



Report on the 2021 and 2022 Seasons of the Madâ'in Sâlih Archaeological Project

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► To cite this version:

Laïla Nehmé, Thomas Bauzou, Pierre-Marie Blanc, Emmanuel Botte, Caroline Durand, et al.. Report on the 2021 and 2022 Seasons of the Madâ'in Sâlih Archaeological Project. 2022. hal-03861945v2

HAL Id: hal-03861945

<https://hal.science/hal-03861945v2>

Preprint submitted on 6 Jan 2023

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Report on the 2021 and 2022 Seasons of the **Madâ'in Sâlih** **Archaeological Project**

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Drawings by Jean HUMBERT, Photographs by Hubert RAGUET and Marc BALTY



October 2022

Cover page photograph, H. Raguet: *Jean Humbert drawing in trench E of Area 34, the Roman fort.*
Next page photograph, H. Raguet: *Pierre-Marie Blanc trying to read the Latin inscription carved on an altar in Area 9.*

Page set up: P. and M. Balty art'air-éd.



الهيئة الملكية لمحافظة العُلا
Royal Commission for AlUla



Report on the 2021 and 2022 Seasons
of the **Madâ'in Sâlih**
Archaeological Project



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Introduction, Summary of Actions, and Prospects

Laïla Nehmé (CNRS–UMR 8167)

Because of the Covid-19 pandemic, the 2021 season of the Madā'in Sālih Archaeological Project (MSAP) was moved from the winter to the autumn (October 28th–November 28th), while the 2022 season took place as it does usually, from February 9th to March 11th. Since the two seasons were undertaken at very close interval, the results are combined into one single report. The 2022 season was the one before last of the five-year research programme signed between the CNRS and the former Saudi Commission for Tourism and National Heritage (SCTH), now replaced by the Heritage Commission of the Ministry of Culture (MoC).¹

Both seasons were supported financially by the French Ministry for Foreign Affairs, the Heritage Commission, and the Royal Commission for AlUla, who all offered substantial funding. As usual, the CNRS provided the salary of the researchers involved as well as a small contribution out of the operating budget of the “Orient and the Mediterranean” institute (UMR 8167). Finally, the sponsorship of the TotalEnergies Foundation helped mainly with airplane tickets and salaries paid to either researchers or technicians. The project is deeply grateful to all these bodies for their continuous effort and the attention paid to its achievements.

Both seasons were placed under the direction of prof. Laïla Nehmé (CNRS) and Maher al-Musa (MoC), who replaced Ibrahim Al-Sabhan (Masmak Museum), retired in early 2021.²

Participants to the 2021 season

Abdulrahman ARAFA	Archaeologist	MoC	Saudi Arabian
Pierre-Marie BLANC	Archaeologist	CNRS	French
Emmanuel BOTTE	Archaeologist	CNRS	French
Caroline DURAND	Ceramicist	Free lance	French
Zbigniew FIEMA	Archaeologist	Free lance	Polish
Jean HUMBERT	Draughtsman	Free lance	French
Mohammad AL-MATHAMI	Archaeologist	MoC	Saudi Arabian
Maher AL-MUSA	Archaeologist	MoC	Saudi Arabian

1. The contract was signed for five years on 21/03/2019.

2. Maher al-Musa has been a member of MSAP team since 2008, first as a trainee, then as an archaeologist in charge of a sector, then of an excavation area.

Zaher AN-NAJEM	Driver	MoC	Saudi Arabian
Laïla NEHMÉ	Archaeologist and epigraphist	CNRS	French
Jérôme NORRIS	Epigraphist	PhD student	British
Agathe PETIT	Restorer	Free lance	French
Alain PIERRE	Intendant	Retired	French
Hubert RAGUET	Photographer	Free lance	French
Laura VIÉ	Ceramicist	CNRS post-doc	French
Saad AL-ZAMAMI	Archaeologist	MoC	Saudi Arabian

Participants to the 2022 season

Abdulrahman ARAFA	Archaeologist	MoC	Saudi Arabian
Marc BALT	Photographer	Free lance	French
Thomas BAUZOU	Numismatist	University of Orléans	French
Pierre-Marie BLANC	Archaeologist	CNRS	French
Emmanuel BOTTE	Archaeologist	CNRS	French
Patricia DAL-PRÀ	Restorer	Free lance	
Jean HUMBERT	Draughtsman	Free lance	French
Maher AL-MUSA	Archaeologist	MoC	Saudi Arabian
Zaher AN-NAJEM	Driver	MoC	Saudi Arabian
Laïla NEHMÉ	Archaeologist and epigraphist	CNRS	French
Agathe PETIT	Restorer	Free lance	French
Saad AL-ZAMAMI	Archaeologist	MoC	Saudi Arabian

Objectives

The objectives defined for the two seasons were the following:

- **excavation** of several areas inside the so-called Residential Area (**fig. 1**);
- **survey** between **Medina and Hegra** on the one hand (as part of the five year research programme of the MSAP) and between **Hegra and Petra**, on the so-called Darb al-Bakrah, on the other hand (as part of a TSVP/France 5 documentary project supported by the communication department of the Royal Commission for AlUla, see the § on Media below);
- **studies** of various categories of material, namely the **pottery** (C. Durand), the **coins** (Th. Bauzou), the **textiles** (P. Darl-Prà), and the **vegetal macroremains** (Ch. Bouchaud).³ The project's director regrets that the archaeozoologist in charge of the faunal material, J. Studer (Geneva Museum of Natural History), was unable to join the fieldwork neither in 2021 nor in 2022.
- **conservation and restoration** are an important part of the project's commitment. No restoration was undertaken on the field during these two seasons. At the dig house, 502 finds were recorded in the MSAP database of objects by the project's restorer, A. Petit (see the report in this volume), and were either restored or cleaned when necessary, particularly the coins. The latter need to

3. Charlène Bouchaud (CNRS–MNHN UMR 7209) is still part of the Madā'in Sālih team but the analysis of the vegetal macroremains is now undertaken in the framework of the ECO-Seed project, supported by Afalula and the Royal Commission for AlUla.

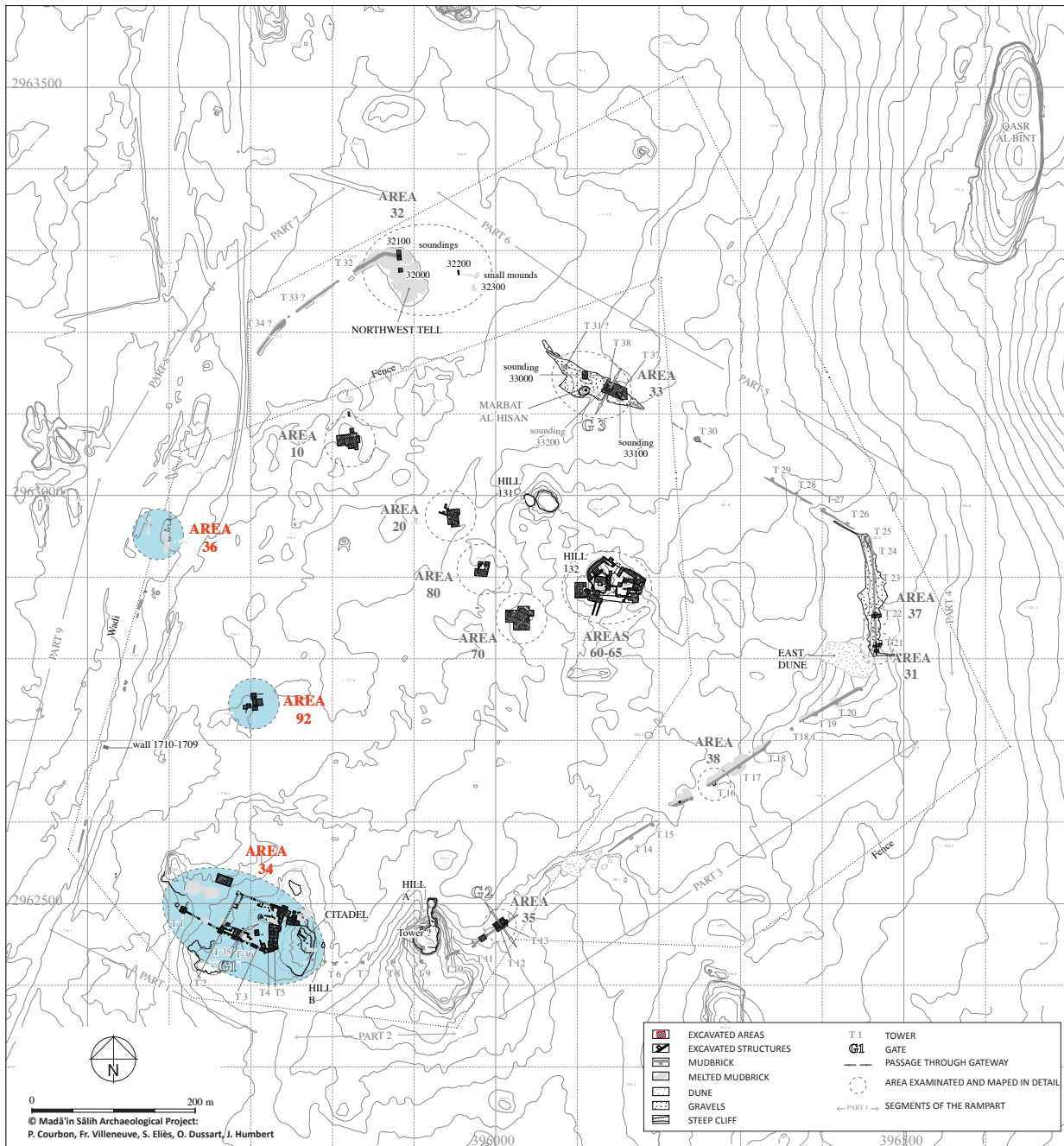


Fig. 1. Plan of the Residential Area of ancient Hegra. In blue the areas excavated in 2021 and 2022.

go through a long and complicated cleaning process before they can be read by the project's numismatist who then usually suggests additional cleaning.

– as far as **documentary aspects** are concerned, the focus was put on the **photography**, prior to the publication of the pottery from Hegra, of the sherds that have been isolated by the project's ceramicists, C. Durand and Y. Gerber (the latter until 2018), since the beginning of the excavations in 2008, i.e. c. 4,000 sherds. Photographs already existed in the MSAP archive but they had been taken by several photographers, lacked homogeneity, and were not always correctly oriented. The systematic photography of the sherds was undertaken by H. Raguet (with the help of L. Vié) in 2021, and by M. Balty in 2022, both being professional photographers. All the sherds were then cropped for inclusion in the drawing (**fig. 2**).

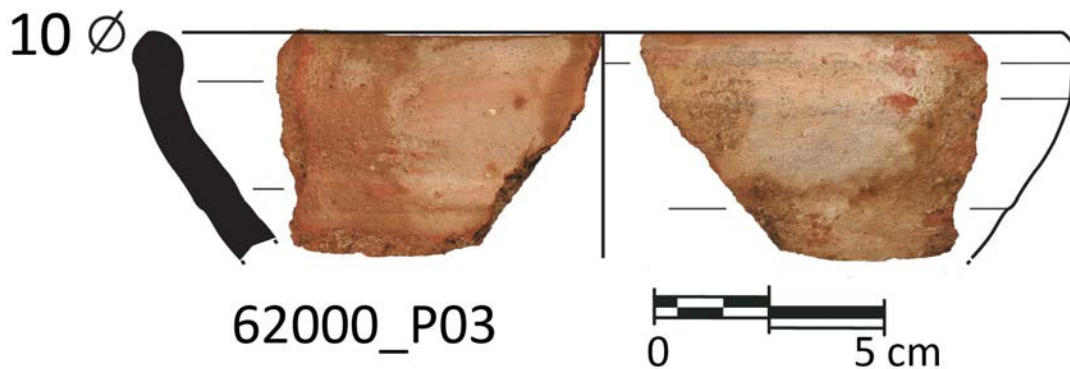


Fig. 2. Photograph of a sherd included in a drawing.

Excavations

With regard to the excavations, four areas and a few limited soundings were selected within the mudbrick rampart of the ancient city (see fig. 1).

– **Area 34** (Z.T. Fiema, see the two reports in this volume), the **Roman fort**, with the aim of collecting all the information needed to publish this large and important building, the excavation of which started in 2015, with a couple of interruptions due to the unavailability of the excavator in charge.

– **Area 36** (M. al-Musa, see the report in this volume), a previously unexcavated area, located on the western edge of the city, and marked by F. Villeneuve on the site's plan as early as 2014. It was characterised by a long north–south wall (c. 40 m) with stone foundations abutted, at regular intervals, by a series of orthogonal walls. In 2014, the complex was tentatively reconstructed as a “caravanserai-like slightly irregular building”. It was interpreted as such because of its plan and because of its proximity to the wadi and to a number of Nabataean wells. This interpretation did however not agree with the presence, immediately to the west (c. 100 m), of five monumental Nabataean tombs, IGN 50–54. Besides, one would expect that a caravanserai would be located close to the ancient caravan road, which does not appear to have run along this side of the ancient city of Hegra and is unlikely to have gone through the narrow passage between the city wall and the western necropolis. In order to clarify this issue as well as provide information on the western boundaries of the ancient city, this area was chosen as the new excavation area to be taken in charge by the Saudi Arabian members of the Project under Maher al-Musa's supervision.

– **Area 9** (P.-M. Blanc, see the preliminary report in this volume), a **mainly domestic** area located south-west of the Residential Area, which had initially been excavated by Z.T. Fiema in 2011, followed by J. Rohmer in 2014 and 2017. The latest report was produced in 2017. Since then, the site had remained unexplored because of J. Rohmer's new responsibilities as the co-director of the Dadan Archaeological Project. Resuming the excavations in Area 9 was important for two reasons: 1/ it is one of the two excavated areas—along with Area 1—which yielded, in the deepest levels of the excavations, the oldest traces of occupation at the site, probably due of its proximity to the wadi; 2/ it shows, below the latest levels of occupation, traces of monumental architecture such as extremely large thresholds, reused capitals, stone-built walls, etc.

– **Area 11** (E. Botte, see the report in this volume), a previously unexcavated area, located in the northern part of the ancient city, where several zones showing large quantities of pottery wasters had been identified by members of the MSAP team during previous excavation seasons.

In addition, fragments of oven walls were identified there by E. Botte in November 2021, thus confirming that this part of the city was most probably devoted to a **pottery craft industry**. The excavation of the area started in February 2022. However, in agreement with the archaeologist in charge, who is presently writing his Habilitation thesis, the full report of the excavated pottery ovens will be submitted later, probably in the course of 2023, and only a summary is presented in this one.

– **Six small trenches** (E. Botte, see the report in this volume) were opened inside the Roman fort (one) as well as on its southern (four) and northern (one) outskirts. The excavation of these trenches was motivated by two reasons: 1/ the search for the **fort's ancient dump**; 2/ the results of the **X-Ray Fluorescence (XRF)** analysis undertaken in 2020 by Marc Ducouso (CIRAD, French Agricultural Research and International Cooperation Organization) and Stéphane Boivin (MNHN, French National Museum of Natural History) at the instigation of the project's director. The XRF technology was applied on 156 sediment samples collected at regular intervals in and around the fort, mainly on its southern side (**fig. 3**).⁴ The results, obtained in the spring of 2021, showed significantly high concentrations of chemical elements usually associated with food dump (i.e. phosphorus, calcium and strontium). Besides, high concentrations of sulfur and several metallic

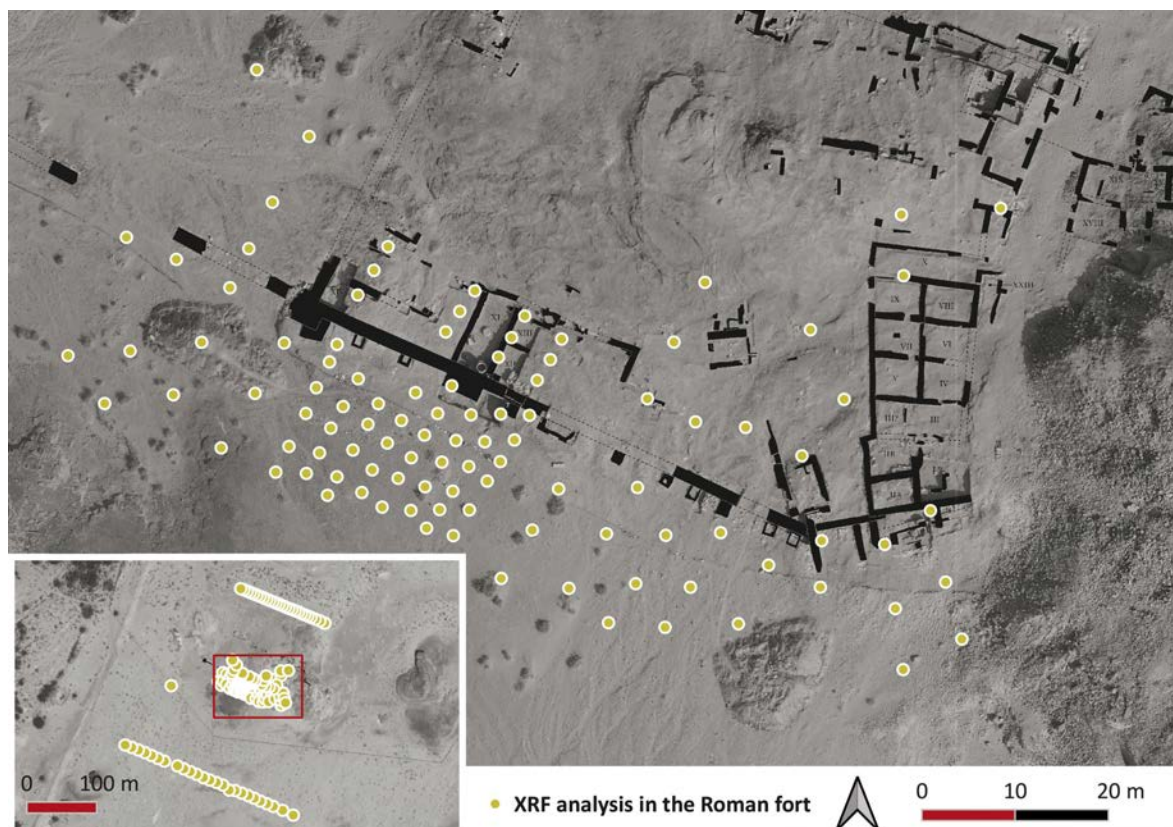


Fig. 3. Location of the 156 samples taken in and around the Roman fort, Area 34.

elements, usually associated with ancient metallurgic activities, were detected in samples located inside of the fort (**fig. 4**). The location of the trenches was determined by the places where the concentrations of the relevant chemical elements was the highest.

4. The XRF technology allows to measure the relative concentration of 81 chemical elements from Mg to U.



Fig. 4. Results of the XRF analyses for Phosphorus, Strontium, and Suffer. TrEXT and TrINT stand for External Transect and Internal Transect respectively. Their location on this document is indicative.

Survey

After two survey seasons, in 2019 and in 2020, for which see the respective reports of the MSAP online, the team continued the survey between Hegra and Medina, which took place between the 5th and the 15th of November 2021 (see the report in this volume). The team was composed of L. Nehmé and J. Norris as archaeologists and epigraphists, F. Égal and A. Morrissey as expedition advisors. It was accompanied by two persons appointed by the TSVP production company, Mathieu Schwartz as film-maker and Corentin Robert as cameraman. The presence of the latter two required the recruitment of two additional drivers, Mamdouh al-Fadel and Mohammad Al-Maarek, experienced desert drivers who also have good knowledge of the region's geography.

Contrary to the first two seasons, which focused on the area between Hegra and Medina, the survey of the 2021 season extended further north, up to Petra in Jordan. This extension was made for the needs of the 90 mn documentary entitled “Expedition to Petra. On the track of the Nabataeans”, prepared under the direction of N. Laville, from TSVP (<https://tsvp-prod.com/>) for France 5 TV programme “Science Grand Format” (see <https://www.france.tv/france-5/science-grand-format/>). The film is to be broadcasted in the late summer or the autumn of 2022. Unfortunately, the filming slowed down considerably the survey and the most important area which remained to be explored, between aṣ-Ṣuwaydirah and Khaybar, could not be properly surveyed (**fig. 5**). On the Darb al-Bakrah, which designates, on the map drawn by Ch. Doughty, the portion of the ancient track between Dār al-Ḥamrā' and Tabūk, several very interesting new sites were visited. Some of them had been pointed to us by members of the Farīq aṣ-Ṣaḥrā' team of amateur explorers. Among them are Mukattabah and Ghadīr ar-Rāshidah. In Jordan, the team went through a few locations where Nabataean inscriptions or sites had been pinpointed.



Fig. 5. The region between al-Ṣuwaydirah and Hegra and the location of Wādī al-Gharas. The red dots indicate Nabataean inscriptions.

Remarkable objects

A number of remarkable objects were brought to light during the 2021 and 2022 seasons and a selection is presented below, starting with the inscriptions.

Inscriptions

Apart from the fragmentary Minaic text which is presented in an independent note by A. Prioretta, three inscriptions, two Latin and one Nabataean, were uncovered during the excavations:

Latin

• **34553_I01**. This text (**fig. 6**) is carved on the edge of a stone basin which was installed during Phase 3 of the occupation in Trench E of the Roman Fort, in the 2nd–3rd century AD, and continued to be used, along with other neighbouring food processing installations, down to the 4th–early 5th century (for more detail, see the report on Trench E by Z.T. Fiema in this volume).

The reading below is Fiema's, who was given by the project's director permission to publish it:⁵ I(ovi) O(ptimo) M(aximo) H(ammoni) AGATHOPVS LIBERTVS AVR(elii) STATORI 7 (centurionis) LEG(ionis) III (tertia) CY(renaicae), "To Jupiter Best and Greatest Hammon, Agathopus, freedman of Aurelius Statorius, centurion of the Third Legion Cyrenaica".



Fig. 6. Latin inscription 34553_I01 (© MSAP).

• **92301_S01**. The text is carved on the main face of a small stone incense burner, 27 x 37.5 cm (**fig. 7**) which was reused upside down as the basis of a doorjamb of the southern door in wall 92301. A 3D view and a drawing of the stone were made.

The preliminary reading below is by Z.T. Fiema but the text will be published by P.-L. Gatier who is in charge of the publication of several new Greek and Latin texts from Hegra, including the Greek one presented in the next paragraph.

5. In a forthcoming Festschrift to David Kennedy by Brill Publishers.



Fig. 7. Latin inscription 92301_S01 (© MSAP).

I O M

HERCVLIS

SEPT(imus/imius) CRISPINVS

MILES LEG III ... [V]

OTVM POS[V]IT

“To Jupiter Best and Greatest Hercules, Sept(imus/imius) Crispinus, soldier of Third Legion [Cyrenaica], he made a vow”.

These two Latin texts bring more information on the involvement of the Third Legion Cyrenaica in Hegra. It is interesting to note that the name Crispinus occurs in a Palmyrene inscription in the form Q[r]spynws (Stark 1971: 49, 111).

Greek

• **34530_I01**. A small sandstone slab with a fragmentary Greek inscription brought to light on top of *locus* 34530, which is attributed to Phase 3 of the Roman Fort, just like 34553_I01 above (see fig. 53 in Fiema’s report).

Nabataean

34508_I01 (fig. 8). This short text was incised before firing on the shoulder of a locally made coarse ware pithos decorated on the shoulder with two wavy lines. According to the project’s ceramicist, C. Durand, the date of the sherd itself, numbered 34508_P10, is not determined precisely: it may be either 1st century AD (Nabataean) or 2nd–3rd century (Roman). The *locus* in which it was found, 34508, is provisionally dated to the late 3rd–early 4th century AD. However, since the text was incised before firing, the Nabataean text may help reducing the interval: the script is clearly calligraphic Nabataean, with no letter featuring a developed form. One may only observe the cursive character of the handwriting, which is best explained by the material, still soft when the text was incised.



Fig. 8. Sherd 34508_P10 inscribed with Nabataean inscription 34509_I01 (© MSAP).

Reading and translation: *šlm ’wšw bṭb l-’lm*, “May ’wšw be safe in well-being forever”.

The text is a simple signature, and uses a typical Nabataean formula. The author, who bears the Arabic name Aws, does not give his father’s name. It is the first sherd inscribed in Nabataean ever discovered at Hegra.⁶

6. It can be compared with the recently published inscribed sherd from Taymā’, TA 5465.8, for which see Macdonald 2020: 128–129.

Architectural decoration



Fig. 9. Nabataean ionic capital 92025_AB02 (© MSAP).

A remarkable **Nabataean capital**, 92025_AB02, was documented (drawing and 3D) during the 2022 season (**figs 9–10**). It had been carefully reused at one end of a monumental threshold in Area 9. It was originally standing on a column the upper drums of which were 0.76 m in diameter. The total length of the capital, including the horns, is 1.44 m and its height is 0.38 m. It belongs to a small series of ionic capitals discovered at Hegra. This includes the capitals of the pilasters flanking the door of tombs IGN 53 and IGN 97 as well as a

small capital discovered during former excavations and published in the *Roads of Arabia* exhibition catalogue in 2010 (no. 126 p. 306). 92025_AB02 is the first capital of its kind ever found in Hegra. It is surely evidence, along with the column drums and other blocks with architectural decoration brought to light during previous excavation seasons in Area 9, of the presence nearby of an important Nabataean building many blocks of which were reused subsequently. There was certainly, somewhere in the vicinity of Area 9, in the Nabataean period, a major religious or public building of which nothing was found *in situ* yet.

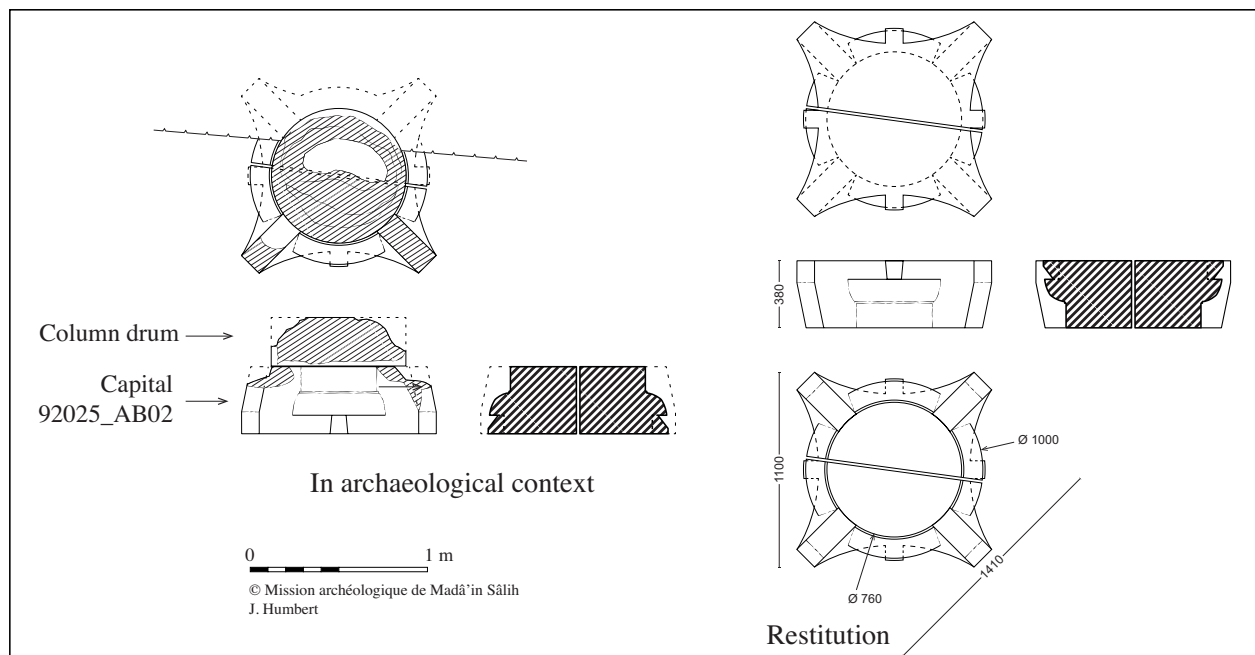


Fig. 10. Drawing of the Nabataean ionic capital 92025_AB02 (© MSAP).

Other

11001_C10, a beautiful Nabataean silver coin



Fig. 11. Nabataean silver coin of Aretas and Huldū 11001_C10 (© MSAP).

Obverse: HRTT MLK NBṬW [...], head of Aretas IV bearing the diadem.

Reverse: [...] ŠNT TLTYN, veiled bust of Huldū.

This coin (**fig. 11**) was surprisingly discovered on the ground in the northern part of the residential area. It is extremely well preserved and is one of the most beautiful Nabataean coins ever discovered in Hegra. It is an Aretas IV (9 BC–AD 40) and Huldū silver coin (17 mm, 4.12 g), struck in Petra in 8/7 BC. It corresponds to the *sela'* (*sl'*, plural *sl'yn*) of Aretas, mentioned in several tomb inscriptions from Hegra.

92235_P01



Fig. 12. Complete pottery lamp 92335_P01 (© MSAP).

A complete pottery lamp (**fig. 12**), possibly dated to the 3rd century AD (to be confirmed), which shows traces of burning around the hole for the lamp wick.

92535_S01

A small complete alabaster container, external diameter 5.9 cm, internal diameter 5 cm, height 3.5 cm.

Grinding tablets

Two grinding tablets (for medicine or cosmetics), a type of object which had not been found before in Hegra.

- **11201_S01 (fig. 13)**. From the surface in Area 11. Very small broken grinding tablet in schist stone with bevelled edges. The width is complete, 3.5 cm, and the preserved length is 6.4 cm, thickness 0.76 cm.

- **36544_S06 (fig. 14)**. Complete green marble grinding tablet with bevelled edges, 6.3 x 6.4 cm. The *locus* in which it was



Fig. 13. Grinding tablet 11201_S01 (© MSAP).

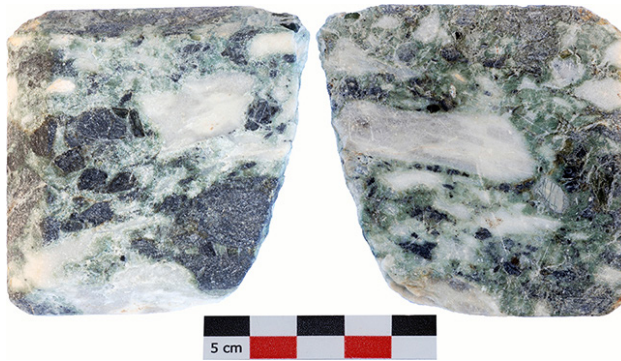


Fig. 14. Grinding tablet 36544_S06 (© MSAP).

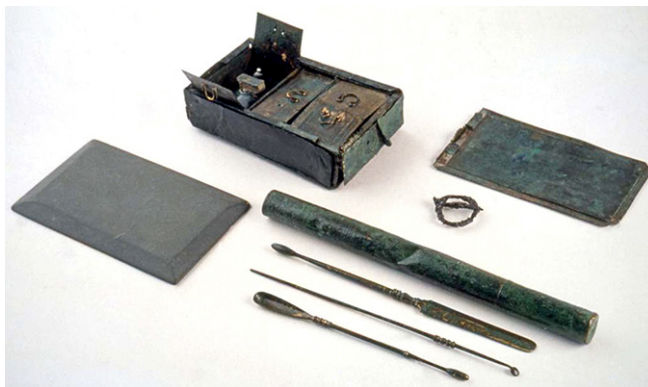


Fig. 15. Oculist instruments, including a grinding tablet, discovered in Lyon (from Lioux 2016: fig. 2).



Fig. 16. Copper alloy key 92240_M04 (© MSAP).

brought to light, 36544, is provisionally dated by C. Durand to the late 1st c. BC/1st c. AD. This does however not necessarily mean that the tablet is of the same date.

Grinding tablets were among the instruments used by ancient physicians to grind medicine. They were widespread around the Mediterranean in the first four centuries AD and were recently studied at length by E. Vigier in her PhD (Vigier 2018).⁷ Oculists used them to grind dry collyrium and the example from Lyon shown **fig. 15** is very similar to 11201_S01.⁸ We know from tomb inscription JSNab 29, dated AD 26/27, that there was at least one Nabataean physician ('sy') in Hegra in the first century AD⁹ and it would not be surprising to find Nabataean medical instruments in the excavations.

92240_M04

A small copper alloy key (**fig. 16**), 2.1 x 3.8 cm, which may belong to the 3rd–4th century occupation phase. This is the second copper alloy key found in Hegra (also 60910_M01).

92331_S01, 92240_S01–S03

Four small alabaster lids (**fig. 17**) with a flat handle found almost together. According to P.-M. Blanc, the archaeologist in charge of this excavation area, they belong to the 3rd–4th century occupation phase and may be related to a craft industry which required transferring product(s) into containers.

Several comparable lids were found in Hegra: 61232_S02, 36050_S01, 36601_S01 (surface). Note that lid 61232_S02 was also found in a 3rd–4th century AD context (see Gazagne in the 2020 report of the MSAP: 54–55, 63). The contexts in 36050 and 36601 are not dated yet.

7. See a summary by E. Vigier at <http://artefacts.mom.fr/result.php?id=PFA-4001>, consulted June 8th, 2022.

8. Lioux 2015: 71–72 and Vigier 2018, vol. 2: cat. 4032, p. 887 and pl. 32).

9. One is also known in Petra, cf. Nehmé 2018: 5–6.



Fig. 17. Alabaster lids from Area 92 (© MSAP).

The textiles from Hegra

Patricia Dal-Prà, a textile restorer and professor at the French Heritage Institute (INP, <https://www.inp.fr/>), continued the recording and analysis of the hundreds of textile fragments brought to light in the tombs during the excavation and clearance of the latter. This work had started in 2012, followed by a second season in 2016. Due to the quantity of material, however, the work is still not finished but a representative selection of more than 100 fragments was made. By the end of 2022, it is hoped that their detailed description will be captured in a database the structure of which was established by L. Nehmé and P. Dal-Prà. The latter includes all the fields which are relevant for the description of textiles (see Appendix 1). Such a database will be extremely useful to anyone interested in the study of the material from an archaeological perspective, for example in order to determine whether the social status of the tomb owners as it can be inferred from the size and architectural decoration of the tomb is reflected in the material brought to light in the funerary structures excavated inside. As for the textiles which have not been studied yet, see the recommendation below.

Recommendation: there is no textile specialist in Saudi Arabia, and it would be worth training one or two motivated persons who would become *the* textile specialist(s) in the country. This person could be trained at several levels:

- conservation;
- technical analysis;
- restoration (this last level requires a high degree of competence which can be acquired only after several years).

The MSAP might help in providing the material to be conserved and analysed to Patricia Dal-Prà who would bring advanced students to Saudi Arabia. The team would then train, in the framework of a field school, a couple or more persons from either RCU or the Heritage Commission.

Analysis of textile fragment 50051_T03

In March 2022, Patricia Dal-Prà drew our attention to the fact that one of the textile fragments discovered in the tombs cleared or excavated at Hegra since 2002, numbered 50051_T03, was made of silk threads (**fig. 18**). It was brought to light in 2008 in IGN 20, one of the large tombs carved on the west side of the Qaṣr al-Bint necropolis.¹⁰ This tomb is not dated precisely because

10. See the report on the excavation of IGN 20 by N. Delhopital and I. Sachet in the 2008 MSAP report (in Nehmé 2010: 210–216).

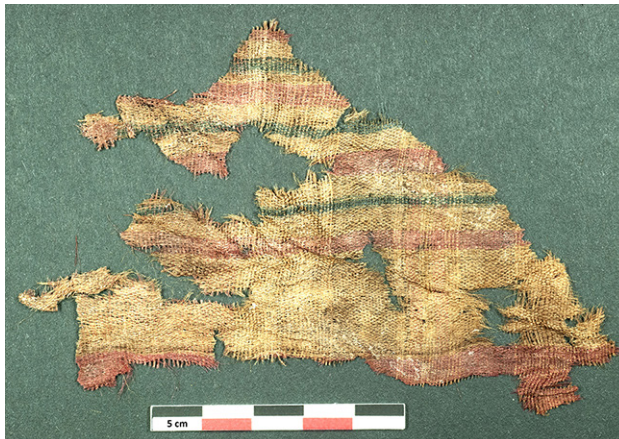


Fig. 18. Silk textile fragment 50051_T03 from tomb IGN 20 (© MSAP).

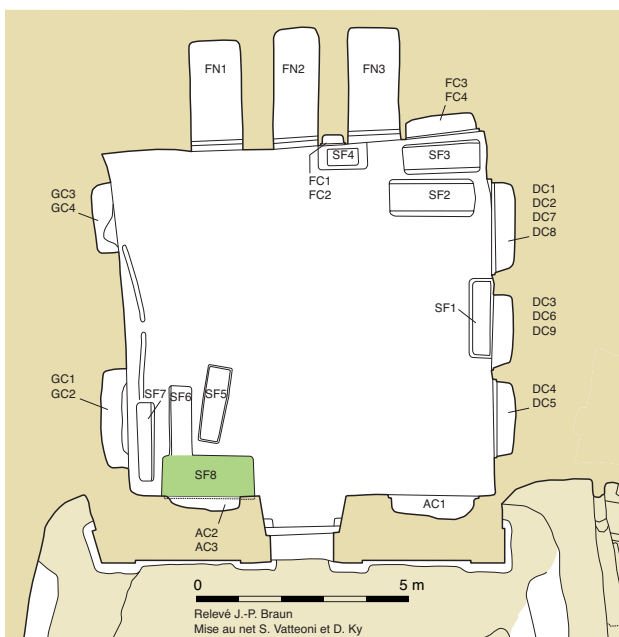


Fig. 19. Plan of tomb IGN 20. In green the pit grave in which textile fragment 50051_T03 was found (© MSAP).

the inscription carved on its façade was partly defaced. On stylistic and other grounds, however, it is assumed that the tomb already existed around AD 80.¹¹ The fragment comes from pit SF8 (**fig. 19**), dug in the floor of the chamber to the left of the entrance. This pit yielded a large amount of archaeological material which was in better condition in the lower levels than in the upper ones. Note that SF8, like most of the pits in this tomb, yielded modern artefacts, but there is no reason to consider that 50051_T03 belongs to this category. A C¹⁴ date was obtained for one human bone from the lower levels of neighbouring pit SF6 (*locus* 50074), with the following result: AD 59–207, which does not contradict the stylistic and epigraphic dating arguments.¹²

The fragment was cleaned and unfolded by P. Dal-Prà. It is a piece of tabby, 11.5 x 7.5 cm after treatment, decorated with coloured bands (red, green, and beige) organized according to a precise pattern. It is very different from all the textile fragments brought to light in IGN 20. Considering that silk is a very rare material in archaeological contexts, the fragment was shown to Sophie Desrosiers (EHESS, Paris), a specialist of silk textiles, who suggested, from simple observation, that it might be wild silk. For this to be confirmed, it was decided to undertake a FTIR (Fourier-transform infrared spectroscopy). This was

done on May 6th, 2022, in the headquarters of the French Agency for the Development of Alula (Afalula) in Paris. The analysis was performed by Sophie Cersoy, from the Research Centre on Conservation,¹³ using a portable infra-red spectrometer device in ATR (Attenuated total reflection) mode (**fig. 20**). One small (0.5 cm) isolated fragment of the textile, which was not attached to the rest, was used for the analysis and was placed on the diamond anvil. Three areas of the fragment

11. See Dentzer-Feydy 2015: 401 and fig. 5.449. Note also that tomb IGN 45, dated AD 49/50, most probably belonged to the father of the owner of IGN 20. This means in turn that IGN 20 is probably one generation later than IGN 45, thus confirming the stylistic approach.

12. GrA-39511, cal2020, with 92% probability (the original cal2004 gave a slightly different result: AD 28–40 or 50–129 with 95% probability). The cal2020 date was calculated using the online Oxcal tool (<https://c14.arch.ox.ac.uk/oxcal.html>) in 2022.

13. Centre de recherche sur la conservation (CNRS, MNHN, Ministère de la Culture), <https://crc.mnhn.fr/fr>.



Fig. 20. Sophie Cersoy, from the Centre de recherche sur la conservation, doing the FTIR analysis of the textile fragment in the Afalula headquarters in Paris (© L. Nehmé).

were analysed, each measuring c. 1 mm: one in the brown area, one in the green, and one on the edge. The spectra were collected from 375 to 4000 cm^{-1} with a resolution of 4 cm^{-1} for a total of 128 scans per measurement. The analysis showed in each of the spectra, at 965 cm^{-1} , the presence of a peak characteristic of wild silks as demonstrated in Palaminy *et al.* 2022. A report of the analysis was submitted by S. Cersoy and it can now be said with certainty that wild silk was imported into Hegra in the first centuries AD.¹⁴

The FTIR analysis was followed by the observation of the fragment by Sophie Desrosiers with a DINO Lite (portable digital microscope,

model AM7915 M2T). Detailed photographs of each part of the textile were taken in order to obtain better images than those which were available so far and help identify the direction of the weft and the warp.

Considering that the fragment is coloured in red and green, it was also decided to undertake an analysis of the dyes used, at least for the red. Indeed, the origin of the dye (an insect or a vegetal) may give indications on the provenance of the textile. This analysis is planned to be undertaken as soon as possible by Mohammed Dallel from the Research Laboratory of Historical Monuments.¹⁵ An additional track of research was suggested by S. Desrosiers: a proteomic analysis (identification of proteins), in order to identify the species of the silk-producing moths which are responsible for the silk filaments composing 50051_T03. This technique was used very recently by Boyoung Lee *et al.* (2022), a presently post-doc scientist at the Museum Conservation Institute of the Smithsonian Institution. Considering that the non domesticated silk-producing moth species (i.e. other than *Bombyx mori*) have a particular geographical distribution from North-East India to Eastern China,¹⁶ identifying the moth species would help determine the provenance of the textile fragment. B. Lee's recommendations are to use 0.5 mg of material per sample. Luckily, the small detached fragment used for the ATR-FTIR analysis weighs 2.3 mg and is therefore heavy enough for a couple of runs to be performed. The proteomic analysis will hopefully be made as soon as Boyoung Lee is available. In the meantime, when the analysis of the dye(s) is done, and based on the results obtained so far, a publication of the fragment in the *Archaeological Textiles Review* (<http://www.atnfriends.com/>) is planned for 2023.

The study of this small textile fragment is the result of a fruitful collaboration between several scientists who all showed great enthusiasm in providing expertise in their respective fields. As far as Hegra and the Nabataeans are concerned, the identification of a fragment of wild silk in tomb

14. The tomb is dated to the first century AD but it may have been used over a longer period, most probably however not beyond the third century AD.

15. Laboratoire de Recherche des Monuments Historiques, <https://www.lrmh.fr/>.

16. See the map in Lee *et al.* 2022: fig. 1.

IGN 20 supports the idea that Hegra was connected not only to the incense route which crossed the Arabian Peninsula from north to south but also to an east–west route which connected the northern part of the Arabian Peninsula to India and/or beyond. It also, along with a—for now—quick examination of the whole range of material contained in tomb IGN 20, confirms the idea, already suggested on the basis of the ostentatious character of the façade and the artefacts brought to light, that the owner and owner’s family of IGN 20 were of a very high social status.

Other Activities

Developing Arabic inscriptions from the Old Town of al-‘Ulā

Two stones bearing Developing Arabic¹⁷ inscriptions, reused in the Old Town of al-‘Ulā (fig. 21), were read by L. Nehmé during the 2022 spring season.

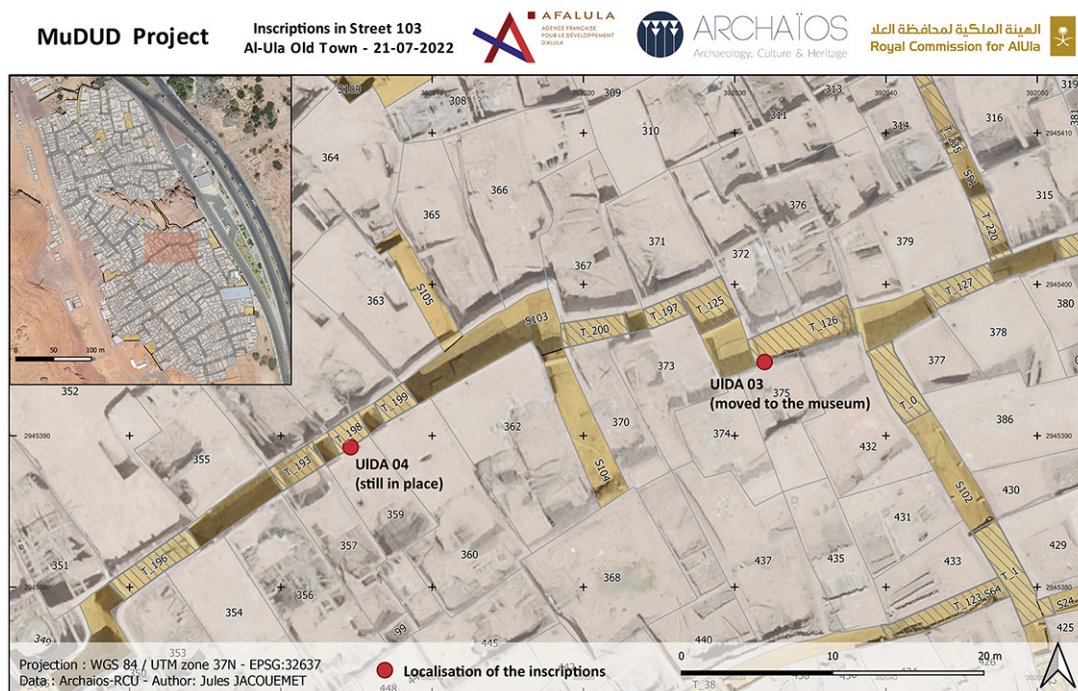


Fig. 21. Plan of al-‘Ulā Old Town showing the location of Developing Arabic inscriptions UIDA 3 and UIDA 4 (© Archaios).

UIDA 3 (CIS II 333) (figs 22–24)

Previous references: **CIS II 333**; **Doughty C.** 1884. *Documents Épigraphiques Recueillis dans Le nord de l'Arabie*. Paris: Imprimerie Nationale, pl. 14 fol. 25; **Euting J.** 1885. *Nabatäische Inschriften Aus Arabian*. Berlin: Georg Reimer, no. 30; **Huber C.** 1891. *Journal d'un Voyage en Arabie (1883-1884)*. Paris: Leroux, no. 5 p. 395.

17. Since the distinction between Nabataeo-Arabic and Pre-Islamic Arabic inscriptions can be very difficult, both have been grouped under a single umbrella which refers to both categories, called “Developing Arabic”. This label has the advantage of providing the initials “DA” which are not used yet, in the epigraphic sigla, for Semitic inscriptions in the Middle East and the Arabian Peninsula.



Fig. 22. Photograph of UIDA 3 (CIS II 333)
(© L. Nehmé).

This text was known so far only from 19th century hand copies or squeezes made by Doughty (unusable), Euting, and Huber (see fig. 23). It was re-discovered by workmen in February 2017 in the area known to our informant, A. al-Emam, as Sūq al-Ḥasan, in the second house from the west end of the street (fig. 25 and see fig. 21). The workmen informed A. al-Emam who, in turn, contacted L. Nehmé. With permission from the SCTH, it was decided to proceed to the removal of the stone and to its replacement by an ordinary block. This was done in the evening of the same day and the stone was taken to the al-‘Ulā Museum where it ultimately received, in June 2021, inventory number RCU.2021.61. The stone is 23 cm wide, 41 cm high, and 15 cm thick. A quick copy was made in 2017 but it was not until February 2022 that L. Nehmé was able to examine it in the museum and make a new copy. Finally, Archaïos, a company specialised in the fields of Heritage and Archaeology, made a 3D scan of the stone and kindly put it at the disposal of the author in June 2022. The new reading proposed below is based on

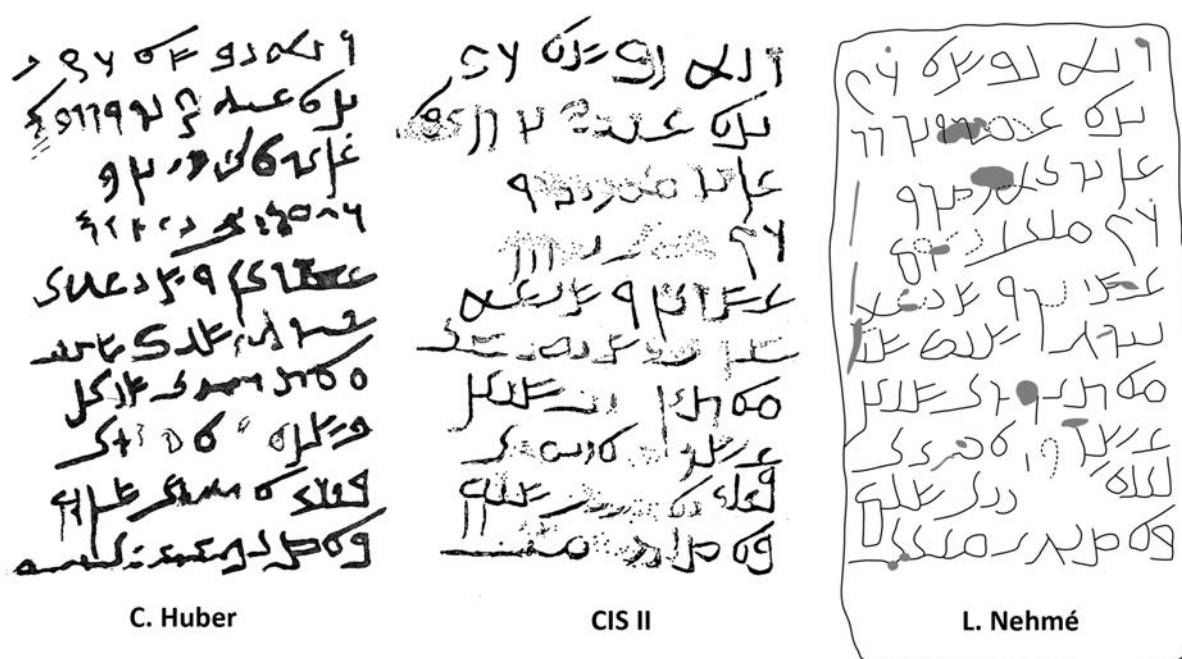


Fig. 23. Facsimiles of UIDA 3 (CIS II 333) (© MSAP for the last one).



Fig. 24. Screen shot of the 3D model of UIDA 3 made by Archaïos showing the name 'mrw, which was not readable on ordinary photographs (© Archaïos).



Fig. 25. The door in the Old Town showing where the block bearing inscription UIDA 3 was reused (© L. Nehmé).

these documents. The text will be submitted for publication in an academic journal.¹⁸

Reading:

1. *dnh npš' dy*
2. *bn' {m}rw br {d/r}{d/r}*
3. *'l brt-{h} {b/n}{s}{d/r}w*
4. *dy mytt {b-yw}m*
5. *š[r]{y}n w šb{h}*
6. *b-yrh šbt šn[t]*
7. *m'tyn {b}rt šnyn*
8. *šr {w} '{m}{š}yt*
9. *lyl' ---- {bn}t šlm*
10. *p-'šbht mytt*

Translation:

¹ This is the *nefesh* which ² was set up by 'A{m} rū son of {d/r}{d/r} ³ for/above his daughter {b/n}{s}{d/r}w ⁴ who died {on the da}y ⁵ tw[en] ty-sev{en} ⁶ in the month of February yea[r] ⁷ two hundred, ⁸ being ten years old. And she entered upon the evening ⁹ the night ---- being a healthy girl, ¹⁰ and in the morning she was dead".

Comment on the reading:

I. 1. The initial *d* is just visible. The hole above the *d* in *dy* in this line may be accidental, as might be the one above the *d* of *dy* in line 4, but both may also be diacritical dots, which would not be surprising on this letter at this period.

I. 2. The name of the person who built the *nefesh* is difficult to read. '{m}rw, which is relatively certain, could be read only with the help of the 3D scan made by Archaïos (see fig. 24).

I. 3. The reading of this line is also difficult and was made easier by the 3D scan. The reading *brt-{h}* was suggested to me by M.C.A. Macdonald, to whom I am very

grateful. The name of 'Amrū's daughter (*bšrw*, *nšrw*?) ends with a -w, which is not impossible for a girl's name in Nabataean.¹⁹

18. Considering the importance of these two texts for the story of the Old Town of al-'Ulā, it seems important to publish them independently from the forthcoming corpus of Developing Arabic inscriptions.

19. Women's names ending with -w are known in Nabataean, for example *ṭrw* and *ḥbw*.

- l. 4. The reading is fairly certain. The small hole above the *d* is either accidental or not (see l. 1). The reading of *ywm* is certain but the presence of the preposition *b-* before is not.
- l. 5. This line gives the numerals indicating the day in the month and the reading is certain despite the traces being very faint.²⁰
- l. 6–7. The reading raises no difficulty.
- l. 8. This line is expected to start with the age of the deceased person for whom the *nefesh* was made. *šr* is preferred to the only other alternative, *šryn*. Indeed, the traces visible on the stone after the *r* are not compatible with a medial *y* but rather with either a *w* or a *p*, and the shape of the *p-* in line ten invites to read *w* here.²¹ What follows is almost certainly a verb in the feminine, starting with *ʾm* and ending with *yt*, i.e. an *ʾpʾl* form which would parallel the verb in line 10, *šbht*. Based on a suggestion by P. Webb (p.c.), Classical Arabic *ʾamsà*, “he entered upon the evening” (Lane 1863–1893: 3020), *ʾamsat* in the feminine, is the best candidate for this verb. In Classical Arabic, the feminine form of this weak final verb would be *ʾamsat* but one should be aware that this form is the result of a contraction of **ʾamasayat* (**ʾamsaya* in the masculine). Nabataean may, as did Safaitic,²² have retained the final *y*.²³ Note that *ʾm[š]yt* would be the first attestation of a final weak verb in the feminine in either Nabataean or Developing Arabic.
- l. 9. *lylʾ* and *šlm* are certain. Between the two, *bnt* may tentatively be read but there is enough space for at least two or three letters which are completely invisible.
- l. 10. The reading is certain.

Commentary on the text:

- l. 1. *dnh npšʾ* is attested in Nabataean along with *dʾ npšʾ*.²⁴ The use of *dnh* here shows that *nefesh* was considered by the author as a masculine substantive.
- l. 2. *bnʾ* is written here with a final *ʾ*, an unusual orthography which occurs only in this text and in JSNab 386.²⁵
- l. 3. The author uses *ʾl*, a preposition which appears, along with *l-*, in Nabataean *nefesh* inscriptions. Both mean “for”—the monument is built *for* someone—but the former may also mean “over/above”, thus indicating the relative position (above the tomb?) of the structure of which the inscribed stone was part. This preposition is used in similar contexts in other *nefesh* texts from

20. By complete chance, the author read the text in the al-ʾUlā museum on exactly the same day, February 27th, an amusing coincidence.

21. Besides, the *p-* introducing the main clause, “and in the morning she was dead”, the preceding hypotactic clause in this line is likely to have been introduced by *w*.

22. For example in *ngyt ʾ-mlk*, “the Queen was announced”, see Al-Jallad 2015: 121).

23. I am very grateful to Peter Webb for his suggestion, and to Marijn van Putten, to whom the issue of the presence of the *y* before the *t* was presented and who explained to me why this orthography is possible.

24. See for example *dnh npšʾ*: Nehmé 2010: no. 1, p. 453, from Summāqiyyāt, and *dʾ npšʾ*: *ibidem*, no. 4, p. 468–470, from Bosrā, and *CIS II 332*, from al-ʾUlā, dated 9/8 BC. According to J. Norris (p.c.), the number of texts using *dnh* is roughly the same as the number of those using *dʾ*.

25. *Bnʾ* had also been read in a Nabataean text dated to the reign of Rabbel II from Avdat in the Negev (Negev 1961: no. 8 p. 135, pl. 31B) but the reading of this text was corrected by J. Naveh (1967: 188) and *bnʾ* does not occur in it.

the first/second,²⁶ third (al-Najem & Macdonald 2009), and fourth centuries AD (JSNab 386).²⁷ The use of two different prepositions shows that *npš* probably referred to several types of monuments, among which the Petra pyramidal stelae and structures of some sort built above burials. The author is less convinced that it refers to “a funerary *inscription* used as a memorial, regardless of what it is written on (an obelisk, a stela, a lintel, a sarcophagus, etc.”, as suggested by M.C.A. Macdonald (2006: 288–290).

l. 4. The expression *dy mytt ywm* finds an exact parallel in the AD 280 inscription from al-Mābiyāt (al-Muraykhi 2008). It is not certain whether *ywm* is preceded here by *b-* but both *ywm* and *b-ywm* are syntactically correct. *Mytt* is the usual Nabataean Aramaic form of M-W-T in the 3rd person feminine singular of the suffixed conjugation.

l. 5. *šb’h* (feminine of *šb’*) is consistent with what would be expected in Nabataean: the gender of the numbers from three to ten is the opposite of the gender of the word they refer to: *ywm* being masculine, *šb’h* is feminine.²⁸

l. 7. The text is dated to year two hundred of the era almost certainly of the Roman province of Arabia, i.e. AD 306. The formula *br/brt + šnyn* + numeral to express the age of a person is a standard Aramaic phrase. It is used in the so-called Māwiyah AD 356 text (see note 27), in an unpublished Nabataean inscription carved on a gravestone from Boşra (BNab 12, for which see Nehmé forthcoming), and finally perhaps in a fragmentary text painted on a stone slab discovered inside tomb IGN 9 in Hegra, where the word *šnyn* can be read (Nehmé 2015: 137, fig. 2.12). The latter two are likely to be dated to the first century AD.

l. 8. See above, comment on the reading.

l. 9. *lyl’*, “the night”. To our knowledge, this word occurs in one other Nabataean text only, JSNab 2, where it is used in a unique expression, *prš lyl’ mn ymm’*, “the one who separates night from day”, a metaphor referring to the god who curses whoever removes bodies from the tomb. The presence of *lyl’* is difficult to explain because it is redundant with *’amsayat*. The reading *{bn}t* remains tentative but if correct, it means that the author used Aramaic *brt* lines 3 and 7, and Arabic *bnt* in line 9, hence shifting from Aramaic to Arabic. Another explanation, less likely, is that *brt* lines 3 and 7 are used for “daughter of” (*brt šnyn* meaning literally “daughter of years”), while *bnt* in line 9 is used for “girl”. As for *šlm*, it is best explained as a verbal noun used in an adjectival sense, i.e. “being healthy”.²⁹ If it was an adjective, one would have expected a feminine form, *šlmt*, not a masculine one.

l. 10. *p-’šbht* is the 3rd person feminine singular suffix conjugation of the *’p’l* form of Š-B-Ḥ. It is the first occurrence of this radical in either Nabataean or Developing Arabic. According to Leslau (1987: 545), it occurs in Arabic, Ancient and Modern South Arabian, and Ethiopian languages. It occurs once in Safaitic in the phrase *šbh tdmr*, “he made a sudden attack (in the morning) on Tadmor”.³⁰ In Arabic, *’ašbaḥa* means “He entered upon the time of morning named *šabāḥ* [which

26. E.g. Nehmé 2010: no. 4, p. 468–470 (first century); al-Salameen and al-Rawahneh 2017 (first or second century).

27. In the fourth century, also perhaps in the so-called Māwiyah text (Stiehl 1970) if the object dedicated is a *nefesh*, but the first line of the text is damaged.

28. Cantineau 1930–1932: vol. 1, p. 96.

29. I am grateful to Marijn van Putten for this suggestion.

30. WH 2833 (http://krc.orient.ox.ac.uk/ociana/corpus/pages/OCIANA_0013732.html). I am grateful to J. Norris for drawing my attention to Safaitic *šbh*.

means both dawn and forenoon]” (Lane 1863–1893: 1641). As for the Arabic character of the conjunction *p*-, it has been debated but it seems that in this particular case, if the existence of a hypotactic clause is correct (see note 21), it is likely to be an Arabism.³¹ As for *mytt*, it is a feminine participle, “dead”, and not a conjugated verb as in line 4.

l. 8–10. The expression “and she entered upon the evening being healthy and in the morning she was dead” is not attested elsewhere in Nabataean or Developing Arabic. These lines are clearly written in Arabic and it is likely that they correspond to a formula which may have an echo in Arabic poetry.

Concerning the script, the following may be said: the text shows the typical features of the Developing Arabic inscriptions from al-‘Ulā at this period. For example, it is very similar to both the AD 280 text from al-Mābiyāt and UIDA 4 below. It differs however from other late 3rd and 4th century texts from elsewhere in North-West Arabia such as UJadhNab 297 (fig. 26), which is exactly contemporary but is written in a more advanced stage of the script, particularly the ‘ and the š. At a lesser degree, it is also less advanced than UJadhNab 309 and UJadhNab 538 (295 and AD 302/303 respectively), in which ‘ and š also have more evolved forms. It is finally surprising that *rs* keep their upper short horizontal stroke, which is not present in other 3rd or 4th century texts except in one instance.³² Apart from these three letters (‘, *r*, *š*), the characters in UIDA 3 agree with what would be expected in this place at this period: forked *d*, looped final *h*, double-stroke *ḥ*



Fig. 26. Developing Arabic inscription UJadhNab 297 (© L. Nehmé).

(*yrḥ*, ‘*šbḥt*), straight or slightly wavy medial *y*, reversed final *y*, circular initial *m* as opposed to calligraphic Nabataean final *m*, ‘ sitting on the baseline, hesitation between calligraphic *t* (in *m’tyn*) and zig-zagged *t* (everywhere else). Other letters are not diagnostic (*b*, *t*, *l*, *n*, *w*, *p*, etc.) and are not commented on here.

Conclusion:

The close examination of the original stone has made it possible to considerably improve the reading of this text. The date, AD 306, is confirmed, and the new copy allows us to compare the letter forms with those of other texts from the same period. The text contains some features worth pointing at:

- the use of *bn’* instead of the more usual *bnh*, the former being possibly an orthographic variant which appears only in later texts;
- the preferred translation for ‘*l*’ in this text is “over/above”, and it is taken to refer to the position of the *nefesh*, assuming it was built above the tomb;
- a possible Arabic formula used to express the suddenness of the death of a ten year old girl;

31. See Healey 1993: 76 and Yardeni 2014.

32. UJadhNab 172, 327/328 AD, which is exceptionally written in calligraphic Nabataean.

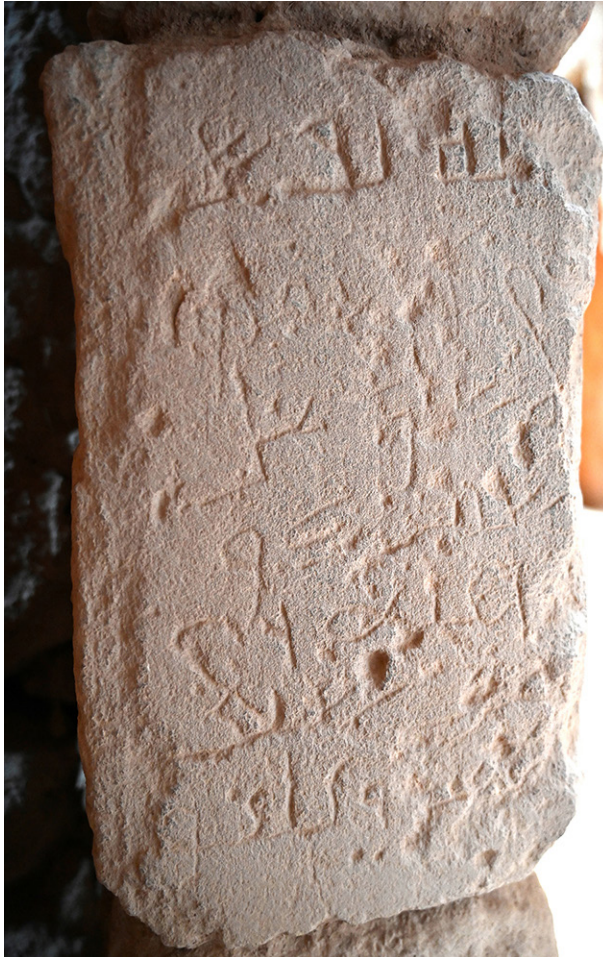


Fig. 27. Photograph of UIDA 3 (© L. Nehmé).

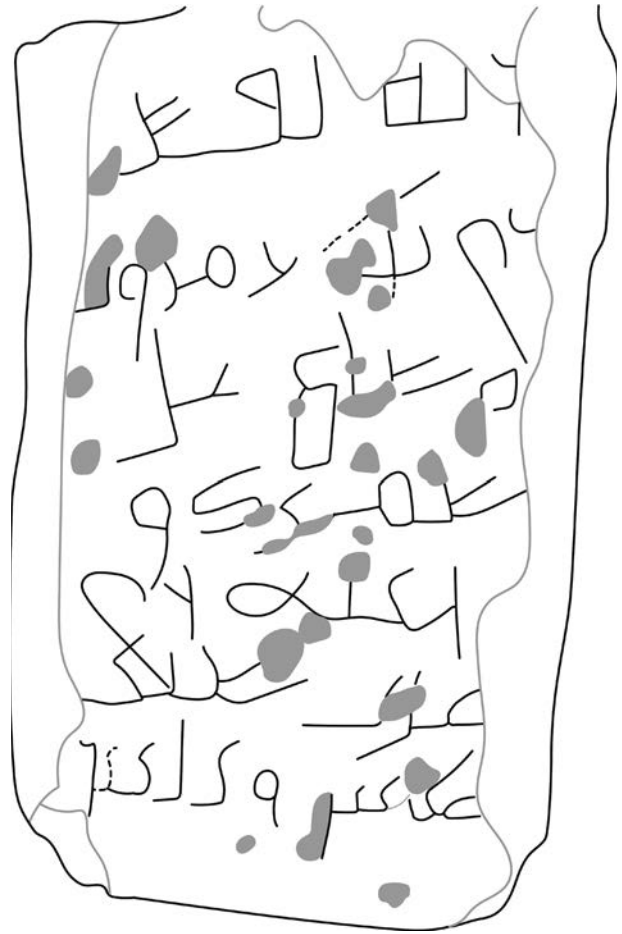


Fig. 28. Facsimile of UIDA 4 (© L. Nehmé).

– the mixture, as in other texts from the same time period, of Aramaic and Arabic, the core of the text remaining however Aramaic.

UIDA 4 (figs 27–28)

UIDA 4 is a previously unpublished inscription which was photographed in February 2021 by A. al-Emam, who sent photographs to the author and showed her the location of the stone in March 2022, thus allowing a copy to be made *in situ*. Finally, Archaios made a 3D scan of the stone and kindly put it at the disposal of the author in June 2022.

The stone, 19 cm wide, 29 cm high, and c. 10 cm thick, is presently reused in the doorjamb of a door in one of the streets of the Old Town accessible to visitors (see fig. 21).

Reading:

1. {d}nh npš[']
2. {d}y bn{'} 'mrw b[r]
3. {'}šlm 'l
4. šm{y}ṭw
5. ḥtn-h dy
6. myt šnt
7. m'tyn w tlt{yn}

Translation:

¹ “[T]his is [the] *nefesh* ² {wh}ich ‘Amrū so[n] of ³ {’}Ašlam set up for ⁴Šam{ī}ṭw ⁵ his son-in-law who ⁶ died year ⁷ two hundred and thir{ty}”.

Comment on the reading:

- I. 1. The *d* of {*d*}nh was observed *in situ* and is just visible.
- I. 2. The reading of *bn{’}* is almost certain. The final ’ remains tentative but the traces visible on the stone are closer to those left by an ’ than to those left by a *h*, which would be the only alternative.
- I. 3. Šlm is preferred to mšlm because of the apparent absence of a horizontal line, and therefore of any form of ligature, between the first letter and the š.
- I. 4. The reading šm{y}ṭw implies a very long ligature between the *m* and the *y* but it is preferred to šmṭw, which would be the only alternative.
- I. 5–6. The reading is clear and does not require any comment.
- I. 7. The reading of *m’tyn* is certain. One may hesitate between *t/t* and *t/tyn*, but the latter is preferred, despite the fact that the *y* is almost completely invisible, because of the presence of a rather clear long vertical stroke at the end of the line which can only be a final *n*. The text is dated to AD 335/336, i.e. thirty years later than UIDA 3.

Commentary on the text:

The letters of the first line are thicker and are incised more deeply than those in the other lines. The script is on the whole very similar to that of UIDA 3. As in the latter, the ’ and the š still have a calligraphic Nabataean form. On the other hand, the only *r* (in ‘*mrw*’) is more evolved than those in UIDA 3, having already the shape of a segment of a circle. The other difference lies in the *t* (in šmyṭw), which retains here its “S” shape. Note also the mixture, in this text, of two forms of final *h* (in *dnh* and *ḥtn-h*), the one in *dnh* being closer to calligraphic Nabataean whereas the one in *ḥtn-h* is similar to the *hs* in UIDA 3. One last difference, albeit less significant, is the *ḥ* in *ḥtn-h*, which is more vertical. These differences, which probably reflect different hands, thus occur in the same place and roughly at the same time. The development process of the letters is however clearly engaged in both texts, particularly for the *m*, the *y*, and the *t*.

As for the contents, this text is very similar to the previous except that it is more concise: it does not give the age of the deceased, it provides only the year when he died (neither the day nor the month) and it does not contain any particular formula. From the linguistic point of view, it does not contain any identifiable Arabic loanword. The only word worthy of comment is *ḥtn*, “son-in-law”, which is known in one Nabataean inscription, JSNab 36, carved on tomb IGN 93 at Hegra.³³ The personal names ‘*mrw*’ and ‘*šlm*’ are well known in the Nabataean and Arabic onomasticon and no particular information on the identity of the persons who bore them can be drawn from them. As for *šmyṭw*, it is new and it may be derived from Arabic *šamīṭ*, “mixed, applied to any two things; or any two colours”; “dawn” (Lane 1863–1893: 1598). Note that *šmyṭw*, with a *t*, occurs in three inscriptions from North-West Arabia: MBAZNab 1 and UJadhNab 462 on the Darb

33. For the meaning and the parallels, see Healey 1993: 229.

al-Bakrah, and a text photographed during the 2020 season of the al-‘Ulā-Medina survey.³⁴ There is however no reason to assume that *šmyṭw* and *šmytw* are the same name.³⁵

General comment on both texts:

These two dedications of a *nefesh* are dated to the first half of the fourth century AD and both were found in the Old Town of al-‘Ulā. The *nefesh* were set up by men bearing the same name, ‘Amrū.

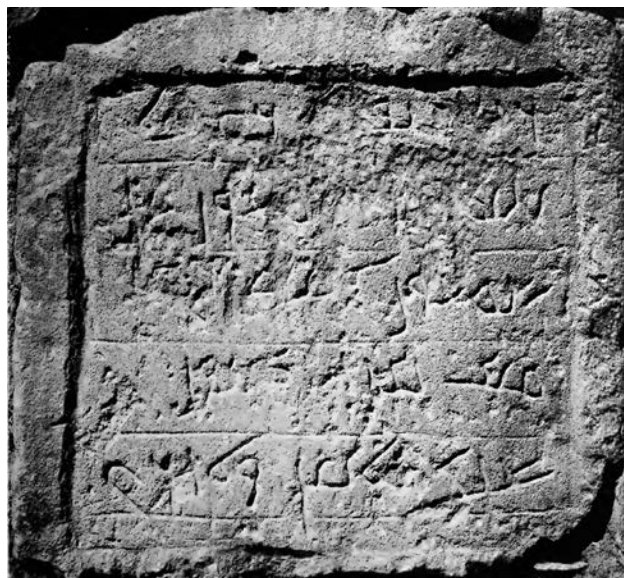


Fig. 29. *Developing Arabic Inscription UIDA 2 (JSNab 386) (from Jaussen & Savignac 1909–1922, Atlas: pl. LXXI).*

They were probably two different persons since the second text is thirty years later than the first and ‘Amrū is a very common name at this period. One additional funerary text should be added to this growing corpus of late antique funerary texts from the area. It also comes from al-‘Ulā—albeit not from the Old Town—and should be included in a reflexion on the occupation of al-‘Ulā in this period. It is JSNab 386, a text known only from a black-and-white photograph and a copy (fig. 29). At the beginning of the 20th century, it was reused in a “modern” wall enclosing a garden close to the Ḥijāz railway in the district known as al-Manshiyyah, 4 km south-east of the Old Town, near the al-‘Ulā Ḥijāz railway station. Its present location is not known.

The data relative to texts from al-‘Ulā written in Developing Arabic characters is summarised in the table below:

Number	Other ref.	Location	Dim.	PA ³⁶	Month	Date	Type
UIDA 2	JSNab 386	al-Manshiyyah	23 x 41 x 15 cm	201	sywn (May-June)	AD 306	<i>nefesh</i>
UIDA 3	CIS II 333 RCU.2021.61	al-‘Ulā Old Town	19 x 29 x c. 10 cm	200	šbṭ (Jan.-Feb.)	AD 306	<i>nefesh</i>
UIDA 4	previously unpublished	al-‘Ulā Old Town	34 x 32 cm	230	—	AD 335/336	<i>nefesh</i>

The three texts are dated to the first half of the 4th century AD, a period which follows immediately the time when the army abandoned the Roman fort in Hegra (end of the 3rd/beginning of the 4th century). The dimensions of the blocks show that they were not gravestones (they are too small) but were probably included in the masonry of the funerary structure to which the texts

34. The handwriting of *šmytw* in these three texts is relatively similar and it is possible that they were written by the same man although this is of course not certain.

35. One might consider that what was read as *ṭ* is in fact a *t* with a slightly lengthened upper line, but the shape of the letter is clearly distinct from that of the *t* in *ḥtn-h*. Besides, there are several examples of Developing Arabic S-shaped *ṭ*s (UJadhNab 178, to become UJadhDA 178, and others).

36. PA: date according to the era of the Roman Province of Arabia.

refer: a *nefesh*. This word is not attested in the inscriptions from Hegra except in the Māwiyah text if indeed it comes from this site. In 4th-century al-‘Ulā, it probably does not refer to the same object as it does in the first century Nabataean inscriptions from Petra, i.e. an obelisk or pyramid shaped commemorative monument. One may also wonder whether the presence of these texts in reused positions in the Old Town indicates the presence, at this period, of a cemetery in the neighbourhood, either in the area of the Old Town itself or at a short distance from it. Some late antique levels were brought to light in Area E of ancient Dadan, south of al-Khuraybah,³⁷ but it is impossible to say whether the stones were transported from there, 3 km further north. The Developing Arabic text carved on the slope overlooking the Old Town³⁸ shows that the area was visited at this period but this text is clearly later (later fourth into fifth century AD) than those which are discussed here.

Lectures

- On November 25th, Laïla Nehmé gave a public lecture entitled “Hegra Excavations and Surveys” in the framework of the 2021 autumn programme of lectures organised by RCU in the Old Education Building at AlUla.
- On February 15th, Laïla Nehmé gave a public lecture entitled “In search of ancient caravan tracks in North-West Arabia” at the French Embassy in Riyadh.

Visits

- On October 31st, Laïla NEHMÉ took on an afternoon tour the **French ambassador**, his excellency M. Ludovic POUILLE, who was accompanied by a number of persons from his staff, including the Cultural attaché, Mrs Catherine Le Thomas.

During the February-March 2022 season, the team received several visitors, among whom:

- a delegation of personalities connected to the French **horse industry**;
- eleven **senators** from the French Senate, all of whom were part of either the Culture Commission or the France-Gulf countries Friendship Group (**fig. 30**);



Fig. 30. Visit of a delegation of French senators at Hegra.

37. J. Rohmer and A. Alsuhaibani, contribution to the AlUla workshop, “Results of the 2nd field season of Dadan Archaeological project (2021)”.

38. Nehmé 2018: 105–106, ‘Ulā 1, now UIDA 1.

- two members of the **French Biblical School of Archaeology** in Jerusalem, Jean-Baptiste Humbert and Jean-Michel de Tarragon, the latter being the conservator of the photo library.

Community Engagement

- Laïla Nehmé was asked by A. al-Emam to participate to a **question-answer session** for the Ruwāt team in the Dadan visitor centre building.
- Laïla Nehmé had a long meeting with a **student** from KSU, Sara al-Hareth, who would like to start a PhD on ancient DNA analysis of human remains.
- Raghad al-Qahtani, currently preparing a master in arts, was **trained** for a week by P.-M. Blanc in Area 9 in March 2022.

Media

In 2021 and 2022, the MSAP team was involved in three documentary projects:

1. November 2021, **OR Media**, dir. Billy Paulett, who filmed several excavation areas and performed a long interview with Laïla NEHMÉ;

2. November 2021, **National Geographic**, dir. Dirk Verheye, in the framework of the 45 mn documentary entitled “The North Arabian Kingdoms”;

3. November 2021, **TSVP** (Tournez s’il vous plaît, <https://tsvp-prod.com/>) for **France 5 TV**, dir. Nathalie Laville (and Mathieu Schwartz) for a 90 mn documentary entitled “Expedition Petra. On the track of the Nabataeans (Expédition à Pétra. Sur la piste des Nabatéens)”. Two TSVP teams were sent to Hegra consecutively:



one in order to follow the MSAP team during the expedition between Medina and Petra and one in order to film and interview the various members of the team in Hegra proper (fig. 31).

Fig. 31. The TSVP crew filming L. Nehmé and J. Norris (© A. Morrissey).

4. February 2022, **Elephant** for **Arte TV**, dir. Anna-Gaëlle Brault, for a documentary broadcasted in the Arte Series “Invitation au voyage” (Invitation to travel), <https://www.arte.tv/fr/videos/111111-003-A/en-arabie-saoudite-jamais-sans-mon-dromadaire/>.

5. March 2022, **National Geographic**, for a 45 mn documentary on the Nabataeans in al-‘Ulā.

Publications

Recently published or forthcoming

The English and Arabic versions of the **Guide to Hegra** (fig. 32) were published at SKIRA publisher in late 2021 and are now available for purchase. The guide aims at providing the learned general

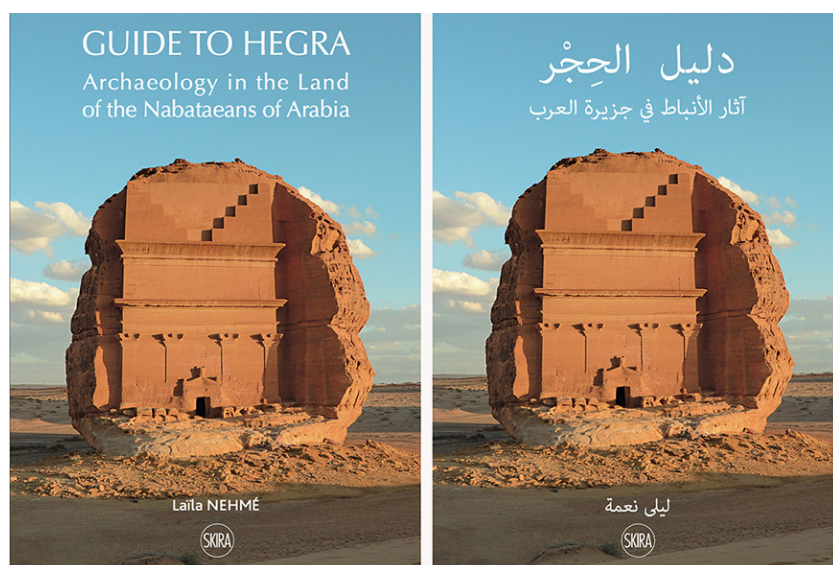


Fig. 32. Cover page of the English and Arabic versions of the *Guide to Hegra* volume.

public and the visitors with both a detailed introduction to the Nabataeans and a high quality guide to the site.

The following references may also be added:

Durand C., Gerber Y. forthcoming: “When the Nabataeans Settled in Hejaz: New Data from the Nabataean Painted Fine Ware Found in Hegra/Madā’in Sālih (Northwest Arabia)”, in *Studies in the History and Archaeology of Jordan* 14. Amman, Department of Antiquities.

Durand C., Bauzou T. forthcoming: “Hegra, a Lihyante Caravan City? A Reassessment of the Early Settlement in Hegra/Madā’in Sālih”, *Proceedings of the Seminar for Arabian Studies*.

Gatier P.-L. 2020 [2022]: “Les Graffites grecs de Mabrak an-Nāqah (Arabie Saoudite)”, *Cahiers Glotz* 31: 105–134.

This is the publication of a group of twenty graffiti written in Greek on the eastern side of the Mabrak al-Nāqah pass, c. 17 km north-west of Hegra. They are dated to the late antique period, 4th–7th centuries AD, a time when Hegra was no longer under Roman political and military rules. The graffiti contain almost exclusively personal names, the majority of which (12 over 20) are Christian, one being Jewish, while the religion of the others is undertermined. The authors were most probably people travelling on the north-south caravan road, which was still used by then. The onomasticon seems to indicate that they came from the provinces of Palestine, Arabia, as well as, perhaps from other Near Eastern Roman provinces. A few names are so particular, however, that they may be specific to the Hījāz and thus suggest regional rather than interregional circulation.

Ryan S. E., Douville E., Dapoigny A., Battesti V., Matthieu L., Dabrowski V., Zazzo A., Bouchaud C. forthcoming: “Strontium isotopes Reveal Nabataean Cotton Cultivation at Hegra, Saudi Arabia”, *Journal of Archaeological Science*.

In preparation

Two publications are underway and the preparation of a third one will start in the autumn of 2022:

Underway

– the commented catalogue of the **coins** from Hegra by Thomas Bauzou. It will hopefully be ready by the summer of 2023. The catalogue of the c. 1200 coins from the site is ready but the documentation and the synthesis still need to be prepared. It might also be necessary to undertake some additional cleaning of the coins as well as some photographs;

– the **pottery** from Hegra by Caroline Durand and Yvonne Gerber. This publication is divided in two volumes:

C. Durand & Y. Gerber. *The pottery from Hegra (Madā'in Sālih). Volume 1 – From the Lihyanite period to the end of the Nabataean period (5th c. BC – early 2nd c. AD).*

Y. Gerber & C. Durand. *The pottery from Hegra (Madā'in Sālih). Volume 2 – From the Roman Province to the abandonment of the site (2nd–5th c. AD).*

The first volume is due to be ready by the end of 2022. The publisher is not chosen yet but an Open Access publication is aimed at so that the data is made available to all those interested in the pottery from these periods.

Starting in the autumn of 2022

– The **Hegra city temple**, i.e. the excavation of the temple excavated on top and at the foot of IGN 132, by Damien Gazagne and Laïla Nehmé.

Prospects

After having celebrated, in 2022, its twentieth anniversary, the Madā'in Sālih Archaeological Project will undertake, in 2023, its 21st fieldwork season and the last of the ongoing 2019–2023 five-year research programme. Since 2002, the last year of each five-year research programme has always been a study season, or at least a season during which there was no excavations, i.e. no workmen, no additional material coming out, no pottery to be washed and treated, etc. This is the only way one can hope to clear the backlog of the unstudied material from an excavation. One other advantage of this organisation is that it allows to match the calendars imposed by the main Saudi and French bodies under the umbrella of which the project is placed. Saudi Arabian archaeological programmes are indeed signed for five years whereas the French Ministry for Foreign Affairs ones are signed for four years. For these reasons, the ongoing programme will apply the same rule.

The programme for the 2023 season

The programme for the season has been defined and will include the following actions.

On the field

1/ Undertake the necessary controls on the **archaeological and epigraphic map** of the site so that it can be submitted as a tool for **site management (fig. 33)**. All the available data is recorded in a QGIS database but the latter still requires to be checked, the page set-up of the various maps done and some of the information captured checked on the field;

2/ Examine more carefully areas located outside the residential area (but within the site of Hegra, particularly in places where large quantities of sherds were observed on the surface. These may

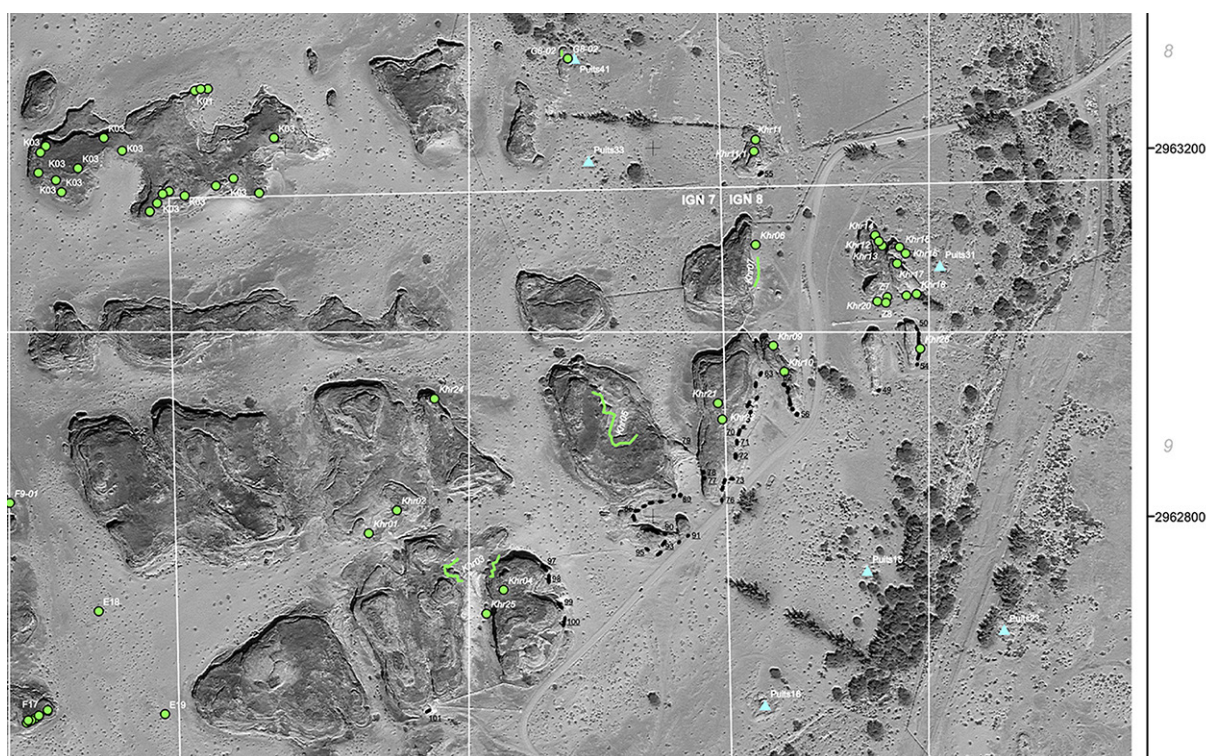


Fig. 33. The Jabal Khaymāt area of the Hegra Archaeological Map (in progress) (© MSAP).

reveal either **additional settlements**, possibly from a different period (later?), or structures such as **farms**;

3/ Examine the potential of the so-called South-East gate of the city in relation with the ongoing search for the **ancient dump(s) of the city of Hegra**. Indeed, the small soundings undertaken for this reason outside the Roman fort in 2021 were unfortunately not successful but it would be a pity not to persevere (see the report by E. Botte in this volume);

4/ If possible, **fill the gap in the survey** between al-‘Ulā and Medina, namely survey the area between aṣ-Ṣuwaydirah, which lies 60 km east–north-east of Medina, and al-Ṣalṣalah, exactly 100 km north-west of the former, along the Wadi al-Gharas (see fig. 5). The presence of Nabataean inscriptions in this wadi, if proved, would confirm that the Nabataeans controlled the route between Khaybar and Ṣuwaydirah (see the report by L. Nehmé and J. Norris in this volume).

Studies

The focus will be put in 2023 on the material which is being prepared for publication, i.e. the coins and the pottery (see above). The priority for the pottery is also to clear, as much as possible, the accumulated backlog of the unstudied material (c. 70 boxes) as well as start/continue the preparation of volume two of the pottery publication.

Apart from these two priority issues, it is hoped that Jacqueline Studer will be able to continue the analysis of the **faunal remains**.

Media

On the communication and **media** side, it is hoped that the project of reconstructing a **camel caravan** between Hegra and Taymā’ can be performed during year 2023. This is ongoing media project between the present director of the MSAP, Jara Prod (<https://www.jaraproduct.com/>)

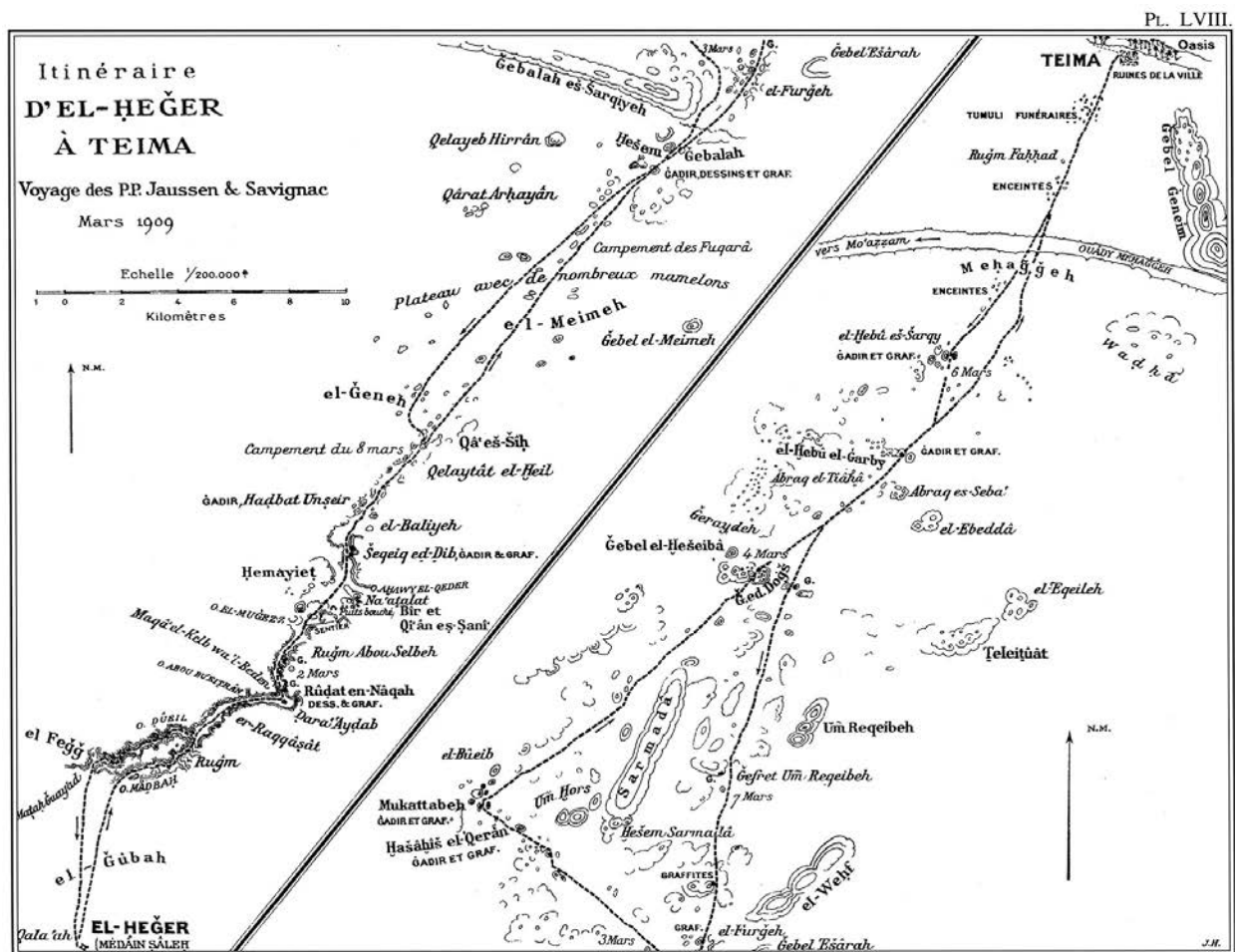


Fig. 34. *Itinerary followed by A. Jaussen and R. Savignac between Hegra and Taymā' (from Jaussen & Savignac 1909–1922, Atlas: pl. LVIII).*

and Arte, with the support of Afalula and the Arpamed endowment fund. The latter agreed to sponsor the scholars who will participate to it.³⁹

The idea is to organise a camel caravan (of c. 15 camels) which would depart from Hegra and follow in a north-east direction the path followed at the beginning of the 20th century by the Dominican fathers A. Jaussen and R. Savignac (**fig. 34**) and meet in Taymā' the team of the *Deutsches Archäologisches Institut* who has been working there since 2004 under the direction of Arnulf Hausleiter.

The 2024–2028 programme

Year 2023 being the last of the five year research programme, a new programme has been set up which tries to take into account the wishes expressed by the different parties.

On the French side:

– the **French Ministry for Foreign Affairs**, which has been supporting the project for 20 years and will hopefully continue to do so for four additional years;

39. The team will include L. Nehmé, J. Norris, Paul Cervantes (presently Master student, PhD student from later 2022), Philippe Cazala (a priest who studied at the French Biblical School of Archaeology in Jerusalem and who will read passages from Jaussen and Savignac's *Mission archéologique en Arabie*), and Bernard Faye (a vet specialist of camels).

- the **CNRS**, which has provided over the years both the salary of several members of the project, including that of its director, and a small but regular financial contribution to the project's annual costs;
- the **French Embassy** in Riyadh, which has also supported the project, logistically and financially, as well as offered it a local showcase through many invitations to give lectures to the general public;
- the **Afalula**, which is now a key actor in the archaeology of the al-'Ulā region and has shown interest in supporting the project in the coming years.

On the Saudi Arabian side:

- the **Heritage Commission**, which has been a fully active and supporting partner of the project for twenty years, thus making it a proper and successful joint project;
- the **Royal Commission for AlUla**, which has become in 2018 an essential actor in the archaeology in the region and has already started to support generously the project in 2021 and 2022.

Change of project director

The submission of a new research programme is also the opportunity to **renew the management team** of the project. After having led the project for over twenty years, it is time for the actual director to hand over the responsibility of it. Many reasons underlie this decision, among which: the need to prepare and accompany the change of director in a smooth way, which requires time and needs to be thought of in advance; the advantages of giving a new impulse and new ideas to the project thanks to the contribution of a scientist both younger and with a slightly different academic profile; the wish of the actual director to work on other important projects such as—to take only two examples—the **Digital Corpus of Nabataean Inscriptions** (DiCoNab) and the **Corpus of the Developing Arabic inscriptions** from the Arabian Peninsula, which have been pending for several years but are now on track. A test version of DiCoNab, a MySQL relational database, was presented to the author in late September 2022 and will hopefully be operational by the end of the year or early 2023. It was developed by Matteo Gallo, a professional developer with a long experience in epigraphic databases at the Scuola Normale Superiore in Pisa. This was made possible thanks to the generosity of Benjamin Suchard, a Leiden University postdoc research fellow who received a grant from the Dutch Research Council (NWO) to undertake research on Nabataean Aramaic as a spoken language.⁴⁰

Naturally, the present director will continue to contribute to the project in her own field of expertise (archaeological map, epigraphy, survey of caravan tracks) and will offer support to the new director if need be.

The **proposed new director** is **Katia Schörle**, a CNRS researcher in the Centre Camille Jullian in Aix-en-Provence (<https://ccj.cnrs.fr/>). She is an archaeologist and historian specialised in the economy of the Mediterranean in antiquity and her CV is attached in Appendix 2. She will participate to the 2023 season in order to get acquainted with the field and meet the key people in both al-'Ulā and Riyadh. The programme presented below was prepared in collaboration with her.

40. <https://www.universiteitleiden.nl/en/news/2019/08/benjamin-suchard-receives-veni-grant-for-research-on-nabataean-aramaic-as-a-spoken-language>

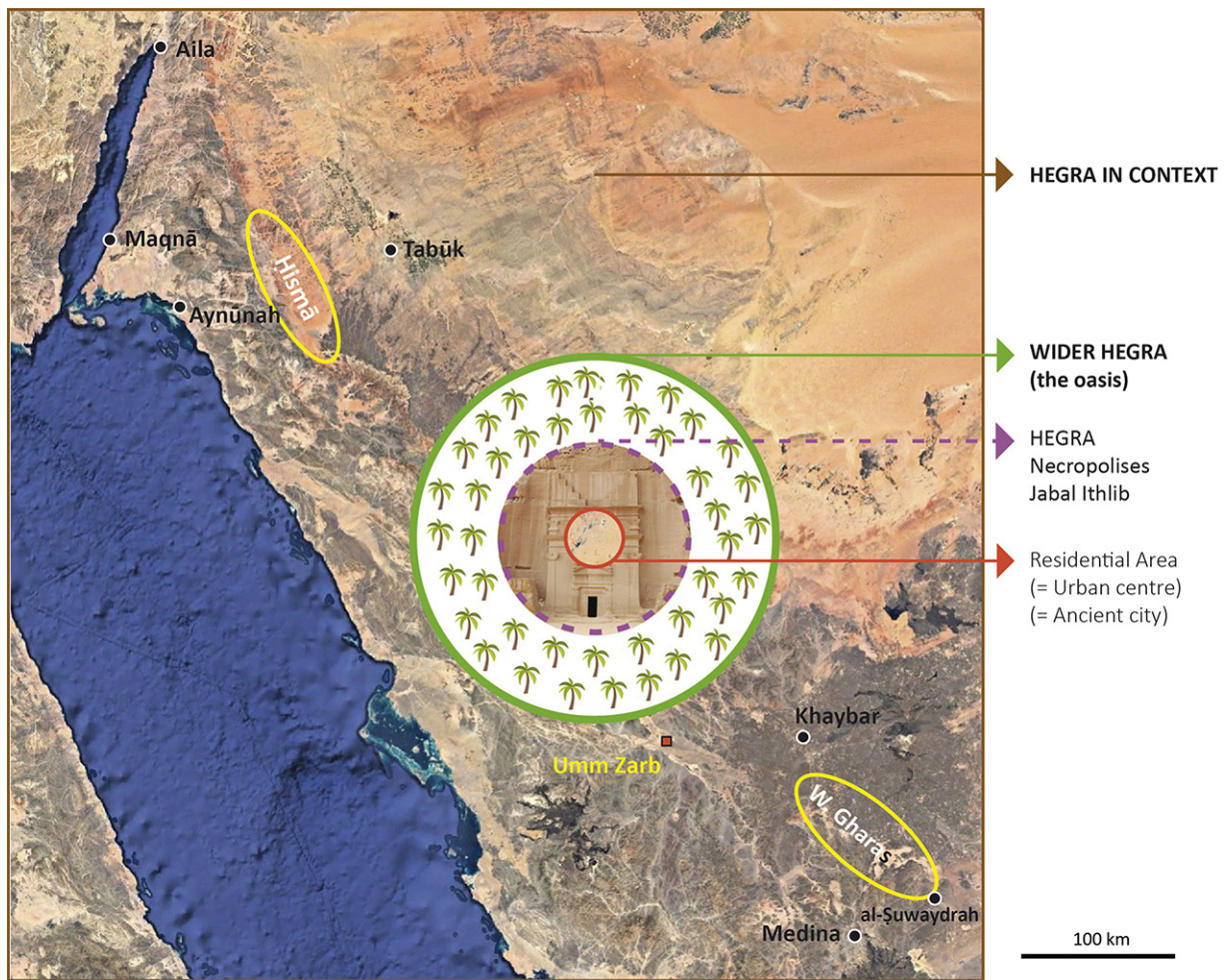


Fig. 35. Map showing schematically the suggested range of the Madā'in Šāliḥ Archaeological Project for 2024–2028) (© MSAP).

The general framework

Over the years, the project has explored, through either surveys or excavations, large parts of ancient Hegra, mostly within the fence which surrounds the archaeological park. Outside the latter, the team undertook surveys in the eastern part of the Jabal Ithlib, labelled Jabal Ithlib East in the reports, including the few rocky outcrops standing south of the Jabal.⁴¹ Further away, attention was only given to the Mabrak an-Nāqah pass, where P.-L. Gatier, the Greek and Latin project's epigraphist, studied the Greek inscriptions, now published (Gatier 2020). Finally, it is only during the last research programme, 2019–2023, that a particular attention was given to the ancient road network of which Hegra was part as an important urban and probably religious centre in the Nabataean and Roman periods. This resulted in three survey seasons in search of the ancient caravan track(s) between Hegra and Medina as well as a complementary survey undertaken while filming for a documentary along the so-called Darb al-Bakrah, north of Hegra on the way to Petra. Within the fence, the team surveyed and excavated three of the four main components of the site: the Jabal Ithlib in the north-east, the residential area, and the necropoleis scattered around

41. This was necessary in order to trace the limits of the site in antiquity and examine the traces left by Roman auxiliary units immediately east of the fence.

it. The new *Guide to Hegra*, now published in three languages, reflects the progress made in the understanding of the history of the site and of the life of its inhabitants during the millennium 500 BC–AD 500, while the forthcoming publications of the pottery and the coins will provide fundamental working tools for scholars working in the region.

The new programme takes into account all that has been done so far. This being considered, it aims at: 1/ filling the gaps in our knowledge of the site's occupation; 2/ trying to better understand the role of Hegra in the political and economic context of the Hijāz in antiquity. These are the two key issues which underlie the actions listed below (**fig. 35**).

Hegra: Residential Area

Within the ancient city wall, the most important targets may be:

1/ finish the work in the three areas where excavations were still ongoing at the end of 2021 or in the spring of 2022;

2/ if the examination of the so-called South-East gate of the city proves successful (see above), undertake soundings in search of the ancient dump of the city.

Three areas are concerned in this section (see fig. 1):

– **Area 34** (Z.T. Fiema): with regard to the Roman Fort, five areas (two bigger and three smaller) look very promising in terms of continuing excavations and would provide important additional information before the final publication (**fig. 36**). The five areas and the reason why they were chosen the following:

- **No. 1.** Clarify the connection with the tower like structure excavated in trench D; clarify the section of the perimeter wall and the abutting structures facing the town;
- **No. 2.** Clarify the connection between the barracks and the tower like structure further north. This is made possible by the presence of a deep deposition there;
- **No. 3.** Clarify the connection between the Nabataean rampart and the Roman perimeter wall; ascertain the function of a strange elongated rectangular room located there;



Fig. 36. Suggested excavating areas in the Roman fort (© MSAP).

- **No. 4.** Finish the excavations which started there in 2021. This sector is characterised by a deep ash deposit;
 - **No. 5.** Learn more about some sort of water-related structure;
 - **Area 36**, on the western side of the city (M. al-Musa);
 - **Area 92**, which revealed a long sequence of occupation and structures belonging to domestic installations, traces of craft industry and elements of monumental Nabataean architecture. The bedrock was not reached in several of the soundings opened in 2021 and 2022, among other reasons because of the very complex stratigraphy which mixes mudbrick walls, stone walls, floors, pits, and reused architectural pieces.
- 3/** On top of these, it may be both interesting and useful to undertake the **extensive excavation** of a domestic area in order to determine the plan of one complete dwelling unit, preferably one opening onto a street. Of course, this extensive excavation would first be limited to the upper levels of occupation, and hence to the Roman/Late Roman phases of the site. However, even if limited to the upper levels, this excavation would necessarily bring to light the walls and structures of the lower levels and possibly help understand the plan of a Nabataean domestic unit. **Area 2**, which is in the northern part of the city, already excavated and the phasing of which is known, may be a good candidate.

Wider Hegra

Little attention was paid so far to what is named here “wider Hegra”. This expression designates the areas which lie beyond the three main components of the ancient site (the Residential Area, the necropoleis, and the Jabal Ithlib religious installations) but still within the site’s fence. These areas are characterised by the presence of numerous wells around which archaeological structures were occasionally identified and recorded. Several actions have been undertaken in these areas since 2002 (**fig. 37**):

- 2003: geomorphological analysis (J.-B. Rigot, cf. Rigot 2006);
- 2004: collecting of surface sherds in various areas (I. Sachet, cf. report of the 2004 season, Augé *et al.* 2010: 209–217, pl. 7.16a);
- 2010: surveys outside the residential (E. Fouache, cf. report of the 2010 season, L. Nehmé *et al.* 2014: 300–301, fig. 4).
- from 2019 onwards: analysis of soils in the framework of the SoFunLand project (<https://mediterranee.cirad.fr/recherche-en-partenariat/projets-en-cours/sofunland>).

Several hamlets or dwelling areas were identified during these surveys and their archaeological potential should be re-examined carefully and, if possible, sample excavations done. Photographs of the sherds picked up and recorded during the 2004 survey (1,174 pieces), as well as drawings of all the interesting ones, are available. A complete study of this material is still pending but would be very interesting in relation to the question of the site’s occupation from a wider perspective. One should indeed remember that the Arabic tradition, as reported among others by A. Jaussen and R. Savignac, refers to seven settlements or hamlets in the region. Besides, in the seventeenth Ottoman geographical manual known as *Jihan Numa*, the site is called Qerāya Sālih, the “villages” of Sālih. Considering that, apart from the Arabic Islamic inscriptions carved in the Jabal Ithlib and a couple of others elsewhere, nothing is known about the site in the Islamic period, investigating the ‘hamlets’ or dispersed habitat may be a good starting point to address the issue from a different perspective.



Fig. 37. Map showing the areas where the MSAP undertook surveys in the ancient oasis of Hegra between 2003 and 2010 (© MSAP).

Hegra in context

The actions presented in this paragraph aim at better understanding the integration of Hegra in the Nabataean and Roman Ḥijāz as well as the relation of the city with both the Red Sea and the caravan routes northwards (to Petra) and southwards (to Medina and beyond). Some of these actions are new additions to the Hegra project (Umm Zarb, Ḥismā), while others are the continuation of actions already partly undertaken (survey to Medina, Mabrak an-Nāqah). As far as the relation with the Red Sea is concerned, the Hegra project does not have any particular action to propose immediately. It should however be kept in mind that **boat sails** and associated objects (cords, rings made from straps) were identified by Dejla Garmi⁴² among the textiles put to light during the excavation of the Nabataean tombs at Hegra. Besides, she identified clear parallels with material discovered in Egyptian sites. This adds new interesting data on the exchanges that existed between both sides of the Red Sea in the Nabataean and most probably the Roman periods, particularly on the line between Myos-Hormos, al-Quṣayr, and Hegra. The relationship between the Nabataeans and the sea is thus worth (re)investigating in the future. In this context, a student from Aix-Marseille University, Sophie Ammerman, is presently preparing a master on the “Nabataean Use of the Sea in International Exchanges” under the direction of Katia Schörle. New tracks of research and new ideas may come out of it.

1/ Rescue epigraphy at Mabrak an-Nāqah and recording, before they are completely damaged, of the hundreds of inscriptions in various scripts and languages carved on a cliff more than 100 m long (Nabataean, Greek, Ancient South Arabian, Thamudic, Arabic and possibly others). Mabrak an-Nāqah (“the place where the she-camel sits”), 17 km north-west of Hegra, was necessarily on the caravan track leaving Hegra towards the north. Twenty years ago (**fig. 38**), Mabrak was naturally protected because there was no road passing through it and only a few people visited the site. The direct road between al-‘Ulā and Tabūk was built in the early 2000s and it is now taken by hundreds of cars and trucks every day. As is to be expected in such a case, the cliff has been damaged by modern tags and the epigraphic material urgently needs to be recorded properly before it vanishes. The difficulty lies however in the very complex distribution of the inscriptions, which form an inextricable puzzle (**fig. 39**). After a long reflexion, it seems that the only way to sort them out is a **collaborative online project** to which would participate as many

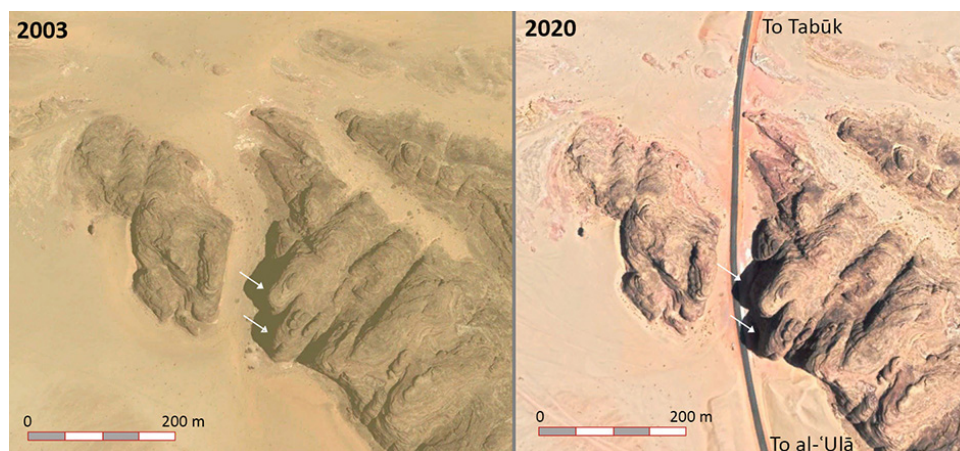


Fig. 38. Google Earth view of the Mabrak an-Nāqah pass in 2003 and 2020 (© Google Earth, with additions).

42. A free-lance textile specialist (<https://www.arar.mom.fr/annuaire/garmi-dejla>) who works among other things on material from French excavations in Egypt.



Fig. 39. One panel out of the eight major panels covered with inscriptions in the Mabrak an-Nāqah pass (© Benoît Millot).

scholars as possible, in a deciphering and reading challenge. High resolution photographs of the cliff were taken in 2022 by Benoît Millot, a film-maker and cultural mediation specialist. The idea of a collaborative project came while viewing the work undertaken by Marc Bouiron on the so-called “Stone of Alcazar”, a 2 m long stone, 2,600 years old, discovered in Marseille, on which are incised many drawings as well as writings (see <https://lejournal.cnrs.fr/videos/le-bloc-de-lal-cazar-en-lumiere>). The collaborative tool was created by Mercurio (<https://mercurioimaging.com/>), a start-up specialised in the transmission of knowledge and information through images. We are convinced that this would be the only solution to proceed to the complete recording of the Mabrak an-Nāqah inscriptions. Preliminary contact was made with Mercurio, and the main obstacle will be the cost of the programming.

2/ Thorough exploration of the fort and associated structures of Umm Zarb (see the report on Umm Zarb in this volume). A systematic survey, a general plan, and limited soundings can be envisaged. Umm Zarb is located 135 km south–south-west from Hegra and is easily accessible by car from the al-‘Ulā–Medina road, with a limited off-road section at the end. The site was visited in 2019 and 2022. It is a very interesting site where at least one Nabataean fine ware sherd was picked up on the surface in 2022 in a tower-like structure built within a large enclosure. The identification of a possible Nabataean fort and Late Roman caravanserail so far south of Hegra is extremely interesting in relation to the issue of the southern limits of the Nabataean kingdom.

3/ The caravans roads: after having explored the caravan itineraries between Medina and Hegra as well as between Hegra and the Saudi-Jordanian border, there are two possibilities of extension: **between Hegra and Taymā’**, along the itinerary already followed by Jaussen and Savignac in the early 20th century; **in the Hismā**, a region visited and partly surveyed but for which no proper documentation is available.⁴³

43. See the history of the exploration of this region in Norris 2020: 438–440.

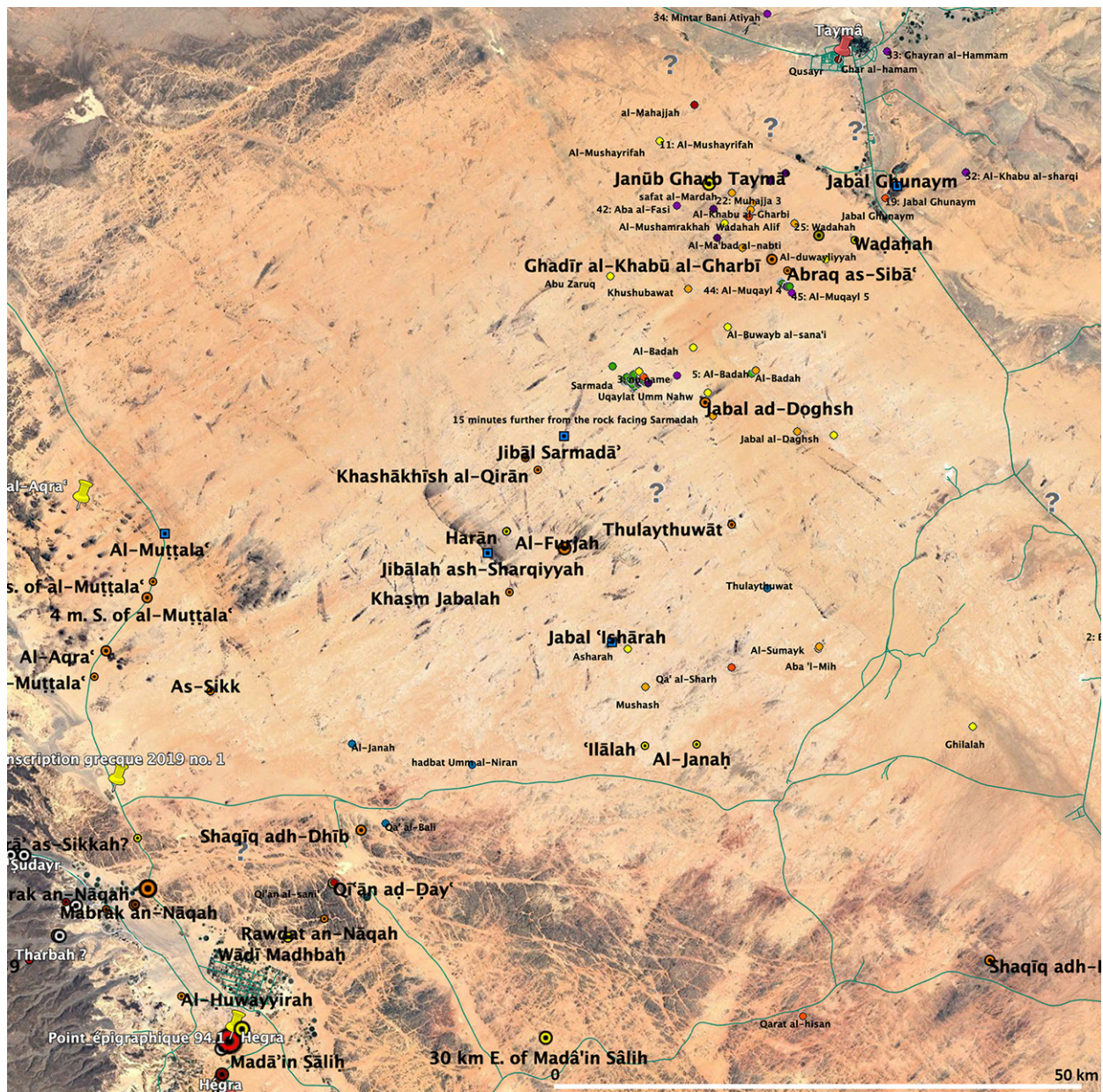


Fig. 40. Google Earth view of the area between Hegra and Taymā' showing the density of the epigraphic (© Google Earth, with additions).

The first one has already been explored partly by Khalid Alhaiti as part of the survey he conducted for his PhD (Alhaiti 2016), and by M.C.A. Macdonald as part of the Epigraphy and Landscape in the Hinterland of Taymā' project. More work is however needed both to sort out the abundant material collected (**fig. 40**) and to record properly the inscriptions. An initial contact with the region may be made during the camel caravan project (see above the paragraph on Media). As for the second one (**fig. 41**), there remains some uncertainty as to whether the Ḥismā was a major road connecting Dadan and Hegra to Aila/Aqaba through ad-Dīṣah and Ruwāfah. This route would be a middle alternative— running on the west side of Harrat al-'Uwayrid and Harrat al-Rahā—to the Darb al-Bakrah on the one hand, and to a probable route along the shore of the Red Sea up to 'Aynūnah, al-Bad' and the Wādī 'Aḥḥ on the other hand.

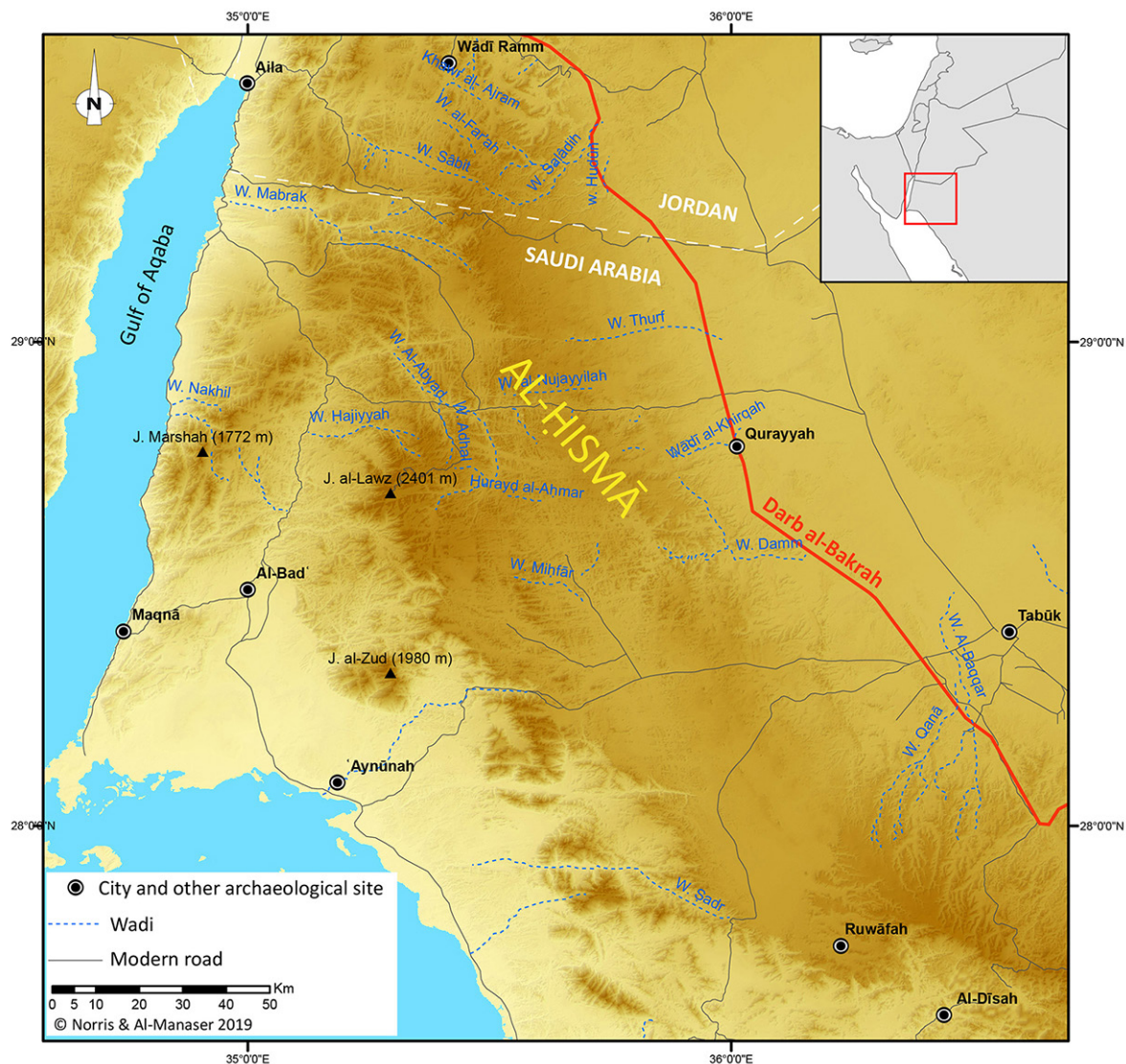


Fig. 41. Map of the Ḥismā area.

Training

The project is willing to participate to the general effort for the training of archaeologists and other specialists in the Kingdom. The offer is in three directions:

- training of a couple of field archaeologists. The site is not adequate for mass training of students because it is mainly built in mudbrick, a material which is very difficult to excavate and needs constant attention. It is therefore better to have one or two motivated advanced students in archaeology who may be given full attention by the archaeologist(s) in charge;
- training of a specialist of textiles (see above, § The textiles from Hegra);
- training of an epigraphist specialised in Nabataean inscriptions: recording, georeferencing, copying, reading, and photographing of the inscriptions, as well as entering them into the Nabataean database web application which is being designed.

Appendix 1

50 051 T 03 50051_T03

Drawing required: _____ Drawing made: _____

Photo required: _____ Photo made: _____

Year of excavation: _____

Main material: _____

Secondary material: _____

Thickness: _____ cm

Height: _____ cm

Length: _____ cm

Width: _____ cm

No. of fragments: _____ cm

Description: _____

Description of
decoration: _____State of
preservation: _____

Other notes: _____

Conservation place: _____

Cupboard_or_drawer_no _____

VERTICAL or WARP when known (FR chaîne)

Number of warp threads: _____

Warp thread (FR fil): _____

Warp twist (FR Torsion): _____

Mater. of warp thread: _____

Reduction warp weaving:
(FR Réduction chaîne) _____

HORIZONTAL or WEFT when known (FR trame)

Number of threads weft: _____

Weft thread: _____

Weft twist: _____

Mater. of weft thread: _____

Reduction weft weaving: _____

Selvage yes or no: _____ Number of selvages: _____
(FR lisière)Description of
selvage: _____Irregularities and
manufacturing defects: _____

Dye yes or no: _____ Dye colour: _____

Dye description: _____

Analysis of dye: _____

Seam yes or no: _____

Thread for seam: _____

Material of thread for
seam: _____Description of seam:
(FR couture) _____

Appendix 2

Katia SCHÖRLE

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h-index: 8, i10-index: 8, Academia: 6.8

EDUCATION

- 2015 *D.Phil.* (Ph.D.), Institute of Archaeology, Oxford University, UK.
Title: *Long-distance trade and the exploitation of arid landscapes in the Roman period (1st–3rd centuries AD)*.
- 2009 *M.Phil.* in Archaeology (M.A.), highest distinctions, Oxford University, UK.
Title: *The Roman Exploitation of the Eastern Desert of Egypt*.
- 2006 M.A. in Classics, highest distinctions (*Summa cum Laude*), University of Wisconsin, USA.
- 2003 B.A. in Classics, highest distinctions (*Summa cum Laude*), University of Wisconsin, USA.
- 2000 Literary Baccalaureate (Section L), highest distinctions, Lille, FRANCE.

CURRENT POSITION

- 2020– *Permanent Researcher*, Centre Camille Jullian, Aix Marseille University / French National Centre for Scientific Research.

PREVIOUS POSITIONS

- 2019–2020 Lecturer, Université Côte d'Azur, Nice, France.
- 2017–2019 Visiting Assistant Professor of Archaeology, Joukowsky Institute for Archaeology and the Ancient World, Brown University, USA.
- 2015–2017 Lecturer, Aix-Marseille University, France.
- 2014–2016 Head Curator of the Mougins Museum for Classical Art, France.

FELLOWSHIPS AND AWARDS

- 2021 Fyssen Foundation Research Award, Paris, France (€ 21,500).
- 2017 University Lecturer National Certification, section 21 (CNU), France (History, Civilisations, Archaeology and Art of the ancient & medieval worlds).
- 2012–2013 Raleigh Radford Fellowship, British School at Rome, Italy (£ 64,000)
- 2009–2011 Scatcherd European Doctoral Award, University of Oxford, UK (£ 44,000)
- 2007–2009 Meyerstein Scholarships (£4,000 *in toto*), University of Oxford
- 2008 *Corpus Christi* Prize, University of Oxford (Distinction)
- 2005 Kuhlmann Prize and Distinction in Classics (University of Wisconsin-Madison)
- 2002 *Phi Beta Kappa* Distinction (top 2% of the University of Wisconsin-Madison, USA)

SUPERVISION OF GRADUATE STUDENTS AND DOCTORAL FELLOWS

I have supervised 11 M.A. Students and participated in the jury of 2 PhDs (2018–)

FIELD EXPERIENCE

(as field director)

2020. Direction of the Salt Heritage of Tunisia project (with A. Drine, INP) for the European Commission H2020 SfaxForward programme. With fieldwork on the Kerkennah Islands and Zarzis.

07/2016. Co-direction of the Can Blai Military Fort Project, Balearic Islands, Spain (with R. González Villaescusa).

07/2015. Co-direction of the surveys and area manager on the excavation of the Roman fort of Can Blai (training camp), Balearic Islands, Spain (with R. González Villaescusa).

2010–2011. Direction of the coastal survey project “Leptis Magna Coastal Survey”, Libya, for the Department of Antiquities of Libya.

(as area manager)

2017. Excavation of the Roman villa of Brač, Croatia (Dir. E. Botte, Centre Camille Jullian, Aix-Marseille University and K. Jelinčić, Institute of Archaeology, Zagreb).

2009–2013. Survey and study of brick stamps at the site of Castel Porziano / Villa of Pliny, Rome, Italy (A. Claridge, Royal Holloway, London).

09/2011. Excavations of Herakleion (Wreck 43). Alexandria, Egypt. Oxford Centre for Maritime Archaeology, University of Oxford.

2010–2011. Berenike excavations, Egypt (Prof. S. Sidebotham, University of Delaware).

(as archaeologist)

2010–2011. Trans-Sahara (Ghadames, Tripolitania) and Desert Migrations (Jarma, Fezzan) projects, Libya (Prof. D. Mattingly, University of Leicester).

2006–2007. Suburban villa of Q. Servilius Pudens, Rome, Italy, American Institute for Roman Culture.

2004–2005. Roman Forum, Italy (*Post Aedem Castoris* Project). Supervisors: Dr. J. Trimble, Stanford University, Prof. A. Wilson, Oxford University, Dr. Arya, American Institute for Roman Culture.

ORGANISATION OF SCIENTIFIC MEETINGS (selection)

– Samples in Ancient Economies, J.-P. Brun & J. Zurbach, Collège de France, Paris, March 24–25, 2022.

– Military Coastal Surveillance in Late Antiquity, Prof. R. Villaescusa for the Casa Velázquez, Madrid and the University of Nice, France, March 2–3, 2017.

– 11th APDCA AGER conference and 37th Antibes International Colloquium on Archaeology and History, France, October 12–14, 2016, González Villaescusa, Prof. Gayet, & Prof. Rechin.

– Coastal Life in Roman times, CNRS-Oxford Collaboration Scheme 2012, November 2012, OxREP Doctoral Workshop (Oxford Roman Economy Project).

REVIEWING ACTIVITIES

– 2020. Scientific Advisory Board, *Mediterranean Archaeology, Libyan Studies*.

– 2020. Scientific Evaluation, National Science Centre (NCN), Poland, (OPUS grants)

– Occasional anonymous reviewer, *Revue d'Études Anciennes, Journal of Roman Archaeology, Zeitschrift für Orient-Archäologie, Journal of Mediterranean Archaeology*

PUBLICATIONS (selection)

Schörle K. *Long-distance Trade and the Exploitation of Arid Lands in Roman Times*. Brepols, Series Borders, Boundaries and Landscapes (manuscript accepted, reviewed, in progress).

Schörle K. “Deserts and the Mediterranean – border and contact zones”, in R. Raja (ed.), *Mediterranean Studies in Antiquity – Setting the Agenda, Mediterranean Studies in Antiquity* 1. Cambridge: Cambridge University Press (submitted, accepted).

Robinson D., Schörle K., Rice. C. 2020. “Ship Losses and the Growth of Roman Harbour Infrastructure”, *Journal of Mediterranean Archaeology* 33.1: 102–125.

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Schörle K. 2012. “Saharan Trade in Classical Antiquity”, in J. McDougall et J. Scheele (eds), *Saharan Frontiers: Space and Mobility in Northwest Africa*, Indiana University Press, Bloomington: 58–72.

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Sigla

CIS II	Nabataean inscriptions in the <i>Corpus Inscriptionum Semiticarum. Pars II. Tomus II. Fasc. 1. Sectio Secunda. Inscriptiones Nabataeae</i> . Paris, 1889.
JSNab	Nabataean inscriptions in Jaussen & Savignac 1909–1922.
MBAZNab	Nabataean inscriptions from Mabnā Abū Zayd.
UJadhNab	Nabataean inscriptions from Umm Jadhāyidh.
UIDA	Developing Arabic inscriptions from al-‘Ulā.

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2016: <https://hal.archives-ouvertes.fr/hal-01518460>

2015: <https://halshs.archives-ouvertes.fr/halshs-01311865>

2014: <https://halshs.archives-ouvertes.fr/halshs-01122002>

2011: <http://halshs.archives-ouvertes.fr/halshs-00671451>

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Preliminary Report on Hegra Pottery Workshops

Emmanuel BOTTE (CNRS, Centre Camille Jullian, UMR 7299)

One of the aims of the 2022 spring season was to investigate the northern part of the Residential Area of ancient Hegra, where the presence of ancient pottery kilns was suspected. Indeed, a pedestrian survey, undertaken in November 2021, following observations made by several members of the Madâ'in Sâlih Project team as well as by Fabien Lesguer from the Dadan Archaeological Project, revealed intriguing quantities of pottery kiln wall fragments and misfired pottery sherds. It was therefore hypothesised that this part of the ancient city was the potters' district. At the end of the season, seven areas were identified which showed the same concentration of elements resulting from the destruction of the kilns and from the production of pottery (**figs 1–2**). Three of them, numbered 11000, 11200, and 11300 (Area 11), were investigated more thoroughly in order to determine the form and the function of these kilns, their date and the kind of pottery they produced.

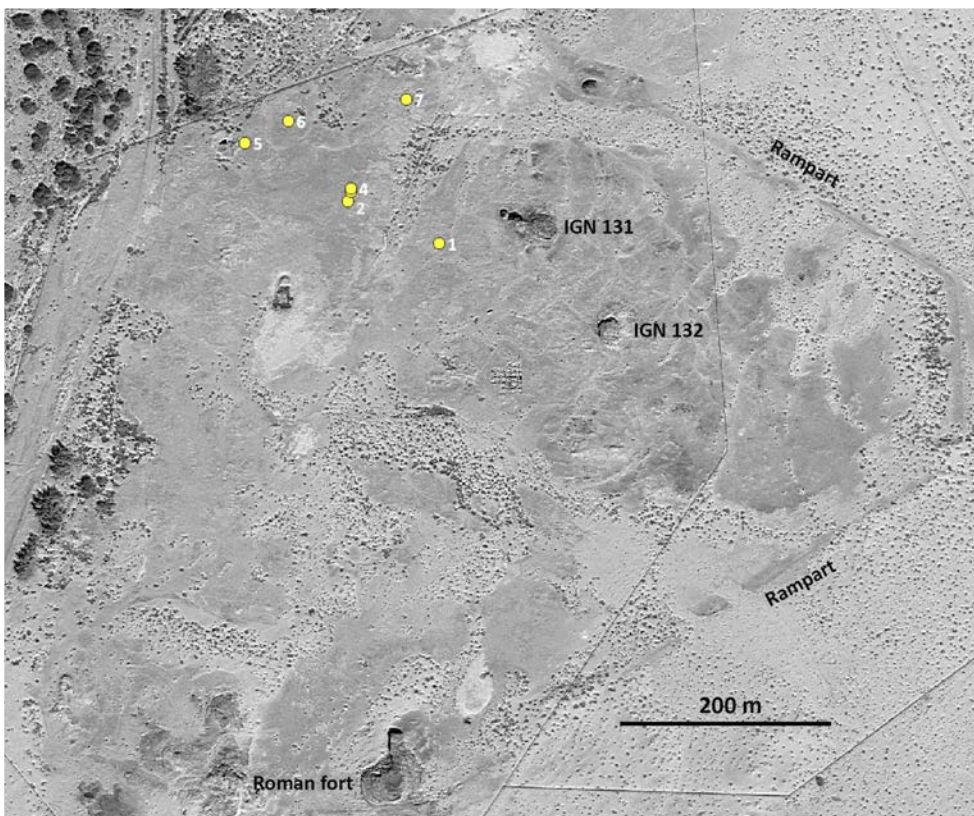


Fig. 1. *The Residential Area. The yellow dots represent the areas with pottery wasters and fragments of kiln walls (© QuickBird with additions by MSAP).*



Fig. 2. *Aarea 11000 before excavation, covered with fragments of kiln walls (© MSAP).*

Note that the report presented here is only a preliminary one. It was indeed decided, in accordance with the project's director, that the full report would be submitted after the present author finished his Habilitation thesis, in less than a year.

Sector 11000

A 10 x 10 m trench in which a circular kiln was put to light (kiln 11007) (**fig. 3**). It is 2 m in diameter and the firebox opens towards the east. According to the project's ceramicist, C. Durand, the misfired jar sherds in common ware found around and in the kiln are representative of the 1st and 2nd centuries AD local production.

The kiln floor was not preserved *in situ*, it had collapsed, but it was still visible in the sounding made inside the kiln. The latter was built in mud-bricks and had a 0.60 m thick wall. The bottom of the firing chamber and of the firebox could not be reached in the sounding because they were more than 1 m deep. The walls of the firing and cooking chambers were probably not protected by a luting, as can be observed in other pottery kilns. Consequently, on the side of the mud-bricks which was in contact with the fire, several centimeters of the wall melted completely (**fig. 4**).

In this type of construction, the cooking chamber was not protected, during the cooking of the vessels, against high temperatures. One can therefore deduce that the chamber was destroyed after each batch. This hypothesis is confirmed by the presence of two destruction levels (*loci* 11006 and 11016) which contained large quantities of melted oven walls (**fig. 5**).

The large layer of charcoal (*locus* 11009) which appeared near the firebox, in the northern corner of the trench, corresponds probably to one of the systematic clearings of the firebox. A vegetal macroremain was retrieved¹ from a bag of earth sample taken in this *locus* and will be used for a C14 date.

1. The analysis of the vegetal macroremains is done by Charlène Bouchaud.



Fig. 3. Drone view of kiln 11007 (© MSAP).



Fig. 4. Detail of a fragment of the wall of kiln 11007 (© MSAP).

Fig. 5. Detail of the surface of locus 11006, which corresponds to the dismantling/destruction of the firing chamber (© MSAP).



Sector 11200

Approximately 100 m south of the first trench, a second one, 4 x 4 m, was opened, numbered 11200 (**fig. 6**). As in trench 11000, the surface of the area was covered with pottery wasters and fragments of kiln walls. The excavation revealed the presence of two kilns, north and south of the trench.

The first, kiln 11203, is better preserved than the second (11208, for which see below). It is rectangular, and the visible part measures 2.40 x 1.40 m. The wall of the firing chamber is 0.40 m thick. A c. 3 m long by 2 m wide kiln may be restored. The kiln floor (*locus* 11209) was partly



Fig. 6. Drone view of sounding 11200 (© MSAP).

preserved, over about 0.50 m, at the bottom of the kiln. It stood on mudbrick pillars built at the same time as the walls. The firebox of the kiln, which lay beyond the limits of the sounding, opened towards the east. As in kiln 11007, the cooking chamber was not permanent and it was dismantled after each batch.

The presence of several cooking wastes of jars in the local common ware invites to propose the same chronology as kiln 11200, i.e. the 1st and 2nd centuries AD. A thick layer of charcoal (*locus* 11211), composed mainly of palm-tree fibres, was put to light at the entrance of the kiln. The sampling of the whole layer will allow the palaeobotanists to possibly determine more precisely the nature of the fuel used for the cooking of the pottery vessels. Since vegetal macroremains were identified in this layer, it will be possible to compare the C14 date obtained for kiln 11203 with that obtained for kiln 11007 and confront both with the pottery production. If these two

kilns, which have different shapes (one is circular and the other is rectangular), are contemporary, this may mean that they were used to produce different types of pottery.

In the north-west corner of the trench, another kiln appeared, 11208. It is very badly preserved because it was cut by two walls (11204 and 11205), thus showing that this sector was reorganised after the kiln ceased to be used. In this respect, it is different from kiln 11007, built in a sector which does not seem to have been reoccupied after the kiln was abandoned.

Sector 11300

Finally, the surface of a fourth kiln, numbered 11301 (**fig. 7**), was cleared. It is also rectangular and is characterised by the fact that the kiln floor (*locus* 11302) was showing on the surface and had melted vessels stuck onto it (*locus* 11303). Based on this preliminary clearing, the cooking chamber seems to have measured 2.60 x 1.30 m. The misfired sherds and the melted vessels stuck to the kiln floor were analysed from photographs by C. Durand. Their date seems to be the same as that of the pottery from the other kilns, 1st and 2nd centuries AD.



Fig. 7. Floor of kiln 11301, with the pottery wasters of the latest batch in situ (© MSAP).

Conclusion

It is worth noting the homogeneity of the structures unearthed. They all have non permanent cooking chambers, built in mud-bricks dismantled/destroyed after each batch. Besides, they all seem to belong to the same chronological range, i.e. the Nabataean occupation phase of the site. This does not necessarily mean that they were used simultaneously but the ceramic repertoire

produced in them seems to be consistent. Kiln 11007 differs from the others in that it is circular. This is not explained for the moment but may be related to either the type or the chronology of the pottery produced. A comparison with other Nabataean kilns will have to be undertaken.

A Note on Minaic Inscription 11000_I02

Alessia PRIOLETTA (CNRS–UMR 8167)

A small fragment of red sandstone, 15 x 11 and 5.2 cm high, bearing a few inscribed letters, was discovered by Emmanuel Botte inside the residential area, west of IGN 131, on the surface. It was given number 11000_I02.



Fig. 1. Fragmentary text 11000_I02.

This very fragmentary text reads *w-ms'mt...*, which may be restored as *ms'mt[ʿm]*, a word already attested in a Minaic inscription from Madā'in Šāliḥ recorded as M 350 A in the CSAI corpus, line 6.¹ This word has been interpreted by A. Jaussen and R. Savignac as an H-stem (Arabic 4th form) participle of radical M-T-ʿ, “save”, which they translated “freed, released” or “preserved”. The meaning of this word in this text would thus be, according to them, “the one preserved by Wadd or another god”.²

It is known that the H-stem verb *hmt'* is used in Sabaic in legal contexts with the meaning “give in usufruct, let use”.³ Inscription M 350 A, though fragmentary, is clearly a legal inscription. The participle *ms'mt'm* applies to an individual named Whbn, who is mentioned thrice in the inscription in

1. <http://dasi.cnr.it/index.php?id=30&prjId=1&corId=0&colId=0&navId=737221635&recId=4254&-mark=04254%2C006%2C006> This is Jaussen and Savignac 1909–1922, vol. 1, Minaic no. 1.

2. Jaussen and Savignac 1909–1922: vol. 1, p. 252.

3. See Sabäisches Wörterbuch (<http://sabaweb.uni-jena.de/Sabaweb/Suche/Suche/SearchResultList>, accessed 30/06/2022), lemma *mt' H (II)*.

relation to possessions (*qny*). The phrase *w Whbn ms'mt'm* (l. 6) is likely to be a nominal phrase and should thus be translated “and Whbn is the one who is granted use of” what is mentioned before, i.e. *kl 'rdm*, “all the land”, the rest of the possessions, if any, being lost because the text is incomplete.

From the above, and based on the comparison with M 350 A, we may assume that 11000_I02 is a fragment of a legal inscription.

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The 2021 Season in Area 34: Trench E.

Preliminary Report

Zbigniew T. FIEMA (University of Helsinki)

The 2021 fieldwork season of the Madâin Sâlih Archaeological Project (ancient Hegra) included the continuation of excavations in Area 34. This area is located directly west of Hill B—one of the two major southern landmarks in the topography of the Madâin Sâlih settlement. The hilltop once held a stone-built citadel, currently ruined. The western side of Hill B slopes westward toward a stony plateau, c. 135 m east-west x c. 90 m north-south, upon which the Roman fort is located. However, the main activities during the 2021 season concentrated on the continuation of the excavations in Trench D, which was last excavated in 2019. That sector, located directly north of Hill B, although not within the perimeter walls of the fort, was its integral part.

Preliminary Observations

The impact of the topography

Undoubtedly, the most significant and influential topographic element in the history of the fort at Hegra was Hill B, the existence of which has largely dictated the location and design of the fort.¹ The relatively flat top (at c. 802 m asl) of the hill must have once housed a citadel or stronghold, the remains of which were almost completely obliterated by the 20th century stone-extraction activities. The hill features almost vertical cliffs on the southern and southeastern sides and a steep slope on the western side (**fig. 1**). The northern side features a vertical cliff, c. 4 m high, which then drastically turns into a gently sloping, rocky spur, trapezoidal in form. The spur continues northward, and its surface very gradually descends westward toward a north-south sandy depression, which separates the sector of Trench E from that of Trench D (**fig. 2**). In the past, that depression formed a convenient access route to the interior of the fort. On the eastern and northern sides, the spur ends in a steep slope. The entire trapezoidal space of the spur is somewhat larger than c. 22 m (east-west) x c. 20 m (north-south) but these measurements represent only the space which was considered topographically suitable in order to be entirely built-up in antiquity, and now excavated as Trench E (**fig. 3**). The surface of Trench E ranged from 790.85 m asl (the bedrock of Room XVII in the south) to 790.30 m (in Room XX), to c. 789.65 m (in Room

1. For these and other topographical considerations, see the report on Trench F, also in this publication.



Fig. 1. *The Roman fort in Hegra: Hill B (centre left), the area of Trench E, i.e., the Northern Annex (centre right), the fort proper (in the background). View from the north-east (E. Botte).*



Fig. 2. *The Roman fort in Hegra: Hill B and Northern Annex (centre left), the passage between Trenches E and D (centre), the fort proper (centre right). View from the north-west (E. Botte).*



Fig. 3. *The rooms and installations in the Northern Annex (E. Botte).*

XXII), to 789.20 m (at wall 34675 being the northern enclosure of the sector) to less than 787.80 m (sandy soil at the northern foot of the spur).

While the structures built on the spur were separated, in the physical sense, from the quadrangular design of the Roman fort, these must have formed an integral part of it (**fig. 4**), an argument further elaborated throughout this text. Thus in functional-historical terms the northern spur may warrant a designation as a fortified (northern) annex to the fort, henceforth named Northern Annex. The topography had heavily impacted the state of preservation of the structures located there. Due to the proximity of the top of Hill B, which virtually “overhang” the structures in Trench E, once that area was abandoned, it was subjected to the continuous wash-down of the material from the hill, including soil, stones and ceramics, forming thick layers on top of the occupational remains. Especially during rainy seasons, the surge effectively obliterated stone walls and “melted” mudbrick structures. Only in the eastern part of Trench E, where the occupation is characterised by tightly clustered stone and mudbrick constructions, the preservation is relatively better and walls still standing are higher than in the western part.

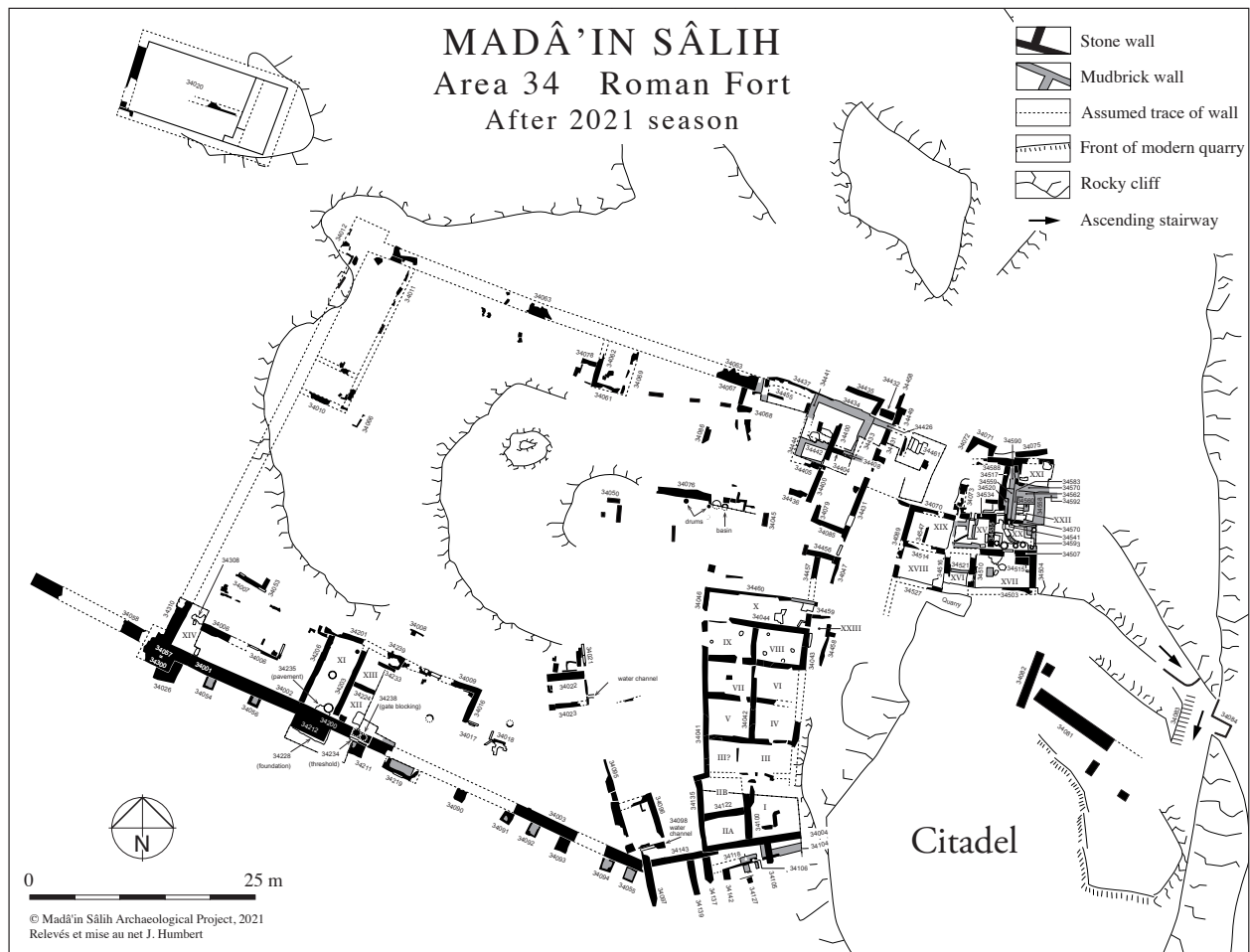


Fig. 4. Plan of Area 34 following the 2021 excavations (J. Humbert).

Phasing and dating

Due to the fact that Trench E was excavated during two seasons, it was at times difficult to synchronise the sequence of events which occurred in the western *versus* the eastern parts of the trench. In 2019, the excavated area was maximum c. 15.5 m (east-west) x 11.50 m (north-south) while in 2021, the remaining, eastern, part of the Trench E was maximum c. 6 m (east-west) x 11 m (north-south), altogether 16.5 m (east-west) x 17.5 m (north-south). The border between these parts run along an imaginary north-south line, north of Room XVII, and along the so-called Central Corridor, which often cut through some structures and matrix *loci* (fig. 5). Therefore, for the sake of achieving the physical and stratigraphic connection between both parts of Trench E, the same *locus* number was given to same soil deposits even if physically separated during the 2019 and 2021 excavations. Generally, the stratigraphy turned out to be more complex than in the any other sector of Area 34, and a daunting task of interpreting the construction sequences and the structural relationships was particularly difficult in the eastern part of Trench E, due to the accumulation of walls, surfaces and structures within a very restricted area. It needs to be kept in mind that while the ceramic material from both seasons was read and at least preliminarily assessed, the recovered coins (altogether sixteen in 2019 and five in 2021) were not fully processed yet. This all may, potentially, lead to the re-examination of some chronological observations offered in this report. Large quantities of metal, glass and stone objects, especially plentiful in 2019, also await further studies.



distinguish between the 2nd and 3rd century ceramic types. Admittedly, the overwhelming majority of activities occurred during the Early and Later Provincial periods, and these could also, theoretically, be designated as the “heated room phase” and the “food processing centre phase”, respectively, the former mainly evidenced in the western part of Trench E and the latter in the eastern one. Such designation was not favoured, however as being too interpretative. What is thus presented here is a description of relative sequence of major building events (i.e., what had followed what, from the constructional point of view) during these two phases. Such presentation, however, will lack necessary closer chronological resolution, as the matrix *loci* associated with the building events cannot, at times, be separated into specifically 2nd and specifically 3rd century deposits.

Phase I. Pre-Provincial Period

In the western part of Trench E, the deposits inside enclosed spaces were relatively shallow and the earliest ceramics there indicated a date not earlier than in the 2nd century. The eastern part, however, presented a much more complex situation, with some lowermost deposits dated exclusively to the 1st century AD. This situation resembled that from Trench A, in the south-east corner of the fort, where the lowermost remains, connected with the so-called Narrow Rampart and the ceramic finds, implied a pre-fort chronological sequence. Undoubtedly, the Nabataeans would have exploited the northern spur of Hill B since the hill provided a most suitable vantage point, towering over the entire settlement, and the ceramics from the citadel included quantities of Iron Age-Nabataean sherds. It also seems certain that among the structures in Trench E the primary candidate for a Nabataean-period structure is Room XVII, although it must be kept in mind that this assignment is based *only* on the ceramic content of the lowermost stratum inside the room, which exclusively represents the 1st century AD.

Room XVII and niche 34502

Presumably, the builders of Room XVII had intentionally “shaved off” vertically either a part or the entire northern cliff of Hill B in order to accommodate the space of this well-preserved, large room (c. 6.10 m, east-west x 3.25 m north-south; see fig. 5). The southern wall—*locus* 34503 (preserved length: 2.60 m, width: 0.3–0.6 m)—is located on a horizontal ledge c. 2.90 m above the bedrock floor (at c. 790.85 m) and its preserved top is at 793.75 m asl (fig. 6). The rock surface below the ledge and flush with it was vertically chiselled out forming the southern limit of the room. The eastern wall, *locus* 34504 (length: 4.20 m, width: 0.70 m, maximum top at 793.13 m) preserves the lower part of a window, with its sill at 792.80 m (i.e., c. 1.60 m above the bedrock level), and the lower part of the wall, c. 0.80 m high, is carved from the bedrock. Wall 34504 bonds with the east-west wall 34507 which is at least 5.55 m long and 0.72 m wide, with the maximum top at 792.30 m. Currently, there is a door (*locus* 34569), c. 1.05 m long (east-west) and 0.75 m (north-south) wide. It consists of two rows of seven stones laying directly on the bedrock, which formed a base for the (not-preserved, wooden?) lower threshold, and a monolithic upper threshold (1.05 x 0.25 x 0.20 m) at 791.10 m. Finally, the western limit of Room XVII is formed by wall 34510 (length: 3.40 m, width: 0.70 m, maximum top at 792.18 m). That wall probably had a door leading either outside or to the space of Room XVI (*infra*). The current door, however, belongs to a later phase.

There are some clusters of stones directly on the bedrock, the most significant being *locus* 34550 (fig. 7), which served to even up the surface of the bedrock, especially in the north-west corner



Fig. 6. Room XVII:
A (wall 34503), B (wall 34504),
C (wall 34515), D (wall 34507),
E (pillar 34511), F (cluster
34550), G (door 34569).
View from the west (Z.T. Fiema).

of the room and directly south-west from the door, *locus* 34569. These clusters of stones served to achieve a relatively uniform level of c. 790.75–.90 m on top of which a layer of hard-packed brownish soil, *locus* 34551, was laid out, serving as an earliest occupational surface of the room. Presumably, the room was roofed but the roof support system is unknown. The large rectangular mudbrick pillar (34511) belongs to Phase 4 and its location (in the western-central part of the room) does not indicate a load-bearing installation. Most likely, the room was roofed using large palm-tree trunks, proofed with reeds and clay, presumably anchored in wall 34503.

In the exterior, less than 1 m from the southern end of wall 34504, there is a niche (*locus* 34502) cut in the rock (**fig. 8**). The niche, c. 0.50 m high and c. 0.30 m wide, is divided horizontally into a double shelf space. The upper one is c. 0.20 m high, slightly rounded in the back and with the depth of c. 0.18 m. The lower space is set off outward and c. 0.24 x 0.30 x 0.18 m, and inside, within the soil mixed with undatable sherds (perhaps Nabataean but also later fabrics), two bronze figurines were found. One was male, resembling ithyphallic Priapus (**fig. 9**). The period of deposition—Nabataean or Roman—is unknown although the latter is more probable.



Fig. 7. Room XVII: clusters of
surface-evening stones, locus
34550 in the centre and centre
right, against wall 34507. Pillar
34511 in background centre.
View from the east (Z.T. Fiema).

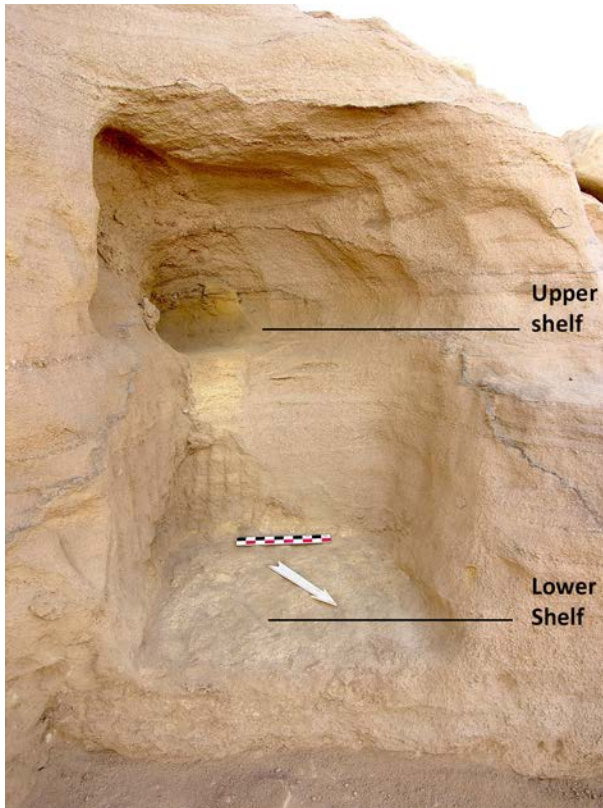


Fig. 8. The niche, locus 34502. View from the east (Z.T. Fiema).



Fig. 9. The figurine of Priapus found inside locus 34502 (MSAP).

Room XVI

The original length of wall 34507 cannot be determined but it most probably continued for another 3 m westward and if so, it would also have formed the northern limit of Room XVI. This is a realistic proposition as there are still some very low and small remains of the northern face of that wall, which have plaster 34533 attached to it (*infra*). Secondly, since a later-in-date mudbrick wall 34529 abuts these plaster remains, there must have been a straight east-west structure there. Therefore, if Room XVII can be assigned to the Nabataean period, Room XVI should be dated likewise. Room XVI, c. 2.00 m (east-west) x 3.5 m (north-south) would have been enclosed by walls 34507, 34510, and 34516 (north-south; preserved length: 2.85 m, width: 0.70 m) and on the southern side by the rock of Hill B. However, neither the door in wall 34510 in its current form, nor the mudbrick partition (34521), which subdivided Room XVI, belong to this phase.

Other pre-Provincial deposits in Trench E

Further north and northwest from Rooms XVII and XVI, the situation is less clear. From the purely stratigraphic and functional points of view, none of the walls and structures can be assigned to the Nabataean period. The exception might possibly be water channel (or drain), locus 34596, located directly west of the later Wall 34517 (fig. 5), but its stratigraphic context cannot be determined (*infra*). There are several soil deposits, which, due to the lack of post-1st century AD sherds, may belong to the pre-Roman period. However, as already observed in Trench D, in the north-east corner of the fort, such deposits (and their ceramic contents) might have been brought in from elsewhere to level the surface of the northern spur at the beginning of the Roman period.



Fig. 10. Room XXII, early installations:
A (wall 34558),
B (wall 34557), **C** (locus 34566),
D (locus 34580),
E (locus 34582),
F (platform 34576),
G (locus 34587),
H (locus 34586),
I (locus 34589), **J** (steps 34585),
K (wall 34559), **L** (wall 34560),
M (locus 34594).
 View from the north
 (Z.T. Fiema).

To these deposits belong: in the area of later Room XX—*locus* 34581 on the bedrock and *locus* 34579 directly above it. The former had considerable quantities of ash,³ the latter must have been deposited just prior to the construction of the fort as some installations belonging to the Early Roman phase are standing directly upon it. The deposits inside later Room XXII include *locus* 34589 on the bedrock, and *locus* 34586 above it (**fig. 10**). Comparing the levels of these *loci*, it is readily apparent that at least *loci* 34581 and 34586 are the same deposits but currently separated physically by wall 34557, constructed later.

Quarry/cistern (?)

This entity was not excavated yet but should be mentioned in the context of probable Nabataean constructions in the area of the northern spur. The so-called cistern is located south of Room XVI and separated from it by a stretch of rock belonging to the lower slope of Hill B, c. 1.10 m wide (see fig. 4). The space of the cistern, entirely carved from the rock, is an irregular quadrangle narrowing toward the west, being c. maximum 5.20 m (east-west) x c. maximum 2.10 m (north-south). The depth is unknown but probably no less than 3–4 m. Initially, the carved space was considered a quarry and it may be so but one might also consider it to have been a cistern or a quarry-cum-cistern. The location is convenient to collect runoff rainwater from Hill B. No specific installations (channels, pipes, rock depressions) have been noted above the cistern but the continuous washing down of stone and soil material from the top of Hill B would have largely obliterated any traces of such. Whether this installation is Nabataean or Roman in date is uncertain although during the Roman period, the proximity of water-storing installation would have been very convenient for water-related installations on the northern spur of Hill B (*infra*).

3. The ash might have originated from burning the surface of the bedrock in order to soften it before levelling, a technique well known in the East.

Dating

Locus 34551 (inside Room XVII) and *loci* 34579, 34581, 34586, and 34589 yielded ceramics dated to the 1st century AD and seemingly no later-dated sherds. Thus the date may well reflect the deposition during the Nabataean period, or just before the Roman takeover. Yet, these could also have been brought in from elsewhere at Hegra already during the early provincial period, to be used as levelling material.

Phase 2. Early Provincial Period

The Roman takeover of the Nabataean Kingdom in AD 106 resulted in the incorporation of Hegra into the newly created Province of Arabia, and the establishment of a fort south of the Nabataean settlement and directly west of Hill B. While the manner, design and function of the fort are not the subject of this report, the tactical advantage of incorporating Hill B and its northern spur must have been readily apparent to the Roman engineers involved in planning. Although physically outside the quadrangular form of the fort, the northern spur area serving as a fortified northern annex to the fort, was sufficiently protected on the eastern side through a very steep slope (see fig. 1). The northern end of the annex received a wall, which was also separate from the fort's perimeter walls, further reinforced by a small tower located on the north-west end of the spur. That tower guarded the entrance the fort from the north (i.e., from the settlement site), and the gentle slope of the western part of the spur provided space for a gate and the inner access route. Series of rooms and/or courtyards were constructed in the western part of the Annex, namely Rooms XV, XVIII and XIX, with the seemingly pre-existent Rooms XVI and XVII, all forming the "backbone" of the entire complex. In the eastern part of the Annex (Trench E East), which is separated from the western part by what is termed here as the Central Corridor (*infra*), the sequence of walls, floors and levels is particularly complex. Nevertheless, there is a physical (stratigraphic) and possibly functional connection between both parts of Trench E, mainly through the space of Room XX and the area immediately west of it. Since as mentioned above, Phases 2 and 3 are both dated to the 2nd through early 4th century, the presentation here will be dominated by the analysis of Room XV (the heated room)—a major structure in Phase 2—as well as other structures, surfaces and installations which would have been *spatially* associated with it.

Rooms XVII and XVI

Inside Room XVII, the main element reasonably attributed to this phase is wall 34515 (east-west, length: 1.65 m, width: 0.87 m, maximum height 1.15 m, seven courses high) which abuts walls 34507 and 34504 (see fig. 6). The southern face of wall 34515 features well-dressed ashlar in relatively regular courses but the inner space has haphazardly placed blocks and rubble. Most probably that wall served to reinforce wall 34507. It may be that the latter, if Nabataean in date, was already somewhat dilapidated by the 2nd century as its northern face appears to have been reconstructed by then (or later). Specifically, that face features a very long (c. 1.60 m x 0.20 m) block decorated with vine leaves (**fig. 11**), probably originally a lintel, being reused here.

Considering its imposing all-stone construction, it is difficult to imagine that Room XVII had beaten earth floor. The deposit inside the room, directly above Nabataean-dated *locus* 34551, was *locus* 34544, a layer of silty soil with 2nd–early 3rd century ceramics and two Nabataean coins of the 1st century AD. Notable feature of this *locus*, which featured the depth of almost 0.35 m, is that it shows clear signs of being churned; broken pieces of stone basins and complete



Fig. 11. Wall 34507: decorated block. Half-basin 34553 and mortar 34554 in foreground. View from the north (Z.T. Fiema).

and broken paving stones were found not only on the surface but also *within* this *locus*. The matrix is exceedingly heterogeneous, consisting of silty sand and clay all mixed together. The *locus* directly above—34512—being a loose silt mixed in places with ashy patches is clearly different in composition and later in date as containing late 4th–early 5th century sherds but also two Roman provincial coins datable to the 1st through the 3rd century. It is therefore impossible to distinguish between a matrix associated with Phase 2 with that of Phase 3—*locus* 34544 presumably represents both. Probably, if there was a flagstone pavement in that room during Phase 2, it was removed, seemingly *in haste*, perhaps sometime in the 3rd century (i.e., during Phase 3).

The space of Room XVI was subdivided in Phase 2 into a northern (c. 2.0 m x 1.80 m maximum as the northern wall of that room is not preserved) and southern part (c. 2.0 m x 1.4 m) by a simple partition, *locus* 34521 (length: 2.10 m, width: 0.33 m, maximum height 0.65 m), being one-row of mud-bricks, three courses high. A very large (c. 0.52 x 0.68 x 0.03 m) slab stands like an orthostat against the southern face of *locus* 34521. Of interest is the fact that the entire space of the southern part of Room XVI was plastered over with a thin whitish plaster, down to the bedrock and also including the orthostat, which might indicate that the flat bedrock served as a floor there (fig. 12). It is also possible that the partition and the orthostat should be assigned to Phase 3 but the room did not provide any datable material.



Fig. 12. Plaster inside Room XVI. Door 34513 in wall 34510 (centre left). View from the north-west (Z.T. Fiema).

Rooms XVIII and XIX

These two large rooms or courtyards definitely belong to Phase 2. Although Room XVIII abuts Room XVI considered Nabataean in date, the orientation of Rooms XVIII and XIX shows clear difference. Instead of following the roughly north-south orientation of Rooms XVI and XVIII, the pair of rooms further west displays a north-north-east–south-south-west orientation, and roughly parallel to wall 34431 which marks the western limit of the inner “street” of the fort (see figs 4 and 5).

Room XVIII, c. 5.50 x 3.50 m, is enclosed by walls 34527 (east-west, length: 1.80 m width: 0.60 m; two courses high), 34089 (north-south, total length: 8.20 m, width: 0.68 m, one course high), and 34514 (east-west; length: 4.60 m, width: 0.70 m, two courses high). The eastern limit is formed by wall 34516 (*supra*) and the rock between Room XVI and the cistern. Along these two and in the corner with wall 34527, there is a very well preserved stretch of pavement (*locus* 34532; total length: 3.05 m, total width: 1.15 m), which features two exceptionally well dressed thin paving slabs (0.68 x 0.56 m, and 0.58 x 0.45 x 0.07 m, at 790.85 m) with smooth surface (**fig. 13**). This is one of very few places in Trench E where the original pavement is preserved and one may envisage that most of the rooms in the fort were paved as such. A possible door in wall 34089 leads out to the space of the inner street of the fort.

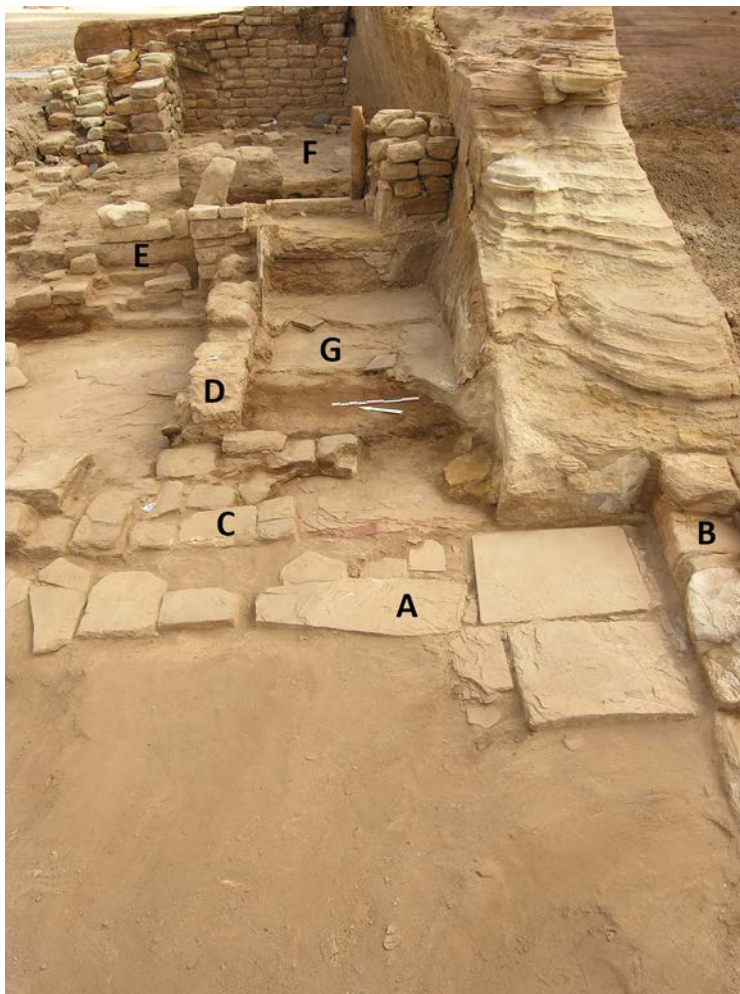


Fig. 13. A (pavement 34532), B (wall 34527), C (wall 34516), D (wall 34521), E (wall 34510), F (interior of Room XVII), G (interior of Room XVI). View from the west (Z.T. Fiema).

Room XIX, c. 4.50 x 3.20 m, is enclosed by walls 34514 (east-west; length: 4.60 m, width: 0.70 m, two courses high), 34089 (north-south, total length: 8.20 m, width: 0.68 m, one course high), and 34070 (east-west; length: 4.30 m, width: c. 0.70 m, one course high). The eastern wall, *locus* 34543 (north-south; length: 1.80 m, width: 0.35 m), is of a mixed stone-mud-brick construction, partially utilising the height of the bedrock, and is narrower than all other walls in the area. That aspect of wall 34543 might probably indicate that it is a partition rather than an actual wall and that there might have been a specific but undetermined functional relationship between Room XIX and Room XV (the heated room; *infra*). The only installation inside the room was a row of four stones, *locus* 34547 (north-south, length: 1.85 m, width: 0.35 m) roughly in the centre-left of the room, which could have served as a bench, partition, or any other installation.



Fig. 14. Locus 34461, the remains of a gate and entryway to the fort. View from the north (Z.T. Fiema).

The inner “Street” and the gate

As mentioned in note 1, the configuration of terrain in the space between Trenches D and E, i.e., between the northern spur and the western plateau was utilised by the Roman engineers to provide an access “street” to the fort’s interior from the northern exterior. Gradually sloping down northward toward the settlement, the space was limited by walls 34449, 34431, 34047 on the western side and by walls 34089 and 34072 on the eastern side (see figs 2 and 4). The intention behind this design was to “channel” the incoming traffic into a roughly squarish space, c. 7.60 m wide, marked by the aforementioned walls but then to gradually restrict the access as the width of the passage further south, between between walls 34431 and 34089, was reduced to c. 5.00 m.

Locus 34461 is located in the centre-left of the squarish space defined above (fig. 14, see fig. 5). The central part of this *locus* is occupied by four large, rectangular paving slabs (altogether c. 2.20 m east-west x 1.50 m north-south), laying in a row, the largest one being c. 0.55 m x 1.50 m. A second cluster of tightly fitting paving slabs is located c. 1 m further south-south-east, and it consists of three rectangular slabs, altogether c. 0.85 x 0.75 m. To the left (west) of the first cluster there is a row of eight stones, c. 2.30 m long and parallel to the cluster (and to wall 34431). Additionally, in several locations around the afore-described elements, there were clusters of tightly packed cobbles. The interpretation of these poorly preserved remains is aided by their location. The first large cluster of paving slabs might perhaps be the remains of a passageway, the second one a base of a pillar, and the clusters of cobbles perhaps the levelling bedding for the not preserved paving slabs, altogether forming a gate, a gatehouse or at least the main passageway associated with some entrance-related structures. This is certainly not a standard gate in Roman forts but again, the topography and other specifics at Hegra often required an unorthodox solution.

The northern wall and the north-west tower

Although Hegra was now under the Roman control, the main access to the fort from the direction of the newly captured town required some defensive measures. Thus east of the main access and directly on the bedrock of the northern end of the spur, series of walls were constructed. Rather



Fig. 15. The small north-west tower of the Northern Annex. View from the west (Z.T. Fiema).

than in a single straight line, the walls follow the configuration of terrain (see figs 4 and 5). On the north-western side, facing the main entryway, there is a salient in the form of an inverted U, made by walls 343072 (north-south, length: c. 2.00 m, width: c. 0.50–0.75 m), 34071 (east-west; length: 1.50 m, width: 0.65 m) and 34074 (north-south; length: 1.50 m, width: at least 0.75 m). These walls form what can be termed as a small tower or at least a guardroom, measuring internally c. 2.4 x at least 1.80 m (**fig. 15**). The east-west wall 34588 (length: c. 2.00 m, width: c. 0.85 m), is offset south by c. 1.00 m from the line of wall 34071, forming a mini-curtain wall which abuts on the eastern side wall 34583 (*infra*) and also abuts another external wall running east-west, i.e., wall 34075 (length: 3.50 m, width: c. 0.80 m). On the north-east and eastern sloping sides of the spur, the excavations did not detect any wall but there is *locus* 34584, a cluster of slabs in two rows, surrounded by larger, irregular flagstones (total 1.50 m east-west x 1.60 m north-



Fig. 16. The northern walls: A (wall 34583), B (wall 34588), C (wall 34075), D (stone cluster 34584). View from the south (Z.T. Fiema).

south). This cluster, also standing on the bedrock, seems to abut wall 34075 (**fig. 16**). Walls 34583 and 345075, which frame the space of Room XXI, might also have been a part of the defensive arrangement, perhaps forming a tower.

Room XV, description

This room stands almost exactly in the centre of Trench E (**fig. 17**, see figs 4 and 5). On the western side, the room shares wall 34543 with Room XIX. The northern limit is formed by wall 34534 (east-west; length: 4.00 m, width: 0.65 m) which in the centre has a small chamber, *locus* 34545. This chamber, c. 0.37 m (east-west) and 0.65 m (north-south) is on both sides internally faced by fired bricks: on the western side mostly rectangular bricks (e.g., c. 0.23 x 0.14 x 0.05 m) and larger, broken bricks were used while the eastern side features mostly square bricks (e.g., 0.23 x 0.23 x 0.05 m) but also some stones (**fig. 18**). The bricks show soot and traces of fire. The bottom of the chamber was made of one larger stone slab (c. 0.40 x 0.25 m) and two smaller ones. On the northern side, the chamber was found open but on the southern (inner) side, a large, very thin slab (c. 0.50 x 0.30 x 0.07 m) was vertically inserted to close the opening.

Wall 34534 bonds with wall 34535 (length: 2.85 m, width: 0.65 m) which terminates against the bedrock on which wall 34507 stands. On the southern limit of the room there is mudbrick wall 34529 which, however, must be later in date (*infra*). It was rather wall 34507 which formed the southern limit, as it probably extended further west than currently visible, i.e., to the point where it would have been abutted by wall 34514. The installations inside Room XV were all constructed directly on the bedrock, which ranges from 790.40 in the south to 789.95 m asl in the north. Stone wall 34540 (east-west; length: c. 1.00, width: 0.50 m) which is located in the corner of walls 34534 and 34535 and abuts both, must be perceived as a bedrock levelling course as its level is 790.30 m. Directly south of *locus* 34545 and in two parallel north-south lines c. 0.40 m from each other, there are two mudbrick walls: 34542 (length: 1.90 m, width: 0.35 m) and 34546 (length: 1.30, width: 0.37 m) with their preserved tops at 790.19 m and 790.12 m, respectively. The bedrock between the two walls appears intentionally chiselled out, with the bottom at c. 790.04 (north) and 790.10 (south), forming a “channel-like” space. Both walls are closed on the

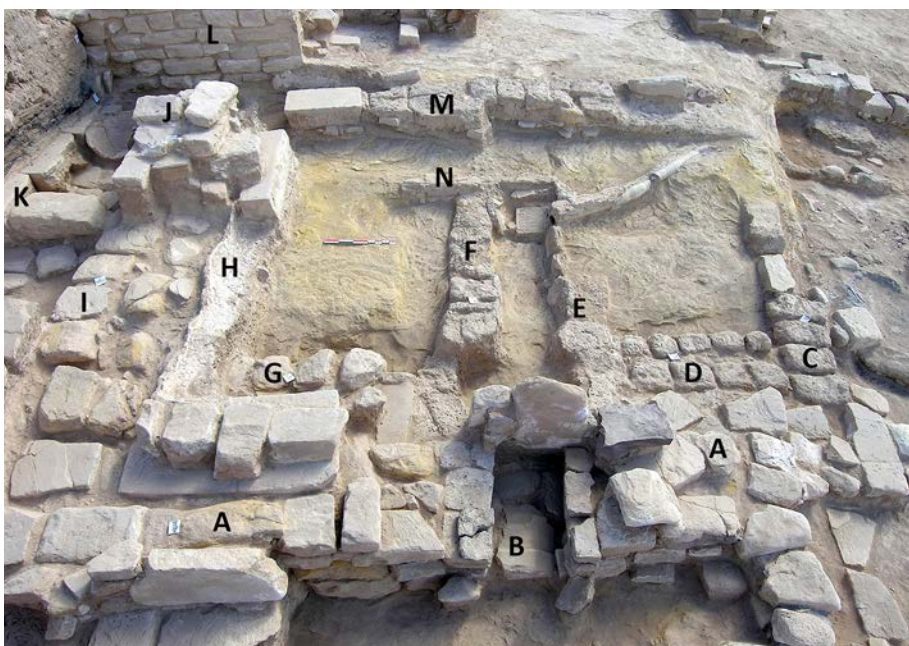


Fig. 17. Room XV: Loci:
 A (wall 34534),
 B (fireplace 34545),
 C (wall 34543),
 D (wall 34539),
 E (wall 34546),
 F (wall 34542),
 G (wall 34540),
 H (plaster 34533),
 I (wall 34535),
 J (wall 34523),
 K (pavement 34538),
 L (wall 34507),
 M (wall 34529),
 N (mudbrick row 34552).
 View from the north
 (Z.T. Fiema).



Fig. 18. Locus 34545, the fireplace; wall 34542 (centre left), wall 34546 (centre right); the ceramic conduit in the background. View from the north (Z.T. Fiema).

the pipes remained tightly in line as one conduit due to being encased in a thick layer of mortar in which rectangular pieces of tiles were embedded. The conduit generally run north-east–south-west but the last, shortest segment was found turning somewhat into west–south-west and additionally, did not fully insert into the preceding pipe but was rather somewhat tilted upward (see

southern side by the east-west row of fired bricks (locus 34552; 0.60 x 0.20 m, top at 790.35 m), two courses high, standing on the higher part of the bedrock (**fig. 19** and **fig 5**). The bricks are all rectangular (roughly 0.42 x 0.24 x 0.07 m), some broken.

The southern end of wall 34543 appears broken, probably to allow the insertion of the end of a long (c. 1.65 m) conduit consisting of four pipes, only one being complete and one very fragmentary (**fig. 20**). The measurements of the pipes (length, external diameter, internal diameter) were as follows:

- no. 1 (ribbed inside and outside): 0.55, 0.095, 0.08 m;
- no. 2 (rim broken, ribbed outside): 0.52, 0.095, 0.09 m;
- no. 3 (rim broken, ribbed outside, deformed): 0.45, 0.095, 0.075 m;
- no. 4 (a fragment only, ribbed inside and outside): 0.15, 0.085, 0.053 m (**figs 21–22**).

Although without male and female ends, the



Fig. 19. The brick row, locus 34552, and the northern outlet of the ceramic conduit, resting on a square tile. View from the north (Z.T. Fiema).



Fig. 20. The ceramic conduit in situ (Z.T. Fiema).

fig. 20). The northeast end of the conduit rested upon a complete tile (0.23 x 0.23 x 0.048 m), comparable to square *bessales*, although somewhat thicker than others found in Arabia (Harvey 2018: 166, 168; Reeves and Harvey 2016: 465, Table 5). That tile lay directly on the bedrock between walls 34546 and 34542 (see fig. 19). The ceramic conduit appears to be an original feature of Room XV considering the facts that it was encased in the coat of mortar and tile on all sides and because, upon the removal, the bedrock shows traces of having been slightly chiselled out to accommodate the rounded shape of the pipes.

The bedrock inside Room XV was not only gently sloping down northward but also featured some depressions, at least some of which appeared regular and intentional. One such, L-shaped, depression, c. 0.45 m wide, runs along the outer faces of walls 34542 and 34540 (fig. 23). That depression was at 789.95 m *versus* 790.14 m of the bedrock directly outside. Another depression, which may or may not be intentional, runs east-west along the southern face of wall 34539



Fig. 21. The components of the ceramic conduit (Z.T. Fiema).

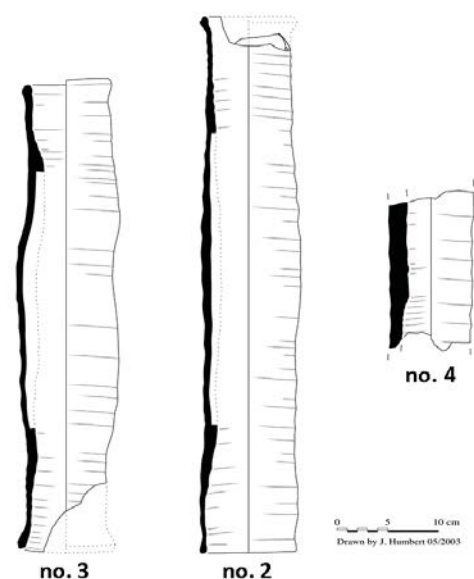


Fig. 22. Drawing of three components of the ceramic conduit (J. Humbert).



Fig. 23. Room XV:
A (ceramic conduit),
B (wall 34546),
C (wall 34542),
D (wall 34539),
E (wall 34535),
F (wall 34540),
G (plaster 34533),
H (depressions in the
 bedrock). View from the east
 (Z.T. Fiema).

(length: 1.00, width: 0.35, bottom at 790.05 m). That mudbrick wall stretched between wall 34546 and the combined stone/mudbrick wall 34543 in the north-west quadrant of the room space. Although ultimately assigned to the following phase, the layer of whitish, seemingly lime, plaster, *locus* 34533 (see fig. 5),⁴ warrants a brief introduction here as it bears on the interpretation of Room XV in Phases 2 and 3. Both horizontal and vertical surfaces *in situ* of that plaster were uncovered. The vertical is a thin and relatively smooth layer. The horizontal layer, which is *stratigraphically* above all installations inside Room XV mentioned above, shows clear marks as if being mixed, poked and smoothed by a chisel-like tool, similarly to preparatory plasters with rough surface serving for a better adherence of final plaster layers (**fig. 24**). In the north-east part of the room, the plaster lay on a large slab (at 790.48 m) which projects for c. 0.20 m from the southern face of wall 34534 but also lips out vertically on the face of that wall (**fig. 25**).⁵ Then the plaster turns south, covering the extant vertical face of wall 34535 but also leaping out horizontally to cover c. 0.25–0.30 m wide soil deposit *locus* 34533A (top at 790.40 m) which continues all the way down to the bedrock (**fig. 26**). Then the plaster continues below and behind a large rectangular slab which abuts wall 34535. Finally, the plaster turns westward in the south-east corner of the room, adhering to the lowermost parts of wall 34507 but also directly on the bedrock (790.38 m), and behind and below the mudbrick wall 34529. In the southern third of the room, seemingly the same plaster was visible in large fragments on top of soil *locus* 34533A (**fig. 27**) with its top at c. 345.37–.39 m, which almost entirely covered the ceramic conduit. But such plaster surfaces were very rare in the central and northern parts of the soil *locus* 34533A which had covered the entire space framed by walls 34534, 34535, and 34543, although the soil was clearly mixed with powdered plaster. Therefore, one may conclude that plaster, *locus* 34533, most likely covered

4. While the actual plaster was designated as 34533, a layer of soil mixed with the plaster fragments and ceramics, located *below* the plaster layer, was erroneously assigned the same *locus* number during the excavations. Its correct designation is *locus* 34533A and as such followed in this text.

5. The fact that the slab projects from the face of the wall *may* indicate that it was, as well the southern face of wall 34534, reconstructed sometime *after* the function of Room XV as a heated space had ended.



Fig. 24. Closeup of plaster 34533 (Z.T. Fiema).



Fig. 25. Plaster 34533 in the north-west corner of Room XV, along and on wall 34534 (right) and wall 34535 (bottom). View from the east (Z.T. Fiema).

horizontally the entire space and was also applied to the faces of most if not all walls surrounding the room. It is puzzling that the eastern, horizontal, part of the preserved plaster (i.e., against wall 34535), is broken off in a rough but clear north-south line just several centimeters away from the face of that wall (see figs 25 and 26). Finally, due to the sloping bedrock, the soil *locus* 34533A, under the plaster layer, is c. 0.30–.35 m thick in the north but only c. 0.05 m in the south (see fig. 26), and it contains sherds datable to the 3rd rather than to the 2nd century.

Room XV, analysis and interpretation⁶

The significant components which differ Room XV from all other rooms in Area 34 are the chamber 34545, the “channel-like” space between walls 34542 and 34546, the brick “enclosure” (*locus* 34552) at the southern end of the “channel”, the other duct-like intentional depressions in the bedrock and finally the ceramic conduit which is connected to the main channel. Coupled with other artifactual evidence, a minimal-

istic interpretation would suggest a room with a very simple *hypocaustum* system, where the suspended floor was heated through the circulation of hot gasses below it, which were produced in a furnace. The uncovering of this room has caused a considerable interest because it was initially recognised as a bathhouse. Recent investigations cannot unequivocally confirm this function and it needs to be remembered that there is a notable lack of evidence for any means for direct access to water, immersion basins or bathtubs, boilers, etc. Although water troughs, pipes and other related artifacts or fragments were recovered in Trench E and elsewhere in the fort (*infra*), a total absence of any traces of hydraulic mortar debris in the area of Room XV is notable.

6. I am grateful to Thibaud Fournet for his insightful remarks and useful suggestions leading toward a better understanding of the heated room at Hegra.

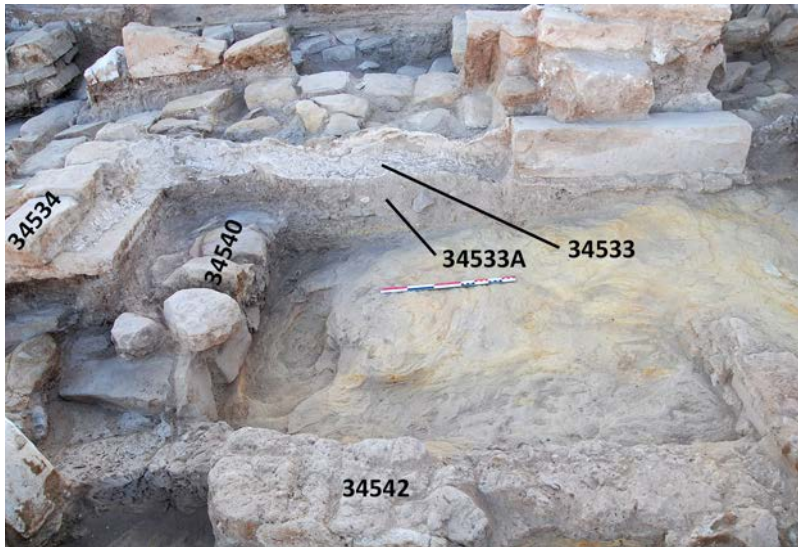


Fig. 26. Plaster 34533 in the north-west corner of Room XV, along and on walls 34534 (left) and 34535 (centre). Soil locus 34533A below the plaster layer. View from the west (Z.T. Fiema).



Fig. 27. Remains of plaster 34533 on top of soil locus 34533A in the southern part of Room XV. The ceramic conduit in the lower right. Wall 34529 on the right. View from the west (Z.T. Fiema).

Therefore, a heated room⁷ is probably the most accurate designation, considering the dearth of evidence for anything more than that.

At first, it is necessary to determine which extant remains represent the initial/original installations, which ones had undergone significant later modifications or were added later and how the entire interior was affected by later occupational processes. As some aforementioned elements in the furnishing of Room XV could not, seemingly, co-exist with the other elements found in the room, it is reasonable to recognise two sub-phases of the heated room, designated here as the sub-phases 2A and 2B. The following elements are proposed as the original furnishing of the heated room, i.e., in the sub-phase 2A.

The brick-faced chamber 34545 is not a stoke-hole for a furnace but must be considered the actual furnace (*praefurnium*). After all, nothing is preserved in front of locus 34545 except for layers of very ashy soil (*infra*) apparently created through the periodical cleaning of the furnace, and there is no indication for a furnace beyond locus 34545. It is suggested that sub-phase 2A

witnessed the existence of a conventional hypocaust system which included hot air/gasses circulating under the floor supported by the stacks (*pilae*) of hypocaust tiles, one of which was found associated with the ceramic conduit (*supra*) while some other were found in the vicinity of the room (*infra*). The *pilae* did not need to have been very high as the circulation would have been

7. Heated rooms which were not baths are well known in the East, and could have served as, for example, winter dininig rooms (see, e.g., Durand *et al.* 2018: 609-610).

enhanced by the existence of bedrock depressions, especially these along walls 34542 (L-shaped) and 34539, which served as air ducts. Depressions of the same kind, although much deeper (c. 0.3 m deep) were presumably utilised for the same purpose in the “proto-hypocaust” in the first heated room on al-Khubthah in Petra (see pit 5075 in Fournet and Paridaens 2016: 88–90 and figs 13, 15, 16). The barrier of bricks, *locus* 34552, might also be the original installation serving as floor support in the area where bedrock is particularly high. However, it better fits the sub-phase 2B as it conveniently closes the main air duct formed by walls 34546 and 34542. Finally, it is probable that hot air was directed to ceramic tubes (*tubuli*) installed against the walls, through which it circulated and warmed the space of the room. Such scenario is realistic as some *tubuli* were found at the site (*infra*).

This original arrangement was substantially modified in the sub-phase 2B, perhaps resulting from a structural instability of the floor, or its complete collapse. The useful ceramic elements of the hypocaust (mostly *pilae* and *suspensura* tiles) were totally dismantled, similarly to the heated room by the *praetorium* in the auxiliary fort in Humayma where once the hypocaust went out of use the remains of suspended floor were removed and accessible bricks taken away for reuse (Reeves *et al* 2017: 129). The hot air and smoke generated in *praefurnium* were now conducted through the main duct formed by mudbrick walls 34542 and 34546, presumably with some ceramic capstones, and with the brick barrier, *locus* 34552, closing the main duct at the southern end. The ceramic conduit, which had direct access to the main air/smoke duct, would have served as a vent pipe carrying away smoke and providing a draught, as without it the heat would not be drawn into the hypocaust circulation under the floor. Reinforcing such interpretation is the fact that the last segment of the conduit appears to be somewhat turning into the vertical exactly in corner of the room where the presence of such flue pipes is often attested. Generally, the heating of Room XV in the sub-phase 2B would be significantly reduced to the area just above the parallel walls 34546 and 34542. Any traces of the locations of *pilae* from sub-phase 2A would now have been completely obliterated by the modifications in sub-phase 2B, also considering the fact that the bedrock is soft and not suitable to preserve such “imprints”. Also, the depressions in the bedrock were no longer functioning as air ducts as they had no direct access to the hot air generated in *praefurnium*. Possibly, mudbrick wall 34539, which firmly abuts walls 34546 and 34543, was constructed then as it partially overlaps one of such bedrock depressions.

The question remains if the remaining space of the room was already backfilled in the sub-phase 2B with soil *locus* 34533A (with ceramics dated mainly to the 3rd century?), or it had only happened following the total abandonment of the heating function in Room XV. Either scenario is possible although the former is possibly less realistic. However, it is evident that while plaster 34533 could not be co-existent with the original, sub-phase 2A hypocaust, it might, theoretically, be associated with sub-phase 2B. Again, as illustrated in fig. 25, in the north the plaster layer is c. 0.3 m above the bedrock, resting on *locus* 34533A, but in the south the plaster practically rests on the bedrock. There is then no space to accommodate *pilae* and *suspensura* tiles. But if soil *locus* 34533A was already deposited in the sub-phase 2B, so its surface could have been plastered then. The abandonment of the heating in Room XV happened in Phases 2 or 3 (both dated to the 2nd–3rd century) and it would have included the removal of the ceramic (?) capstones over the main duct, the removal of the actual floor (if there was such in the sub-phase 2B), the deposition of soil 34533A (unless it was already there) followed by the plaster 34533 on the soil and on the walls of the room. The southern (inner) opening of *praefurnium* was blocked by the insertion of a thin vertical slab.



Fig. 28. Large brick recovered from locus 34500 (Z.T. Fiema).

Room XV, related artifacts and parallels

To complete the presentation, it is necessary to mention certain artifacts found in Trench E or elsewhere in Area 34, which may have been used in Room XV, although other locations of such utilisation, especially still unexcavated areas of the fort, might also be possible. To begin with the water supply, two stones which might have been troughs were found on the surface of the trench (*locus* 34500), being so badly eroded that only the general length (c. 0.35 and c. 0.47 m) and the internal width (c. 15 cm) could be safely established. Some small forts in the Egyptian Eastern Desert (e.g., Maximianon and Didymoi) exclusively used cisterns as water supply for baths (Redon 2009: 414–415) and a probable cistern in Hegra is located only c. 9 m to the south of Room XV. *Locus* 34500 also yielded a very well-preserved tile (0.54 x 0.28 x 0.055 m, **fig. 28**), which might have been a part of *suspensura* spanning the space between individual *pilae*. A more fragmentary tile (c. 0.32 x 0.18 x 0.05 m; **fig. 29**) found in *locus* 34518, might have served the same function, similarly to fragments found in *locus* 34051 (**fig. 30**) and 34512. Fragments of flue pipes (*tubuli*) were recovered from *loci* 34052 (**fig. 31**), 34551 (**fig. 32**), and 34116. In addition to the pipes from the ceramic conduit, described above, ceramic pipes were found in *loci* 34530, 34505, and 34052 (incomplete; ribbed, external diameter 0.095, internal diameter 0.06 m; **fig. 33**). Three pipe fragments were found in *locus* 34220, the largest one c. 0.15 m long (external diameter 0.11/0.08 m, internal diameter 0.065/0.075 m; **figs 34 and 35**).



Fig. 29. Fragment of a large brick, 34518_P05 (MSAP).

Although still featuring some elements related to the sub-phase 2B modifications, the extant appearance of Room XV does not allow for a functional designation being more precise than just a “post-heated room”. It is difficult to find relevant parallels because the original appearance cannot be fully reconstructed. For example, comparing with the Roman bath (E077) outside the fort and the



Fig. 30. Fragment of a brick, 34051_P22 (MSAP).



Fig. 32. Fragment of tubulus 34051_P21 (MSAP).



Fig. 34. Pipe fragment 34220_P09 (MSAP).



Fig. 31. Fragment of tubulus recovered from locus 34052.

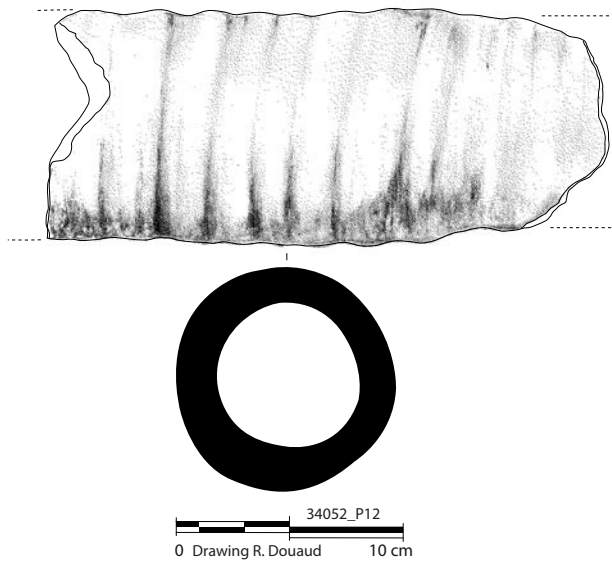


Fig. 33. Pipe fragment 34052_P12.

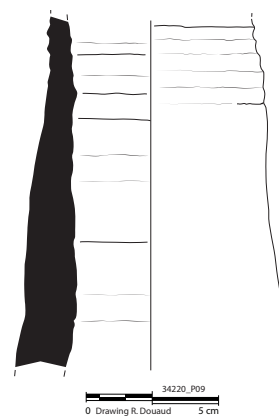


Fig. 35. Pipe fragment 34220_P09

heated room (E116) by the *praetorium* in Humayma (Oleson *et al.* 2008; Reeves *et al.* 2017), Room XV is exceedingly modest and the remains much less informative. The heated room at Hegra was most probably built by soldiers of *legio III Cyrenaica*, which relocated to Arabia from Egypt. They might thus have been familiar with bathing installations there. Nevertheless, reviewing the examples of the hybrid “Graeco-Romano-Egyptian” baths (Fournet and Redon 2017: 112–114) or modest bathhouses in *praesidia* of the Eastern Desert (Reddé 2018, § 10–26) one cannot detect any similarities besides the generic elements of the hypocaust system.

More meaningful comparisons can, however, be proposed with regards to the location of Room XV. While bathhouses in legionary fortresses were often located *intra muros*, in auxiliary forts these were more commonly located in fortified annexes attached to the forts (Webster 1974: 198–99, 218–219). For example, the heated room in Humayma is situated in the extension to the *praetorium* of the auxiliary fort at Humayma, but a large Roman bathhouse associated with the fort is also located outside the fort’s limits. In Egypt, military-related baths were either inside the perimeter walls (like in small desert *praesidia*) or located outside, often close to one of the major gates of the fort (see Redon 2009: 425–433, especially 430–433, for discussion). Room XV, although a heated room only, would easily fall within the latter category as while an integral part of the fort, it is physically located *extra muros*, i.e., in a fortified annex, and close to the main gate leading from the settlement to the fort.

Room XV, the access and the central corridor

As for the access to the interior of Room XV, the southern side, where presumably wall 34507 extended westward, should probably be excluded, just as the northern side where the *praefurnium* was located. The eastern side is a possibility but requiring a review of the immediate surroundings. On the northern side of Room XV there are exceedingly poorly preserved remains of wall 34073, the construction date of which is unknown (see fig. 5). However, if this wall existed in Phase 2, it would have formed the western limit of a space directly in front of wall 34534 and *praefurnium* 34545. In this space, the first deposition directly on the bedrock was *locus* 34536, followed by *locus* 34531, an extensive layer containing large quantities of ash and charcoal as well as ceramics dated to the 2nd–3rd century (see Durand 2019 for ceramic details). *Locus* 34531 probably represents a periodical clearance of the *praefurnium*. Small amount of ash was also found in *locus* 34537 inside the latter, and also including a few sherds dated to the 2nd–3rd century. Directly east of *locus* 34531 was stone installation 34549 (c. 1.10 x 1.70 m), which resembles a flight of five steps in L-shaped manner. The first three steps, running east-west, abut wall 34534, then there is a small landing followed by two steps which turn south abutting wall 34535 (fig. 36).

These steps provide access to what is termed here as the Central Corridor which, due to its size and probable function does not warrant the room designation. The corridor is 3.40 m (north-south) x 1.00 m (east-west). On the western side it is limited by wall 34535 and on the eastern side by mudbrick wall 34559 and the stone corner section 34541 (figs 37 and 38, see fig. 5). Further south, the corridor is open on the eastern side, giving access to the space of early Room XX. Originally, the corridor was paved with stone slabs (*locus* 34538) on the same level as the highest step of *locus* 34549 (at 790.61 m) but some slabs were later removed, especially in the central part of the corridor, others replaced by mud-bricks. In the southern part of the corridor, the pavement forms a somewhat sunken rectangular space (*locus* 34591 at c. 790.40 m), being



Fig. 36. Wall 34534, steps 34549, wall 34522 (right). View from the east (Z.T. Fiema).



Fig. 37. The corner section, locus 34541 (centre), wall 34557 (right). Mudbrick wall 34559 in upper left. View from the south-west (Z.T. Fiema).

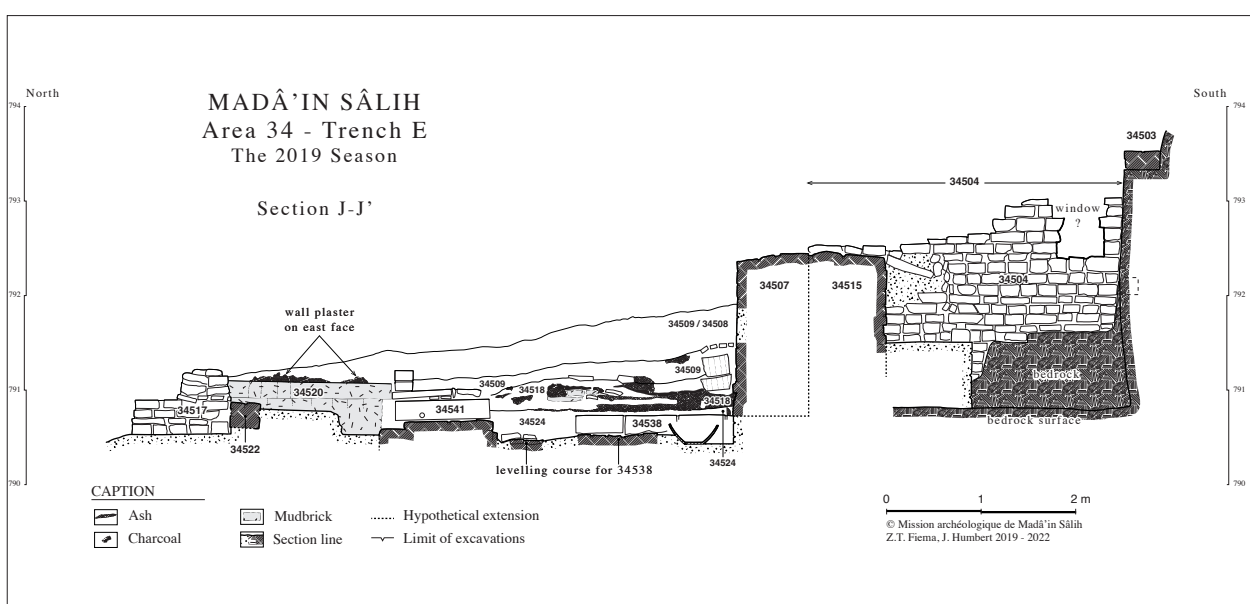


Fig. 38. The 2019 south section (Z.T. Fiema and J. Humbert).



Fig. 39. The Central Corridor (southern part): pavement 34538 surrounding (the lower) pavement 34591. Large jar in situ. Wall 34507 in background. View from the north (Z.T. Fiema).

c. 0,90 x 1.5 m.⁸ The lower half of a large pithos or flat-bottomed storage jar (diameter of bottom, c. 0.33 m, diameter at the preserved top c. 0.48 m, maximum height c. 0.46 m) still stood on the bottom of the sunken space (**fig. 39**, see figs 5, 51, and 52). Whether it could originally have served as a container for washing or scrubbing, and if it was indeed somehow associated with Room XV, remains unknown.

At any rate, the accessing of the interior of Room XV from the Central Corridor is a debatable proposition. The preserved surface of wall 34535 features two relatively flat areas, in the northern part and in the south directly against wall 34507. Although both are more or less at the same level (c. 790.54–790.60 m) as the preserved pavement of the corridor (790.60–790.67 m), neither preserves any traces of a door or even a threshold. Thus, the only realistic option of accessing the interior of Room XV is from the western side. Room XIX although not preserving exactly the same orientation as Room XV, since being adjusted to the orientation of the “inner street” of the fort (*supra*), would have been a convenient antechamber of the heated room. However, the poor preservation of the combined

stone/mudbrick wall 34543 prevents any reasonable propositions. Similarly, the chronological assignment of mudbrick wall 34539, which abuts walls 34546 and 34543, is uncertain (the sub-phase 2B?).

Early Phase 2 walls in Trench E East

Directly east of the Central Courtyard the construction sequence becomes exceedingly complex and the association of specific walls, surfaces and installations with Phase 2 depends on spatial organization, which is complex there since no specific dating of some structures was possible (**fig. 40**). It seems that the earliest Phase 2 construction there is stone wall 34583 (length: at least 5 m but probably longer; width: 0.55 m), which runs north-south and lay mostly under mudbrick wall 34559 (see figs 5 and 16). Its Phase 2 association relates to its lowermost location (directly

8. There is c. 0.20 m difference between the uppermost step of *locus* 34549 and the corridor pavement 34538 on the one hand, and the “sunken” pavement 34591 in the southern part of the corridor on the other hand. Theoretically, *locus* 34591 might have been the earliest pavement of the corridor, overlaid later on (but presumably also during Phase 2) by less regular pavement 34538. In such case the flight of steps (*locus* 34549) would also be a later addition.



Fig. 40. The structures in Trench E east. View from the south (Z.T. Fiema).

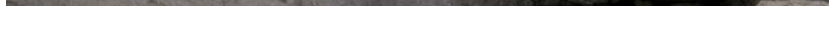


Fig. 41. Walls and installations in Room XXII: A (wall 34562), B (wall 34560), C (wall 34558), D (wall 34557), E (wall 34559), F (wall 34520), G (installation 34565). View from the south-west (Z.T. Fiema).

on the bedrock in the northern part of the spur) but also because it abuts wall 34588 considered a part of fortifications of the Northern Annex.

Probably soon after, a series of mudbrick walls appeared in the eastern part of the Northern Annex (fig. 41, see figs 4 and 5). To these belong the north-south wall 34559 (length: 3.40 m, width: 0.80 m), which partially incorporates stone wall 34583. The western face of wall 34559, which flanked the steps (*locus* 34549) in the northern part of the Central Corridor, still preserves light brownish wall plaster. At the southern end of wall 34559, there is a massive stone corner section (*locus* 34541, see figs 37 and 38), which is offset by c. 0.25 westward from the western face of wall 34559.⁹ *Locus* 34541 consists of a threshold-like large block (c. 0.92 x 0.18 m) with two large slabs oriented east-west on top of it and two smaller perfectly dressed stones at the northern part of the installation. This installation must have strengthened wall 34559 as in Phase 2 its southern end was not anchored to any east-west running wall.

9. A narrow mudbrick wall 34520 which abuts Wall 34559, filling exactly the offset space created by the corner section 34541, must be considered a later addition as it abuts the plastered western face of Wall 343559 (see fig. 63).



locus 34592 (length: 1.65, width: 0.50 m) running east-west, which continues east beyond the eastern face of wall 34558. Thus perhaps there was another enclosed space, east of Room XXII, although quite narrow judging from the fact that the steep eastern slope of the Annex is only c. 2.50 m east from wall 34558. The walls described above formed three spaces: Rooms XXI, XXII and XX, neither of which having all four surrounding walls present in Phase 2.

Room XXI

This space, being the front room of the Northern Annex (**fig. 44**), is enclosed by walls 34075 (north), 34560/34562 (south) and 34583 (west), and is at least 3.50 m (north-south) x at least 3.80 m (east-west). The eastern side remains open and it is entirely unknown if the row of stones, *locus* 34584 (*supra*) had played any role in the enclosing the room. The main matrix deposit inside the room is *locus* 34575, directly on the bedrock. Its ceramics included Nabataean period sherds, late 1st century AD being predominant. It is therefore either the latest Nabataean deposit or the earliest one associated with the fort. Possibly, the latter as the *locus* also contains some broken ashlar presumably helping to level the bedrock in the northern space of the spur.



Fig. 44. The front of the Northern Annex. Room XXI and wall 34570 (with very large ashlar course) in centre left. View from the north (Z.T. Fiema).

It is puzzling that there is a mudbrick wall (*locus* 34570; length: c. 3.50 m, width: 0.75–0.90 m), which abuts the combined wall 34560/34562. The northern face of the latter is coated with either a mud mortar or a very coarse mud-based plaster. Furthermore, the northern face of wall 34570 is not parallel to wall 34560/34562 (see figs 5 and 43). Wall 34570 rests upon soil *locus* 34575, and the bottom of this wall is c. 0.40 m lower than the (discerned) bottom of wall 34560/34562. Finally, wall 34570 features, at its lower (or foundation) section a very fine course of large ashlar (e.g., 0.60 x 0.32 m), with at least three courses of mud-bricks above (see fig. 44). Wall 34570 also appears to abut wall 34583. The presence of a mud plaster on the northern face of wall 34560/34562 may indicate that it was constructed earlier than the deeper-based wall 34570 as it would make much less sense to construct a new mudbrick wall inside the room if it was already enclosed by a sturdy wall. So the assignment of wall 34570 to Phase 2 is somewhat doubtful unless constructed in the later stages of that phase. Regardless of which wall preceded which in time, it is evident that still in Phase 2 and certainly in Phase 3, the southern limit of Room XXI was a massive wall c. maximum 2.30 m wide. Since there is no indication that the space of Room XXI



Fig. 45. Room XXI, installations 34573 (centre) and 34574 (upper right). View from the south (Z.T. Fiema).

was ever roofed (although it is not impossible), the top of the combined wall 34560/34562/34570 might have served as a convenient observation platform for sentries keeping guard and controlling access to the fort from the settlement. This hypothesis may find support by the examination of the interior of the neighbouring Room XXII (*infra*).

Finally, there are two installations on top of *locus* 34575 (**fig. 45**). *Locus* 34573 (c. 1.15 m east-west x c. 0.70 m north-south, top at 789.95 m) consists of five stones tightly grouped in east-west orientation, including large paving slabs (c. 0.60 x 0.45 x 0.08 m). *Locus* 34574 (c. 0.90 m east-west x 0.85 m north-south, top at 789.88 m) features six slabs in two east-west rows, forming a flat surface. The largest stone is a typical paving slab c. 0.68 x 0.30 x 0.08 m. Considering the date of ceramics from *locus* 34575 (*supra*) both clusters of slabs might have been a part of the original flagstone floor in Room XXI. However, these might also belong to Phase 3 (if not 4) when reused paving slabs could have served as pedestals, bases/surfaces for something unknown.

Room XXII

In Phase 2, the space of Room XXII was enclosed by walls 34560/34562, possibly also 34570 (north), 34558 (east), and 34559 (west), enclosing a space of c. 2.00 m (east-west) x 2.20 m (north-south). The southern side of the room remained open although probably possessing a formal entryway (*infra*). The northern and eastern walls appear to stand on *locus* 34586 (at c. 790.10) —presumably the latest pre-Roman deposit in this sector of Trench E (see fig. 42), which yielded ceramics dated to the 1st century AD as well as relatively large quantities of partially burned palm tree trunk branches, perhaps related to the constructing activities at the beginning of the Provincial period. The following deposit—*locus* 34582 (top at 790.40 m)—entirely confined within the walls of Room XXII, contained predominantly 2nd century ceramics. On top of this *locus* and abutting wall 34559 was a flight of three stone steps (*locus* 34585; from bottom to top: 0.60 x 0.27 x 0.04 m, top at 790.65 m; 0.57 x 0.26 x 0.10 m, top at 790.87 m; 0.66 x 0.35 x 0.08 m, top at 791.10 m), north-south oriented (**fig. 46**, see figs 5 and 10). Theoretically, these steps might have led to an upper floor of Room XXII but since no traces of such are extant, it would make sense that they led to the top of the combined wall 34560/34562/34570 if it served as an observation platform. A strange installation (*locus* 34594) abutted the steps on the eastern side, consisting of a round base made of two stones on top of which there was a combined stone/clay “receptacle”,

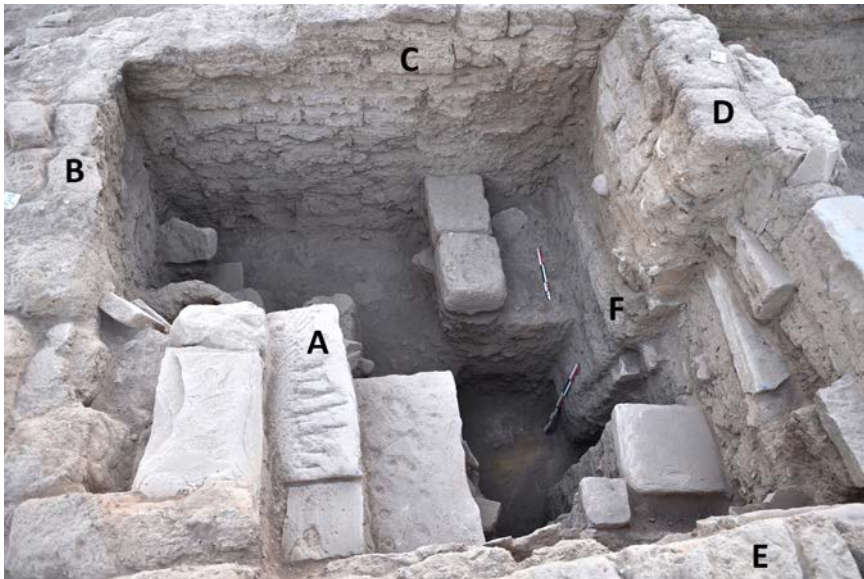


Fig. 46. Room XXII:
A (steps 34585),
B (wall 34560), C (wall 34558),
D (wall 34557), E (wall 34559),
F (platform 34576). View west
(Z.T. Fiema).

backed up against the steps by two upright stones (see fig. 10). The opening of the receptacle, being only c. 0.13 m in diameter and c. 0.22 m deep must have served to insert something vertical (pole? shaft?) rather than to store anything inside.

Well-constructed southern corner section (*locus* 34541) of wall 34559, mentioned above as flanking the Central Corridor, was reinforcing the end of that wall, since in Phase 2, there was no wall limiting Room XXII on the southern side. More importantly, however, it reinforced and anchored the stone entryway to that room from the space of Room XX. Currently it is wall 34557 (east-west), which separates Room XXII from Room XX but it is a highly composite and haphazard construction, which had been raised and reconstructed at least once (see fig. 5) and its main part must belong to Phase 3 (*infra*). As the occupational levels rose during Phases 2–4, the wall and the entryway's threshold level were raised as well, often in the exceedingly haphazard manner. These consecutive phases of construction and increasingly higher surfaces in Rooms XXII and XX are well reflected in the structure of wall 34557 by what is called here the Lower, Middle and Upper Thresholds (fig. 47). Thus in Phase 2, there was only a stone-built entryway which consisted of the several small quadrangular stones (top at 790.45 m) laid on top of *locus* 34581,



Fig. 47. Wall 34557 and other
installations: A (wall 34557),
B (the Lower Threshold),
C (the Middle Threshold),
D (the Upper Threshold),
E (the corner section 34541),
F (platform 34576), G (large jar
34568). View from the south
(Z.T. Fiema).

and serving as a base for a long horizontal slab (c. 1.15 m long and c. 0.15 m high, top at 790.68 m) which served as the Lower Threshold. Directly east of the threshold there was a composite stone/mudbrick platform, *locus* 34576,¹⁰ the description of which is presented in relation to Room XX. The function of Room XXII is difficult to define in Phase 2 but the existence of steps leading up implies that the room could have served as a guardroom for the sentries stationed on top of the combined wall 34560/34562/34570. Also, the room was probably not roofed.

Room XX

During Phase 2, this room can be defined as a largely open space, which was basically limited only on the southern side by wall 34507. The northern side was open, the eastern limit is unknown as presumably beyond the limit of excavations, but wall 34558 might have continued further south and thus provided the limit.¹¹ Another possibility for the eastern limit is the enigmatic wall 34593 in the south-east corner of the room (**fig. 48** and see **fig. 5**) but since it does not show in the eastern baulk of the trench, it would have been razed down after Phase 2. On the western side, Room XX was open to the Central Corridor. Altogether Room XX in Phase 2 was c. 3.90 m (east-west) x 2.90 m (north-south). Several installations were built on top of *locus* 34579 (top c. 790.45 m) which mainly contained 1st–possibly early 2nd century AD sherds. In the north-east corner, abutting the foundation course and the Lower Threshold of wall 34557 was platform 34576 (**fig. 49**, see **figs 5** and **42**). Its total limits cannot be fully established as its northern end is currently under the later wall 34557 and the eastern side appears as partially overlapped by wall 34558 (see **fig. 46**). As currently visible, platform 343576 is a rectangle, 1.30 m (north-south) x 1.20 m (east-west), c. 0.36 m high and with the top at 790.55 m. The rectangle has a frame made of small roughly cut stones, three courses high, while the interior is made of mud-bricks, which form an even and tight surface. The function of the platform cannot be determined but on top of

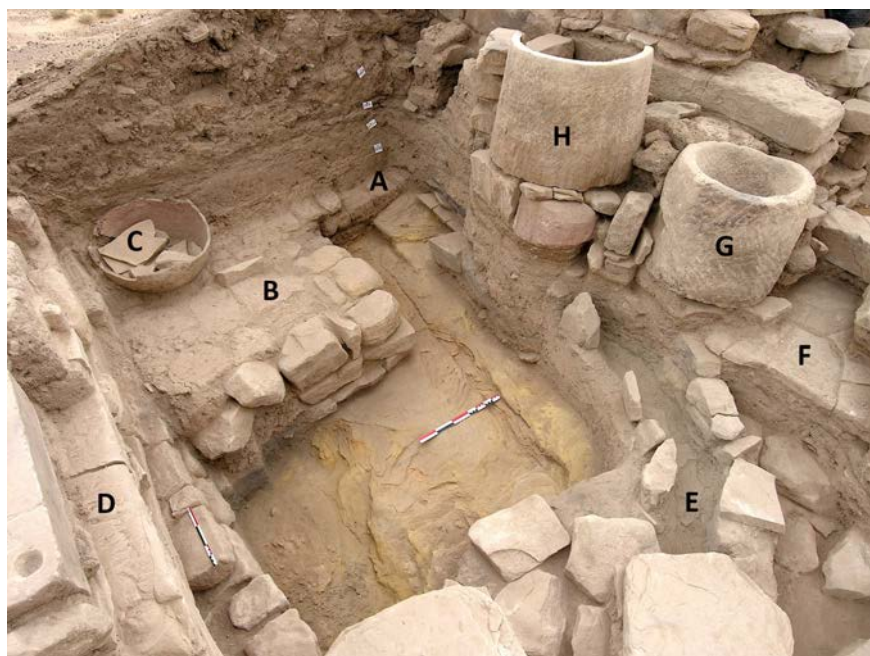


Fig. 48. Room XX: A (wall 34593), B (platform 34576), C (large jar 34568), D (the Middle Threshold of wall 34557), E (channel 34578), F (pavement 34595), G (stone mortar 34554), H (half-basin 34553). View from the north-west (Z.T. Fiema).

10. Currently the platform appears to “enter” the structure of the eastern, mudbrick, part of wall 34557 but, in fact, this mudbrick part was built later on on top of the platform.

11. If so, it would have been reduced in width (two rows rather than three).



Fig. 49. Room XX: A (platform 34576), B (large jar 34568), C (wall 34593), D (tabun 34561), E (half-basin 34553), F (mortar 34554), G (channel 34578), H (threshold section of wall 34557). View from the south (Z.T. Fiema).



Fig. 50. Room XX: A (large jar 34568), B (platform 34576), C (clusters of stacked stones 34577), D (channel 34578). View from the east (Z.T. Fiema).

it there was a large storage jar/pithos (*locus* 34568), thin-walled and rather poorly fired (**fig. 50**, see figs 5, 42, 48–49). Only the bottom and lower part of the body were preserved, the total being c. 0.40 m high with c. 0.55 m diameter at the preserved top. The most intriguing aspect of this jar was that it was, apparently intentionally, entirely filled up with broken stones.

Another installation in Room XX is *locus* 34578 (length: c. 1.90 m, width: at least 0.35, height: c. 0.28 m), which resembles a channel running roughly south-east–north-west (**fig. 51**, see figs 5, 49–50). The southern end is unknown as it is currently hidden under the installations of Phase 3 but it might have started somewhere by the northern face of wall 34557. The north-west end is visible as it enters the space of the Central Corridor. The channel consists of two parallel rows of upright-standing stones (some stacked up), c. 0.22 m from each other. The so created “trough”, however, does not display any watertight mortar and the bottom consists of either small, flattish stones or just beaten earth (see **fig. 48**). Toward the north-west

end the parallel rows of stones are capped by two large somewhat irregular slabs (0.44 x 0.44 x 0.07 m and 0.90 x 0.50 x 0.07 m, top at c. 790.65–7.90.71 m). Visually, the installation looks like a channel but it is hard to assign it a liquid-conducting function as its watertight capability is

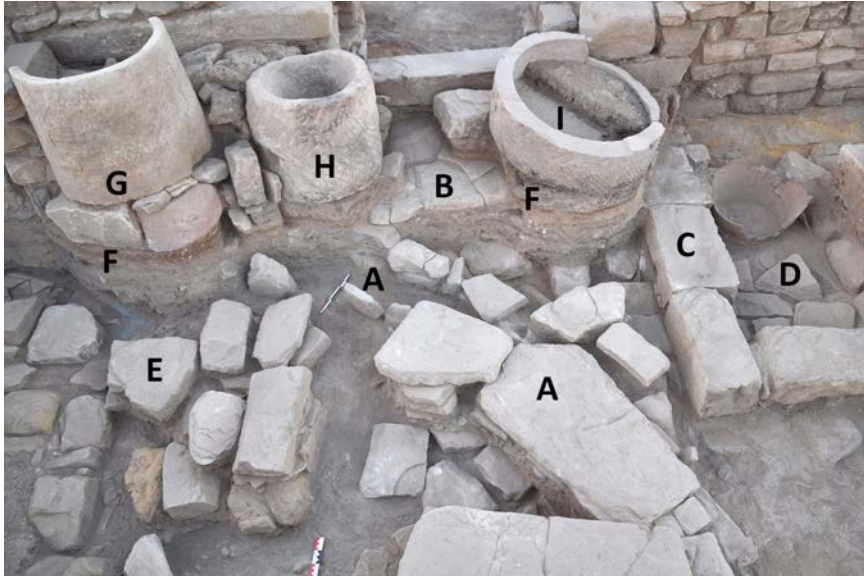


Fig. 51. Room XX: A (channel 34578), B (pavement 34595), C (pavement 34538), D (pavement 34591), E (cluster of stacked stones 34577), F (layer 34518), G (half-basin 34553), H (mortar 34554), I (basin 34555). View from the north (Z.T. Fiema).

doubtful. Assuming that once it entered the Central Corridor, channel 34578 might have turned more northward, and ultimately connected with the enigmatic yet relatively well-preserved channel 34596 located directly west of Wall 34517. It will require the partial removal of Wall 34517 and pavement 34538 to confirm or disprove this hypothesis.

The space between the channel, the Lower Threshold and the platform 34576 is haphazardly filled up with slabs and stone fragments (recorded as *locus* 34577), many stacked up (fig. 52, see figs 50 and 51). Two main clusters occupy the south-east location (top at 790.65 m) and the central location in the room, the latter cluster being c. 1.10 m(north-south) and 0.85 m (east-west) and consisting of two-three courses of stones stacked up (top at 790.70 m). There is no pattern in the configuration of these piles of stones and not entire space of Room XX is filled up with such piles. Thus it is largely unknown if the entire space of Room XX was originally “paved” with irregular slabs (just like these in *locus* 34577) or if the empty spaces were filled out with soil as some stones might have been removed later on. Deposit 34564, a silty-clayish soil with top at 790.70 m, currently fills out these empty spaces and partially covers the tops of the installations



Fig. 52. Room XX: A (clusters of stacked-up stones 34577), B (platform 34576), C (half-basin 34553), D (mortar 34554), E (channel 34578), F (basin 34555), G (pavement 34538), H (pavement 34591), I (Wall 34559), J (corner section 34541), K (wall 34557). View from the west (Z.T. Fiema).

inside the room. *Locus* 34564 is either an intentional deposition or results from the gradual rise of the floor level as associated with continuing occupation. The ceramics from that *locus* are dated to the 2nd–3rd century.

Finally, in front of door 34569, in wall 34507, there is a stretch of irregular but tight stone pavement, *locus* 34595 (c. 1.80 m east-west x 0.80 m north-south) at 790.78 m (see figs 5 and 51). The upper threshold (top at 790.10 m) of the door, being presumably of the Nabataean period (*supra*) must have had some kind of corresponding step or surface on the exterior, currently below *locus* 34595. In Phase 2, *locus* 34595 served to facilitate stepping down from the threshold onto the space of Room XX, the difference in levels being 0.32 m, somewhat high but not insurmountable. Concluding the description of Phase 2 in Trench E East, it is important to keep in mind that the tops of all installations mentioned in this section (with the exception of platform 34576), e.g., the Lower Threshold of wall 34557, the capstones of channel 34578, the stacks of stones (*locus* 34577), the stretch of pavement (*locus* 34595) and also the pavement in the central and southern part of the Central Corridor remain at roughly the same level (c. 790.60–790.75 m) and thus likely belong to the same occupational horizon. Whether the installations in Room XX somehow relate to the function of the heated room (XV) is not impossible but cannot be determined.

Dating

All soil *loci* mentioned in relation to Phase 2 yielded ceramics datable to the 2nd–3rd century although some ceramic assemblages were slightly earlier, i.e., *locus* 34579 (1st–probably early 2nd century), 34582 (2nd century), and 34544 (2nd–early 3rd century).

Phase 3. Later Provincial period

During this phase, the original function of the heated room was abandoned. Yet some activities took place there, which modified the interior and its surroundings. In the eastern part, the installations in Rooms XX and XXI were not only abandoned but in fact covered by soil deposits, indicating limited activities. Only later, the interiors of both rooms feature intensive activity most probably related to food processing and/or storage. Therefore, it could theoretically be possible to recognise a separate phase between Phases 2 and 3, which would reflect a drastic reduction of activities if not a partial disuse of the Northern Annex. Such chronological framework is, however, not favoured here because ceramic components would still indicate 2nd–3rd century date, possibly extending to the early 4th. Thus, the interpretative description offered below is primarily based on the stratigraphic sequence of building and depositional events rather than on the actual absolute chronology, which cannot be established with certainty. At any rate, the modifications in Room XV, the abandonment of installations in Room XX, and the removal of some paving stones in certain rooms, including the Central Corridor, may indicate perhaps not a complete disuse but a drastic reduction of the occupation density in the Northern Annex area. Whatever has caused that occupational “crisis” cannot be easily discerned.¹² The evidence from other excavated trenches in Area 34 would indicate that such emergency might have happened in early-to-mid 3rd century (e.g., Fiema 2016). On the other hand, the food-processing activities

12. This issue is further discussed in the Concluding Remarks.

in Rooms XX and XXII, while uncertain in chronological terms, could have begun later in the 3rd century and presumably continued at least until the early 4th if not later (i.e., in early Phase 4). The assumption, then, is that these activities, evidenced in the eastern part of the Northern Annex, still belong to the Later Provincial period, i.e., when the Roman military still occupied the site, but their continuation might possibly have coincided with the Roman abandonment of the fort in Hegra, estimated to have happened sometime at the end of the 3rd–the beginning of the 4th century.

Rooms XVII and XVI

The difficulty with the chronological assessment of matrix *locus* 34544 in Room XVII, which has only 2nd–early 3rd century sherds, was already noted above. It was not possible to separate strata in that room, as related to Phase 2 *versus* Phase 3. The proposition that there might have been a flagstone floor, removed sometime during the Later Provincial period (the 3rd century?) at the latest is speculative but not impossible. Whether the room remained in occupation or was temporarily disused then cannot be ascertained but the following soil deposit (34512) yielded sherds characteristic for the latest occupational phase in ancient Hegra (late 4th–early 5th century) but also two Roman provincial coins (1st–3rd century).

Presumably, the major change in this phase was a new door in wall 34510 which separated Room XVII from Room XVI. Theoretically, with the level of *locus* 34544 being c. 791.20 m and the upper threshold of the door being at 791.57 m, the access to such door would have been possible. Also, if there was a stone floor in Room XVII already in Phase 2, such door could have been accessed by a flight of steps. Suffice to say, the extant door 34513 realistically came into being no later than in Phase 3 and was not featured in the Phase 1 arrangements. The door is well preserved and displays elements, probably reused, of perfectly carved masonry (see figs 5, 12, and 13). It consists of a flat bedrock “ridge” the top of which is c. 0.35 m higher than the adjacent bedrock. This ridge separates both rooms on which the original wall 34510 (and presumably the original Phase 1 door) stood. A perfectly carved threshold (0.76 x 0.12 x 0.11 m) lay directly on the bedrock, and an equally impressive doorjamb monolith (0.67 x 0.12 x 0.10 m) stands directly on the southern end of the threshold. If a similar arrangement was also on the northern side, i.e., the doorjamb standing on the end of threshold, the resulting door opening would be no more than 0.50 m. One might argue that instead of a late very narrow and high door, this *locus* represents an early and low (Nabataean?) window but the former interpretation is preferred.

Room XV

As proposed above, sometime during the Provincial period, specifically at the end of the sub-phase 2B, the function of Room XV as a heated space was ended, any useful elements (except for *loci* 34542, 34546, 34552 and the ceramic conduit) were dismantled and the interior of Room XV filled with soil 34533A (unless already backfilled in the sub-phase 2B). On top of that *locus*, a thick layer of plaster, *locus* 34533, was laid out (unless already in the sub-phase 2B) and at least the lower parts of the walls of the room were plastered as well. Also, plaster 34533 goes behind and below three structural elements, which must be dated to post-heated room phase, i.e., to Phase 3 (see figs 5, 26, and 27). These are: are two large ashlar located close to the south-east inner corner of the room. One abuts wall 34523¹³ and the second slab is located in the otherwise

13. Wall 34523 is difficult to assess. It might be considered as a narrower superstructure of wall 34535 on which it is standing. Alternatively, it is an entirely new, unknown wall built later on the remains of wall 34535.

empty corner between wall 34535 and mudbrick wall 34529. The latter (length: 2.70 m, width: 0.60 m, two courses high) must also have been built then as it stands on the plaster and the same plaster is behind it adhering to the remains of stone wall 34507.

At any rate, the function of plaster 34533 inside the “post-heated room” is unknown. Furthermore, there is no ready answer as for why plaster 34533, so well preserved against wall 34535 and still visible on top of 34533A in the southern part of the room, was not detected further north. And also why it appears as broken off in a relatively uniform way just several centimetres west of wall 34535. Evidently, these phenomena somehow relate to the changed function of the room, which cannot be easily ascertained. Admittedly, the horizontal surfaces, marked by a poking tool (see fig. 24) might have secured a better adherence of whatever was placed on top of it, such as the two aforementioned large ashlar and wall 34529. Also, the function of wall 34529 cannot be determined unless it served to limit the space Room XV on the southern side. But this would imply that the western part of wall 34507 was either destroyed, mostly dismantled or deteriorated, requiring the reinforcement by a new wall. The almost total, except for the lowermost few centimetres, disappearance of wall 34507 in the area where it must initially have formed the northern limit of Room XVI is indeed puzzling.

Two matrix strata soon accumulated on top of the plaster. The first was a very thin *locus* 34530 (top at 790.35–790.45 m) which can be distinguished from the underlaying plaster by its silty grayish color. The pottery component was mixed and while predominantly of the 3rd (?), it may also contain ceramics slightly later in date. Additionally, four coins were found: one unidentified (34530_C01), the Arabia coin of Trajan (111–115, 34530_C02), antoninianus of Vahballathus (270–275, 34530_C04), and a Lihyanite, Nabataean or Jewish coin (34530_C03). Also, a small slab with a very fragmentary Greek inscription (34530_I01) was found on top of that *locus* (fig. 53). Followed was *locus* 34526 (top at 790.60–790.85 m) which provided large quantities of ceramics, including broken pithoi, datable to the 2nd–3rd century. That *locus* also contained large quantities of bones (e.g., of at least four dromedaries) and so it is not improbable that it served as a midden in relation to food processing installations which functioned in Room XX during the later Phase 3.¹⁴



Fig. 53. Broken slab with fragmentary Greek inscription on top of locus 34530. View from the north (Z.T. Fiema).

14. Also, fragmented date seeds were found in *loci* 34533 and 34530 (Ch. Bouchaud, 2022, personal communication).



Fig. 54. Locus 34524 covering pavement 34538 and the large jar. Locus 34518 visible as a layer with ash and burnt remains. View from the north (Z.T. Fiema).

elements *in situ*, or dumping of already burned debris. Loci 34524 and 34518 are stratigraphically equivalent to loci 34526 and 34519 in the area of Room XV and they extended over the entire space of Room XX (**fig. 56**) covering all installations from Phase 2, including the large pithos standing on top of platform 34576.

Finally, locus 34519 (top at 790.85–791.00 m) which also featured 2nd–3rd century pottery, covered the entire area west of the Central Courtyard.

Low intensity occupation east of Room XV?

While some activities were still conducted in the area of Room XV, the evidence is more ambiguous further east. In the Central Corridor, some of the paving slabs were definitely removed and that space, including large jar or pithos in the southern part of the corridor, were partially covered by locus 34524 (top at c. 790.80 m) containing mixed ceramics from the late 1st to the 2nd/3rd? (**fig. 54**, see fig. 38). In turn, that locus was covered by locus 34518 (top at 790.85–790.90 m), a soft layer of silty soil, which contained 2nd–3rd century sherds, probably more of the 3rd century date.¹⁵ Significantly, that locus also contained large quantities of charcoal, many totally burned horizontal pieces, as well as ashy pockets (**fig. 55**, see figs 38 and 42). This manner of deposition of burned material is ambiguous and it may represent a localised fire consuming wooden



Fig. 55. Loci 34524 and 34518 as visible in the 2019 north-south section, see fig. 38 (Z.T. Fiema).

15. A small part of that locus, excavated in 2019 specifically in the Central Corridor, had ceramic dated to the 4th century, but the ceramics in the baulk of the locus, excavated in 2021 in the area of Room XX, were definitely of the Roman period (2nd–3rd century). Both parts of that locus were exactly on the same level.



Fig. 56. Locus 34518 inside Room XX. The installations (in the background) standing on top of this locus include (from left to right): tâbûn 34561, half-basin 34553, mortar 34554 and basin 34555. View from the north (Z.T. Fiema).

Room XXII and wall 34557

Inside Room XXII the situation is particularly complicated. Steps 34585 were standing on *locus* 34582 which yielded 2nd century sherds. Just like in Room XX (*infra*), the level of deposits rose inside Room XXII either through specifically natural process of deposition or through occupation or presumably through both, gradually overlaying the level of the Lower Threshold and platform 34576 flanking the former on the eastern side. This process and other largely unknown functional reasons deemed it necessary to create a physical separation of Room XXII from Room XX. Thus, wall 34557 (length: c. 1.85 m excluding *locus* 343541, width: 0.40–0.75 m) was constructed then although it must be kept in mind that its extant form might have been the result of gradual raising of the structure. The southern face of the wall is a bewildering and haphazard combination of stones and mud-bricks. On the western side, the corner section (*locus* 34541) of wall 34559 gradually rises and immediately to the east, the threshold section consisting of a piled-up slabs, displays the consecutive phases of construction including the Lower, Middle and Upper Thresholds (see fig. 47). Associated with Phase 3 is the Middle Threshold, a long thin slab (c. 1.05 x 0.20 m) the top of which is at c. 791.06 m, only c. 0.20 m higher than the adjacent top of *locus* 34541 from Phase 2 and c. 0.35 m higher than the top of the Lower Threshold. The Middle Threshold functioned as an actual threshold of a door between Room XX and Room XXII because by then, these rooms were physically separated by wall 34557. Directly east of the threshold section, on the top of platform 34576, there is a confusing sequence of irregular and partial courses of mud-bricks, wildly interspersed with equally partial courses of stones. The top view of the wall reveals that it is neither straight nor of equal width (see fig. 5).

However, a glance on the northern face of wall 34557 (see figs 10 and 42) helps to clarify the situation. On that side, the wall's mud-brick courses are regular and standing on the sequence of strata deposited on platform 34376,¹⁶ i.e., from the bottom up: *loci* 34582, 34580 (top at 790.60 m) and 34566 (top at 790.75–790.90 m), all of which also covered the entire space of Room XXII. The lowermost mudbrick course of wall 34557 starts roughly at the level of the Middle Threshold. The three soil *loci* inside Room XXII could possibly have had their—at least partially—continuing

16. The corner of platform 34576 is visible on fig 10.

equivalents in *loci* 34564, 34524, and 34518 inside Room XX (and in the Central Corridor), until wall 34557 was fully constructed. At least stratigraphically, these two sets of *loci* are roughly equivalent. However, rather unexpectedly, the *loci* inside Room XXII yielded ceramics dated to the 1st century BC–1st century AD (*locus* 34580) and late 1st–2nd century (*locus* 34566) in a clear opposition to the dating of the ceramic material from *loci* 34524 and 34518.

The comments on this highly complicated and confusing history of wall 34557 may conclude with the proposition that on the northern side, i.e., inside Room XXII, the entire mudbrick section was built on top of soil layer 34566 (and on top of the prior soil *loci* in the same time), thus it bears much a more regular form. On the southern side, wall 34557 probably grew organically, i.e., the stone segment on top of the Lower Threshold was periodically stacked up as the occupational surface rose inside Room XX. Additional, irregular courses of stones were added on top of the corner segment (*locus* 34541), directly adjacent to the threshold, and in the eastern side the combined mudbrick/stone section of the wall bears the image of the extremely haphazard and practically makeshift construction, which may have been gradually added up.

Room XXII: food processing installations

Although the stratigraphic sequence is secure, the fact that the ceramic dating of *loci* inside Room XXII is confusing and uninformative makes it much more difficult to establish which deposits and installations originated in Phase 3 and then continued into the following phase and which originated only in Phase 4. *Locus* 34566 served as a base on which the northern (mudbrick) side of wall 34557 was constructed. On top of *locus* 34566, and partially embedded in it, an enigmatic *locus* 34565 (top at 790.95 m) was placed (**fig. 57** and see figs 41–42). It is a roughly oval (c. 1.60 m north-south x 1.70 m east-west) layer of very dense, medium-hard, light brownish-grey silty clay, c. 0.30 m thick. Due to its oval form, the layer does not occupy the entire interior of Room XXII. It partially lips out onto wall 34560, abuts wall 34559 but is not in contact with wall 34558. The surface, with well-defined edges, is slightly concave, with very small flat pebbles and equally small pieces of pottery embedded in it. In the south-west part of installation 34565, four large stones (*locus* 34567, top at 790.00–791.10 m), including at least three typical paving slabs, were piled up. Three stones (0.50 x 0.30 x 0.08 m; 0.46 x 0.38 x 0.13 m; 0.40 x 0.25 x 0.10 m) are in a north-south row while the fourth (0.70 x 0.30 x 0.08 m) is flanking the row on the eastern side (**fig. 58**).



Fig. 57. Room XXII: Installation 34565. View from the south (Z.T. Fiema).



Fig. 58. Room XXII: installation 34565 (centre) with a stack of paving stones on top of it. Wall 34557 (left), wall 34558 (bottom), wall 34560 (right), wall 34559 (background top). View from the east (Z.T. Fiema).

Whether these stones remain in a functional relationship with installation 34565 is unknown but they were placed exactly in the part of Room XXII where steps 34585 (currently under installation 34565) existed in Phase 2. Upon the removal of slabs, *locus* 34567, deep imprints in the surface of *locus* 34565 may perhaps indicate that these were placed when the oval surface was still relatively wet and soft.

Upon the removal of installation *locus* 34565, the recovered diagnostic sherds were dated to the 1st century AD, which perhaps is not altogether surprising as this kind of clay is not evidenced anywhere in Trench E, so it must have been brought to the site together with small sherds embedded in it. This hypothesis is also reinforced by the discovery of two early coins (34565_C01 and 34565_C02: denarius of Trajan from 98/99 and drachma of the same emperor, dated to 112–114) within the structure of the installation. The interpretation of *locus* 34565 is not easily forthcoming. Undoubtedly, its oval, platform-like form, smooth surface and hard consistency related to the function, perhaps as a place where foodstuffs were processed and separated, meals were prepared or fruit/vegetables/meat (?) left to dry in the air.

Room XX: food processing installations

Possibly soon after the construction of wall 34557, the occupation intensity in Room XX increased again, exemplified by several installations which can be related to food processing. In Room XX, these installations stand on ashy *locus* 34518 (with 2nd–3rd century ceramics (see fig. 56) but the utilisation of these would have continued concurrently with the continuous deposition of *locus* 34509 and the gradual rising of the occupational surface (see figs 38 and 42). That *locus* has yielded many cooking pots, jars and pithoi (all broken) of somewhat later date (4th–early 5th century), among which there were also amphorae Kapitän 2 (3rd–4th century). Thus, while the installations described in this section originated in Phase 3, their utilisation might have continued in the following phase. There are four installations in Room XX, all placed against the northern face of wall 34507 (see figs 5 and 51). These include: a large stone half-basin (*locus* 34553), a stone mortar (*locus* 34554), and another stone basin (*locus* 34555). The fourth installation is a *tâbûn*-type oven (*locus* 34561), in the corner, directly east of basin 34553. It probably also belongs to the same period of activities although it might start operation a bit earlier, when *locus* 34518 was being deposited.



Fig. 59. Room XX: half-basin 34553 (right) and mortar 34554 (left). Top view from the south (Z.T. Fiema).

Basin 34553 (c. 0.51 m high, diameter 0.61 m), is in fact a half of this object, standing on two large stones, one of which appears to be a quarter-column drum (**fig. 59**, see figs 51 and 56). The entire interior of the half-basin as well as the space between it and the face of wall 34507, and the space between the half-basin and mortar (34554) was filled up with tightly placed stones in relatively regular courses. On top of the stone deposit inside the basin was a small basalt *meta*. Stones were also stacked up on the eastern side, between the basin and the *tâbûn*, locus 34561. To preserve the stability of the half-basin *in situ*, only approximately the upper half of the stone deposit was removed from its interior during the excavations, revealing several non-diagnostic sherds (dated by fabric to Roman/Late Roman period) as well as an iron blade (**fig. 60**), probably of a knife or dagger. The flat rim of the basin carries a Latin inscription which is a dedication to Jupiter Hammon by Agathopus, the freedman of Aurelius Stator, *centurio* of *legio III Cyrenaica*.¹⁷ It



Fig. 60. Iron blade 34553_M01 found inside half-basin 34553 (MSAP).

is difficult to imagine the function of this half-basin. Apart from purely sentimental value (due to the dedication), the basin could not store anything due to its half-preserved form. However, the careful and tight filling it out with stones might indicate that it served as some kind of “pedestalled surface”.

The neighbouring large stone mortar (*locus* 34554) stands directly on *locus* 34518 and very close to wall 34507 (see figs 49, 51, and 59). The mortar is complete (height: 0.52 m; top diameter 0.54 m) with the V-shaped section, c. 0.34 m deep. Basin 34555 is, in fact, only the bottom part, which was found tilted as partially standing on a stone slab, itself standing on ashy *locus* 34518 (see figs 38, 51, and 52). The basin is c. 0.28 m high, with the external diameter of c. 0.87 m, 0.18 m deep inside, and with thick (0.09 m) walls. It was found filled with soil and stones as well as by an almost complete small jar which, based on profile and fabric, should be dated to the 2nd/3rd century, most probably the second half of the 3rd, even the early 4th. Finally, close to the south-east corner of Room XX, there is a *tâbûn* oven (*locus* 34561; see figs 5 and 42), protected by stacked up mud-bricks in the eastern side, and by stacked-up broken slabs

The neighbouring large stone mortar (*locus* 34554) stands directly on *locus* 34518 and

17. Inscription 34553_I01, to be published by the author at a later date.



Fig. 61. Room XX: tâbûn oven 34561 (Z.T. Fiema).

on the western side. The *tâbûn* consists of a bell-shaped shell (height: 0.30 m, diameter 0.27 m) made of poorly fired clay, at the bottom of which was a small horizontal stone slab showing some burning traces. Also inside, there was a broken-up cooking pot without the rim and the bottom, perhaps utilised to keep food warm inside the *tâbûn* (**fig. 61**). The pot belongs to a type common in the 2nd–4th centuries. The interior of the *tâbûn* was filled up with deep greyish-blue ash which also is accumulated in front of the *tâbûn*, directly on top of *locus* 34518 (see **fig. 56**).

Walls and installations associated with Phase 3 or Phase 4

Although a relative construction sequence of the following walls is apparent, the specific assignment to Phase 3 or Phase 4 lacks supporting evidence. In the northern part of the Central Corridor, there are three such walls (**fig. 62**, see **figs 5** and **38**). Wall 34520 (length: 1.80 m, width: at least 0.35 m) is a single row of mud-bricks, which abuts the plastered western face of wall 34559 (**fig. 63**), filling exactly the offset space created by the corner section 34541. In turn, wall 34520 is abutted by wall 34517 (length: 5.00 m, width: 0.80 m, at least six courses high) which partially rests upon the steps 34549, then continues northward where its poorly preserved remains seem to abut wall 34588. The third one is *locus* 34522 (length: 1.40 m, width: 0.48 m), a stone wall



Fig. 62. A (wall 34517), B (wall 34520), C (steps 34549), D (wall 34522), E (wall 34534). View from the west (Z.T. Fiema).



Fig. 63. Wall 34520 (centre) abutting the plastered western face of wall 34559 (background). Wall 34517 in lower left corner. View from the south-west (Z.T. Fiema).

running east-west and featuring two-three very irregular courses of small stones. Wall 34522 also partially overlaps the earlier steps 34549, abuts wall 34517, and its western part rests on *locus* 34531 which contained 2nd–3rd century ceramics. Not only the chronological assignment but also the function of these structures cannot be determined. These probably formed some late room spaces north of Room XV and west of Rooms XXI–XXII.

Dating

The matrix *loci* discussed in this section generally continue to be dated to the 2nd–3rd century. The notable exceptions although not too different are *loci* 34544 (2nd–early 3rd century), 34533A and 34530 (most probably the 3rd century), 34524 (late 1st–possibly through the 3rd century), 34565 (1st century AD), 34509 (2nd–early 4th), 34555 (2nd/3rd). The dating of ceramics from *loci* 34580 (the 1st century BC–1st century AD) and 34566 (late 1st–2nd century) clearly remains in opposition to their stratigraphic location thus presumably these *loci* were somehow re-deposited.

Phase 4. The post-Provincial period

This chronological-historical designation may potentially be a misnomer. On the basis of excavations in other parts of Area 34, it is assumed that the Roman fort in Hegra was militarily abandoned sometime at the end of the 3rd–beginning of the 4th century and the last occupation phase inside the fort was civilian. However, it is unknown whether or not the Romans still exerted some kind of political hegemony over this part of the northern Hijâz, i.e., if Hegra still remained the subject of Roman provincial administration in the early 4th century (see note 2). Undoubtedly, Phase 4 is the latest occupation phase in the Northern Annex and it was probably civilian although the ceramics, including imported Mediterranean types, indicate that at least some commercial contacts with the empire were maintained. This phase also corresponds to what is recognised as the last occupational phase in the entire settlement of Hegra. Phase 4 is best evidenced in the eastern part of the Annex, i.e., in Rooms XVII, XX and XXII. In the latter two the previous activities seem to continue although with some notable changes (Room XXII). There is no evidence of activities in the western part of the Annex. Rooms and spaces there appear largely abandoned and gradually covered by natural deposition.

Rooms XVII and XX

Inside Room XVII, the much-disturbed deposit 34544 was superseded by soil, *locus* 34512. As already specified, the sherds associated with these *loci* feature distinctly different dating: no later than the early 3rd century (*locus* 34544), and late 4th–early 5th century (34512). Whether or not this means a *hiatus* in occupation inside this room cannot be determined with certainty but it remains a distinct possibility. The surface of *locus* 34512 (top at c. 791.35–791.45 m) was a hard-beaten silt with some small ash pockets and some collapsed (?) ashlars and pavers in the south-west part of the room (**fig. 64**). On top of this surface stands a solid, rectangular, pillar-like mudbrick structure, *locus* 34511 (0.95 m x 0.65 m, maximum height c. 0.40 m; top at 791.78 m), which is at least two courses high (see figs 5–7). The pillar is located in the centre-west part of the room. Theoretically, it might have served as a support of some kind of lightweight roof. But since no corresponding installation (or traces of it) exists in the centre-east part of the room, perhaps only a part of the room was roofed in this phase. Alternatively, *locus* 34511 might have served as a pedestal or raised platform of a kind.

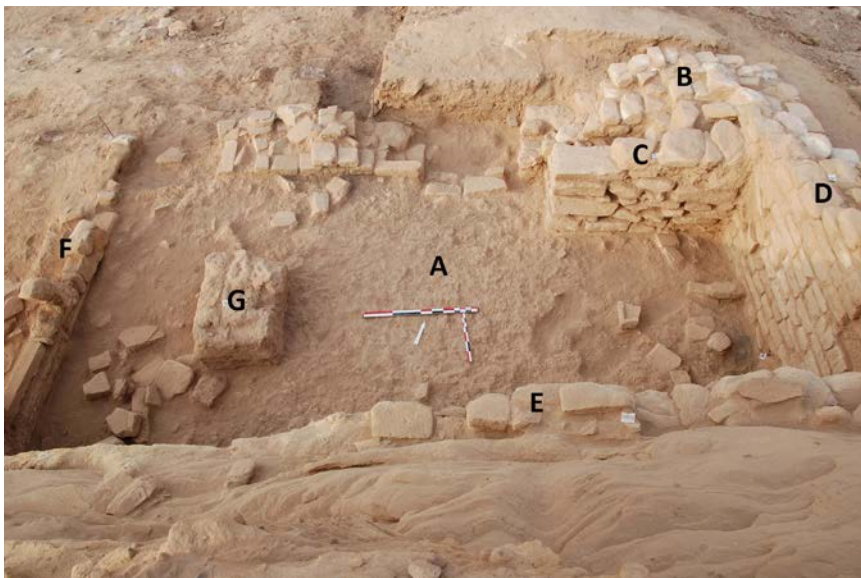


Fig. 64. Room XVII:
A (*locus* 34512), B (wall 34507),
C (wall 34515), D (wall 34504),
E (wall 34503), F (wall 34510),
G (pillar 34511).
View from the south
(Z.T. Fiema).

Following *locus* 34512 in Room XVII, there was a sequence of matrix *loci* (from the bottom up): 34509, 34508, 34506 and 34505. All contained pottery dated to the 4th–5th century but also earlier-dated sherds. For example, African *sigillata* and Dressel 2–4 amphora sherds were found in *locus* 34505, amphorae Kapitän 2 (3rd–4th century) in *loci* 34508 and 34509, Mesopotamian green glazed ware in *loci* 34505 and 34506. Potentially, some of these sherds might be residuals and/or might have tumbled down from the top of Hill B. Particularly, *locus* 34508 contained large quantities of cooking pots, jars and pithoi of the 4th–5th century, and it may be interpreted as a midden presumably associated with the continuing food-processing activities across wall 34507, i.e., in Room XX. Inside the latter, *loci* 34509 and 34508 are dominant depositions which gradually covered the installations of Phase 3, yet permitted their utilisation.

Room XXII

Locus 34563 (top at 791.12 m) covered the oval installation *locus* 34565 but not the stones, *locus* 34567. Although several pieces of good quality, light brownish wall plaster with smooth surface were found in deposit 34563, it was generally a silty sandy layer, almost pure in consistency, as

if being a wind-blown material, perhaps indicating a possible temporary disuse of Room XXII. On the other hand, few associated ceramics were, rather unexpectedly, dated to the 1st–2nd century, which may mean that *locus* 34563 was intentionally brought in to cover the installation 34665, or that the ceramic material from *loci* 34563 and 34565 was mixed during the excavations. This conflicting evidence is further complicated by the fact that the new *locus* (34556) deposited on top of 34563, yielded ceramics dated to the late 3rd/early 4th century and so it could potentially have originated already in Phase 3. However, due to its characteristics, which are considerably different from previous deposits inside Room XXII, it is reasonable to postulate that *locus* 34556 reflects an entirely new function of this room, and thus warrants its assignment to a new phase. *Locus* 34556 occupied the entire space of Room XXII. Roughly in the middle, there is a simple partition made of mud-bricks and one stone (top at 791.28 m), which divided the interior into the western and eastern parts, although not proceeding all the way to wall 34560 (figs 65 and 66, see figs 5 and 42). The partition is exceedingly crude and makeshift as under the mud-brick there were two joining pieces of a jar, featuring a Nabataean inscription (34508_101). The eastern half (top at 791.25 m) had large quantities of ash mixed with some charcoal, which increased



Fig. 65. Room XXII, locus 34556. Wall 34559 (left), wall 34558 (right), wall 34557 (foreground). View from the south (Z.T. Fiema).



Fig. 66. Room XXII, locus 34556. Wall 34557 (left), wall 34558 (foreground), wall 34559 (upper left). View from the east (Z.T. Fiema).

in density turning into pure ash c. 0.10 m below the surface of the *locus*. A dense, almost pure deposit of ash is also located just north of the partition (see fig. 65). The western half (top at c. 971.35 m), especially its southern part, was filled up with fragments of mud-bricks, poorly fired clay elements and two larger but broken slabs. Below this mixed mass, and at a level corresponding with the bottom of ash in the eastern half, there was also an ashy surface although not as intense as in the eastern half. Notably, the eastern face of wall 34559 shows faint traces of fire in few places while the western face of wall 34558 does not show any such traces. Ceramics were collected from both halves in considerable quantities, most of them being cooking pots, many blackened with soot.

On the basis of the evidence, it may be suggested that the interior of Room XXII was converted into a large fireplace. The mud-bricks and poorly fired clay fragments in the south-west part of *locus* 34556 might have been the superstructure of a large yet simple oven while the eastern half served to store ashes periodically removed from the oven. Perhaps such installation did not function for a long time. The mud-bricks and clay elements from the south-west part of the *locus* show only little soot and minimal firing which should be more evident if these constituted the superstructure of a hypothetical oven. It is also possible that a simple open fireplace existed in the western part of the *locus* while the broken mud-bricks/clay elements represent the collapsed elements of the adjacent mudbrick wall 34559. After all, there is almost no ash in this part of the deposit; it only significantly increases *under* these presumably collapsed elements. Alternatively, but less likely, *locus* 34556 was the place of disposal of burnt fuel from a fireplace, which was located elsewhere. No such installation was found in the vicinity and *tâbûn* 34561 features

totally different, grayish-blue ash resulted from a total combustion.

The last activity attested in Room XXII is the insertion of the so-called Upper Threshold in the doorway in wall 34557. The rising surface level in Rooms XX and XXII and especially the utilisation of the latter's space for installation 34556, deemed it necessary to raise the height of the wall and its threshold (see figs 5, 41, and 47). For this purpose, a very well-dressed monolith (length: 0.69 m, width: 0.18 m, height: 0.18 m, top at 791.36 m) was placed on top of a layer of small stones and clay, which, in turn, was deposited on top of the Middle Threshold. The monolith, which is clearly a reused threshold from an unknown door (**fig. 67**), very poorly fits the threshold space and more likely should be interpreted as the blocking of the door. Such interpretation would make sense considering the fact that the interior of Room XXII was now being filled up with ash and the blocking would prevent a spillover into Room XX.



Fig. 67. Wall 34557, the Upper Threshold (Z.T. Fiema).



Fig. 68. Room XXI: installation 34572. View from the north (Z.T. Fiema).

Room XXI

Inside that room, platforms *loci* 34573 and 34574, which stood on top of *locus* 34575, were covered by soil *locus* 34571. That *locus* (top at c. 790.60 m) was a very heterogeneous deposit consisting of silt, pockets of sand, clayish surfaces and some mud-bricks and stones, which seemingly tumbled down from the north. The dating of the recovered ceramics ranged from the pre-Nabataean to the 2nd–3rd century. It is thus entirely unknown to which phase belongs installation 34572 which was found *within* the *locus*—it was impossible to recognise a surface on which it was standing. Installation 34572 (**fig. 68**; top at 790.40 m) appears as a very simple construction consisting of two upright-standing paving slabs opposite each other, with other large stones forming the back of the space in the shape of the inverted letter “U” open to the north. A patch of ash was located at the “entrance” but no specific ceramic finds were associated with that spot. The installation seems to have been an ephemeral shelter/windbreaker and/or food preparation place.

Phase 5. Post-occupational period

So far, no ceramics dated to the (early) 5th century were found in Area 34 and the Northern Annex is no exception. Likewise, there is no evidence for any construction or occupation activities in that part of Area 34, which could be dated beyond the 5th century. Instead, the entire northern spur was covered by two main soil *loci*. *Locus* 34500 (maximum top c. 793.10 m) forms the surface of the western part of the spur, while the eastern part has *locus* 34501 (maximum top c. 792.90 m) as the topmost deposit (**fig. 69**; compare with figs 3 and 44). Both *loci* provided enormous quantities of pottery of very mixed date, including pre-Nabataean (Iron Age) and Nabataean but the most represented types among diagnostic sherds were of 2nd–3rd century date. Significantly, the sherds representing the latest phase of occupation in Hegra (and in the Northern Annex area), dated to the late 4th–5th century were statistically insignificant, especially in *locus* 34500. This phenomenon may lead to the following hypothetical proposition. Undoubtedly, the most (if not all) of soil and ceramics in *loci* 34500 and 34501 would have been washed down throughout the ages from the top of Hill B which, as suggested above, housed a citadel, apparently occupied in the Nabataean and Roman times. The lack of the late 4th–5th century sherds may then indicate



Fig. 69. Trench E. Locus 34500 partially removed from the western (right side) part of the trench. Locus 34501 (left side) in the eastern part of the trench is still in situ. View from the north (Z.T. Fiema).

that the citadel as an integral part of the fort was indeed militarily abandoned at the end of the 3rd–beginning of the 4th century. Yet in some areas of the former fort, such as Trench B (Fiema 2016) and in the Northern Annex, the occupation, presumably civilian, continued into the 5th century.

Concluding remarks

The excavations of the Northern Annex to the fort of Hegra have confirmed preliminary interpretations related to some specific occupational phenomena in Area 34 but have also raised new questions to be addressed in the future fieldwork and research. Any further doubts concerning the proposition that the Northern Annex was an integral part of the Roman fort in Hegra should now be dismissed. The history of that sector and the recovered ceramics closely reflect the history and the material culture as reconstructed on the basis of excavations inside the fort proper. Although no more detailed information can be gathered from the ruins on top of Hill B, it is a well-grounded hypothesis that these three entities (the fort, the Northern Annex and the citadel) were the components of the same military reality in Hegra during the Roman period (**fig. 70**, see **fig. 1**). Incidentally, it is also worth noting that not only the excavations in Trench E but also those in other areas of the fort yielded a relatively large number of coins of Trajan (AD 98–117) indicating that the significant influx of Roman soldiers in the newly conquered town of Hegra is well reflected by the number of early 2nd century coins.

At this point of time, the 3rd century appears to be the most enigmatic period in the history of the site. The excavations of the fort and the Northern Annex have not revealed any distinct traces of destruction, although some kind of localised (?) fire might have affected some sectors. Yet, there are undeniable signs that some kind of a “crisis” or “emergency” had caused disruptions during that time, which deemed it necessary to undertake some new, hasty arrangements. These include the removal of paving stones evidenced in Trenches B, C and E, the blocking of the main gate in the southern perimeter wall, and the construction of small buttresses along that wall. One wonders if the abandonment of the initial function of Room XV as a heated room in Trench E should also be added to this list. Whatever was the reason for that “crisis” cannot be evaluated



Fig. 70. Trench E at the end of excavations in 2021. View from the south-west (Z.T. Fiema).

as historical sources are silent regarding this part of the empire in the 3rd century. Nevertheless, not only the response to such postulated crisis but also the long-term outcome can be discerned in archaeological record. In Trenches B, C, and E, the occupation, being the last military one, continued albeit with a somewhat reduced intensity until the end of the 3rd or even the beginning of the 4th. Yet, in the meantime, some areas of the fort may have been either temporarily or permanently abandoned. Also, the reuse of flagstones in non-paving function is notable and well attested. The excavations in Trench E also confirm the previous proposition that the last phase of occupation, dated to the 4th–early 5th century, before the final and total abandonment of Area 34, might perhaps be associated with the civilian population moving inside the fort after it was vacated by the military. These last occupational stages, however, need further amplification through the new archaeological data.

Regarding the extant remains in Trench E, some micro-scale phenomena received interpretation, which is only partially satisfactory. For example, the function of plaster layer 34533 inside Room XV (the sub-phase 2B or Phase 3) remains unexplained, nor its curious pattern of preservation. Similarly, the sequence of construction episodes involving the northern limit of Room XXII, i.e., walls 34560, 34562, and 34570 is uncertain and the combination of these walls into one massive structure does not find easy functional explanation. Was there a guard post located there or over Room XXII in the form of an observation platform or even a tower? Finally, it is puzzling that both large jars—in the Central Corridor and inside Room XX (on top of platform 34576)—remained standing *in situ* throughout Phases 3–4, even if the tops of their bodies were broken. Why the latter was carefully filled up with stones, similarly to the stone half-basin 34553? Such questions will need to be addressed through the continuing fieldwork as well as the intensive research toward the final publication of the Roman fort in Hegra.

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The 2021 Season in Area 34: Trench F (the Eastern Barracks) Preliminary Report

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In addition to the fieldwork conducted in Trench E (see separate report), the 2021 season at the site of the Roman fort in Hegra (Area 34) also included the excavations in Trench F located in the eastern part of the fort. This trench covered the northern part of the so-called Eastern Barracks, i.e., a block of at least eleven rooms located at the foot Hill B which once housed the citadel (**fig. 1**). The exact number cannot be securely proposed as only three and a half of the rooms were fully excavated. Depending on the assessment of the space west of Room I (Rooms IIA and IIB) and the design of Rooms III and X (single rooms or subdivided), the number of the rooms in the block may be as high as thirteen (see fig. 4 of the report on Trench E).



Fig. 1. The eastern side of the Roman fort in Hegra. The Eastern Barracks are in the centre, with the citadel hill in the background, the sector of Trench E in upper left and the sector of Trench D in lower left (E. Botte).



Fig. 2. *The Eastern Barracks (E. Botte).*

As opposed to other excavated rooms inside the fort (e.g., Rooms XI–XIV) which internally abut the southern perimeter wall as well as the unexcavated yet discernible rooms abutting the western and northern perimeter walls, the Eastern Barracks can generally be considered as designed to be a free-standing block of rooms,¹ oriented north-south, and featuring *at least* three units, each being two room deep, i.e., featuring double-room spaces (**fig. 2**). Only on the southern side, in the sector of Trench A (Room I, and only partially exposed Rooms IIA and IIB) the block abuts the so-called Narrow Rampart, which appears pre-Roman (Nabataean) in date. There, the structural arrangement (Rooms IIA, IIB and III) is neither symmetrical nor regular, requiring further clarification through excavations. Altogether, the block occupies the space of maximum c. 29 m (north-south) x 12 m (east-west). Notably, series of rooms continue further north of the Eastern Barracks, all the way to the sector of Trench D, but their orientation is changed into north-north-east–south-south-west and there is no apparent connection between these rooms and the Eastern Barracks.²

Because of its location close to the base of the western slope of Hill B, the eastern part of the fort, including the Eastern Barracks, was always affected by the movement of the colluvium, i.e., the deposits of soil and rock material created by slow but continuous downslope wash, especially during the winter seasons. As the ground continues to slope in the area of the Eastern Barracks and further west, replicating the contour of the bedrock there, and due a considerable erosion

1. When viewing this building in the structural-chronological and functional perspectives rather than considering a purely physical arrangement.

2. Except through wall 34557 which continues southward from the sector of Trench D but its course is unclear when approaching the sector of Trench F. Thus it cannot be determined if the three stones in the north-east corner of Room X belong to that wall or to wall 34616.

there, the movement of the colluvial material from the slopes of Hill B, was not consolidated there. Rather, while almost completely obliterating the Eastern Barracks' remains, the material continued tumbling further down in a west–south-west direction. The sandstone bedrock in the sector of the Eastern Barracks is particularly soft and with color ranging from pale yellow to bright reddish-orange. As such it remains in total opposition to the much harder, presumably older, rock formation characteristic for the lower slope of Hill B, the color of which ranges from deep reddish-brown to almost black.³ These geo-environmental factors heavily impacted on the construction methods used and the state of preservation of the Eastern Barracks.

Excavation record

Some conclusions in this preliminary report remain tentative, due to the fact that the final assessment of the ceramic material recovered there is still pending. As noted above, the state of preservation of structures in Trench F is exceedingly fragmentary. Basically, only the lowermost courses of enclosing stone walls are preserved and the excavated deposits, nowhere deeper than 0.5–0.6 m, represent strata at and mostly below the original floor levels, the composition and appearance of which cannot be determined. The preliminary readings of ceramics recovered from the excavated *loci* uniformly indicated a date in the 2nd–3rd century, with no earlier or later pottery identified. It is thus reasonable to assume that the excavation record represents only one general time-period, i.e., the construction and to a certain degree the period of use. The presentation will at first concentrate on the description of the physical remains, to be followed by the interpretation and commentaries dealing with specific aspects of the barracks.

The walls and doors

Trench F, maximum c. 7.5 m (north-south) x 12.5 m (east-west) covers the entire space of Rooms VIII and IX as well as little more than the eastern one-third of Room X, all excavated down to the bedrock (**fig. 3**). Due to the exceedingly fragmentary preservation of the walls, it was not always possible to discern where one wall ends and another begins, nor to fully observe the relationships (abutting/bonding) among them. For example, wall 34044 is a long, seemingly single east-west installation separating Rooms VIII and IX on one side from Room X on the other. But the separation between Rooms VIII/IX and Rooms VI/VII appears composite and effected by two walls, 34617 and 34608, the former seemingly abutted by the latter. The northern wall of Room X is also composite, i.e., featuring the stone section (34460) and the mudbrick section (34615). Generally, the short north-south walls, such as 34607, 34043 and 34616, seem to be abutting the long, east-west walls but this is not necessarily applicable in all cases. For example, the short, north-south wall 34618 appears to be abutted by the east-west wall 34617. These irregularities, however, indicate that the barracks' block, *at least in the northern and central parts* (i.e., Rooms IV–X) is not a result of gradual addition of rooms. Rather, the construction there proceeded according to a pre-designed plan including all rooms specified above, and the irregularities resulted from the differing pace of the building process.

While all walls feature two rows of stones, neither was more than two courses high and most had only one course. Therefore, the examination of the tops did not produce any meaningful

3. It is also possible that this very hard blackish rock is, in fact, an uppermost crust of the otherwise much softer and lighter sandstone formation which makes up the plateau on which the fort was built.

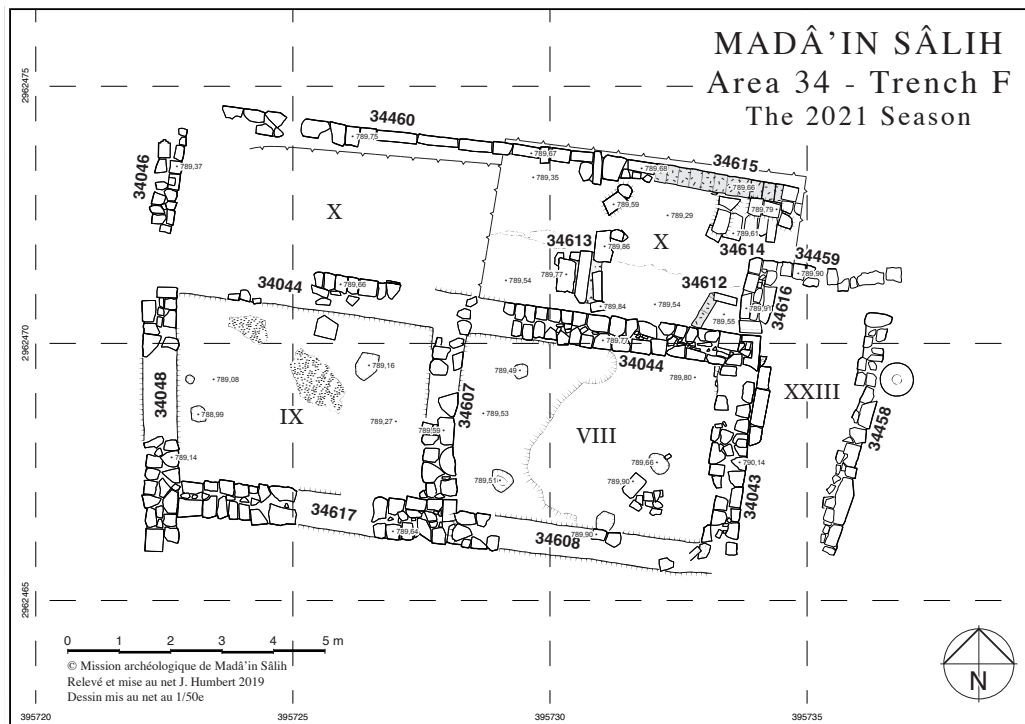


Fig. 3. Top plan of Trench F (J. Humbert).

indication as for where the doors to specific room spaces were located. However, it is reasonable to assume that there was a connection between Rooms VIII and IX, over wall 34607, and the “gaps” in walls 34618 and 34046 may indicate that there were doors leading from the west to the interiors of Rooms IX and X, respectively. Finally, there is a possibility that there were also doors in the easternmost north-south walls, i.e., walls 34043 and 34616 (*infra*).

Room VIII

This room is enclosed by walls 34043 (east; length: 3.40 m, width: 0.75 m), 34608 (south; length: 4.70, width: 0.60 m), 34607 (west; length: 3.40 m, width: 0.65 m), 34044 (north; total length: c. 11.45 m, width: 0.65 m). The space enclosed by these walls is 3.60 m (north-south) x 5.00 m (east-west). Below *locus* 34600—a brownish topsoil silt mixed with sand—there were *loci* 34602 (south-east quadrant) at c. 789.90 m asl, and 34603 (the rest of the room space) at c. 789.70 m asl—both being greyish-brown on color. *Locus* 34609, a pocket of greyish silt (c. 0.55 x 0.41 x 0.25 m) was dug into the surface of *locus* 34603, along wall 34044, and it contained several sherds, including these of a jar dated to the 2nd–3rd century. On top of *locus* 34602 which, in turn, was located directly on a slightly higher, roughly triangular in shape, bedrock, there was a cluster of smaller stones and a larger stone slab (c. 0.60 x 0.30 x 0.17 m) which might or might not have been a paving slab (**fig. 4**), yet not *in situ*. This is the only evidence, albeit extremely ambiguous, from Rooms VIII–X, which may potentially indicate that the rooms had flagstone floors. C. 1 m north-east of the slab, there was a cooking pot inserted into a roughly round depression (diameter c. 0.3 m, the bottom at 789.66 m asl) in the very soft bedrock, and secured in place by soil of *locus* 34602. The pot (34602_P01), with its neck and rim missing, was filled with soil but no other finds inside. Further west, in the area of *locus* 34603, there was another, larger storage jar (34603_P01) inserted into a roughly round depression (diameter c. 0.45 m, bottom at 789.51 m asl) in the bedrock. Only the lower part of the body of that jar was preserved (**fig. 5**). Notably, there were also some other roughly round or oval depressions in the bedrock but these did not form any meaningful pattern indicating “postholes” for roof support, etc. (**fig. 6**). Both *loci*—34602 and 34603—provided very few ceramics and no datable diagnostics.



Fig. 4. Room VIII. The cluster of stones, including a paving slab, and a dug-in ceramic vessel (34602_P01) within locus 34602. View from the west–south-west (Z.T. Fiema).



Fig. 5. Room VIII. The storage jar (34603_P01) dug into the bedrock in the south-west corner of the room. View from the west–south-west (Z.T. Fiema).



Fig. 6. Room VIII after the excavations, featuring two other depressions or holes in the bedrock. View from the north (Z.T. Fiema).

Room IX

This room is enclosed by walls 34607 (east; length: 3.40 m, width: 0.65 m), 34617 (south; length: 5.50 m, width: 0.70 m), 34618 (west; length: 3.75, width: 0.65 m), and 34044 (north; total length: c. 11.45 m, width: 0.65 m). The space enclosed by these walls is 3.55 m (north-south) x 4.95 m (east-west). There are significant gaps in the roughly central parts of walls 34617 and 34618. Judging from the configuration of preserved stones, at least the former might have been a door (c. 1.5 m wide). The stratigraphy was uncomplicated and the excavated deposits provided no artifacts except for ceramics. Following the topsoil, *locus* 34601, the northern half of the room space was occupied by *locus* 34604—a greyish-brown silt (top at 789.43 m asl), which contained considerable amount of powdery whitish material (presumably disintegrated mortar?) in its central-northwestern part (**fig. 7**). Below *locus* 34604 was *locus* 34605 (top at 789.30 m asl) which occupied the entire room space, and the bedrock (top at 789.24–789.06 m asl) below it. *Locus* 35605, a brownish-grey deposit, contained considerable quantities of ash, either mixed with silt or in small patches, especially in the southern part. Again, as in Room VIII, there were three roughly



Fig. 7. Room IX. Locus 34504 with a deposit of whitish powdery material. View from the west-south-west (Z.T. Fiema).



Fig. 8. Room IX after the excavations, featuring other depressions or holes in the bedrock. View from the north (Z.T. Fiema).

oval depressions in the bedrock (no deeper than 0.15–0.20 m) and again these did not form any meaningful pattern (**fig. 8**). The largest one, diam. c. 0.60 m, might theoretically have been used to insert a ceramic vessel. Very few sherds were found in Room IX and none diagnostic.

Room X

This room is enclosed by walls 34616 (east; preserved length: 1.60 m, width: 0.65 m), 34044 (south; total length: c. 11.45 m, width: 0.65 m), 34046 (west; preserved length: c. 2.00 m, width: 0.55 m), and two walls on the northern side: 34460 (stone; length: 10.70 m, width: maximum 0.40 m) and 34615 (mudbrick; length: 2.45 m, width: 0.40 m). While the minimal width of wall 34460 is probably related to the very poor state of preservation, the equally insignificant width of the mudbrick wall 34615 is puzzling. Both walls represent the same orientation and course and, due to the northward sloping down of the bedrock (789.60 in the south *versus* 789.25 in the north), both stand on c. 0.15–0.20 m deposits of soil (**fig. 9**). But while structurally wall 34615 is a continuation of stone wall 34460 but in mudbrick, it is debatable whether or not it was an actual load carrier. Perhaps, it should rather be considered as a part of a massive levelling and backfilling as that encountered in the area of Trench D (*infra*).

Only the eastern part of the room has been excavated, amounting to the space of c. maximum 2.65/2.80 m (north-south) x 5.50 m (east-west). Since it is not known if Room X was subdivided into two spaces by a north-south wall, it can only be noted that its total size is 2.65/2.80 m (north-south) x 11.40 m (east-west). As this room is considerably narrower than Rooms VIII–IX and considering the large quantities of ceramics and bone found there, the function of Room X was probably different than that of other rooms (*infra*).

The topsoil, *locus* 34606, a light brownish-grey deposit (top at 789.88 m asl) yielded considerable amount of ceramics and bones, however, again without decisive diagnostics. Below the topsoil, the entire excavated area down to the bedrock was occupied by *locus* 34611, a heterogeneous



Fig. 9. Room X. View from the south–south-west (Z.T. Fiema).



Fig. 10. Room X.
Locus 34610.
View from the north
(Z.T. Fiema).

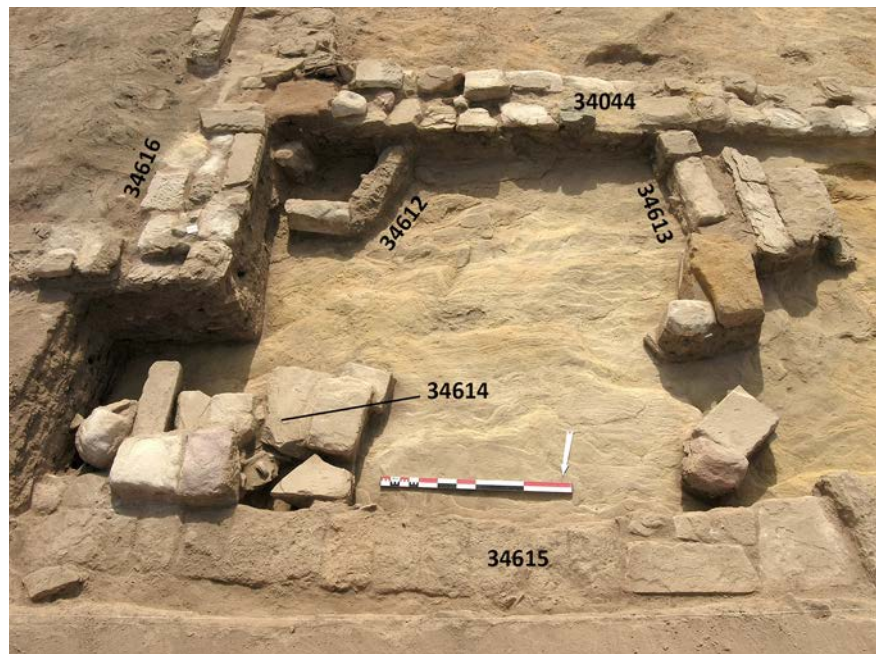


Fig. 11. Room X.
View from the north
(Z.T. Fiema).



Fig. 12. Room X. Locus
34614 centre, wall 34615 in
foreground. View from the
north.

deposit of silty/clayish soil which contained numerous sherds (mostly pithoi and storage jars), with datable sherds of the 2nd and 3rd c. AD and no earlier or later material. In the north-east part of this *locus*, a particularly dense deposition of ceramics and small stones in clayish soil (**fig. 10**), occupying a roughly quadrangular area (c. 2.80 x 1.20 m) was recognised as *locus* 34610 (top at 789.80 m asl). That *locus* also contained numerous fragments of pithoi and storage jars datable to the 2nd–3rd century AD. Also below the topsoil there was *locus* 34613, a north-south barrier-like installation (top at c. 789.85 m asl), located c. 2.80 m west of wall 34616 (**fig. 11**). It consists of three stones in a north-south row, altogether c. 1.60 m long, 0.30 m wide and c. 0.25–0.30 m high, which partially stand on soil *locus* 34611. There are also two stones in a row, located on the western side of *locus* 34613, being c. 0.95 x 0.25 m, and one stone (c. 0.60 x 0.40 x 0.10 m) in front of the above and standing directly on the bedrock. The installation is either a significantly eroded/damaged partition or some sort of a “platform”. Also below the topsoil and in the south-east corner of the room there is a roughly quadrangular small enclosure (c. 1 m east-west x 0.80 m north-south), *locus* 34612 (top at 789.55 m asl), formed by two mud-bricks and one longer slab (see **fig. 11**). The soil inside the enclosure contained several sherds of a larger pithos, which could be dated to the 2nd–3rd centuries. Finally, *locus* 34614 is an installation located in the north-east corner of the room (**fig. 12**, see **fig. 11**). It consists of seven stones standing partially on the bedrock, in an east-west line, and abutting wall 34615. The installation is c. 1.70 m long (east-west), c. 0.80 m wide (north-south), its maximum height is 0.28 m and its top is at 789.60 m asl.

Room/Space XXIII

This space, which was not excavated, is formed by walls 34459 (east-west; length: 3.05, width: c. 0.35 m) and 34458 (north-south; length: c. 5.00 m, width: c. 0.45 m), both in a very poor state of preservation (**fig. 13**). The former is probably bonding with wall 34616 (= the eastern wall of Room X) exactly south of the place where a central gap is visible in that wall. The Room/Space XXIII is c. 5.50 m (north-south) x c. 2 m maximum (east-west). The surface of the interior features large quantities of ash. Abutting the outer (eastern) face of wall 34458 is a large, roughly circular

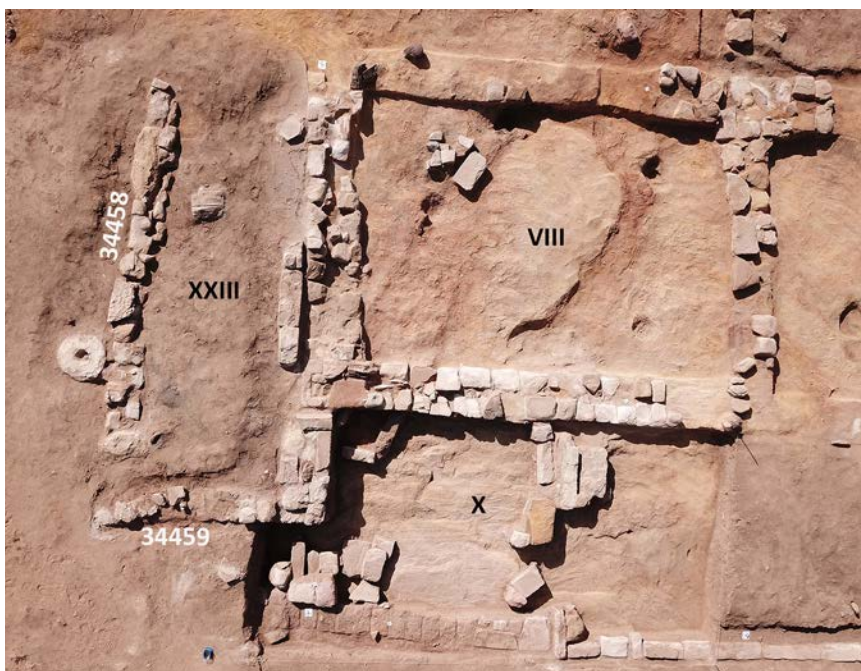


Fig. 13. Room/Space XXIII, VIII, and X in the lower centre (E. Botte).

(diam. c. 0.67 m) stone made of soft, whitish sandstone, with a socket-like depression in the centre (diameter c. 0.28, depth c. 0.15 m). Since not excavated, the function of this space remains undetermined but it must have remained in a meaningful relation to Rooms VIII and X, perhaps serving as a porch, veranda or a storage space.

General Observations and Interpretation

On the basis of previous investigations and the 2021 excavations of Rooms VIII–X, some general interpretative observations can be offered which, while specifically pertaining to the excavated units, may also be applicable to the entire building. At first, it must be kept in mind that the Roman fort in Hegra, due to its peculiar topographical setting and the apparent physical and functional connection with Hill B (the Citadel), which required specific architectural solutions, cannot easily fit in the typology of the military fortifications in Roman Arabia (see Parker 1995).⁴ Not only typological but equally chronological parallels are either inadequate or only partially relevant, mostly due to the paucity of the comparable material. Except for the auxiliary fort at Humayma (*infra*), no safely dated 2nd century AD fort is known from Roman Arabia.⁵ After all, the early provincial garrison was distributed throughout the territory, both in urban centres and distant outposts, and the major expansion in military constructions happened only in the 3rd century (Kennedy 2004: 51). The *praesidia* in the Eastern Desert of Egypt, dated to the 1st through the 3rd century (Brun 2018), thus chronologically comparable to the early 2nd century fort in Hegra, provide relevant structural parallels to some other parts of the fort in Hegra but not to the Eastern Barracks. Therefore, it will be instructive to restrict this presentation to specific comments concerning the design and size, locational arrangement, construction techniques, and the assumed function of the Eastern Barracks.

Design and size

As already suggested (Fiema and Villeneuve 2018: 710), the building located in the eastern part of the fort, oriented north-south, and featuring units which are two-room deep, should be interpreted as military barracks. Such arrangement resembles a double-room unit in Roman barracks, which served to accommodate *contubernium*, a squad of eight soldiers⁶. With regard to the general design, the closest blueprint parallel is provided by Davison Type B—rectangular front room (*arma*) serving as storage and living space and rectangular rear room (*papilio*) containing sleeping arrangements, both rooms being of roughly the same dimensions. This type appears more common in auxiliary forts rather than in legionary fortresses, especially during the Antonine period (Davison 1979: 4–5, 101, 267, fig. A).

Rooms IV–IX at Hegra are roughly 3.6 m wide and 5 m deep, and if applying *pes Monetalis* (0.296 m), these measure 12 x 17 p.M. This indicates that at least these rooms were subjected

4. This complex issue will be fully treated in the final publication of the fort in Hegra.

5. The fort at Khirbet Khiraf in the Jordan Valley, with rooms against the perimeter walls, was tentatively dated to the 2nd century, as based on the collected pottery and very limited excavations, and the date of the supposedly Trajanic fort at Tel Sheva is uncertain (Hirschfeld 1991: 170, 178, 179).

6. For the discussion on the allocation of space per one inhabitant of *contubernium*, see, e.g., Davison 1979: 39, 101, 127; Reddé 2006: 244–245.

to the modular design in use by Roman engineers (for the subject, see Oleson 2017). For comparison, the free-standing *contubernia* in the fort at Humayma in Jordan, the chronologically closest parallel to Hegra, as dated to the early 2nd century, feature *arma* which are somewhat smaller (c. 3.4–3.6 m x 3.8–4.6 m) than *papiliones*, which are c. 3.6–3.9 m x 4.6–4.8 m, although due to the substantial later modifications of these rooms, their original size is difficult to establish and thus the application of specific Latin terminology is ambivalent.⁷ Chronologically comparable rooms in the Egyptian *praesidia* are also rectangular, from c. 4 to 6 m in length and c. 3.50 to 4 m in width⁸ but these are peripheral installations, not free-standing (Reddé 2006: 244).

Locational arrangement

Generally, the free-standing barrack blocks are characteristic for legionary fortresses and auxiliary forts of the Early and Late Empire but, as suggested above, the fort in Hegra cannot easily fit into any of these typological categories of Roman military fortifications. On the other hand, with the barracks and other utility rooms abutting the inner faces of the southern, western and northern perimeter walls, the fort in Hegra resembles many smaller forts and fortlets dated to the 3rd century and later, although it has been demonstrated elsewhere (Gregory 1995: 140) that this is not an exclusive rule either with regard to the date or the size of a fortification. The aforementioned *praesidia* in the Eastern Desert of Egypt feature barrack rooms solely built against the inner faces of the perimeter walls, thus well-reflecting a similar arrangements along the three curtain walls at Hegra but not providing parallels for the double units of the free-standing Eastern Barracks.

There are three fundamental factors, which influenced the locational arrangement and, to a certain degree, the design of the Eastern Barracks: the possibility of previous (Nabataean) occupation, the overall design of the Roman fort, and the geology/configuration of the terrain. Concerning the first factor, the information is limited but it is highly probable that Room I already existed in the 1st century AD as it associated with the so-called Narrow Rampart (Fiema 2016). It is also probable that the structures directly north and west of Room I (i.e., Rooms IIa, IIB and possibly Room III?) also originated in pre-Roman times. That would account for the irregularity of design in the southern part of the Eastern Barracks, which is quite notable when compared with the part further north (see fig. 2). If the aforementioned structures already existed when the fort was constructed in the early 2nd century, these could have provided an opportunity to be supplemented by regularly planned and equal in size Rooms IV–IX, and thus ultimately creating a roughly uniform barrack block.

Secondly, the fort does not have the eastern perimeter wall because the citadel must have been included as an integral part of the fort. Although next to nothing can be said about the citadel (the area was subjected to intensive quarrying in the early 20th century and currently resembles an enormous mound of stones, with many good quality ashlar), remains of at least three walls can still be visible at the top and the intensive surface sherding provided large quantities of pottery dated from the Iron Age through the Late Roman period. There must have been some access from

7. Also, the application of specific Latin terminology is somewhat ambivalent in this case. See Oleson, forthcoming. I am grateful to the author for this still unpublished information and his other comments.

8. For example, the best preserved *praesidium* at *Maximianon* (al Zarqa), dated to the late 1st century AD, these are c. 6 x 3m, while at the equally well preserved fort at Qusur al Banat (early Severan period), these are c. 5 x 3.5 m (Reddé 2018, § 33)

the interior of the fort to the top of the hill but no longer discernible under the stone material on the slope. Incidentally, there is, however, a “backdoor” access, i.e., a flight of steps (*locus* 34083) on the north-east side of Hill B, leading from the sector of Trench E to the top of the hill.

Thirdly, it is notable that the Eastern Barracks are located precisely at the tectonic division between a relatively soft yellowish-orange bedrock (to the west) and a much harder, dark bluish-black rock surface located to the east (*supra*). The latter is relatively flat directly east of the Eastern Barracks, forming a north-south path or a “street” which leads from the assumed North Gate of the fort (between the sectors of Trenches D and E) southward (see fig. 1), providing a convenient route to the eastern part of the fort as well as, presumably, to the top of the citadel. This path is c. 4–7.5 m wide and further east the rock dramatically rises in a steep manner toward the top of Hill B.

One might thus propose that in the context of the observations above, the block of the Eastern Barracks makes functional and locational sense, especially from the point of view of the spatial organisation in Roman forts. Were Hill B and the citadel non-existent, the fort would have had an eastern perimeter wall against which series of barrack rooms would have been placed, just as is the case of the southern, western and northern perimeter walls at Hegra. In short, the Eastern Barracks are located exactly where the eastern perimeter wall (and its peripheral barracks) would have been.

Construction techniques and internal arrangements

The topography and the geology of the area had considerably affected not only the construction methods employed at the Eastern Barracks but were also instrumental in the context of the overall planning and the final design of the fort in Hegra. Due to the gradual sloping down westward of the bedrock in the area of the Eastern Barracks, the walls generally stand on a very thin soil layer (in the west) or directly on the bedrock (in the east). This is particularly observable in walls surrounding Rooms VIII and IX as the bedrock there, while broken and disarticulated, gradually but not steeply slopes westward. The situation is different in the area of Room X where the bedrock, at first horizontal, rapidly slopes down northward, i.e., toward the area of Trench D (fig. 14).

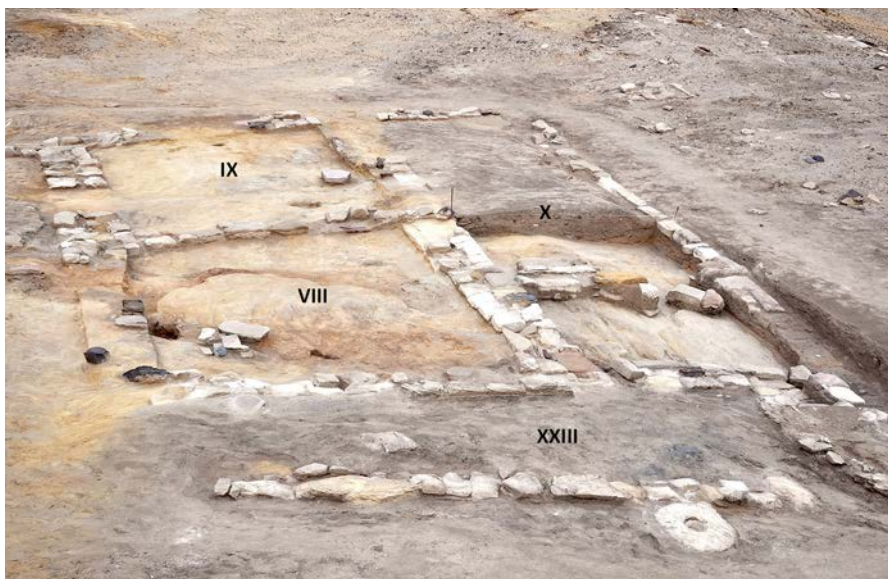


Fig. 14. Area 34, the Eastern Barracks. The bedrock’s rapid sloping down northward is well visible in the interior of Room X. View from the east.

At first, it is notable that the fort's perimeter walls follow the topography of the rocky plateau west of Hill B. For example, the southern wall was built on the edge of the plateau, and the western one largely follows the topographical contours of the plateau. Bearing in mind that the Roman engineers intended to impose a traditional quadrangular plan of the fort upon the high ground, they must have encountered a major problem in the north-east part of the plateau. The bedrock slopes down northward already in the space of Room X and the difference of levels between the bedrock there and in the front of the northern perimeter wall is little less than 2 m (789.50 m *versus* 787.70 m asl, in the space c. 20 m). This means that in the north-east part of the plateau there was a large natural depression in the bedrock, which would have prevented the proper executing on the fort's walls there. What was already observed during the excavations in Trench D (2017), located precisely in that area, was a massive backfilling and levelling process. It took the form of series of stone and mudbrick enclosures which were then filled up either with brought-in soil or layers of mudbrick, or both. It is not known how large was that natural depression and in which place the backfilling and levelling would have started, but it may then be that the southern limit of those operations is formed by mudbrick wall 34615 and stone installations 34614 and 34613. This hypothesis, however, can only be tested through the continuation of excavations north of Room X.

Little can be said about the appearance of the Eastern Barracks. It is not known how high were the stone sections of the walls but it can be safely assumed that the superstructure was made of mudbricks, just like in other places in Hegra (e.g., Area 2). The extensive use of mudbrick in military constructions is well-known in the East, for example in 'Ain Sinu, where mudbrick walls were used in the construction of the so-called Roman Barracks (AS I), with stones or stone rubble as

the foundation course (Oates and Oates 1959: 212). The Eastern Barracks must have been a relatively simple building, probably featuring a lightweight roof. There is no evidence for internal supports, and the existent "postholes" show meaningless pattern. Presumably, the roofing was of a traditional vernacular type (wooden beams reinforced by branches and reeds and proofed by a layer of clay), a technique well attested in the region for the millennia and still employed in the 19th–20th century buildings in the nearby settlement at al-'Ulâ (fig. 15).

The differences in the depth of deposits under the walls indicate that despite the apparent slope, the engineers tried to secure a relative horizontality of the living surface inside the rooms. Since the extant walls represent the lowermost cours(es) it is assumed that *loci* excavated inside mostly represent deposits *at* or *under* the original floor level. A fragment of stone pavement is preserved in the corner of Room XI abutting the southern perimeter wall, but in the area of the Eastern Barracks there was no clear indication of stone paving. Either the paving slabs were removed at a



Fig. 15. The roofing in traditional 19th–20th century houses in the Old Town of al-'Ulâ (Z.T. Fiema).

certain point of time, as documented in other rooms of the fort, or, more likely, the Eastern Barracks being a block of military rank-and-file did not have any formal pavement except for a beaten-earth surface. One may envisage mats and simple carpets covering such surface, which would also permit easy access to the pots and storage jars inserted in the bedrock depressions in Room VIII (*supra*). Incidentally, a large pithos-like vessel was also located in the south-west corner of the otherwise unexcavated Room VII.

Function of specific Rooms

The excavations have not revealed any specific utilitarian installations inside the rooms, except for *loci* 34613, 345612, 34614 (*supra*) the interpretation of which is uncertain. Thus no specific function can be assigned to these rooms except that, according to the conventional understanding, each pair of rooms (front *arma* and rear *papilio*) served a *contubernium*. It is assumed that the front room would be this which faces the interior of the fort and which has the main access door to the pair. As such, Room IX (as well as Rooms VII and V) would serve as storage and living space. Room IX (as well as Rooms VI and IV), being a back room would serve as a dormitory. However, since the Eastern Barracks are considered as basically free-standing and flanked on the eastern side by an access path/street (*supra*), it is possible that there were also entrances to the *papiliones*. In such case, Room/Space XXIII might have served as a porch or veranda. Finally, a highly speculative hypothesis (Fiema and Villeneuve 2018) proposing that the Eastern Barracks might be interpreted as “stable-barracks” i.e., the structures where horses were accommodated in the front rooms equipped with soakaway pits, and troopers in the back rooms (Sommer 1995), cannot be supported on the basis of excavations in Rooms VII–X.

The conventional barrack blocks of legionary fortresses or auxiliary forts were abutted on one end by a larger suite of rooms, which served as a dwelling, office and storage for centurion and his *optio*. There is no indication that Room X could have had such function. If anything, it appears to be smaller (narrower) than Rooms IV–IX and it is not certain if it was subdivided. However, as opposed to Rooms VIII–IX, the excavations of Room X have yielded very substantial quantities of ceramics in *loci* 34610 and 34611. The ceramics were mostly storage jars and large pithoi, all datable to the 2nd–3rd century. Judging from their deposition pattern, the lowermost sherds might theoretically have been mixed up with the soil and stones, which levelled the bedrock during the construction period. Later, vessels were either dug into or placed upon that layer. Apparently, accidentally broken vessels were left *in situ* and covered with more soil contributing to the rising level of occupation. Ultimately, and toward the end (?) of the military occupation, at least some sherds of the broken vessels were pushed aside to the north-east quadrant of the excavated part of Room X, where the density of deposition is particularly high in *locus* 34610. It is less certain how some sherds found themselves within the structure of installation 34614 (see fig. 12) but perhaps these belonged the lowermost levelling stratum. Admittedly, such interpretation of the deposits inside Room X is not overwhelmingly convincing as it implies a certain disorderly simplicity in the otherwise well-organised and disciplined behavior of Roman soldiers. Nevertheless, it is difficult to propose a function to Room X other than being a storage space for ceramic containers, which presumably stored elements of the soldiers’ diet.

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In Search of the Rubbish Dump in the Roman Fort at Hegra

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In 2020 a team from CIRAD (Centre de coopération internationale en recherche agronomique pour le développement [Agricultural Research Centre for International Development]), led by Marc Ducouso, undertook a series of X-ray fluorescence (XRF) analyses around and inside the Roman fort at Hegra, with the aim of revealing, through the chemical composition of the soil, the possible presence of one or more rubbish dumps (see introduction to this report, fig. 3).

The results of these analyses have revealed spikes of phosphate, sulphur, calcium, and strontium (see introduction, fig. 4) in a few locations. As one of these spikes was found south-west of the fort's southern gate, it was reasonable to suppose that this concentration indicated the presence of a soldiers' rubbish dump. On other contemporaneous sites, notably in the fortlets of the Egyptian Eastern Desert, it has been shown that dumps are systematically located outside forts, very often in close proximity to the main gate. Excavated Egyptian dumps have revealed numerous layers of ash which could explain the phosphate spikes (**fig. 1**).



Fig. 1. Section of the rubbish dump in front of the Roman fortlet of Iovis (Egypt), contemporaneous with that of Hegra (© E. Botte).

Four test trenches were therefore opened south of the fort's gate (**fig. 2**).



Fig. 2. Drone view of the test trenches opened outside the fort (© MSAP).

Test trench 34700

The first test trench (34700), measuring 5 x 5 m, was opened at XRF measuring point no. 19. A thick layer of charcoal (34701) very shortly appeared under a fine layer of aeolian sand (**fig. 3**), but there was no other archaeological level underneath. As the altitude of this charcoal layer was higher than the access and circulation levels of the fort, it is most likely that this is a relatively recent, and not an ancient, layer.



Fig. 3. Charcoal level 34701 viewed from the east (© MSAP).



Fig. 4. View of the mudbrick level at the bottom of trench 34710 (© MSAP).

Test trench 34710

Measuring 3 x 1.5 m, this test trench gave a negative result. Only a layer of mudbricks (34711) that did not form part of a wall appeared at the bottom of the open trench (fig. 4).



Fig. 5. Test trench 34720, viewed from the south (© MSAP).

Test trench 34720

This test trench, measuring 3 x 1.5 m, also gave a negative result, and no archaeological level was revealed (fig. 5).

Test trench 34730

A final test trench, measuring 3 x 1.5 m, was opened south of the fort, this time in close proximity to the gate. It only revealed a layer of compacted sand which could represent the northern edge of a ditch (fig. 6). However, no characteristic evidence of a dump was exposed.



Fig. 6. Test trench 34720 and layer of compacted sand, viewed from the east (© MSAP).

Test trench 34740

Following the inconclusive results of the first four test trenches, a fifth trench, measuring 2 x 2 m, was opened north of the fort, near XRF measuring point no. 112. The latter had revealed a significant concentration of phosphorus (fig. 7), probably due to a thick layer of ash (34742) located c. 20 cm under the current surface (fig. 8). Underneath lay a very compacted level (34745) overlying two levels of mudbrick wall (walls 34748 and 35749) (fig. 9). Wall 34748 rested on a layer of ash (34750) which occupies a large part of the trench. The latter is part of a series of *loci* which

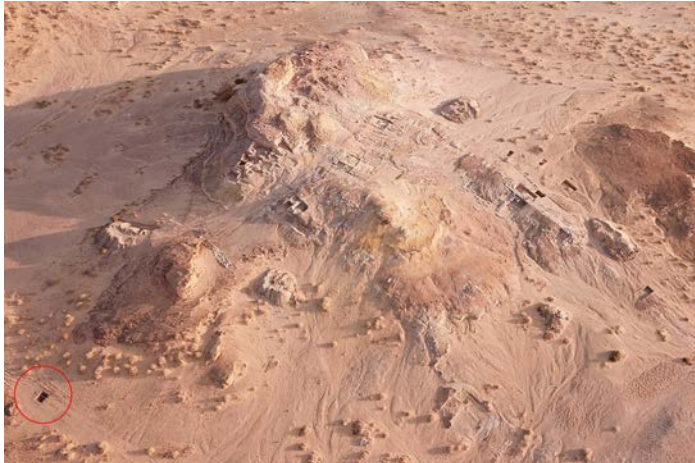


Fig. 7. Drone view of test trench 34720, north of the Roman fort (© MSAP).



Fig. 8. Layer of ash 34742, viewed from the north (© MSAP).



Fig. 9. Walls 34748 and 34749, viewed from the north (© MSAP).

have yielded a large quantity of metal wastes and charcoals. Samples were taken systematically.

Stratigraphy of the trench **(figs 10 and 11)**

— 34740: very compacted layer of silt. It contained three coins: an owl coin (Lihyanite?), a drachm of Antoninus Pius, and a second- or third-century AD Roman Provincial coin that provides a *terminus post quem* for the formation of this level.

— 34741: level of compact sand and silt covering ash layer 34742.

— 34742: thick layer of ash in the south-western part of the trench. A 10-litre sample was taken.

— 34743: thin layer of silt, in the south-western corner of the trench, partially covered by ash layer 34742.

— 34744: ash lens in the north-eastern part of the trench.

— 34745: very compacted layer of silt on the surface. It yielded a (Lihyanite?) owl coin dated between the third and first centuries BC.

— 34746: ash/charcoal lens resting on floor level 34747.

— 34747: very silty floor level, light beige in colour.

— 34748: mudbrick wall oriented east-west. The bricks measure 35 x 22 cm.

— 34749: mudbrick wall oriented north-south. The bricks measure 35 x 22 cm.

— 34750: layer of ash between walls 34748 and 34749, in the northern part of the trench. This layer appears to pass under wall 34748 and corresponds to ash layer 34751 located south of wall 34748. A 10-litre sample was taken.

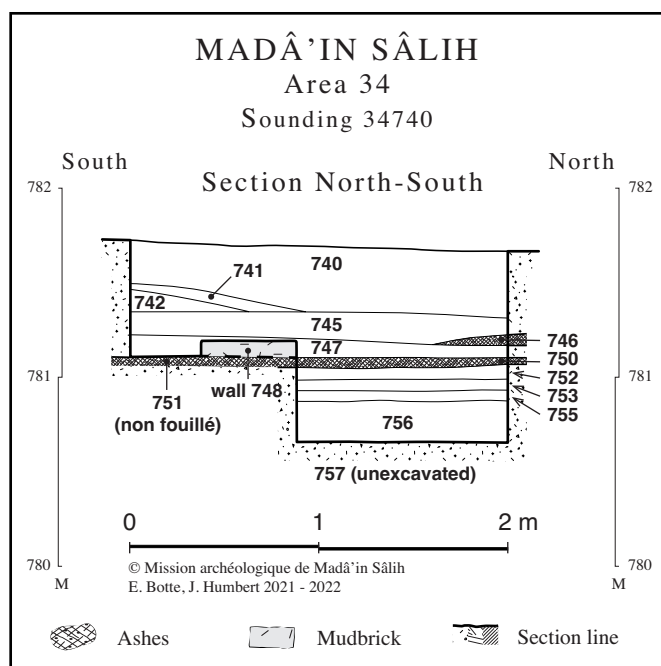


Fig. 10. North–south section of trench 34740 (© MSAP).

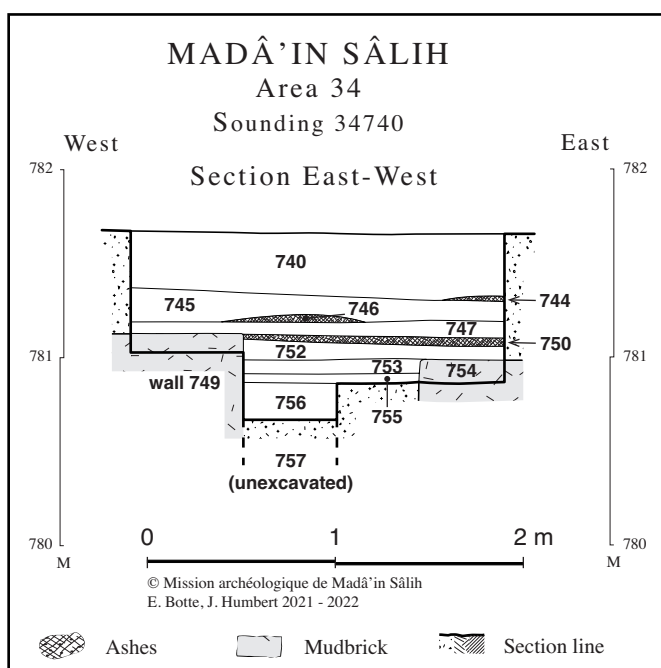


Fig. 11. East–west section of trench 34740 (© MSAP).

— 34751: layer of ash between walls 34748 and 34749, in the southern part of the trench. It was not excavated.

— 34752: thin layer of silt under ash layer 34750. The layer yielded a large amount of slags as well as crucible fragments and faunal remains, but very little pottery.

— 34753: layer of sandy silt containing large amounts of charcoal and slags. A 10-litre sample was taken.

— 34754: layer of mudbricks located in the eastern part of the trench.

— 34755: floor level under 34754.

— 34756: thick, very silty layer containing large amounts of charcoal and slags, as well as a coin. A 10-litre sample was taken.

— 34757: this level was not fully excavated. A layer of sand containing, as the previous one, large amounts of charcoal. A 10-litre sample was taken.

Interpretation

It should be noted that, according to a preliminary study of the pottery by C. Durand, this test trench has yielded a promising pre-Nabataean period context. If the coin discovered in 34756 can be used as evidence, it should provide a *terminus post quem* for the relevant levels. The nature of the discovered remains and the importance of the metal wastes (slags, crucible fragments) suggest a workshop in this sector linked to metalworking (e.g.

bronze forge or workshop). All these levels are sealed by a thick layer of ash on which walls 34748 and 34749 appear to have been built.

Occupation was short-lived, however, as level 34745 marks the abandonment of the sector, which was visited but no longer occupied. Hearths appear occasionally (*loci* 34746 and 34742), providing evidence of these visits.

The chronology of the test trench appears to lie between the Lihyanite and Roman periods: level of abandonment 34745 yielded a (Lihyanite?) owl coin dated between the third and first

centuries BC, while *locus* 34740 yielded three coins—one (Lihyanite?) owl coin, one drachm of Antoninus Pius, and one Roman Provincial coin from the second or third century AD.

The 2021–2022 Seasons in Area 36, Trenches 1 (south) and 2 (north). Preliminary Report

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Introduction

This report presents the first two seasons of the archaeological excavations that took place in 2021 and 2022 in Area 36. The latter is located in the western part of the so-called Residential Area of ancient Hegra, within the city wall, c. 200 m east of the rock-cut tomb façades numbered IGN 50–54 of the Jabal al-Khraymāt necropolis, which are about 200 m away (**fig. 1** and see fig. 1 of the introduction in this volume).

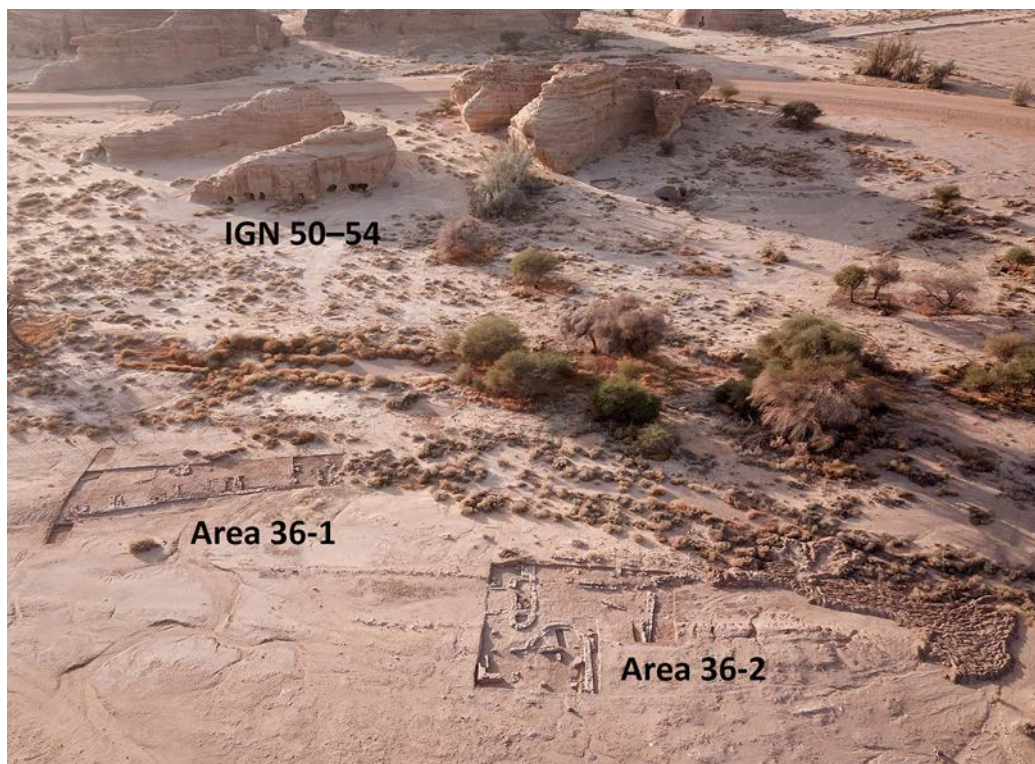


Fig. 1. Aerial view of areas 36-1 and 36-2, with tombs IGN 50–54 in the background.

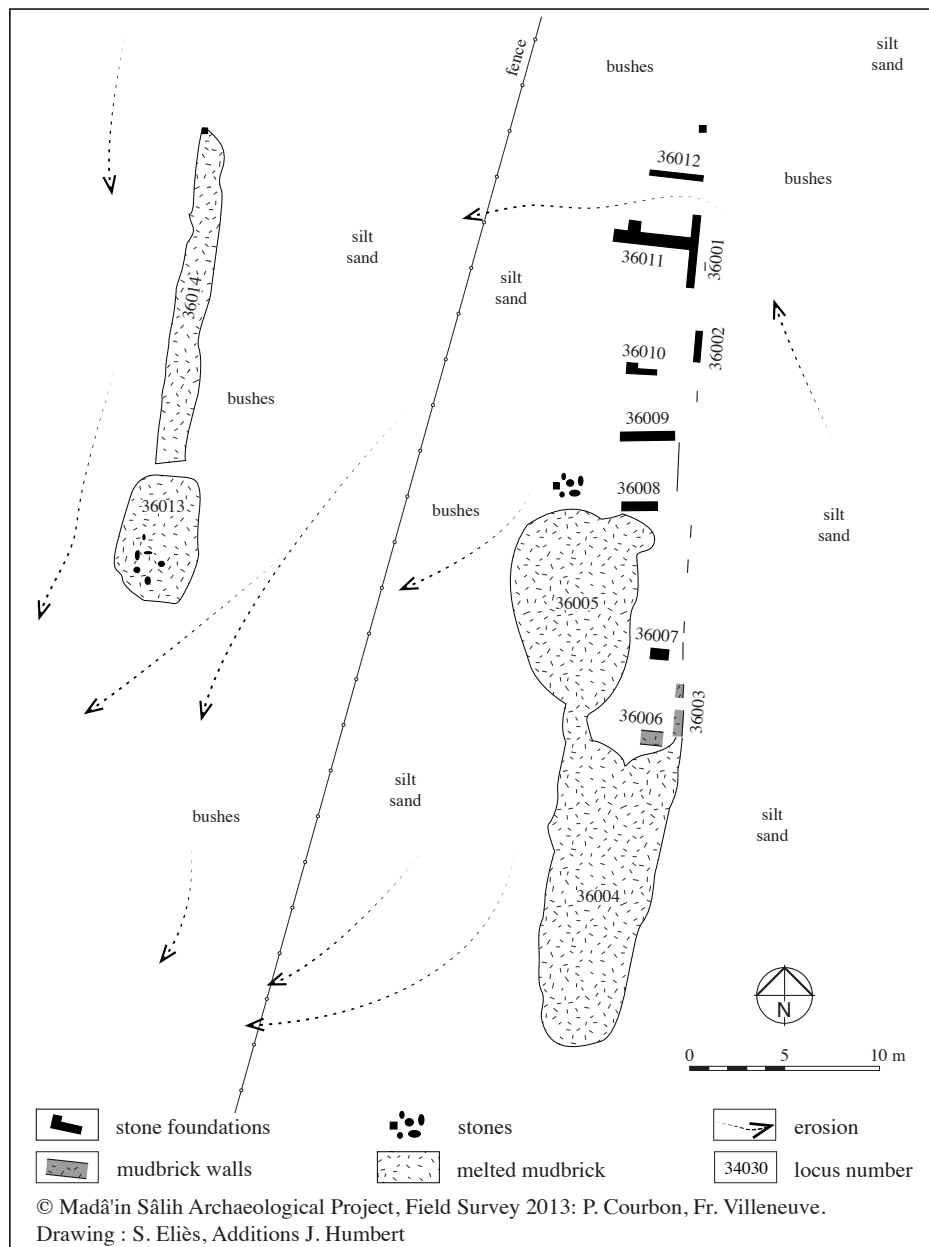


Fig. 2. Area 36 as it was sketched after a preliminary survey in 2013.

This area was chosen because no excavations had been undertaken in this part of the city before and because it seemed important to determine the line of the rampart there and the way it was connected to the closest architectural elements, as it was done in other parts of the city. Sections of the city wall had been identified in this area by François Villeneuve in 2014 and 2015, but the line of the rampart remained unclear due to the lack of traces visible on the surface. Besides, the area, particularly its southern part, suffered from the erosion caused by the floods of the main north–south wadi as well as by the run-off of a number of rivulets (**fig. 2**). It also suffered from the building and use of the Ḥijāz railway, which runs a few meters to the east.

The area as it was excavated in 2021 and 2022 consists of two parts, 36-1 in the south and 36-2 in the north (see **fig. 1**).

Area 36-1 (south, *loci* 36700, **figs 3–4**) revealed nine adjacent architectural units. The elements of the latter were not built exactly at the same time but they seem to belong to the same general



Fig. 3. Orthophoto of Area 36-1.

architectural phase. Indeed, some features overlap each other, there were occasional additions to the structures, and one observes minor differences in the construction method. Apart from the nine architectural units, a large and dense surface of mudbricks was brought to light. The 2021 season was devoted to surface clearance in order to uncover whatever structures might exist. In 2022, two soundings (trench 1 and 2) were dug in square 36700—west of the mudbrick surface—in order to determine the extension and depth of the mudbricks.

Area 36-2 (north, *loci* 36500, **figs 11–12**) was explored using the same strategy: surface clearance in 2021 in order to obtain a general view of the structures visible on the surface; soundings in 2022. The surface clearance revealed the existence of what may be considered as two independent buildings, both in the southern part of the square, in addition to scattered sections of walls disconnected from each other and with different orientations. These are not likely to belong to the same architectural unit. In 2022 season, trenches were dug in the two buildings in order to understand the stratigraphy and determine the function of the buildings.

The clearance and excavation of areas 36-1 and 36-2 revealed buildings of a type that had not been evidenced before in Hegra: a series of adjacent rooms in 36-1

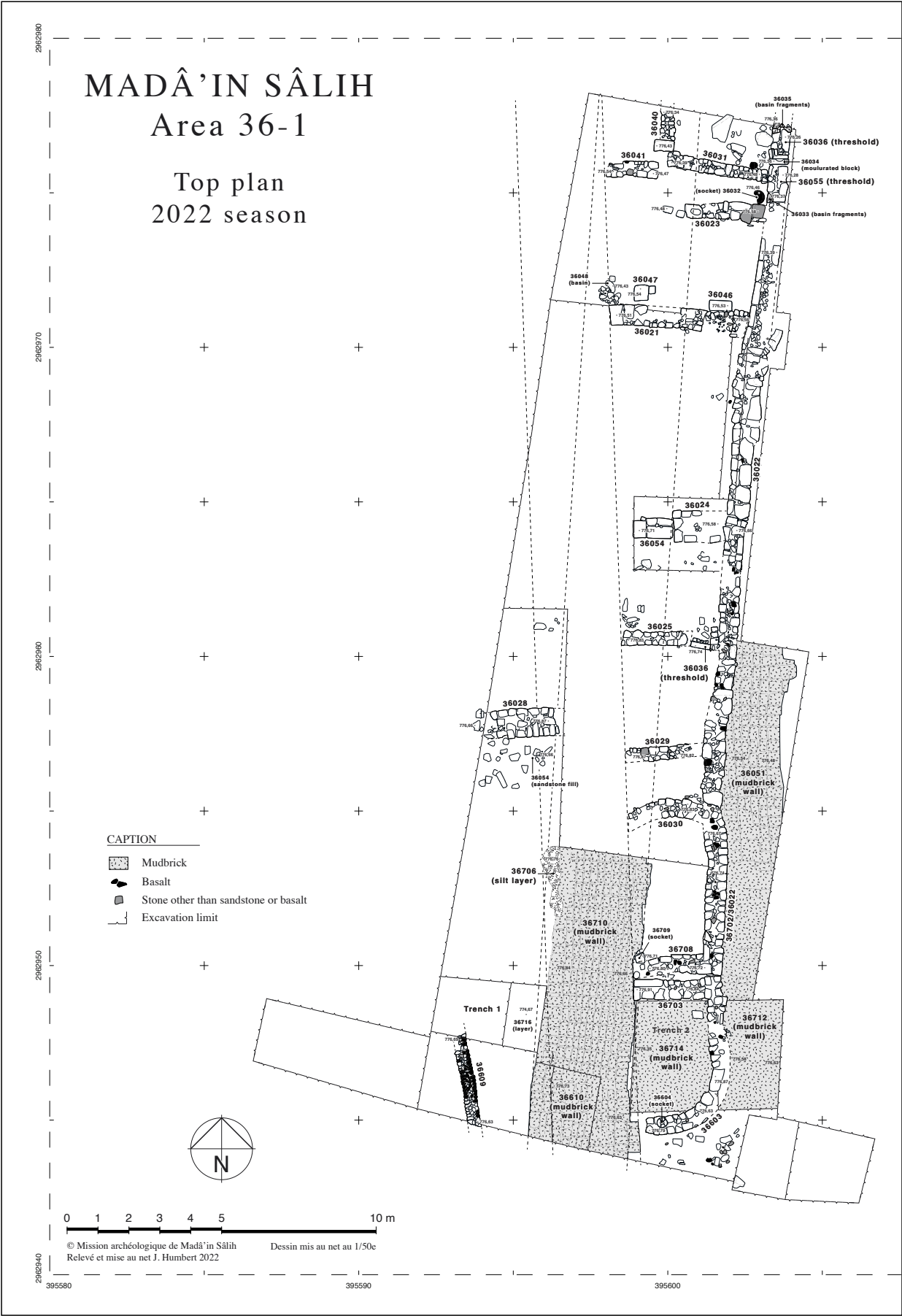


Fig. 4. Top plan of Area 36-1.



Fig. 5. Wall (rampart) 36610/ 36710 from the south-east.

and an apsed building in 36-2, the form of which naturally invites one to interpret it as a church. This interpretation raises however many difficulties, among which the absence, so far, of any artefacts with a religious significance, the fact that the apse is on the west, and the dating of the building which, at least provisionally, does not seem to belong to the very last occupation phase of the site, although this needs to be confirmed (see the pottery report by C. Durand in this volume). One of the consequences of the fact that the whole area is affected by floods and erosion is that the pottery assemblages from the upper levels are mixed, which does not help dating them. They are relatively clearly dated to the late 4th/early 5th century AD in 36-1 (south) and may be earlier—to be confirmed—in 36-1 (north).

Area 36-1 (figs 3–4)

The squares excavated in this area (*loci* 36000, 36600, and 36700), covered a 37 x 10 m surface. They revealed a north–south section of the rampart of the city abutted, on the eastern—internal—side of the city wall, by nine architectural units. The latter are made of sixteen architectural features, including sandstone and volcanic sockets.

Before the 2021 and 2022 clearance and excavations, this area was tentatively interpreted as a caravanserail which would have stood on the edge of the city, the western—blind—wall of the caravanserai being part of the city wall (see Villeneuve 2014: fig. 3 p. 49). It is now clear, however, that the mudbrick city wall already existed in this place and was abutted later by the architectural units.

Wall 36610/36710

This wall corresponds to a north–south section of the western rampart of the ancient city of Hegra. It was uncovered in squares 36600 and 36700. The general surface cleaning undertaken in

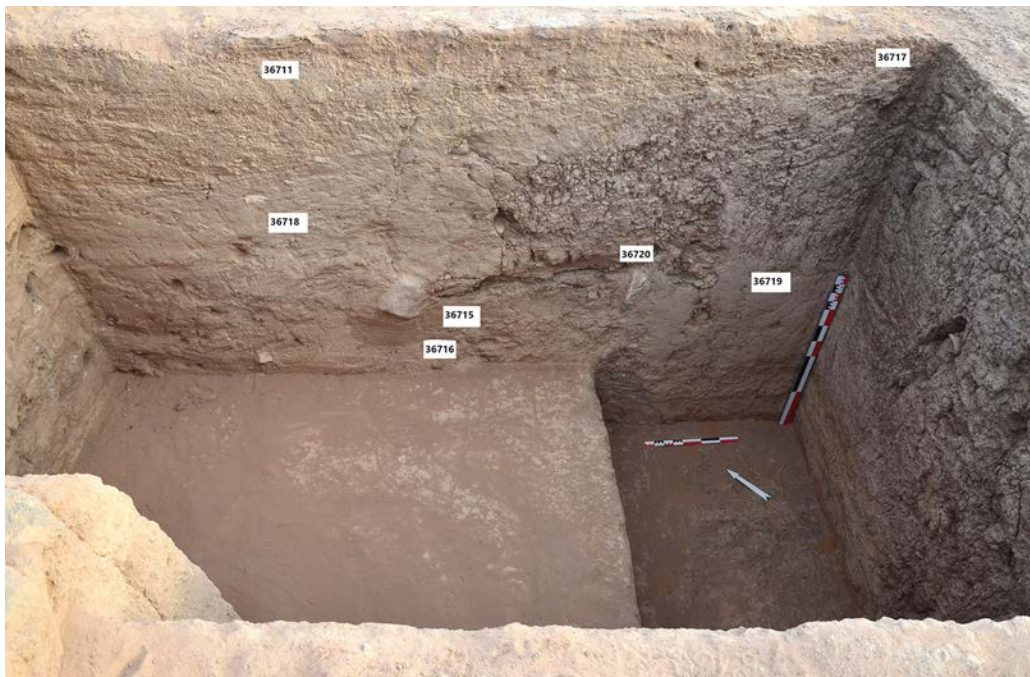


Fig. 6. North section of Trench 1 in Area 36-1.

2021 was followed by two soundings dug to reveal the western and eastern faces of the wall. On the west, trench 1 measured 3.45 x 2.20 m; on the east, trench 2 measured 4.90 x 3.60 m.

The rampart is 3 m thick and the section uncovered is 9.25 m long. On the west side, it is more than 0.60 m high and it is composed of five courses of mudbricks. Two courses of mudbricks only are visible on the east side. The mudbricks are 35 to 40 cm long, 18 cm wide and 12 to 14 cm high. They are arranged differently according to whether they are placed on the edges of the the wall or in its internal part: as headers on the edges and as stretchers inside (see fig. 4).

The two soundings revealed, in their upper parts, layers of fallen mudbricks (*loci* 36717 and 36714) which probably belonged originally to the rampart. In trench 1, on the west, the excavations revealed a sequence of seven layers, reaching a depth of 2.06 m. From bottom to top (**fig. 6**): clay soil 36716, very hard layer of silt 36719 at the same level as sand layer 36715, thin layer of ash 36720, then the fallen mudbricks 36717, clay layer 36718 and finally, at the top of the sounding, mixed sand and clay layer 36711.

The architectural units

Nine adjacent architectural units, abutting the rampart from the inside, were uncovered. The main architectural feature, which forms the backbone of the architectural units, is the long north–south wall 36022/36702. In the north, the faces of the wall are composed of long and narrow sandstone blocks with rubble stones between them. This building technique is used to slightly beyond wall 36021. Further south, down to beyond wall 36024, wall 36022/36702 is built with medium-sized sandstone blocks. The stones then become smaller down to the level of wall 36030. It seems that wall 36022/36702 abuts the latter, which is unfortunately badly preserved. It does therefore not continue further south, and from then on, the north–south wall should have been given another *locus* number. It may be hypothesized that there were originally, in the southern part of the trench, two units formed by: 1/ 36030, 6022/36702, and 36708; 2/ 36603 and 36703. These two



Fig. 7. Northern unit of Area 36-1.

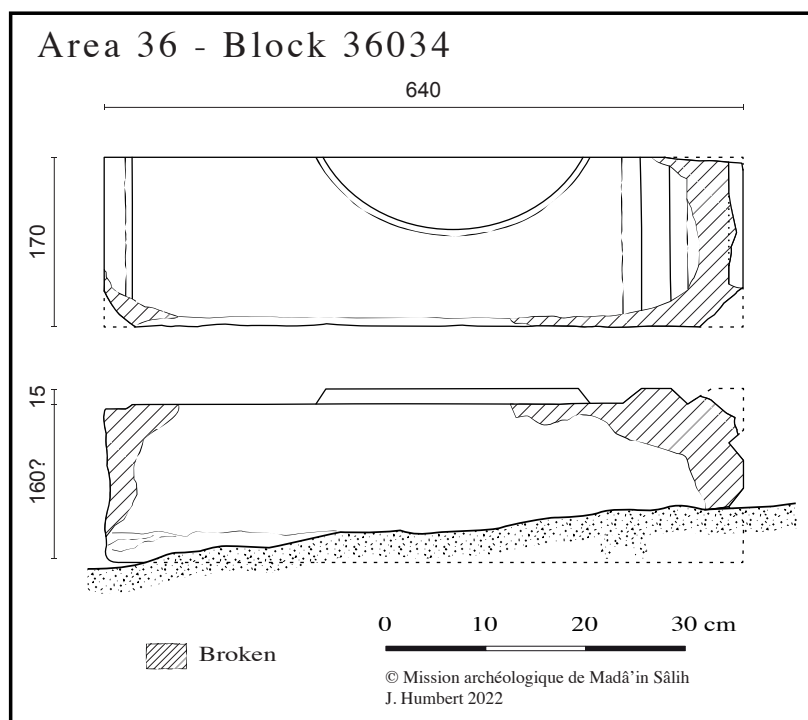


Fig. 8. Moulurated block 36034 in threshold 36036, Area 36-1.

units were clearly separate, as indicated by the existence of parallel walls 36703 and 36708. The features uncovered form a number of distinct units abutting the rampart. They vary in size and shape and their walls form right angles except for the last two which seem to form two roughly symmetrical half rounded enclosures.

Two walls, 36023 and 36041, are considered as later additions in the unit formed by walls 36021, 36031, and 36022. Note also that thresholds 36036 and 36055 are made of reused stones, including fragments of stone basins (36033

and 36035) and a moulurated sandstone ashlar 36034 (figs 7–8).

Sandstone or volcanic door sockets and benches were also brought to light during the excavations (36032, 36046, 36047, 36703, 36709, 36604). It should be kept in mind that the architectural units were excavated only superficially and the walls are thus only one course high. They may be worth investigating deeper in the future.



Fig. 9. Coin 36020_C01, Roman follis from emperor Licinius (317/8 AD).

General observations and interpretation

Thanks to the 2021 and 2022 excavations in this area, the line of the rampart on the western side of the city is now determined, as it is also on its northern, southern and eastern sides thanks to the research undertaken at Hegra in the last few years. The architectural features unearthed in Area 36-1 concern two periods of occupation of the site: the Nabataean one, with the rampart, and one of the late phases, 4th–5th centuries AD. The complete carinated pots 36028_P01 and 36046_P02 are dated to the late 4th/early 5th century AD by C. Durand (see Durand, fig. 5, in this volume). Also, the very well preserved coin no. 36020_C01 is a follis of Licinius I dated AD 317/318¹ (fig. 9).

Area 36-2 (figs 11–12)

This area (*loci* 36500) is located north-east of Area 36-1. It lies in the middle of a continuation of the Wādī al-Ḥijr which runs north–south to the west of the Ḥijāz railway. The rails and railway sleepers of the latter have all been retrieved for secondary use by the people of al-Ḥijr who lived on the site until the mid-1980s, but the earth railway embankment is still clearly visible.

The excavated area measures 20 x 18 m, and some architectural features were already apparent on the surface prior to excavation (fig. 10), including the quarter of a circle marked unit 1 on fig. 11 and parts of walls 36502 and 36547.

The excavations revealed two independent structures named building 1 and building 2 on fig. 11, as well as a number of other architectural features, mainly walls which do not seem to be connected to each other and do not have the same orientation. After the general cleaning of the

1. Identification by Thomas Bauzou.



Fig. 10. Area 36-2 before excavation. In the foreground, the structure forming a quarter of a circle.

2021 season, four soundings (in green on fig. 11) were opened in 2022. Finally, the area around the excavated structures was cleaned superficially in order to obtain a wider and more complete view of the structures (in yellow on fig. 11).

Building 1

This building is quadrangular and consists of five architectural units numbered on fig. 11. Some are not complete and extend beyond the limits of the square. They are composed of twenty-two archaeological features among which walls, floors, doors, stairs, and thresholds. None of them is more than one course high.

The most intriguing unit is no. 1, a quarter of a circle which protrudes from the quadrangle in its north-east corner. No such structure was ever observed in Hegra before. The walls do not show any trace of threshold and the unit may therefore not have been entered from either the outside or the inside (a tower?). It is paved with irregular sandstone slabs (36551) wedged with small stones (**fig. 13**). Since the slabs do not fit exactly the quarter of a circle, it is probable that they were retrieved from another building and were reused here.

The presence of a staircase, made of *loci* 36559 and 36522, suggests that the building either had two storeys or had a roof terrace to which the staircase gave access. It is possible that feature 36564, which was not fully excavated in 2022, was part of another staircase leading to the top of unit 4 (see the plan fig. 12).

The main sounding in this building was dug in unit no. 5, the eastern half of which was excavated. The sounding continued, though not as deep, on the east side of walls 36517 and 36576. Inside the quarter of a circle, the sounding did not go much beyond the stone pavement 36551 because it was decided not to remove the latter; it only reached the space between the slabs as deep as the trowel could go in order to try to document the pre-pavement phase and obtain a *terminus post quem*.



Fig. 11. Orthophoto of Area 36-2.

The soundings showed that some of the architectural features were built over stone and mudbrick foundations (**fig. 14**). This is the case of the walls of unit no. 1 and of the paved floor of the latter². This is also the case of doors and door thresholds nos. 36507, 36509, 36516, and 36574. It is very likely that building 1 was constructed over an earlier—mainly mudbrick—building the extension of which is unknown. A typical Nabataean pottery sherd with incised wavy lines was discovered while cleaning the stones below the stone slabs (see fig. 13). Of course, this sherd alone only gives a *terminus post quem*, it does not give the date of the paving itself.

2. It is not certain whether the stones scattered around and below the paved floor (36551) are foundation stones. In any case, the paved floor is incomplete.

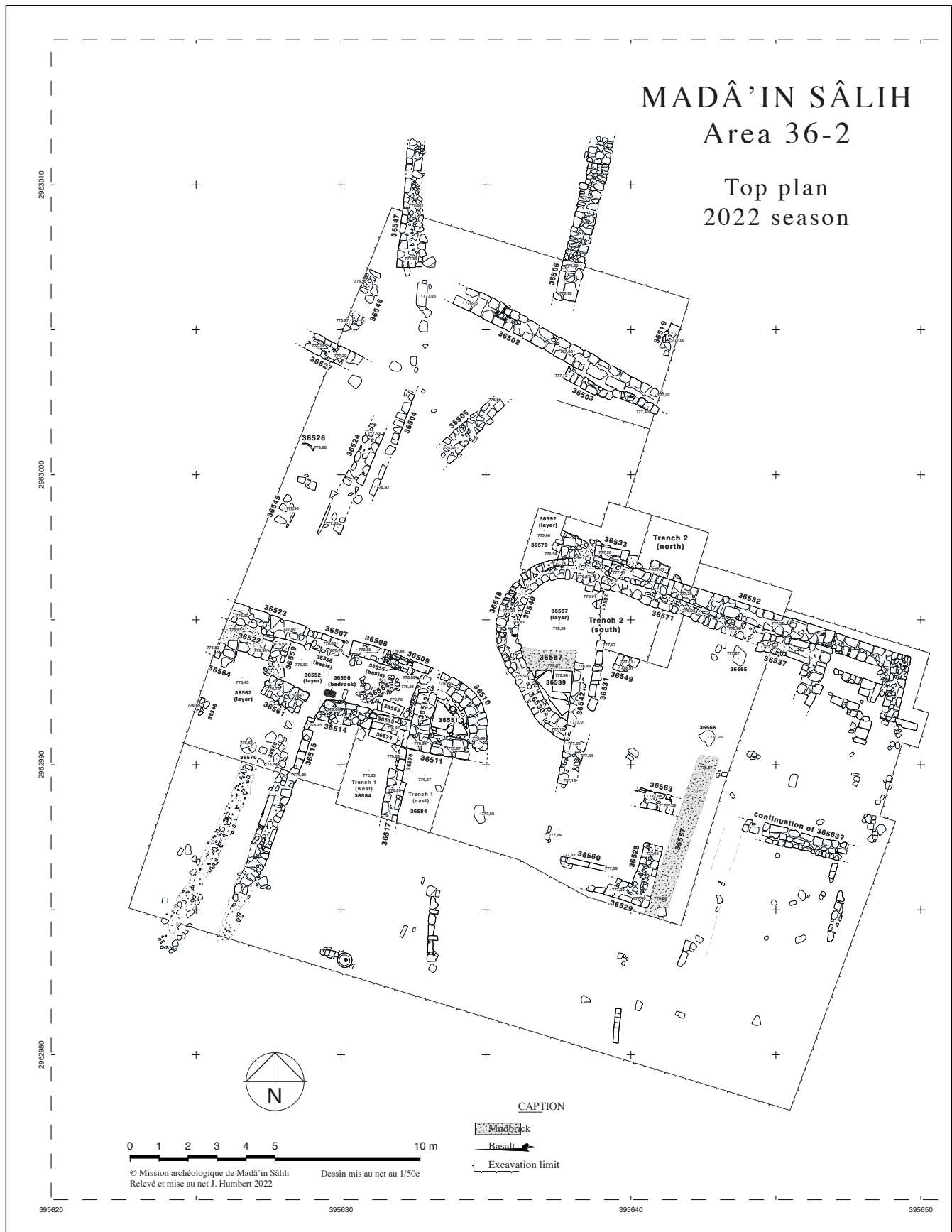


Fig. 12. Top plan of Area 36-2.



Fig. 13. Area 36-2, building 1, unit 1.



Fig. 14. Area 36-2, building 1, view of the sounding in unit 5 at the end of the 2022 season.

Building 2

Located immediately north-east of building 1 but clearly separated from it, building 2 consists of two architectural units within excavated area 36500. A third unit was cleaned outside the latter on the east. The excavated trench was originally smaller but it was extended in 2022 to uncover as much as possible of the building's plan. In 2022, a sounding was dug in unit 2 and on the other side of wall 36571 (see figs 11–12). The excavations showed that the building itself witnessed four successive architectural phases and was built over structures from an earlier period. The plan of building 2 is unprecedented in ancient Hegra, which is why it deserves particular attention.

Shape and design

The building starts with unit 3, on the eastern side of which was probably the main entrance, though this remains to be confirmed. This unit may be interpreted as a kind of entrance hall, or external hallway, to the building. It is a rectangular barlong room and it shows internal partitions the connections of which with the other walls need to be investigated. West of this hall is unit 2, the largest architectural unit in the building. It is also rectangular and contains a number of features which belong to the last two architectural phases of the building. *Loci* 36532, 36571, 36581, and 36593 (**fig. 15**) correspond to the northern walls of the unit while wall 36563 correspond to its southern wall. Unit 2 is separated from unit 1 by walls 36531 and 36542. Unit 1 consists of a semi-circle made of walls 36518, 36530, 36540, and 36591 (**fig. 16**), which belong to the last two architectural phases of the building. As indicated on fig. 11, the semi-circle was affected, at a certain point, by the building of wall 36530, the curve of which is not as perfect as that of 36518 and 36540. The present shape of unit 1 is thus not perfectly semi-circular. The reason for this change is not known: perhaps wall 36518 was damaged and was rebuilt as wall 36530 with less care.

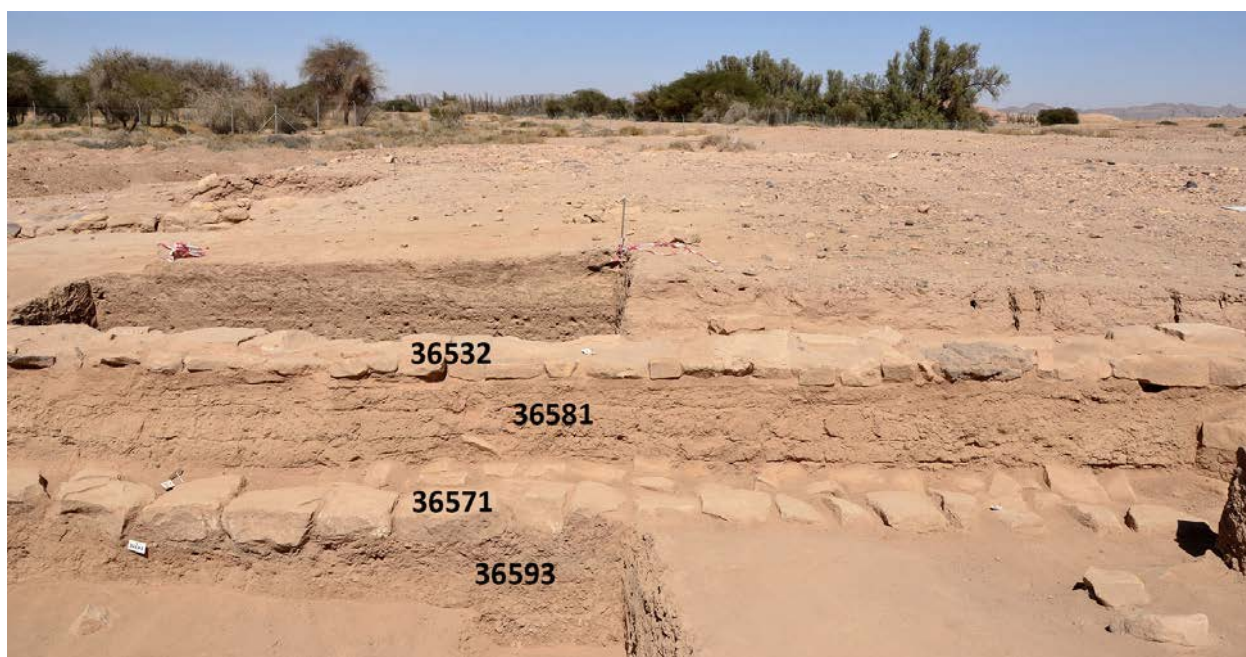


Fig. 15. Area 36-2, building 2, the superposition of mudbrick and sandstone walls forming the northern limit of the building.



Fig. 16. Area 36-2, the loci in building 2, unit 1.

The southern part of the unit, starting roughly where wall 36530 begins, is paved with sandstone slabs (36539) which are certainly in a secondary use here. They are fixed to the ground with mud mortar (36587), over a layer of clay soil (36557). One slab only is complete (0.74 x 0.66 m and 0.06 m thick). A careful cleaning of the ground north of the preserved slabs showed the negative imprint of some slabs which had been removed.

An offering table (36541) lies flat at the level of the summit of wall 36571 (see fig. 16).

Architectural phases

The preliminary results obtained so far show that building 2 witnessed four architectural phases and was built on earlier remains possibly belonging to an older building. The sounding dug north of walls 36532 and 36534 (trench 2 north) showed that the stratigraphic sequence reached a depth of 1.80 m. The earliest phase, Phase 1, corresponds to wall 36579, which runs north-west-southeast and continues below building 2. Phase 2 is represented by wall 36586, which abuts wall 36579 on its southern face (**fig. 17**). It is probable that walls 36579 and 36586 (phases 1 and 2) both belong to an earlier building the orientation of which is very different from building 2 as it appears on the plan. The latter is concerned by phases 3 and 4.

Phase 3 corresponds to walls 36540 and 36591. 36540 is built with sandstone blocks whereas 36591 is a mudbrick wall.³ Paved floor 36539 was also attributed to this phase because it was laid along wall 36540. Also belonging to this phase is wall 36542, which separates units 1 and 2 in this phase. In unit 2, the walls which belong to this phase are 36571 and 36593, which are at the same level as 36540 and 36591 in unit 1. To this phase belongs finally the southern wall of the building, 36563⁴.

3. Note that wall 36591 corresponds to wall 36590, evidenced in the southern section of trench 2. 36591 is in fact the southern face of the wall while 36590 is simply the northern face of the same wall.

4. Only a small section of this wall (1.36 m long and 0.63 cm) was uncovered in the excavations but the cleaning undertaken outside the original trench revealed that it continued eastwards.



Fig. 17. Area 36-2, part of the southern section of trench 2, north of wall 36532.

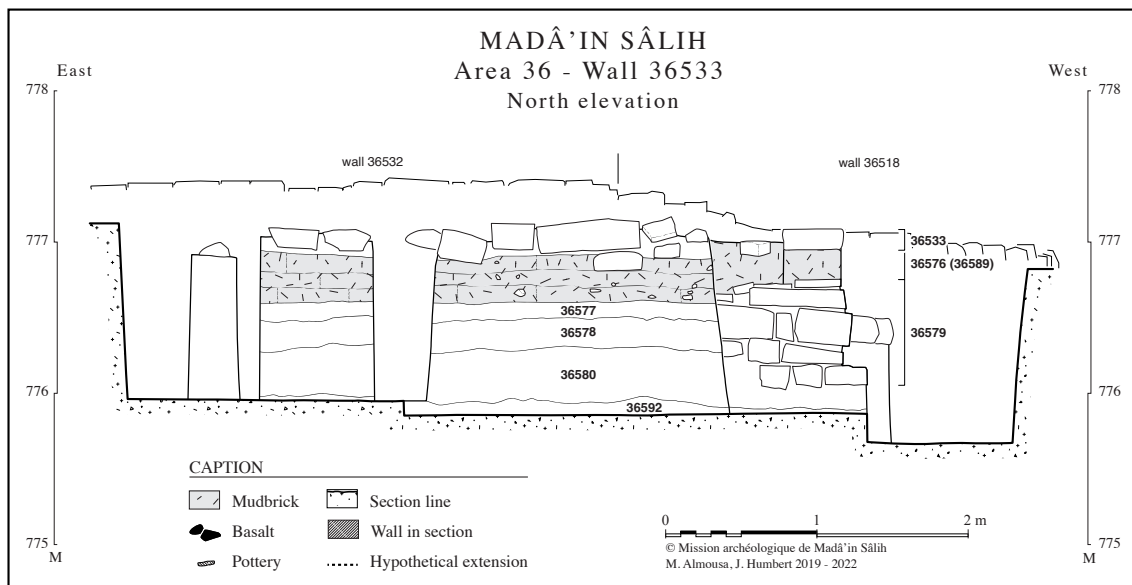


Fig. 18. Area 36-2, southern section of trench 2, north of wall 36532.

The fourth and final architectural phase is represented by walls 36533 (stone) and 36576 (mudbrick) which are in fact one single architectural element with different building materials. These two may have been outside buttresses for building 2 (**fig. 18**). To this last phase belong also walls 36518 and 36530 from unit 1 and wall 36531 from unit 2. The latter is interpreted as the wall separating units 1 and 2 in this phase. Finally, walls 36532, 36537, 36549, 36581, and 36582, as well as the scattered remains of a sandstone paved floor also belong to this phase (36534—which was removed and does not appear on the plan, 36565, 36566).

The loci outside the buildings

A number of architectural features which do not belong to either of the two buildings were uncovered in the excavated area. These are o sandstone walls 36502, 36503, 36506, 36527, and 36547, all one course high. Their function and the building(s) to which they originally belonged are not clear.

General observations and interpretation

The results of the 2021–2022 excavations have shown that this part of the Residential Area of ancient Hegra was occupied in the late period: 4th-5th centuries in Area 36-1, with a series a adjacent rooms abutting the Nabataean rampart; possibly a little earlier, though this remains to be confirmed, in Area 36-2, with two independent buildings the plan of which is unprecedented in Hegra.

The buildings were mainly built in sandstone blocks but sandstone and mudbrick could occasionally be used together in the same features. This is the case of walls 36581 and 36532. This mixture of building material was also observed in 36540 and 36591, 36571 and 36593 as well as in 36576 and 36533.

The complete stratigraphic sequence is unfortunately still unclear in Area 36-2, not only because the pottery has not been fully studied yet, but also because it appears that most of the material was mixed, with dates for the pottery material ranging from the 3rd century BC to the Late Roman period (**figs 19–20**). This time interval is also reflected in the coins recorded in this area (**figs 21–22**). The small bronze figurine 36000_M03, collected on the surface of Area 36000, represents possibly a Roman Victory (**fig. 23**). Despite this uncertainty, it is possible to say that the remains presently visible in Area 36 mostly belong to the latest phase of occupation of the site.



Fig. 19. Pottery sherd 36544_P15, Rhodian amphora bottom (3rd/1st c. BC).



Fig. 20. Pottery sherd 36544_P20, probably Nabataean, 1st century AD.



Fig. 21. Coin 36544_C01, Lihyanite owl (massive style) overstruck on a Ptolemaic coin, 3rd-1st c. BC.



Fig. 22. Coin 36578_C01 (Area 36-2, T2), owl group.



Fig. 23. Bronze figurine 36000_M03, representing a Roman Victory.

As for the interpretation of the buildings, it is difficult to be sure yet. The adjacent rooms in Area 36-1 may have had a utilitarian function. As for building no. 2 in Area 36-2, the apsed unit may one think of a church, even it is on the west side of the building—this is not impossible—but this is still a very hypothetical interpretation, especially since no material with a religious character, apart from the offering table 36541 (possibly reused), was put to light in it.

Reference

Villeneuve F. 2014. “The Rampart and the South-Eastern Gate (Area 35). Survey and Excavation Seasons 2011 and 2014”, *Report on the Fifth Season (2014) of the Madâ'in Sâlih Archaeological Project*: 17–76.

Preliminary Report on Area 9

Pierre-Marie BLANC (CNRS-UMR 7041)

Since the full report was not submitted in time by the archaeologist in charge, only a preliminary report is presented here, in the hope that the full report will be submitted subsequently.

MADÂ'IN SÂLIH
Area 9

Top plan 2022

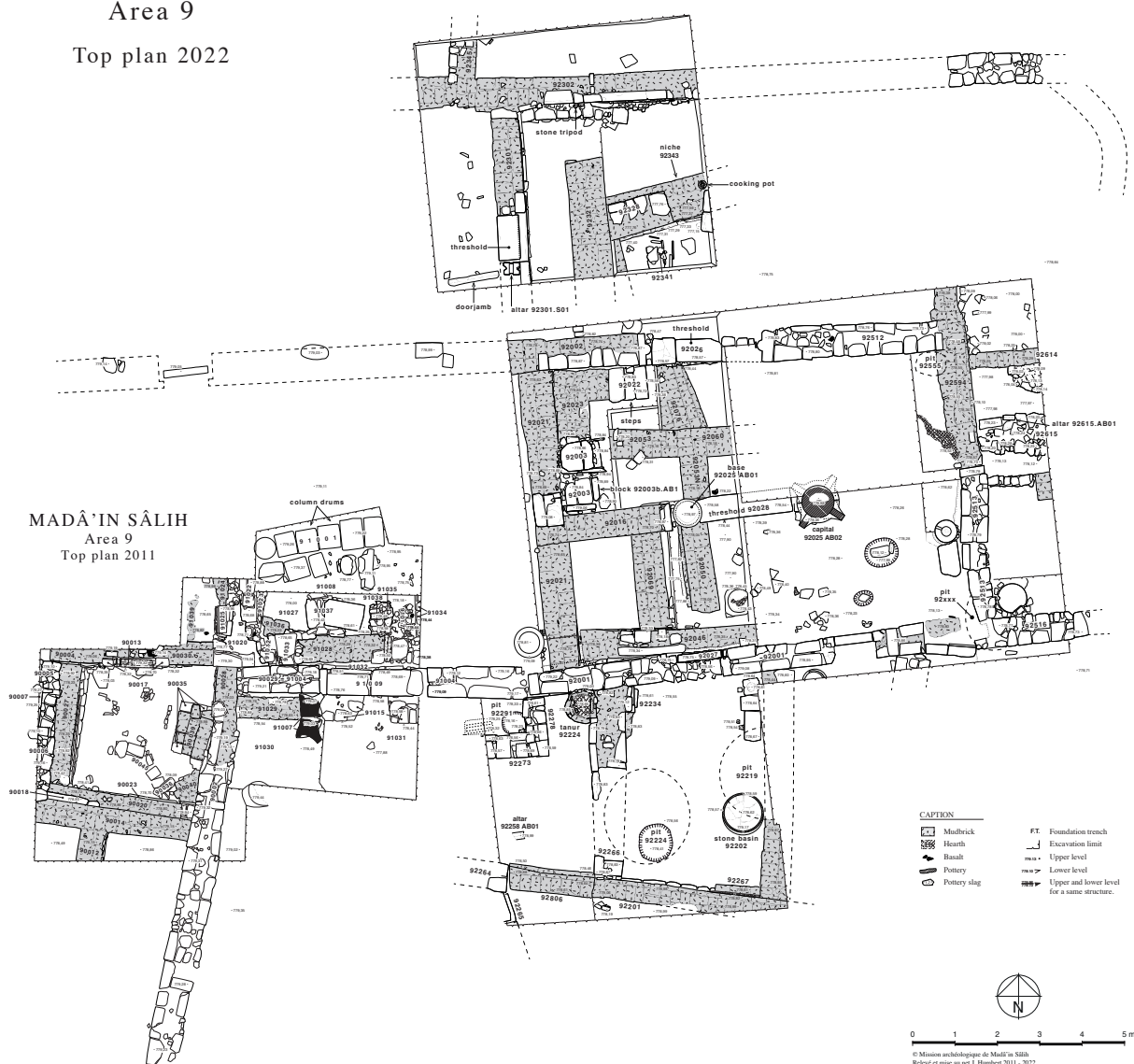


Fig. 1. Area 9 at the end of the 2021 season, showing the location of the various trenches (© MSAP).

Area 9 has been excavated by Zbigniew T. Fiema, followed by Jérôme Rohmer, until 2017. It was taken over by Pierre-Marie Blanc in 2021. The objectives were to understand better the buildings and their chronology in this area which has yielded many reused blocks which originally belonged to a monumental architecture. A careful excavation allowed to identify a larger number of phases of occupation than were previously recognized. Unfortunately, at the end of the 2022 season, the lowermost levels were reached only on a very small surface in trench D (**fig. 1**).

In this trench, the sandy surface revealed an occupation made of small pits which yielded only one pottery sherd. The suggested date for this first occupation (4th-3rd centuries BC) remains therefore hypothetical. Following it, two mudbrick walls forming an angle were built using a very narrow foundation trench. The mud-bricks of the lower course are all headers (c. 18 x 35 cm) and one header in five is slightly recessed. To this angle are associated the cooking structure 92342 and the chest/table 92341 excavated by Rohmer in 2017.

The trench opened south of trench C in 2021 revealed that some of the rooms witnessed a late reoccupation phase with an oven (*tannûr*) (**fig. 2**) and a small wall (92234). This phase is probably contemporary with the remains of a bronze workshop put to light in 2021 slightly further east (proposed date end of 4th-5th century CE). Several raw fragments of amethyst found together in the corner of two walls belonging to the Nabataean phase (Phase 2) suggest the existence of a semi-precious workshop.

In the middle of the sounding, a large and deep robbing pit, excavated down to more than 1.20 m (**fig. 3**) revealed the destruction levels of a fine Nabataean building. This is suggested by the presence of numerous fragments of plaster and of broken vessels (glazed bowl, significant fragments of fine Nabataean pottery imported from Petra). Traces of fire were also noticed (ash, charcoal,



Fig. 2. An oven and a latrine put to light in 2022 in one of the late phases of occupation in Area 9 (© MSAP).



Fig. 3. A large pit in the southern soundings in Area 9. Inside the pit, the destruction of Nabataean levels (© MSAP).

blackened blocks, melted copper alloy fragments, etc.). East of it, a smaller pit was possibly dug to retrieve a stone basin—visible on the surface of the trench— which turned out to be too broken to be reused.

While examining the occupation levels of the 3rd-4th century phase, a probable craft industry structure was identified (92253) which involved the transferring of product(s) into small stone containers several lids of which were found close to each other (see the Introduction, fig. 17, 92224_S01). The presence in contemporary levels of two amphora stoppers cut into pottery fragments, sealed with plaster and bearing traces of resins (pitch?), is another argument for the interpretation of this space as a commercial area. Note that the abandonment level of the latter was rich in copper alloy metallic artefacts (key, (see the Introduction, fig. 16, 92240_M04, box fragments, etc.). A large fragment of a plaited basket was also found in another, older, abandonment level, associated with a counterweight. The installation of a latrine in one corner (see fig. 2) of the same room may however lead to question this interpretation.

In the central space, the presence of a remarkable ionic Nabataean capital made of three blocks carefully wedged in place, upside down, cannot be explained yet (**fig. 4** and see the Introduction, figs 9-10). It is surely evidence, along with the column drums and other blocks with architectural decoration put to light during previous excavation seasons, of the presence nearby of a important Nabataean building many blocks of which were reused subsequently. There was certainly, somewhere in the vicinity of Area 9, in the Nabataean period, a major religious or public building of which nothing was found *in situ* yet. Figures 2 and 3 show the complexity of this area.



Fig. 4. Nabataean capital 92025_AB02 in its reused context (© MSAP).

The 2021 Medina–Petra Survey

Laïla NEHMÉ (CNRS–UMR 8167) and Jérôme NORRIS (University of Lorraine)

The objectives of the 2021 al-‘Ulā–Madīnah survey season were initially to explore the area between aṣ-Ṣuwaydirah, c. 60 km east–north–east of al-Madīnah, and Khaybar, 130 km to the nord-west (fig. 1). The reason why it seemed important to explore it was the recording, at al-Ṣuwaydirah, in 2019, of twelve Nabataean and Developing Arabic inscriptions among which two Nabataean texts mentioning a *strategos*, i.e. a provincial governor.¹ The presence of a high rank Nabataean official more or less at the latitude of al-Madīnah strongly suggested some sort of Nabataean control, either on the territory south of Hegra or on the routes which connected the most important oases in the region, al-Madīnah (ancient Yathrib), Khaybar, and Hegra. Besides, the recording of Nabataean and Developing Arabic inscriptions at al-Qaṭī‘ah, Ḥaḍabat al-Ra‘ayṣah



Fig. 1. The area between Hegra and al-Madīnah.

1. See the 2020 report, <https://hal.archives-ouvertes.fr/hal-03131855>, p. 126–127.

and as-Sij (see fig. 1) suggested the possible existence of an itinerary connecting Hegra to aṣ-Ṣuwaydirah through Khaybar.

These plans were unfortunately hampered by the fact that the survey team was engaged, in 2021, in the filming of a 90 mn documentary the object of which was the exploration journey between al-Madīnah and Petra, 760 km apart (see the Introduction to this report for more detail). In order to fit the tight filming schedule, the amount of time which could be devoted to the exploration between al-Ṣuwaydirah and Khaybar was considerably reduced. In the end, one afternoon only was spent driving along the wadis connecting al-Ṣuwaydirah and Khaybar, partly along the Wādī al-Gharas. The quick observation of the surrounding rocks with binoculars did not allow to discover any inscription. This does not mean that there were not any, and the area will have to be explored more thoroughly in the future.

Most of the surveying days were in fact devoted to the section between Hegra and the Saudi-Jordan border, along the well-known Darb al-Bakrah² where some areas had already been visited in the past while others remained to be explored. Besides, the team took the opportunity of entering Jordan to visit the previously published sites of Jabal al-Munayshīr and Jabal Kharazah. The former is known for several texts in Nabataean and other scripts published by D. Graf (1994: 306–307) and the latter for an impressive hydraulic installation, rock-cut monuments (among which a cistern), as well as Nabataean and Greek inscriptions.³

On the Darb al-Bakrah, the publication of which is under the responsibility of L. Nehmé, the team surveyed several sites which had not been visited in 2004, when the route was first followed. The coordinates of these new sites were indicated to us by the most active person of the Farīq aṣ-Ṣaḥrā team of amateur explorers, Abdullah al-Saeed, to whom we are grateful for his long-term engagement in the service of knowledge of these region and his willingness to share data and information with scholars from various countries. Some of them had already been included in the Darb al-Bakrah publication but more exact coordinates and additional photographs were taken. Among them are the impressive water pools of Ghadīr ar-Rāshidah and the sites DBv1 to DBv3, to which proper names need to be given after the examination of 1/50,000 maps of the region.⁴ Others had not been published before and the inscriptions they contain will ultimately be included in a supplementary volume on the Darb al-Bakrah. Another significant site is al-Mukattabah, “the written (place)” in Arabic, a toponym which suits particularly well the area, the rocks of which are covered with inscriptions written in Nabataean and other scripts and languages, sometimes isolated and sometimes forming groups of texts. Finally, several new sites were discovered on the way.

Below is a table listing the sites visited (**figs 2–3**).⁵ It is still preliminary for two reasons: 1/ it does not include the sites which yielded only Ancient North Arabian inscriptions. These still need to be numbered by J. Norris, a task made difficult by the number of texts in this category; 2/ the “sites” are still referred to by the GPS number they were given during the survey. As long as the sites with

2. For which see Nehmé 2018.

3. See Kirkbride and Harding 1947: 19–21, pl. VI, fig. 1; Milik 1958: 249–251, who published the two Nabataean inscriptions carved near the dam.

4. “DBv” stands for “Darb al-Bakrah various”.

5. The precise coordinates of the sites are not given in this report in order to avoid visits by ill-intentioned persons.



Fig. 2. The portion of the route on which the survey team concentrated in 2021.

only Ancient North Arabian inscriptions, or only rock-drawings/archaeological structures are not properly listed, it would indeed be counterproductive to number them now. They will ultimately receive an identification number following the system used in 2019 and 2020, from UM001 to UM999 for the section between al-'Ulā and Medina.⁶ As for the section between al-'Ulā and Petra, they will receive the siglum UP.

6. 127 sites have been recorded in 2019 and 2020, the numbering will therefore start again from UM128.

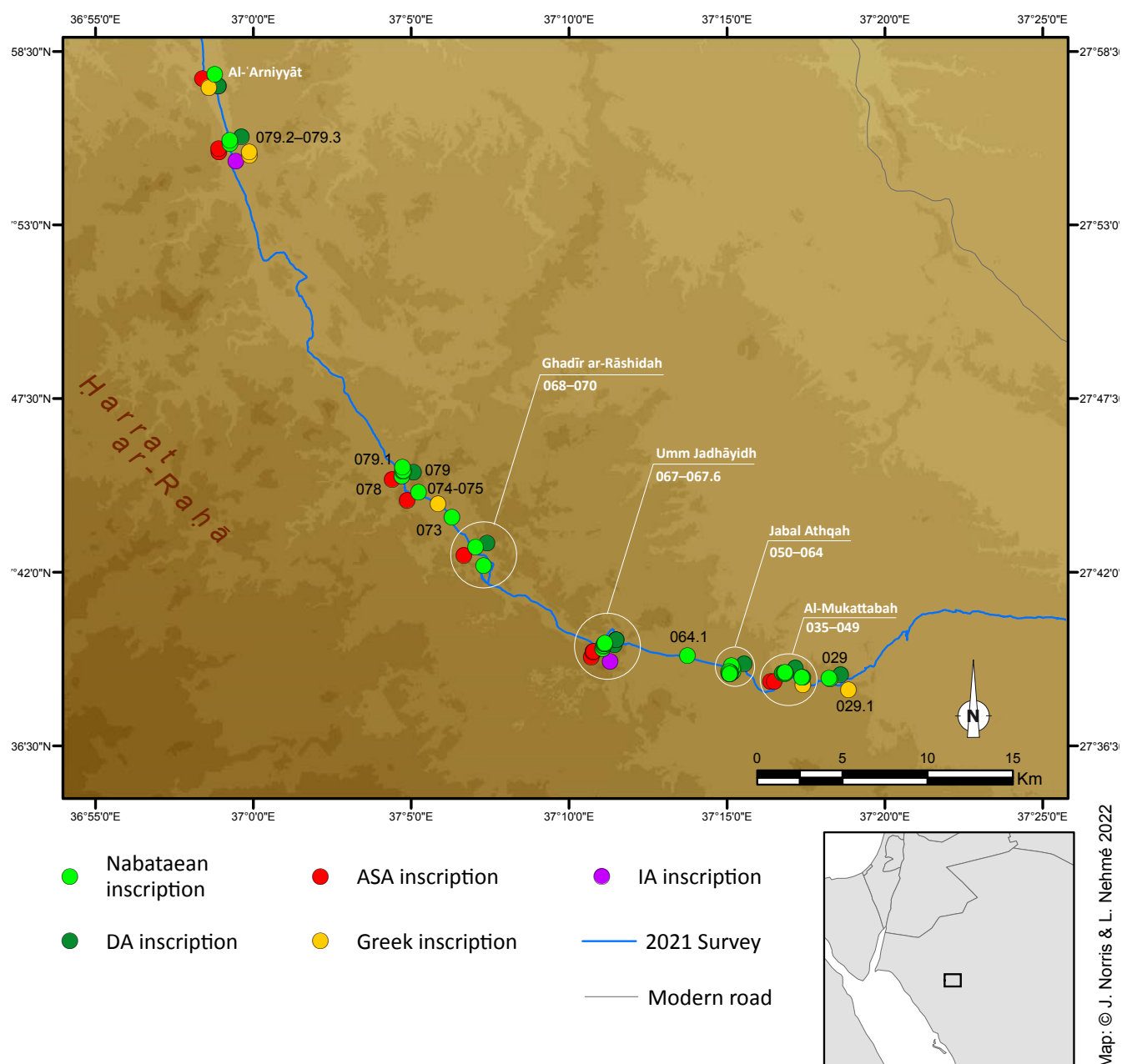


Fig. 3. Close-up map on the most strategic part of the route between al-Mukattabah and al-'Arniyyāt.

ASA = Ancient North Arabian, IA = Imperial Aramaic, DA = Developing Arabic, ANA = Ancient North Arabian.

GPS	Site name	Nb of I.	IA	ASA	Greek	Nab	DA	Arabic	ANA
024	Rī' as-Sij North	> 10				x	x		x
026	Ash-Shayrawān West	≤ 2				x			
029	Jibāl Samḥah	≤ 2				x			
029.1 ⁷	Jibāl Samḥah	< 10			x	x	x		
032	Wādī al-Mukattabah	≤ 2				x			
033	Wādī al-Mukattabah	< 10				x			

7. This site was kindly indicated to us by Saad Tuwaijri.

GPS	Site name	Nb of I.	IA	ASA	Greek	Nab	DA	Arabic	ANA
034	Wādī al-Mukattabah	< 10				x			
35–49	AL-MUKATTABAH								
035	Al-Mukatttabah	≤ 2						x	
036	Al-Mukatttabah	≤ 2						x	
037	Al-Mukatttabah	≤ 2					x	x	
038	Al-Mukatttabah	> 10				x			
039	Al-Mukatttabah	> 10		x		x			
040	Al-Mukatttabah	> 10				x			x
041	Al-Mukatttabah	≤ 2				x			
042	Al-Mukatttabah	> 10		x?		x			x
043	Al-Mukatttabah	< 10			x	x			x
044	Al-Mukatttabah	< 10				x			x
045	Al-Mukatttabah	≤ 2		x?		x			
046	Al-Mukatttabah	< 10				x			
047	Al-Mukatttabah	c. 10		x		x		x	
048	Al-Mukatttabah	1				x			
049	Al-Mukatttabah	1				x			
50–64	JABAL ATHQAH								
050	Jabal Athqah	c. 10				x			x
051	Jabal Athqah	< 10				x			
053	Jabal Athqah	≤ 2				x			
054	Jabal Athqah	≤ 2					x		
055	Jabal Athqah	≤ 2				x			
057	Jabal Athqah	< 10				x			
058	Jabal Athqah	≤ 2				x			
059	Jabal Athqah	≤ 2				x			
060	Jabal Athqah	> 10				x			x
061	Jabal Athqah	≤ 2				x			
062	Jabal Athqah	> 10				x			
063	Jabal Athqah	< 10				x			
064	Jabal Athqah	< 10				x			x
064.1	Jabal Umm Quway'	< 10				x			
67–67.6	UMM JADHĀYIDH								
067	Umm Jadhāyidh	> 100		x		x	x		x
067.1	Umm Jadhāyidh	≤ 2				x			
067.2	Umm Jadhāyidh	≤ 2				x			
067.3	Umm Jadhāyidh	> 10				x	x		x
067.4	Umm Jadhāyidh	> 10	x	x		x	x		x
067.5	Umm Jadhāyidh	> 10		x		x	x		x
067.6	Umm Jadhāyidh	> 10		x		x			x

GPS	Site name	Nb of I.	IA	ASA	Greek	Nab	DA	Arabic	ANA
068	Ghadīr ar-Rāshidah	> 10				x			
069	Ghadīr ar-Rāshidah	≤ 2				x?			
070	Ghadīr ar-Rāshidah	≤ 2						x	
DBv1	Wādi ar-Ruwayshid	> 10				x		x	
073	Wādi ar-Ruwayshid	< 10				x			x
074-075	Wādi ar-Ruwayshid	> 10		x	x	x		x	x
076 ⁸	Wādi ar-Ruwayshid	> 10				x	x	x	x
077	Wādi ar-Ruwayshid	> 10				x		x	x?
078	Wādi ar-Ruwayshid	> 10		x		x		x	x
079	Wādi ar-Ruwayshid	c. 10				x		x	
079.1	Wādi ar-Ruwayshid	< 10				x			
079.2 ⁹	Wādi Na‘ām Nuqayb al-Bakrah	> 10	x	x	x	x		x	x?
079.3	Wādi Na‘ām Nuqayb al-Bakrah	> 10		x	x	x	x	x	x
080	Al-Ma‘ayṣī	> 10				x	x	x	x

General commentary

Four sites in the list are remarkable, either because of the number of inscriptions they contain or because of the outstanding character of their environment. These are:

- **al-Mukattabah**, where thirteen epigraphic points have been recorded, all of which contain c. 100 texts, possibly more;
- **Umm Jadhāyidh**, where 572 texts were recorded and published in Nehmé 2018;
- **Jabal Athqah**, where c. 50 texts, probably more, were recorded (some of which already appear in Nehmé 2018);
- **Ghadīr ar-Rāshidah**, where the number of inscriptions is relatively small (c. 20), the importance of the site being given by the presence of a significant and probably permanent—except perhaps in very dry years—source of water (**figs 4–5**). The small number of inscriptions in the immediate surroundings of the *ghadīr* is best explained by the fact that travellers did not station around the main pool, where there was certainly not enough space. Indeed, it is likely that the caravans circumvented the upper pool though a very passable wadi to the east, and reached the lower pools from downstream (**fig. 6**). That is where the travellers stationed, at site DBv1, where Farīq aṣ-Ṣaḥrā’ have, in 2017, photographed 49 inscriptions, published in Nehmé 2018. The number of texts will probably increase when all the photographs taken during the 2021 visit are studied. The inscriptions are carved either on the cliffs overhanging the wadi or on boulders/stones lying below them. Some are of a remarkable quality and can be considered among the most beautiful Nabataean inscriptions (**fig. 7**). Three previously unpublished texts reveal that the site

8. = DBv 1.1

9. = DBv3



Fig. 4. *The upper pool of Ghadīr ar-Rāshidah.*



Fig. 5. *The lower pools of Ghadīr ar-Rāshidah.*



Fig. 6. Satellite view of the area of Ghadīr ar-Rāshidah.

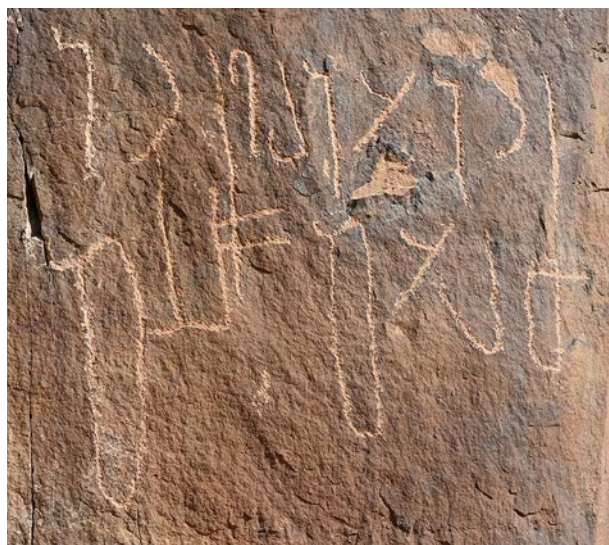


Fig. 7. Inscription DBv1Nab 13, zbd'dnwn br 'n'm šlm.



Fig. 8. Satellite view of the (Nabataean?) encampment at DBv1.



Fig. 9. Ground view of the encampment at DBv1.

was among those controlled and secured by several *strategoi* (see below, § *Strategoi* controlling caravan routes). Finally, a group of stone enclosures identified at the foot of the cliff (**fig. 8–9**) are probably the remains of an ancient (Nabataean?) encampment (see below § Structures along the ancient route).¹⁰

Apart from the four sites listed above, ten sites (GPS points 073–079.3) were recorded along the 50 km line of wadis which connect Umm Jadhāyidh to al-ʿArniyyāt, the latter being the last site known to us before entering the plain of Tabūk (see **fig. 3**). Starting from Umm Jadhāyidh, these wadis are named Wādī ar-Ruwayshid and Wādī Naʿām Nuqayb al-Bakrah on SCECO map NG 37-1 and others. They form a natural and very easy path for the caravans to go through. These ten sites are less spectacular than the four most important ones, but the number of inscriptions they contain, often more than ten each, and the fact they are regularly distributed, makes it certain that they were stops on the caravan route.

What is less certain, and will require more investigations, is the route followed by the caravans after the impressive descent to the plain of Tabūk (**fig. 10**). Did it go *through* Tabūk, which was a major oasis? There is little chance we might be able to answer the question because the landscape in the plain is not at all suitable for the carving of inscriptions. It would be odd that the route turns west to reach the sites of Ṭalʿat al-Midrāt, Mabnā Bayt Abū Zayd and ʿAyrīn, each of which

10. The remoteness of the area and the absence of sub-modern or modern graffiti makes it likely that the stone enclosures are pre-19th century.



Fig. 10. *The impressive descent to the Tabūk plain through Wādī Na‘ām Nuqayb al-Bakrah.*

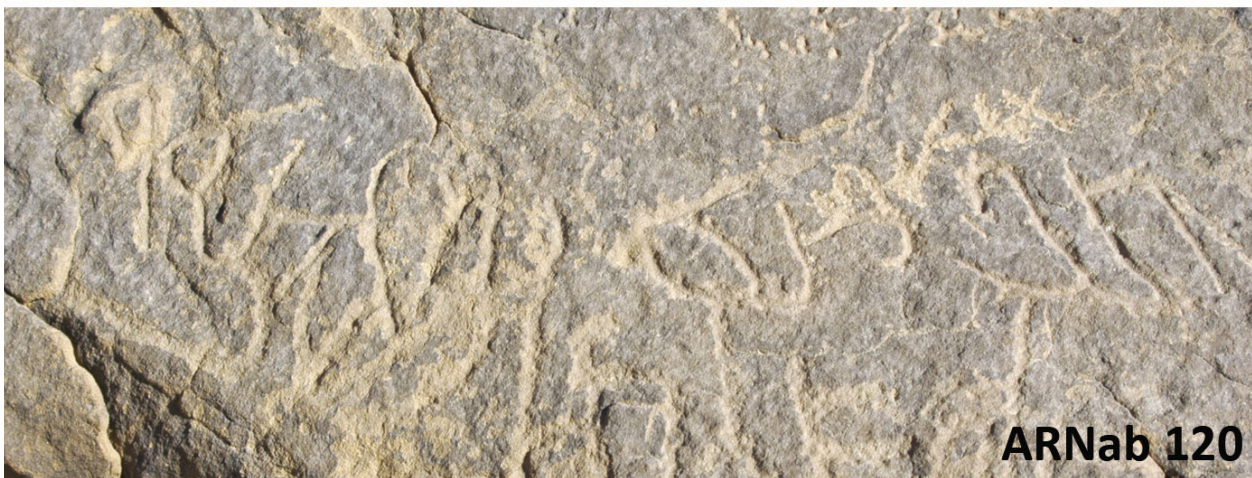
yielded a few texts.¹¹ Rather, one may suggest that the latter three sites were part of another—alternative?—itinerary, running west of the Darb al-Bakrah and going through Wādī Atānah, which seems to be a very passable wadi and where the presence of Nabataean inscriptions is reported. The departure point of this alternative route may have been Umm Jadhāyidh, as suggested by the fact that one individual carved his signature at Ṭal‘at al-Midrāt *and* Umm Jadhāyidh.¹² Identifying individuals who carved their signature in different places is the most reliable and secure way one can trace caravan routes. Thanks to the new sites recorded in 2021, it will certainly be possible to establish new connections once all the inscriptions are read and indexed. One example is *tpṣ’ br hn’w*, who carved his signature at both Mukattabah and al-‘Arniyyāt (**fig. 11**).

The significance of point 080 (al-Ma‘ayṣī)

On the map produced fig. 2, one point, no. 080 (al-Ma‘ayṣī), 85 km north-west of Tabūk, is completely isolated from the others. As shown by the blue line indicating the itinerary followed in 2021, the team purposely went west from Bi‘r Ibn Hirmās, in the hope of finding inscriptions in the area where rocky outcrops, at the end of the large plain of Tabūk, start appearing again in the landscape. Indeed, if one considers that the Darb al-Bakrah continued in a northwesterly direction from point 079.3 onwards, one would expect to find inscriptions in this area. There is indeed no reason for the route to go further west, to Wādī Ḍamm which, according to our expedition

11. See the map in Nehmé 2018: 27 fig. 2.

12. Nehmé 2018: 36 no. 10.

**ARNab 46****ARNab 120**

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Al-Mukattabah

Fig. 11. The signatures of Tps' son of Hn't at two different sites, al-Mukattabah and al-'Arniyyāt, 54 km apart as the crow flies.

advisors, is hardly passable, nor to Wādī al-Bāṭinah, both in the Ḥismā. The area north and south of modern road no. 394, connecting in an almost east-west line Bi'r Ibn Hirmās and ash-Sharaf seemed the most promising one. After a couple of unsuccessful attempts, the team was helped in its quest by two Sudani herdsman and their Saudi boss who led us to a rocky outcrop where seve-



Fig. 12. Footprints carved on the summit of the outcrop of point 080 (MSAP).

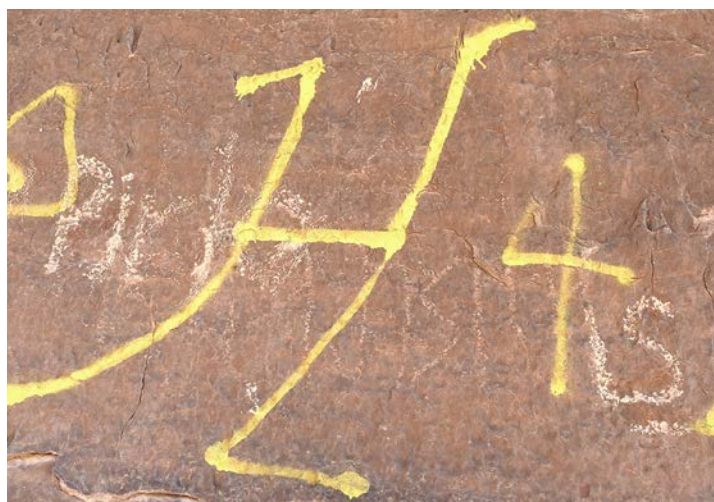


Fig. 13. Badly weathered and defaced Nabataean inscription at point 080 (MSAP).

ral inscriptions were found: one Nabataean on the southern flank of the outcrop while on the summit of the latter were two Developing Arabic and several Hismaic texts, as well as many footprints, drawings of animals and *wusūm* (fig. 12). The Nabataean text (fig. 13) is unfortunately almost illegible because the rock is very eroded at this point and it is covered with modern paint and carving. The text was finely carved and the letters are almost 20 cm high. The only letters visible are: {d/r} followed by two vertical strokes possibly connected from their upper part (z and n, or ḥ), then by yt{d/w/r}, thus {d/r}{zn/ḥ}yt{d/w/r}... No sense can be made of this sequence of letters, except possibly the name {ḥ}yt. As for the two developing Arabic texts, they are still under study but one of them contains the theophoric name 'bd'l'zy, which was popular in both Nabataean (in the form 'bd'l'z') and Developing Arabic texts.

Point 080 was certainly of some im-

portance in antiquity. From the top of the outcrop, one has a 360° view over the surrounding landscape. It was probably not a caravan stop—the number of inscriptions would have been larger—but the presence of texts in various scripts shows that it was a place people went through. Even if one cannot take point 080 as clear evidence to trace the caravan route, it is located in the place where one would expect the caravan route to go through, north-west of Tabūk and in the direction of Petra.

Structures along the ancient route

In 2004, a few archaeological structures had been identified along the Darb al-Bakrah but not much investigated.¹³ A few additional ones were recorded in 2021.

Tombs

A very clear **tomb** at Jabal Athqah, at the foot of a few boulders bearing Nabataean inscriptions (GPS point no. 063) (fig. 14). The tomb itself, ovoid in shape, is marked by an unfortunately ane-

13. For example near UJadhNab 237.

pigraphic stele pointing to the south-west. Its boundaries are marked by stones, three of which bear Nabataean and Hismaic inscriptions (**fig. 15**). This tomb is certainly ancient and its location, far from any settlement, suggests that the individual who was buried there was a member of a caravan, or at least someone travelling along the route. As far as can be judged, the tomb was not



Fig. 14. Ground view of the tomb at site 064 (© MSAP).



Fig. 15. Drone view of the tomb at site 064 (© MSAP).



Fig. 16. Possible looted tomb at site DBv1 (© MSAP).

looted. If it was excavated, it would be the first time in the history of archaeological research that the tomb of a probably Nabataean member of a caravan is investigated. Finally, the presence of a Hismaic text among the ones which are associated to the tomb illustrates, as suggested previously (King 1990: 100–101, Norris & al-Manaser 2020: 436), the links between the people writing in Hismaic and the Nabataeans.

Another tomb, unfortunately looted, was observed at site DBv1 (**fig. 16**).

A (Nabataean?) encampment

As mentioned above, a possible Nabataean encampment was observed at site DBv1 (see fig. 8–9). It lies at the foot of the cliff, is composed of several stone enclosures, and was only 150 m opposite the lowest pool visible on Google Earth. For this and other reasons detailed above, DBv1 was certainly a very important site on the caravan route, only 9 km from Umm Jadhāyidh as the crow flies.

Strategoi controlling caravan routes

Two previously unpublished inscriptions, mentioning three *strategoi*, were discovered during the survey. Both come from DBv1 and had not been photographed in 2017 by Farīq aṣ-Ṣaḥrā’.

1/ Carved in large letters on the cliff (**fig. 17**):

– *’rtnpṭ / br ’rtnpṭ / ’srtg’*, “*’rtnpṭ* son of *’rtnpṭ* the *strategos*”. Both father and son bear the same name, which is unusual in Nabataean. The name appears here for the first time in Nabataean and it is likely to be of Iranian origin. It may indeed be a theophoric name built with Arta- such as Artapāta, “protected by Arta”, Artadāta, “Given by Arta”, Artazušta “beloved by Arta”, etc.¹⁴

2/ Deeply incised on a small stone broken on all sides found lying on the ground at the foot of the cliffs (**fig. 18**).

– *...g{d/r}y tym’bdt ... / ... w wrylw ... / ’srtgy’*, “... the clients of/enclosures of (?) (see note 15) Taym’ubdat ... and Wuraylū ... the *strategoi*.”

14. Boyce 1982: 141–142.



Fig. 17. Signature of the *strategos* named 'rtnpt at site DBv1 (© MSAP).

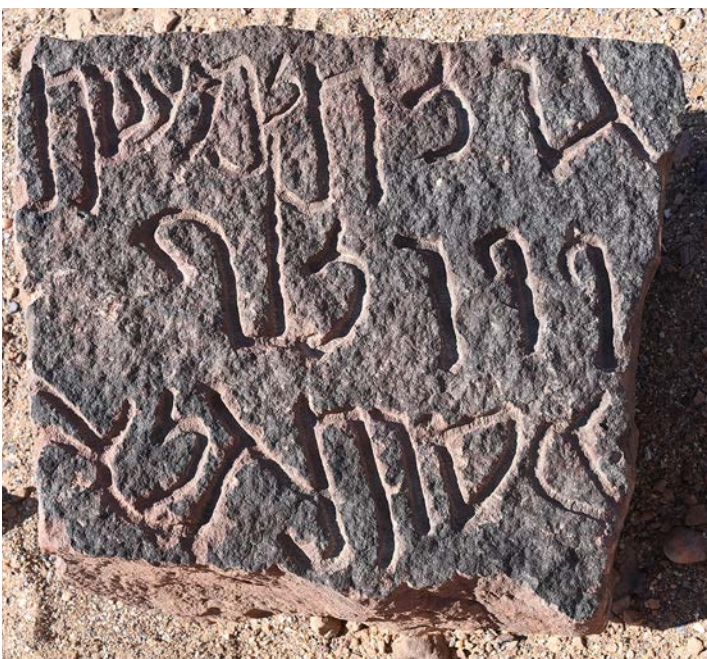


Fig. 18. Fragmentary inscription mentioning *strategoi* at site DBv1 (© MSAP).

The first three letters are probably the end of a word best interpreted as a substantive in the plural construct followed by the personal name Taym'ubdat. Several words ending with either *-gd* or *-gr* are attested in Nabataean,¹⁵ and there is no way to decide which one is used here though *msgd* can probably be dismissed.

Taym'ubdat is a very common name in Nabataean and no *strategos* is known to have borne it. As for *wrylw*, it occurs elsewhere on the Darb al-Bakrah (UJadhNab 406 and 433). More importantly, it is the name of a *strategos* who carved his signature south-west of Taymā'.¹⁶ Considering that the name is relatively rare and that in two cases

at least it is associated with the word *strategos*, is likely—though not certain—that *wrylw* is one of the *strategoi* who wrote this fragmentary text.

The Nabataean *strategoi* are usually interpreted as provincial governors with both a civilian and military authority over a territory. In the article she devoted to this high rank Nabataean office, one of the authors of the present report explained the signatures of *strategoi* outside provincial

15. *gr*, “client” (in JSNab 12); *wgr*, “tomb, possibly betyl” (see Nehmé 2015: 105 with other references there); *hgr*, “enclosure” (JSNab 329); *msgd*, “altar” (many references throughout the Nabataean kingdom); *ngd/ngr*, “caravan leader/carpenter” (in Petra, see MP 9, MP 125, MP 749). All these are attested for certain, but the interpretation of some is debated and would require a full study.

16. Nehmé 2015: 105 and 110, with references to previous publications.



Fig. 19. The Rabīb'el son of Damasippos inscription at Jabal al-Munayshīr in Southern Jordan.

urban centres as mere signatures left by travelling individuals.¹⁷ It is certainly true that the *strategoi* played a role in the administration of the Nabataean provinces and it is now clear that this included the control of the routes and the traffic. That is why they are found outside urban centres, particularly in strategic places such as Ghadīr ar-Rāshidah, which was an important watering place. They were probably not stationed there but their presence was expected at regular intervals as they were probably in charge of the tax collection and the security of the

roads. In the same way as the presence of Ancient South Arabian and Greek inscriptions (see the following paragraph) indicates that one is on a caravan route, the presence of an inscription mentioning a *strategos* or signed by someone known to be a *strategos*, should be envisaged as evidence for interpreting this place as being on a caravan route. Apart from the two examples cited above, this is probably the case of the Jabal al-Munayshīr inscription, 16 km east of Wādī Ram in Jordan (**fig. 19**). This text, published 30 years ago by D. Graf (1994), is carved at the tip of a 4 km long outcrop, in an ostentatious manner. It mentions someone named Rabīb'el son of Damasippos, without specifying that he is a *strategos*, but Rabīb'el was a figure and a *strategos* known to be active throughout North-West Arabia (see Nehmé 2015: n. 20).

Inscriptions in scripts other than Nabataean and Ancient North Arabian.

Some of the sites visited during the 2021 survey yielded inscriptions in scripts other than Nabataean or Ancient North Arabian, namely Greek (five), Ancient South Arabian (a number to be determined), and a possible Imperial Aramaic one. The latter was recorded at site 079.2 and was published by M.C.A. Macdonald in the *Darb al-Bakrah* volume under number DBv3ImpAr 1. As for the five Greek graffiti, they are new and will be published by P.-L. Gatier, thus adding to the ten graffiti already published by F. Villeneuve in the same volume.

Finally, eight new Developing Arabic graffiti were recorded in 2021. They were included in the database of the Developing Arabic inscriptions from the Arabian Peninsula presently under construction.

The presence of graffiti in Ancient South Arabian and in Greek in significant numbers is interesting. They confirm that the route followed was a caravan route and they highlight its “international” character since it shows that it was frequented by persons travelling between Nabataean urban centres as well as by groups from outside the Nabataean realm, including from Yemen.

17. *Ibidem*: 116: “As for the five *strategoi* who appear southwest of Taymā', it is possible that they signed their names while they were on their way from there to Hegra or coming from Hegra”.

The recording of the Nabataean inscriptions: the DiCoNab project

Following several years of reflexion, it has been decided, at the beginning of 2022, to launch the much awaited Nabataean database project, now officially named DiCoNab (Digital Corpus of Nabataean texts). The opportunity to do so was given by the research grant awarded to Benjamin Suchard, a post-doctoral research fellow from Leiden University whose research focuses on Nabataean Aramaic as a spoken language. He received a Veni grant from the Dutch Research Council (NWO)¹⁸ in 2019 and agreed to devote part of what remained of the funding he was granted to create an SQL database.¹⁹ The latter will be developed by Matto Gallo, a professional developer specialised in digital humanities who has been working for a long time with the *Scuola Normale Superiore* and the University of Pisa in Italy, in particular for the ERC DASI project (Digital Archive for the Study of pre-Islamic Arabian Inscriptions, <http://dasi.cnr.it/>), and more recently for the French ANR project Maparabia (<https://anr.fr/Projet-ANR-18-CE27-0015>).

Following this decision and the funding being secured for the development of the software, the detailed design brief was produced in the spring of 2022 with the help and expertise of M.C.A. Macdonald and J. Norris. The structure of the database was drawn, the list of fields for each of the files forming the database was determined and the morphological tags used for the index of the words contained in the inscriptions were listed. The actual development of the software will start at the end of summer 2022.

It is hoped that this database will at last provide a tool for the recording of the Nabataean inscriptions from all the regions where they were found and will be used internationally.

Conclusion

The 2021 survey was not able, due to external constraints, to survey the area initially planned. It concentrated mainly on sites along the Darb al-Bakrah, north of Hegra and up to the area of Tabūk. Several sites where the presence of inscriptions was known but which had not been visited by the 2004 survey team, were visited and the inscriptions they contained photographed. The importance of this portion of the caravan route was once again evidenced by the number of major epigraphic sites recorded as well as by the remarkable water pools of Ghadīr ar-Rāshidah. This strategic route was probably under the responsibility of Nabataean *strategoī* and was used by people who wrote in various scripts and languages, including Greek. The examination of the new Ancient South Arabian texts by specialists will, hopefully, be in line with the date suggested Chr. Robin and M. Arbach in the Darb al-Bakrah publication, the first century BCE and possibly the first century CE.²⁰ Finally, a possibly Nabataean encampment and tomb were identified and the excavation of the latter may be envisaged.

18. <https://www.universiteitleiden.nl/en/news/2019/08/benjamin-suchard-receives-veni-grant-for-research-on-nabataean-aramaic-as-a-spoken-language>

19. We are extremely grateful to Benjamin Suchard and the NWO for their generosity.

20. Nehmé 2018: 61.

Sigla

- ArNab Nabataean inscriptions from al-ʿArniyyāt published in Nehmé 2018.
- JSNab Nabataean inscriptions published in A. Jaussen and R. Savignac 1909–1922. *Mission archéologique en Arabie*, 5 volumes. Paris (Publications de la Société Française des Fouilles Archéologiques, 2).
- MP Nabataean inscriptions published in Nehmé L. 2012. *Atlas archéologique et épigraphique de Pétra. Fascicule 1. De Bāb as-Sīq au Wādī al-Farasah*, Paris, Académie des Inscriptions et Belles-Lettres (coll. Épigraphie & Archéologie, 1).
- UJadhNab Nabataean inscriptions from Umm Jadhāyidh published in Nehmé 2018.

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Umm Zarb, a Nabataean Caravan Stop and Fort South of Hegra?

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and Caroline DURAND (Afalula/CNRS–UMR 5189)

During the 2019 season of the al-‘Ulā-Medina (UM) survey season, the team visited a site located at the junction between Wādī al-Jizl (which runs southwards from al-‘Ulā) and Wādī al-Ḥamd (which runs from the south-east to the north-west between Medina and al-Wajh) (**fig. 1**).¹ These two large wadis form natural communication routes between the major oases of the region, on the north–south route linking Medina, al-‘Ulā and Tabūk on the one hand, and on the east–west

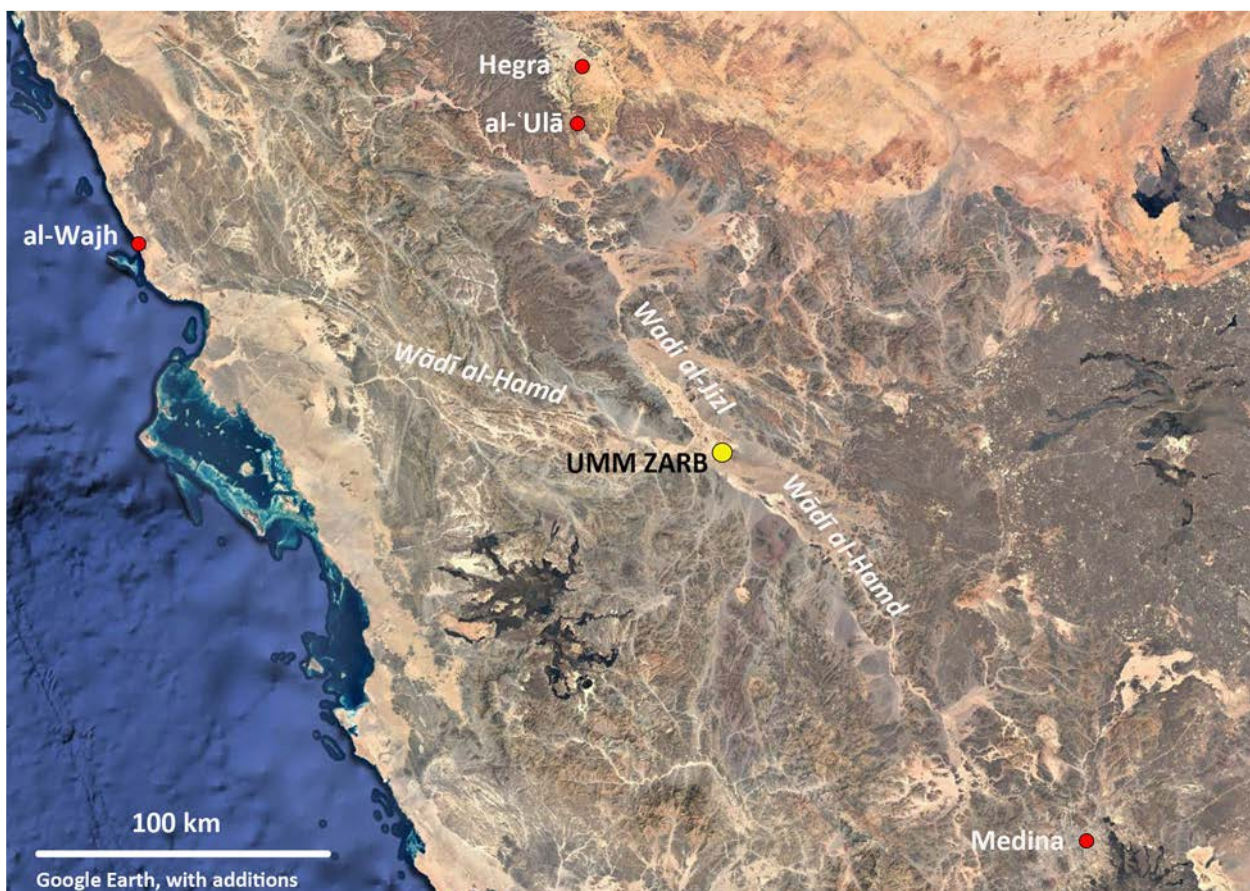


Fig. 1. *The geographical context of Umm Zarb.*

1. See the 2020 report, <https://hal.archives-ouvertes.fr/hal-03131855>, p. 133.

route linking the oases of Medina and al-'Ulā to the Red Sea, particularly in the area of al-Wajh, on the other hand. At the exact point where the two wadis join, at the northern end of a stony basaltic plateau which provided building material in abundance, two large structures built with

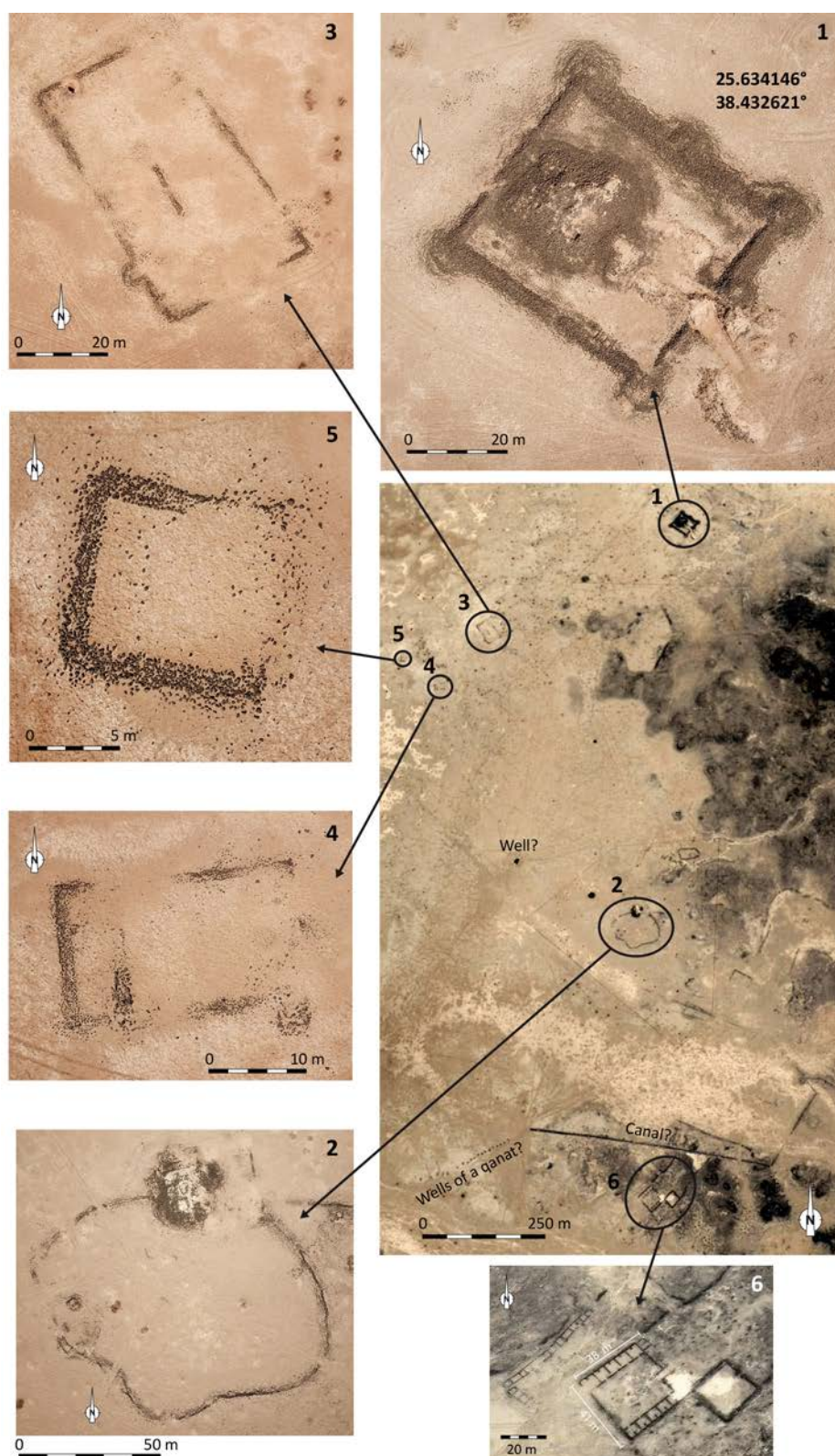


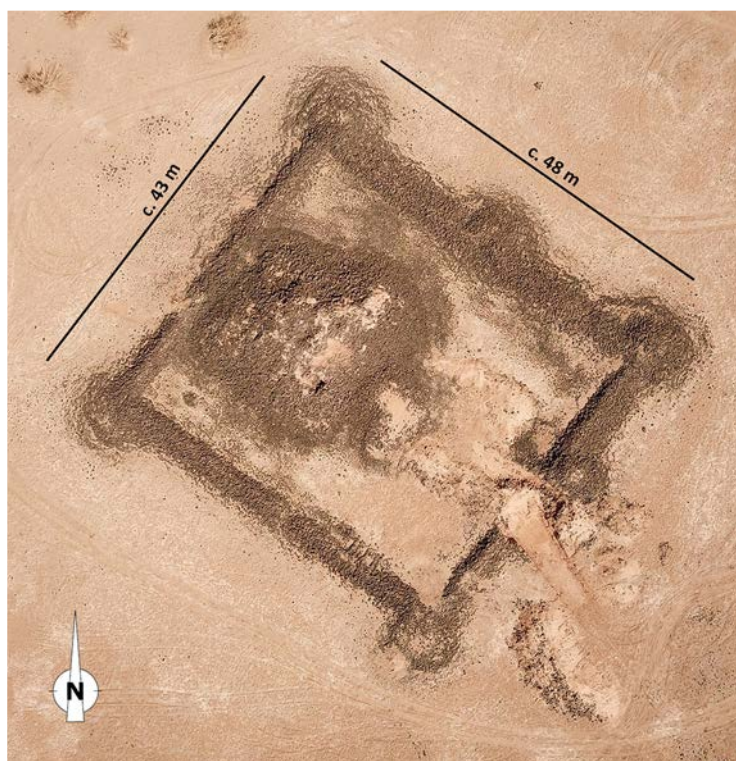
Fig. 2. The distribution of the structures (MSAP).

basalt stones were recorded and photographed. In 2019, they were named al-Muṣanna‘ah 1 and 2 based on local informants. The analysis of the small number of pottery sherds collected on the surface showed that neither of them was diagnostic of the Islamic period while one was typical of the early (pre-first century BC) pottery from Hegra.

Considering the strategic importance of the location, the monumental character of the two buildings (now Umm Zarb 1 and 2), the still pending question of their date, and the incomplete character of the information collected in 2019, it was decided to undertake a one day trip to the site on March 8th, 2022. The aim was to spend more time examining the structures spotted on Google Earth, collect more pottery sherds on the surface, and make drone photos (**fig. 2**).

Toponymy

The most important structure (Umm Zarb 1) is known locally as al-Muṣanna‘ah, “the built” in Arabic, a name particularly well suited considering its monumental character (**fig. 3**). It is probable, however, that the name refers only to this structure, and not to the entire site to which it belongs. The nearest attested toponym is Umm Zarb,² sometimes spelt Umm Darb,³ or Umm Dharb.⁴ Since it is certainly better to use a proper place-name than a nickname, Umm Zarb is preferred in the present report. Muṣanna‘ah 1 thus becomes Umm Zarb 1, Muṣanna‘ah 2 becomes Umm Zarb 2, etc.



Two modern settlements associated with farms are located near Umm Zarb and appear both on topographic maps (e.g. SCECO map NG37-10) and on Google Earth (**fig. 4**): al-Qi‘arah and al-Ḍulay‘ah. At al-Ḍulay‘ah, six or seven Arabic inscriptions were recorded by the survey team around a rocky outcrop. North and south-west of al-Qi‘arah, two “ruins” appear on the SCECO map (see **fig. 4**) and only the former, north of al-Qi‘arah, may possibly be equated with the ruins of Umm Zarb. As for the latter, they may correspond to a castle-like structure which was not visited by the team, located at 25.558247° / 38.380625°.

Fig. 3. Drone view of Umm Zarb 1 (MSAP).

2. As it appears, among others, on the 1:500,000 (NG37-SW) map of the region.

3. For example by A. De Maigret (1997: 322 and map 4 **fig. 4**). This spelling (in Russian) appears also on the Soviet Genshtab g37-21 map. A large ruin is reported on this map at exactly 25.646994° / 38.434763. This may correspond to Umm Zarb 1, which on Google Earth, is 1,452 m south of this point.

4. Al-Jāsir, *Bilād Yanbu‘*: 216, also Groom 1981: 194.



Fig. 4. SCECO map NG37-10 in the region of Umm Zarb.

Finally, one place-name, Dhū al-Marwah, mentioned in a number of Arabic sources,⁵ is equated by al-Jāsir, followed by others, with Umm Zarb.⁶ Dhū al-Marwah was a halt on the Syrian pilgrimage road and is described by al-Muqaddasī, in the 11th century, as a “strongly fortified town”.⁷ Dhū al-Marwah was in turn identified by Sprenger (1875: 154) as Ptolemy’s Mochura.⁸ According to al-Ghabban,⁹ Dhū al-Marwah was named after the small whitish rocky outcrop which stands in the wadi (fig. 5).

5. Al-Wohaibi 1973, s.v. Dhul-Mawah, p. 157–161.

6. al-Jāsir n.d.: 216; al-Wohaibi 1973: 161; De Maigret 1997: 322; al-Kilābī 2010: 461 (“After al-Rahba, the route headed towards Dhu’l-Marwa, which was a celebrated town at the start of the Islamic era, and situated at the meeting point of Wadi al-Jazal and Wadi al-Hamd in the region of Umm Zarb, near Bada’i’ al-Zali’a”; al-Ghabban 2011: 103–104.

7. <https://al-maktaba.org/book/23696/84> consulted on June 20th, 2022:

[10] العين على اثني عشر ميلا والمروة بلد حصين كثيرة النخيل جيّدة

[11] التمر سقياهم من قناة غزيرة

[12] عليها خندق وأبواب حديد وهي معدن المقل والبردي حارة في الصيف الغالب عليها بنو جعفر

English Translation in al-Wohaibi 1973: 159: “a strongly fortified town abounding in palm trees and excellent dates. A wide canal supplies it with drinking water. It is surrounded by a ditch and guarded by iron gates. It abounds in bdellium (*chamoerops humilis*) and an excellent variety of dates known as Burdi (Barni). The town is hot in summer. It is dominated by B. Ja’far”. Note that Arabic *muql* refers in this text to a variety of palm-tree, the Theban palm (*Hyphaene thebaica*), not to the *Commiphora muql* from which the resin known as bdellium is extracted.

8. In this he was followed by Groom 1981: 194 and De Maigret 1997: 322. The identification of Umm Zarb with Mochura is further confirmed by new mathematical formulae applied to Ptolemy’s geographical coordinates: Abshire et al. 2020: 24.

9. Al-Ghabban 2011: 99. *Marwu* means “pebble, flint” in Arabic (Groom 1983: 181).



Fig. 5. *The whitish rocky outcrop which may have given its name to Dhū al-Marwah (MSAP).*

The ruins pointed at on some of the modern maps are referred to as Umm Zarb. They lie south of al-Ḍulay‘ah and north of al-Qi‘arah, two modern settlements. Umm Zarb is likely to equate medieval Dhū al-Marwah and the identification of both with Ptolemy’s Mochura is further supported by the newly acquired information that Umm Zarb 1 is ancient rather than medieval (see below).

Archaeological context

During the surveys undertaken in 1980 in the framework of the Saudi Arabian Comprehensive Survey Programme, several sites were plotted in the area of Umm Zarb (**fig. 6**). They bear numbers 204-33 to 204-37. Unfortunately, no information on what was recorded at these sites is given in the publication. The only site mentioned explicitly in the text is 204-35, where the team is said to have collected Nabataean sherds. These are, however, not documented in the pottery drawings prepared by the authors. In 2019, the survey team tried to visit it, using the coordinates as they appear on the 1981 printed map, but in the place reached and the surrounding area, there was absolutely no sign of an archaeological site. This shows the difficulty of finding sites recorded at a time when GPS technology did not exist, unless they are identified by a toponym or are associated to archaeological structures still visible in the landscape. It is thus hopeless to try to find again places such as site 205-35 where only a few sherds were collected. More generally, matching Ingraham’s map with the sites recorded during the 2019 survey is not easy. It is just possible that Umm Zarb 1 and Umm Zarb 2 equate with 204-34, but when the former two are plotted on Ingraham’s map, they appear a little more than five kilometers south-east of 204-34. Of course, this may be due to the inaccuracy of the coordinates, but it would nevertheless be surprising, if the 1980 team had been through the site, that they did not mention it. No other site appears to have been plotted in the vicinity and to our knowledge, no other archaeological survey was undertaken in the area.¹⁰

10. Note that the 2016 season of the al-‘Ulā–al-Wajh Survey undertaken under the direction of Z.T. Fiema, surveyed the Wadi al-Ḥamḍ starting from al-Quṣayr but the easternmost recorded site, B8, lies approximately halfway between al-Quṣayr and Umm Zarb (Fiema *et al.* 2016).

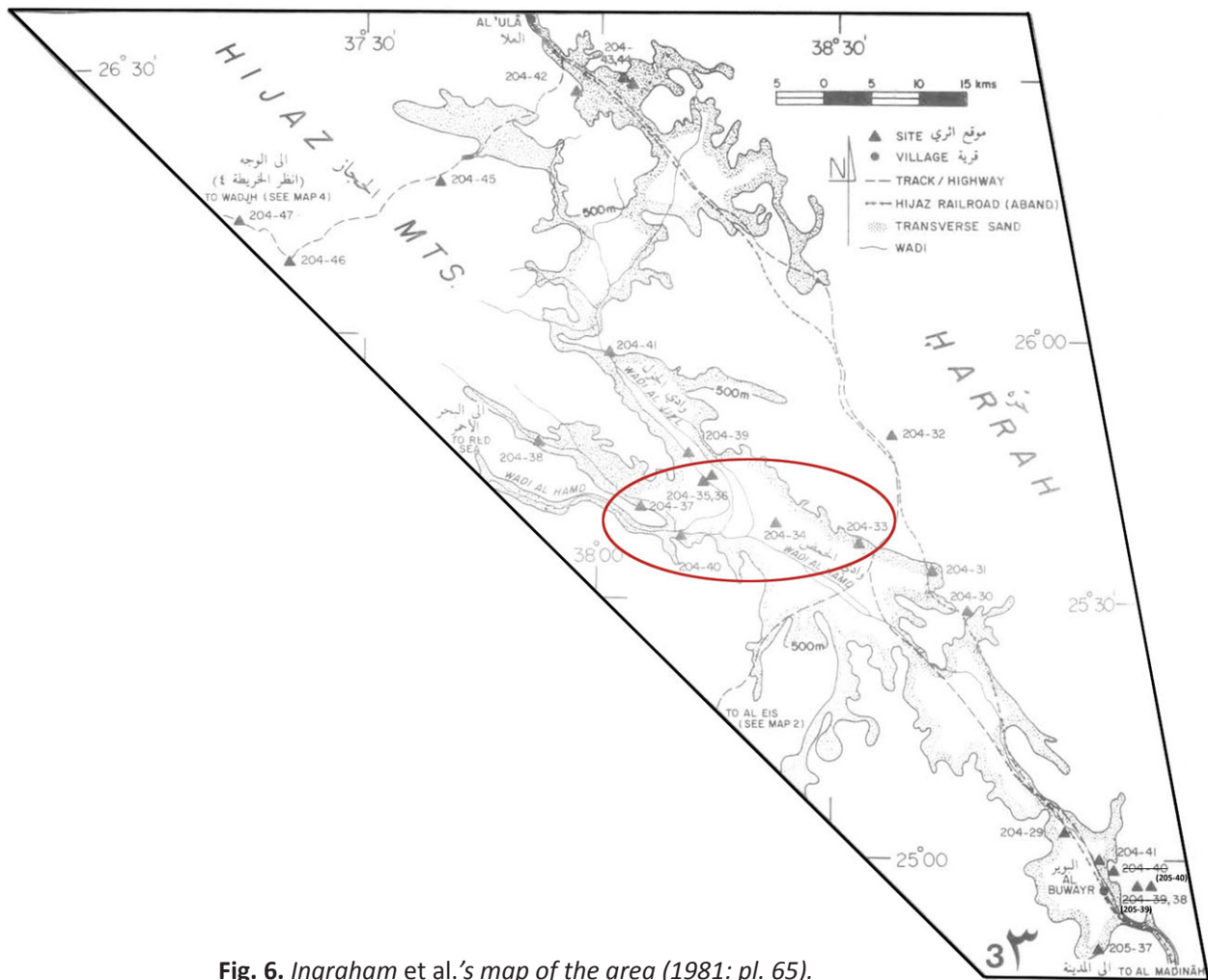


Fig. 6. Ingraham et al.'s map of the area (1981: pl. 65).

The archaeological structures at Umm Zarb

Six archaeological structures were recorded near the abandoned settlement of Umm Zarb, five of which were flown over with a drone while the last one was identified only on Google Earth.

Umm Zarb 1 (formerly al-Muṣanna'ah 1) (see fig. 3)

This corresponds to the 2019 survey site UM019 (25.634146° / 38.432621°). The structure is the most conspicuous one in the plain. It is surrounded by a modern fence the gate of which, on the eastern side, was open both in 2019 and 2022. The structure is locally known as al-Muṣanna'ah, “the built”. It forms a quadrilateral enclosure, 48 x 43 m, orientated north-west–south-east, with a gate on the south-east side. Three-quarter circle towers protected each corner and a fifth tower, semi-circular, was built in the middle of the north-east side while the north-west and the south-west sides were devoid of any structure. The gate was probably flanked by two circular bastions, one of which is still visible both in plan and in section (**fig. 7**) while the second seems to have been bulldozed.

Inside the enclosure, abutting the central part of the north-western enclosure wall, lies an artificial mound, c. 10 m high, composed mostly of basalt stones resulting from the collapse of the massive structure which stood there. Under the rubble, walls are still clearly visible in places and



Fig. 7. Section of the best preserved side of the gate of Umm Zarb 1 (MSAP).

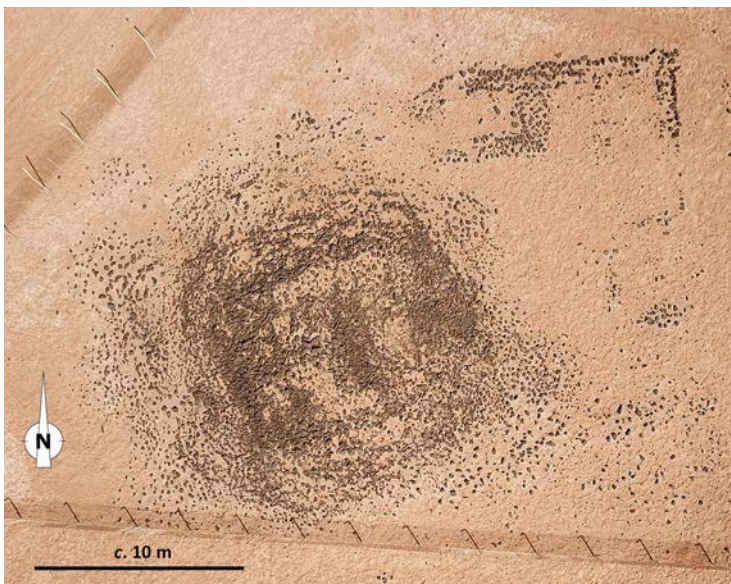


Fig. 8. Drone view of the additional structures within the enclosure of Umm Zarb 1 (MSAP).

formed what was probably a 6 m wide structure, possibly a watch-tower. Several walls, perpendicular to the slope, helped stabilise it. The walls are built in *opus quadratum* with large basalt blocks of irregular shapes. They were assembled with mud mortar, the beige colour of which contrasts with the black basalt. From the top of the tower, one has a 360° view towards wadis al-Jizl and al-Ḥamḍ.

Several pottery fragments were collected on the surface in 2019 and 2022 and a charcoal fragment will provide a C14 date.

Within the modern enclosure of Umm Zarb 1, but approximately halfway between Umm Zarb 1 and Umm Zarb 3, two additional structures, with different orientations, are clearly visible on the aerial photographs (**fig. 8**). The best preserved one is a c. 8 x 10 m rectangle with internal subdivisions forming three rooms abutting the western side and opening onto a courtyard. The latter may have been further divided into compartments but these are difficult to delineate on the photographs. The second additional structure is less well preserved and may have been cut by the first.¹¹ Two sides of a rectangular building with internal subdivisions, at least 15 x 10 m, are all that remains visible on the surface.

11. Since they do not have the same orientation, they probably do not belong to the same building/phase.

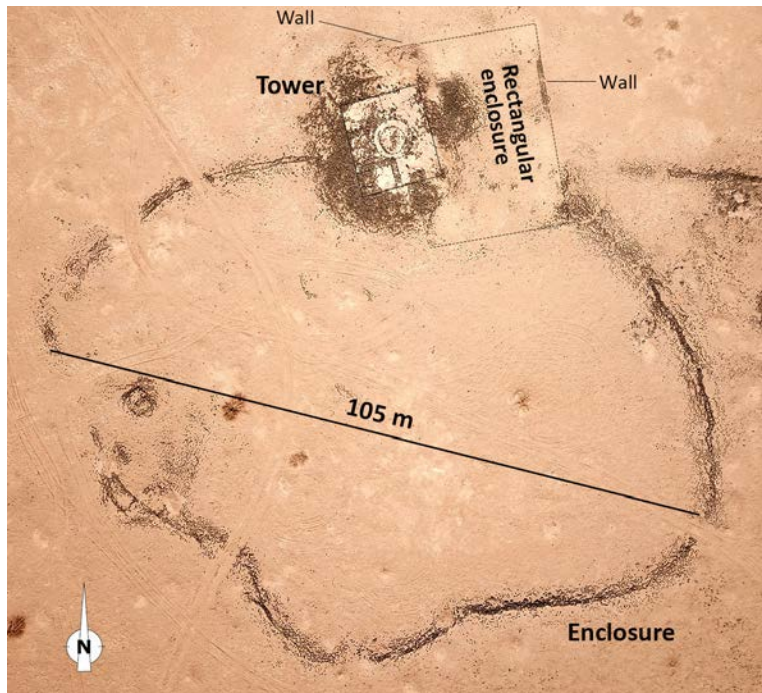


Fig. 9. Drone view of Umm Zarb 2 (MSAP).

Umm Zarb 2 (formerly al-Muṣanna'ah 2) (fig. 9)

This corresponds to site UM020 surveyed in 2019, located 1 km south–south-west of Umm Zarb 1. It is surprising that a second large structure was built so close to the first one, unless they are not contemporary or served different purposes. Like Umm Zarb 1, it is protected by a modern fence the gate of which was open when we visited it.

Umm Zarb 2 is composed of three elements which do not have the same orientation:

- a large enclosure, roughly semi-circular, with a protrusion in

the middle of the southern segment. The maximum width of the enclosure is 105 m, and it is therefore much larger than the enclosure of Umm Zarb 1;

– a squarish, c. 12 (east–west) x 15 m (north–south) tower like structure, forming a mound several meters high (fig. 10). In the centre is a circular element, c. 4 m in diameter, surrounded by six to eight rooms/corridors. The tower is not built *inside* the enclosure: it cuts, roughly in the middle, the northern semi-circular wall. It is likely that the enclosure is earlier than the tower. Like Umm Zarb 1, the walls are built in *opus quadratum* with large basalt blocks of irregular shapes (fig. 11);



Fig. 10. Drone view of the mound at Umm Zarb 2 (MSAP).



Fig. 11. The southern face of the mound showing the well-preserved wall (MSAP).

– a rectangular enclosure extending east of the tower, which seems to include it only partly. The restitution of this enclosure, based on the walls which are visible on the aerial photographs and on the lighter colour of what would be its internal space (see fig. 9) is hypothetical. Since the north–south wall of the enclosure is not parallel to the walls of the tower, the connection between these two elements of Umm Zarb 2 remains uncertain.

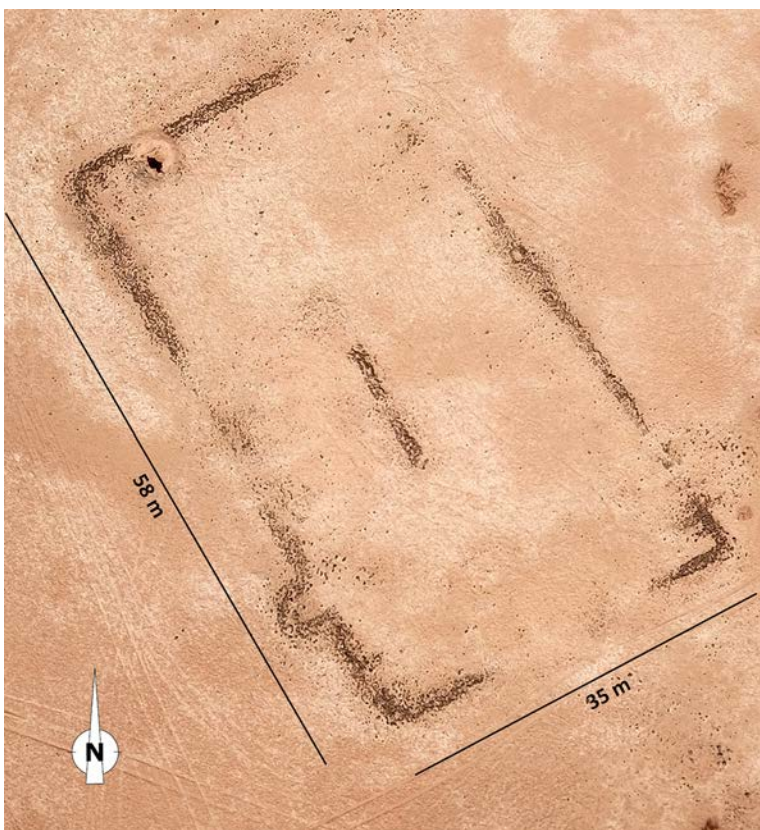


Fig. 12. Drone view of Umm Zarb 3 (MSAP).

Umm Zarb 3 (fig. 12)

A c. 58 x 35 m rectangular enclosure, c. 500 m south-west of Umm Zarb 1. Inside, the only visible element is a wall, roughly perpendicular to the long sides of the enclosure. The western wall of the latter is interrupted, a few meters away from the angle, by an apse, irregular in shape. If it was a *mihrāb*, it would have probably been installed on the south—rather than the west—side of the enclosure. A looting pit (fig. 13), dug along the inner face of the northern wall, allows to see that the wall is of much poorer quality than the walls of Umm Zarb 1 and 2. The function of this enclosure is undetermined.



Fig. 13. Looting pit along the northern wall of Umm Zarb 3.

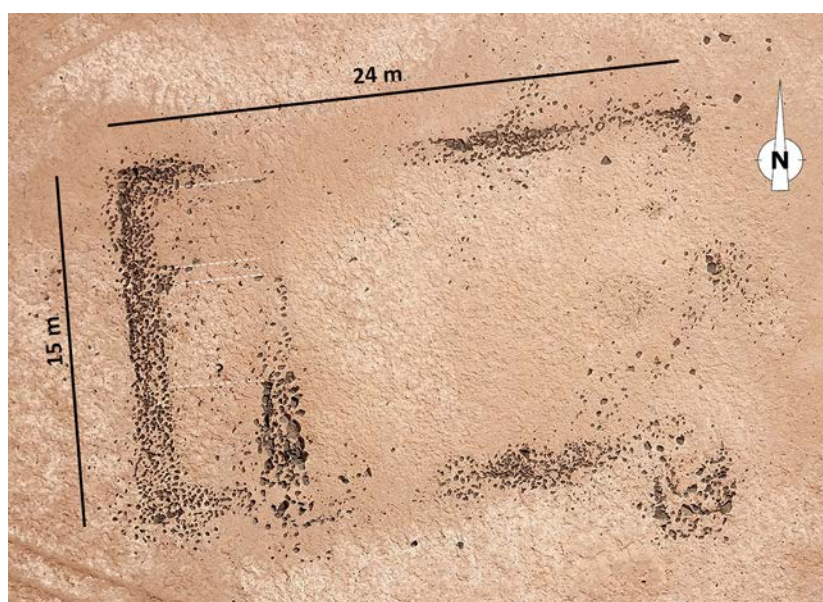


Fig. 14. Drone view of Umm Zarb 4 (MSAP).

Umm Zarb 4 (fig. 14)

A rectangular enclosure, 24 x 15 m, c. 170 m south-west of Umm Zarb 3. In the south-east angle of the building, a squarish room or bastion abuts the outer face of the southern wall. Inside, three rooms may have occupied the western part of the building.

Umm Zarb 5 (fig. 15)

A 11 x 12 m empty square building, c. 200 m west-south-west of Umm Zarb 3.

Umm Zarb 6 (fig. 16)

A large squarish structure, c. 33 x 40 m, located c. 1500 m almost due south of Umm Zarb 1, orientated north-east-south-west, with a gate in the north-eastern wall, slightly off centre. Unfortunately, the authors of the present contribution were not aware of its existence before visiting the site in 2022. Consequently, no pottery was collected and no ground or drone photos were taken.

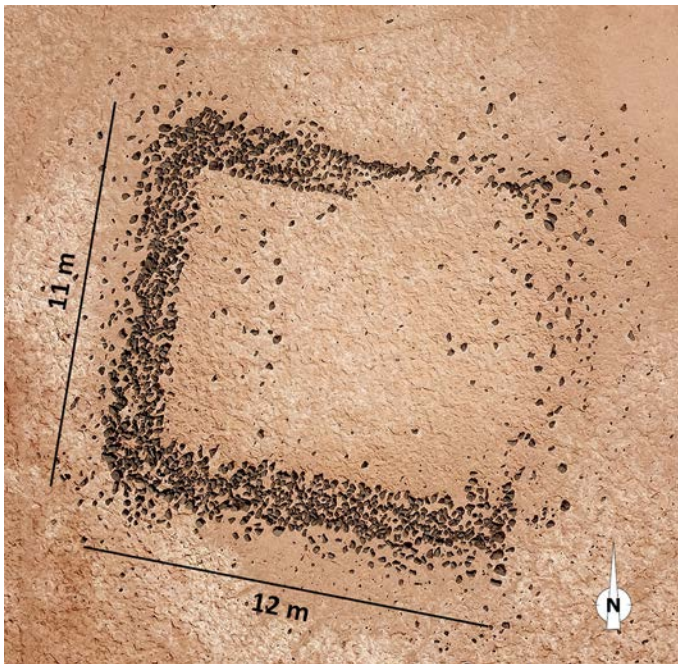


Fig. 15. Drone view of Umm Zarb 5 (MSAP).



Fig. 16. Google Earth view of Umm Zarb 6 (MSAP).

The only available source of information is Google Earth.

The plan of the building is not strictly regular, the structures on the north-eastern side being asymmetrical. Two rows of five rooms are built on the north-west and south-east sides, the other two being left empty. The rooms on the north-west side are bigger than the rooms on the south-east side. They have identical dimensions, c. 6 x 7 m, except for the one at the north-western corner, which is slightly bigger (c. 7 x 7.30 m). In the middle of the back wall of each room, opposite the entrance, there is a short wall, between one quarter and one third the length of the room. The same short walls appear in the rooms of Khan 1 at 'Aynūnah, where they have been interpreted as buttresses separating the space into two aisles (fig. 17).¹² Around the building are several additional structures which will not be described fully here (see fig. 16). Among them are a square empty building (animal pen?) with the same orientation as the main one, and a long series of c. 14 rooms in a row, with another series of four perpendicular to them. A similar combination can be observed at 'Aynūnah where Khan 2, built very close

to Khan 1, consists also of rooms aligned in two rows perpendicular to one another.

It will by now be clear that the closest parallel to Umm Zarb 6 is Khan 1 at 'Aynūnah. Both share a certain number of features:

- they have comparable dimensions, 33 x 40 m for Umm Zarb 6 and 35 x 37 m for Khan 1;
- both of them are associated to a tower-like structure;
- they have rooms on two sides only and the rooms are bigger on one side;
- there is a short dividing wall perpendicular to the back wall in some (Khan 1) or all the rooms (Umm Zarb 6);
- there are independant rows of rooms close-by.

12. Juchniewicz *et al.* 2021: 110 for these walls and more generally the whole contribution on Khan 1.

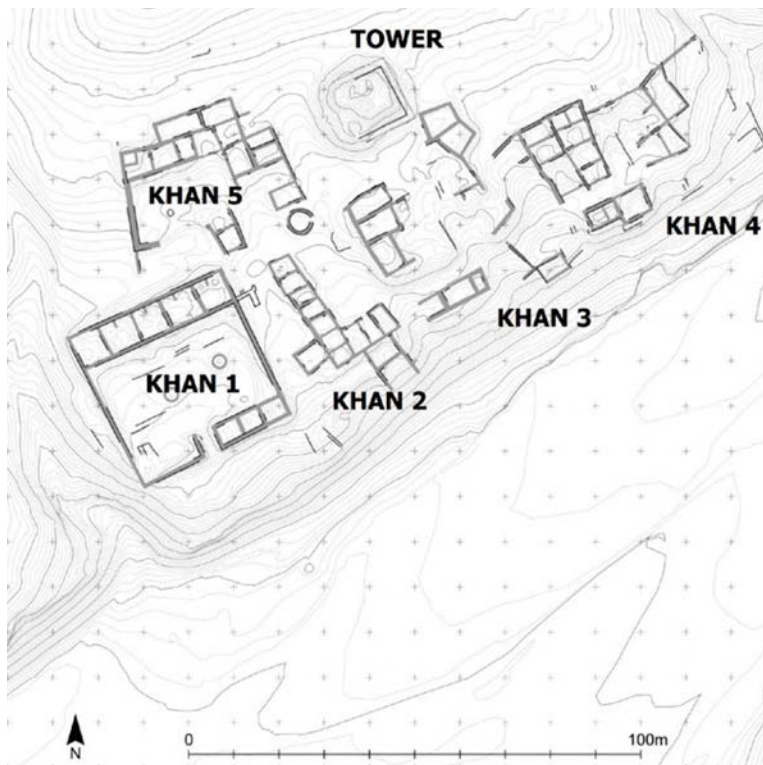


Fig. 17. Plan of the Khans at 'Aynūnah (Gawlikowski et al. 2021: fig. 6 p. 15).

As for the differences, one may note that the gate in Khan 1 opens in the middle of the side with rooms whereas it opens on a room-free side in Umm Zarb 6. Both Khan 1 at 'Aynūnah and Umm Zarb 1 are typical of the buildings most often identified as caravanserais (or *mansiones*), many examples of which, dated to the interval between the Nabataean and the Islamic periods, are found throughout the Middle East.¹³ Some specifically Nabataean ones were identified near along the Petra-Gaza road.¹⁴ Another one, partly excavated at Şabrah, south of Petra, built in the 2nd century, was used as such until the second half of the 3rd century. It was then occupied by the military until it

was destroyed in the middle of the 4th/early fifth century.¹⁵ These structures, sometimes associated to a fort (or *castellum*), are mostly found along ancient caravan routes. They provided security, shelter, food and water to the travellers and the pack animals. They were most often square, their external walls were blind and they were equipped, on one or more (up to the four) sides, with rows of rooms, while the central space was an open-air courtyard. Both Umm Zarb 6 and 'Aynūnah Khan 6 correspond exactly to this definition, as pointed out by M. Gawlikowski (2022). K. Juchniewicz, however, who was actually in charge of the excavation of Khan 1, interprets it as a "residential compound rather than caravanserai", with an archaeological material pointing to a domestic usage and the possibility that it may have been used as a "place for seasonal market".¹⁶ In the introduction to the 'Aynūnah volume,¹⁷ the excavators state that Khan 1 witnessed two main periods of use, one early Nabataean, only the foundations of which are visible under later floors, and one late Roman (4th century). The Khan is also said to have been used down to the early Islamic period. Elsewhere in the volume, however,¹⁸ K. Juchniewicz suggests, based on the

13. The best analysis of caravanserais remains that of Dentzer 1994. Gawlikowski *et al.* (2021: 14) interprets Khan 1 as such: "We have provisionally applied this name [caravan inn] to this (*Khan 1*) and to four other neighbouring buildings of the same type, less well preserved (*Khans 2 to 5*)".

14. For which see most recently Bar-Oz *et al.* 2022. The best preserved Nabataean caravanserai on the road are Orhan-Mor (Moyat 'Awad) and Sha'ar-Ramon.

15. Tholbecq 2016: 291–292, Tholbecq 2021: 42–50 (sub-chapter by N. Paridaens & A. Wimlot), and personal communication July 2022

16. Juchniewicz *et al.* 2021: 83–85.

17. Gawlikowski *et al.* 2021: 14, 21.

18. Juchniewicz *et al.* 2021: 83.

pottery and C14 dates, that Khan 1 is dated to the 7th century CE. Yet, he adds that this chronology is still under discussion because of three 4th century coins put to light during the excavations and the abundance of Late Roman pottery. It might be possible to reconcile these views if one considers that the building was a Late Roman caravanserai which continued to be used as a domestic facility in the early Islamic period.

Water canals and well(s)?

Apart from the buildings described briefly above, one may mention what looks like a long canal and a possible subterranean qanat system with a series of aligned small access wells (see fig. 2). Besides, although no well was identified on the ground, it is likely that wells were dug in the wadi. They appear now as depressions in which palm-trees grow. The site being in the wadi, the water table was probably relatively high. Many farms are still in exploitation south of Umm Zarb, at al-Qi'arah.

The pottery

Several pottery sherds were collected during the survey. As in 2019, the fabrics of the body sherds suggest a pre-Islamic date for the sites Umm Zarb 1 and Umm Zarb 2. Besides, in 2022, the surveyors were lucky enough to find a very small rim sherd of Nabataean fine ware bowl, possibly from Petra. The sherd does not show any traces of paint on the interior, although it is very difficult to be certain given the size of the fragment. It is covered by a white slip on the exterior. If unpainted, based on the fabric and the thickness of the sherd, the vessel may belong to Schmid Group 2 and be dated between the mid-first century BCE and the beginning of the first century CE (**fig. 18**). The sherd was found at the bottom of the wall surrounding the tower-like structure of Umm Zarb 1, several meters above the surrounding ground level. It can therefore not have been brought with the alluvial deposits and thus necessarily reflects at least one of the site's phases of occupation, at the very latest the first quarter of the 1st century CE.



Fig. 18. *The Nabataean sherd from Umm Zarb 1 (MSAP).*

Discussion and significance

The site of Umm Zarb is mentioned by A. De Maigret (1997: 322 and fig. 4, spelled Umm Darb) as having a “fort and ruins” (**fig. 19**). According to him, it was one of the stations along the ancient caravan road that connected Medina and Hegra. He describes it as an important centre “as it was the starting point for the road that led to the sea, following the valley of w. al-Ḥamd to the west”.

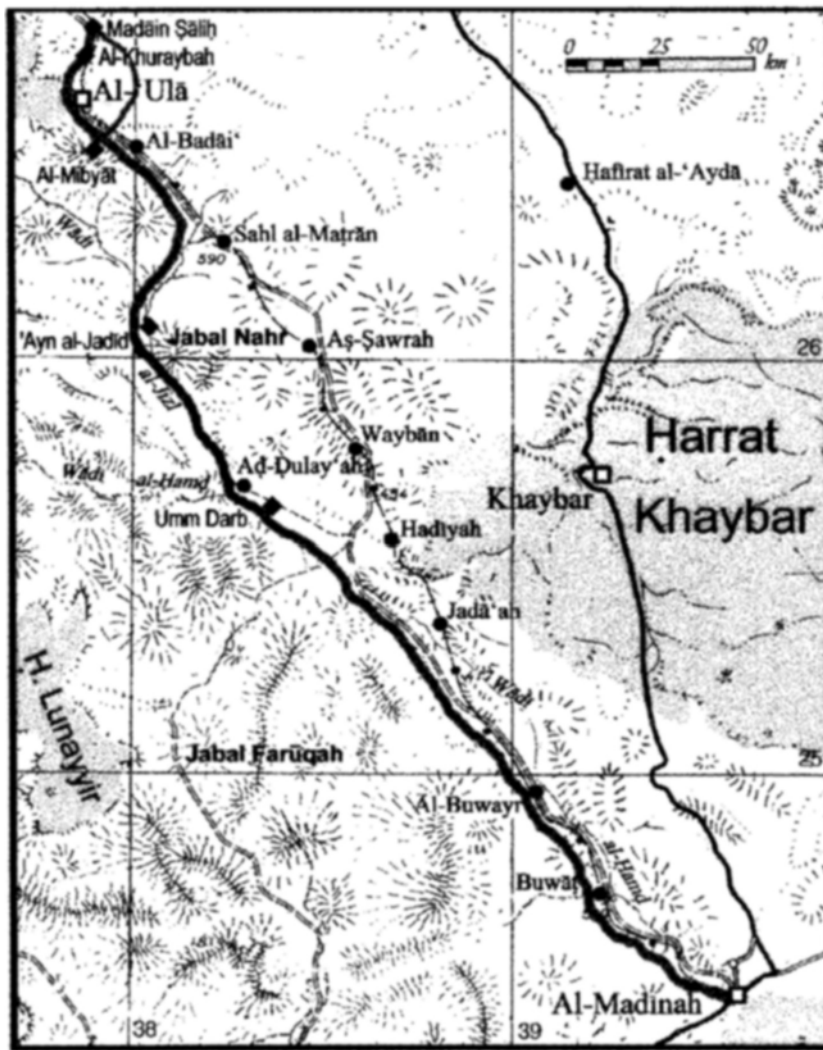


Fig. 19. A. de Maigret's map (1997: fig. 4) of the ancient route between Medina and al-'Ulā.

The recent survey and the material collected confirm this hypothesis. The plain of Umm Zarb was located at the junction between two important wadis, al-Jizl and al-Ḥamd, which connected the oases of Medina (Yathrib) and al-'Ulā (at Hegra), and both of them to the sea. The significance of the site is given by the number and the monumental character of the structures. They may not all be contemporary but Umm Zarb 1, at least, yielded a mid-1st century BC/early 1st century CE sherd and it is possible that some of the other structures were ancient as well. Access to ground water and the existence of a thick layer of alluvium ensured the local inhabitants and the travelers with food and water supply.

The discovery of a Schmid Phase 2 Nabataean sherd *inside* a fort allows to reconsider the Nabataean involvement in the region south of Hegra. We already know that the Nabataeans were present on the Red Sea coast, for instance at al-Quṣayr, near al-Wajh (Fiema *et al.* 2020), and that they controlled the route down to Yathrib.¹⁹ Besides, Nabataean sherds are found at a couple of

19. One may recall that a Nabataean man carved an inscription at Umm Jadhāyidh in which he said that he came from Yathrib (whatever the exact meaning of *dy mn*, “who is from”). Besides, the presence of two Nabataean governors at the site of aṣ-Ṣuwaydirah, c. 60 km east-north-east of Medina, supports the hypothesis of a Nabataean control over the routes in this area. See the 2020 report, <https://hal.archives-ouvertes.fr/hal-03131855>, p. 126–127.

sites down to Southern Arabia, though not in large quantities.²⁰ We cannot ascertain yet that the area between Hegra and Medina was part of the Nabataean kingdom but the discovery of this relatively early sherd in the fortified building Umm Zarb 1 certainly shows their presence at this important crossroads between wadis al-Jizl and al-Ḥamḍ.

As for the date of the caravanserai, Umm Zarb 6, the parallel with ‘Aynūnah invites to cautiousness and suggests that it is a Late Roman building, not a Nabataean one. Finally, the newly acquired conviction that Umm Zarb is an ancient settlement supports its identification with Ptolemy’s Mochura.

At a more regional level, the identification of an ancient site at Umm Zarb strengthens the authors’ conviction of the parallels and the connections to be made, as far as territorial organisation and control are concerned, between the Egyptian and the Arabian shores of the Red Sea, particularly visible in the Roman period.

Umm Zarb is a very promising site where test excavations in two or three structures (1, 2, and 6) and a more systematic survey would be extremely informative. They would also be a useful complement to the survey of Wādī al-Ḥamḍ undertaken by Z.T. Fiema. The combination of at least one Nabataean fort and a caravanserai was so far observed only on the Petra-Gaza road. It is high time that the southern parts of the incense road are explored with modern means and technology.

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The coins of Hegra

Thomas BAUZOU (University of Orléans)

This text was written during the 2022 season to be included in the new edition of the catalogue of the AlUla exhibition. It is repeated here with the permission of the editors because it offers a short synthesis on the coins of Hegra.

Excavations at Hegra have led to the discovery of 1000 silver and bronze coins from all over the site, dating from the fourth century BC to the end of the fourth century AD, a period of almost eight centuries. There are three main groups of coins: Lihyanite, Nabataean, and Roman.

The Lihyanite coins

The oldest are imitations of Athenian coins from the fifth century BC, representing on the obverse, the helmeted head of Athena and on the reverse, an owl. These imitations can be explained by the fact that silver Athenian tetradrachms, which the Greeks called 'owl coins', were in circulation in the Near East as a bona fide international currency. Kingdoms and cities would thus produce imitations of them, sometimes adding a distinctive mark. On those that were struck in the Kingdom of Lihyan, Athena's cheek bears the letter *dal* from the Dadanitic alphabet on the drachmas and a crescent on the tetradrachms. The style of these imitations soon distanced itself from the Greek model and evolved towards an increasingly stylized design, while their weight, which originally conformed to the Attic standard, became progressively lighter. By the end of the fourth century BC, drachmas had disappeared and tetradrachms were minted only in bronze.

It is these bronze coins, a very stylized version inspired by the Athenian 'owls', that were uncovered at Hegra. Athena's profile is reinterpreted, at first returning to its main outlines before evolving towards an increasingly more schematic design, following canons very far removed from those of Greek art (**fig. 1**). They are neither royal nor civic coins as they do not bear a legend or mark to identify the emitting authority or to enable a precise dating. The transition from silver to bronze and the evolution towards a different graphic style from the Greek model were fairly rapid, as very stylized bronze tetradrachms have been found at both Hegra and Petra in fourth-century BC archaeological contexts. Others, displaying an even more schematic style, were overstruck on third-century BC Ptolemaic bronze coins.

Although found in great numbers at Hegra, these Lihyanite owl coins are very rare elsewhere. The first silver imitations, in the fourth century BC, could in theory have been exported. On the other hand, it is clear that, from the third century BC when these coins were produced only in bronze,



Fig. 1. Bronze Lihyanite tetradrachm, fourth–third century BC. Hegra, Surface_C320 (© MSAP).

they formed part of a local currency destined for circulation only within the limits of the oases of Dadan and Hegra, where they were found. Bronze was not intended for export or to be used as currency abroad. The scarcity of silver in pre-Nabataean Hegra is perhaps evidence of a decline, between the fourth and third centuries, of its long-distance trade relations.

The Nabataean coins

When Hegra came under the control of the Nabataean kingdom towards the end of the first century BC, the oasis adopted the Nabataean coinage, which was very different from the one in circulation in the previous period. It was a royal silver and bronze coinage bearing the images and names of kings and queens with, occasionally, a date (**fig. 2**). At Hegra, it marked the return of precious metal coinage, a possible sign of a resumption of exchanges with the outside world. For daily internal trade, the Nabataean bronze coinage was used in parallel with the old Lihyanite owl coins which were still in circulation, although the only coinage accepted by the authorities was silver coinage, *sela'* in Nabataean. Indeed, inscriptions engraved on the facades of the rock-cut tombs state that fines for the desecration or appropriation of burials had to be paid in '*sela'* of Aretas'.

Apart from a few rare examples, Nabataean coins found at Hegra date from Aretas IV to Rabbel II, in other words from the ninth century BC to AD 106. They represent almost half of all coins found and identified on the site, although they cover a maximum span of 115 years. This clearly attests to the prosperity of the oasis and its local market during this Nabataean golden century. The



Fig. 2. *Sela'* of Aretas IV and Huldū, dated year 2 of the reign of Aretas, 8/7 BC. Hegra, 11001_C10. Meshorer 50 (© MSAP).

Nabataean coins minted at Petra were in circulation throughout the kingdom, but it is possible that Hegra minted its own coinage. Very unusual bronze coins have been found, which do not appear to be part of the Nabataean monetary system. One face depicts a large Nabataean *h* while the other depicts a large O. These two letters, or symbols, whose meaning is unknown, often appear together on royal Nabataean coins, but those coins that bear only these symbols have never been found outside Hegra.

The Roman coins

The annexation of the Nabataean kingdom by Trajan in AD 106 and its transformation into a province of the Roman Empire called ‘Arabia’, was accompanied by an ambitious monetary programme. The Romans minted silver drachmas, probably in Antioch, bearing the image of Trajan. On the reverse is an allegory (or personification) of Arabia accompanied by a small camel. Other drachmas, minted in Rome, depict a two-humped Bactrian camel (**fig. 3**). These drachmas were specially intended for the Province of Arabia to supply the monetary circulation. They were the equivalent of the *selaʿin* of the Nabataean kings, and some were even overstruck on these coins. To date, about twenty drachmas datable to AD 111–117 have been found at Hegra. Subsequently, the silver coins in circulation at Hegra were the denarii minted in Rome or in the East, as was the case in the rest of the Empire. Tetradrachms, dating to the mid-third century and minted in Antioch or even Rome and destined for the eastern provinces, have also been found.

In the case of Roman bronze coins, those in circulation at Hegra were fairly heterogeneous. Initially, the Romans introduced coins from Rome (sesterces, assēs, etc.) as well as old coins from Antioch—so worn as to be sometimes illegible—that were countermarked to extend their validity. During the second and third centuries, other bronze coins of all types were added, minted in Rome, Antioch, and Alexandria, as well as local coins, sometimes illegally issued by cities of



Fig. 3. *Drachma of Trajan minted in Rome in AD 115–117 for circulation in the Province of Arabia. Hegra, 64301_C01. RPC III 4076 (© MSAP).*

Arabia, such as Petra and Bosra. Some of these local coins also came from much further away, notably the Balkans. Unlike other cities of Arabia which had adopted the Greek institutions and obtained the right to mint their own bronze civic coinage, Hegra never issued any.

By the end of the third century, the Roman Empire had adopted a unified coinage bearing Latin legends, identically produced by various workshops distributed throughout the Empire. These late coins have been found at Hegra, though in relatively moderate quantities. Hegra differs in

this respect from northern sites in the Province of Arabia where fourth-century coins are always found in great numbers. The fact that only a few have been found at Hegra is a clear sign of the decline of the oasis at this time. Coins suddenly become rare in the mid-fourth century, the latest coin to be identified being a small coin of Honorius (393–423). By this date it is not known whether the army and the authorities of the Empire were still present in the Hijaz.

Appendix

Selection of coins from the catalogue

Thomas Bauzou (University of Orléans)

This selection of coins was made during the 2022 season for the new edition of the AlUla exhibition to be held in Beijing. It is repeated here because it gives an idea of what the catalogue of coins of Hegra may look like.



35014_C01

Lihyan, drachma, fourth century BC.

Silver, 14 mm, 2.07 g. Found at Hegra (Saudi Arabia), 35014_C01.

Obverse: stylized helmeted head of Athena, facing right, with the Dadanitic letter *dal* on her cheek.

Reverse: P (retrograde) ΘE, owl standing right, head facing; olive branch and crescent on left.

AlUla, Archaeology and Heritage Museum.



10096_C01

Lihyan, bronze tetradrachm, third century BC (?).

Bronze, 23 mm, 9.32 g. Found in Hegra (Saudi Arabia), 10096_C01.

Obverse: stylized helmeted head of Athena, facing right, with crescent on her cheek.

Reverse: ΘE, stylized owl standing right, head facing; olive branch and crescent on left.

AlUla, Archaeology and Heritage Museum.



Surface_C242

Lihyan, bronze tetradrachm, third century BC (?).

Bronze, 23 mm, 10.60 g in Hegra (Saudi Arabia), Surface_C242.

Obverse: stylized helmeted head of Athena, facing right, with crescent on her cheek.

Reverse: ΘΕ, stylized owl standing right, head facing; olive branch and crescent on left.

AlUla, Archaeology and Heritage Museum.



Surface_C047

Lihyan, bronze tetradrachm, late fourth/early third century BC.

Bronze, 22 mm, 12.70 g. Found at Hegra (Saudi Arabia), Surface_C047.

Obverse: stylized helmeted head of Athena, facing right, with two crescents on her cheek.

Reverse: ΘΕ, stylized owl standing right, head facing; olive branch and crescent on left.

AlUla, Archaeology and Heritage Museum.



34015_C05

Lihyan, bronze tetradrachm, third century BC (?).

Bronze, 20–24 mm, 11.24 g. Found in Hegra (Saudi Arabia), 34015_C05.

Obverse: stylized helmeted head of Athena, facing right, with two crescents on her cheek.

Reverse: ΘΕ, stylized owl standing right, head facing; olive branch on left.

AlUla, Archaeology and Heritage Museum.

**90042_C03**

Alexander the Great, tetradrachm, maker unknown, late fourth century BC.

Silver, 29 mm, 15.85 g. Found at Hegra (Saudi Arabia), 90042_C03.

Obverse: head of Heracles, beardless, wearing a lion's skin.

Reverse: Zeus seated and facing left, legs crossed, holding an eagle and sceptre.

AlUla, Archaeology and Heritage Museum.

**Surface_C329**

Cleopatra VII (51–30 BC), 80 drachma coin, minted in Alexandria (Egypt).

Bronze, 27 mm, 16.65 g. Found at Hegra (Saudi Arabia), Surface_C329.

Obverse: Draped bust of Cleopatra, facing right.

Reverse: Eagle standing left, cornucopia and letter Π (80).

AlUla, Archaeology and Heritage Museum.

**Surface_C308**

Single-sided bronze coin, eastern Arabia, third–fourth century AD?

Bronze, 21 mm, 7.83 g. Found at Hegra (Saudi Arabia), Surface_C308.

Obverse: smooth. Reverse: lines and circles.

These coins were produced in ad-Dur or Jabal Kanzan, in eastern Arabia, during a late period (third–fourth century). The abstract design on the reverse derives from the image of a god seated facing left, as on the tetradrachms of Alexander.

AlUla, Archaeology and Heritage Museum.



11001_C10

Aretas IV (9 BC–AD 40) and Ḥuldū, *sela'*, Petra, 8/7 BC.

Silver, 17 mm, 4.12 g. Found at Hegra (Saudi Arabia), 11001_C10.

Obverse: ḤRTT MLK NBTW [...], head of Aretas IV wearing a crown, facing right.

Reverse: [...] ŠNT TLTYN, bust of Ḥuldū wearing headscarf, facing right.

AlUla, Archaeology and Heritage Museum.



90025_C01

Aretas IV (9 BC–AD 40) and Ḥuldū, *sela'*, Petra, 9/8 BC.

Silver, 17 mm, 3.75 g. Found at Hegra (Saudi Arabia), 90025_C01.

Obverse: [ḤRT]T MLK NBTW [...], laurel-crowned head of Aretas IV facing right.

Reverse: [...] MLKT NB – ṬW Š[NT ...], bust of Ḥuldū wearing headscarf, facing right.

AlUla, Archaeology and Heritage Museum.



25430_C02

Aretas IV (9 BC–AD 40), divisional currency coins, Petra.

Bronze, 15 mm, 1.42 g. Found at Hegra (Saudi Arabia), 25430_C02.

Obverse: laurel-crowned head of Aretas IV, facing right.

Reverse: two crossed cornucopias.

AlUla, Archaeology and Heritage Museum.

**10048_C01**

Aretas IV (9 BC–AD 40) and Shaqilat, divisional currency coins, Petra, 20–40 AD.

Bronze, 20 mm, 3.00 g. Found at Hegra (Saudi Arabia), 10048_C01.

Obverse: bust of laurel-crowned head of Aretas IV and bust of Shaqilat wearing a headscarf, both facing right.

Reverse: ḤRTT / ŠQY/LT across three lines, between two crossed cornucopias.

AlUla, Archaeology and Heritage Museum.

**34414_C01**

Trajan (98–117), drachma, Antioch for Arabia, 114/115 AD.

Silver. Found at Hegra (Saudi Arabia), 34414_C01.

Obverse: Greek inscription off-centre; laurel-crowned bust of Trajan facing right.

Reverse: [...] ΕΞ ΙΗ ΥΠΑΤ Σ (18th power tribunician, six times consul), allegory of Arabia standing left, a small camel at his feet.

AlUla, Archaeology and Heritage Museum.

**64301_C01**

Trajan (98–117), drachma, Rome for Arabia, 115–117 AD.

Silver, 19 mm, 1.85 g. Found at Hegra (Saudi Arabia), 64301_C01.

Obverse: [...]ΚΑΙCΝΕΡΤΡΑΙΑΝ[...], laurel-crowned, draped and armoured bust of Trajan facing right.

Reverse: [...]ΥΠΑΤΟC, two-humped camel facing left.

AlUla, Archaeology and Heritage Museum.



36000_C04

Hadrian (117–138), currency of Petra.

Bronze. Found at Hegra (Saudi Arabia), 36000_C04.

Obverse: [ΑΥΤΟΚΡΑΤΩ]Ρ ΚΑΙCΑΡ ΤΡΑΙΑΝΟC ΑΔΡΙΑΝΟC CΕΒΑCΤΟC], laurel-crowned and armoured bust of Hadrian facing right.

Reverse: ΠΕΤΡΑ ΜΗΤ – ΡΟΠΟΛΙC, Tyche of Petra seated left on a rock, stretching her right arm out and holding a trophy over her left shoulder.

AlUla, Archaeology and Heritage Museum.



34740_C01

Antoninus Pius (138–161), bronze drachma, Alexandria, AD 138–139.

Bronze, 35 mm, 20.37 g. Found at Hegra (Saudi Arabia), 64301_C01.

Obverse: [ΑΥΤ Κ Τ] ΑΙΛ ΑΔΡ [ΑΝΤΩΝΙΝΟC ΕΥCΕΒ], draped and armoured bust of Antoninus Pius facing right.

Reverse: [Λ Β], Serapis wearing a calathus headdress and holding a sceptre; seated facing on a ram walking right, head left; altar on right.

AlUla, Archaeology and Heritage Museum.

**34208_C02**

Philip II Caesar (244–247), tetradrachm, Antioch.

Silver, 26 mm, 11.52 g. Found at Hegra (Saudi Arabia), 34208_C02.

Obverse: ΜΑΡ ΙΟΥΛΙ ΦΙΛΙΠΠΟΣ ΚΕΣΑΡ, draped and armoured bust of young warrior facing right.

Reverse: ΔΗΜΑΡΧ ΕΞΟΥΧΙΑC, eagle facing left, clutching a palm, holding a crown in its beak; inscription 'S C'.

AlUla, Archaeology and Heritage Museum.

**34207_C02**

Etruscilla (wife of Emperor Trajan Decius, 249–251), tetradrachm, Antioch.

Silver, 26 mm, 11.25 g. Found at Hegra (Saudi Arabia), 34207_C02.

Obverse: ΕΡΕΝΝΙΑ ΕΤΡΟΥΣΚΙΑ CΕΒ, draped bust facing right in a crescent, wearing a crown.

Reverse: ΔΗΜΑΡΧ ΕΞΟΥΧΙΑC, eagle standing right, clutching a palm, holding a crown in its beak; inscription 'S C'.

AlUla, Archaeology and Heritage Museum.



60901_C01

Licinius (308–324), follis, Rome, 314–315 CE.

Bronze, formerly silver, 22 mm, 2.56 g. Found at Hegra (Saudi Arabia), 60901_C01.

Obverse: IMP LICINIVS P F AVG, laurel-crowned and armoured bust facing right.

Reverse: SOLI INVICTO [comiti], Sol facing left, with right hand raised and holding a globe; 'R/X' on left, 'F' on right, illegible inscription.

AlUla, Archaeology and Heritage Museum.

Pottery Study, 2021 Season

Caroline Durand (Afalula/CNRS–UMR 5189)

The study of the pottery took place between the 27th October and the 28th November under the responsibility of the author. Due to the absence of a draughtsperson, the diagnostic fragments isolated in 2021 were drawn in February 2022 by Jean Humbert. The recording focused primarily on Area 61, which corresponds to the Nabataean sanctuary known as IGN 132, and concerned the leftovers from the 2019 and 2020 seasons. Some of the pottery material uncovered in 2021 was also studied and recorded, particularly from Area 34, the Roman fort, where food processing and storage installations have been discovered.

Remainders from previous seasons

About ten boxes of pottery material from the IGN 132 sanctuary area (Area 61), excavated during previous seasons by Damien Gazagne, remained to be studied. Clearing this backlog was the priority for the 2021 season. Considering that the first volume of the final publication of the pottery from Hegra, currently under preparation, includes the Nabataean material, it was necessary to examine the material from the sanctuary. Indeed, this religious compound was founded in the Nabataean period and was occupied until Late Antiquity. Most of the levels recorded in 2021 showed mixed assemblages, the most coherent contexts having already been studied previously. Only *loci* 61278 and 61285 correspond to the early phases of occupation of the sanctuary (1st–2nd century AD).

Pottery material from the 2021 season

Area 34 – Roman Fort

Regarding the 2021 season, the pottery study concerned particularly the Roman fort (Area 34), excavated by Zbigniew Fiema. In Area 34500, to the north-east of the fort and below the “citadel” (Hill B), several rooms used for food processing and storage were discovered (see Fiema, Trench E, in this volume). The excavations revealed several occupation phases which yielded good coherent assemblages of culinary pottery, including several complete or almost complete vessels.

Locus 34518 (**fig. 1**) can be dated to the 2nd or 3rd century AD, most probably late 2nd–3rd century AD. It includes in particular a painted beaker which can probably be related to the “Petra painted common ware” (34518_P11), although its provenance is not determined. The assemblage also includes vessel types typical of the Roman period, such as a cooking-pot with short vertical neck and bevelled rim (34518_P13) and several casseroles with triangular cut rim and

horizontal pinched handles (34518_P14 & 34518_P15). Culinary pottery from *locus* 34556 (**fig. 2**) is characterised by its very sharp profiles, such as the almost complete cooking-pot 34556_P03, with short vertical neck and bevelled rim, and the complete carinated casserole 34556_P02. The fabrics are close to those of the 4th–early 5th c. AD occupation phase. Therefore, the *locus* might be dated to the late 3rd to early 4th century AD. It also includes a wide coarse ware jar (34556_P01; diameter 62 cm), locally produced, the function of which remains undetermined.

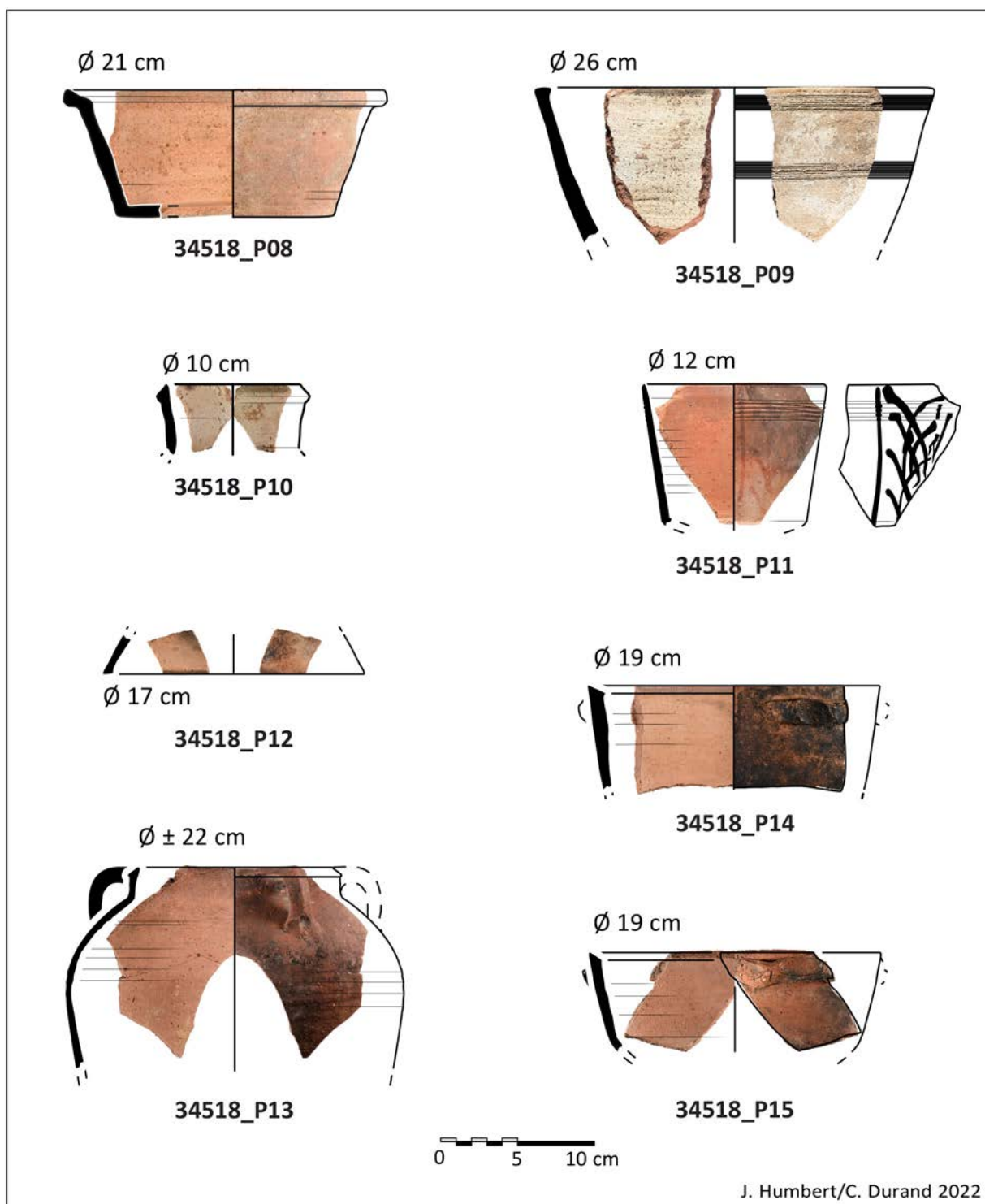


Fig. 1. Pottery selection from *locus* 34518, Roman period, 2nd–3rd century AD.

Lastly, area 34500 also yielded a fragment of local storage jar bearing a short incised Nabataean inscription (34508_P10 = 34508_I01; **fig. 3**). This category of inscription, incised on the pottery before firing, is the first of its kind found in Hegra (for the reading, see Nehmé, Introduction, in

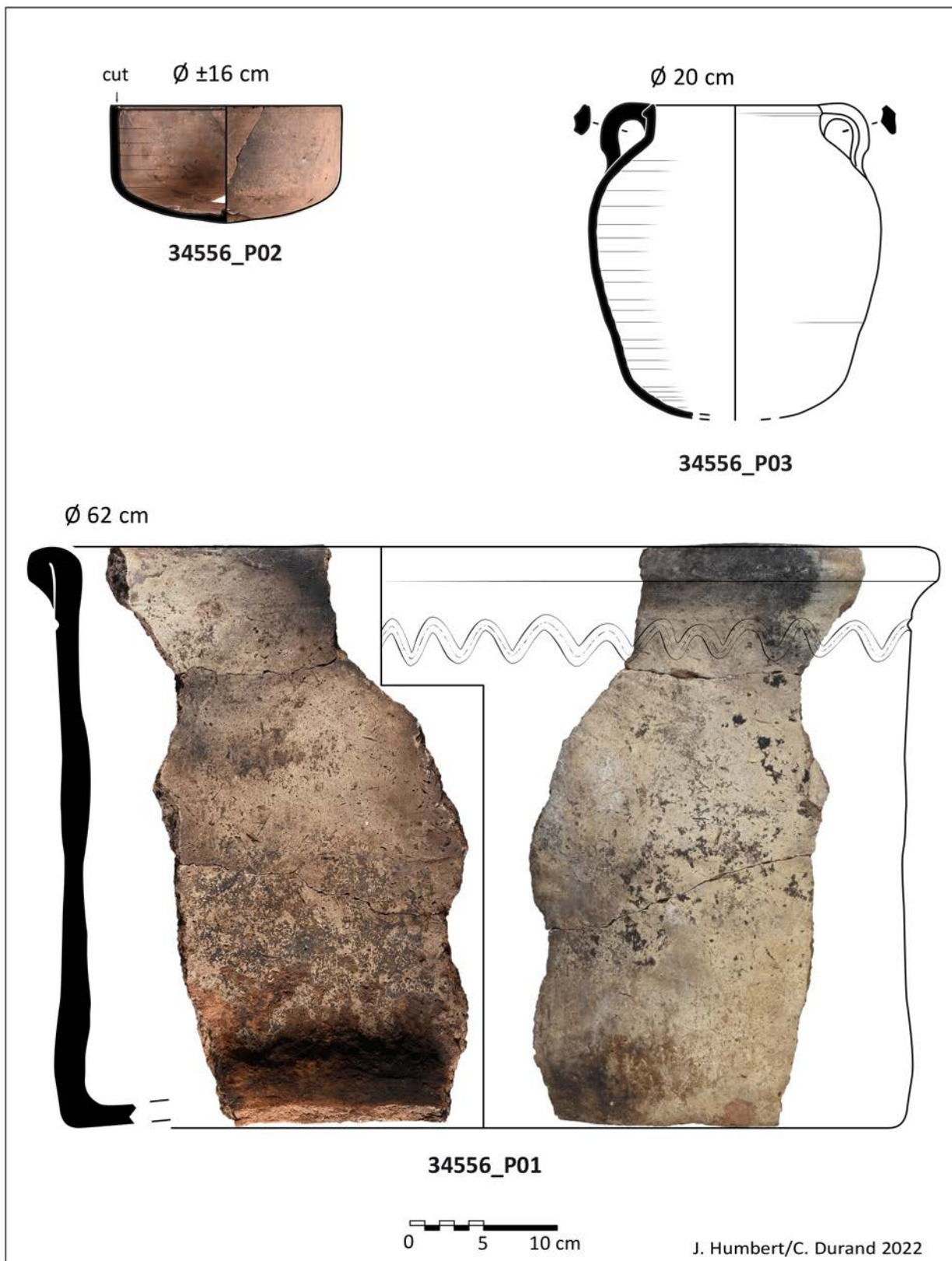


Fig. 2. Pottery selection from *locus* 34556, Roman period, possibly late 3rd–early 4th century AD.

this volume). Another incised Nabataean inscription was found on a storage jar from Taymā' (Macdonald 2020: 128–129, TA5465.8). This type of local storage jar, rather coarse and decorated with incised pointed wavy lines, is very common in Hegra but it is still difficult to date it accurately. Moreover, *locus* 34508 is mixed and seems to result from the fall of various elements from the

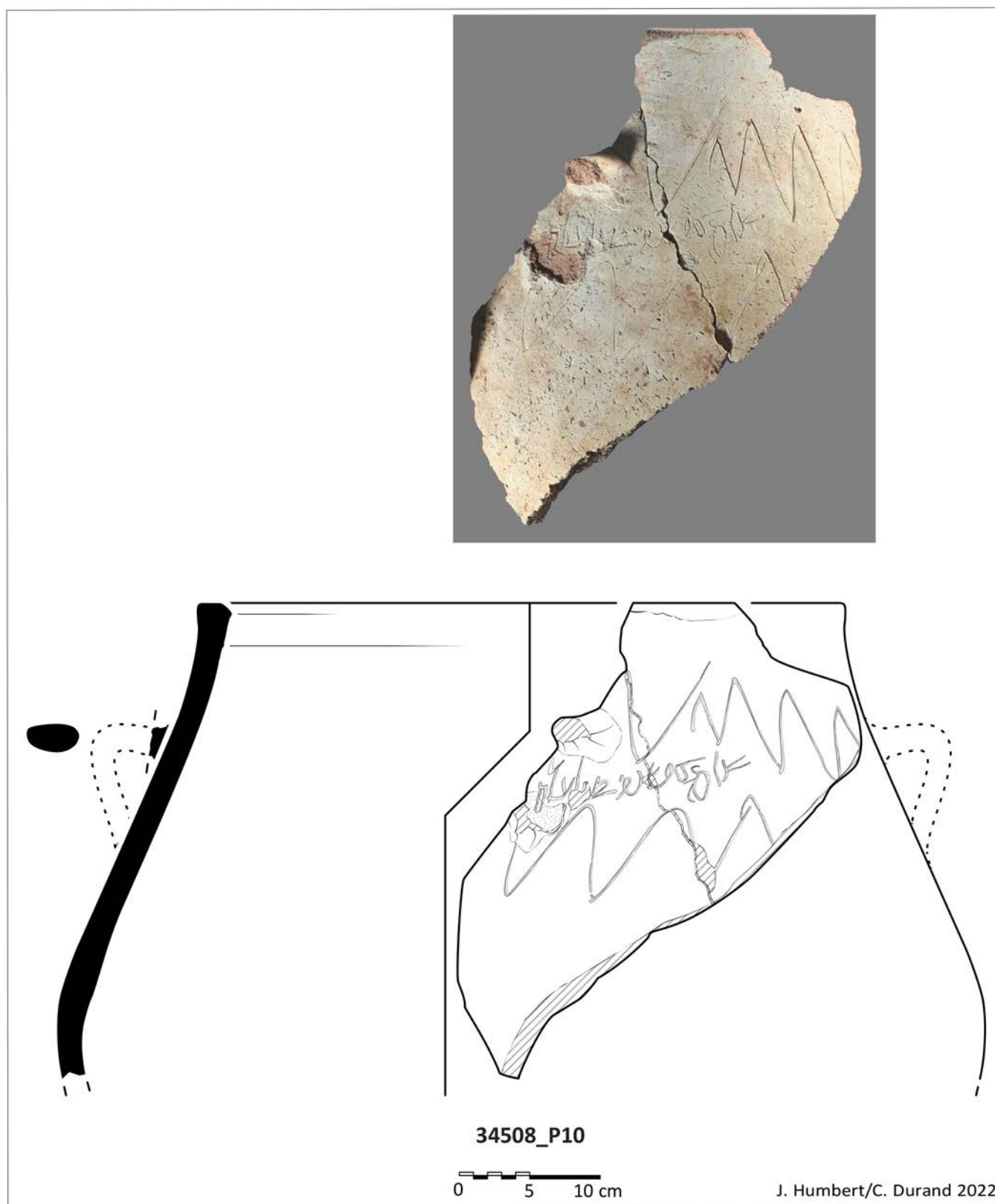


Fig. 3. Storage jar with Nabataean inscription from *locus* 34508.

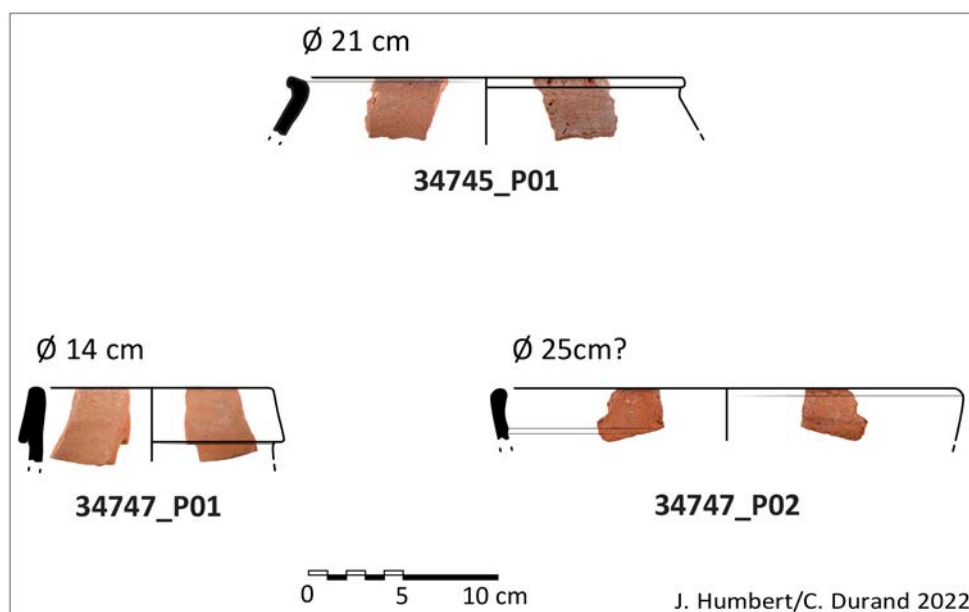


Fig. 4. Pottery selection from the sounding 34740, pre-Nabataean/Liyanite period.

top of the citadel. Based on the palaeography of the inscribed text, a date in the 1st century is possible but a later date, into the 2nd century, cannot be excluded.

Area 34600 corresponds to the barracks related to the fort, to the west of Area 34500 (see Fiema, Trench F, in this volume). The remains in this area are very worn and the main archaeological contexts are situated below the foundation levels of the walls. These contexts yielded a large number of fragments of large pithoi/storage jars, suggesting a storage function for these rooms during the Roman period. The storage jars were probably buried in order to improve the preservation of the foodstuffs inside.

Finally, several soundings (*loci* 34700) were carried out by Emmanuel Botte in order to identify a potential dump associated with the fort, the strategy being based on investigating the anomalies detected by the soil analyses undertaken by Marc Ducouso in 2020 (see Nehmé, Introduction). Unfortunately, these soundings did not bring any convincing evidence for ancient dumps (see Botte, Dumps, in this volume). As a compensation for this failure to discover the dump(s) of the fort, sounding 34740, to the north of the Roman fort, proved promising as it yielded pre-Nabataean pottery of the Liyanite period (**fig. 4**), associated with metallic slags. The pottery assemblage is composed of pre-Nabataean fabrics such as fine pale fabric with white inclusions (fabric no. 41), pinkish fabric with coarse inclusions (fabric no. 9) and red fabric with vegetal temper, among which a probable cooking-pot with everted rim (34745_P01) and a bowl with rounded rim (34747_P02). It also includes an imported Mediterranean amphora rim sherd (34747_P01), possibly of Dressel 1 type. As these early levels are located immediately below the ground surface, without any subsequent reoccupation, an extensive excavation of this area could be particularly interesting, as the occupation levels dating to the pre-Nabataean/Liyanite period are so far limited to a few small contexts in deep soundings from the residential area and the Roman fort, with only few associated structures.

Area 36

In addition, a new excavation area was opened to the north-west of the residential area (Area 36). This area was subjected to intensive surface stripping which uncovered several building complexes and yielded very large quantities of pottery. To the west, a series of small rooms or cells, leaning

against the rampart or placed on the outside of the town, can be dated to the end of the 4th or beginning of the 5th century based on the presence of several complete carinated cooking pots characteristic of the last period of occupation of the site (36028_P01, 36046_P01 & 36046_P02; **fig. 5**). Inside the city wall, an architectural complex with an apse building seems to be earlier. From the few contexts studied this year, pottery material from the last occupation phase seems to be absent. Although mixed assemblages were found, these can be dated to between the Nabataean and Late Roman periods.

Area 9

Lastly, Area 9, previously excavated, was the subject of new excavations by Pierre-Marie Blanc. In 2021, research focused on the upper, later levels, and continued in 2022 to reach the Nabataean levels. The pottery material from these two excavation seasons will be studied at a later date.

Reference

Macdonald M.C.A. 2020. *Taymā' II. Catalogue of the Inscriptions Discovered in the Saudi-German Excavations at Taymā' 2004–2015.* Oxford: Archaeopress.

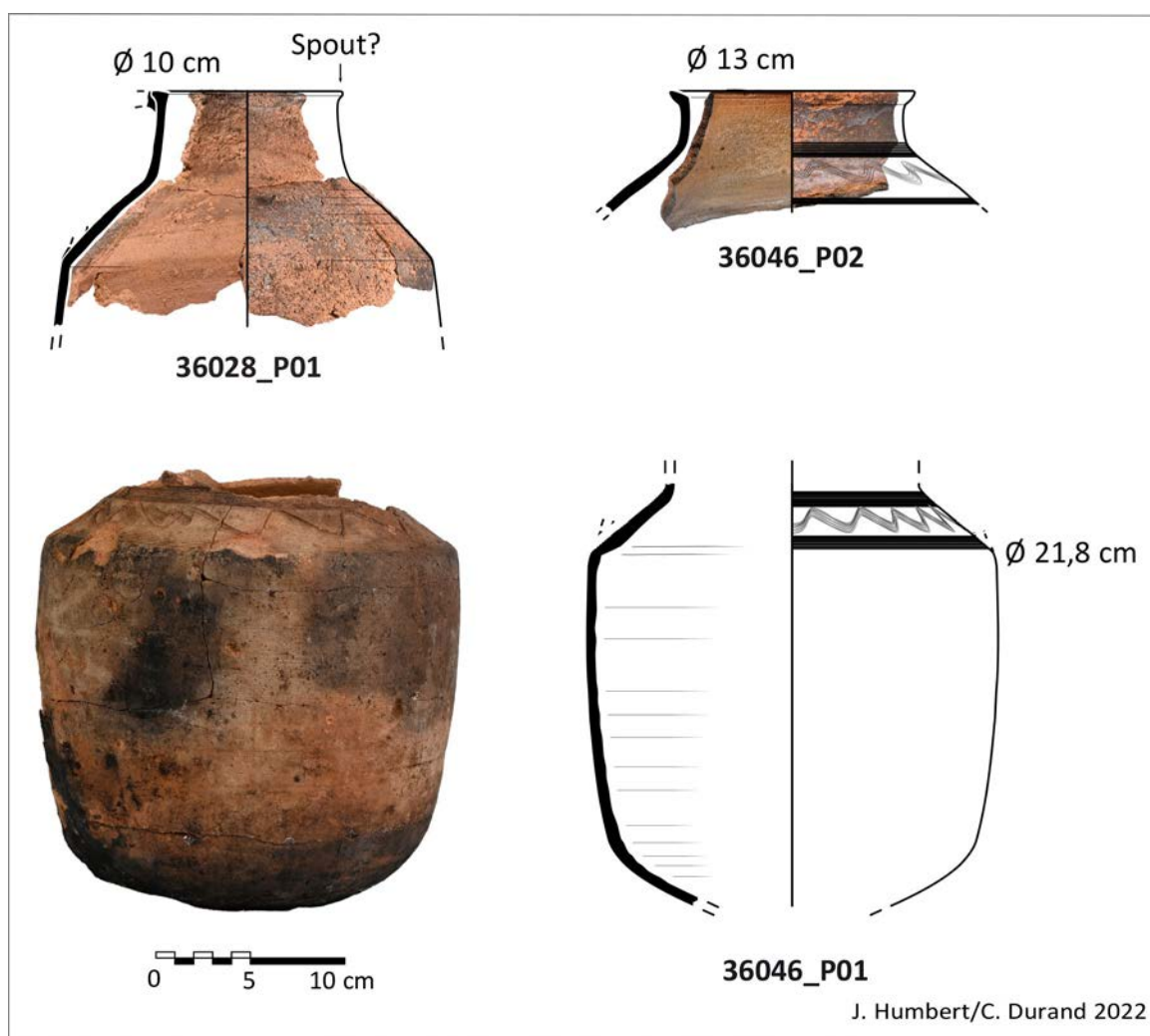


Fig. 5. Late 4th–early 5th century AD cooking-pots from Area 36 south.

Conservation and Care of Artefacts

Agathe PETIT (Independent conservator)

Metallic artefacts and coins

The 2021 and 2022 excavations yielded many metallic artefacts, mostly in copper alloy but also in silver and ferrous alloy, including complete objects such as a blade (34553_M01) or fragments of a bronze figurine (36000_M02). All these objects were treated in the laboratory set up in the dig house in order to obtain information on elements and details which were not visible under soil and corrosion, such as decoration, technical, and aesthetical details. They were either partly or totally cleaned, depending on the size of the object, the preservation of the material and the accuracy of the treatment.

The conservation techniques are the same for every artefact but they are combined differently. Both chemical and mechanical treatments are used under binocular. They include solvents (distilled water, ethanol, acetone), sequestering agents (EDTA, TAC), citric acid, scalpel, fiber-glass sticks, Dremel® (with diamond burs, corindon burs, steel brushes, etc.). Some broken parts were glued back together with acrylic resins (Paraloid®B72 and B44 diluted to 30% by weight in acetone).

The 2021 and 2022 excavation seasons yielded a large amount of coins (approximately 78 in 2021 and 76 in 2022). Most of them are made of copper alloy of different quality and manufacturing technique. Some are very well preserved but most are in very poor condition. The corrosion layers of copper alloy coins are typical of archaeological contexts: the external layer is very thick, light green and contains a lot of sand grains. The internal layers are mostly made of cuprite, red, dense, and hard. The original surface which contains the interesting information is more or less located at the interface between these two layers. One should note however that the succession of layers varies over the surface of the coins and the identification of each is therefore neither easy nor immediate. This increases the time needed to clean each coin. A stratigraphic study to identify the layers of corrosion is performed on the edge of each coin using a scalpel blade, before starting the cleaning interventions.

The treatment applied to the coins allowed to identify silver coins, more or less well preserved under a thick copper corrosion (the material used was probably an alloy made of a lot of silver and a little copper) (**figs 1–4**).

Some coins are probably of Nabataean origin with cut flank shapes while some can be clearly identified as Roman (**figs 5–6**). In addition, two coins with a hole in them may have a Ptolemaic origin. Finally, many thick “owl” coins are now readable (**figs 7–8**).



Figs 1–2. Coin 11001_C10, obverse (left) and reverse (right) before treatment (© MSAP).



Figs. 3–4. Coin 11001_C10, obverse (left) and reverse (right) after treatment (© MSAP).



Fig. 5. Coin 36020_C01, obverse before treatment (© MSAP).



Fig. 6. Coin 36020_C01, obverse after treatment (© MSAP).



Fig. 7. Coin 36544_C01, reverse before treatment (© MSAP).



Fig. 8. Coin 36544_C01, reverse after treatment (© MSAP).

Finally, the 2021 season was the occasion to establish a very precise condition report on the camel figurine put to light during the 2020 excavation season (68302_M02). A treatment proposal was submitted and validated by the Royal Commission for AlUla so that the object can be treated and stabilized as soon as possible, in any case before it is exhibited in a different environment.

Pottery

The areas excavated provided many almost complete pottery pots, broken into pieces. In 2021, the inside of two pots were conserved in Minigrip® to be studied or analyzed later. In order to help the pottery specialist studying the pottery types and shapes, more than twenty of them were restored (**figs 9–10**).

The fragments were cleaned with water by a workman, except for one fragile specimen. However, the edges were systematically cleaned again with mechanical tools, due to the hardness of the soil crust. The sherds received a preliminary coat of acrylic resin in solution in acetone (Paraloid®B72 10% in acetone) in order to limit the porosity and to obtain an efficient bonding. Some surface flaking was consolidated with the same adhesive. The fragments were then bonded with adhesives of similar nature and more concentrated (Paraloid®B44 40% in acetone).



Fig. 9. Pottery 36046_P01 before treatment (© MSAP).



Fig. 10. Pottery 36046_P01 after treatment (© MSAP).

Glass, shells, and stone objects

All sandstone artefacts were dry cleaned with soft brushes. Some required consolidation treatments (using a solution of Paraloid®B72 diluted to 10% by weight in acetone).

On the last day of the 2021 excavation season, a particularly conspicuous find, inscribed incense burner 92301_S01 (see the Introduction, fig. 7), required immediate treatment. It was dusted with a soft brush and consolidated using the same solution to avoid any loss of material. As for the other stone objects, when the surface condition and porosity allowed it, they were cleaned with a solution of deionized water and ethanol in equal proportion by volume. The shells were treated according to the same protocol.

Some glass artefacts required emergency treatment due to their advanced state of degradation caused by the high salinity of the soil. Almost all the glass objects show weathering alterations, resulting in a strong iridescence and significant flaking. These objects were consolidated by

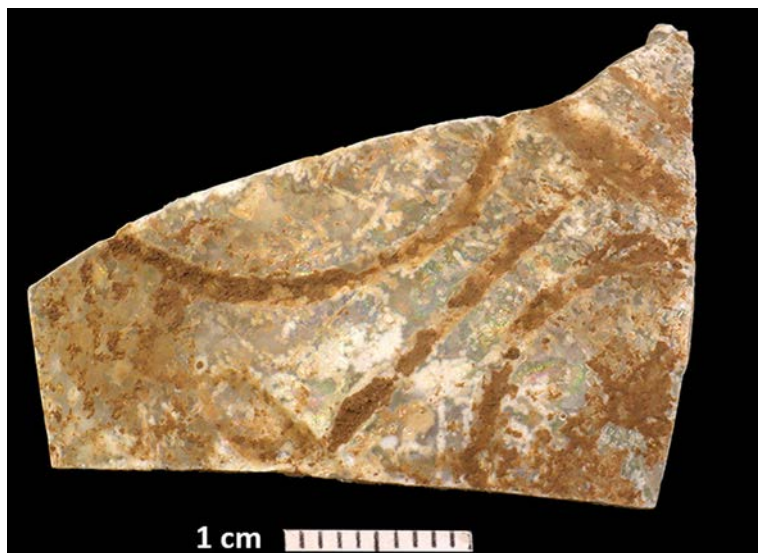


Fig. 11. *Incised glass fragment 34508_G02, before treatment (© MSAP).*

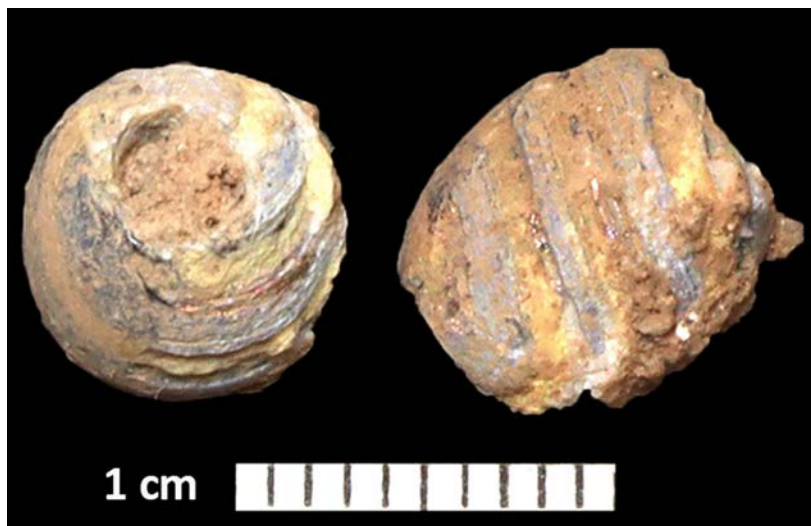


Fig. 12. *Glass bead 34571_G05, before treatment (© MSAP).*

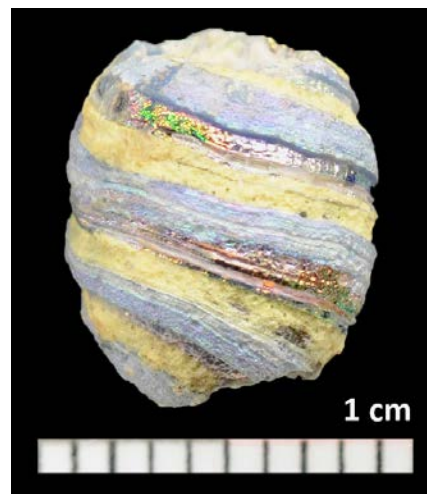
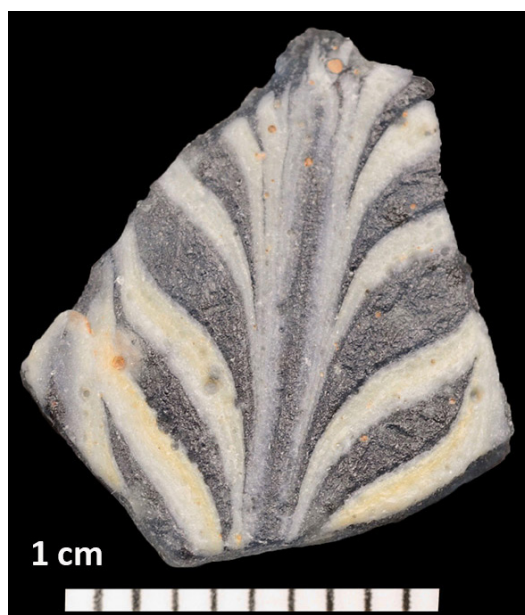


Fig. 13. *Glass bead 34571_G05, after treatment (© MSAP).*



bathing in a solution of Paraloid®B72 diluted to 10% in ethanol. The sediments were then removed by gradually lowering the consolidating layer.

Some of the glass could be partially reassembled by bonding (Polaroid®B72 diluted 30% by weight in acetone). We noted the conservation of some engraved glass (**fig. 11**), and of glass paste beads of various sizes and shapes, including one tricolor (**figs 12–13**). Two fragments of “Egyptian type” glass with blue and white decoration are particularly remarkable (**fig. 14**).

Fig. 14. *Glass fragment 92400_G01, after treatment (© MSAP).*