of vessel glass and one bead found in floor **10016**.

10016_G01. Body fragment. Weathered glass. No colour visible. Max. dim. 1.5.



Pl. 1. Area 1.

10016_G02. Spherical bead, partly broken. Green opaque glass. Diam. 0.8.

10016_G03. Body fragment. Green glass. No colour visible. Max. dim. 1.

10016_G04. Body fragment. Green glass. No colour visible. Max. dim. 2.

One fragment of bangle in the interface layer (**10047**) between floor 10016 and destruction layer of phase 6.
10047_G01. Pl. 1. Fragment of bangle. Deep blue glass. H. 0.9; max. dim. 3. D section. No decoration.

Room 10113

One bead, one fragment of bangle, one fragment of vessel glass found in floor **10017**.

10017_G01. Pl. 1. Fragment of bangle. Glass appearing black. H. 0.8; max. dim. 2.5. D section. Ribbed decoration.

10017_G02. Fragment of a spherico-annular bead. Deep blue glass. Diam. 1.3. White trail applied in the middle of the bead.

10017_G03. Rim fragment too small to be assigned. Deep blue glass. Max. dim. 0.8.

10192: platform for preparation of food or staircase.

10192_G01. Pl. 1. Miniature spherical bead. Made up from a bichrome white and blue cane. Diam. 0.4.

In Courtyard 10184

Interface between destruction layer and floor 10137.

10145_G01. Bottom of a goblet with thread applied and flattened. The latter is actually visible only through the traces it left. Greenish glass. Max. dim. 3.

Floor 10137 + 10172

10137_G01. Spherical bead (half preserved). Red glass. Diam. 1.3.

10172_G01. Pl. 1. Spherico-annular bead. Weathered glass, no colour visible (appearing black?). Diam. 1.3; h. 0.8. Thin white thread applied in the middle of the bead and not marvered.

Floor 10151

10151_G01. Ball. Glass appearing black. Diam. 1.8.

10151_G02. Bottom fragment of a plate or bowl with annular base. Weathered glass, colour non visible. Base diam. 6, preserved h. 0.8.

Small structure 10196 in the courtyard

10196_G01. Two body fragment. Colourless glass. Max. dim. 1. Thickness 0.1.

10196_G02. Body fragment. Colourless glass. Max. dim. 4. Thickness 1.

10196_G03. Fragment of a bangle. Glass appearing black. H. 0.8. Max. dim. 1.4. D section.

Room 10185

Floor **10174**

10174_G01. Fragment of spherical bead. Glass appearing black. Diam. 1.8.

10174_G02. Body fragment of vessel glass (goblet?). Weathered glass. Max. dim. 3.

10174_G03. Roughly spherical bead cut at both ends. Weathered glass. Diam. 1.7; Max. H. 1.7.

Room 10111

Floor **10177**

10177_G4. Fragments of body. Very weathered glass, no colour visible. Dim. max. 3. Thickness 0.1.

Room 10136

Floor **10181**

10181_G01. Pl. 1. Roughly spherical bead cut at both ends. Weathered glass. Diam. 1.7; Max. H. 1.7. White thread applied and marvered.

House phase 5 (see Report 2011: 45, fig. 16)

Room 10304

10194: destruction layer

10194_G01. Roughly spherical bead cut at both ends. Weathered glass. Diam. 1.7; h. 1.7. White thread applied and marvered.

House phase 4 (see Report 2011: 44, fig. 15)

Room 10294

Hearth **10238**

10238_G01. Bottom fragment of a plate or bowl with annular base. Weathered glass, colourless glass. Base diam. 6, h. 0.8.

Room 10295

10059: occupation layer

10059_G01. Pl. 1. Neck fragment with departure of the rim. Yellowish green glass. Preserved h. 1.5.

House phase 3 (see Report 2011: 43, fig. 14)

Room 10296

10240: occupation layer

10240_G01. Pl. 1. Folded out rim of plate. Weathered colourless glass. Diam. 14. Applied and tooled thread on the rim.

10240_G02. Body fragment. Colourless glass. Max. dim. 4. Belonging to the same vase as 10240_G01.

Under house phase 1

10255, under house phase 1 (see Report 2011: 39, fig. 10)

10255_G01. Roughly spherical bead cut at both ends. Weathered glass, appearing black. Diam. 1.4; h. 1.1.

Street 10183 phase 2 (see Report 2011: 32)

10340 level of the street 2nd/1st century BC–mid-1st century AD.

10340_G01. Spherical bead. Weathered green opaque glass. Diam. 0.8.

Trench H

10120: thick mudbrick destruction layer (see Report 2010: 44–45, fig. 31 Step 4; pottery and coins dated to the 1st century AD)

10120_G01. Bottom fragment and body fragment of a plate or bowl with annular base. Light blue glass. Base diam. 6, h. 0.8.

10120_G02. Spherical bead. Deep blue glass. Diam. 0.8.

10124 and **10130**: layer under paved floor 10122 (see Report 2010: 45, fig. 32 pottery and coins dated to the 1st century AD).

10124_G01 + 10130_G01. Pl. 1. Two rim fragments belonging to the same linear-cut mould bowl. Light blue glass. Diam. 14. Preserved H. 3. Thin rim.

10214 (see Report 2010: 46, fig. 34 pottery and coins dated to the 1st century AD).

10214_G01. Pl. 1. Rim fragment of a linear-cut bowl. Brown glass. Diam. 16. H. 2. Internal groove on the internal rim.

Contexts to be localised

10031 (pottery mixed with elements dating from the Hellenistic period to the 4th century AD)

10031_G01. Pl. 1. Fragment of bangle. Deep blue glass. H. 0.9; max. dim. 3. D section. No decoration.

10061 (pottery of the 4th century AD).

10061_G01. Pl. 1. Spherical bead. Green opaque glass. Diam. 1. Published in Report 2008: 224, fig. 55.

Area 2: residential complex and street

Area 2 was implanted on the basis of the results of the geophysical survey, in order to investigate the presence of a street and the residential buildings along it. It has been excavated between 2008 to 2010 through several trenches and by three different excavators. In the absence of full report, it is difficult to assign all the objects to an archaeological phase or to a room. We will therefore concentrate on the external criteria to date the sherds.

Thirty-six sherds were recorded, four of which are spherical beads. Out of the thirty-two lots of glass vessel, seventeen are body fragments not assignable to a particular form. Twelve are made of colourless glass, one of greenish glass, two, of light blue glass and of very small size, come from the upper or surface layers. The earliest form attested is a small bowl with everted rim and a fold below (25004_G01, 21010_G01). It is common in the contexts of the end of the first century AD and the beginning of the second century AD. A second series, made in colourless glass, gathers open forms, goblets (25034_G01) or bowls (25130_G01–G02, 25420_G01), characterised by a thickened rim and applied thread below it. These forms have often an annular base made of a thread applied on the flattened bottom (21003_G01; 25413_G01). They appear at the beginning of the second century and are the main quality vessel of the second century and the first part of the third century throughout the ancient world. To the same fabric belong jugs and flasks of which we have only fragments: neck of a medium size flask (25015_G01), fragment of the handle of a rather big jug (25010_G01). In this same glass was also manufactured a luxury vessel with engraved decoration of which 26002_G01 (spherical bowl with spaced vertical long facets) is an example.

To these vessels dedicated to drinking should be added another big jug in greenish colourless glass, of which only the ribbed handle (25108_G01) has survived.

All these vases (those for which the context is known) were found in layers of phase 3 or to the destruction of phase 3, dated to the second and beginning of the third century AD. No earlier nor later glass fragments were observed in this domestic area.

Trench A (see Report 2008: 53–60)

20001: decay layer

20001_G01. Body fragment. Colourless glass. Dim. max. 1

Trench B (see Report 2008: 63–64 and Report 2010: 57)

21003: southern part of the trench, hard soil, charcoal in some areas, few pottery sherds, bones.

21003_G01. Five fragments belonging to the base of a bowl. Thin thread forming the annular base. Colourless. Base diam. 6.2.

21003_G02. Body fragment. Colourless glass. Max. dim. 1.

21010: southern part of the trench, street; level containing ash and animal bones, pottery sherds, bones, bronze coin (Nabataean?).

21010_G01. Fragment belonging to an open vase (goblet?) with a very thin annular applied base. Colourless glass. Diam. 5.

21011: southern part of the trench.

21011_G01. Body fragment. Greenish glass. Max. dim. 2.

21009: northern part of the trench.

21009_G01. Body fragment. Deep blue glass. Max. dim. 3.

21009_G02. Pl. 2. Spherico-annular bead. Deep blue or deep violet glass appearing black, thin white thread applied on the middle of the bead. Diam. 0.8.

25211: abandonment layer of phase 3, 2nd–3rd century AD.

25211_G01. Spherical bead. Weathered glass, colour non visible. Diam. 0.8.

Trench C (see Report 2008: 67–78)

22001: decay layer.

22001_G01. Two body fragments. Colourless glass. Max. dim. 3 et 1.

22001_G02. Reinforced rim of a small bowl with everted rim. Bluish glass. Diam. 8.

22001_G03. Rim of a bowl. Blue-green glass. Diam. 14?

22001_G04. Body fragment. Colourless glass. Max. dim. 2.

Trench D (see Report 2009: 117–121)

23001: surface layer

23001_G01. Body fragment. Colourless glass. Dim. max. 2.

Trench F (see Report 2009: 83–114; Report 2010: 49–89; Report 2011: 52–54)

25003: surface layer.

25003_G01. Four body fragment. Colourless glass. Dim. 2.5.

25004: abandonment/destruction layer (phase 4 dated to the end of the 2nd–beginning of the 3rd century AD, see Report 2009, fig. 24).

25004_G01. Pl. 2. Rim fragment of a small bowl. Everted rim and fold under the rim. Colourless glass. Diam. 8.

25015: occupation layer under 25004 (phase 4 dated to the end of the 2nd–beginning of the 3rd century AD, see Report 2009, fig. 24).

25015_G01. Pl. 2. Three joining fragments which belong to the rim and neck of a flask. Colourless glass. Cylindrical neck, rim softened by heat. Diam. 3. For its localisation, see Report 2009, fig. 24.

25010: occupation layer 25004 (phase 4 dated to the end end of the 2nd–beginning of the 3rd century AD, see Report 2009, fig. 24).

25010_G01. Rim of a jug with the upper part of a big handle applied against the rim in two folds. Colourless glass. Max. dim. 4.

25012: courtyard, occupation layer / abandonment of phase 3) beginning of phase 4 (phase 4 dated to the end of the 2nd–beginning of the 3rd century AD , see Report 2009, fig. 24).

25012_G01. Four body fragments. Colourless glass. Dim. max. 2.

25034: occupation layer/abandonment of phase 3–beginning of phase 4, under 25012 (phase 4 dated to the end of the 2nd – beginning of the 3rd century AD , see Report 2009, fig. 24)

25034_G01. Pl. 2. Two joining fragments of rim belonging to a goblet. Colourless glass. Diam. 8.

Reinforced rim, applied trail under the rim. 25012_G01 + 25034_G01 probably belong to the same goblet.

25050: to be located (pottery 2nd–3rd century AD).

25050_G01. Body fragment. Blue green glass. Dim. max. 1.

25058: to be located (no chronological indication from pottery study).

25058_G01. Spherical bead. Weathered glass, colour non visible. Diam. 0.8.

25071: to be located (no chronological indication from pottery study).

25071_G01. Body fragment. Weathered glass, colour non visible. Max. dim. 2.

25089: to be located (no chronological indication from pottery study).

25089_G01. Fragment of spherical bead. Weathered glass, colour non visible. Blue-green? Max. dim. 1.5.

25108: to be located (no chronological indication from pottery study).

25108_G01. Pl. 2. Big ribbon handle with four ribs of a jug. Greenish colourless glass. H. 7.5.

25108_G02a. Fragment of a bowl with padbase. Colourless glass. Max. dim. 2.5.

25108_G02b. Body fragment. Greenish glass. Max dim. 2.

25120: to be located (pottery 2nd–3rd century AD).

25120_G01. Body fragment. Colourless glass. Max. dim. 2.

25129: courtyard, occupation layer / abandonment of phase 3–beginning of phase 4 (phase 4 dated to the end of the 2nd–beginning of the 3rd century AD, see 25012).

25129_G01. Four body fragments. Greenish glass. Max. dim. 3.

25130: to be located (no chronological indication from pottery study).

25130_G01. Pl. 2. Two joining rim fragments of a bowl. Colourless glass. Diam. 13. Thickened rim, applied trail under the rim.

25130_G02. Pl. 2. Two joining rim fragments of a bowl. Colourless glass. Diam. 14. Thickened rim, applied trail under the rim.

25413: trench F East, courtyard, 3rd–beginning of the 4th century AD.

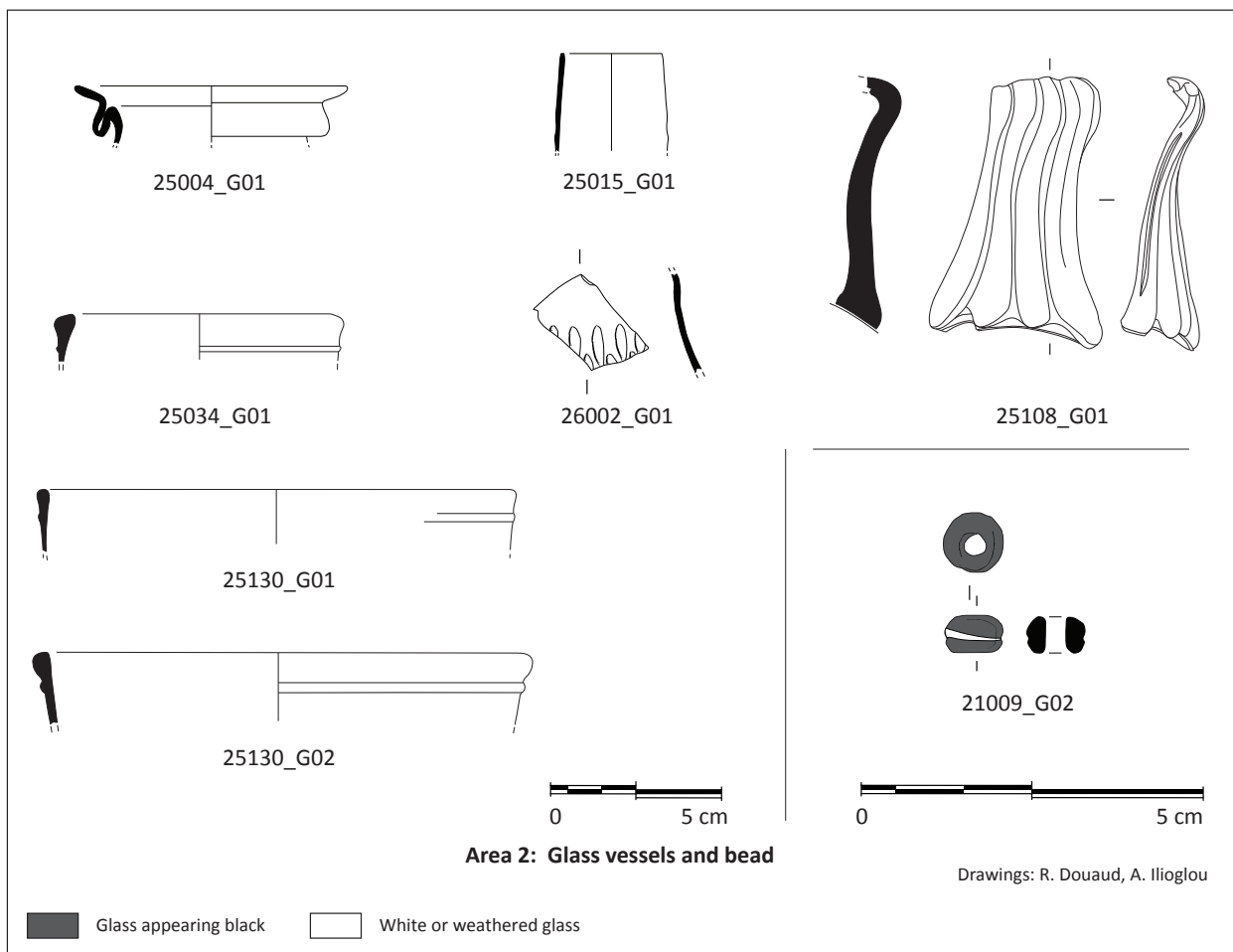
25413_G01. Bottom fragment of a bowl. Colourless glass. Max. dim. 3.5. Thickened bottom.

25417: trench F East, courtyard, 2nd–beginning of the 3rd century.

25417_G01. Body fragment of a bowl. Colourless glass. Max. dim. 2.5.

25420: to be located (no chronological indication from pottery study).

25420_G01. Rim fragment of a cylindrical bowl. Colourless glass. Diam. 10. Thickened rim, applied trail under the rim.



Pl. 2. Area 2.

Trench G, see Report 2010: 83–114

26001: Surface layer.

26001_G01a. Body fragment. Blue-green glass. Max. dim. 1.5.

26001_G01. Body fragment of bowl. Colourless glass. Max. dim. 2.

26002: Surface layer.

26002_G01. Pl. 2. Body fragment of bowl. Colourless glass. Max. dim. 1.5. Horizontal rice decoration: two rows preserved.

Area 3: Rampart of the city of Hegra

Loci 30000 correspond to various trenches excavated along or close to the rampart of the city. They were opened in order to understand the development of the city wall. Because of the small number of glass objects in the trenches, they only give information about the absolute chronology and the general use of the glass in Hegra, when they do not come from surface layers.

For **area 31**, glass objects do not contradict stratigraphical and pottery studies.

For **area 32**, glass objects do not contradict stratigraphical and pottery studies.

For **area 33**, glass objects do not contradict stratigraphical and pottery studies.

For **area 34**, it should be stressed that 34022_G01 is the only testimony of mosaic vessel glass. It is imported from Rome and it is dated to the Augustean–Tiberian period.

34231_G01 is a piece which dates to the second century rather than to the end of the 1st–beginning of the 2nd century AD.

For **area 35**, bowl 35408_G01 confirms the pottery chronology at the end 2nd–3rd century AD.

Sector 31000, “Agglo 21” (see report 2008: 87–93)

All the material of the sector is dated to the 1st century AD

31027: to be located (no chronological indication from pottery study [C. Durand])

31027_G01. Miniature spherical bead. Weathered glass, colour non visible. Diam. 0.3.

Area 32 “Tell nord-ouest” (see Report 2008: 93–101)

32004: last phase of occupation, 1st century AD (see Report 2008: 96–97)

32004_G01. Two joining fragments of the cylindrical neck of a toilet bottle (unguentarium). Weathered blue green glass. Diam. 2.5.

32010: collapse layer: Last quarter 1st century AD (Rapport 2008: 98)

32010_G01. Spherical bead. Weathered glass. Diam. 0.8.

32012: floor under 32010 (pottery study [C. Durand] second half of 1st century AD)

32012_G01. Body fragment. Weathered blue green glass. Max. dim. 2

32016: floor under 32012 (pottery study [C. Durand] second half of 1st century AD)

32016_G01. Body fragment. Weathered glass. Max. dim. 1

32018: levelling layer under 32016 (pottery study [C. Durand] second half of 1st century AD)

32018_G01. Body fragment. Weathered glass. Max. dim. 1

Nos. 32004_G01, 32012_G01, 32016_G01 could belong to the same object considering the same thickness and weathering of the glass.

32015: under 32004, layer non excavated (pottery study [C. Durand] second half of 1st century AD)

32015_G01. Body fragment with one thin rib. Colourless glass. Max. dim. 1.

Area 33 “North Gate” (see Report 2009: 130; 2011: 330)

33005: to be located (pottery study [C. Durand] 1st century AD).

33005_G01. Part of plaque with rounded sides in Egyptian blue. Max. dim. 4 x 3; thickness 1.5.

33200: surface layer.

33200_G01. Pl. 3. Flattened biconical bead. Deep blue glass. Diam. 1.3; h. 0.7

Area 34, Roman Camp (see Report 2016: 19–46)

34000: surface layer.

34000_G01. Pl. 3. Rim fragment of a bowl with cut and concave rim. Colourless glass. Diam. 10; preserved h. 3.5.

34013: bedrock (see Report 2016: 38)

34013_G01. Ovoid bead. Blue green glass. H. 0.8; diam 0.6.

34014: “north-western area: overwhelmingly 2nd–3rd century material, with some Late Hellenistic and few Early Byzantine sherds” (see Report 2016: 41).

34014_G01. Pl. 3. Rim and body of a goblet ls. 6. Weathered colourless glass. Preserved H. 5.3; Diam. 10. Two engraved lines on the rim, external and internal.

34015: surface layer.

34015_G01. Miniature spherical bead. Light green opaque glass. Diam. 0.4.

34015_G02. Flat bottom fragment which belongs to a flask. Light green translucent glass. Diam. 8.

34015_G03. Spherical bead. Light green translucent glass. Diam. 0.8.

34015_G04. Fragment of a bangle. Medium blue translucent glass. Max. dim. 3.

34022: surface layer (see Report 2016, fig. 1).

34022_G01. Fig. 7 and Pl. 3. Fragment of a small mosaic bowl with an applied base formed by a bichrome yellow and white cane with a green support and part of the body constituted with violet floral canes with white petals and colourless floral canes with yellow petals. Max. dim. 1.5.

34111: Trench A, room I, end of 1st–3rd century (see Report 2015: 27–29).

34111_G01. Body and bottom of a small blown bottle ribbed vase. Colourless glass. One rib is preserved, probably applied.

34202: fort, Room XII, phase 6, uppermost deposit dated to the end of the 4th–beginning of the 5th century (see report 2016: 40).

34202_G01. Pl. 3. Roughly spherical bead cut at both ends. Deep blue glass appearing black. Applied white thread in the middle of the body of the bead marvered. Diam. 1.3; h. 1.

34207: Fort, Room XI, phase 5, end of the 4th–beginning of the 5th century (see report 2016: 40).

34207_G01. Roughly spherical bead cut at both ends. Deep blue glass appearing black. Applied white thread in the middle of the body of the bead. Diam. 1.3; h. 1

34207_G02. Spherical bead. Weathered deep blue glass appearing black. Diam. 0.8.

34231: rampart construction, fill of the bedrock dip in preparation of laying out the the pavement, end of the

1st–beginning 2nd century AD (see Report 2016: 28, fig. 12 et p. 32),

34231_G01. Pl. 3. Rim fragment of a bowl. Colourless glass. Two thin incised line on the rim and on the upper part of the body, between them a row of rice elongated facets of which one is preserved. Diam. 15–16.

34401: to be located end of 4th–beginning of 5th century (see Report 2017: 181).

34401_G01. Ovoid bezel. Deep blue glass. H. 0.9, larg. 0.7.

Area 35, South-east Gate (see Report 2017: 51–87)

35278: to be located (no chronological indication from pottery study).

35278_G01. Body fragment. Colourless glass. Max. dim. 1.5.

35278_G02. Body fragment. Light green glass. Max. dim. 1.

35280: to be located (no chronological indication from pottery study).

35280_G01. Body fragment of a goblet. Colourless glass. Max. dim. 3.4. Two thin lines incised on the upper part of the body.

35408: refuse deposit in the robbing trench for the threshold of the first-state gate (Pottery Study [C. Durand] end of the 2nd–3rd century).

35408_G01. Fig. 7 and Pl. 3. Rim and body of a low cylindrical goblet with slightly everted rim. Colourless glass. Diam. 10; preserved h. 4.8. Cut rim, thin lines engraved on the upper and lower part of the body. Published in Report 2017: 84, fig. 35, 85; p. 189, fig. 20–21.

35500: surface layer.

35500_G01. Slightly concave bottom of a flask (?). Weathered colourless glass. Diam. 5; preserved h. 1.

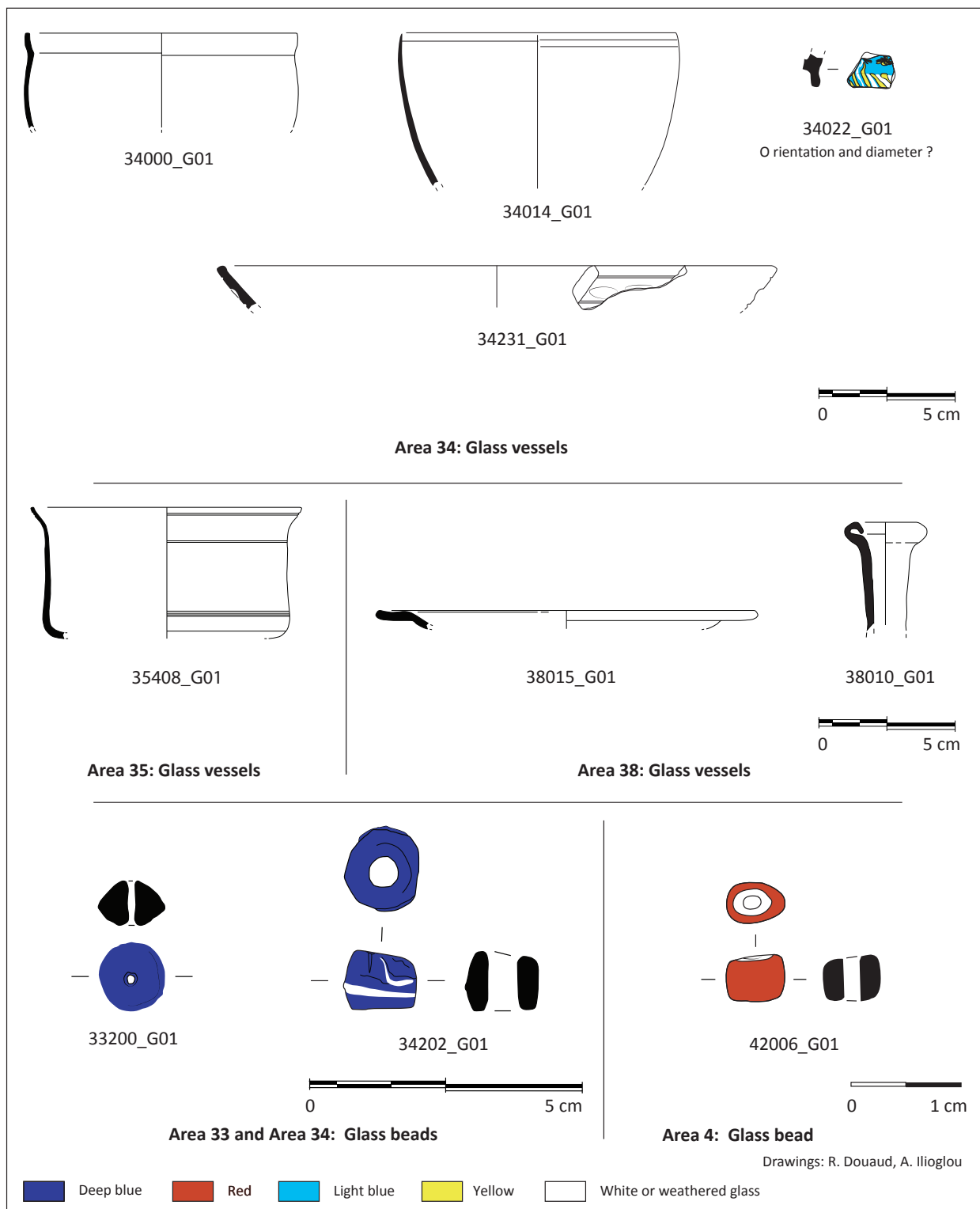
Area 38, Tower 16

Report 2017: 93–94 (no mention of *loci*, study of the pottery to be done).

38000_G01. Body fragment. Blue green glass. Max. dim. 1.

38010_G01. Pl. 3. Rim and cylindrical neck of an unguentarium. Greenish glass. Folded-in rim. Diam. 3.8; preserved h. 4.

38015_G01. Pl. 3. Everted and flat wide rim and body of a bowl. Moulded glass. Colourless glass. Diam. 14.



Pl. 3. Areas 3 and 4.

38044_G01 and G02. Cut rim and body fragment of a goblet. Colourless glass. Diam. unknown, max. dim 2 and 4.

38049_G01. Body fragment. Colourless glass. Max. dim. 1. Could go with 38044_G01–G02.

Area 4

Cairn complex in Jabal al-Khraymât, sandstone hill no. 22, loci 42000

42006: late addition to the original cairn occupation dated to Bronze Age. No dating is provided by the pottery (Report 2009: 195). Only the glass bead would provide a chronology (Report 2009: 174). It can be dated to the medieval or to a more recent period.

42006_G01. Pl. 3. Miniature flattish ovoid bead constituted of a white core and a red translucent outer layer. H. 0.6; diam 0.4.

Area 5

Tomb IGN 20

Report 2008: 117 and p. 159 *loci* 50035-50078.

Loci where glass was recorded:

50036–50037 = ground of the tomb;

50066 = pit SF1;

50039, 50045 = pit SF2;

50053, 50054 = pit SF8;

50061 = pit SF3;

50076 = pit SF7.

The excavations in tomb IGN 20 has shown that except for structure SF1 which still preserved a body in connexion, the layers both on the floor of the tomb and in the pit graves have been disturbed. Nevertheless, they show that glass vessels were deposited in the tomb or used for ceremonies.

The glass material has been treated as a whole in order to determine the minimum number of glass vases, with a weighting by colour and techniques. All in all, thirty-five fragments were uncovered. They show a variety of colour with sixteen colourless fragments, seventeen blue green and two violet. Regarding the manufacturing technique, blown glass is predominant, and there is just one fragment attesting mould blown glass (the only one attested so far in Hegra). Colourless glass is used mainly for tableware, but also for small toilet bottles; blue-green glass pertains mainly to

medium size toilet bottles, and violet glass is employed for one or two small toilet bottles.

At least six open vases of very good quality colourless glass were deposited in the tomb. They show different kinds of decoration:

- goblet showing painted decoration;
- beaker with abraded lines;
- beaker with honeycomb facet decoration;
- beaker with hot-tooled depressions;
- bowl with lines and facet decoration;
- bowl with facet and dash decoration.

A big bottle with flaring rim in colourless greenish glass and applied thread should be added. Two small toilet bottles in colourless glass are attested at least.

For the blue green glass, the fragments belong mainly to toilet bottles which must have been relatively big. There are at least three of them.

The chronological range is relatively wide. It shows elements dating back to AD 30–70 (painted glass and mould blown glass), colourless goblets dating to between AD 70 and 150 (honeycomb, depressions) and elements from the end of the second century–beginning of the third (bowl with facets, bowl with facet and dash), the big bottle with flaring rim is probably the latest fragment (third century).

Polychrome glass

50036_G2. Fig. 7 and Pl. 4. Rim fragment of a flask. Violet glass. Diam. 4; preserved h. 0.8. Folded-in rim, on the rim, red thread applied and marvered, under the rim, yellow thread applied and marvered, then red thread applied and marvered.

Mould blown glass

50045_G02. Fig. 7 and Pl. 4. Lower part of the body of a small flask in mould blown glass. Violet glass. Fluted decoration up the relief marking the lowest part of the body. Base diam. 4; preserved h. 1.5.

Painted glass

The two fragments may be part of the same vase.

50066_G01. Fig. 7 and Pl. 4. Body fragment of a painted bowl. Colourless glass. Max. dim. 3.5, thickness 0.25. Rinceau of vines of red and yellow colour from which come yellow tigels ending in a volute at the top, part of a bird (yellow and red tail), or part of the plant.

50045_G01. Three very small joining body fragments of a painted bowl. Colourless glass. Max. dim. 1.5 thickness 0.25. Band of green paint.

Colourless glass

50037_G01. Fig. 7 and Pl. 4. Body fragment of a facet cut goblet. Colourless glass. One line in relief, row of facets in honeycomb pattern. Max. dim. 4.

50076_G02. Fragment of a bottom with annular base partly preserved. Colourless glass. Max. dim. 2.5. It may be part of the lower part of the body of the facet beaker 50037_G01.

50061_G01. Fig. 7 and Pl. 4. Lower part of the body of a goblet with tooled depressions. Colourless glass. Max. dim. 3.

50045_G04. Two body fragments of a goblet (?). Colourless glass. Two series of two abraded lines. Max. dim. 2.5. Thick. 0.1.

50036_G01+50045_G03+50054_G01+50077_G01. Fig. 7 and Pl. 4. Three rim fragments and one body fragment belonging to the same bowl. Colourless glass. Diam. 16. Cut rim, one incised line on the rim, one incised line on the upper part of the body, engraved decoration of circular facets.

50061_G02. Pl. 4. Bottom and lower part of the body of a bowl with engraved decoration. Colourless glass. Flat bottom delimited by a circle engraved. On the lower part of the body, row of circular facets alternating with double short lines ending up and down by a slender horizontal facet. Preserved H. 1.4.

50053_G01b. Pl. 4. Fragment of the rim of a small flask. Colourless glass. Folded-in rim which make the rim sloping bottom. Diam. 3; Preserved H. 1; thickness 0.2. It may belong to the same vase as 50039_G01 + 50061_G3.

50039_G01 + 50061_G3. Two joining fragments of the bottom of a small flask. Colourless glass. Slightly concave bottom. Preserved H. 1.5; thickness 0.2.

50053_G01a. Pl. 4. Fragment of the bottom of a small flask. Colourless glass. Slightly concave bottom. Preserved H. 1.1; thickness 0.1.

Colourless glass with greenish tinge

50045_G01a. Rim fragment of a jug. Colourless glass with greenish tinge. Applied thread under the rim. Diam. at the level of the thread 6. Preserved H. 1.8.

Blue green glass

50045_G06. Pl. 4. Rim fragment of a small container. Blue-green glass. Everted rounded rim. Diam. 4.

50053_G2. Bottom fragment of a small bottle with probably spherical or ovoid body. Blue green glass. Diam. 4. Preserved H. 1.5.

Unguentaria

Neck fragments: 50045_G01b Pl. 4, 50054_G02, 50055_G01.

Shoulder fragment: 50057_G01.

Body fragments: 50037_G02 (1 frgt); 50045_G01c (2 frgts), 50045_G07 (3 frgts); 50061_G04 (3 frgts); 50076_G01 (1 frgt); 50078-G01 (1 frgt).

Tomb IGN 117

Report 2008: 123-128; Report 2009: 169-215; Report 2011: 79-85

The excavations in tomb IGN 117 have shown that all the tomb has been disturbed. It has nevertheless provided the testimony that glass vessels were deposited in the tomb. Three objects deserved attention: the mosaic bead 50089_G01 and at least two jugs with a similar complex rim (50082_G01 +? 50111-G1; 50242_G01), which were probably transported to Hegra for their contents and are dated between the end of the 1st century AD and the end of the 2nd century AD.

50082: cleaning of the surface layer inside the tomb; second occupation of the tomb. Pottery is dated to the 1st century AD.

50082_G01. Pl. 4. Rim, neck and handle of a big jug with mushroom lip. Greenish glass. The mushroom rim is made by folding down and up to form a bulge, then horizontally to form the rim itself. The handle is made of by a flat ribbon applied on the neck and then drawn up along the neck and then drawn towards the outside. Diam. rim 7, preserved h. 4.

50089: sand filling of the tomb. Glass bead dated to the 1st century AD.

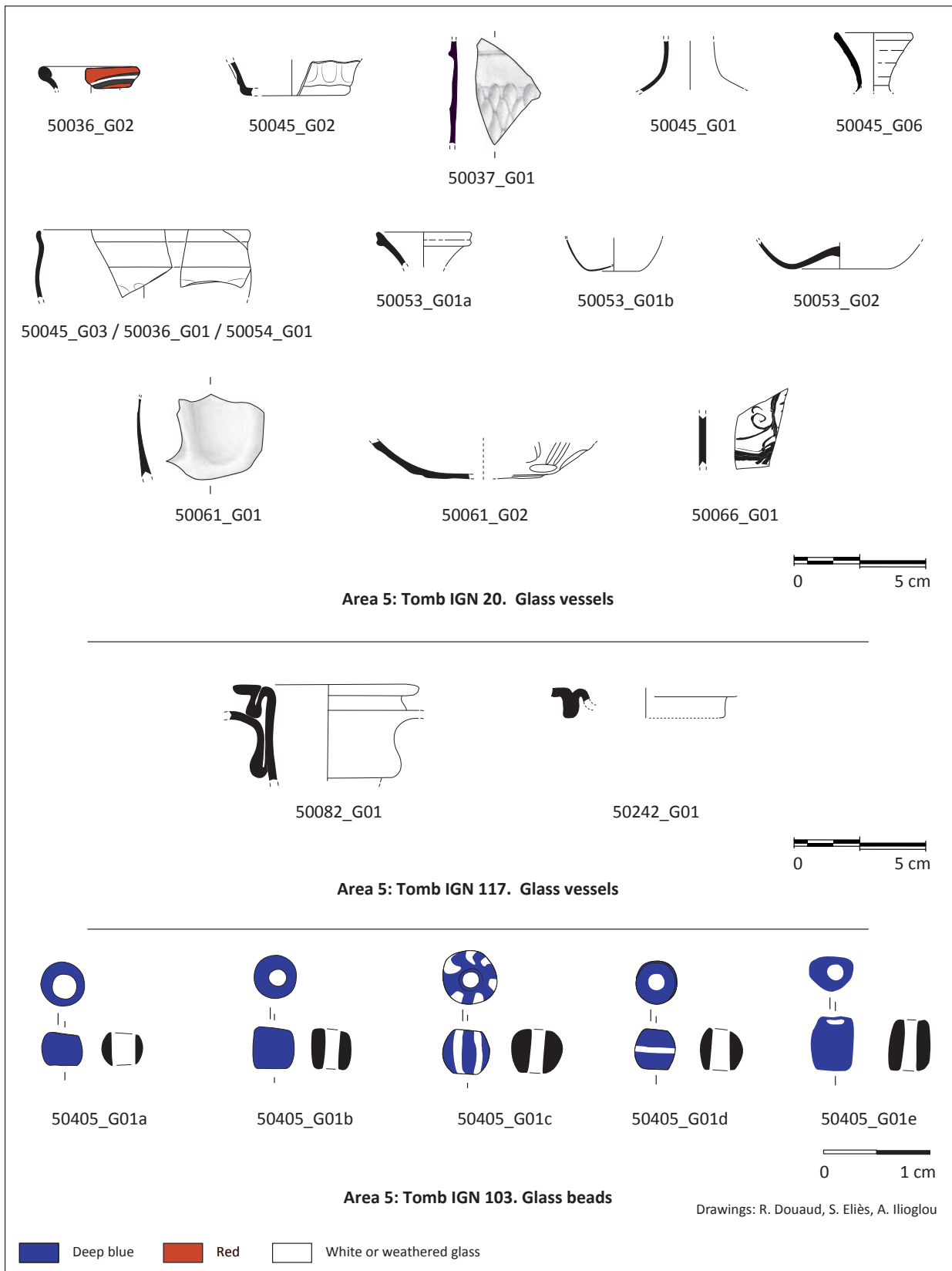
50089_G01. Pl. 4. Bead with chequerboard pattern (in France; for analysis).

50095: entrance of the tomb (pottery joints with the three next *loci* [C. Durand]).

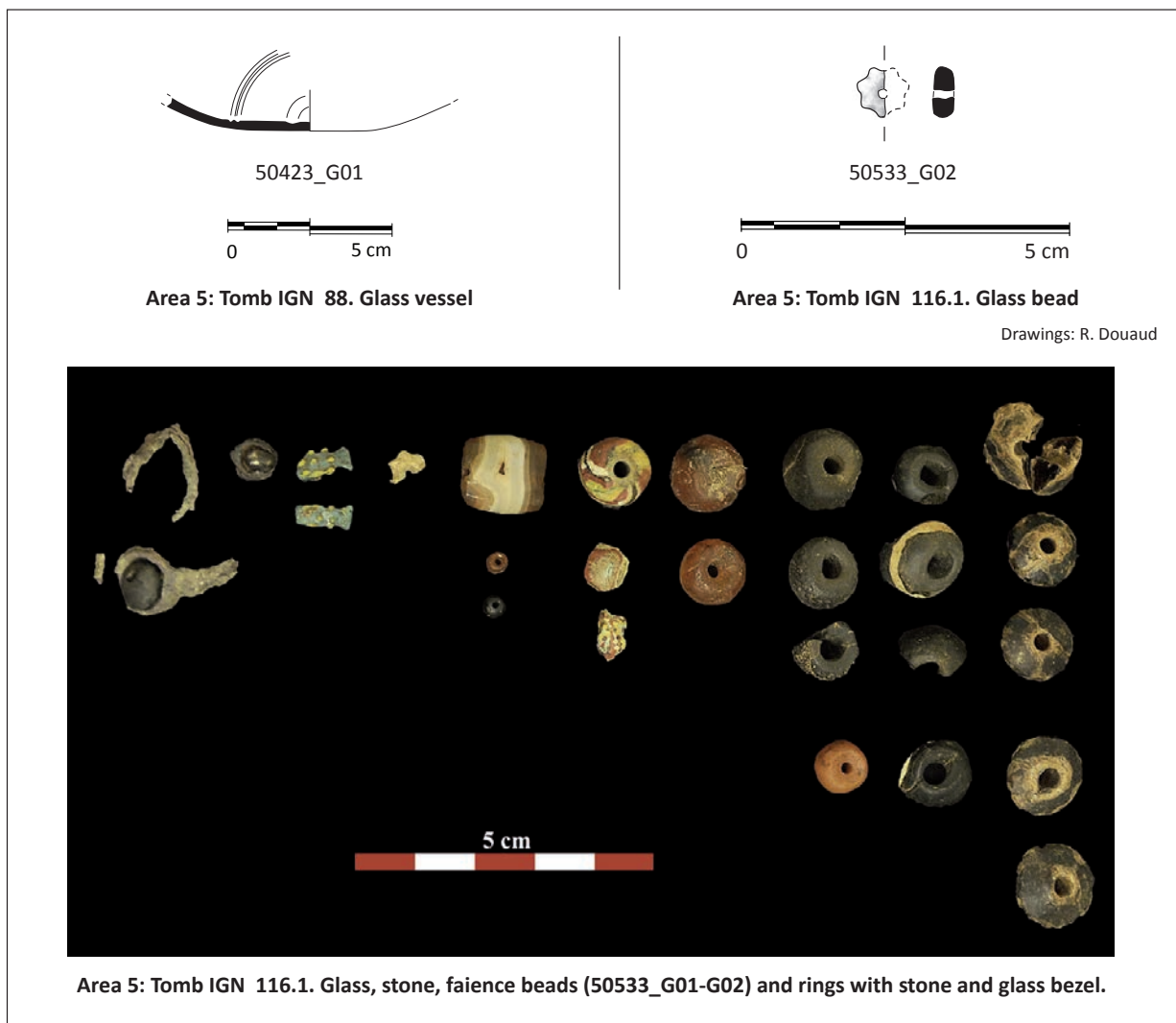
50095_G01. Body fragment. Weathered glass, colour non visible. Max. dim. 1.2.

50111: entrance of the tomb (pottery dated to the second half of the 1st century AD [C. Durand]) .

50111_G01. Two lower body fragments which belong perhaps to a closed vase (cf. 50082_G01). Colourless glass with greenish tinge. Max. dim. 5.5; Max. diam. 14. Published in Report 2009: 205, fig. 33.



PI. 4. Area 5/1.



Pl. 5. Area 5/2.

50123: inside the tomb, area A (pottery dated to the second half of the 1st century AD [C. Durand]).

50123_G01. Seven very small fragments of body. Blue-green glass.

50242: inside the tomb, area B (pottery dated to the second half of the 1st century AD [C. Durand]).

50242_G01. Pl. 4. Fragment of the rim of a big jug with mushroom lip (smaller size than 50082_G01). Weathered greenish glass.

50332: inside the tomb, area D (pottery dated to the second half of the 1st century AD [C. Durand]).

50332_G1. Neck fragment and body fragment belonging to a flask. Yellow-greenish glass. Max. dim. 3. For localisation, see Report 2011: 97, fig. 5.

50332_G2. Very small fragments of colourless glass not assignable to date or form.

50335: to be located (no chronological indication from the pottery [C. Durand]).

50335_G01. Body fragment. Weathered glass. Max. dim. 1.

Tomb IGN 103

Report 2014: 139–141.

Inside the tomb, in pit grave SF9, was discovered the skeleton of an immature, with a twisted bronze bracelet (1st-3rd century AD) at the left arm and a necklace of glass beads at the level of the feet. Pottery sherds are dated to the 1st century BC (C. Durand).

50405_G01. Pl. 4. Necklace composed of thirty-two miniature beads:

– seven cylindrical beads, probably in dark blue glass; diam. 0.4; thickness 0.1 (50405_G01b);

– five dark blue spherical beads with a white thread applied in the middle of the bead and marvered; diam. 0.3; H. 0.4 (50405_G01d);

– two spherical beads made from a dark blue and white thread, stretched and cut; diam. 0.4 (50405_G01c);

– fourteen spherical beads in weathered light green glass; diam. 0.4 (50405_G01a);

– one cylindrical bead in weathered glass in white glass, diam. 0.4; H. 0.4;

– three coffee bean beads in weathered glass. H. 4; diam. 3 (50405_G01e);

Published in Report 2014: 140-141, fig. 15 and Report 2015: 56, fig. 1.

Tomb IGN 88

Report 2014: 141–143 and p. 195.

Robbed tomb, pottery dated to the 1st century AD. Glass bowl belonging to the early phase of production of linear cut bowl, between 30 BC and AD 40.

50423: cleaning of the tomb.

50423_G01. Pl. 5. Bottom fragment of a moulded bowl. Greenish glass. Flat bottom. Two internal concentric lines engraved to define the zone of the bottom. Diam. engraved lines: 5. Preserved H. 1.

Tomb IGN 97

Report 2014: 143 and p. 195.

Robbed tomb. Glass bowl belonging to the early phase of production of linear cut bowl, between 30 BC and AD 40.

50432: cleaning of the tomb. Nabatean pottery dated to the end of the 1st century BC–mid-1st century AD.

50432_G01. Lower body fragment of a ribbed mould bowl. Mosaic glass, blue cane with white spirals. Two ribs preserved. Max. dim. 2.1.

Tomb IGN 116.1

Report 2015: 77.

Inside the wooden 'coffin' 50533, were discovered a ring with a glass bezel at one finger of skeleton no. 50555, as well as another stone bezel ring and a necklace made of elements in faience, stone and glass which cannot be associated to one particular skeleton (see Report 2015: 80, fig. 65 for the whole find). The

mosaic glass beads as well as the faience beads point to a date in the 1st century AD.

50533_G01. Pl. 5. Necklace composed of twenty-five elements in glass, stone and faience (not seen in March 2018, description from photograph).

– five biconical (?) beads. Glass appearing black.

Diam. 1 to 1.2. Published in Report 2015: 80, fig. 70.

– three spherical beads. Glass appearing black.

Diam. 1.

– one spherical bead. Glass appearing black. Diam. 0.8.

Published in Report 2015: 80, fig. 70.

– one spherical bead. Glass appearing black. White thread applied in the middle of the bead. Diam. 1.2.

– three cylindrical beads. Glass appearing black.

Diam. 1 to 1.2.

– two mosaic glass beads made from a cane of white, light green, yellow, deep blue and red glass, stretched and twisted. Diam. 1. One complete and one in fragments. Published in Report 2015: 80, fig. 71.

– fragments of a mosaic glass bead with chequerboard pattern. From a cane of white, light green, yellow, deep blue and red glass. Published in Report 2015: 80, fig. 71.

– two spherical beads in cornaline (?). Diam. 1 to 1.2.

– one spherical bead in cornaline (?). Diam. 1.

– one spherical bead in cornaline (?). Diam. 0.5.

Published in Report 2015: 80, fig. 75.

– one cylindrical bead in agate. H. 1.5, diam. 1.

Published in Report 2015: 80, fig. 75.

Belonging probably to the same necklace.

50533_G02. Pl. 5. Fragment of a bead in form of a flower. Colourless glass. In form of a flower. diam. 0.8.

H.0.2. Published in Report 2015: 80, fig. 74.

50533_G03. Body fragment of brown glass with one incised line, part of the necklace? Max. dim. 0.4.

Published in Report 2015: 81, fig. 76.

50533_TF1. Two faience pendants in the form of the god Bes. Blue green faience with yellow faience spots.

H. 1. Published in Report 2015: 81, fig. 72.

50533_M01. Pl. 5. Iron ring with ovoid violet glass bezel. Bezel convex on the upper side, flat on the lower side attached. Max. dim. H. 0.8, width 0.4 cm, max.

thickness 0.3. Published in Report 2015: 79, fig. 66-67.

Area 6

Jabal Ithlib

Report 2008: 160 for the objects.

Ith 23-25

60000: surface sand.

60000_G01. Two body fragment. Colourless glass. Modern.

Triclinium Ith54

60101: a date between the second half/end of the 1st century BC and the 1st century AD.

60101_G01. Three body fragments and one rim fragment of a goblet with thickened rim, body fragment with applied thread. Weathered glass, colour non visible. Diam. 8; preserved h. 1.5.

IGN 132: sanctuary

Report 2010, fig. 43.

Sector 1: rock-cut chamber IGN 132a and the glacis to the left of the doorway

60618: “glacis” next to the staircase leading to room IGN 132 (no pottery [C. Durand]).

60618_G01. Rim fragment of a plate or bowl with wide flat rim. Moulded glass. Colourless glass. Diam. unknown.

Sector 2: “is more complex because of the following: it is large (around 15 m north-south and 8 m east-west), the layers slope steeply from west to east (over 8 m, there is 1.27 m difference in elevation in the northern part of the sector and 1.58 m in its southern part), the presence of bedrock against which all the archaeological layers abut to the west, and finally, the variety of structures brought to light.”

60601: surface, report 2010: 258.

60601_G01. Pl. 6. Spherical bead. Black glass. White and red glass spots. Diam. 0.8.

60613: destruction layer of the walls surrounding the basins (basin 3).

60613_G01. Body fragment. Blue green glass. Max. dim. 1.

60630: layer of compact earth below the destruction layer.

60630_G01. Body fragment. Colourless glass. Max. dim. 3.

Sector 3 north of massif IGN 132, two terrace walls

60631: cleaning of the eastern part of the internal terrace wall (mixed pottery 1st–4th century AD [C. Durand]).

60631_G01. Pl. 6. Cylindrical neck of an unguentarium. Blue-green glass very weathered by exposure. Diam. max. 2; preserved h. 3.5. Departure of the rim. 2nd century AD.

60631_G02. Beginning of a handle. Blue-green glass. Max. dim. 2.8. 2nd century AD?

60631_G03. Body fragment. Blue-green glass. Max. dim. 2.9.

60636: spread of ash between the western parts of the internal and external terrace walls (mixed pottery 1st-4th century AD [C. Durand]).

60636_G01. Miniature spherical bead. Green glass. Diam. 0.3.

60636_G02. Spherical bead. Green glass. Diam. 1.

Subsector C (see Report 2014, fig. 17)

60718: abandonment layer (no chronological indication from pottery or no registered pottery [C. Durand]).

60718_G01. Folded-out rim of a small bowl or goblet. Blue-green glass. Diam. 7; preserved h. 0.5.

Dump south of the summit (see Report 2015: 36)

60777: (no chronological indication from pottery [C. Durand])? Glass dating: 1st century BC- 1st century AD.

60777_G01. Fragment of stick for cosmetic. Purple glass. Finely twisted. Max. dim. 1.2.

Building at the South-East of enclos IGN 132

Report 2016: 47-63.

60805: wall phase 2 (pottery 1st century AD [C. Durand]). External glass dating: Second half of the 1st century AD–2nd century AD

60805_G01. Pl. 6. Bottom of a small ampulla. Thick greenish glass. Diam. 1.8; h. 0.8. Bottom cut.

60806: wall phase 1 (mixed pottery end of the 1st century–2nd century AD [C. Durand]). External glass dating: Second half of the 1st century AD–2nd century AD.

60806_G01. Pl. 6. Body fragment of a small container with spherical body. Greenish glass. Preserved h. 2; diam. 5.

External glass dating: Second half of the 1st century AD–2nd century AD.

60822: to be located (pottery end of the 1st century BC–beginning of the 1st century AD [C. Durand]).

60822_G01. Miniature spherical bead. Blue-green glass. Diam. 0.3.

60826: occasional occupation 4th century AD (mixed pottery 1st century AD–4th century AD [C. Durand]).

60826_G01. Flattened bitronconical bead. Glass appearing black. Diam. 1.2; h. 0.8.

60847: floor? (?) Building to the west (mixed pottery 1st century AD–4th century AD [C. Durand]).

60847_G01. Pl. 6. Flattened bitronconical bead. Deep blue glass. Diam. 0.7; h. 0.6.

60847_G02. Fragment of bangle. Medium blue glass. Diam. 0.5; h. 0.5. 4th century AD.

Trench 60800: north corner of the sanctuary

Report 2017, fig. 24.

60880: building layer of the 1st century AD.

60880_G01. Annular bead. Green glass. Diam. 1.2; h. 0.7.

60885: to be located (no pottery [C. Durand]).

60885_G01. Spherical bead. Green glass. Diam. 1; h. 0.8.

60885_G02. Pl. 6. Half preserved cylindrical bead. Deep blue glass, white feather decoration. Diam max. 1.2; Preserved h. 2.2.

60885_G3. Flattened bitronconical bead. Deep blue glass. Diam. 0.7; h. 0.5.

60893: floor with coin of Aurelian AD 275.

60893_G01. Pl. 6. Double spherical bead. Glass appearing black. One white thread applied on the middle of each bead. Diam. 0.8; h. 1.3.

63000, South of IGN 132

Report 2014: 196 for objects; Report 2015: 45.

63000: surface layer.

63000_G01. Spherical bead. Red Glass. Diam. 0.8.

63002: surface layer.

63002_G01. Pl. 6. Bottom and body of a low ribbed bowl. Light blue glass. Bottom Diam. 0.8; Max. dim. 5.5. Internal bottom delimited by two engraved circles. Two long ribs preserved.

63004: surface layer

63004_G01. Body fragment fragment. Light blue glass. Max. dim. 2.

63021: mixed assemblage.

63021_G01. Thick body fragment belonging to a closed vase (?). Colourless glass. Max. dim. 1.5. Thick. 0.5.

63022: mixed assemblage.

63022_G01. Thick body fragment belonging to a closed vase (?). Colourless glass. Max. dim. 5; thickness 0.5.

63057: pit (no chronological indication from pottery study [C. Durand]).

63057_G01. Body fragment belonging to a bowl. Colourless glass. Two circular facets engraved. Max. dim. 2.8.

Area 64000, south-west corner of architectural unit (near IGN 132)

Report 2016: 54

64008: surface layer (mixed pottery 1st century AD–4th century AD [C. Durand]).

64008_G01. Fragment of a finely ribbed large handle of a big jug. Colourless glass. Width 4.5; preserved h. 3.

64008_G02. Pl. 6. Bottom fragment of an open vase (cylindrical bowl?) with thin applied annular base. Colourless glass. Base diam. 8, preserved h. 0.4.

Area 64000, south-east corner of architectural unit (near IGN 132)

Report 2016: 72 and 77.

64102: level dated to the 1st century.

64102_G01. Pl. 6. Bottom fragment of an open vase with a thin folded annular base. Light bluish green glass. Base diam. 7, preserved h. 0.4.

64102_G02. Pl. 6. Rim fragment of a linear-cut bowl. Colourless glass. Diam. 12; preserved h. 3.

Area 7

Report 2009: 139–143.

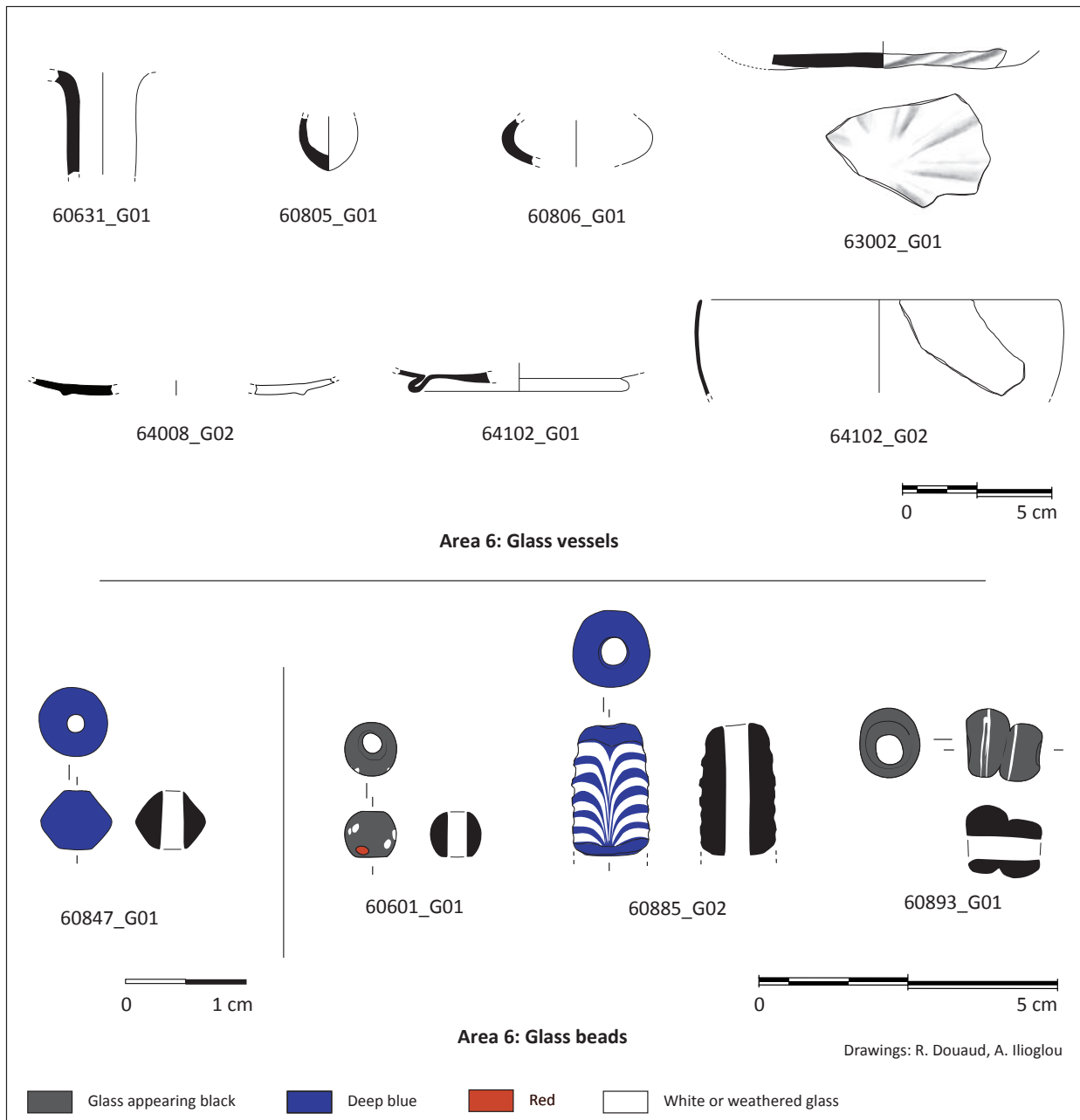
East part of the city.

70600: surface collecting.

70600_G01. Bottom of a moulded ribbed bowl. Weathered glass. Ribs around the flat bottom. Max. dim. 4.3. 1st century AD.

70600_G02. Pl. 7. Full flat base of a goblet. Blue green glass. Diam. 4.3; preserved h. 1.4. 1st century AD.

70600_G03. Body fragment. Green glass. Aryballos? Max. dim. 2.



Pl. 6. Area 6.

Area 8: Residential area

Report 2009: 152–164; Report 2010: 169–187; Report 2011: 147–163.

80000: surface layer.

80000_G01. Ovoid Bezel with convex upper side and flat lower side. Deep blue glass appearing black. H. 2.5; width 2; thickness 0.5.

80000_G02. Fig. 7 and Pl. 7. Bottom fragment of a core-formed alabastra or amphoriskos. Deep blue

glass, with thread applied spirally. Internal wall covered with brownish material. Max. dim. 2.

80000_G03. Fragment of bangle. Glass appearing black. Max. dim. 1.8; h. 0.8. Ribbed decoration.

80000_G04. Spherical bead. Green glass. Diam. 0.5.

80013: to be located.

80013_G01. Body fragment. Colourless glass. Max. dim. 2.

80016: water drum.

80016_G01. Body fragment. Colourless glass. Max. dim. 2.8.

80017: floor 80017 next to the water drum.
80017_G01. Body fragment. Colourless glass. Max. dim. 1.3. One engraved line.

80018: wall 80018 next to water drum.
80018_G1. Pl. 7. Rim of an aryballos. Weathered blue-green glass. Rim folded in and flattened, cylindrical neck. Diam. 3.7; Preserved h. 1.2.

80027: trench G, surface layer.
80027_G01. Body Fragment. Light blue glass. Max. dim. 1.6.

80037: to be located.
80027_G01. Neck fragment of the flask. Colourless glass. Max. dim. 1.5.

80101: surface layer
80101_G01. Body Fragment. Colourless glass. Max. dim. 1.3; thickness 0.1.

80105: surface layer, layer of decayed bricks.
80105_G01. Body fragment of closed vase. Weathered glass, colour non visible. Dim. max. 3.5.

80106: surface layer.
80106_G01. Spherical bead. Green glass. Diam. 0.5, h. 0.4.

80113: to be located.
80113_G01. Pl. 7. Folded-out rim of small bowl. Yellow-greenish glass. Diam. 7; max. h. 0.8.

80139: to be located.
80139_G01. Irregular spherical bead. Glass appearing black. Diam. 1.2.

80154: to be located.
80154_G01. Irregular spherico-annular bead. Weathered glass appearing black. Diam. 1.5, h. 0.8.

80189: Sounding G.
80189_G01. Two body fragment of a closed vase (?). Weathered glass, no colour visible. One with three abraded lines, one with two abraded lines Diam. 1.5, h. 0.8.

80189_G02. Rim fragment of a jug. Weathered glass; Diam. unknown, preserved h. 1. Thick thread applied under the rim.

80224: to be located.
80224_G01. Body Fragment. Colourless glass. Max. dim. 1.3.; thickness 0.1.

80230: to be located.
80230_G01. Pl. 7. Body fragment of a bowl (?). Colourless glass. Max. dim. 2. Engraved decoration:

one line and under rice facet placed vertically and circular facet.

80231: sounding H north; occupation layer associated with walls 80211 and 80212. (see Report 2011: 148)

80231_G01. Body Fragment. Weathered glass, no visible colour. Max. dim. 2; thickness 0.3.

80233: to be located.

80233_G01. Body Fragment. Weathered glass, no visible colour. Max. dim. 1; thickness 0.2.

80240: to be located.

80240_G01. Three body fragment. Weathered glass, no visible colour. Max. dim. 1; thickness 0.1.

80281: to be located.

80281_G01. Body or bottom fragment of a vase. Weathered colourless glass. Max. dim. 2, max. Thick. 0.4. One thin applied thread.

Area 9

Trench A

Report 2010: 191–215; Report 2011: 167–222.

90008: see Report 2010: 208, fig. 5 and Report 2011: 215, pl. 3

90008_G01. Pl. 7. Four spherical beads cut from the cane created by rolling on mould. Blue-green glass. Long. 2; diam. of bead 0.5.

90010: see Report 2010: 210, fig. 10 and Report 2011: 216 pl. 3. Glass dating end of the 2nd–3rd century AD.

90010_G01. Pl. 7. Rim fragment of a cylindrical bowl. Colourless glass. Diam. 12. Thickened rim, applied colourless thread 1 cm below the rim. Two rows of engraved rice-grain facets.

90010_G02. Rim fragment of a small flask with flaring and rounded rim. Colourless glass. Diam. 4. Thickened rim.

90014: “Fire-place opportunistically placed among the *collapsed stones*”, phase 10. Minor destruction (?) and casual occupation (?). See report 2011: 191. Proposed dating soon after phase 9 dated to the 1st AD, but the glass sherd indicates a date in the 4th century AD.

90014_G01. Pl. 7. Bottom fragment of a goblet. Greenish glass. Greenish applied thread to form the base and flattened. Diam. base 3.5; h. 1.

Trench C

Report 2014: 123–138.

All the fragments of glass come from the surface layer or the destruction layer of the upper phases. The glass is dated to the 2nd–3rd century AD.

92005: thick layer of disuse.

92005_G01. Pl. 7 Rim fragment of cylindrical bowl. Colourless glass. Diam. 12. Thickened rim, applied colourless thread 0.5 cm below the rim.

92008: thick layer of disuse

92008_G01. Body fragment. Light blue glass. Dim. max. 2.

92008_G01. Two body fragments. Colourless glass. Max. dim. 2.5.

92012: inside destruction layer 92015.

92012_G01. Pl. 7. Rim fragment of a cylindrical bowl. Colourless glass. Diam. 1. Thickened rim, applied colourless thread 1 cm below the rim.

92013: surface layer in southern area.

92013_G01. Fragment of bangle. Glass appearing black. Diam. 8. H. 0.7. D Section.

92013_G02. Pl. 7. Rim fragment of cylindrical bowl. Colourless glass. Diam. 12. Thickened rim, applied colourless thread 1 cm below the rim.

92014: destruction layer under surface layer.

92014_G01. Pl. 7. Lower body fragment of an unguentarium with conical body. Greenish glass. Diam. 8; preserved h. 2.4.

92015: destruction layer.

92015_G01. Body fragment. Colourless glass. Max. dim. 2

Trench D

Report 2017: 170–177.

92303: phase 4, end of the 3rd–4th century AD

92303_G01. Body fragment of a bowl. Colourless glass. Max. dim. 4.5. Engraved line to delimit the zone of the lower body. Same vase as 92309_G01?

92304: phase 4, end of the 3rd–4th century AD.

92304_G01. Body fragment. Colourless glass. Max. dim. 1.5.

92307: phase 4, end of the 3rd–4th century AD.

92307_G01. Neck fragment of a big closed vase. Colourless glass. Applied thread. Diam. max. 3.3; preserved h. 4.

92309: phase 3b, 3rd AD. Glass dating 3rd century AD.

92309_G01. Pl. 7. Rim and body fragment of a bowl with a slightly everted cut rim. Colourless glass. Diam. rim 9. Decoration of engraved lines, one on the

rim, and three equally spaced on the body. Same vase as 92303_G01?

92313: phase 3b, 3rd AD. Glass dating 1st century AD.

92313_G01. Body fragment of a ribbed bowl. Moulded glass. Weathered glass, no colour visible. Max. dim. 2.5. One rib preserved.

92318: phase 3a, 2nd–3rd AD.

92318_G01. Pl. 7. Bottom of a small cylindrical container. Weathered colourless (?) glass. Diam. 2.2; preserved h. 1.8.

92340: phase 1, 2nd–1st BC.

92340_G01. Small flattened bitronconical bead. Weathered glass. Diam. 0.8; h. 0.7.

Surface finds

Surface_G01. Pl. 8. Rim fragment of a plate. Colourless glass. Everted rim with fold at the transition of the body, on the rim applied thread, tooled. Diam. 14.

Surface_G02. Pl. 8. Annular bead. Light blue opaque glass. Diam. 0.8; h. 0.2.

Surface_G03. Pl. 8. Triangular bead. Red Glass. H. 1.4; width 1, thickness 0.3. Hole on the upper part.

Surface_G04. Spherical bead. Blue green glass. Diam. 0.5. Half preserved.

Surface_G05. Appliqué in the form of a lion head belonging to the handle of a jug. Colourless glass. Preserved h. 2.5, Projecting 2.

Surface_G06. Body fragment. Blue-green glass. Max. dim. 2.5.

Surface_G07. Pl. 8. Bead in form of an aryballos. Weathered glass, no colour visible. H. 1; diam. 1.

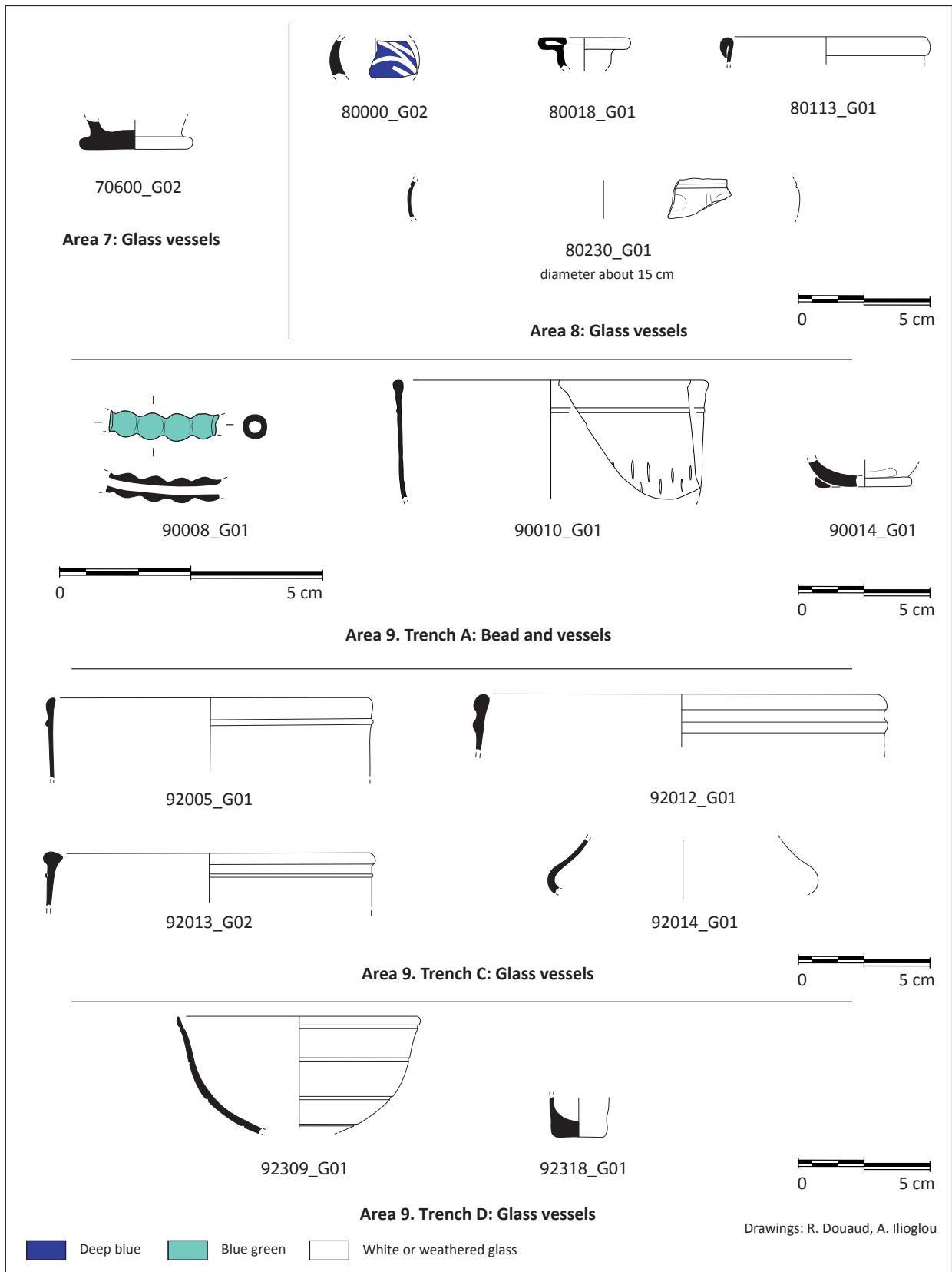
Surface_G08. Lower part of the ribbon handle of a big cylindrical jug or amphoriskos with flat shoulder. Colourless glass. Min. width handle 4, preserved h. 3.2.

Surface_G09. Rim fragment of an unguentarium. Blue-green glass. Diam. 0.5; Preserved h. 0.5. Rim formed by folding-in and flattening.

Surface_G_10. Rim fragment of an aryballos. Green glass. Thick thread with folding. Diam. 5.

Surface_G11. Double spherical bead. Glass appearing black. H. 0.9, diam. of bead. 0.8. White thin thread applied in spiral in the middle of the bead.

Surface_G12. Body fragments. Deep blue glass. Max. dim. 1.5.



Pl. 7. Areas 7, 8, and 9.

Surface_G13. Fragmentary spherical bead. Mosaic glass. Diam. 1.7. Blue floral cane with flower with white heart and white thin petals.

Surface_G14. Area 34. Pl. 8. Rim, neck, handle of an aryballos. Greenish glass. Rim formed by folding in and flattening leaving a small aperture. Cylindrical neck. Small delphiniform handles. Diam. 3.5; Preserved h. 3.

Surface_G15. Pl. 8. Base of a goblet. Deep blue glass. Diam. 4.5; preserved h. 1.3. Full flat base of a goblet, convex internal. On the flat side of the base, pontil mark.

Surface_G16. Body fragment of a conical lamp-goblet. Colourless glass, deep blue glass drop. Max. dim. 0.7.

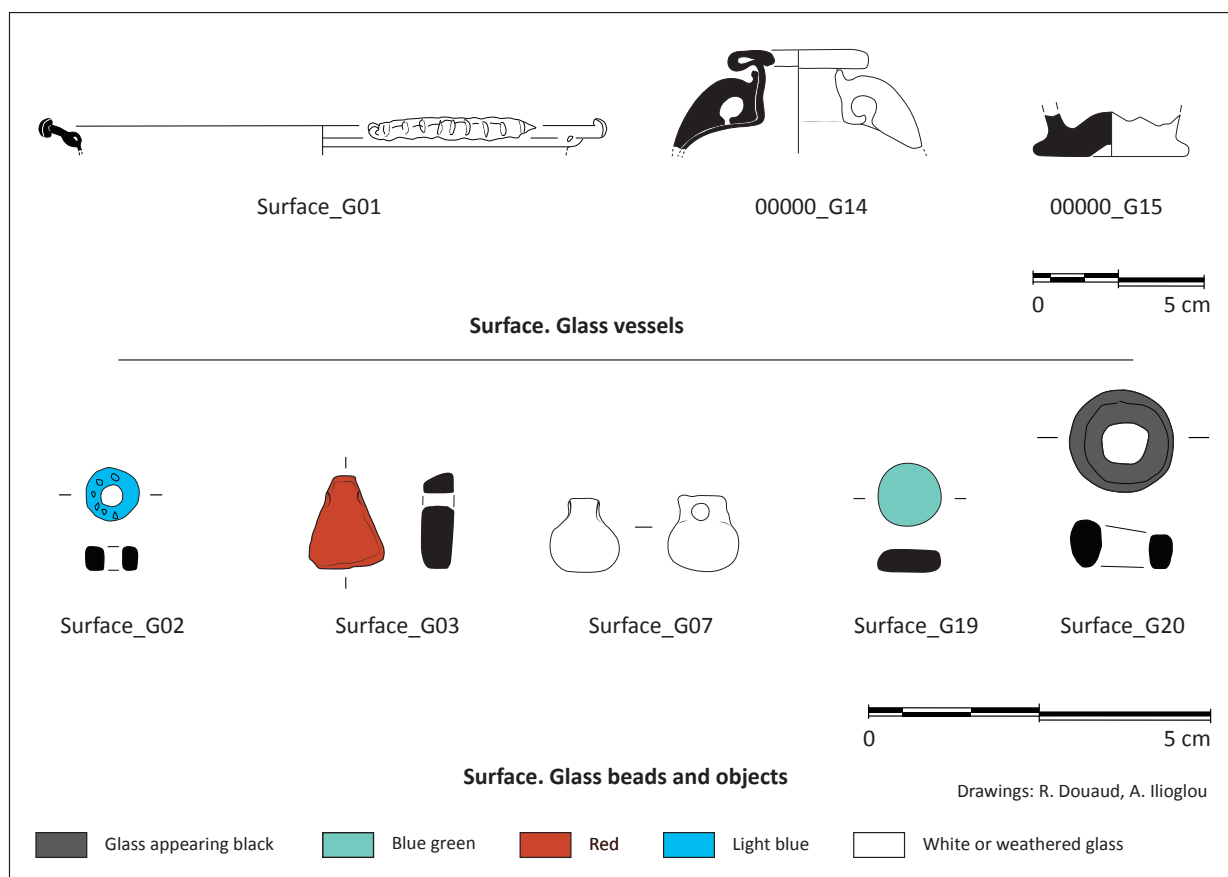
Surface_G17. Two body fragments Colourless glass. Max. dim. 2.

Surface_G19. Pl. 8. Small flat patch. Blue green glass. Diam. 0.8; thickness 0.1.

Surface_G20. Pl. 8. Annular bead. Glass appearing black. Diam. 1.4; h. 0.5.

Surface_G21. Spherical bead. Green opaque glass. Diam. 0.8.

Surface_G22. Spherical bead. Green opaque glass. Diam. 0.8.



Pl. 8. Surface.

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Archaeobotanical Report, 2018

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The fieldwork took place from the 14th to the 28th of March, 2018. It was the fifth archaeobotanical season at Madā'in Šāliḥ and it had two main objectives. First, process the samples of sediment as well as the hand-picked material taken by the archaeologists during the last four excavation seasons in the various excavation areas (2014, 2015, 2016 and 2017). This was done in order to extract and identify the plant macro-remains. Second, undertake a botanical survey in order to collect the main herbaceous and woody species which grow naturally or are cultivated at Madā'in Šāliḥ and in the neighbouring areas. The plant macro-remains include both non-woody remains such as seeds, fruit, stems or roots, and charcoal fragments. Their study will bring new data on the vegetal environment in Antiquity as well as on the local agrarian system, the fuel managements practices, the suspected long-distance trade of plant products, the different uses of plants and the way they are processed in different archaeological contexts (for what has already been done, see Bouchaud 2010a–b, 2011, 2013, 2014a–b, 2015; Bouchaud *et al.* 2011, 2012, 2015; Charloux *et al.* 2018).

Processing of the archaeobotanical samples

The archaeobotanical samples come from the archaeological areas excavated between 2014 and 2017: the Roman fort (Area 34), the Southeast gate of the rampart (Area 35), tower 16 of the rampart (Area 37), tombs IGN 88 and 103 (Area 50), the sanctuary around IGN 132 (Areas 60 and 61), finally others areas in the urban centre (Areas 9 and 65). They represent all in all 43 excavation units (*loci*), 59 samples of soil and a total volume of 241.25 liters of sediment (**table 1**). One archaeological context of the neighbouring site of al-Khuraybah (ancient Dadan), dated to the Byzantine or the Islamic period, was also processed at the request of Dr. Abdulrahman Alsuhanbani. It consisted in three samples of 1 liter each.

Previous archaeobotanical studies at Madā'in Šāliḥ revealed that almost all the plant macro-remains are preserved by charring, except in the tombs where some organic items are desiccated (see for instance Bouchaud *et al.* 2015). We therefore followed a processing system which had already been tested with success during the previous seasons. Samples of sediment were dry-sieved on a column of sieves (with a mesh size comprised between 2 and 0.5 mm). The largest material (2 mm fraction) was then hand sorted by observation with the naked eye in order to separate the charcoal fragments, the seed and fruit remains from other types of organic material (such as dung or organic mass), insects, bones (macro and micro-fauna) and archaeological artifacts (such as pottery and pearls). The refuses of smaller material (0.5 fraction) have been floated in order to diminish the

Table 1. List of the archaeobotanical samples

Site	Locus	Season	Context type	Date*	Volume (liters)
MS	34024	2016	sounding	2nd–3rd c., possibly late 2nd c.	3
MS	34217	2016	dump	end 2nd–beg. 3rd c.?	5
MS	34219	2016	dump, exterior activity	end 2nd–beg. 3rd c.	5
MS	34220	2016	dump	mid 3rd c. to beg. 4th c.	4
MS	34225	2016	occupational floor	mid 3rd–beg. 4th c.	3
MS	34302	2017	dump, refuse layer	late 3rd–early 4th c.	3
MS	34306	2017	ashy layer, destruction layer, other	mid 3rd c., maybe later	2
MS	34418	2017	occupational floor		2
MS	35085	2015	other	end 2nd c.	2
MS	35162	2018	floor	1st part of 3th c.	7
MS	35163	2018	floor	1st part of 3th c.	13
MS	35286	2016	abandonment layer, foundation	2nd c.	2
MS	35318	2016	other	1st c. or before	1
MS	35329	2016	hearth		0.25
MS	35540	2018	construction backfill	end of 2nd c.	3
MS	35668	2018	ashy layer, hearth, dump	1st c.?	29
MS	37056	2017	ashy layer, combustion area, cooking pit	1st c.?	8
MS	37059	2017	jar	2nd c.	1
MS	37065	2017	ashy layer	Lyon–14527=2045 BP +/- 30, cal 165 BC–cal 24 AD**	4
MS	50405	2014	burial (human), pit SF9	disturbed context	H-P***
MS	50421	2014	abandonment layer, burial (human)	disturbed context	H-P
MS	60777	2015	cleaning up excavation rubble	disturbed context	1
MS	60814	2016	habitats inside sanctuary	3rd c.?	H-P
MS	60816	2016	habitats inside sanctuary	3rd c.?	6
MS	60831	2016	backfill	4th c.?	3
MS	60897	2017	hearth	terminus post quem 275	16
MS	61016	2017	occupational floor	3th–4th c. Lyon–14528=1850+/-30 BP, cal 85–235 AD	17
MS	65000	2016	disturbed context		3
MS	65104	2014	backfill, occupational floor		1
MS	65207	2014	dump, occupational floor		6
MS	65214	2014	occupational floor		1
MS	92044	2014	dump, fill, hearth	second half 1st c.–1st half 2nd c.	1
MS	92047	2014			3
MS	92064	2017	occupational floor	late 1st c. BC–early 1st c.	25
MS	92072	2017	fill, hearth, pit		13

MS	92080	2017	floor	2nd–1st c. BC (Phase C1) Lyon–14529=2185 +/-30, cal 361–172 BC Lyon–14530=2300 +/-30, cal 407–234 BC	6
MS	92081	2017	occupational floor	2nd–1st c. BC (Phase C1) Lyon–14532=1810 +/-30, cal 128–323 AD	3
MS	92082	2017	dump, hearth, oven/tannûr	2nd–1st c. BC (Phase C1)	8
MS	92234	2017			6
MS	92306	2017	hearth	late 3rd–4th c. (Phase D4)	16
MS	92318	2017			3
MS	92332	2017	occupational floor, refuse layer	2nd–1st c. BC (Phase D1)	3
MS	92343	2017	fill, jar	2nd half 1st c. BC (cooking pot)	3
KH	4-1-G21-103	2018	dump, oven/tannûr, refuse layer	Umayyad–Abbassid?	1
* Dates without information correspond to AD no calibrated dates, otherwise indicated.					
** 14C calibration dates at 2 sigmas, Reimer et al. 2013.					
*** Hand-picked.					

sorting time, or discarded if the coarse fraction contained no plant material (**fig. 1**). The flotation process consisted in pouring slowly the sediment in a bucket partly filled with water. The charred elements, the density of which is lighter than the density of water, floated on the surface and were collected with a flexible sieve (with a 0.3 mm mesh). All the 2 mm fractions were sorted during the fieldwork and their study offers the following preliminary results.

Of the 59 samples processed at Madā'in Šāliḥ in 2018, 54 contain charcoal fragments of wood, 56 contain seed/fruit items and 5 contains insect remains. Four samples had no plant or insect remains (35318, 37059 which comes from inside a jar, 61016, and 92043 which comes from inside a jar). Of the 3 samples from al-Khuraybah, 2 contain charcoal fragments of wood and 1 contains seed/fruit items. The results of the preliminary identification of seed/fruit are roughly similar to those of previous studies, with some new results as well (tables 2–9). Date stones (*Phoenix dactylifera*) and grains of cereals (barley, *Hordeum vulgare*, and free-threshing wheat, *Triticum aestivum/durum*) dominate. One new pulse, chickpea (*Cicer arietinum*) was found in area 92 (92047). One seed of flax (*Linum usitatissimum*) was also identified for the first time at Madā'in Šāliḥ (92306). This seed, in



Fig. 1. Manual flotation process.

addition to numerous fragments of textiles in linen discovered in the tombs, may point to a local production of flax.

Cotton (*Gossypium* sp.) seeds are numerous and were identified in areas 34, 60, 65 and 92. They all belong to domestic contexts dated to the last phases of the occupation of the site (2nd–4th/5th century AD). Many of them are very well-preserved and complete. They have been integrated into the morphometric study conducted by Juliette Milon in order to identify the cotton morphotypes present at Madā'in Šāliḥ through time (Milon 2018).

Olive stones (*Olea europaea*) appear in several contexts in areas 61, 65 and 92. These finds show a small but regular consumption of this fruit, which may have been cultivated in the oasis.

Hand-picked material collected in the tombs (Area 5, **table 5**) contains rare items which are not found in the other excavated areas, such as doum palm (*Hyphaene thebaica*) and walnut (*Juglans regia*). Since they were found in a disturbed context (50421), it is however not absolutely sure that they are ancient. Several seeds are pierced and may have been part of a necklace or bracelet but it was not possible to identify them.

Additionally, some identification of charcoals were made using a stereomicroscope (**table 2, 3, 6**). Almost all of them correspond to large pieces of date palm trunk (stipe) or date palm rachis (central part of the leaf). In *locus* 34418, many large charred pieces of date palm stipe were found, some of them with small holes that may indicate the presence of nails. We suggest, on the basis of what we observed in the old city of al-'Ulā, that these pieces correspond to part of a burnt door (**fig. 2**). The first identifications made on one sample from al-Khuraybah (**table 10**), possibly dated to the Byzantine or Umayyad period, show the presence of grains of barley and of date palm stipe.



Fig. 2. Modern door in the old city of al-'Ulā, made of several sections of date palm trunk (a) joined together with a transversal beam (Tamarix) and nails (b).

Table 2. Area 34. Archaeobotanical taxa

Taxa	Remains	34024_ Bot1	34217_ Bot1	34217_ Bot2	34219_ Bot1	34219_ Bot2	34220_ Bot1	34225_ Bot1	34302_Bot1	34306_ Bot1	34418_ Bot1
Seed/Fruit (charred)											
Fabaceae	seed									+	
<i>Gossypium</i> sp.	seed						+				
<i>Hordeum vulgare</i>	caryopsis		+	+	+	+	+				
	rachis segment			+	+						
<i>Phoenix dactylifera</i>	fibers									+	
	seed						+	+		+	
<i>Triticum aestivum</i>	caryopsis					+					
Other	coprolite					+					
	coprolites										
	ovicaprids						+				
	organic material										
Charcoal											
Chenopodiaceae											+
<i>Phoenix dactylifera</i>	rachis									+	
	stipe/rachis								+		
	processed wood ?										+

Table 3. Area 35. Archaeobotanical data

Taxa	Remains	35085_Bot1	35162_Bot1	35162_Bot2	35163_Bot1	35163_Bot2	35286_Bot1	35540_Bot1	35668_Bot1	35668_Bot2
Seed/Fruit (charred)										
<i>Acacia</i> sp.	seed			+						
Fabaceae	seed		+	+						
<i>Hordeum vulgare</i>	caryopsis		+	+	+	+		+		+
<i>Medicago</i> sp.	seed			+						
<i>Phoenix dactylifera</i>	seed		+	+	+	+	+	+	+	+
<i>Triticum aest/durum</i>	caryopsis					+				
Other	coprolite		+			+		+		
Charcoal										
<i>Phoenix dactylifera</i>	stipe/ rachis		+				+			+

Table 4. Area 37. Archaeobotanical data

Taxa	Remains	37056_Bot1	37056_Bot2	37065_Bot1
Seed/Fruit (charred)				
<i>Hordeum vulgare</i>	caryopsis	+		
<i>Phoenix dactylifera</i>	seed	+	+	+

Table 5. Area 5. Archaeobotanical data

Taxa	Remains	50405_Bot1	50421_Bot1
Seed/Fruit (desiccated)			
<i>Hyphaene thebaica</i>			+
Juglans regia			+
<i>Phoenix dactylifera</i>	seed		+
Unidentified (Flora)	endosperm	+	

Table 6. Area 60. Archaeobotanical data

Taxa	Remains	60631_Bot1	60777_Bot1	60814_Bot1	60816_Bot1	60816_Bot2	60897_Bot1	60897_Bot2
Seed/Fruit (charred)								
<i>Gossypium</i> sp.	seed			+			+	1
<i>Hordeum vulgare</i>	caryopsis	+		+			+	1
<i>Phoenix dactylifera</i>	seed	+		+		+	+	1
<i>Triticum aest/durum</i>		+						
Other	organic material				+			
	coprolite	+				+	+	1
Charcoal								
<i>Phoenix dactylifera</i>	Charcoal						+	

All the archaeobotanical samples were exported to be studied at the archaeobotanical laboratory of the National Museum of Natural History in Paris (MNHN).

Processing of mud-bricks

Sixteen mud-bricks and fragments of mortar coming from three different locations of the rampart (Areas 35, 37 and 38) were studied in order to determine the types of organic temper used to make them. Samples of mud-bricks were broken and organic elements were observed and identified when possible (**table 11**). The majority of them (15) contain plant elements which are not preserved and are visible only through their imprints. They correspond to cereal grains and stems (**fig. 3**), leaves of date palm (**fig. 4**) and small fragments of charcoal. One of the latter was identified with a stereomicroscope (*Tamarix* sp.). Finally, charcoal fragments from mud-brick 35402_Bot1 were exported to be studied in more detail. Other organic elements such as imprints of coprolites, animal bones and beetles (**fig. 5**) were identified. Coprolites and animal bones may indeed have been used as temper. The presence of beetles is probably accidental.



Fig. 3. Mud-brick 35087_Bot1. Detail of the plant temper. Imprints of cereal grains (long arrow) and stems (short arrows).



Fig. 4. Mud-brick 35087_Bot1. Detail of the plant temper. Imprints of date palm leaves (arrows).



Fig. 5. Mud-brick 35315_Bot1. Detail of the plant temper. Imprints of beetle (arrow).

Botanical survey

The botanical survey consisted in identifying and collecting some short-lived herbaceous and woody species. The identifications were made using available flora and botanical surveys (Kürschner & Neef 2011; Mandaville 1990; Osman *et al.* 2014). Each plant collected was photographed (fig. 6) and sampled before it was stored in a herbarium press (fig. 7) borrowed from the

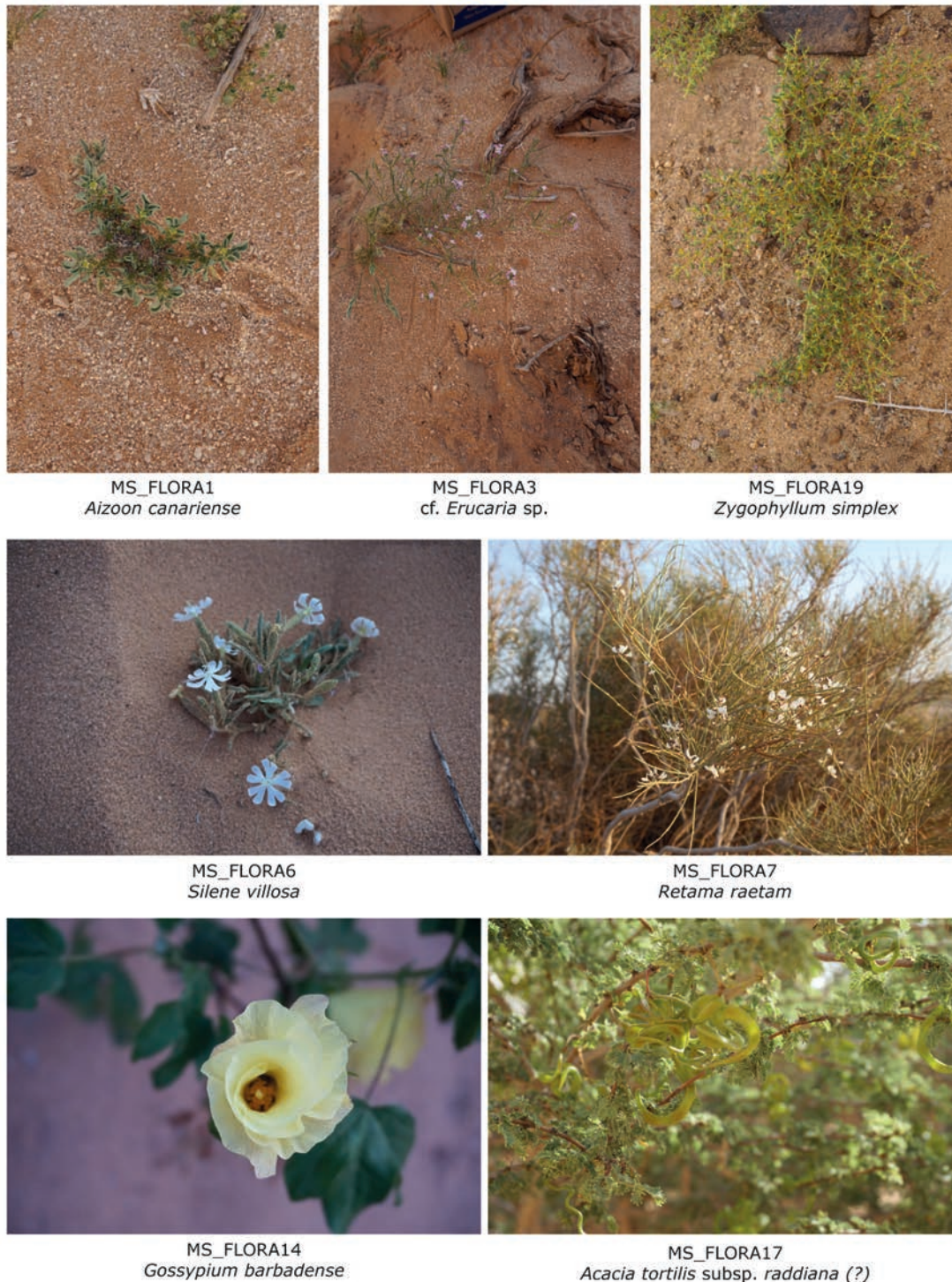


Fig. 6. Some examples of herbaceous and woody plants collected at Madā'in Šālīḥ and around. See Table 12 for details.

Herbarium of the National Museum of Natural History (collaboration: Vanessa Invernón, Serge Muller). All the useful information was recorded (**table 12**). Most of the boards were recently integrated into the Herbarium of the MNHN: <https://science.mnhn.fr/institution/mnhn/collection/p/item/list?recordedBy=Bouchaud> (**fig. 8**).

In addition, some of the wood elements were carbonized and integrated into the modern reference collection of charcoal (*anthracothèque*) of the archaeobotanical laboratory (UMR 7209). Collected seeds will also be included in the reference collection of modern seeds (*carpothèque*).



Fig. 7. Juliette Milon and Charlène Bouchaud putting plants in a herbarium press (© H. Raguet).

 A screenshot of a specimen card on the website of the National Museum of Natural History. The card displays the following information:

- Species:** *Haloxylon cf. salicornicum* (Moa.) Bunge ex Boiss.
- SPECIMEN:** Bois: MNHN-P-P00915721; Sector: ASI (Asia)
- TAXONOMY:** Family: Amaranthaceae; Genus: Haloxylon; Species: Haloxylon salicornicum; Name: Haloxylon cf. salicornicum (Moa.) Bunge ex Boiss.
- ORIGIN:** Country label: arabie saoudite; Country ISO (code): Saudi Arabia (sa); Phenology: #; Collector's name: C.Bouchaud; With: J. Milon; Expedition: Mission archéologique de Mada'in Salih; Collector's number: 92; Collection date: 2019-3-27; Altitude: 750; Geographic coordinates: 28° 48' 38.46" N ; 37° 56' 31.924" E
- DETERMINATION:** Bouchaud, 2018, Haloxylon cf. salicornicum (Moa.) Bunge ex Boiss.

 A map of Saudi Arabia is shown, with a blue dot indicating the collection location in the Mada'in Salih region.

Fig. 8. Example of card on the website of the National Museum of Natural History.

Table 7. Area 61. Archaeobotanical data

Taxa	Remains	61016_Bot1	61016_Bot2	61016_Bot3
Seed/Fruit (charred)				
<i>Citrullus colocynthis</i>	seed	+		+
<i>Hordeum vulgare</i>	caryopsis			+
<i>Olea europaea</i>	endocarp			+
<i>Phoenix dactylifera</i>	seed	+	+	+
<i>Vitis vinifera</i>	seed	+		
Other	coprolite	+	+	+

Table 8. Area 65. Archaeobotanical data

Taxa	Remains	65207_Bot1	65207_Bot2	65214_Bot1
Seed/Fruit (charred)				
<i>Gossypium</i> sp.	seed	+	+	
<i>Hordeum vulgare</i>	caryopsis	+	+	+
<i>Olea europaea</i>	endocarp			+
<i>Phoenix dactylifera</i>	seed	+	+	+
Triticum aestivum/durum		+		
Other	coprolite	+		

Conclusion

The fieldwork allowed to process all the archaeobotanical samples taken during the four last excavation seasons. Their preliminary examination highlights the presence of the economic crops usually encountered at Madā'in Šālih, among which cotton seeds and olive stones are frequently attested. Some new identifications, chickpea and flax, were also made. The study of plant temper imprints preserved in mud-bricks and fragments of mortar brings new data as well. It reveals the use of the commonest plant by-products—cereal straw and date palm leaves—as well as other alternative products (animal bones, coprolites). The botanical survey allowed collecting modern plants that will be used in reference collections.

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Table 9. Area 92. Archaeobotanical data

Taxa	Remains	92044 _Bot1	92047 _Bot1	92064 _Bot1	92064 _Bot3	92072 _Bot1	92072 _Bot2	92080 _Bot1	92080 _Bot2	92081 _Bot1	92082 _Bot1	92082 _Bot2	92234 _Bot1	92234 _Bot2	92306 _Bot1	92306 _Bot2	92332 _Bot1	
Seed/Fruit (Charred)																		
<i>Cicer arietinum</i>	seed		+															
<i>Citrullus colocynthis</i>	seed			+														
Fabaceae	seed		+															
<i>Gossypium sp.</i>	seed	+											+			+		
<i>Hordeum vulgare</i>	caryopse		+							+			+			+		
<i>Linum cf. usitatissimum</i>	seed															+		
<i>Olea europaea</i>	endocarp			+														
<i>Phoenix dactylifera</i>	seed		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Triticum aestivum/durum</i>			+													+		
<i>Vitis vinifera</i>	Pip				+													
<i>Phoenix dactylifera</i>	Charcoal									+								
	Stipe											+						
Other	coprolite			+				+										
	coprolites rodent												+	+				
	organic material	+				+			+									

Table 10. Al-Khuraybah. Archaeobotanical data

Taxa	Remains	4-1-G21-103_Bot2
Seed/Fruit (charred)		
<i>Hordeum vulgare</i>	caryopse	+
Other	organic material	+
Charcoal		
<i>Phoenix dactylifera</i>	Stipe	+

Table 11. Plant temper analysis

Samples	Season	Description	Nature of plant/organic elements used as temper	Comments
35041_Bot1	-	mud-brick	cereal stems (monocots) imprints / leaves of <i>Phoenix dactylifera</i>	Loamy
35087_Bot1	2015	mud-brick	cereal stems (monocots) / leaves of <i>Phoenix dactylifera</i> / caryopsis of <i>Hordeum vulgare</i>	High concentration of plant temper. Density of the mud-brick: medium to brittle
35238_Bot1	-	mud-brick	few charcoal fragments – not identified	-
35267_Bot1	-	mortar	few charcoal fragments – not identified	-
35281_Bot1	2016	mud-brick	cereal stems (monocots) / leaves of <i>Phoenix dactylifera</i>	-
35294_Bot1	2016	mortar	few charcoal fragments – not identified	-
35311_Bot1	2016	mortar	few charcoal fragments – not identified	Plaster of the wall 35049
35315_Bot1	2016	mud-brick	cereal stems / insect / few charcoal fragments	Medium concentration of plant temper de dégraissant
35390_Bot1	2016	mud-brick	cereal stems / bones / charcoals – not identified	very loamy with a low concentration of plant temper
35402_Bot1	2016	mud-brick	charcoals (to be studied)	-
37056_Bot1	2017	clay	No observation of plant elements	-
38015_Bot1	2017	mud-brick	leaf imprints of <i>Phoenix dactylifera</i> / cereal stems / charcoals of <i>Tamarix</i> sp.	Density of the mud-brick: medium to brittle. High concentration of charcoal (branches)
38044_Bot1	2017	mud-brick	coprolites / bones / small stones / cereal and stem imprints	Very dense and solid, compact/ low concentration of plant temper
38044_Bot2	2017	mud-brick	leaf imprints of <i>Phoenix dactylifera</i>	Very brittle, low concentration of plant temper
38048_Bot1	2017	mortar	fragments with leaf imprints of <i>Phoenix dactylifera</i>	-
38055_Bot1	2017	mud-brick	cereal and stem imprints	-

Table 12. List of the modern plants collected

Collect number	Herbarium MNHN	Locality	GPS coordinates	Family	Species	Altitude (m)	Nature	Charcoal reference	Seed/fruit
MS_FLORA1	Bouchaud_1	Madâ'in Şâliḥ	26.789425° N 37.963105° E	AIZOADADE	<i>Aizoon carariense</i>	799	wild		no
MS_FLORA2	Bouchaud_2	Madâ'in Şâliḥ	26.789425° N 37.963105° E	MALVAADADE	<i>Malva parviflora</i>	799	wild		no
MS_FLORA3	Bouchaud_3	Madâ'in Şâliḥ	26.789425° N 37.963105° E	BRASSICAADADE	cf. <i>Erucaria</i>	799	wild		yes
MS_FLORA4	Bouchaud_4	Madâ'in Şâliḥ	26.789425° N 37.963105° E	ASTERAADADE	<i>Centaurea pseudosinaica</i>	799	wild		yes
MS_FLORA5	Bouchaud_5	Madâ'in Şâliḥ	26.789425° N 37.963105° E	FABAADADE	<i>Medicago</i> cf. <i>laciniata</i>	799	wild		yes
MS_FLORA6	Bouchaud_6	Madâ'in Şâliḥ	26.806308° N 37.944853° E	CARYOPHYLLAADADE	<i>Silene villosa</i>	799	wild		no
MS_FLORA7	Bouchaud_7	Madâ'in Şâliḥ (in front of al-Hijr station)	26.806308° N 37.944853° E	FABAADADE	<i>Retama raetam</i>	721	wild	UMR7209/0801	no
MS_FLORA8	Bouchaud_8	Madâ'in Şâliḥ (in front of al-Hijr station)	26.825049° N 37.954650° E	RESEDAADADE	<i>Ochradenus baccatus</i>	721	wild	UMR7209/0804	yes
MS_FLORA9		Al-Helwah farm, princess Nûra al-Fageer	26.825049° N 37.954650° E	VERBENAADADE	<i>Alosya plustacha</i>	782	cultivated		no
MS_FLORA10	Bouchaud_10	Al-Helwah farm, princess Nûra al-Fageer	26.825049° N 37.954650° E	POAADADE		782	cultivated		yes
MS_FLORA11	Bouchaud_11	Al-Helwah farm, princess Nûra al-Fageer	26.825049° N 37.954650° E	CORNAADES	<i>Cornus mas</i>	782	cultivated		yes
MS_FLORA12	Bouchaud_12	Al-Helwah farm, princess Nûra al-Fageer	26.825049° N 37.954650° E	RHAMNAADADE	<i>Ziziphus spina-christi</i>	782	cultivated		yes

MS_FLORA13	Bouchaud_13	Al-Helwah farm, princess Nûra al-Fageer	26.825049° N 37.954650° E	BRASSICAADAE	<i>Brassica</i>	782	cultivated		yes
MS_FLORA14	Bouchaud_14	Al-Helwah farm, princess Nûra al-Fageer	26.825049° N 37.954650° E	MALVAADAE	<i>Gossypium barbadense</i>	782	cultivated	UMR7209/0809	no
MS_FLORA15	Bouchaud_15	al-'Udhayb	26.7270556°N 37.93503888° E	FABAADAE	<i>Senna italica</i>	791	wild		yes
MS_FLORA16	Bouchaud_16	Madâ'in Şâlih	26.825083° N 37.954648° E	POAADAE	<i>Panicum turgidum</i>	723	wild		yes
MS_FLORA17	Bouchaud_17	Madâ'in Şâlih	26.825083° N 37.954648° E	FABAADAE	<i>Acacia tortilis</i> subsp. <i>raddiana</i> (?)	723	wild		yes
MS_FLORA18	Bouchaud_18	Madâ'in Şâlih	26.780715° N 37.940815° E	ZYGOPHYLLAADAE	<i>Fagonia bruguieri</i> DC	760	wild		yes
MS_FLORA19	Bouchaud_19	Madâ'in Şâlih	26.780715° N 37.940815° E	ZYGOPHYLLAADAE	<i>Zygophyllum simplex</i>	760	wild		yes
MS_FLORA20	Bouchaud_20	Madâ'in Şâlih	26.777347° N 37.942091° E	AMARANTHAADAE		759	wild		no
MS_FLORA21	Bouchaud_21	Madâ'in Şâlih	26.777347° N 37.942091° E	AMARANTHAADAE		759	wild		yes
MS_FLORA22	Bouchaud_22	Madâ'in Şâlih	26.777347° N 37.942091° E	AMARANTHAADAE	<i>Haloxylon cf salicornicum</i>	759	wild	UMR7209/0808	yes
MS_FLORA23	Bouchaud_23	Madâ'in Şâlih	26.777347° N 37.942091° E	LORANTHAADAE	<i>Loranthus acacia</i>	759	Parasite acacia	UMR7209/0802	no
MS_FLORA24	Bouchaud_24	Madâ'in Şâlih	26.777347° N 37.942091° E	AMARANTHAADAE	<i>Salsola cf volkensis</i>	759	wild	UMR7209/0803	yes
MS_FLORA25	Bouchaud_25	Madâ'in Şâlih	26.777347° N 37.942091° E	SOLANAADAE	<i>Lycium shawii</i>	759	wild	UMR7209/0807	no
MS_FLORA26	Bouchaud_26	Madâ'in Şâlih	26.778934° N 37.944166° E	TAMARICAADAE	<i>Tamarix aphylla</i>	765	wild	UMR7209/0805	no
MS_FLORA27	Bouchaud_27	Madâ'in Şâlih (in front of al-Hijr station)	26.806308° N 37.944853° E	FABAADAE	<i>Acacia tortilis</i> subsp. <i>raddiana</i>	799	wild		yes

Osteological Study, 2019

Nathalie DELHOPITAL (anthropologist)

Since the osteological study of the bones found in the tombs excavated at Madā'in Šāliḥ could not be completed during the last season I spent in the field, in 2015, I spent two weeks in al-'Ulā in 2019 in order to continue this study. I also took the opportunity to give my expertise for a project of facial reconstruction of Nabataean individuals, launched by the Royal Commission for AlUla. The aim was to identify the skulls that would enable a reconstruction (one female, one male, and one child) and to evaluate the proposals sent to the Commission following the call for tenders. The osteological study proper focused on the material contained in tombs IGN 116.1 and IGN 97, as well as on two individuals revealed in Area 34—the Roman fort.¹

IGN 116.1

Begun in 2015, the osteological study had established that twenty-seven individuals had been interred in this tomb, eleven of them in the central part of the funerary chamber and eight in each of the two wooden frames. In total, twenty adults were identified, including two females and four males, together with seven immature individuals (two perinatals, three aged between 1 and 4 years, one aged between 5 and 9 years, and one female adolescent). Discrete traits observed during excavation and detailed examination had indicated that they were probably all members of the same family. It was also concluded that there had been no demographic selection (**fig. 1**).

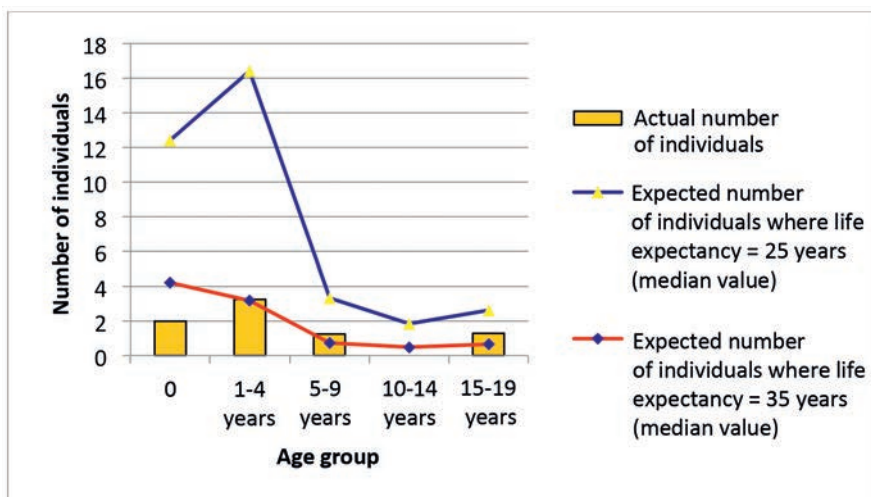


Fig. 1. *Graphic representation of the osteological study of tomb IGN 116.1.*

In 2019 we completed the examination of 'isolated' bones from coffins 50521 and 50533. These are bones that we were unable to attribute to a particular individual during excavation.

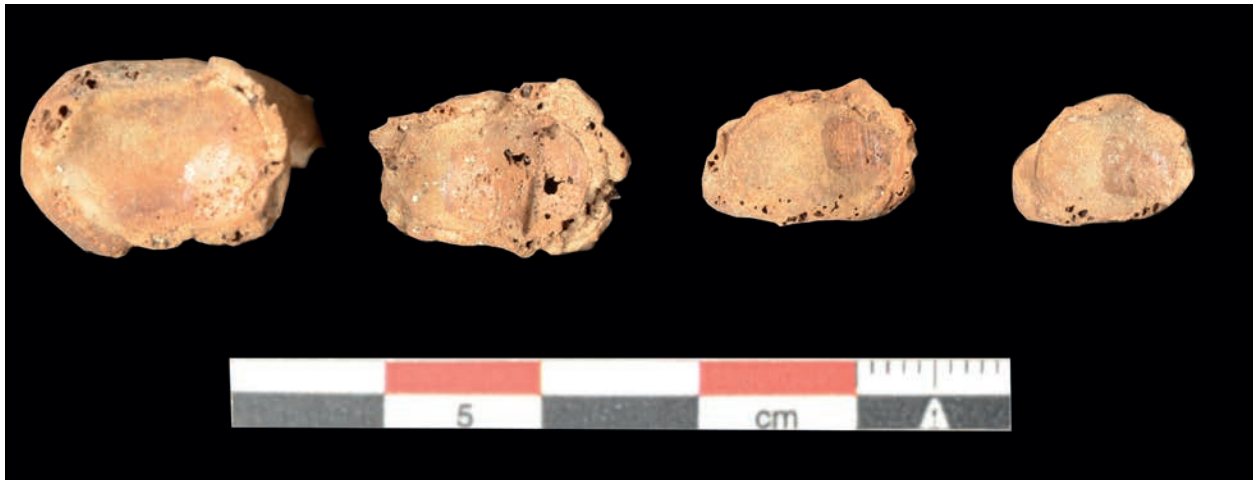


Fig. 2. 50533_B02, carpal bones showing signs of osteoarthritis.

To recap, coffin 50533 contained eight individuals, including the following:

Skeleton 50555: this is possibly an individual who died while giving birth. Height 1.65 m (\pm 5.03 cm).

Skeleton 50550: a male adult individual. Height 1.70 m (\pm 4.14 cm).

Skeleton 50556: individual aged between 20 and 30 years. Height 1.59 m (\pm 4.14 cm).

Skeleton 50557: adult individual.

We observed osteoarthritis in isolated bones belonging to at least one adult individual. It was found in the hands (phalanges) with stage 1 and stage 3 osteoarthritis (**fig. 2**); in the feet (phalange/talus/calcaneus); and in the knees (patella/femur).

Coffin 50521 contained eight individuals, including six adults:

Skeleton 50538: adult 1.62 m (\pm 4.20 cm).

Skeleton 50534: adult 1.63 m.

Skeleton 50535: adult 1.47 m.

The height of the adult individuals is between 1.47 and 1.63 m.

During the examination of the bones, a skull with cribra orbitalia was observed.

Osteoarthritis was observed in the cervical vertebrae. Also noted were signs of crushing on one thoracic vertebra, and osteoarthritis on the lumbar vertebrae. These bones could not be attributed to one particular individual.

The height of the individuals in this tomb varies between 1.47 and 1.80 m. The study of the teeth was not feasible and therefore could not provide any information on stress indicators and dental pathology. Pathology of the joints appears to be linked to old age rather than to physically strenuous activity. The fractures observed were probably associated with falls.

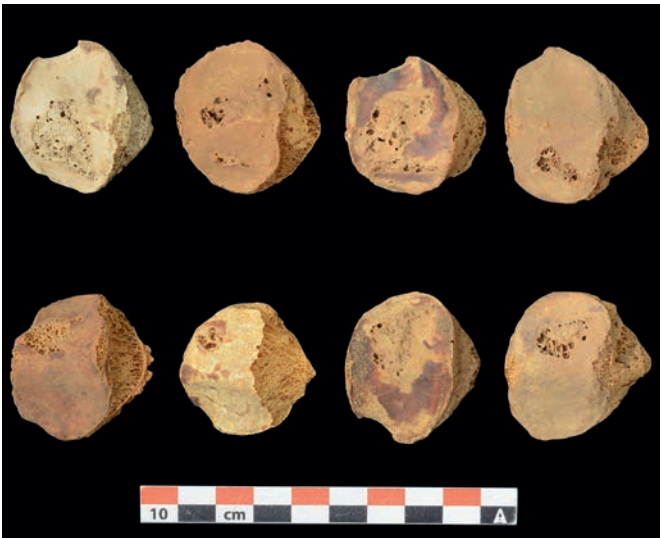


Fig. 3. 50432_B01, patellae from IGN 97 and showing signs of osteoarthritis. Left: left patellae; right: right patellae.

IGN 97

During the 2015 study season, only the craniofacial area of the skeletons was examined. From the number of mandibles, a minimum number of individuals (MNI) was established, in this case fifty, of which thirty-two are adults and eighteen immature individuals. Among the immature individuals, two are aged between 5 and 9 years, two between 1 and 4 years, two between 6 and 9 months, and finally twelve are less than 6 months old. This remains a partial examination although an absence of very young children was noted.

In 2019, only an examination of the patellae was undertaken: thirty-six adult right patellae, of which four presented stage 2 osteoarthritis (**fig. 3**), with patellar strength indices between 82 and 105. There were thirty-one left patellae, two of which with stage 2 osteoarthritis and one with stage 1, with patellar strength indices between 84 and 102 (**fig. 3**).

Skull 35538

In 2017, a cranium, its mandible, and its first two cervical vertebrae (atlas and axis) were discovered during excavation of the so-called south-east gate of the city wall (**fig. 4**) (see the report by F. Villeneuve at <https://archives-ouvertes.fr/hal-01804965>). It was established by Jacqueline Studer that this skull had been decapitated, as had been suggested by the archaeologist. A healed wound is visible near the eye (**fig. 5**). A projectile probably penetrated the eye and bony regrowth can be observed at the point of impact (**fig. 6**).

Biological description of the skull: the skull is hyper-brachycranial. No discrete trait was noted. All the teeth were present except for the third molars (probably a result of dental agenesis). No caries was observed but the presence of tartar on the lower canines and incisors was noted. The lower teeth were considerably worn, relating to buccolingual wear which is more pronounced on the lingual side. In the case of the upper teeth, the opposite is true, the wear is more pronounced on the buccal side, especially in the second premolars and the first and second molars. Finally, stages 1 to 2 hypoplasia of the dental enamel was noted, occurring between the ages of 2 and 4.



Fig. 4. Skull 35538, viewed from the side.



Fig. 5. Left eye socket of skull 35538.



Fig. 6. Bony regrowth where the projectile penetrated the eye socket of skull 35538.

The skeletons in Area 34

The bones were quite badly preserved, limiting the biological examination.

Individual 34133-1

A healthy adult individual (more than 30 years old). No osteoarthritis was observed but the presence of enthesopathy was noted on the vertebrae. The teeth were fairly heavily worn (stages 4 to 5): three lower molars at stage 4, two upper premolars at stage 5 as well as two central incisors.

Individual 34133-2

The second individual, aged over 30, is female. No osteoarthritis was observed. It was not possible to examine the teeth.

Conservation and Care of Artefacts

Marie PEILLET (Metallic and archaeological objects conservator)

During the 2019 season, the conservation work focused as usual on the metallic artefacts, specially the coins, and on the restoration of artefacts for exhibition.

1. Coins

The 2019 excavations yielded an exceptional amount of coins from each of the three excavated areas. More than 100 coins or parts of coins were treated in the conservation laboratory, among which several silver coins from the Nabatean and Roman periods. For this, usual conservation techniques were used : mechanical and chemical treatments, mostly scalpel and Dremel © under binocular, as well and citric acid baths (fig. 1). The results of the treatment were good enough to identify many types of Nabatean and Roman coins, as well as coins which belong to the so-called “owl type” (fig. 2–6).

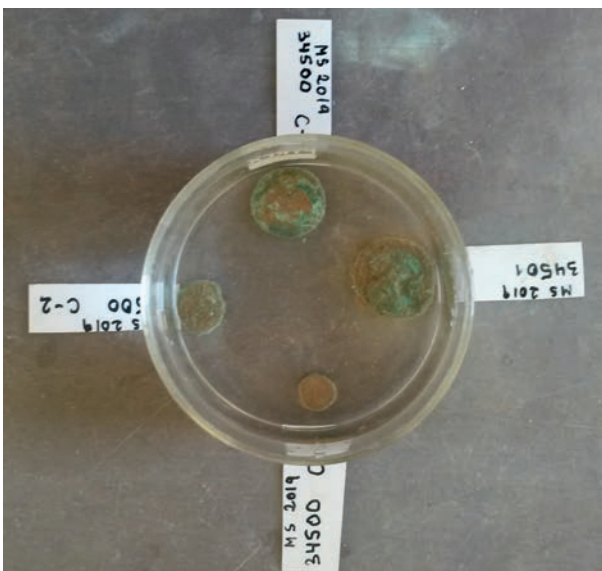


Fig. 1. Coins under chemical treatment.



Fig. 2. Low quality copper alloy coin 34500_C05, bad condition.



Fig. 3. Copper alloy coin 34088_C36 before treatment.



Fig. 4. Copper alloy coin 34088_C36 after treatment. The details of the surface have become legible.

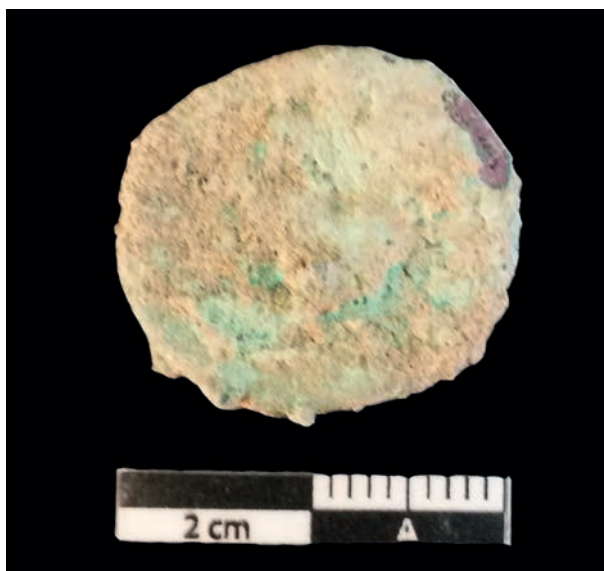


Fig. 5. Silver coin 64301_C01 before treatment.



Fig. 6. Silver coin 64301_C01 after treatment: it shows a bactrian camel on one side.

2. Metallic artefacts

The beginning of the 2019 season was marked by the exceptional find of two copper alloy figurines in Area 34. One of the figurines, representing a Priapus, is very well preserved but the other is badly damaged. One can however still identify a human shape (fig. 7–10).

Another remarkable copper alloy object was found on the surface of Area 61: an armour scale which showed, after cleaning, a nice chiselled decorative pattern (fig. 11).

As usual, among the undetermined metallic pieces, some *instrumentum*, rings, plates, etc. were treated in the conservation laboratory with the usual mechanical and chemical techniques. Some broken objects were also put back together with cyanoacrylate glue and acrylic resins (Paraloid® B72 and B44) (fig. 12–14).



Fig. 7. *Figurine 34502_M02 representing a human figure, very damaged. It may be some kind of putto in a dynamic posture. The core of the figurine swelled and the corroded surface exploded.*



Fig. 8. *Figurine 34502_M01 before treatment.*



Fig. 9. *Figurine 34502_M01 under treatment.*

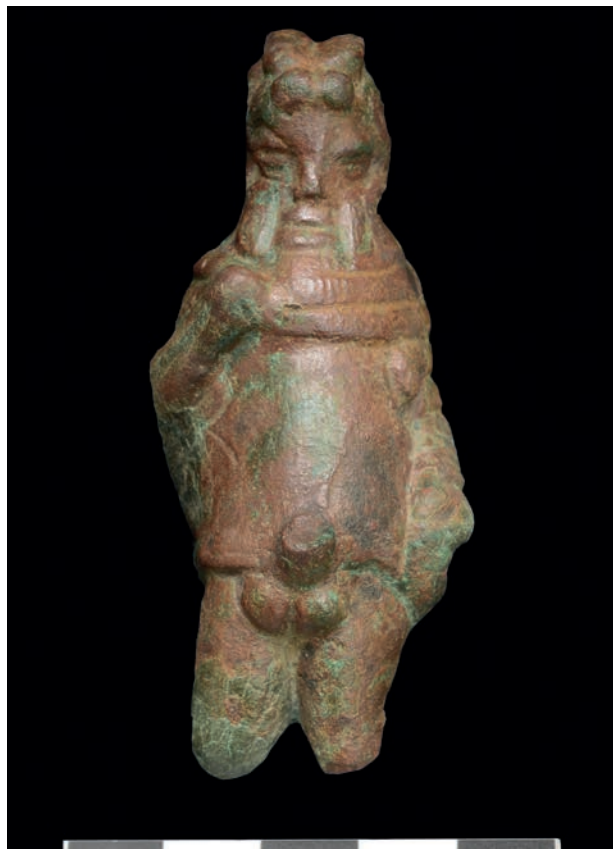


Fig. 10. *Figurine 34502_M01 after treatment. It represents a Priapus.*



Fig. 11. Copper alloy decorated armour scale (from a lorica squamata), Surface_M279, after treatment. The chiselled and stamped patterns were made before the perforations.

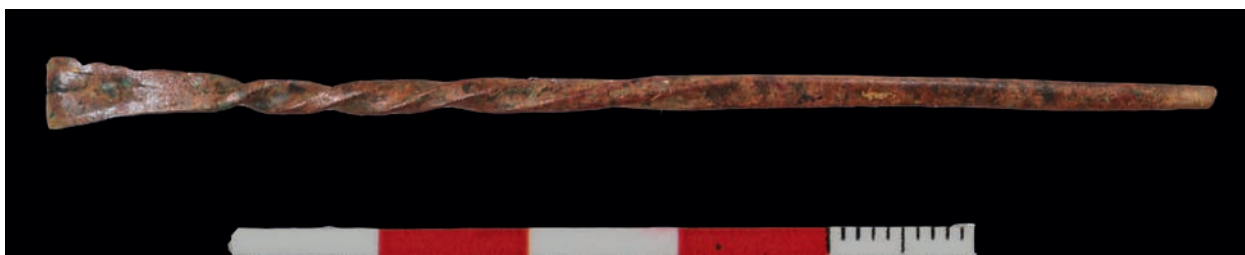


Fig. 12. Copper alloy instrumentum 34088_M03 after treatment. It may be a hygiene tool for ears or nails.



Fig. 13. Copper alloy engraved signet ring 34531_M01 after treatment. Unfortunately, the engraved pattern is too worn to be legible.



Fig. 14. Copper alloy small pendant 34509_M01, attached to an iron ring, after treatment. It may have been part of a necklace or an earring.

3. Pottery

This year, the work on the pottery was a little less important than during the previous seasons because there were fewer complete shapes. A couple of well preserved, almost unbroken, jars were unearthed and consolidated at the lab.

4. Other works

Bone, stone, glass and shell objects were also treated in the lab, mostly for cleaning. The glass objects usually deserve more attention because this category of artefact suffers damage due to

the composition of the soil of the site. It must therefore be systematically consolidated. After they are dried, the glass fragments are plunged in a 15% concentration solution of acrylic resins (Paraloid© B72 and B44) (fig. 15). The 2019 excavations have yielded more glass objects than usual, mostly beads for necklaces of various sizes and shapes. One of them showed after cleaning the very fine representation of a human face in the millefiori technique (fig. 16–17).

The work in the conservation lab during the 2019 excavations was also devoted to the preparation of the objects selected for the AlUla exhibition due to open on October 9th, 2019, in the World Arab Institute in Paris (see (<https://www.imarabe.org/fr/expositions/alula-merveille-d-arabie>)). About fifty objects were isolated, cleaned, protected and restored to stand the manipulations,



Fig. 15. Fragment of a glass vessel, 34506_G01, after treatment. The size of this artefact is unusual since the excavations have yielded mostly small sherds, the soil of Madā'in Šālīḥ being corrosive for glass vessels.



Fig. 16. Part of glass bead 34088_G02 before treatment.



Fig. 17. Part of glass bead 34088_G02 before and after treatment. A simple water cleaning revealed a good quality multi-layered glass bead with a 4 mm high human face made in the millefiori technique.



Fig. 18. *Work in progress for the restoration of two big jars from tomb IGN 116.1.*

transportation and change of environment involved by the exhibition. The most important work was performed on two big jars from tomb IGN 116.1 which needed to be filled with plaster since large gaps did not allow us to handle it properly (**fig. 18**).

Finally, it is interesting to note that during the 2019 excavations, a complete reorganization of the drawers in the storerooms of the al-'Ulā museum was undertaken in order to save space for the newly found artefacts and to make the research of specific objects easier.

Archaeozoological Study: Priorities and Projections

Jacqueline STUDER (Natural History Museum, Geneva)

Following eight archaeozoological seasons that have taken place since 2010, each lasting between two and six weeks, the analysed remains of wild and domestic fauna exploited by the inhabitants of the ancient town of Hegra number more than 30,000. In addition, several thousand rodent and reptile bones—the contents of old pellets regurgitated by birds of prey—were discovered in the Nabataean tombs. Within the precinct of the ancient town, faunal material was present in all the excavated residential quarters, from pre-Nabataean to post-Roman levels. The significant amount of bones already studied corresponds to the chronological levels and structures best documented by the archaeology. However, it only represents 20 to 30% of the total faunal material collected to date. Moreover, certain aspects of the faunal remains are still not well documented. I have therefore focused on establishing research objectives to enable us better to define the animal's place in a society that evolved during the course of more than six centuries at Madā'in Šāliḥ. Priority was given to the following:

- It is essential to continue to document the current excavations. As agreed with the archaeologists, first of all a detailed examination is planned *in situ* of all the *loci* from which bone material has been collected by sieving;
- The faunal assemblage is poor in fish and bird remains. Numbering 300 fragments, ichthyofaunal remains represent barely 1% of the total number of remains. Avifaunal remains are scarcely more numerous, with 250 bird remains, including about 100 ostrich eggshells and just 45 chicken bones. Even though it would appear that products from the Red Sea and poultry meat were not regularly consumed at Hegra, whatever the relevant period or the residential area and other places of activity, it would be interesting to complete the study of these assemblages as far as possible. An assessment of the hundreds of assemblages deposited at the al-'Ulā Museum and not yet examined would enable us to obtain the desired pieces and establish a short inventory of each *locus*;
- Sorting through the collection of boxes and sample bags would provide the opportunity to isolate all the less frequent species (equids, gazelles, etc.) and unique anatomical pieces (e.g. whole long bones of goats or sheep);
- Long neglected because they are few in number and were collected without sieving, the bones collected from the trenches excavated along the city wall could provide information that is

HEGRA		Area Locus Period	34 34509 pRom	34 34525 pRom	34 Total	6 60885 LRom	6 61015	6 61016	6 61022	6 61026	6 61902 pRom	6 Total	TOTAL
DOMESTIC MAMMAL													
Dromedary	<i>Camelus</i> <i>cf. dromedarius</i>		54	40	94	7	4	3	1	-	-	15	109
Donkey	<i>Equus asinus</i>		1	-	1	2	-	-	-	-	-	2	3
Donkey/horse			1		1	1	--	-	-	-	-	1	2
Pig	<i>Sus domesticus</i>		6	5	11	-		-	-	-	-	-	11
Sheep/Goat	<i>Ovis aries/</i> <i>Capra hircus</i>		205	78	283	356	21	5	32	-	25	439	722
Cattle	<i>Bos taurus</i>		3		3	-		-	-	-	-	-	3
WILD MAMMAL													
Rodents			-	1	1	-	-	-	-	-	2	2	3
Cape hare	<i>Lepus capensis</i>		2	6	8	1	--	-	-	-	-	1	9
Red fox	<i>Vulpes vulpes</i>		-	-	0	2		-	-	-	-	2	2
Arabian oryx	<i>Oryx leucoryx</i>		2	-	2	-	-	-	-	-	-	-	2
Gazelle	<i>Gazella spp.</i>		4	1	5	52	-	-	-	-	-	52	57
DOMESTIC BIRD													
Chicken	<i>Gallus domesticus</i>		12	7	19	3	-	-	-	-	-	3	22
WILD BIRD													
cf. Raptor			19	1	20	7	-	-	-	-	-	7	27
Mollusc				1	1	4	-	-	-	-	-	4	5
Fish			1		1	1	-	-	-	-	-	1	2
Mammal indet.			215	146	361	1426	14	4	115	2	546	2107	2468
Bird indet.			-	-	-	1	-	-	-	-	-	1	1
Total	Total		521	285	806	1810	39	12	148	2	573	2585	3391

Table 1. Faunal remains identified in 2019.



Fig. 1. Area 34, locus 34525. The post-Roman levels of Area 34 yielded numerous camel remains.



Fig. 2. Area 34, locus 34509. Fragment of a horn core belonging to an Arabian oryx (*Oryx leucoryx*).



Fig. 3. Sorting an assemblage of bones collected by sieving. Area 6, locus 61902.

presently lacking from the areas of the ancient town and the military camp. Their analysis is currently ongoing.

These priorities characterized the 2019 archaeozoological season, which took place from 24 January to 14 February. It enabled the analysis of a total of 3391 faunal remains from two areas currently being excavated (**table 1**). The first is the Roman military camp (Area 34, *loci* 34509 and 34525) from which 806 animal remains were analysed. Batches from this area comprise a great quantity of bones from large animals, primarily camel, along with a few donkey and cattle bones (**table 1, fig. 1**). The remains of these three species bear traces of butchery characteristic of the treatment of carcasses for meat consumption. Also notable are two fragments of horn core from an Arabian oryx (*Oryx leucoryx*) (**fig. 2**) which, for the first time, attest to the presence of antelope in the area of the Roman camp (*locus* 34509, phase 6). The quantitative importance of food waste from large animals could indicate not only the presence of rubbish areas suitable for large amounts of waste, but also a more frequent consumption of camel meat than elsewhere. This is a challenging problem that calls for the examination of other *loci* before undertaking more detailed analyses, such as spatial and chronological distribution. It should be noted that these groups are

dated to the post-Roman period in accordance with the pottery study (phase 6; see Caroline Durand's report).

The second area studied this year is Area 6 of the ancient town, the Nabataean sanctuary (*loci* 60885, 61015, 61022, 61026, and 61902) from which 2585 faunal remains were examined (**table 1**). This material is composed of the numerous remains of mammals collected from ashy layers (**fig. 3, Table 1**). Significantly, 52 gazelle bones were recovered in *locus* 60885, which is a relatively high number. Taking into consideration the skeletal distribution as well as the anthropic traces observed on these bones, it would seem that this material indicates a successful hunting expedition followed by a good meal.

