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Madâin Sâlih Archaeological Project (MSAP)

Summary Report on the 2016 and 2017 Seasons

This is the provisional version (before page set up and proofs) of the article to be published in *Atlat*, the Saudi Arabian archaeological journal. The figures are not included.

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Introduction

The 2016¹ and 2017² excavation and study seasons were undertaken in the framework of the 2014–2018 work agreement signed between the French National Centre for Scientific Research (Orient & the Mediterranean, UMR 8167), represented by Laïla Nehmé, and prince Sultan bin Salman bin Abdulaziz, president of the Saudi Commission for Tourism and Antiquities.³

Excavations were conducted exclusively in the so-called Residential Area, i.e. the ancient city of Hegra, which occupies a surface of c. 52 ha in the central part of the ancient site and was surrounded by a mudbrick rampart of c. 3 km long. Six areas were excavated within it (**fig. 1**):

- Area 34, the Roman fort (2016 and 2017);
- Area 35, the South-East gate (2016 and 2017);
- Areas 37 and 38, two towers on the eastern side of the city wall (2017);
- Area 6 (IGN 132), the Nabataean sanctuary and its surroundings, including the large residential unit on its southwestern side;
- Area 9, a domestic area south-west of the city.

As for the studies, they concerned the coins (with a special focus on the so-called Owl coins), the pottery, the faunal remains (with a special focus on the camel bones of Area 34 and the modified knucklebones), the textiles put to light in three Nabataean monumental tombs (IGN 88, 97, and 116.1), and the architectural blocks from Areas 6 and 9. Analyses were

¹ In 2016, the team was composed of the following persons: Khalid Alhaiti, Thomas Bauzou, Pierre-Marie Blanc, Rozenn Douaud, Patricia Dal-Prà, Caroline Durand, Zbigniew T. Fiema, Damien Gazagne, Yvonne Gerber, Jean Humbert, Pierre-Yves Marion de Procé, Muhammad al-Mathami, Maher al-Musa, Laïla Nehmé, Marie Peillet, Ibrahim as-Sabhan, Jacqueline Studer, and Daifallah al-Talhi.

² In 2017, the team was composed of the following persons: Khalid Alhaiti, Thomas Bauzou, Pierre-Marie Blanc, Rozenn Douaud, Caroline Durand, Zbigniew T. Fiema, Damien Gazagne, Yvonne Gerber, Jean Humbert, Muhammad al-Mathami, Maher al-Musa, Laïla Nehmé, Marie Peillet, Alain Pierre, Jérôme Rohmer, Ibrahim as-Sabhan, Delphine Seigneuret, Jacqueline Studer, and François Villeneuve.

³ A full report of these two seasons was submitted to the authorities in charge of antiquities in Saudi Arabia and are available online (see under “MSAP reports” in the bibliography). This contribution is a summary of the work done but it does not include the discussion of the epigraphic material, for which the reader is invited to refer to the full reports.

performed only on some metal corroded artifacts, the physicochemical characterization of which was made at King Abdullah University of Science of Technology.

The last main field of activity of the MSAP dealt with inscriptions in various scripts and languages. The Arabic inscriptions carved in the Jabal Ithlib area, the number of which reaches one hundred, were surveyed by M. al-Musa in 2017.⁴ Khalid al-Haiti and Laïla Nehmé re-examined the collection of c. 100 Dadanitic inscriptions of Madā'in Šāliḥ which belong to about about seventeen epigraphic points scattered throughout the site. Proper geographical coordinates were taken, previously published inscriptions the precise location of which was not known were searched for and new photographs were taken. These inscriptions are now ready to be handed over to a trained epigraphist for publication. The Developing Arabic (Nabataeo-Arabic) inscription known as CIS II 333, re-discovered by A. al-Emam in the Old Town of al-'Ulā, where it was reused in the doorjamb of the door of a house, was examined *in situ* and, with the agreement of the general secretary of the Saudi Commission for Tourism and Antiquities, Dr. Ali al-Ghabban, it was removed from its reused location, replaced by an ordinary stone and taken to the al-'Ulā museum.⁵ Finally, a few miscellaneous inscriptions were studied thoroughly. Two come from the area of the Roman fort: a fragmentary Ancient North Arabian Inscription (34077_I01, A. Al-Jallad) and an inscription in the Ancient South Arabian Script (34057_I01, Irene Rossi). A stone block bearing four Nabataean inscriptions, found reused in a wall of the residential unit built south-east of the main Nabataean sanctuary of the city was also carefully examined (64114_I01 to I04, Laïla Nehmé). Among these four texts, 64114_I01 is particularly interesting because it mentions *šmy'*, "Heaven", a probably supreme male deity known only in the region of al-'Ulā.⁶

Excavations (see fig. 1)

Area 34, the Roman fort (by Z.T. Fiema)

The 2016–2017 fieldwork seasons included the continuation of excavations in Area 34, located on a stony plateau, c. 135 m (east–west) x c. 90 m (north–south). This area lay directly to the west of Hill B the top of which once held a citadel which must have remained in a close functional relationship with the extant structures in Area 34. The prior hypothesis that these structures relate to the Roman military presence in Hegra, and should be recognised as a Roman fort, has been confirmed during these seasons. The fort is a quadrangle, c. 85 m (east–west) and over 65 m (north–south) and is limited by three perimeter walls (**fig. 2**). The fourth side, at the foot of the steep slope of Hill B, is occupied by a large multiple-room building, i.e., the Eastern Barracks (Rooms I–X).

The fieldwork included a major clearance of the surface of the entire stony plateau, and the excavations in Trench B (Rooms XI, XII and XIII), Trench C (Room XIV) and Trench D (**fig. 3**). The clearance served to firmly establish the course and construction of extant walls as well as it provided numerous finds. The majority of large quantities of surface ceramics date to the 1st–4th century CE. Bronze coins found on the surface were also abundant. Of particular interest

⁴ Note the only eight Arabic inscriptions from Madā'in Šāliḥ were previously published by H. al-Kilābī in 2009 (no. 78–185).

⁵ It finally received inventory number RCU.2021.61 and is now published in Nehmé 2022.

⁶ For which see now Nehmé 2020: 131 and 138.

are bronze objects, which surpass the number of such artifacts found elsewhere in Hegra. These objects included tie-hooks, binding elements, small plates, metal straps/bands, rings for buckles and fasteners, and strap-junctions and terminals, and at least some must relate to specialised equipment, e.g., horse harness and/or bronze armor.⁷ Of interest is an openwork baldric (sword belt) fastener which finds rounded or oval parallels from Dura Europos, dated to the 2nd–3rd centuries (**fig. 4**).⁸ Several bronze plates feature series of punched holes; these perhaps are the locally made replacements of scales of *lorica squamata*.⁹ Also, fragments of bronze fibulae and statuettes were found.

The southern perimeter wall of the fort, c. 65 m long and running WNW–ESE, is the best-preserved element of the fort. Trench B was opened in the central part of that wall, and it revealed a small postern gate, c. 2.1 m (i.e., a little over 7 *p.M.*)¹⁰ wide, flanked by two solid, rectangular towers, c. 3.70 x 1.70 m and 4.20 x 1.70 m (6 *p.M.*), respectively. The foundation deposit of the flanking towers yielded late 1st–early 2nd century sherds. Room XI, adjacent to the gate on the northwestern side, was occupied in the 2nd century, but by the mid-3rd, most of the flagstones were removed, the gate was blocked by inserting two stone basins and the stacks of flagstones, and a small buttress (1.5 x 1.5 m) was built outside, in front of the blocking (**fig. 5**). Room XI appears to have been militarily occupied until the end of the 3rd century. However, the latest occupational phase, dated to the early 4th century, features different spatial organisation and material remains, probably indicating civilian reoccupation of the militarily abandoned fort.

A unique deposit of several bronze objects was found inside Room XI under the intentionally overturned stone basin. The objects included a figurine of domestic male goat, a broken tree-trunk-shaped lamp-stand, a figurine of ithyphallic Priapus (**fig. 6**), and a figurine probably representing the Greek-Egyptian deity Harpocrates, as well as an astragal bone. The stratigraphic analysis indicates that this apparently ritual deposition would have taken place during the last stages of the military occupation of the fort, probably at the end of the 3rd–beginning of the 4th century. Trench B also provided interesting archaeozoological evidence, which mirrored the finds from Trench A. These finds confirmed the unique nature and pattern of habitation in the fort, which clearly sets Area 34 apart from all other areas in Madâin Sâlih. For example, the preference in consumption of large mammals (cattle, camel, donkey, horse, but also sheep and goat to a certain extent, see below: Faunal remains), and butchering done somewhere outside of the fort would reflect a policy of wholesale purchase, butchering and redistribution, just like in the context governed by a military commissariat.

The investigations of the southern perimeter wall also included nine small buttresses, roughly square, measuring from 1.30 x 1.30 to 1.60 x 1.60 m. These buttresses, evidently contemporary with the buttress in front of the postern gate, must have been built after the gate was blocked. Additionally, during the 2017 clearance, a large, external corner tower was uncovered c. 50 m north-west of the south-west corner of the fort. It is not certain if the tower

⁷ For similar objects see, e.g., Dixon and Southern 1992: 61–70; James 2004: 76–77, e.g., nos 42–45, 86–87.

⁸ James 2004: 52, 62, 74–75, no. 18–20.

⁹ Bishop and Coulston 1993: 117; see also *ibidem*, p. 88, fig 51.i, for an example with two pairs of top horizontal holes from Carnuntum.

¹⁰ *Pes monetalis*, i.e., Roman foot (= 0.296 m)

also belonged to the (enlarged?) fort or formed a part of new, Roman, fortifications of the Hegra town.

Trench C was opened inside the corner created by the southern and western perimeter walls which formed the space of Room XIV. The apex of the corner is occupied by a tower, max. *c.* 4.2 x 4.1 m = *c.* 14 x 14 *p.M.*, which projects outward by 1.7 m (i.e., 6 *p.M.*). The ceramics recovered from the foundation trench of the tower confirmed the construction date, as provided by sounding in Trench B. Just like in Room XI in Trench B, paving slabs were also removed from Room XIV sometime around mid-3rd century. Considerable layer of ash/charcoal found in Trench C, indicated extensive fire but whether or not it resulted from an enemy action or was accidental, cannot be ascertained (**fig. 7**). Following the fire, the room was again occupied serving most probably as a depot for ceramic vessels, perhaps associated with food processing/consuming activities nearby. In the final phase the room was turned into a place of disposal of debris and disused ceramics, and that occupation was probably no longer military. As opposed to Trenches A and B, neither coins nor bronze objects were found in Trench C, only one very fragmentary ceramic lamp and few scraps of bronze. However, a major find was a large altar with the dedication by Aurelius Glorious, the imperial freedman, dated to 213–217.¹¹ The altar was evidently reused in Room XIV as a step or pedestal.

Trench D was opened in the north-east part of the fort, where a convenient, natural depression formed a possible entranceway from the town of Hegra to the fort. The excavations in Trench D lend support to this proposition as the large structure uncovered there appear to have been tower-like, thus flanking such entranceway. However, the function of specific rooms in Trench D could not be easily discerned due to the very complicated and much disrupted stratigraphic sequence. As the bedrock in this place rapidly slopes northward, the construction of the structure required the installation of a massive levelling substructure made of mudbrick walls with spaces in-between filled with soil and debris.

The 2016–2017 excavations provided a date for the construction of the fort, being the early 2nd century, which makes the fort one of the earliest military structures in Roman Arabia. The fort at Humayma in southern Jordan (Oleson 2009) provides the closest temporal and structural parallels for the Hegra fort. Similar to the Humayma fort, the measurements of some structures and walls can be easily converted into Roman feet indicating the modular planning employed by Roman engineers.¹² So far, the excavations in Trenches A–C indicate an unknown emergency around the mid-3rd century, marked by hastily undertaken reinforcement of the fort. The southern gate of the fort was blocked and nine small buttresses were built against the curtain wall. A massive robbing out of convenient reinforcement or blocking material (mainly, large flagstones) indicates somewhat desperate measures in response to some kind of potential or actual threat. Ultimately, however, the military occupation continued until the end of the 3rd–the beginning of the 4th century. The archaeologically attested military abandonment of the fort in Hegra coincides with the lack of historical information which would confirm the presence of Roman garrisons in the northwestern Hejaz after the 3rd century.¹³ Subsequently to the military abandonment, it

¹¹ Fiema, Villeneuve, and Bauzou 2020: 195–197.

¹² Oleson 2017.

¹³ Fiema and Nehmé 2015: 385–386.

appears that the fort, or parts of it, was re-occupied by civilian population. That last phase in the history of the Hegra fort might have continued throughout the 4th century.

*Area 35, the South-East Gate (by F. Villeneuve)*¹⁴

The South-East gate was excavated between 2011 and 2017 during five excavation seasons (**fig. 8**). In 2018, it was stabilised for conservation. The gate has undergone two major phases of construction, one in the Nabataean period (first-state gate) and one in the Roman period (second-state gate), the remains of which are the only ones presently visible. The structures of the Nabataean gate, which are much more damaged, were excavated in depth in front and to the east of the second-state gate (from sounding E deep to sounding M, see fig. 8). Each of these two states comprises a number of phases.

The second-state gate, built in stones within a mudbrick rampart measuring more than 2 m wide at this point, flanks a 3.75 m-wide gateway comprising two roughly rectangular towers, measuring 6.70 x 4.25 m (Tower 12), and 7.15 x 4.15 m (Tower 13).

Fig. 9 represents mainly the second-state—Roman—gate at the end of the completed excavation. In the middle ground, it shows its floor and threshold levels at the draughtsman's—Jean Humbert—chest height. In the foreground, it shows the older excavated levels which revealed the foundation of the facade wall of Tower 13 (second-state) and the Nabataean gate, the floor and dismantled threshold of which are at the level of the draughtsman's feet.

Several Greek and Latin inscriptions, including two painted ones, were found reused in the masonry of the gate (**fig. 10–11**). They were presented in the 2017 report but were fully published in 2020.¹⁵ The two Latin inscriptions (35004_I09a–b) painted on a reused stone and laid upside down in the foundation of the facade wall of Tower 13 (35002), can be roughly dated by a name of Roman emperor mentioned explicitly in inscription 35004_I09a, Marcus Aurelius Antoninus. This emperor may be one of the two or more who is paid homage to in inscription 35004–I09b. Unfortunately, this name could refer either to Marcus Aurelius (161–180), to Caracalla (211–217) or, less likely, to Elagabalus (218–222). As for inscription 35004–I09b, it dates from the co-reign of two or three emperors and could therefore date to one of the following time intervals or date:

- 161–169 CE, M. Aurelius and L. Verus;
- 177–180 CE, M. Aurelius and Commodus;
- 198–209 CE, Septimius Severus and Caracalla;
- 209–211 CE, Severus, Caracalla, and Geta;
- 211 CE, Julia Domna, Caracalla and Geta.

Thus the *terminus post quem* for the construction of the gate is 170 CE, the first year of the reign of Marcus Aurelius as a single ruler. The other inscriptions reused in the gate are not explicitly dated. Seven or eight Greek incised graffiti, by soldiers who left their names, have so far been discovered on some of the gate stones, at human eye level and in visible locations: corners, inner walls, threshold. Contrary to 35004_I09a–b, these graffiti were not written on reused stones, they were produced *in situ* and they provide *termini ante quem* for the

¹⁴ This is a short summary of the detailed contribution by F. Villeneuve in the 2017 report of the MSAP. It only presents the conclusions and refers to subsequent publications.

¹⁵ Fiema, Villeneuve, and Bauzou 2020.

construction of the extant gate. None of them is explicitly dated but they contain the name Komodos, which is taken from an emperor of the last decade of the 2nd century CE, while there is no Aurelius, a name which became extremely common after 211. The extant Roman gate was therefore already constructed c. 200, and mostly used by Roman soldiers in the decades 200–210. This is consistent with the pottery and the glass material from the occupational levels in the towers and around them (3rd century).

The following chronology can therefore be proposed for the South-East gate:

A. Construction of the Nabataean gate in the 1st century CE;

B1. Construction and use of a Roman military shrine for ex-votos, to which inscriptions 35004_I09a–b, among others in Greek and Latin, belonged. According to these inscriptions, the shrine remained in use at least until the 170s. This shrine was probably standing close to where the gate is located, but it was destroyed in order to reuse its stones;

B2. Abandonment and decay of the Nabataean gate and of the shrine. This process, which took place in the second century, was long. The stratigraphy shows indeed that there was a significant period of abandonment, marked by a thick sand deposit, between the end of the use of the Nabataean gate and the construction of the Roman one. B2 is at least partly contemporary with B1. The process terminates with the dismantling and reuse of the remaining stones at the same time as the destruction of the shrine;

C. Construction of the Roman gate. This took place between the late 170s and the 190s;

F. Use of the Roman gate, first controlled by soldiers of the Roman army or auxiliaries of the latter, possibly until 220 (or later) and then, with numerous and progressive small changes in the architecture, by another authority.

A decapitated head outside Tower 12

In the well-sheltered and fairly well-hidden corner formed by walls 35008 and 35533 (the tower and the rampart, see fig. 8), one expected traces of occupation and refuse. There was indeed, above the badly defined floor level, a loose but fairly ashy refuse dump (35538) which contained a lot of large pottery fragments from jugs and bowls, as well as many animal bones. At the bottom of 35538, 25 cm from the corner of Tower 12 and the rampart, lay a human skull (**fig. 12**), which had either been placed there or had simply fallen and landed there. The head, lying on its side and horizontal, faced south-west. The bone was well preserved, the jawbone still in place (though slightly displaced by the initial strike of the pick during excavation), attesting to the fact that the skull had got there shortly after death. The articulation of the jawbone is particularly unstable and is one of the first to become disjointed. It is much more unstable than the joints of the spine.

The skull was examined in 2018 by the project's anthropologist, N. Delhopital, whose analysis is given below (**fig. 13**). The bones discovered in the excavations include a cranium, its mandible, and its first two cervical vertebrae (atlas and axis). J. Studer has also confirmed, as has been suggested by the archaeologist, that this skull has been decapitated. A healed wound is visible near the eye (**fig. 14**). A projectile probably penetrated the eye and bony regrowth can be observed at the point of impact (**fig. 15**). The skull is hyper-brachycranial and no discrete trait was noted. All the teeth were present except for the third molars (probably a result of dental agenesis). No caries was observed but the presence of tartar on the lower canines and incisors was noted. The lower teeth were considerably worn, relating to

buccolingual wear which is more pronounced on the lingual side. The opposite is true in the case of the upper teeth, i.e. the wear is more pronounced on the buccal side, especially in the second premolars and the first and second molars. Finally, stages 1 to 2 hypoplasia of the dental enamel was noted, occurring between the ages of 2 and 4.

The decapitated head was either thrown on the ground, at some distance from the body, and rapidly covered by rubbish from dump 35538, or it just fell there—a torture victim's head fixed on a pike and displayed as an example on the south corner of Tower 12—in a very public location at one of the main entrances to the town. Affected by the passing of time and weather conditions, the head subsequently fell to the ground.

Areas 37 and 38, two towers on the rampart (by P.-M. Blanc)¹⁶

As part of the investigation of the rampart of Hegra, two towers built on the eastern section of the latter were excavated in 2017 in order to determine whether they were built at the same time as the initial building programme of the rampart or later. The towers are numbered 22 (Area 37) and 16 (Area 38). Note that Tower 21 was excavated in 2009 (see fig. 1).

Tower 22, Area 37

Tower 22 forms a slight bulge in the landscape. Its south-east corner as well as part of its eastern and southern sections were visible on the surface but were heavily damaged. Material collected on the surface includes pottery sherds, fragments of milling and/or grinding tools, both mobile grindstones and stationary flat or Pompeian-type quern stones, mortars and pestles, as well as elements of stone vases.

Half of the tower was excavated and a 12 m long section was therefore opened perpendicular to the rampart (**fig. 16–17**).

The tower is formed of three double-faced walls made up of stretchers and headers resting on the external wall of the mudbrick rampart. The tower is 4.30 m wide and 3.30 m deep and the walls are 0.75 m thick (**fig. 18**). A significant proportion of the white sandstone used for the construction comes from reused blocks. One of them presents a decorative carving.

The rampart itself consists of an initial foundation course (see fig. 18) forming a wall 1.40–1.45 m wide (state 1 on fig. 13). The remainder of the wall is constructed of mud-bricks of two sizes. The eastern side of the rampart is preserved up to a maximum of six mud-brick courses set slightly back, the three lower courses measuring 12–15 cm wide, and the three upper courses only 9 cm (**fig. 19**). Excavation on the western side of the wall revealed evidence for a widening of the wall (state 2 on fig. 13) which then becomes 1.75 m wide. An intentional deposit, made before the construction of the second phase of the rampart, contained a complete cooking-pot probably dated to the Roman period, 2nd to 3rd century CE.

Tower 22 was simply placed alongside the eastern face of the second state wall and there is no evidence in the visible remains of an attempt to bond them together. What is clear is that the bottom of the rampart was already eroded and silted up with sand when the tower was built.

The excavation have also provided evidence for two earlier phases of occupation, one of which is associated with a thick ashy layer and a hearth area with a scatter of charcoal. One of the

¹⁶ This is a slightly revised version of the contribution of P.-M. Blanc in the 2017 report of the MSAP.

charcoal was radiocarbon dated to 154 BCE–58 CE.¹⁷ This ashy context is very rich: numerous green-stone vases, counters, as well as a great quantity of pottery attest to a domestic occupation or a small-scale manufacture activity nearby. Note that the same horizon, which lies 1 m below the current surface, was found throughout the sounding, over an area of at least 8 x 5 m and undoubtedly much larger.

The dating of this earlier phase of occupation relies on both the C14 date given above and the pottery contained in the *locus* just above the ashy layer, which was interpreted by the ceramicists as being mid to second half of the 1st century CE, thus providing for the ashy layer a *terminus ante quem* of the mid first CE. The dating interval given by the C14 date covering 200 years, it is still difficult to determine whether this horizon belongs to a pre-Nabataean or a Nabataean phase, though an early Nabataean phase is more likely. Besides, it is not certain whether it results from the scatter of industrial or domestic activities performed on the edge of the city before it was surrounded by a rampart. The sub-horizontal character of this deposit suggests a deliberate scatter, the alternative being that one is inside a huge courtyard.

It is therefore possible that the early Nabatean city was either an open city or, less likely, a much smaller city with a huge industrial suburb which was later surrounded by a rampart enclosing a larger surface.

Tower 16, Area 38

During the initial examination of the eastern section of the rampart, its course was followed towards the south-west, after crossing a large dune (see fig. 1). Roughly in the centre of this long section of the rampart, a temporary water course cut the latter and destroyed it over about 20 m (**fig. 20**). A sounding made by the Saudi Department of Antiquities and a cleaning operation in 2008 were undertaken on the south side of this wadi (Area 30)¹⁸ and revealed the presence of a tower which was excavated in 2017.

The excavation revealed a rectangular tower, 4.40 x 3.10 m (by comparison, Tower 22 is 4.30 x 3.30 m). Its walls are 10 cm thicker than those of Tower 22 (85 versus 75 cm), probably because part of the preserved section was made of mud-bricks. Careful examination of the demolition provided evidence for a beaten-earth floor covering cut reeds which rested probably on one or two palm-tree trunks, all of which formed the upper terrace of the tower. Among the remains collected from the demolition were the bottoms of at least two basins used for holding water. These basins appear to have been common in towers to provide water for the lookouts during their watch.

Like Tower 22, Tower 16 abuts the rampart, which at this point appears to have been previously reinforced. A carefully jointed line of mud-bricks, 0.55 m wide, was constructed against the remains of the initial rampart, which is 1.45 m wide. The total width of the rampart thus reaches 2 m.

The excavations undertaken in the two towers have shown that the rampart has two phases, one measuring c. 1.40–1.50 m, the other nearly up to 2 m. The towers, at least those that line the eastern section, were built against the second-state wall.

¹⁷ *Locus* 37065, Lyon–14527(SacA 51497), 95% probability, Calibrated date 2 sigmas Oxcal 2020.

¹⁸ Villeneuve 2010: 160–161, fig. 2.

*Area 6 (IGN 132), the Nabataean sanctuary*¹⁹

One of the largest excavation areas of Hegra lies roughly in the middle of the city, on top and around a sandstone rocky outcrop known as IGN 132. The excavation of this area started in 2010. The text below presents a synthesis on the results obtained until the 2017 season. IGN 132 and its surroundings are no doubt the largest *intra muros*—i.e. within the rampart—Nabataean sanctuary (see fig. 1).

The outcrop, orientated north-south, is c. 35 x 20 m and its top is 16 m higher than the neighbouring excavation areas, which means that it dominates the surrounding landscape (**fig. 21**). Its southern side is rather steep while its northern side forms a terrace where the bedrock is visible in places. Before excavation, several rock-cut structures were visible around the outcrop, among which a rock cut chamber (which bears number IGN 132a) and three niches with betyls (IGN132b-d). The top of the outcrop forms a platform which slopes up from north to south (see fig. 21).

Long term excavations have been undertaken by the Saudi Arabian side of the Madâin Sâlih Archaeological Project south-west of IGN 132 (**fig. 22**). The Latin inscription dated to 175–177 CE, which mentions possibly the restoration of the town's rampart,²⁰ was found in a baulk between two squares. The excavations in this area have put to light what is certainly a large residential unit, with a paved central courtyard and several rooms around it, the first phase of which goes back to the first century CE. It is possible, but not certain, that it had a connection with the nearby sanctuary. It may for example have been a priestly residence. The eastern limit of this unit was put to light by Maher al-Musa in 2017, and it appears that it does not connect directly with the sanctuary: the eastern wall of the residential unit is indeed exactly 6 m far from the western end of the *temenos* wall of the sanctuary. Nothing, for the moment, allows to make firm hypotheses as to the exact function of this residential unit.

Several areas were excavated between 2010 and 2017. Soundings of different size and in various locations were opened either by Laila Nehmé, by Laurent Tholbecq or, since 2016, by Damien Gazagne (**fig. 23**).

If one looks at either the aerial photograph or the plan, two elements appear immediately: the presence of a *temenos* wall (**fig. 24**), which clearly defines a sacred area, and the presence, on top of the outcrop, of a monumental structure, a paved *tetrapylon*, now restored, surrounded by a wall built with white sandstone blocks. These contrasted with the yellow colour of the bedrock in the area. This wall, which had one face only, was probably not very high. Even so, one has to imagine the effect produced by this monument when viewed from far away (**fig. 25**), especially since IGN 132 is one of the highest outcrops in the central part of the Madâin Sâlih plain. It must have been a very conspicuous mark in the landscape and it certainly caught people's attention.

The excavation strategy was twofold: soundings and surface stripping. Eight soundings or excavation areas were thus opened and a great part of the surface was stripped and cleaned in order to reveal the walls of what should now be recognised as a large Nabataean sanctuary.

¹⁹ This text is based on the contribution submitted in February 2018 for publication in the Proceedings of the first Archaeological Convention that took place in Riyadh in November 2017. To our knowledge, it was not published.

²⁰ al-Talhi and al-Daire 2005.

After seven excavation seasons, the results of which have been systematically presented in the project's yearly reports, four phases of occupation were recognized in the area.

Phase 1 (**fig. 26**) corresponds to the oldest religious feature identified so far, a rock cut niche in form of a basin (63026), possibly associated with niche IGN 132d, which has a betyl inside it, although the latter is carved at a higher level. Both are cut in the southern flank of the outcrop and they were both, in phase 2a, hidden by wall 63001, which has a *terminus ante quem* of the late first century BCE. Since there is no indication of a door in wall 63001, it is likely that it was built to hide the lower part of the rock face, either for religious (change of ritual?) or for purely aesthetic reasons. The two above mentioned niches, 63026 and IGN 132d, are therefore necessarily earlier than 63001 and they were thus carved before the end of the first century BCE. It is likely that they are more or less contemporary with the arrival of the Nabataeans at Madâin Sâlih, which is now dated to the second half of the first century BCE.

Phase 2b (see fig. 26) is the main Nabataean phase of the sanctuary and it is dated to the late first century BCE and the first century CE. It is impossible to determine the stratigraphic relationship between the structures which are on top of the outcrop and the structures which are at its foot. However, on the basis of the dates given by the preliminary reading of the pottery by C. Durand and Y. Gerber, one can suggest the following sequence: one section of the temenos wall, 63016, abuts wall 63001 and is therefore later, i.e. it has a *terminus post-quem* of the late first century BCE. Since 63016 and 63008 are joined and since wall 63008 continues, with different numbers (see fig. 24), all around the area, one can assume that this surrounding wall, and therefore the area it defines, have a *terminus post-quem* of the late first century BCE.

One should probably distinguish a sub-phase 2c, which corresponds to the building of several small rectangular rooms (8 square meters), built at regular intervals outside the temenos wall and accessible from inside (**fig. 27**). Their walls abut the temenos walls and are therefore later, but possibly not much later, phases 2b and 2c being probably two phases of the same building programme. The function of these rooms is not certain but it is possible that some were used as kitchens associated with meeting rooms. To the same phase 2b belong, on the basis of the pottery, the *tetrapylon* built on top of the outcrop and probably the original access which led to it from the west. To it belong also a rock cut basin and a cistern cut in the bedrock at the foot of the outcrop, on the east. It is also presumably the case of the well dug at the foot of the crack which divides the outcrop in two parts, although no absolute date is available for it. The building techniques used in the upper part of the well (the bottom part is cut in the bedrock) are very similar to those used in the other Nabataean wells of the ancient oasis. It is likely that this well was built precisely at the bottom of the crack in order to collect the runoff. If this is true, it would suggest that it was both a well *and* a cistern. From a strictly hydrological point of view, its location is very inadequate because it is built on a higher ground than all the other wells, and the water table was therefore several meters deeper. Finally, in the south-east corner of the *temenos* wall, excavations by Damien Gazagne have evidenced the presence, in this area, of 1st century CE structures, namely floors, two rooms and a mudbrick bench. The very nice Nabataean Ionic doorjamb capital 60834_AB01 (**fig. 28**) found fallen on a later threshold, belongs to this phase. It has parallels in Hegra, in tombs IGN 53 and 97, and

it can be compared to a small capital discovered in the nearby residential unit.²¹ The date of the tombs bearing these capitals is either 25–50 CE or 25–75 CE.²²

We therefore have, in the Nabataean period, a large sanctuary, c. 60 m east-west and 45 m north-south (**fig. 29**), surrounded by a *temenos* wall which defines a sacred area, known in many Nabataean inscriptions as the *mḥrmt*.²³ The earliest building phases of this sanctuary are dated to the end of the first century BCE, and it was in use through the first century CE. It is composed of an ‘upper’ temple, with the *tetrapylon* and the enclosure wall around it, and a ‘lower’ temple, the precise form of which is not known because most the Nabataean levels have been subsequently dismantled. We know it was associated, in a possible sub-phase, to a series of annexe rooms. It included monumental architecture, as shown by the doorjamb capital. Finally, water for practical and ritual purposes was available through a cistern and a well.

There are no exact parallel to this sanctuary in the Nabataean realm. A partial parallel made be drawn between it and a structure from Petra (**fig. 30**), numbered Dalman no. 520,²⁴ which shows a similar kind of arrangement: installations both on top and at the bottom of a sandstone outcrop, with a staircase to link the two. More generally, however, this sanctuary reflects the Nabataean taste for high places, for cults performed on the roofs of the houses, for activities on the roofs of the temples, which were accessible through staircases.²⁵ Examples of the integration of high places into sanctuaries are known, the most famous being the sanctuary of Khirbat ay-Tannūr, where the early phases,²⁶ in the late second and first century BCE, are characterised by an altar built in an enclosure associated with some rooms (**fig. 31**).

After the Nabataean period, the sanctuary witnessed two more phases of occupation:

Phase 3 (see fig. 27), dated to the second and early third century CE at least. This is the Roman phase, during which there was still a monumental installation in the area, most probably religious. The evidence for a monumental architecture comes mainly from three blocks which were put to light in Roman levels: 60871_AB02 (*terminus post quem* second century CE), 60820_AB01 (not dated) and 61016_AB01 (second or third century CE). These blocks are decorated with triangles and diagonal lines (see below, “Architectural blocks”).

Phase 4 (see fig. 27), which has a *terminus post quem* of 270 CE given by a coin, and which is characterised by the installation, within the *temenos* wall, of craft and possibly domestic activities which needed a lot of water, hence the presence in the relevant levels of many basins, of stone pestles, of a stool, etc. The *temenos* wall, which was probably still partly standing, offered an adequate shelter to these activities in the late third and fourth century CE. No occupation in the area is attested firmly after the early 5th century CE.

²¹ al-Talhi *et alii* 2010: pl. 1.13b, and see also p. 25.

²² Dentzer-Feydy 2015: 393 and 402.

²³ For example in *CIS II* 158 in Puteoli in southern Italy, in an inscription from al-Jawf (Savignac and Starcky 1957), in an inscription from Bosra (Nehmé 1998: 65–67 on the meaning of the word) and in one from Qrayyah (Nehmé 2010: no. 5, p. 470–471), etc.

²⁴ Nehmé 2012: 161 (Dalman 1908: 286, fig. 231, plan of the top).

²⁵ No synthesis is available on the terraces or roofs accessible by staircases in the Nabataean temples, but see the examples given in Alpass 2013 and the discussion of the religious spaces in Nabataean temples in Tholbecq 2007 and 2017.

²⁶ McKenzie *et alii* 2013: 47 and fig. 51.

As for the deity/deities who was/were worshipped in this sanctuary, little information comes from the objects put to light during the excavations, among which a stone incense burner, a complete bronze casket with compartments which was probably used to store cosmetics, and a small bronze eagle which was probably a votive offering.²⁷ It was suggested some time ago that it was dedicated to the cult of the Sun god. This was based on the following two arguments: the fact that the platform of the *tetrapylon* is almost exactly orientated to the south, which means that from there, when looking south, one can follow completely the daily path of the sun; the second argument is Strabo's text (*Geography* XVI, 4, 26) according which the Nabataeans "worship the sun, building an altar on the top of the house, and pouring libations on it daily and burning frankincense." The top of IGN 132 would indeed be an ideal place to worship the sun, and the objects discovered certainly show that frankincense was burnt. But of course neither of these arguments is decisive.

More recently, during the excavations undertaken by Maher al-Musa in the residential unit to the south-west of IGN 132 (see fig. 22), an interesting discovery was made. An east-west mudbrick wall (64114) built over a one course stone substructure was put to light. Two ashlar, reused in the stone substructure, bear graffiti. One block bears four of them (**fig. 32**), numbered 64114_I01 to 64114_I04, while the second one, a couple of metres away, bears one single word, *šlm* (60114_I05). According to the archaeologist in charge, wall 64114 belongs to the first building phase identified in this area, and is probably dated to the first century CE. Graffito 64114_I04 reads: ¹ *šlm š---m br k---* ² *hn't mn qdm šmy'*, "May Ša[.]m son of K--- [son of] Hāni'at be safe, in the presence of Heaven". The expression *mn qdm*, "in the presence of" is widely attested in Nabataean, and most often it is followed by one or two divine name(s), thus *mn qdm dwšr'* (more than 10x), *mn qdm dwšr' w tbwš* (1x), *[m]n qdm [dw]šr' w 'bdt* (1x), *mn qdm 'lhy' klhm* (3x), *mn qdm dwšr' w 'lhy' klhm* (1x), *mn qdm dwšr' w mnwtw/mntw* (3x), *mn qdm 'lh gy'* (1x). Finally, the expression *mn qdm šmy'*, occurs in another text from Hegra, CIS II 236, discovered by Charles Doughty in the Jabal Ithlib and correctly read by J.T. Milik much later.²⁸ It reads ¹ *dkrwn ṭb l-zydw br gḏṭb* ² *br zydw mn qdm šmy'* ³ *{zydw}*, "May Zaydū son of Gadṭab son of Zaydū be remembered in well-being in the presence of Heaven. {Zaydū}". This beautiful text was written on a quarry face by someone who was familiar with stone cutting tools, perhaps a man who was involved in the exploitation of the quarry. Aramaic *šmy'* can be interpreted as the emphatic plural of *šmyn*, and best translated "Heaven", most probably a supreme divine figure. In the two Nabataean inscriptions where it occurs, it is preceded by *mn qdm* and it is therefore very likely that it has this meaning in Nabataean as well.

64114_I04 is written on an ashlar reused in the masonry of a building which was very close to the sanctuary IGN 132. The monument from which this ashlar originally came from cannot be identified but it was probably not very far from the place where it was reused. One might therefore be tempted to consider that *šmy'* was 'at home' in this area of the ancient city, and that it was connected with the sanctuary IGN 132. One step further would be to consider that *šmy'*, who—until otherwise proven—is specific to Hegra, was the god worshipped in the main

²⁷ Illustrations of these can be seen in Nehmé 2012: pl. 4–5.

²⁸ Milik 1972: 410.

Nabataean sanctuary of the city. Of course, this graffito may have no connection at all with the sanctuary and its presence in its vicinity be a pure coincidence.

Although further research is needed both to reveal more of the internal structure of the sanctuary, its chronology and the function of some of the rooms, the excavations undertaken so far have transformed what looked like a poorly preserved sandstone outcrop in the middle of the residential area of ancient Hegra into what was probably the main sanctuary of the city.

Area 9, a domestic area (by J. Rohmer)²⁹

Area 9 is located in the south-western part of the residential area of ancient Hegra (see fig. 1). It is relatively higher than the surrounding landscape. On the western side, Area 9 is limited by the disused line of the Hijâz railway and by a shallow wadi densely covered by vegetation. The excavations in Area 9 began in 2010 under the supervision of Z.T. Fiema (trenches A and B) and were taken over in 2014 by J. Rohmer (trench C). After a two-year break, fieldwork resumed during the 2017 season. The goal was twofold:

- confirm the chrono-stratigraphic sequence recovered in trench A (5th/4th century BCE– 4th century CE) and achieve wider exposure of the earliest occupational levels;
- achieve wider exposure of the latest architectural phase in order to understand its function and organization.

Two deep soundings were opened in trench C, extensive surface stripping was carried out on visible wall lines around Area 9, and eventually a 6.5 x 5 m east-west trench (trench D) was opened north of trench C, leaving a 1 m thick baulk (**fig. 33**).

The deep soundings in trench C

First deep sounding: the first deep sounding was opened in the southern half of trench C. Taking into account the 2014 excavations, a 1.70 m deep stratigraphic sequence was recovered. This sequence breaks down into three main phases.

Phase C3 (“upper stratum” in 2014 report): 4th century CE: this is the latest phase. A more detailed study of the pottery and coins from this phase than the one carried out in 2014 suggests a 4th century CE date.³⁰

Phase C2 (“lower stratum” in 2014 report): late 1st century BCE–2nd century CE: it features mudbrick walls without stone foundations which melted or were levelled before the construction of phase 3 buildings. Based on the material from all the excavated *loci*, phase 2 was divided in 2017 into two sub-phases separated by a short episode of disuse: phase 2a dated to the late 1st century BCE/early 1st century CE; phase 2b dated to the later 1st and (early?) 2nd century CE.

Phase C1 (2nd/1st century BCE): the foundation trench of wall 92046 (see fig. 33) was dug into a hard flat layer of melted mudbrick resulting from the melting of walls but also probably from a deliberate levelling of the area. Under this layer, an earlier north-south mudbrick wall (92069) was identified along the eastern baulk of the sounding. The layers which abut this wall, under the lowermost of which was a layer of virgin sand, yielded a homogeneous

²⁹ This is a summarised version of the contribution included in the 2017 report of the MSAP.

³⁰ The lowermost layers belonging to phase 3 have 4th century CE pottery. Besides, one of the main chronological anchors for this phase, coin 92043_C01, which had been provisionally dated to the early 3rd century CE, can now be safely identified as a *foliis* of Galerius (306–309 CE).

material which can be dated to the 2nd and 1st centuries BCE. Note however that the two radiocarbon dates obtained for the lowermost occupation layer (92080) are earlier.³¹

Second deep sounding: the second deep sounding was opened in the north-eastern corner of trench C. The excavations brought to light a 1.60 m deep stratigraphy with three main phases which match those of the southern sounding.

Trench D

Trench D (see fig. 33) is a rectangular trench (6.50 m east-west x 6 m north-south), separated from trench C by a 1 m wide baulk. The excavations of this trench could not be completed in 2017 and the phasing proposed is therefore provisional (**fig. 34**).³²

Phase D4 (later 3rd?–4th century CE): Phase 4 is the latest architectural phase, which corresponds to phase C3 (“upper stratum”) in trench C. Note that wall 92302 is earlier than 92301. The pottery from the layers excavated east and west of wall 92301 as well as north of wall 92302 was dated to the 4th century CE. Under the layer interpreted as the abandonment and collapse of the building (92303), a silty soil (92307), which seems to have been deposited after wall 92302 (because it covers its foundation trench), yielded mostly 2nd/3rd century CE pottery, with a few 4th century CE elements. In turn, 92307 covered an irregular surface made of compact clayish soil (92308) the pottery of which was dated to the later 3rd/early 4th century CE. Since the foundation trench of wall 92302 was dug from this surface, it is uncertain whether it represents the latest surface of phase 3 or the earliest surface or construction level of phase 4. If the latter is true, the beginning of phase 4 should be moved to the later 3rd century CE.

Phase D3 (2nd/3rd century CE): this phase is represented mainly by a thick occupation layer with abundant pottery and bones (92313/19/26). Under it, a levelled rectangular mudbrick platform (?) was uncovered. It is roughly north-south, c. 0.90 m wide and at least 2 m long (92321), and preserved on one course only. It ends abruptly in the north, without any connection to another feature and it is therefore probably not a wall. Occupation levels abutting this platform were identified both to the west and to the east. It seems that the mudbrick platform was laid over layers of hard silty/clayish soil probably representing periods of disuse or levelling works.

In view of the excavated layers, phase D3 can be broken down into two architectural sub-phases: phase D3a, represented mainly by platform 92321 and the associated occupation layers; phase D3b, represented by wall 92335 and the associated occupation layers, among which 92309 (after the levelling of platform 92321). 92335 was most probably an ancient wall forming the south-western corner of a room lying east of trench D (it is visible in the eastern baulk, see fig. 34).

All the layers of phase D3 studied in 2017 belong to a 2nd/3rd century CE horizon. However, since 92309 yielded several characteristic 3rd/4th century sherds (including a fragment of Kapitän II amphora), sub-phase D3b should probably be dated to the 3rd century CE.

³¹ Seed, Lyon-14529(SacA 51499)): calibrated date 2 sigmas Oxcal 2020, 367–155 BCE; bone, Lyon-14530 (SacA 51500): calibrated date 2 sigmas Oxcal 2020, 409–211 BCE.

³² In 2022, the lowermost levels in trench D were reached only on a very small surface in trench D.

Phase D2 (later 1st/early 2nd century CE): contrary to trench C, trench D yielded surprisingly little Nabataean pottery. Only one Nabataean context was identified, *locus* 92325, which probably abutted a WSW-ENE mudbrick wall (92328), built in phase 1 (see fig. 33–34, located in the south-eastern corner of the trench, and built in phase 1. It also seems to abut a possible mudbrick wall (92346) preserved on two courses under wall 92302. The pottery from 92325 was dated to the second half of the 1st century CE and/or the first half of the 2nd century CE. Phase D1: 2nd/1st century BCE: the main feature of phase 1 is wall 92328, a 0.80 m thick mudbrick wall the lowest visible course of which sticks out towards the north. The northern face of its second and third courses is made of roughly hewn stones, and it features a kind of niche (92343, **fig. 35**) which contained a cooking pot *in situ*. Several layers abut the northern side of the wall (see the section, fig. 28, from 92324 to 92339).

Layers 92333, 92338 and 92339 yielded pottery dated to between the 2nd century BCE and the first half of the 1st century BCE, confirming that wall 92328 was in use during this time period. *Locus* 92329, which probably represents an episode of disuse, yielded however a somewhat later assemblage, dated to between the second half of the 1st century BCE and the late 1st century CE. This suggests that the end of phase 1 took place at some point during the later 1st century BCE. This is confirmed by the dating of the complete cooking pot found in the niche, 92343_P01 (second half of the 1st century BC), which was probably left *in situ* before the area was temporarily abandoned.

The southern side of wall 92328 also shows a succession of layers (92331, disuse, and 92334, ash). 92334 covered a small stone feature made of two small upright stone slabs and several piled up horizontal slabs (92341) which were probably originally also in an upright position (a cooking installation?). Given the absence of specific artefacts (e.g. pottery wasters), it is probably a domestic oven. It rested on a layer of soft clayish soil (92040/92042). The pottery from these layers belongs to a chronological horizon spanning the 2nd and the first half of the 1st century BCE. This is consistent with the dating of the *loci* excavated on the northern side of the wall as well as with that of the *loci* associated with the ash layer 92082 in the northern deep sounding of trench C.

Surface stripping

In addition to the deep soundings, it was decided to extend the excavated area in order to obtain a better understanding of the layout of the latest architectural phase. Surface stripping was carried out within a c. 20 m radius around trench C. South of trench C, it revealed a WNW-ESE mudbrick wall (92201) which seems to be the continuation of wall 90014 brought to light in 2010 in trench A (see fig. 33). It was suggested in 2017 that the area south of wall 92001 was devoid of constructions during the latest phases of the site but subsequent excavations (in 2021) revealed the existence of a late occupation phase with an oven and a small wall.

Conclusion

The 2017 excavation season in Area 9 established that the building brought to light in trench C extends towards the north (trench D) but no decisive clue concerning its nature and function was collected. The layout of the earlier phases remains very fragmentary. From a chronological point of view, the complete stratigraphic sequence of trench C was recovered in two deep soundings which provided consistent results. It features three main phases

spanning the 2nd/1st century BCE to the 4th century CE,³³ with an apparent occupational gap between the mid-2nd century CE and the late 3rd/early 4th century CE. This gap was not observed in trench D, where 2nd/3rd century CE occupations are clearly represented (phase D3). Two explanations can be proposed for this discrepancy between trenches C and D (an ‘invisible’ occupational gap in trench D, though perhaps shorter than in trench C, or the fact that the 2nd/3rd century CE occupations in trench D seem to be less elaborate than the previous and the later ones. Except perhaps for 92335, no proper wall seems to have existed in trench D during phase D3. Alternatively, several makeshift features and postholes were observed and it is therefore possible that the 2nd/3rd century CE occupation was less dense and less intensive than the previous and the following ones.

As far as the earliest phases of the site are concerned, the results from trenches C and D have been quite disappointing until now. Judging by the data at hand, the occupation of Area 9 probably began by the 5th/4th century BCE but it intensified from the 2nd century BCE onward.

The occupational sequence of trenches C and D is summarised as follows (**fig. 36**):

General phase	Local phase in trench C	Local phase in trench D	Dating
1	C1	D1	2nd/1st c. BCE ³⁴
2	C2	D2	1st/early 2nd c. CE
3	/	D3	(2nd–)3rd c. CE
4	C3	D4	4th c. CE

Studies

During the 2016 and 2017 excavation seasons, the study of the pottery focused on the recording in the project’s database of the diagnostic sherds put to light in the various excavations areas as well as on the preparation of the final publication of the pottery. The reports submitted by the project’s ceramicists, C. Durand and Y. Gerber, thus consisted in brief syntheses on the material uncovered in order to give the archaeologists in charge of each area an overview of the type and date of the pottery from each excavated *locus*.

As for the coins, the project’s numismatist, Thomas Bauzou, wrote in 2016 a detailed article on the so-called “Owl” coins from Hegra, 242 pieces of which had been recorded by then, representing 33.4% of the total number of coins from the site. These coins are either in low-standard silver or, much more often, in bronze, of various standards and weights, varying in weight between over 17 g to under 1 g. They are invariably of the same type, derived from Athenian tetradrachms of the fifth century BCE. Bauzou’s 20 pages article is too long to even be summarised here but it is accessible in the 2016 report of MSAP. It presents the original coin type of the Athenian owls, followed by a summary on the state-of-the-art, then by a typochronological classification of the coinage from the types which are the closest to the Athenian model to the most stylised ones. Eight classes were thus distinguished, each of which illustrated by examples from Hegra or elsewhere, including those from the commercial sector or from private collections. A small appendix presents the owls from Maghā’ir Shu’ayb—350 km north-west of Hegra—collected in 1878 by R. Burton, 28 of which are now part of the

³³ See however the date of 92080 and note 25 [xxxx datations radiocarbone].

³⁴ But see note 25.

British Museum collection. The article ends with a tentative relative chronology of the owls coins of Hegra from the first to the last type of the classification. As for the absolute chronology, it covers the interval between the fourth and the first century BCE. The last issue examined in Bauzou's contribution is that of the issuing authority of these coins. It is all the more difficult since the coins do not bear any indication of issue. In 2016, based on the hypothesis that the Lihyanite Kingdom was earlier than the third century BCE³⁵—a hypothesis which is not valid anymore—Bauzou ruled out the possibility that these coins were minted by the Lihyanite kingdom. A recent reassessment of the available data, based on both the pottery and the coins, leads to the opposite conclusion, i.e. that this coinage is Lihyanite and may have been minted in Hegra.³⁶

*Faunal remains (by J. Studer)*³⁷

Camel bones

During the 2016 and 2017 seasons, the faunal material put to light in Area 34—the Roman fort—during the 2015 and 2016 seasons was studied. This represented 2413 faunal remains, of which 1251 were identified to species and/or skeletal element. The majority of the analysed bone assemblage comes from levels dated to the Roman period, but all the occupation phases identified in the areas excavated in the fort yielded faunal material.

The faunal material can be distributed as follows:

- 194 remains, among which 129 were identified, come from Nabataean contexts (first century BCE–first century CE);
- 671 remains, among which 337 were identified, come from contexts dated to the transitional phase between the Nabataean and Roman periods (end of the first–beginning of the second century CE);
- 737 remains, among which 425 were identified, come from Roman contexts
- 512 remains, among which 260 were identified, come from post-Roman contexts.

The quantity of bones examined in 2016 was too small to establish the relative frequencies of taxa by occupational phase. However, even based on this limited sample of material, the faunal assemblage of Area 34, appears to stand out in that it shows an abundance of large bones belonging mainly to camels. The latter are represented by 336 remains, 20 of which have been attributed specifically to the dromedary (*Camelus dromedarius*), the others to non identifiable large camelids. For sake of simplicity, this whole assemblage has tentatively been attributed to the *Camelus* cf. *dromedarius*. This overwhelming presence of camelids was observed in both the Nabataean (40% of the total), the transitional (28% of the total), and the Roman periods (33% of the total). This observation will need to be confirmed by a study based on the material which came to light in the Roman fort in subsequent excavation seasons as well as by taking into account fragments that have not been attributed to species, but which may be attributed according to size classes, i.e. corresponding to large- (e.g. dromedary) or medium-sized (e.g. caprines) animals. Other parameters, such as the minimum number of individuals (MNI) will also help establish a more solid quantitative approach to species.

³⁵ Rohmer and Charloux 2015: 311–313.

³⁶ Durand and Bauzou forthcoming [2023].

³⁷ This is a short version of the reports of J. Studer in the 2016 and 2017 reports of the MSAP.

Apart from this quantitative aspect, the exploitation of camels can be tackled by observing anthropic marks on each bone. Bone modification left by butchery or food preparation have been grouped into three categories: striation marks following the use of a knife (**fig. 37**), chop marks left by a heavy cutting tool such as a cleaver (**fig. 38**), and impact points made by a club or heavy instrument of percussion to fracture the bone. The average of bones bearing cut marks is 19% for the transitional period and 32% for the Roman period. These averages are higher than in Dūmat al-Jandal and al-Yamāmah but lower than in Petra.³⁸

The 50 butchery marks observed on the camel remains in Area 34 occur on all the elements of the carcass (from skull to phalanges), and especially in the articulated areas of the skeleton, on the shaft of the long bones (as chop marks), and on the thorax (reflected by splitting of the ribs and vertebrae with a blunt tool). The variety of damage to all anatomical elements of the carcass undeniably points to camel butchery and consumption. Moreover, a few marks observed on the camel remains in Area 34 were made by the precise action of an expert butcher or cook (skinning, cutting up of the carcass, removal of the meat, jointing, preparation of pieces of meat for cooking, etc.).

In conclusion, based on the quantity of camel remains and the extent of butchery damage, their meat must have formed a significant part of the diet of the soldiers stationed in the Roman fort at Hegra. The widespread spatial distribution of these large bone remains throughout the areas and levels excavated until 2016 in Area 34 support the hypothesis that the archaeozoological results presented above are reliable.

Modified knucklebones

The unexpected find of a talus (or knucklebone) in the Roman fort was the opportunity to discuss the talus bones put to light in Hegra. This bone has raised a lot of interest among archaeozoologists, for reasons which are summarised below.

The astragalus, also known as the talus or knucklebone, is one of the relatively small compact bones at the junction of the lower hind limb. Two such bones, a left one and a right one, are found in each animal. Apart from astragali which represent dietary and butchery refuse, modified astragali of caprines (sheep and goats) are frequently found in archaeological sites from different periods all over the world. Several types of modifications have been documented in the publications. These include: 1/ smoothing of the medial and/or lateral sides of the bone to create flat surfaces; 2/ intentional perforation, often multiple, with holes sometimes filled with metal; 3/ coloration applied to astragali; 4/ decoration with incisions; 5/ writing of inscriptions on them. In addition, concentrations of astragali are found (from pairs to hundreds of items), sometimes made of unmodified bones only and sometimes made of a mixture of modified and unmodified bones.

Many different uses for these modified astragali and astragali caches have been suggested. They have been interpreted as offerings (votive offerings in temples or in funerary contexts), as weights for use in commerce, as tokens or money, as objects used for divination, and as pieces used for gambling or for games, much like dice). Caprine astragali have a particularly suitable size and shape for use in games which require a number of pieces on a wooden or stone flat board and their interpretation as gaming pieces has been the most commonly

³⁸ Dūmat and Yamāmah: Monchot 2014: 202, 204; Petra: Studer and Schneider 2008: 586.

adopted explanation. Astragali are still used in games in Asia, Europe, and North America (e.g. Brewster 1960, Dandoy 2006).

Nearly all of the 32,000 animal remains recovered to date from ancient Hegra derive from culinary process. Bone elements which do not enter into this process are difficult to recognise and this is particularly the case of the talus (**fig. 39**). To date, at Hegra, 315 talus have been documented, 289 of which correspond to domestic sheep and goat, and 5 represent gazelle. The presence of an anthropic modification on the bones, an accumulation of talus in the same *locus*, and finally a specific and/or unusual archaeological context, are arguments in favour of interpreting 86 pieces as non-refuse bones, i.e. as artefacts. They derive from sheep, goats, and gazelles.

Several types of modifications have been noted, the most common and the easiest to recognise (observed on 12 astragali) consists in the abrasion of the lateral or medial side of the talus by rubbing it against a hard surface (**fig. 40**). This may either be intentional or result from wear, and only microscopic analysis—not undertaken yet—would allow to distinguish between the two. Another type of modification is the presence of a patina which covers part or all of the astragalus. It is likely to be the result of contact between the talus and a smooth surface, whether vegetal or animal. A regular manipulation of the talus in the hands would explain it. Two such astragali have been identified in post-Roman period *loci* of Area 1. Finally, three exceptional types of modifications—not or rarely documented in the publications—have been identified at Hegra: 1/ two talus from a 4th century *locus* in Area 1 were painted in red; 2/ a talus was probably intentionally put in fire to become harder; 3/ a talus presents a slight patina around the hole in the centre of its dorsal face. The latter can be related to the votive/cultic deposit found in room XI of the Roman fort (in a late 3rd–early 4th century CE context) which includes several Cu/Cu alloy statuettes. As a preliminary interpretation, it is suggested that this astragalus was used as a recipient or as support for a soft substance (incense?).

Four groups of knucklebones were found in ancient Hegra:

1/ The oldest one is dated to the pre-Nabataean period and consists of 14 talus (Area 1). 5 are from goat, 6 are from sheep and 3 are from unidentified domestic caprines;

2/ The second group comes from a level dated to the 4th century CE (Area 6) and consists of 22 astragali. 6 are from goats, 6 are from sheep, 7 are from unidentified domestic caprines, and 3 are from gazelles;

3/ The third group contains 21 astragali and was found in the same room as the flat base of a basin possibly used as game board.³⁹ 7 are from goat, 7 are from sheep, and 7 are from either sheep or goat;

4/ The fourth group includes 20 talus found in the Roman fort. 5 are from goat, 12 are from sheep, and 3 are from unidentified domestic caprines.

This preliminary analysis of the astragali used by the inhabitants of ancient Hegra shows that this particular bone served different purposes. Talus have served as some kind of hard support in a votive/cultic context in Area 34 as well as game pieces in Area 1. Both sheep and goat were equally used and the animal species did not play a crucial role in the choice of the bone, except

³⁹ Charloux *et al.* 2018: 58.

for the gazelle. The reason for each concentration of talus, especially the accumulation in Area 6, with gazelle astragali, coloured sheep or goat pieces and such a large number of talus, is still a pending question.

Textiles (by P. Dal-Prà)⁴⁰

Two tombs cleared in 2014 (IGN 88 and 97, Jabal al-Khraymāt) and one tomb excavated in 2015 (IGN 116.1, Jabal al-Aḥmar) yielded textile fragments which were studied during the 2016 season. The material is comparable to that of tombs IGN 20 (Qaşr al-Bint) and 117 (Jabal al-Aḥmar), studied in 2012. It includes cloth coated in layers of resin, numerous straps with or without a knot, fragments of cloth, mainly ecru plain weave,⁴¹ and leather both connected and unconnected to textiles. The most common fibre is flax, but hair (from unidentified animal: sheep, goat, camel?) and cotton were also found.

The material from tomb IGN 116.1 is very badly preserved but some have fortunately kept the shape of pleats of the fabric. Only a few fragments show few millimetres of plain weave on which the twist of the thread—S-twist⁴²—can be observed. Occasionally, it is possible to analyse the fibre—flax—and count the number of threads. Two types of plain weave were observed, one tighter than the other.

Tomb IGN 97 yielded small conglomerated layers of resin⁴³ in contact with layers of cloth, fragments of straps, numerous pieces of plain weave as well as a very small number of variations of the plain weave in which the warp and weft threads are grouped in twos or more. The most commonly used fibre is flax, but a small quantity of wool (or rather hair, as the animal species could not be identified) and cotton was also found. Four 50 x 30 cm bags were filled with flax straps, accounting for several hundred fragments of various sizes (between 1.8 and 4.2 cm wide) showing various kinds of weave, twenty of which have a knot (**fig. 41**). These straps are very similar to those found in the other tombs. A few cotton cords, folded into a loop and knotted, were also collected from the tomb (**fig. 42**). They may have been used as harness decoration.

Of the twenty-four analysed fabrics, ten are of S-twist flax, five of S-twist cotton, five of S-twist hair or a Z-twist made up of two S-twist ends, and four could not be analysed. No connection was found between the thread count of the flax and cotton weaves. Indeed, whatever the fibre, the number of threads varies from six threads in one direction and eight in the other to twenty threads in both directions. The woollen cloths, on the other hand, all have a higher thread count, the highest being twenty threads in one direction and twenty-eight in the other. The difference in quality in the same group suggests that this may be the layer of fabric that lay closest to the body.

Several fragments of plain weave⁴⁴ of the same cotton fabric, both warp and weft, exhibit fringes, selfband, and strips with holes in the warp. These holes are surprising, but they could

⁴⁰ This is a short version of the report of P. Dal-Prà in the 2016 report of the MSAP.

⁴¹ The weave is the style of crossing over the warp and weft threads.

⁴² Twist of a thread which, when held vertically, spirals in the direction of the letter S (as opposed to Z-twist).

⁴³ Which consist of fatty substances mixed either with vegetal gum or with a triterpenic resin (Mathe *et al.* 2009).

⁴⁴ 50432_T41, 50432_T42, 50432_T43, and 50432_T44, 12 to 15 simple threads, Z-twist in the warp, 10 to 12 simple threads, Z-twist in the weft.

be explained by the fact that threads of a different material were used, which have now disappeared (50432_T41, **fig. 43**). This textile has no equivalent in the other tombs.

The textile and leather materials put to light in these three tombs show similarities with the material discovered in tombs IGN 20 and 117, which is not surprising. The next steps will be to compare it with the material from other Nabataean cemeteries, for example with that from Khirbat Qazone.

*Architectural blocks (by D. Seigneuret)*⁴⁵

Forty-one architectural blocks discovered in Areas 6 (the Nabataean sanctuary) and 9 were studied in 2017.⁴⁶ These blocks include capitals, column drums, and decorated blocks. Among the most conspicuous ones is a ionic capital of doorjamb (60834_AB01, cf. fig. 22) which shows on its upper surface incised lines. These are preparatory guiding lines used by the stone-cutter during the cutting process of the capital, probably to help him clear away the superfluous material (**fig. 44**). Another pilaster capital, IGN 132_AB01, was observed in the sanctuary area (**fig. 45**) and may be either a pseudo-Doric capital such as those framing the door of IGN 40 or the lower register of a Corinthian Nabataean two-register capital similar to the capitals of the main order (i.e. those flanking the facade) of tomb IGN 20.

The largest collection of blocks (thirty-four) belongs to the category of column drums. Twenty-four were reused in various built structures while the remaining ten were found lying on the ground. The diameter of the drums falls between 50 and 70 cm and they can be divided into three groups:⁴⁷

– diameter between 50 and 56 cm, which corresponds to the diameter (55/56 cm) of the columns of the tetrapylon which stood originally on top of the outcrop of IGN 132. The fact that no drum was found either on top of IGN 132 or in the destruction layers at its base shows presumably that these blocks have been reused when the monument was dismantled.

– diameter between 60 and 64 cm, similar to that of the columns of the Temple of the Winged Lions at Petra.⁴⁸

– diameter between 68 and 70 cm, the same as the columns of the *môtab* in the temple of Khirbat adh-Dharīh.

The vast majority of the drums recorded around IGN 132 have a mortise (square, rectangular, or circular, side length 4 to 5 cm and diameter 5 cm) cut in the centre of the upper and lower faces of the drums, used for an axial dowel which prevented the separation of the assembled drums. The absence of flow channel suggests that the transverse dowels were made of wood and not of metal. This technique is also attested in Petra, for example in the Temple of the Winged Lions,⁴⁹ as well as in Dharīh and Tannūr. All these blocks seem to have been cut using a lathe, as shown by the striation still visible on some of them.

Apart from the capitals and the column drums, a few decorated blocks were also examined. The first group among these is made of two blocks decorated with triangles carved in bas-

⁴⁵ This is a short version of the report of D. Seigneuret in the 2017 report of the MSAP.

⁴⁶ To these, examined in 2017, should now be added the blocks put to light during subsequent excavation seasons, notably in 2020, for which see the full report online.

⁴⁷ Due to erosion, the dimensions of the blocks may have been slightly larger the measurements given here.

⁴⁸ Hammond 2003: fig. 245.

⁴⁹ Rababeh 2005: 126.

relief (61016_AB01 and 60821_AB01, **fig. 46–47**) and one decorated with parallel oblique lines, 60871_AB01 (**fig. 48**). The archaeological context in which they were uncovered suggests a *terminus post quem* of the second century CE. 61016_AB01 was probably the capstone of a corner pilaster while 60821_AB01 was probably the capstone of an intermediary pilaster or of a doorjamb the upper part of which is visible on the block. The decoration of these three blocks is rather simple and crude and was probably executed by local craftsmen. No parallels were found in the Nabataean world and further research is necessary, particularly among monuments of the same period from the Negev.

The relatively late contexts in which they were found suggests that a significant structure stood at the foot of the outcrop at the beginning of the Roman period, as subsequent excavations have since 2017 amply demonstrated.⁵⁰ This monument had no doubt been dismantled by the third century CE, as indicated by the reuse of block 60821_01 in wall 60821, which was provisionally dated to the 3rd century CE.

The second group of decorated stones includes two blocks decorated with triglyphs, 60000_AB01 (**fig. 49**) and 60000_AB02 (**fig. 50**), both carved in a pink-reddish sandstone. 60000_AB01 bears a stone mark—the Nabataean character ‘ (‘ayn)—incised on the upper part of its outer face. These two blocks were also part of a monumental architecture but their exact origin is difficult to determine.

Finally, two fragments, numbered 60715_S01 (**fig. 51**), found in a reused position, show a crowstep motif:

Based on the available descriptions and the examination of the blocks, the tetrapylon on top of IGN 132 stood on a square paved platform measuring c. 4.50 m on each side. The tetrapylon itself, also square in plan, measured c. 2.80 m on each side. The distance between the columns was 1.50 m and the diameter of the columns was between 55 and 60 cm. If one considers an average diameter of 58 cm and following the proportion considered as normal in book III, 3, 10 of Vitruvius’ *De Architectura*, the columns of the tetrapylon must have been between 4.60 and 5.80 m high. From the available evidence, one may suggest for the tetrapylon the following elevation: the columns were probably capped with Nabataean capitals decorated with horns, which were themselves topped by a Doric entablature decorated with a frieze of triglyphs and metopes c. 50 cm high. An attic, an Egyptian entablature, and a crown in the form of a crowstep motif (c. 40 cm high) topped the whole. The kind of roof used to cover the tetrapylon is not known but it was not necessarily made with heavy and costly material.

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⁵⁰ See particularly the report by D. Gazagne, “The Sanctuary IGN 132”, in the 2020 report of the MSAP.

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