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## **Report on the Fourth Excavation Season (2011) of the Madâ'in Sâlih Archaeological Project**

Laila Nehmé, Wael Abu Wazizeh, Christophe Benech, Guillaume Charloux, Nathalie Delhopital, Caroline Durand, Zbigniew T. Fiema, Khâled Al-Hâitî, Solène Marion de Procé, Nina-Ann Müller, et al.

### ► **To cite this version:**

Laila Nehmé, Wael Abu Wazizeh, Christophe Benech, Guillaume Charloux, Nathalie Delhopital, et al.. Report on the Fourth Excavation Season (2011) of the Madâ'in Sâlih Archaeological Project. 2011. <halshs-00671451>

**HAL Id: halshs-00671451**

**<https://shs.hal.science/halshs-00671451v1>**

Preprint submitted on 5 Mar 2012

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# Report on the Fourth Excavation Season (2011) of the Madâ'in Sâlih Archaeological Project

**Edited by L. Nehmé**

With contributions by

W. Abu-Azizeh, Chr. Benech, G. Charloux, N. Delhopital, C. Durand,  
Z. T. Fiema, Kh. al-Hâ'itî, S. Marion de Procé, N.-A. Müller,  
M. al-Mûsa, L. Nehmé, J. Rohmer, I. as-Sabhân, I. Sachet,  
J. Studer, D. al-Talhi, Fr. Tourtet

and the drawings of J. Humbert and S. Eliès



**December 2011**

Paris, December 2011  
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# Introduction

Between the 10<sup>th</sup> January and the 28<sup>th</sup> February 2011, the archaeological project at Madâ'in Sâlih carried out its fourth excavation season at the ancient site of Hegra, a medium-sized Nabataean town on the southern border of the Nabataean kingdom and later of the Roman province of Arabia (**fig. 1**). This season follows the third, on which a complete report was presented to the excavation committee in January 2011.

Eight excavation areas were selected in 2011 (**fig. 2**), one of which only lies outside the residential area (Area 5 / tomb IGN 117) and the others inside it (Areas 1, 2, 3, 8, 9, 6 / IGN 132, for which see **fig. 3**). They are presented below under the authorship of each area supervisor, and scientific coordination is ensured by the project directors. In 2011, the activities of the Saudi members of the team were devoted to the area excavated in 2003: M. al-Mûsa and Kh. al-Hâ'itî removed some of the baulks left between the squares (see **figs 4-7**) and took protective measures against the water which runs from the neighbouring hill, IGN 132. Another Saudi member of the team, I. as-Sabhân, devoted all his time to the manufacture of mudbricks, to be used in the restoration of the mudbrick walls which were put to light during the excavations as well as to the building of a small section of the rampart for tourism attraction. The number of mudbricks made in 2011 reached 1,300 units. Each mudbrick measures 40 x 25 cm and weighs 22 kilos. Since a report on these activities has already been published in Arabic,<sup>1</sup> they will not be presented at length here (see below, the section on "Restoration").

Apart from the excavations and the restoration, several specialists contributed to our knowledge of the ancient occupation at the site:

- Christian Augé completed the study of all the coins which were found since 2008, including those found in 2011 (635 coins);
- Jacqueline Studer (see her report in this volume) studied the fauna;
- Christophe Benech (see his report in this volume) undertook a geophysical survey in various parts of the site, both in the central part of the city and in the area of the so-called southeastern gate (see **fig. 3**). After two seasons, the survey covers a surface of 10 ha. The results reflect the environmental conditions and the state of preservation of the archaeological structures. In the areas which resisted to the erosion, the map gives interesting results about the spatial organization of the urban space. It clearly shows the orientation of the streets and buildings but it is difficult to determine their internal organization;
- Wael Abu-Azizeh (see his report in this volume) undertook a systematic survey and mapping of the area in which *tumuli* have been identified, recording hundreds of structures;
- In the absence of Yvonne Gerber, who was not able to join the team this year, Caroline Durand continued the study of the pottery by herself (see her report in this volume).

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1. D. al-Talhi, I. as-Sabhân, Kh. al-Hâ'itî and M. al-Mûsa, *Taqrîr mûzaj 'an 'a 'mâl al-bi'tha al-su'ûdiyya al-faransiyya, madâ'in sâlih, 2011*, SCTA, 2011.

As in the previous reports, the following chapters are a complete report on all the project's activities. It is presented to the French *ministère des Affaires étrangères*, as well as to our umbrella organisations, our partners and to a certain number of French and foreign scholars who will thus be able to disseminate the results of the project's work throughout the academic world. But first and foremost, it is a working document for the team members and their future colleagues on the project and must, therefore, provide detailed and accurate information on the work carried out in the field. The existence of this report is a *sine qua non* for the success of the final publication.

## ACKNOWLEDGMENTS

As each year, the directors of the project would like to thank all the institutions and people who helped make this second season a success:

- the Supreme Commission for Tourism and Antiquities in Riyadh (SCTA);
- *la Division des sciences sociales et de l'archéologie* of the *ministère des Affaires étrangères* in Paris;
- *l'Ambassade de France* in Riyadh and the *Consulat général de France* in Jeddah;
- the Saudi Arabian Embassy in Paris and its Cultural Bureau;
- the Archaeological Museum in al-'Ulâ;
- *l'UMR 8167* of the *CNRS, Orient & Méditerranée*, Ivry sur Seine;
- *l'UMR 7041* of the *CNRS, Archéologie et Sciences de l'Antiquité*, Nanterre;
- the University of Paris 1;
- *l'Institut français du Proche-Orient (IFPO)*;
- the Simone and Cino del Duca Foundation.

Grants from the French Senate, Total and OTV Île de France were obtained in 2008 and are recalled here. They helped in the acquisition of material and the preparation of publications.

The project directors would also like to thank the members of the Madâ'in Sâlih team for their professionalism, efficiency and co-operation. We would also like to give particular thanks to Daniel Ollivier and Pierre Vincent of the *Service de coopération et d'action culturelle (SCAC)* of the *Ambassade de France* in Riyadh, and to Alain Marquer and Elie Nehmé of the Jeddah branch of the SCAC. Finally, we would like to express our warmest thanks to Mutlaq al-Mutlaq, our inspector and good friend, who solved all the daily problems of the project, as well as to Nâyif al-'Anzi, the director of the al-'Ulâ museum, who spared no effort in making the new bedrooms available in time for the team.

## AFFILIATIONS, DIRECTORS AND PARTICIPANTS

### Affiliations

The project works under the aegis of the following bodies, to which its directors are affiliated and which evaluate its work:

- *la Division des sciences sociales et de l'archéologie* of the *ministère des Affaires étrangères* in Paris;
- *l'UMR 8167, Orient & Méditerranée*, (Ivry sur Seine); *UMR 7041, Archéologie et Sciences de l'Antiquité* (Nanterre).
- the Supreme Commission for Tourism and Antiquities, Riyadh.

### Directors and participants

The project is directed by Daifallah al-Talhi, professor at the University of Hâ'il, by Laïla Nehmé, researcher at the CNRS in the *Orient & Méditerranée* section and by François Villeneuve, professor at the University of Paris 1. These three directors took it in turn to be on the site, so that at least one, or

more usually two or even all three directors, would be present at the site so as to provide the best possible supervision of the work.

Twenty-four persons, whose names and roles are presented in the table below, participated in the 2011 season:

SURNAME First name	Nationality	Institutional affiliation	Role	Work on the project
Abu-Azizeh Wael	French	IFPO	archaeologist	tumuli area
Augé Christian	French	director of research at the CNRS	numismatist	study of the coins
Benech Christophe	French	CNRS	geophysician	geophysical survey
Bernel François	French	engineer, IFPO Damascus	conservator of metal objects	conservation
Charloux Guillaume	French	research engineer at the CNRS	archaeologist	area 1
Delhospital Nathalie	French	CNRS	anthropologist	area 5 (IGN 117)
Durand Caroline	French	post-doctoral research, University of Lyon II	ceramicist	ceramic analysis
Eliès Sylvie	French	CNRS	draughtsperson	drawing (ceramics and objects)
Fiema Zbigniew	Polish	Academy of Finland	archaeologist	areas 2 and 9
Gaiani Serge	French	retired	camp manager	administration, photography of objects
al-Hâ'itî Khaled	Saudi	SCTA	archaeologist	2003 excavations (baulks)
Heydel Laurent	French	IGN	topographer	
Humbert Jean	French	IFPO	draughtsman	field drawings
Marion de Procé Solène	French	PhD student at the University of Paris 1	archaeologist	area 8
al-Mûsa Mâher	Saudi	SCTA	archaeologist	2003 excavations (baulks)
al-Mutlaq Mutlaq	Saudi	SCTA, assistant director of the al-'Ulâ Museum	archaeologist	conservation
Nehmé Laïla	French	researcher at the CNRS	archaeologist	area 6
Rohmer Jérôme	French	PhD student at the University of Paris 1, ATER	archaeologist	area 2
as-Sabhân Ibrahim	Saudi	SCTA, Masmak Museum	archaeologist	restoration
Sachet Isabelle	French	post-doctoral contract	archaeologist	area 5 (IGN 117)
Studer Jacqueline	Swiss	Geneva Natural History Museum	archaeozoologist	
as-Suhaibani Abdulrahman	Saudi	PhD student at the University of Paris 1	archaeologist	trainee (several areas)
al-Talhi Daifallah	Saudi	University of Hâ'il	archaeologist	director, restoration
Villeneuve François	French	professor at the University of Paris 1	archaeologist	director, area 3, rampart

Four participants belong to the Saudi Commission for Tourism and Antiquities (from al-'Ulâ: M. al-Mutlaq and from Riyâd: M. al-Mûsa, Kh. al-Hâ'itî and I. as-Sabhân), one to the University of Hâ'il (D. al-Talhi) and nineteen to various research institutions in France and Europe, two of which are not French (the Academy of Finland: Z. T. Fiema, and the Natural History Museum of Geneva: J. Studer). Three persons are affiliated to the *Institut français du Proche-Orient* (W. Abu-Azizeh, F. Bernel and J. Humbert) and one to the *Institut Géographique National* (L. Heydel). There are three students from the University of

Paris 1 (S. Marion de Procé, J. Rohmer and A. as-Suhaibani). The CNRS provided three researchers (Chr. Augé, Chr. Benech and L. Nehmé) and two engineers (G. Charloux and S. Eliès) and the University of Paris 1 one professor (F. Villeneuve). Finally, S. Gaiani, a retired teacher, joined the team as steward.

## **FINANCING AND PARTNERSHIPS, 2011 SEASON**

Financing for the project were provided by contributions from both the public and private sectors as follows:

### **Public Partners**

- *le ministère des Affaires étrangères* (government grant);
- *l'Ambassade de France in Riyadh* (government grant);
- the Saudi Arabian Embassy in Paris (logistical support, visas);
- *l'UMR 8167, Orient & Méditerranée* and *UMR 7041, Archéologie et Sciences de l'Antiquité* (individual missions);
- *l'Institut français du Proche-Orient* (availability of personnel);
- the Saudi Commission for Antiquities and Museums (help in kind, publications, lodging, etc.).

### **Private Partners**

*French firms:*

For the publication of the monumental tombs: OTV Île de France (Veolia Eau).

For the purchase of equipment only (not for fieldwork): 2008 grant from Total.

### **Prizes**

2008: the project won the Grand prize for archaeology of the Simone and Cino del Duca Foundation.

In the future, we will still rely heavily on contributions from the *ministère des Affaires étrangères*, which has long been interested in the excavation project at this major site. This contribution is the only regular one and also provides a source of legitimacy to our work in Saudi Arabia. Equally, the support of the *Ambassade de France* in Riyadh is essential for our fieldwork to take place.

## **PRACTICAL ASPECTS**

### **Cars**

The project rented four cars in Jeddah from a private rental agency (Hanco).

### **Lodging**

The team was once again housed in the flat next to the Museum of al-'Ulâ. On top of the pre-fabricated building of three rooms with bathrooms which was purchased by the project in 2009, the Saudi Commission for Tourism and Antiquities built several rooms for use by the team (two rooms and a tent at the back of the Museum in 2010 and a new separate building, containing four bedrooms and two bathrooms, entirely furnished, on the side of the museum). We are very grateful to the SCTA for these new rooms, which make the team's daily life much easier.

### **Security**

In 2011, no particular security measures were taken by the Saudi security services: no military escort nor surveillance were given to the team, whose members could get around freely.

## Publications

- The 350 page volume (in English) presenting the work of the first season (2008), has been printed in Riyad and distributed to various libraries in the world as well as to a certain number of scholars. We, again, are very grateful to the SCTA for making this publication possible, especially with such a high printing standard.
- The full reports on the 2009 and 2010 seasons are available online on the “Open pluridisciplinary archive” website of the French National Center for Scientific research (<http://hal.archives-ouvertes.fr/>):  
**2009:** <http://halshs.archives-ouvertes.fr/halshs-00548747/fr/>  
**2010:** <http://halshs.archives-ouvertes.fr/halshs-00542793/fr/>
- A contribution for *Atlal* on the results of the 2009 and 2010 seasons has been submitted to the SCTA in January 2011 and is in the press. Another contribution for *Atlal* will be submitted in January 2012.
- A publication in Arabic was prepared and published by the Saudi members of the 2011 field season: D. al-Talhi, I. as-Sabhân, Kh. al-Hâ’itî and M. al-Mûsa, *Taqrîr mûzaj ‘an ‘a ‘mâl al-bi ‘tha al-su ‘ûdiyya al-faransiyya, madâ’in sâlih, 2011*, SCTA, 2011.
- The preparation of the publication of the volume devoted to the necropolises of the site has been going on in 2011, especially the chapter on the architectural decoration, by Jacqueline Dentzer. Once this chapter is finished, the director of the publication, L. Nehmé, will be able to make the necessary modifications in the chapters she is in charge of (“Introduction” and “General presentation of the tombs”). The publisher will normally be the *Publications de la Sorbonne*, i.e. the publisher of the University of Paris 1 (director Bertrand Hirsch). One problem remains to be solved: the photographs of the tombs which are to be used as illustrations for this volume were taken between 2002 and 2004, that is before the removal of the very unaesthetic metallic ladders which gave access to quite a number of tombs. It is therefore necessary to take new photographs of these tombs, and this will be done during the 2012 study season.
- The project has been associated, in 2010, with the preparation of the exhibition “Routes d’Arabie” which was organized in the Louvre from July to September 2010. A chapter on Madâ’in Sâlih was written by L. Nehmé for the Catalogue of the exhibition who also provided a contribution for the journal *Archeothema*. This exhibition is due to move, in late 2011, to Berlin. A chapter on the Nabataeans in northwest Arabia was submitted for the German catalogue by L. Nehmé.
- Finally, we would like to draw attention on recent publications, by Ch. Bouchaud, on the archaeobotanical remains of Madâ’in Sâlih:

Ch. Bouchaud, “Les pratiques alimentaires en Arabie antique. Étude archéobotanique de Madâ’in Sâlih”, *Cahier des thèmes transversaux ArScAn 2007-2008* (vol. IX), p. 247-256. Available online at: [http://www.mae.u-paris10.fr/Cahiers/FMPro?-db=cahiers.fp5&-format=detaillfasc.htm&-lay=cahiers&Theme=orient\\*&-recid=33298&-find=](http://www.mae.u-paris10.fr/Cahiers/FMPro?-db=cahiers.fp5&-format=detaillfasc.htm&-lay=cahiers&Theme=orient*&-recid=33298&-find=)

Ch. Bouchaud, M. Tengberg, P. Dal-Prà: « Cotton cultivation and textile production in the Arabian Peninsula during antiquity; the evidence from Madâ’in Sâlih (Saudi Arabia) and Qal’at al-Bahrain (Bahrain) », in : *Vegetation History and Archaeobotany*, May 2011. Available online at: <http://www.springerlink.com/content/4553148g27587h67/>

Ch. Bouchaud, I. Sacht and N. Delhospital, “Les bois et les fruits des tombeaux nabatéens de Madâ’in Sâlih/Hégra (Arabie Saoudite): les provenances des végétaux et leur utilisation en contexte funéraire”, *Anthropobotanica* 2010.1.11. Available online at: [http://www.mnhn.fr/museum/foffice/science/science/DocScientifique/publications/presentation/listeParution/ficheParution/ficheContenu.xsp?CONTENU\\_ID=4067&PARUTION\\_ID=2366&PUBLICATION\\_ID=313&idx=11&nav=listeParution](http://www.mnhn.fr/museum/foffice/science/science/DocScientifique/publications/presentation/listeParution/ficheParution/ficheContenu.xsp?CONTENU_ID=4067&PARUTION_ID=2366&PUBLICATION_ID=313&idx=11&nav=listeParution)

## Lectures

As usual, L. Nehmé gave a lecture at the French Embassy in Riyadh and at the French consulate in Jeddah. The title of these lectures was: “The Nabataean stone cutting techniques in Petra and Hegra”.

L. Nehmé also gave a lecture on archaeology at the French school in Riyadh to three classes of 15 year old pupils from various origins.

## Visits

The president of the University of Paris 1, Jean-Claude Colliard, visited the site just before the arrival of the team, on the 11<sup>th</sup> of January. He was guided through the site by D. al-Talhi and F. Villeneuve (**fig. 8**).

On the 28<sup>th</sup> of February, a group of ten ambassadors and their families visited the site (Austria, Belgium, European Union, France, Germany, Italy, Lebanon, Norway, Spain, United Kingdom). They were given a complete tour by L. Nehmé, ending in front of the Qasr al-Farîd tomb (**fig. 9**).

On the 8<sup>th</sup> and 9<sup>th</sup> of February 2011, two members of the Saudi-German Joint Archaeological Project at Taymâ', Nina-Ann Müller and Francelin Tourtet, visited the team at Madâ' in Sâlih in order to compare the ceramic evidence of these two sites (see their report at the end of the “Pottery study”).

## RESTORATION

### The 2003 excavations (by Kh. al-Hâ'itî and M. al-Mûsa)

During this season, an attempt was made to undertake restorations in the 2003 excavations made by the Department of Antiquities. The purpose of this work was twofold:

- 1/ remove the baulks which were left between the squares. This will help understanding better the plan of the building unit;
- 2/ build a barrier to protect the eastern part of the excavation area, which was badly affected by the water running from the nearby outcrop (IGN 132).

Four baulks were removed (B1, B2, B3 and B4, see fig. 4) and four squares (W27, W28, V27, V8) were thus joined together. Following is a brief description of the structures put to light: there is a door west of square V27 (for location, see fig. 6), with two small buttresses built of five rows of sandstone with mud mortar. The southern buttress is 1.34 x 0.60 and 0.50 m high and the northern one is 1.70 x 0.60 and 0.50 m high. The threshold of the door consists of two long sandstones blocks, 1.25 x 0.22 m each. East of the southern buttress, there is an E-W wall (no. 1), with two facings, 3.30 m long and 0.44 m wide. This wall belongs to the second phase of the building (the most recent one). The builder gave it particular attention as he used dressed stones. There are also three steps leading, through a door, to a room paved with white medium size slabs. It is in this area that the Latin inscription mentioning possibly the restoration of the rampart was discovered in 2003.

East of the stairs, there is an E-W wall (no. 2), built with large stones (if compared to the other walls in the area. This wall continues east beyond the excavated area and belongs to the first phase (the oldest).

Wall no. 3 is parallel to wall no. 2, but it belongs to a different phase (Phase 2, the most recent). It is about 2.89 m long, 0.96 m wide and 0.51 m high. The lowest part of the wall was built of mudbricks while its upper part was built of stone. South of this wall, there is a platform, about 0.66 m long. In the southeast corner of the paved room, there are various cube-shaped stones (47 x 37 x 33 cm) and above them lies another stone, with a more or less circular shape, which may be a column base. Beside it, there is a circular water basin (diameter 72 cm, depth 20 cm).

No complete unit appeared in the excavated area, even after the removal of the baulks. If the excavations were to continue, it is recommended that they should expand to the south.

## TRAINING

### Training of A. as-Suhaibani

Apart from the European PhD students (S. Marion de Procé and J. Rohmer), the 2011 team welcomed a Saudi student who is presently preparing a PhD at the University of Paris 1. A complete training programme was prepared for him and he was asked to write a report on his participation, which was corrected and commented by L. Nehmé. He participated actively to the excavations in Area 2 (one week, with J. Rohmer), in Area 35 (one week, with F. Villeneuve) and in tomb IGN 117 (two days, with I. Sachet and N. Delhopital, in order to learn about excavation in funerary contexts). He was also shown the process through which the pottery goes, from washing to analysis (with C. Durand) and drawing (with S. Eliès). He also received a one to one course on numismatics by Chr. Augé and on the archaeozoological remains by J. Studer. Finally, he followed a training in geophysical survey (with Chr. Benech, **fig. 10**). In the middle of his stay, he participated to a two day survey of three early Islamic dams in the Medina region (with L. Nehmé, J. Schiettecatte and L. Heydel). These dams were described, photographed and mapped using a theodolite (see below, section on “Other activities”). This allowed him to experiment and follow a survey methodology. A. as-Suhaibani is a very promising young scholar who will probably become part of the Saudi academic elite.

### Training of students of Hâ'il university

It was agreed with professor D. al-Talhi that the Madâ'in Sâlih project's topographer, L. Heydel (IGN) would give a three day training in topography applied to archaeology to a group of students of Hâ'il university. L. Heydel's explained the principles of topography and the operation of the level and the theodolite. His stay in Hâ'il was paid by the university.

## EXCAVATIONS AND SURVEYS CARRIED OUT IN 2011

In 2010, one excavation area only was located outside the ancient city wall: tomb IGN 117. The others were all within the city wall (see **fig. 3**). Some of them had been started in 2008 and continued in 2009 (Areas 1, 2), while others were opened in 2009 (Areas 7 and 8), 2010 (Area 9 and 6 / IGN 132) or 2011 (Area 35, which is part of the greater Area 3, which concerns the rampart and its surroundings).

**Areas 1 and 2** are the two large trenches which brought to light domestic structures dated from the 1<sup>st</sup> century BC to the beginning of the 7<sup>th</sup> century AD, for which see the reports of G. Charloux and J. Rohmer in this volume;

**Area 3** concerns the rampart and all the structures associated with it. In 2011, several spots along the rampart were explored and one gate of the city, the so-called southeastern gate, was partly excavated;

**Area 8** covers the remains of structures which belong to several phases which are difficult to date and interpret, one of which reuses monumental building material rather crudely assembled (see the report of S. Marion de Procé in this volume);

**Area 9** was opened during the second half of the 2010 season and continued in 2011. It was very successful since it yielded the earliest settlement discovered so far at the site (see the report of Z. T. Fiema in this volume, which covers seasons 2010 and 2011);

In and around **IGN 132**, excavations started in 2010. IGN 132 is one of the few rocky outcrops which stand in the middle of the residential area. In 2011, the excavations have put to light, on the summit of the outcrop, the existence of a sanctuary, possibly devoted to the sun god, which is made of a paved platform on which stood a *tetrapylon*. At the foot of the outcrop, a well was also partly excavated (see the report of L. Nehmé in this volume);

**Area 5 / IGN 117:** the funerary chamber of the rock-cut tomb was fully excavated in 2011 and the human bones as well as all the other material uncovered can now be studied (see the report of I. Sachet and N. Delhospital in this volume).

**The *tumuli*:** quite a lot of effort was put, in 2011, in the systematic survey of the areas, west and south of the site, which contain *tumuli* (see the report of W. Abu-Azizeh in this volume).

## OTHER ACTIVITIES

### 1/ Visit to the “Minaean fortress”

On Friday 21<sup>st</sup> of January, the team undertook a visit to the so-called “Minaean fortress”, on top of the mountain which dominates al-Khurayba, the site of ancient Dadân. The team started from the wâdî al-Mu‘tadil and reached the top of the mountain from the east, discovering several inscriptions on the way (**fig. 11**). Several structures which belonged obviously to the defensive system of the site were photographed: long monumental wall between two outcrops (**fig. 12**), tower, walkway along which were found several Dedanitic inscriptions, a fortress, etc. These elements point to the existence of a complete and elaborate defensive system aimed at protecting ancient Dadân from any intrusion coming from the east, by enemies who would have crossed the mountains. These elements, and more, have been documented in the 1980s by A. Nasîf (*Al-‘Ulâ. An Historical and Archaeological Survey With Special Reference to Its Irrigation System*, p. 22-24, plates p. 29-45, map p. 107) but they are worth a more thorough examination, should be mapped properly and the inscriptions recorded in the area should be published.

### 2/ Survey of dams in Medina region

The Madâ’in Project was used as a home base for an expedition which aimed at documenting three probably early Islamic dams in the Medina region. Permission for this expedition was given by the SCTA and help was granted by two members of the SCTA office in Medina. This expedition was placed under the supervision of J. Schiettecatte but the Madâ’in Sâlih project provided logistical support and several of its members participated to it (archaeologists A. as-Suhaibani, Kh. al-Hâ’itî and L. Nehmé, topographer L. Heydel). The reason for setting up this expedition is the following: it is possible that these structures or some predecessors, the building and maintenance of which required a strong political power, are of pre-Islamic date. One of the objectives of the expedition was therefore to take samples of mortar (containing charcoal) in order to obtain <sup>14</sup>C dates for the building of these dams.

On the 9<sup>th</sup> and 10<sup>th</sup> of February, the team visited the dams of wâdî Khushub, of ‘Urayda and the great dam of Mu‘âwiya. Topographic sketch-plans were made and several samples were taken for each dam. The <sup>14</sup>C dating is in process.

## APPENDIX: MANUFACTURING OF MUDBRICKS

By Ibrahim as-Sabhân

The manufacturing process was established and carefully followed by I. as-Sabhân. The following description is taken directly from the report he published in Arabic (in D. al-Talhi, I. as-Sabhân, Kh. al-Hâ'iti and M. al-Mûsa 2011, see note 1 above, p. 89-133).

Once the material (clayish earth, sand and water) has been collected from appropriate sources of supply, it consists in the following (**fig. 13**):

1. prepare wooden moulds with handles on the small sides (internal size 40 x 25 x 13 cm): **fig. 13.1**;
2. choose a flat and stoneless area;
3. lay down flat 8 x 8 m plastic sheets and fix them on the sides and on the corners with stones or mudbricks: **fig. 13.2**;
4. in order to prepare 35 mudbricks, put 650 kilos of clay and 400 kilos of sand on the plastic sheet, using a wheelbarrow (**fig. 13.3**), and mix them properly with a shovel (**fig. 13.4**);
5. prepare pyramid-shaped mounds and make a bowl-shaped depression (a crater) at the top;
6. fill the crater with water and spray the sides of the mound with water so that the earth is not blown by the wind (**fig. 13.5**);
7. the following morning, bring the earth up, taking it with a shovel from the bottom to the top (**fig. 13.6**). If the crater is not completely wet, it is possible to make another one just below the top one (**fig. 13.7**);
8. renew this operation (filling the crater with water, spraying the sides of the mound with water and bringing the earth from bottom to top) every day for a week;
9. trample on each mound until it becomes completely homogeneous. It takes the form of a flat disc (**fig. 13.8**);
10. spread 600 grams of temper ("Fos Fiber P1" was used instead of straw) uniformly over the disk of earth (**fig. 13.9**) and mix it carefully with the earth by trampling on it barefeet (**fig. 13.10**). It is better to divide the temper into three portions and mix them successively. After mixing each portion, make a pyramid-shaped mound which can be trampled again. Once the temper has been completely mixed with the earth, make a mound (**fig. 13.11**) and leave it to rest for one day;
11. trample the mound barefeet one last time in order to make it soft and homogeneous;
12. clean the ground on which the mudbricks are going to be put to dry;
13. plunge the wooden mould into water (**fig. 13.12**) and spray sand on its internal faces;
14. put the mould in the place where you want to make the mudbrick and fill it by hand with the earth (**fig. 13.14**). It is easier to use clods of earth prepared in advance (**fig. 13.13**) pressing it carefully in order to avoid air bubbles. When the mould is completely filled, make its surface smooth with the hands or with a trowel (**fig. 13.15**);
15. lift the mould using the handles (**figs 13.16-17**) and spray a little bit of sand on the surface of the mudbrick, in order to help it dry and protect it from the sun;
16. wash the mould and start the same process for a new mudbrick. There should be enough distance (a few centimeters) between the mudbricks for them to dry properly;
17. every two or three days, turn all the mudbricks on their side so that each side dries homogeneously;
18. when the mudbricks are completely dry, they can be used as building material.
19. In 2011, 1,300 mudbricks were made with 35 earth mounds scattered over 7 plastic sheets, which makes an average of 37 mudbricks per mound.



Fig. 1 Location of the site



**Fig. 2** Areas excavated so far outside the rampart of the city. For the excavations in the residential area, see **fig. 3**



**Fig. 3** Satellite image showing the excavations undertaken within the residential area

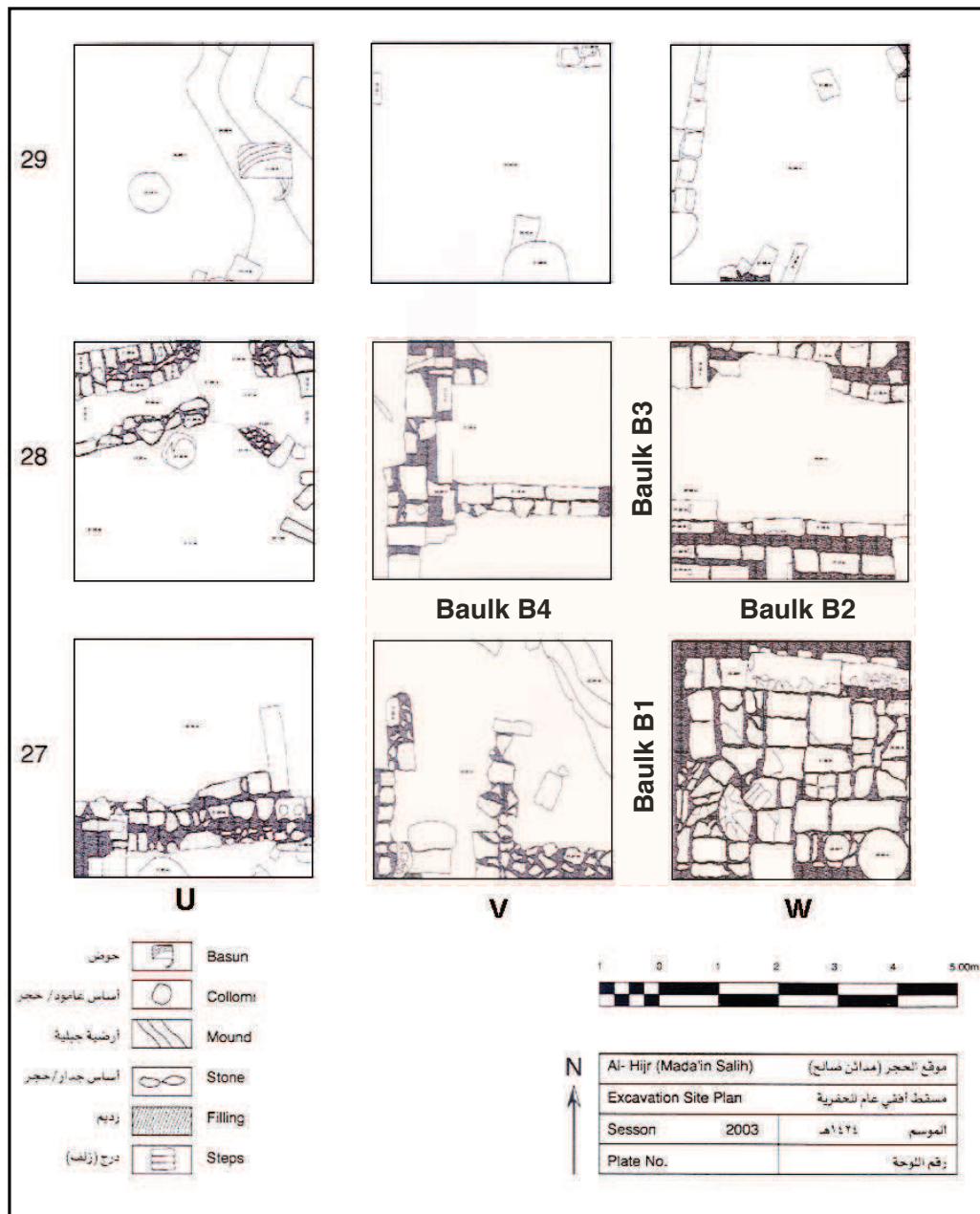
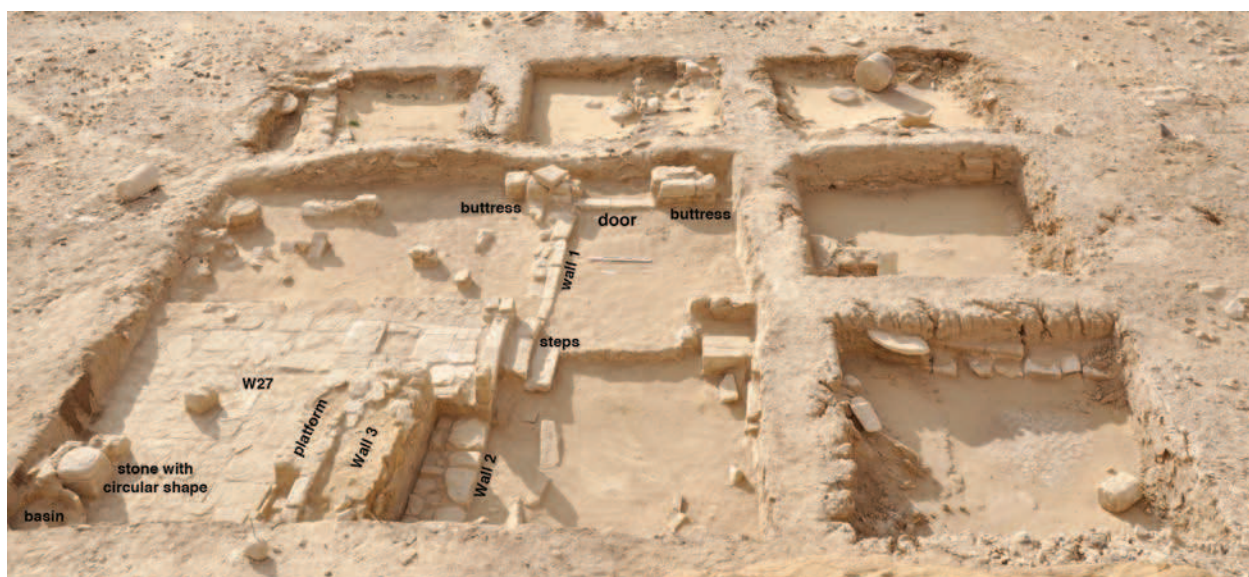


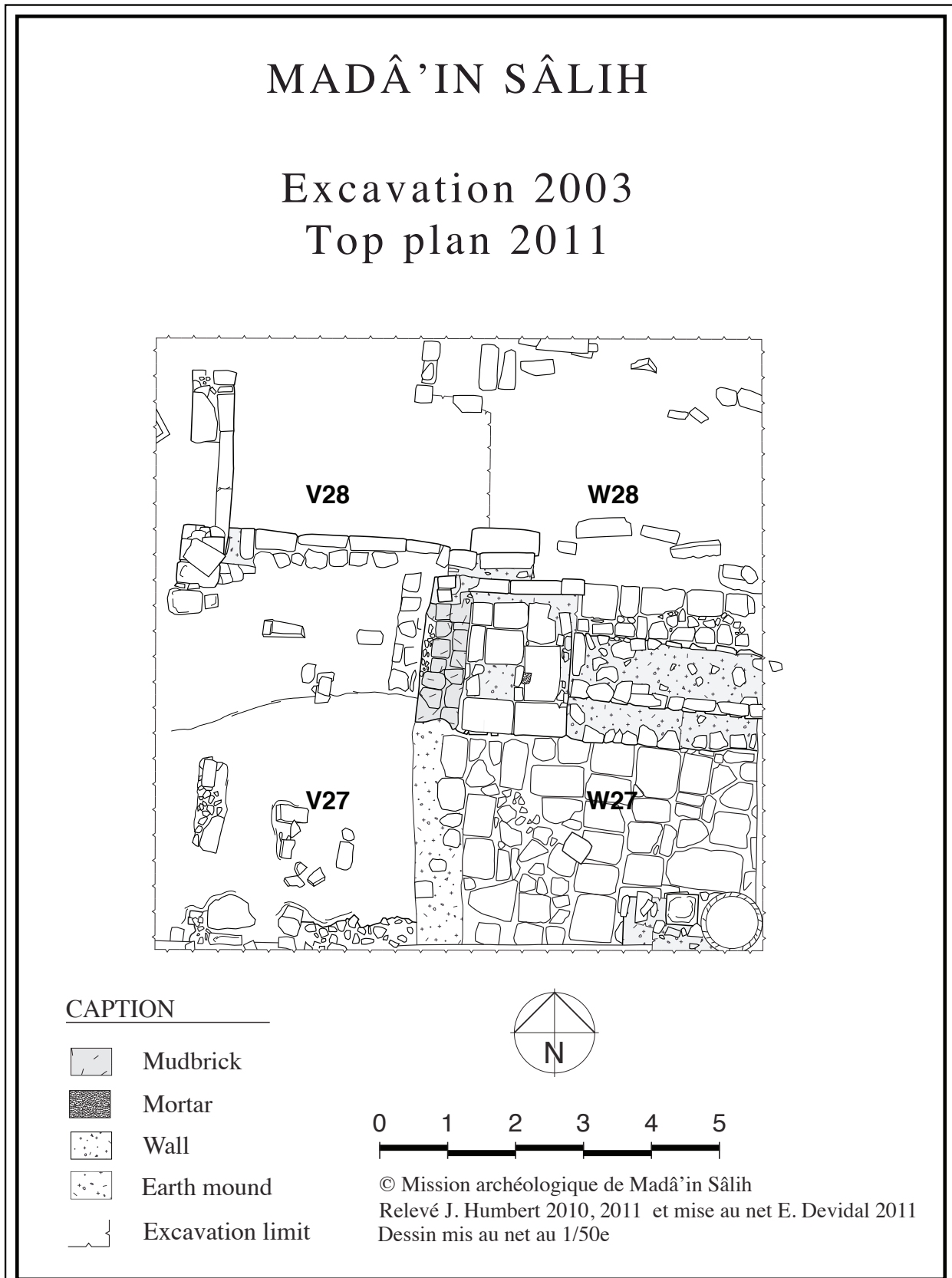
Fig. 4 The squares of 2003 excavations showing the baulks which were removed in 2011



**Fig. 5** The 2003 excavation area in 2011 before the removal of the baulks



**Fig. 6** The 2003 excavation area in 2011 after the removal of the baulks



**Fig. 7** Final plan of squares V27-28, W27-28



**Fig. 8** From right to left: D. al-Talhi, F. Villeneuve, Mr. and Mrs Colliard on their visit to Madâ'in Sâlih



**Fig. 9** The ambassadors of European Union and other countries (and their photographer!) at the end of their visit to Madâ'in Sâlih



**Fig. 10** Chr. Benech explaining to A. as-Suhaibani the functioning of the magnetometer

**Fig. 11** L. Nehmé, M. al-Mûsa and C. Durand reading a Dadanitic inscription at the back of the so-called Minaic fortress above al-Khurayba



**Fig. 12** A long wall part of the defensive system of ancient Dadan, above al-Khurayba

**Fig. 13 Manufacturing of mudbricks**



**Fig. 13.1** Wooden mould



**Fig. 13.2** Plastic sheets



**Fig. 13.3** Clay and sand



**Fig. 13.4** Mixing of clay and sand with a shovel



**Fig. 13.5** Pyramid-shaped mound with central crater filled with water



**Fig. 13.6** Bringing the earth up on following morning



**Fig. 13.7** Two-level crater to facilitate the wetting of the earth



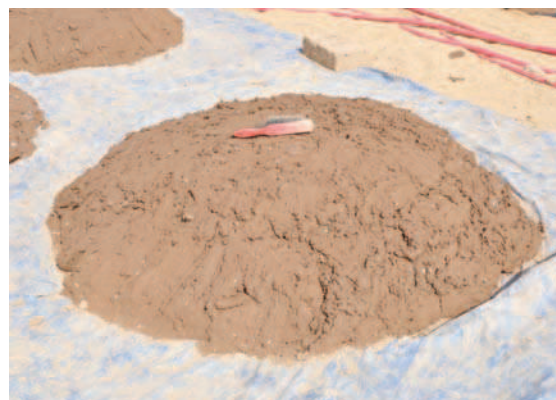
**Fig. 13.8** Trampling of the mound



**Fig. 13.9** Temper spread on top of trampled mound



**Fig. 13.10** Trampling the earth with the temper



**Fig. 13.11** Mound after mixing of earth with temper



**Fig. 13.12** Wetting the wooden mould



**Fig. 13.13** Clods of earth prepared for the filling of the mould



**Fig. 13.14** Filling of the mould



**Fig. 13.15** Smoothing the surface of the earth in the mould



**Fig. 13.17** Successful operation!



**Fig. 13.16** Removal from the mould

## **Area 1**

Guillaume CHARLOUX (CNRS, UMR 8167, Orient & Méditerranée)



# Area 1

Guillaume CHARLOUX

The 2011 season in Area 1 (February 5<sup>th</sup> to 26<sup>th</sup>) aimed at achieving three main objectives, the importance of which was decided at the end of the 2010 season<sup>1</sup> (**figs 1-2**).

- 1/ Understand the relationship between the eastern and western sectors of the area during the late Byzantine – early Islamic period, i.e. during Phase 6, which is the latest phase in Area 1. Note that the eastern sector is represented by trench J and the western sector by all the other trenches. The problem lies in the presence of a long and deeply founded north-south wall, 10064, which separates the two sectors. This wall prevented us from making connections between the layers on each side of it, except through the comparison of their altitudes. However, because of a difference of altitudes between floors 10016 in trenches A-C and 10138 in trench J, the stratigraphical sequence in trench J was not completely certain: should the upper level in trench J be attached to Phase 6 or to Phase 5? In order to determine the relationship between both sectors, we decided to excavate in the southern part of trench J, at the end of wall 10064.
- 2/ The second objective was to extend to the north the deep sounding opened in 2010 under room 10110, in order to get more information on the type and layout of the original structures of Phases 1 and 2 which were observed in the south, as well as to clarify the complex archaeological sequence for these early phases.
- 3/ The third objective was to complete the excavation of street 10183, down to its base, and to confirm the hypothesis according which the street was in use at least since Phase 3, the reason being the presence of walls 10005/10098, delimitating its southern side.

The following report presents briefly the results of the 2011 season. The full study of Area 1, including the stratigraphy, the study of the findings and the architectural analysis will be published after the study season of 2012.

## TRENCH J, PHASE 6

In order to compare and connect the stratigraphy of trenches J (room 10185) and C (room 10187), it was decided to clear completely floor 10174 (/10148), located under a hard and deep melted mudbrick layer 10134 (**figs 3-4**). This clearing had been started in 2009 and continued in 2010.

The floor layer (**fig. 5**), which contains a lot of artefacts – pottery, stones, bones, coins –, extends southwards, where it abuts the northern side of mudbrick wall 10321, the southern face of which was easily distinguished in room 10187 / floor layer 10147. Stone foundation of wall 10173, south of threshold 10306, was also reached during this operation.

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1. Three to twelve workmen assisted us during this season.

Since floor 10174 does not extend southwards, floors 10174 in trench J and 10147 in trenches C-J are probably contemporary, despite their different altitudes. However, one should not discard the possible existence of an upper floor, which would have taken place above 10174 and which would have been washed away by erosion. This last solution seems however less convincing.

The clearing of room 10185 revealed a deep light grey powdery layer, floor 10147, with ashy areas located against the southern face of 10321 and western face of 10320. A small oven (“*tannûr*”), made of a cylindrical bottomless pottery deeply buried into the ground, was full of black dark ashy powdery soil 10315 (**fig. 6**). Wall 10320, which is perpendicular to mudbrick wall 10321, was not fully understood since its masonry is made of an eroded course of small or medium-sized stones irregularly positioned. It is very eroded and seems wider in its southern part than in its northern part, where two flat white sandstone blocks may indicate the presence of a door threshold or of stairs. A pathway was perhaps constructed to reach room 10369, not fully studied in 2011: all we did in room 10369 is clear the surrounding walls and reach their foundations built in sandstone blocks. The same was done in the south-west corner of room 10305, where floor 10279 was cleared over a small area, thus allowing the cleaning of the eastern face of the stone foundation of wall 10173.

## TRENCHES A-C, THE DEEP SOUNDING (PHASES 1 AND 2)

The deep sounding opened under room 10110 in 2010 (floor 10016) revealed a long stratigraphical sequence (Phases 1-6) which yielded large amount of archaeological material and well identified floors (**fig. 7**). The northern half of the sounding had not been fully excavated in 2010. Indeed, at the end of that season, the excavation had stopped at a well preserved grey-blue silty floor, 10260, which was attributed to Phase 2 (**fig. 8**). Therefore, we had to continue the work there in 2011.

In order to better understand the complicated layout of the structures which belong to Phases 1 and 2, we first removed carefully the central baulk, thus completing the study of all previous floor layers: 10242 ; 10245-10251. In order to get a better view of Phases 1 and 2, we also took away mudbrick wall 10231, finding that it was founded on one course of sandstone blocks, a detail which had not been seen in 2010 (**fig. 9**).

### Phase 2

The excavation of the northern part of the deep sounding in 2011 showed that Phase 2 is composed of at least three sub-phases, as we had suggested after the 2010 season (**fig. 10**). However, it is still difficult to determine precisely the sequence of phases in this area because the sub-phases are identified only through postholes and pits – other sub-phases are thus possible – and because these sub-phases are only 20 to 30 centimetres high (**figs 8 and 11**).

#### *Phase 2c*

After the removal of the baulk, we reached floor 10260 and exposed it completely. However, this floor suffered from the removal of the baulk and from successive cleanings (**fig. 13**). White sandstone basin fragments, pottery sherds and a glazed pot were scattered on the surface of floor 10260 in the south-east corner of room 10293, against wall 10278. To the north, floor 10260 abuts mudbrick wall 10351.

#### *Phase 2b*

Phase 2b is marked by the presence of a wide grey to dark blue ashy area, 10313, which looks like a hearth, and which seems to have been dug by a few structures (**fig. 13**):

- 10333 is a wide, deep and circular posthole, against the northern face of wall 10355. It contains large stones placed vertically at the bottom;
- 10344 is a circular pit with a large sandstone block inside;

- 10345 is a wide posthole (or pit?) with three sides protected by high stones. Like pit 10344, it is located against the southern face of wall 10351.

To the south-west, a triangular area full of light black-brown powdery silty soil (10316) was observed.

### ***Phase 2a***

Under 10313 and its bedding layer 10314-10317, we reached the hardened silty-clayey soil 10319, which covers all the surface except the triangular area with 10316.

To the north-west, two perpendicular mudbrick walls were put to light, 10323 and 10364. Wall 10323, of which only one course of mudbricks is preserved, is on top of layer 10360 (Phase 1) and abuts wall 10351 to the north.

Pit 10326, circular in shape, is dug into 10319 and 10348 and was full of grey to beige silty soil.

Oval pit 10327 was filled with grey to beige silty soil and was also dug into 10319. It is separated from 10326 by a small and elongated remain of layer 10319. Some kind of narrow evacuation channel runs from the southern limit of this pit towards the south of the room. It cuts posthole 10330, which belongs to Phase 1, and it seems to stop against wall 10278.

Circular pit 10342, north-east of 10327, is bordered on the south by a white sandstone block and its northern part is made of flat stones laid side by side. Small stones, beige silty soil and flat pottery sherds were found in it. Structure 10346, identified by a line of two stones surrounding it, was not excavated because it extends under the eastern section of the deep sounding. Furthermore, postholes 10343 were dug into it.

Each of these pits seems to have had a specific function which cannot be determined yet.

Apart from the pits, we recognized a series of postholes:

- 10343 is composed of three small (*c.* 5 cm diameter) aligned postholes, full of dark ash;
- 10356 is a wide circular posthole dug into 10322;
- 10357 is as medium-sized posthole dug into 10322;
- 10358 is a deep posthole also dug into 10322, filled with ash at the bottom and clay at the top;
- 10347 groups two medium sized postholes located between 10342 and 10345, filled with light beige clay;
- 10365 is a series of five small and aligned postholes (5 to 7 cm) dug into 10319 at the southern limit of pit 10326.

### **Phase 1**

In 2011, two sub-phases were distinguished in Phase 1 (**figs 8 and 12**).

#### ***Phase 1b***

During Phase 1b was built wall 10364, against which abut ashy layers 10322 (dark grey to black) to the south and 10360 (dark grey to grey) to the north. These ashy layers were observed at the same altitude in the previous excavation seasons in rooms 10289, 10290, 10293 and 10291, which probably shows that a general burning event took place in the area.

A series of twelve apparently contemporary postholes, 20 cm in diameter, are related to Phase 1 but it is difficult to determine with certainty their relationship with 10322 since they are all composed of ashy layers<sup>2</sup> and layer 10322 is also powdery, very soft and shallow.

Only posthole 10359, which was certainly dug before the installation of wall 10364, as can be seen in the section, could be earlier than 10322. The sub-phases are therefore difficult to distinguish.

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2. They are numbered 10325, 10328, 10329, 10330, 10331, 10332, 10334, 10335, 10336, 10337, 10338 and 10349.

### ***Phase 1a***

The first installation in Area 1 is apparently not linked to the postholes. A small sounding against the northern face of wall 10278 has indeed shown that it was founded at a lower altitude than the postholes (777.28 m). Its foundation trench was dug into virgin soil 10363 to the south, and it is abutted to the north by layers 10361 and 10362, the latter being possibly the continuation of floor 10350 exhibited further north (**fig. 8**).

## **3. STREET 10183, TRENCH A, PHASES 1 TO 6**

As we already supposed in 2010, street 10183 has had a long and uninterrupted use in antiquity. Although we lacked time for a complete study of all the layers<sup>3</sup>, we managed to show that the walls bordering street 10183 were continuously rebuilt from Phase 2 (sub-phase 2a) up to Phase 6. We also showed the existence of successive evacuation channels.

### **Phase 6, 6<sup>th</sup>-7<sup>th</sup> c. AD<sup>4</sup>**

During this phase (**fig. 3**), street 10183 is bordered to the south by wall 10005 and to the north by walls 10149 and 10176, with two thresholds 10053 giving an exit onto the street. Floor layer is probably 10080, although we did not get any material from it in 2008, as it was much eroded.

### **Phase 5, 4<sup>th</sup>-5<sup>th</sup> c. AD**

During this phase (**fig. 16**), street 10183 is also bordered to the south by wall 10005 and to the north by walls 10149 and 10176. A series of floor layers all numbered 10095 is located under mudbrick destruction 10011. A system of two evacuation channels numbered 10033 was observed in the street: one parallel to wall 10005 but on a short distance, the other slightly curved, closed to a small oval pit 10312.

### **Phase 4, 2<sup>nd</sup>-3<sup>rd</sup> c. AD**

During this phase (**fig. 15**), street 10183 is delimited to the south by wall 10098 and to the north by walls 10354 and 10176. Successive floors were observed, among which 10102 and 10104. We excavated carefully a long evacuation channel 10324, parallel to wall 10098 and dug into the previous layer 10366. In places, it is made of oblique stones and it is partly covered with small stones and pottery.

### **Phase 3, mid.- end 1<sup>st</sup> c. AD**

During this phase (**fig. 14**), street 10183 is bordered to the south by wall 10098 and to the north by walls 10354 and 10176. Successive floors, numbered 10366, were observed. A wide and deep pit of an evacuation channel 10367, parallel to 10098, was identified during the drawing of the eastern and western sections (**fig. 17**).

### **Phase 2, 2<sup>nd</sup>/1<sup>st</sup> c. BC - mid. 1<sup>st</sup> c. AD**

It seems that street 10183 was installed at the beginning of Phase 2 (sub-phase 2a). It is delimited to the south by wall 10351 and to the north by walls 10354 and 10353. Successive floors layers were identified numbered 10368 and 10340. The pottery and artefacts from layer 10340, still under study, seem to indicate

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3. Only layers from Phases 2 (10340) and 1 (10339, 10341, 10350) were carefully observed in order to get a larger amount of pottery from these phases.

4. Preliminary dating which has to be confirmed by the pottery study and radiocarbon datings.

a pre-Nabataean date, possibly 2<sup>nd</sup> or 1<sup>st</sup> c. BC, although this phase 2 surely continues down to the middle of the 1<sup>st</sup> c. AD.

### **Phase 1, 3<sup>rd</sup>-2<sup>nd</sup> c. BC (?)**

Phase 1 (**fig. 12**) is represented by a soft grey ashy layer 10360, which runs under walls 10351 and 10352, but abutting wall 10353.

The function of this space cannot be determined because almost no artefacts or structures were found in place apart from an evacuation channel, 10339. The channel, orientated east-west, is an elongated narrow furrow dug into layer 10341. Three small stones and one bone laid obliquely form the southern side of the channel. The other side had no masonry.

Although we are not sure that street 10183 already existed in Phase 1, it is interesting to note that channel 10339 is located at the same place and with the same orientation as the successive channels 10324, 10367 and 10033. It may indicate that it was already a pathway.

Layer 10341 is a light brown silty clayey soil, with few pottery and bones. Its removal uncovered a perfectly flattened floor, 10350, with a slight slope, at the altitude 777.20 m. Its white surface, which looks like plaster, contrasted strongly with the upper layer. It abuts the eastern extremity of wall 10353 and extends against the side a large red sandstone block located at the base of the wall. Layer 10350 was cleaned over half of the sounding. It lies on top of light brown clayey virgin soil 10363.

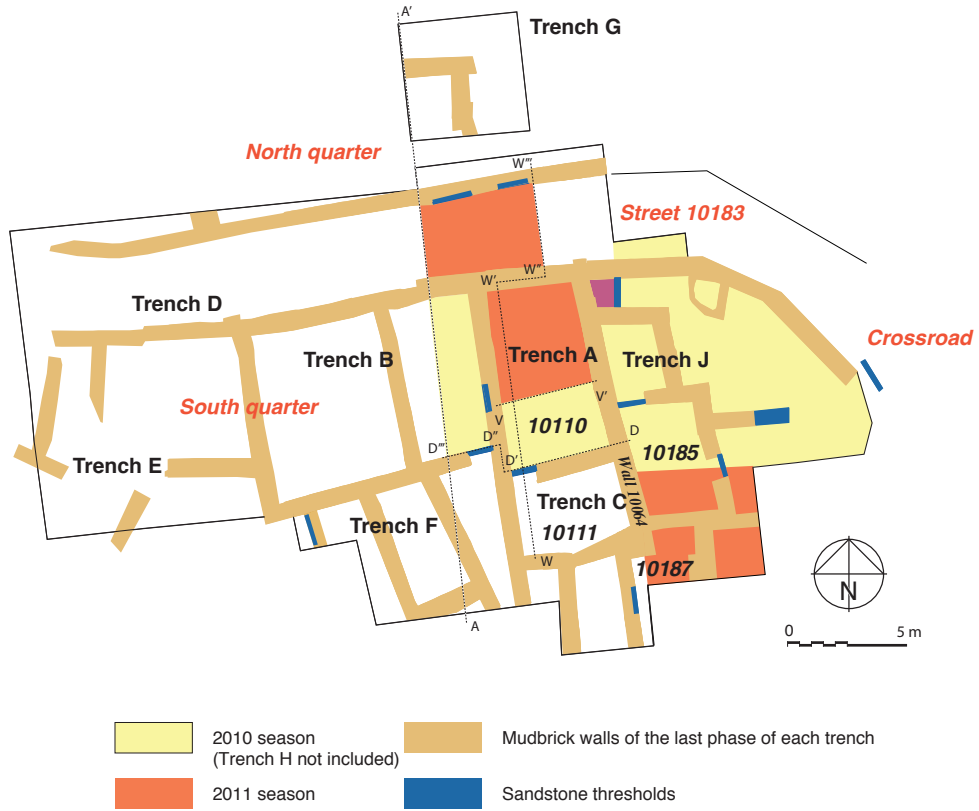
## **CONCLUSION**

The objectives of 2011 season have been fulfilled and will allow a further and complete study of Phases 1 to 6 in Area 1:

- 1/ On the basis of the results obtained in 2011, the floor layers of trench J which had been cleared from 2008 to 2010 should be linked to Phase 6. It seems therefore that the floor layers have different altitudes in the east and the west of Area 1.
- 2/ The deep sounding under room 10110 revealed a long and uninterrupted archaeological sequence. Clearing of Phase 2 showed numerous structures (walls, pits and postholes) which may have to be divided into at least three sub-phases.  
A series of postholes may be linked to Phase 1 but the first occupation in Area 1 does not seem to be related to them. A dark ashy layer, 10322, also excavated in the other soundings, covers the floor of Phase 1, which may indicate a burning event in Area 1.
- 3/ Street 10183 (**figs 18-19**), located north of the residential quarter in Area 1, was founded at the beginning of Phase 2, in a pre-Nabataean period. It continues without interruption down to Phase 6, in the 6<sup>th</sup>-7<sup>th</sup> c. AD. Successive evacuation channels, parallel to the walls which border the street, are attested from Phase 3 to Phase 5. Another channel (10339) was also observed in Phase 1. It may be the sign that a pathway already existed there in Phase 1.

The results of our excavations, added to those of the geophysical survey, which showed the existence of streets, are evidence for the long use of the same urban planning system. From the beginning of the occupation to the abandonment, residential quarters seem to have been limited by the same streets. Consequently, all the architectural changes which took place within the residential units between Phases 2 to 6 were restrained by the inflexibility of these lines. They left little room for extension and they explain the most of the walls keep the same orientation, leading to a fairly static pattern of internal mobility (**fig. 20**).

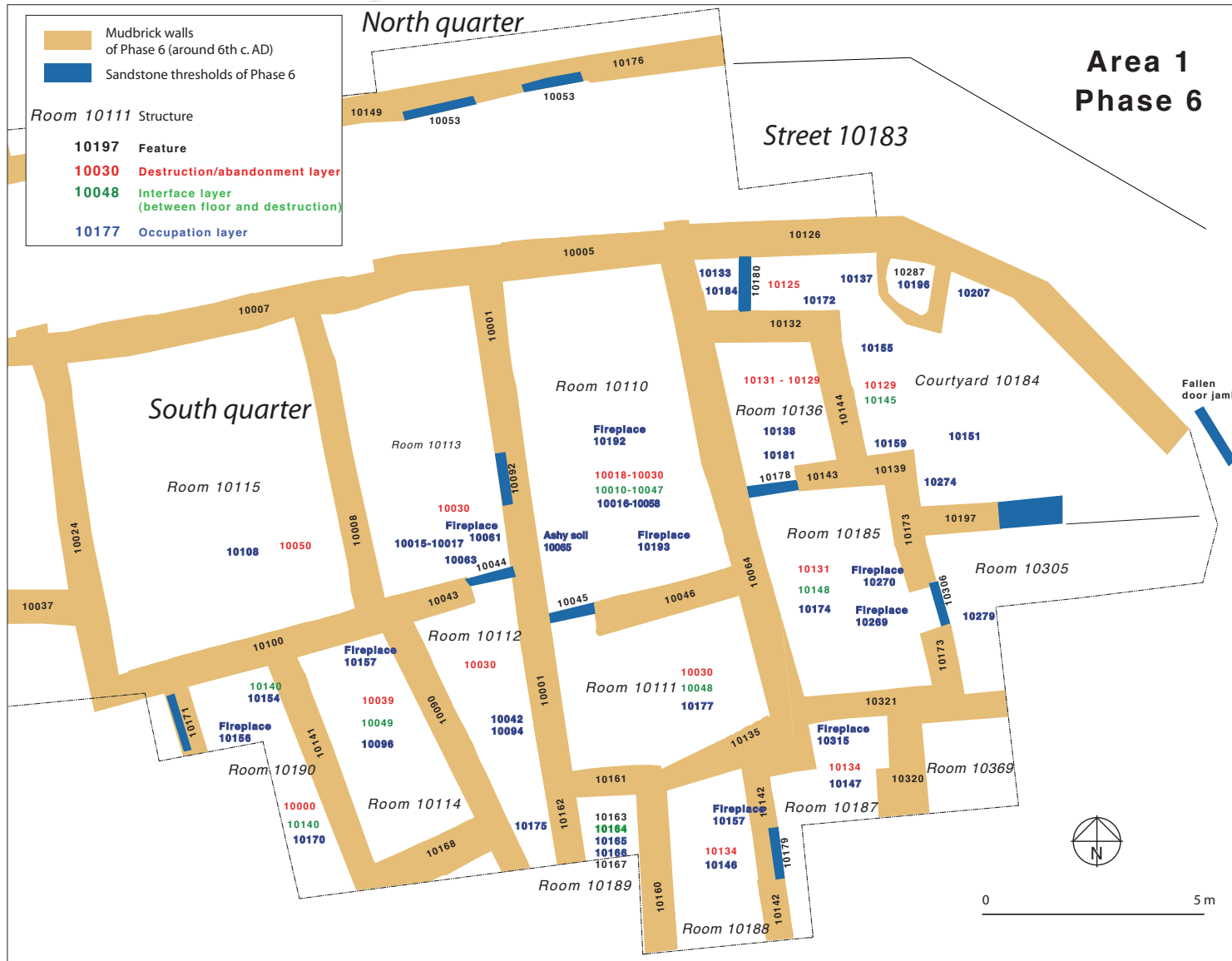
In order to protect the site, mudbrick walls in Area 1 have been restored and all the soundings have been filled with sand at the end of the 4<sup>th</sup> archaeological season.



**Fig. 1** General plan of Area 1, showing the location of the work undertaken in 2011



**Fig. 2** General view of Area 1 from the north, during the 2011 fieldwork



**Fig. 3** Plan of Phase 6



**Fig. 4** General view of trench J, from the south



**Fig. 5** View of floor 10174, from the west

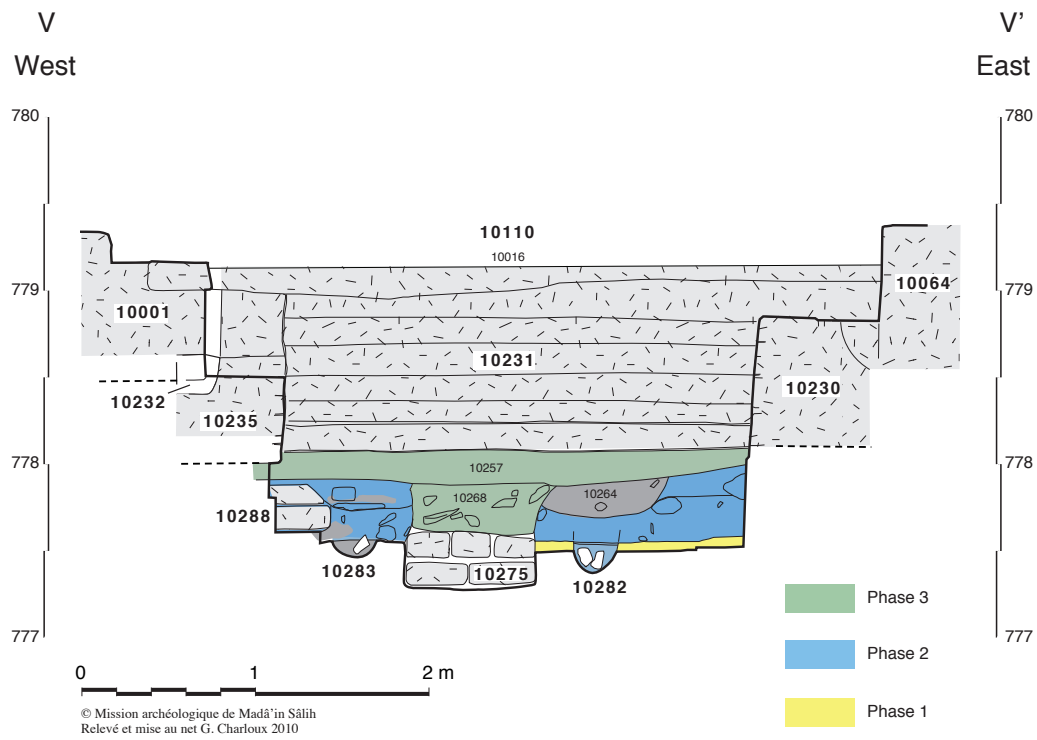


**Fig. 6** View of a *tannûr* (small domestic oven) in the north-west corner of room 10185, from the west



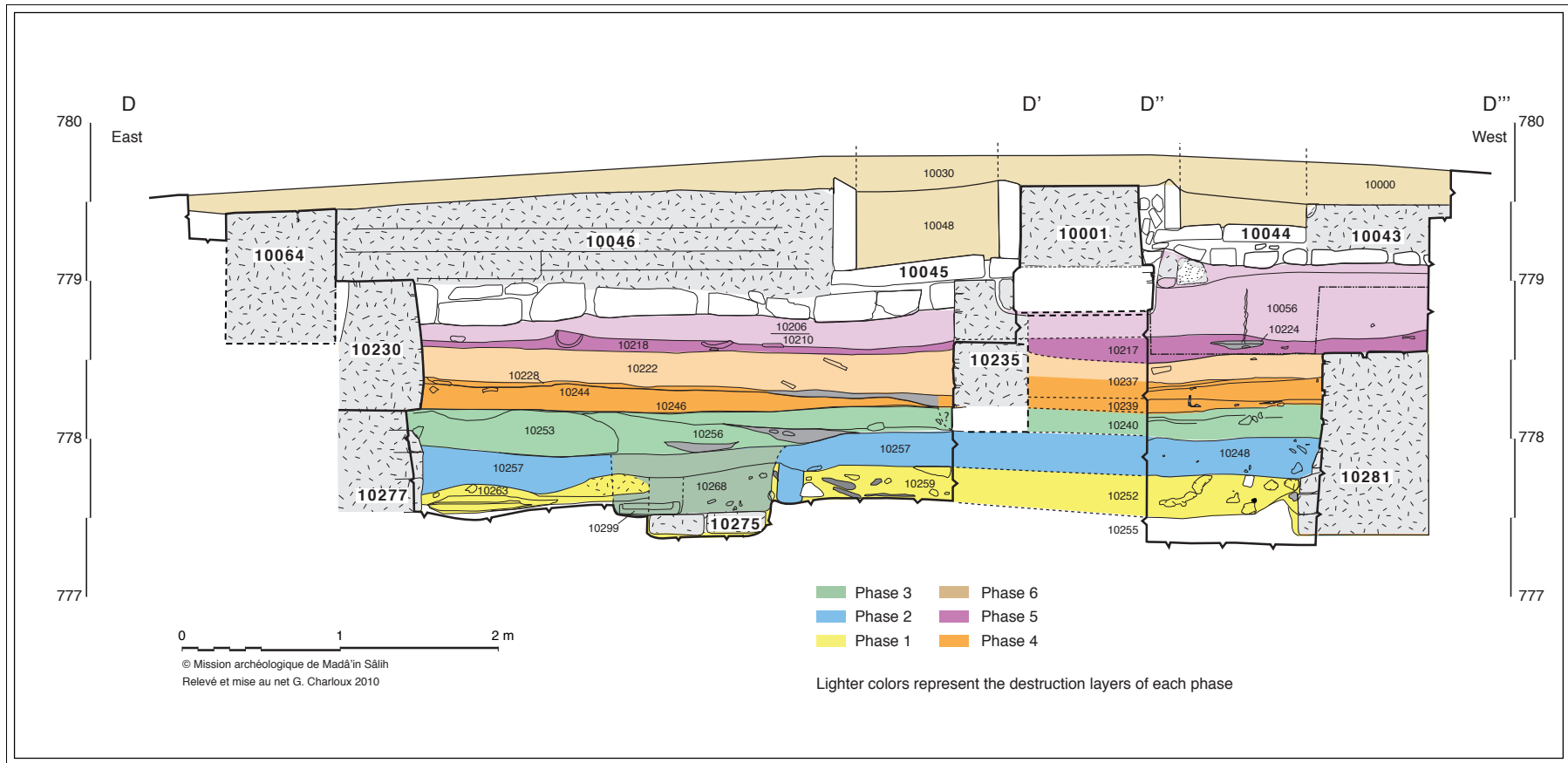
**Fig. 7** General view of the deep sounding, from the south-west

For **Fig. 8**, see following page



**Fig. 9** Section V





**Fig. 10** Section D



**Fig. 11** View of Phases 1 and 2 in the deep sounding, from the north-east

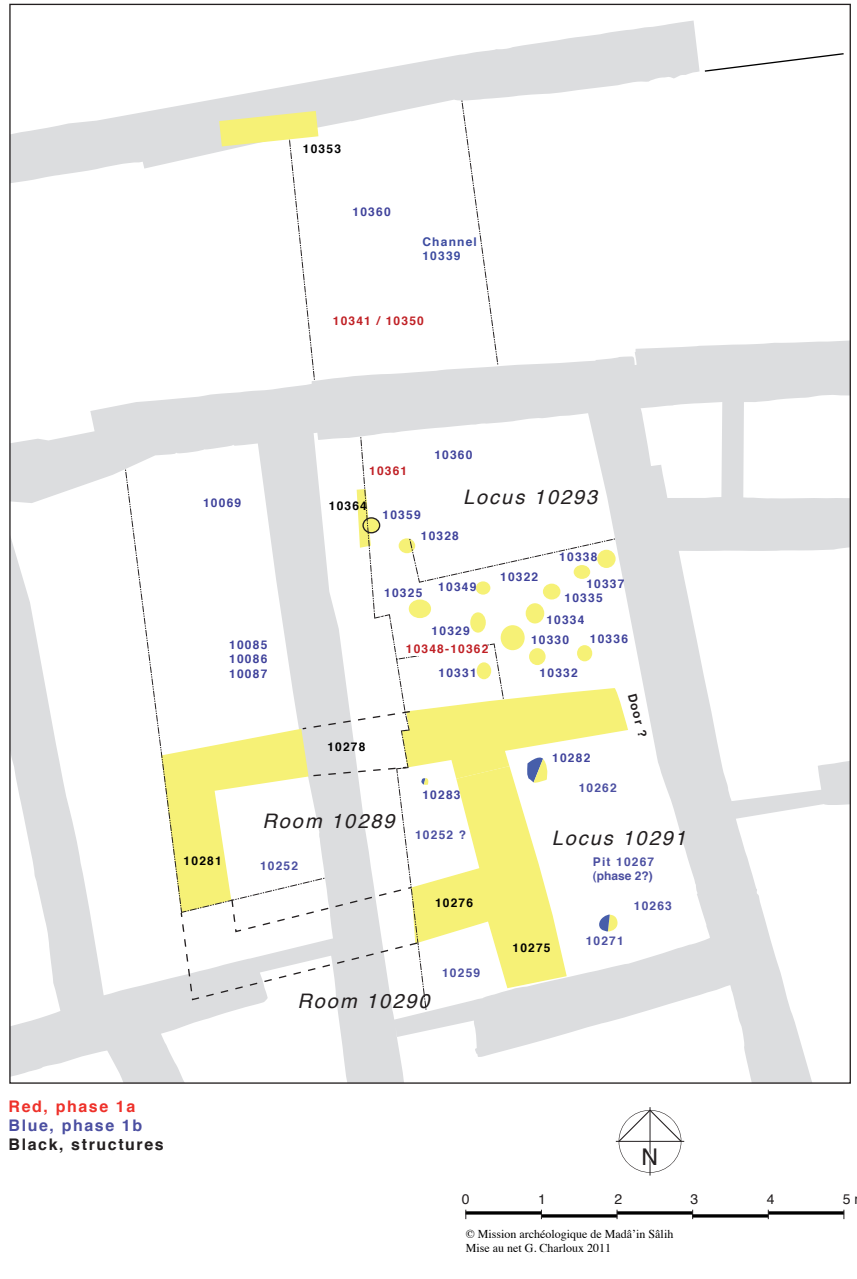
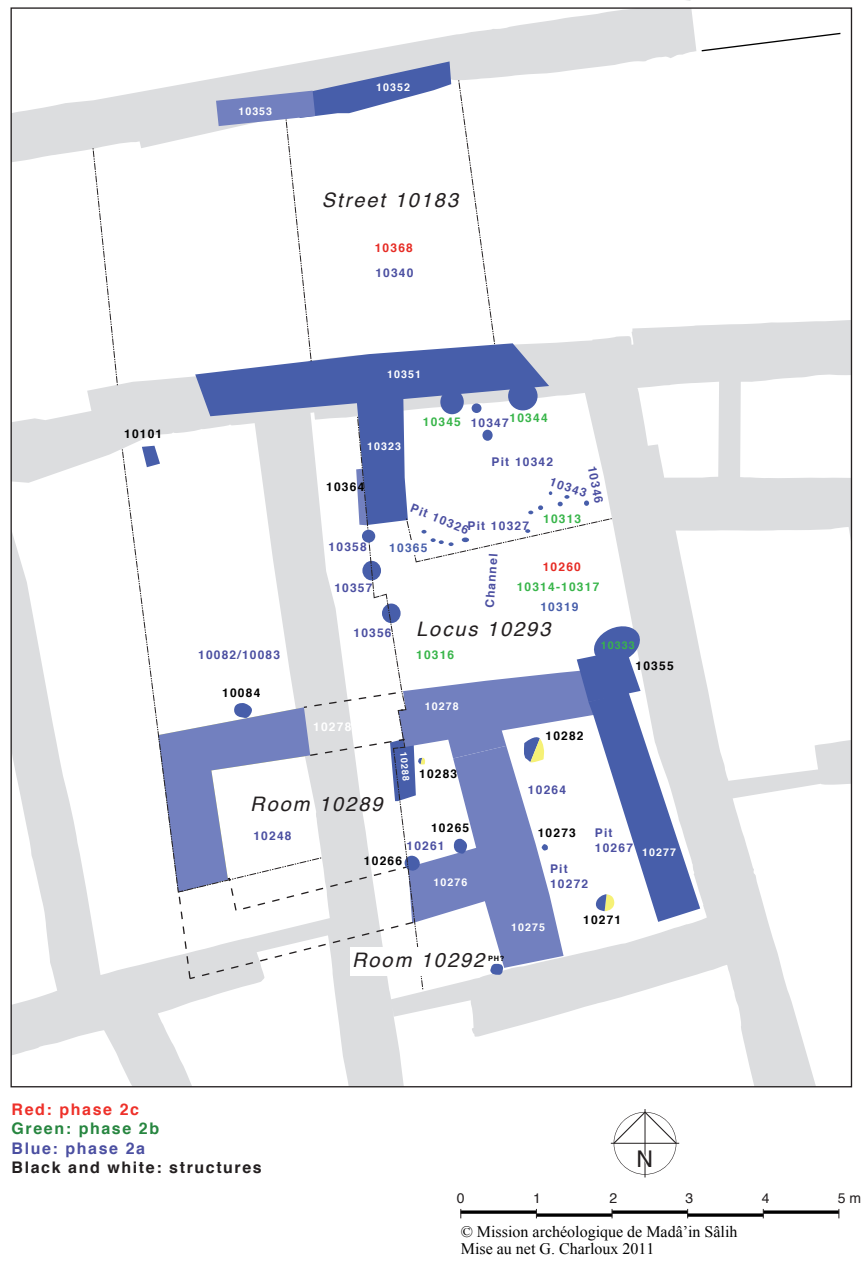
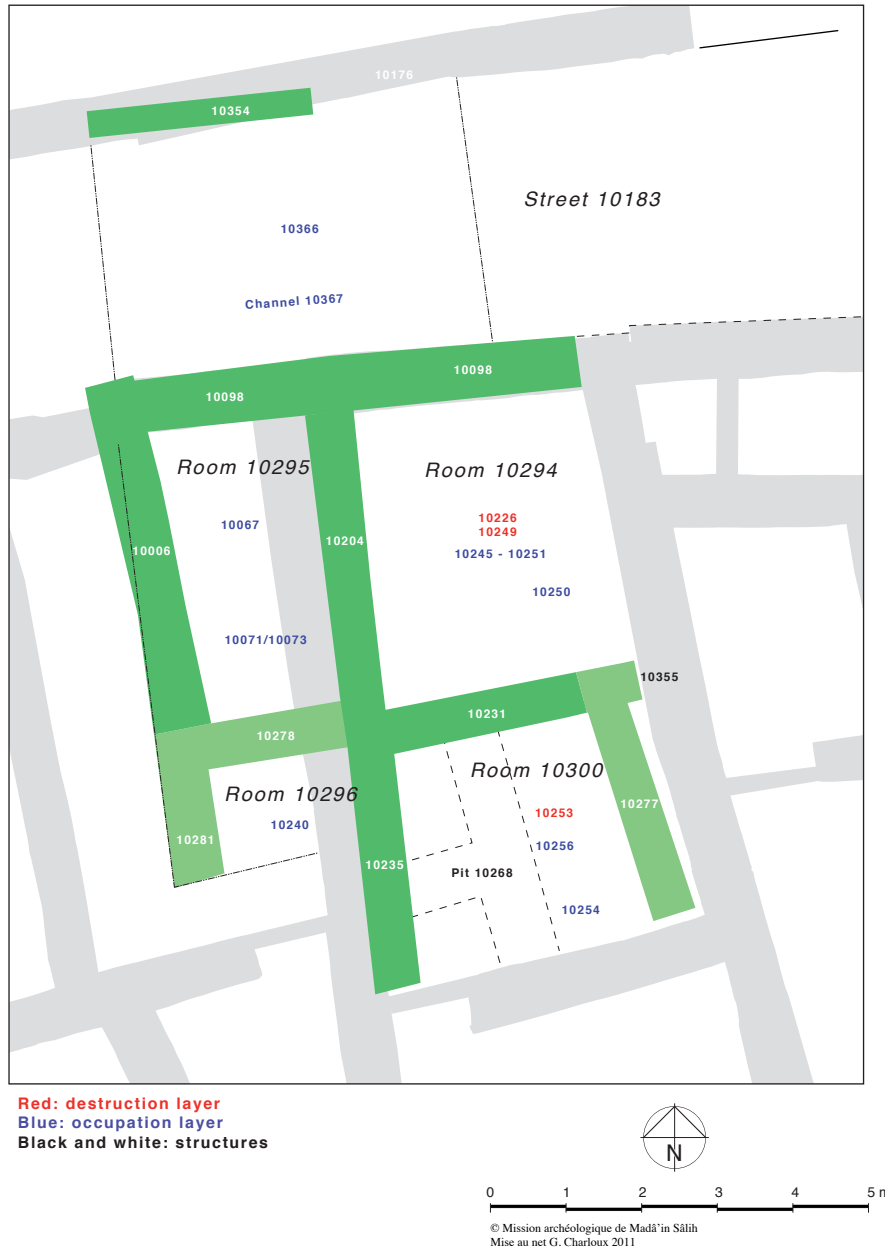


Fig. 12 Plan of Phase 1



**Fig. 13** Plan of Phase 2



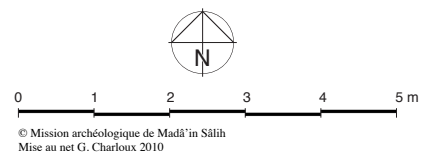
**Fig. 14** Plan of Phase 3



**Fig. 15** Plan of Phase 4



Red: destruction/abandonment layer  
 Blue: occupation layer  
 Green: abandonment layer  
 Black and white: structures



**Fig. 16** Plan of Phase 5

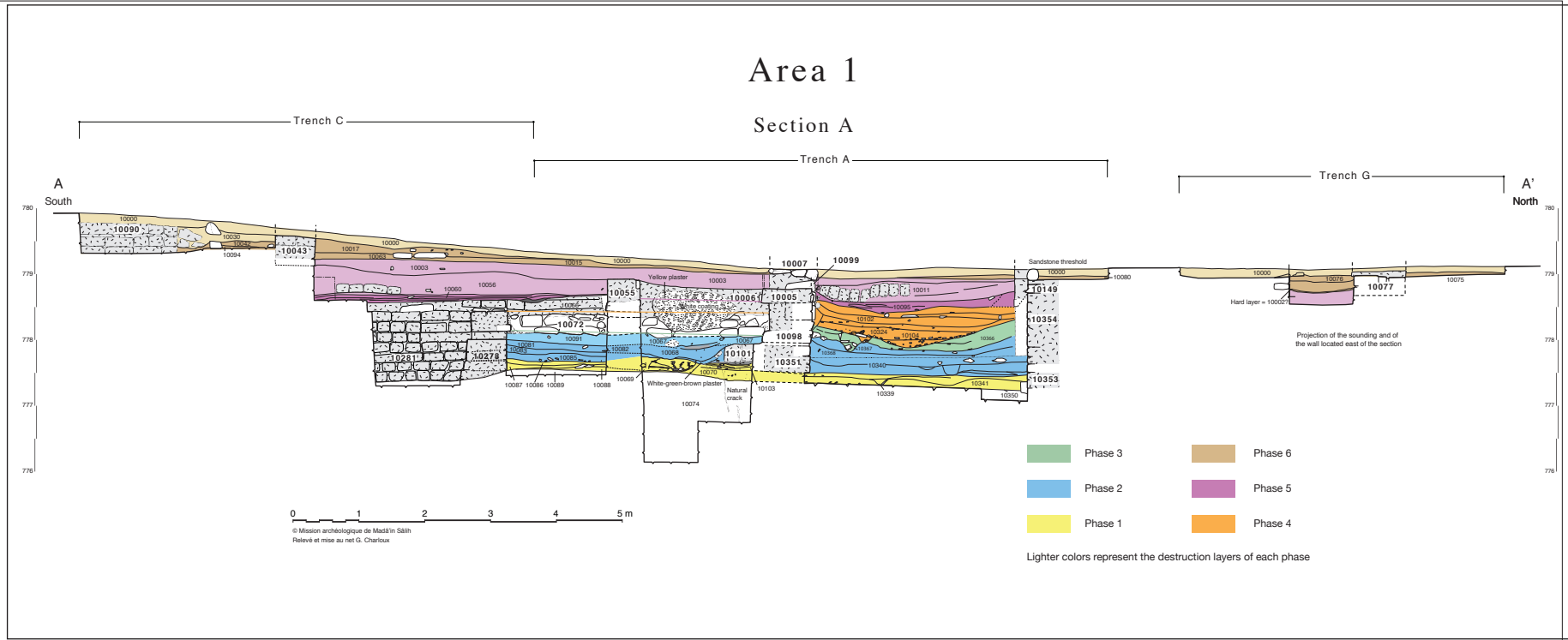


Fig. 17 Section A



**Fig. 18** View of the street, southern border, from the north



**Fig. 19** View of street, northern border, from the south



**Fig. 20** General view of the excavations, from the north-west



## **Area 2**

JÉRÔME ROHMER (PhD Student, University of Paris 1)



## Area 2

Jérôme ROHMER

The 2011 field season in Area 2 took place from January 15<sup>th</sup> to February 10<sup>th</sup>, under the supervision of J. Rohmer. It concentrated, this year, on the northern half of the area. Three main operations were carried out (**fig. 1**):

- 1/ in the east, trench F was extended by 2 m towards the east, in order to ascertain the extension of the late domestic courtyard exposed in the 2009 and 2010 field seasons. This extension is a 2 x 7 m rectangle (trench F east);
- 2/ in the west, a 2.5 x 8 m N-S extension was opened west of trench C (trench C west). In the south, this extension reached the limit of trench A west. In the north, it exceeded by 2 m the original northern limit of trench C. The goals of this extension of trench C were the following:
  - clarify the stratigraphy and occupational sequence of the large courtyard identified during the previous field seasons;
  - check whether there was any subdivision or central feature in this unusually large and carefully built courtyard;
  - uncover more features of the early phases, since this wide open area with a low density of late constructions provided a good opportunity to expose early remains on a wide scale;
- 3/ finally, a 5 x 2.5 m N-S sounding was opened by A. as-Suhaibani, north-west of trench C, in order to check the continuation of the western wall of the monumental courtyard (27016) towards the north, and to look for a potential north-western angle (trench I).

The 2011 excavations led to a revision of the global phasing proposed in the earlier reports. Therefore, I will first expose the local phasing of each trench, before discussing their implications on the general phasing of Area 2.

### TRENCH F EAST: LOCAL PHASING

#### **Local phase F east 1: mudbrick feature 25437 and related occupations (last decade of 1<sup>st</sup> c. BC – early 1<sup>st</sup> c. AD)**

The earliest feature identified in the eastern extension of trench F is a razed mudbrick construction of very irregular shape (*locus* 25437), covering most of the space left free between the later walls (**figs 1- 2**). It rests on a virgin soil made of silt and sand (25435) and only one course, 10 cm thick, is preserved. It is made of bricks and fragments of bricks of various shape and size. Our first impression was that it was a mudbrick pavement. However, there are significant “holes” filled with distinct silty soil (in the south-west, north-west and east), which give it the shape of an irregular T. In the south-western hole, there was a surface with artefacts (25434), associated with a stone-lined pit (25440), which clearly abuts the mudbricks (**fig. 3**). This implies that feature 25437 had a certain elevation. Therefore, we are left with three possibilities: a wall, a platform or a bench. The last two are unlikely, since a freestanding T-shaped platform or bench in the

middle of a room or courtyard seems rather pointless. This feature is more probably the remnants of early walls, which were razed down in local phase F east 2.

Feature 25437 can be broken down into three to four distinct walls. The first one (25437a, the vertical bar of the T) is oriented ENE-WSW, and is most likely the continuation of wall 25083, found in 2010 in trench F. The fact that 25437a and 25083 are one and the same wall is all the more likely since they share the same irregular shape and construction technique (bricks and brick fragments). Both wall segments seem to join under wall 25075, which is built over them (although it was founded at a deeper level).

The horizontal bar of the T forms either one NNE-SSW mudbrick wall or two distinct walls abutting the western end of 25437a. Judging by the layout of the bricks, the latter option seems more likely, although the masonry of all three walls seem to be closely integrated. The northern wall (25437b) progressively widens up towards the north. The southern one (25437c) follows a slightly curved course, but its eastern face is unclear. The departure of a fourth wall, east of 25437c, may be guessed on the plan drawn by J. Humbert, but it is very dubious.

These walls represent the earliest architectural phase in trench F. They can be associated with other features. The western end of wall 25083/25437a, which was uncovered this season, abuts a SSW-NNE mudbrick wall (25302) running under the late wall 22061. In the south, wall 25437c probably abutted wall 25087.<sup>1</sup> Considering all this, walls 25083/25437a, 25302 and 25087 formed a c. 4 x 2 m E-W rectangular room. The surface exposed in 2011 (25434) is most probably the continuation of surface 25090, uncovered in 2010 in central trench F, on the other side of wall 25075. Hearth 25094, associated with surface 25090, lay in the centre of the room. Few artefacts were found on this surface: three sherds, some stones (among which a polished pebble), one bone and a small alabaster cap (for a bottle?). The scarce amount of material and the presence of a hearth may suggest an open-air area – a small courtyard?

A *terminus post quem* for the dating of this first architectural phase is provided by a coin found on surface 25434 which, according to a preliminary reading by Chr. Augé, dates back to the early years of Aretas IV (from 9 BC onwards). Therefore, the first occupation trench F cannot be much earlier than the last decade of the 1<sup>st</sup> c. BC.<sup>2</sup>

### **Local phase F east 2: destruction of walls 25437, construction of wall 25075 and related occupations (1<sup>st</sup> c. AD)**

The first phase seems to have been short-lived, judging from the low sedimentation associated with its walls. Not very long after their construction, walls 25437 were apparently levelled down to their first course in order to reorganize the area. Only 2/3 centimeters above the preserved top of walls 25437, a first probable surface, with horizontal stones and two coins, was found (25432; alt. 777.67 m; **fig. 4**). One of the coins lay over wall 25437a, which suggests that by the time the surface was in use, this wall had been levelled. This coin may be considered as intrusive but on the next surface, c. 8 cm above the first (25430; alt. 777.75 m; **fig. 5**), another coin and one metal object (a knife?) lay respectively over walls 25437b and 25437a. Surfaces 25427 and 25422, lying at 777.83 and 777.90 m respectively, also yielded artefacts which lay above the walls.

To the west, these four surfaces abut wall 25075,<sup>3</sup> which was built over the levelled walls 25437. In the south, this wall abutted wall 25087, preserved from the previous phase (**fig. 6**). Walls 25075 and 25087

1. Wall 25087 is earlier than wall 25075, which abuts it. It may therefore be ascribed to this very early phase.

2. Surface 25090, in central trench F, could be the same surface as 25434. It lies at the same altitude (777.65 m) and clearly abuts wall 25083. However, it did not provide any characteristic coin or sherd.

3. See 2010 report, p. 54.

delimited a rectangular area the northern and eastern limits of which are unknown, but which was at least 3.70 m long (N-S) and 2 m wide (E-W).

West of wall 25075, the wall segment 25083 was probably preserved up to a certain height, since the uppermost surface which abutted wall 25075 (*locus* 25081) seems to abut 25083 as well. Walls 25075, 25083, 25087 and 25302 (below 22061) formed a square area, in which two surfaces were found in 2010 (25086, 25081). Surface 25081 featured a hearth (25084) just along wall 25083.

The only dating evidence available so far for this phase comes from *loci* excavated in 2010: in trench F, the uppermost surface associated with wall 25075, which is 25081, and the layer which lies under it (25082) have provided fine Nabataean pottery of the 1<sup>st</sup> c. AD.<sup>4</sup> The pottery and coins from the newly excavated *loci* (surfaces 25432/30/27/22 and intermediate layers of disuse), which was not studied during the 2011 season, will hopefully help refine this dating.

### Local phase F east 3: the large domestic courtyard (2<sup>nd</sup> / early 3<sup>rd</sup> c. AD)

The following phase witnessed major architectural changes in trench F. Wall 25075 was levelled in order to clear the area and create a large courtyard communicating with a small square roofed room in the south-west, and to the paved room of trench C in the west.<sup>5</sup> The western (22061), southern (25009) and northern (25134) walls of this courtyard had been uncovered during previous field seasons. The eastern limit was uncovered in the eastern extension of trench F (**fig. 2**). An L-shaped wall abutting wall 25009 in the south (25415) was found in the southern half of the area. North of it is a dressed rectangular stone with a square hole at one end (25419), obviously reused here as a threshold.<sup>6</sup> The wall continued to the north with a poorly preserved segment, slightly protruding under the eastern baulk (25418). The walls have no stone foundations, and their lower courses are very unclear. However, the altitude of the base of the threshold (778.02 m) provides a good clue as to the level of the original surface of the courtyard.

In this courtyard, the results of the 2009 and 2010 excavations suggested the existence of two distinct occupational phases, separated by an episode of destruction or disuse.<sup>7</sup> This sequence was fully confirmed during the 2011 season. No clear surface was found at the base of the threshold, which is not surprising in an outdoor area. However, a layer of loose silty soil containing an unusually large amount of animal bones was abutting the threshold (25417; alt. 778.07-778.13 m). This layer was sealed by an impressive destruction (25416; alt. c. 778.10 / 778.15 m), with seven large architectural blocks scattered on the floor and some ash (**fig. 7**). The architectural blocks, obviously fallen, were probably part of the door frame. In the south-eastern corner of the courtyard, an *in situ* complete jar was crushed during the same episode of destruction (24422\_P01; **fig. 8**). This jar, the base of which lay 18 cm lower than the base of the threshold (alt. 777.84 m), was probably partly buried – which is no surprise given its rounded base. Although it was registered as 25422\_P01, it should therefore be ascribed to the occupation 25417 or the destruction 25416. This is confirmed by the content of the jar: it contained a fragment of alabaster vessel, matching another fragment found in *locus* 25413. The jar also contained a lot of animal bones, which suggest that it was used as a trash can.<sup>8</sup>

Another feature belonging to this phase is the rectangular mudbrick platform built along wall 25134. Its western half had been uncovered in 2009 (25135). It continued eastward on 1.10 x 0.75 m in the extension

4. *Ibid.*

5. *Ibid.*, p. 60-61.

6. The stone is obviously reused as a threshold, since a square hole is not particularly convenient for a door-socket.

7. *Ibid.*, p. 60-63.

8. The content of the jar is being studied, together with the associated *loci*, by J. Studer. Biomolecular analysis has been requested for an organic deposit found inside the pot.

of trench F (where it was named 25424). The total dimensions of the rectangular platform were therefore 2.60 x 75 m. It was preserved on only one course, and both the occupation 25417 and the destruction 25416 abutted it (**fig. 7**).

Since the pottery and coins from these *loci* have not been studied in 2011, there is no new evidence for the dating of this phase. Layers 25417 and 25416 broadly correspond to *locus* 25012 excavated in the initial trench F in 2009. At first sight, the shape and fabric of the jar *in situ* found this year (25422\_P01) match the “Late Roman” dating (2<sup>nd</sup> – early 4<sup>th</sup> c. AD) proposed for the pottery of this layer. Surface 25129, excavated in 2010 in the northern extension of trench F, lay at *c.* 778.12 m and is probably the continuation of 25416. It seems to have a characteristic 2<sup>nd</sup> c. AD assemblage, which suggests an early date within the “Late Roman” period.

#### **Local phase F east 4: post-destruction occupations of the courtyard (3<sup>rd</sup> / 4<sup>th</sup> c. AD?)**

After the destruction of phase F east 3, the courtyard was reoccupied with minor architectural changes. The destruction layer was covered by a 15 to 20 cm thick layer of disuse (25413), made of silt, with clayish areas (melted mudbrick?). Over this layer (alt. *c.* 778.25 m) lay a surface with two coins, one metal object, one big bone and two fallen architectural blocks (25408; **fig. 9**). This surface also corresponds to the top of a pit filled with stones, the western half of which was excavated in 2009 (25045/25409). It is perhaps contemporary with a restoration of wall 25134, to which an upper course made of reused stones (fragments of a basin and of a channel) was added (25444). This feature, which is delimited on both sides by small flat stones laid vertically, may also be the blocking of a door, but this is uncertain.

Surface 25408 equals surface 25008 uncovered in 2009 in central trench F.<sup>9</sup> It is therefore contemporary with several minor changes brought to the western part of the courtyard: the construction of the stone buttress 25111 and of the “cupboard” 25113 in the north-western corner of the courtyard, and the blocking of the door (25001) leading to the south-western square room.<sup>10</sup>

North of wall 25134, a surface (25411) with several stones, one shell and the upper half of a jar was found approximately at the same altitude, i.e. 778.30 m (**fig. 10**).

The dating evidence from previous excavation seasons suggests a dating of this phase in the 3<sup>rd</sup> / early 4<sup>th</sup> c. AD.<sup>11</sup>

#### **Local phase F east 5: late occupations (between 6<sup>th</sup> / 7<sup>th</sup> c. AD?)**

Surface 25408 was covered by a *c.* 25 cm thick layer of disuse, with little material (*loci* 25403/06/07). A concentration of artefacts was found over this layer, at *c.* 778.50 m (25402; **fig. 11**). It included a fragment of stone basin, several stones and sherds. It probably corresponds to a late occupation of the area. No walls associated with this occupation could be identified, since the mudbrick features of this late occupation have been washed away by water-induced erosion. However, wall 25009 was certainly still standing up to a certain height during this phase, since it is abutted by a newly built perpendicular stone wall and by a hearth in the south (see below). The same is probably true for walls 25415 and 25134.<sup>12</sup>

9. See 2009 report, p. 93.

10. See 2010 report, p. 61-62.

11. 25008 contained Nabataean common painted ware of a type which is common in Petra during the second half of the 3<sup>rd</sup> c. AD.

12. Wall 25134 was certainly standing in this late phase since it is abutted in the north, outside trench F, by a segment of stone wall showing over the surface.

On the southern side of 25009, at the same level as occupation 25402, a small stone wall and a hearth were found (**fig. 12**). Both features abut wall 25009. The stone wall (25401) is thin (50 cm) and poorly built, with very irregular stones assembled in a haphazard way. It is preserved on one course, and its base lies at *c.* 778.45 m. It is very similar to other very late structures found in Area 2, such as wall 25002.<sup>13</sup> The hearth (25442) was a 40 cm wide and 20 cm circular stone-lined pit, the bottom of which was paved with flat stones. It was filled with ash (25405). In Area 2, such large hearths were often found in the latest levels just under the current surface.

No pottery was found in this hearth, but it is likely to be contemporary with other features of this type found just under the surface in other part of trench F (25007, 25103, 25107/9). These are dated to the “Late Byzantine” or Early Islamic period (6<sup>th</sup> / 7<sup>th</sup> c. AD).

## TRENCH C WEST: LOCAL PHASING

### Local phase C west 1: early mudbrick features

Early mudbrick walls had been identified in trench C during the previous seasons.<sup>14</sup> However, no occupation associated with these constructions had been found so far. The 2011 excavations have allowed to complete the plan of these early mudbrick features and to identify their occupational layers.

The earliest occupation took place directly over a layer of sterile aeolian sand, already identified in 2008 (27249/22031). On the top of this sand layer were large pockets of ash, about 40 cm wide and 5 cm deep, probably the remnants of small fireplaces. Three were found in the area east of the later wall 27207 (27251a, b, c; **fig. 13**), and one west of this wall, partly under the western baulk (27256; **fig. 14**). The western one contained charcoals and animal bones. None of them contained pottery, and the associated surface (27253) provided only one coin, lying immediately next to one of the ash pockets.

In the north and the east, this first occupation abutted the early walls uncovered during the 2008 and 2009 seasons: 22015 and 22100.<sup>15</sup> Wall 22015 was found continuing westward on at least 2.80 m from the initial western limit of trench C. During this season, the remaining segment of wall 22100 was fully uncovered in the south-western corner of the extension.

The southern limit of the space delimited by these walls was discovered this year in the southern part of trench C west, just under the later wall 20002. It is a mudbrick wall founded at 777.05 m, directly over the sand (27250; **fig. 15**). Three courses and one row of mudbricks are preserved. Its southern row was destroyed by the stone foundations of later wall 20002, which was dug into it. Its door lies partly under later wall 27207. This door was blocked with stones, either during phase C west 1 or later, at the beginning of phase C west 2, in order to strengthen the foundations of wall 20002.

The western limit of the space was uncovered just under the western baulk. It is a SSW-NNE mudbrick wall (27257) made of at least two rows of bricks, of which four courses are preserved, built directly over the sand. It is founded at 776.73 m – i.e. 20 cm lower than wall 25015 and 30 cm lower than wall 27250 – and forms a right angle with wall 25015 which abuts it (**fig. 16**). It was most probably abutted at its southern end by wall 27250, but the connection of these walls still lies under the western baulk.

The walls of phase C west 1 delimit therefore an almost square space of 3.80 m (N-S) x 3.60 m (E-W), which was accessed from the south by an axial door in wall 27250. This wide space had no proper floor, featured several fireplaces and contained very little material. Therefore, it was certainly an open-air court-

13. See 2009 report, p. 96 and fig. 29.

14. 2008 published report, p. 117-118; 2009 report, p. 83-84; 2010 report, p. 51-52.

15. See 2010 report, p. 52.

yard. Based on the available evidence, the continuation of wall 22015 east of wall 22100 suggests that it was part of a building extending eastward.<sup>16</sup> However, the existence of an eastern door is impossible to check since the northern half of wall 22100 was totally destroyed by the stone foundations of wall 22006. Inside this space, the first surface with the fireplaces (27251/53) was covered by a *c.* 20 cm thick layer of debris, marked by scattered stones of various sizes, pottery and fragments of poorly fired clay (27247 / 44; **fig. 17**). Among the stones were many flat stones and one fragment of a shallow basin. The fragments of poorly fired clay resemble fragments of traditional Middle-Eastern bread ovens (*tannûr*). These debris were particularly concentrated in the south-eastern part of the area. It still abuts wall 27250 in the south, and wall 25015 in the north. It may reflect an episode of destruction or a reuse of the courtyard as a dump.

The pottery from the layers of occupation and abandonment has not been studied in 2011. However, a preliminary study of the coins (before cleaning) by Chr. Augé provides good clues as to the dating of this phase. A coin lying on surface 27253, immediately next to a fireplace, seems to date back to the beginning of the reign of Aretas IV, which sets the *terminus post quem* of this phase in the last decade of the 1<sup>st</sup> c. BC. Two other coins of Aretas IV have been found in the layers of destruction / abandonment (27247 / 44). These datings will have to be confirmed once the coins are cleaned, but they are consistent with the evidence from eastern trench F as to the beginning of human activity in Area 2 (see above).

### Local phase C west 2: building of the monumental stone walls (1<sup>st</sup> c. AD)

After the episode of destruction or abandonment which brought an end to phase C west 1, the early mudbrick walls were levelled (**fig. 15**) and two massive stone walls with 1.40 m deep stone foundations were built: 22006 in the east and 20002 in the south.<sup>17</sup> The foundations of these walls were dug into phase C west 1 walls 22100 and 27250. The uppermost course of these foundations is protruding outward, forming a lower bed which is wider than the wall. With walls 27016 in the west, these walls formed a large courtyard which was 7 m wide E-W, and at least 8 m long N-S.

In 2008, a surface was identified at the base of wall 22006 in the western part of the initial trench A (22026). It lay at an average altitude of 777.45 m. The continuation of this surface was exposed this year in the western extension of trench A (*locus* 27240 / 38; **fig. 18**). It was covered with a large amount of small flat stones which could be remnants of stone cutting. Surface 27240 is likely to be the level of construction of walls 22006 and 20002.

The problem is that this surface lies *c.* 10 cm lower than the top of the uppermost course of the foundations of 20002, which is 10 cm higher than in 22006. It seems that this course was not protruding over the surface, since the foundation trench seems to go up to its top (some small stones seem to be wedged against it). Moreover, the objects on surface 27240 seem to abut wall 27250, although the top of this wall is not visible (melted) at this level. Hence two possibilities:

- either surface 27240/38 is the top of the destruction layer of phase C west 1. However, it clearly continues surface 22026, which covered the foundations of wall 22006;
- or wall 27250 was still slightly protruding over the surface when wall 20002 was built, forming a small heap of melted mudbrick or a small step against the base of the wall.

In my opinion, the second option should be favoured, because surface 27240 / 38 clearly continues surface 22026 (which was uncovered at the base of the wall in 2008)<sup>18</sup> and because there is no other significant

16. The eastern continuation of wall 22015 was identified in sounding C5: see 2008 published report, p. 117).

17. For a description of these walls, see 2008 published report, p. 118-119.

18. 22026 lay over the top of the foundation trench of wall 22006.

occupation layer at the base of walls 22006 and 20002. For safety, the material from surface 27240 will not be considered as dating evidence for phase C west 2.

Slightly above this surface, a small concentration of sherds and small flat stones (27235) was found at the altitude of 777.52 m, i.e. exactly at the level of the top of the foundations of 20002 (**fig. 19**). Though of very limited extension, this feature cannot be the result of random natural deposition and it certainly marks an occupational surface abutting walls 20002 and 22006.

A preliminary study of the pottery from 27235 shows that it is mostly composed of jar and cooking pot fragments. This is consistent with our interpretation of the area as a courtyard. The suggested dating is 1<sup>st</sup> c. AD, which is consistent with our previous dating for the building and use of walls 22006 and 20002.<sup>19</sup>

### **Local phase C west 3: subdivision of the courtyard and blocking of the door in wall 22006 (2<sup>nd</sup> / 3<sup>rd</sup> c. AD)**

In the next phase, the courtyard was subdivided and the door of wall 22006 was blocked. The last occupation of local phase C west 2 (27235) was covered with a *c.* 30 cm thick layer of compact silt with little pottery and bones, going up to 777.85 m (*loci* 27233 / 32 / 31 / 23 / 21). No clear surface was identified within this layer. An *in situ* cooking pot, nearly complete, was found in it. Its base rested at 777.70 m. However, this level, registered by precaution as surface 27231, was virtually devoid of artefacts: this pot was in fact probably buried from an upper level, since it was covered with a flat stone belonging to surface 27220 (**fig. 20**).<sup>20</sup> Layers 27233 / 32 / 31 / 23 / 21 correspond therefore to a thick layer of disuse.

Surface 27215 / 20 lay over this thick layer of disuse, at an average altitude of 777.85 m (**fig. 21**). It featured many horizontal sherds, stones of various sizes and a coin. It is contemporary with newly built walls which subdivide the courtyard. To the north, it abutted wall 22052 (uncovered in 2008 / 2009), which in turn abuts the blocking of the door of 22006. To the west, it abutted a mudbrick wall running SSW-NNE across the excavated area (27207).

Wall 27207 has considerably melted and forms an indistinct mass of clay where the seams between the bricks can hardly be seen. It is made of one row of stretchers and one row of headers. About four of its courses are preserved. The mudbricks rest directly on the soil, at *c.* 777.48 m at its southern end. It abutted wall 22052 in the north.

In this phase, the excavated area was therefore subdivided into three parts. Wall 22052 divided it along an ESE-WNW axis. The area north of this wall was apparently left undivided and lies for the most part outside of the excavated area. The southern part, between walls 22052 and 20002, was bisected along a SSW-NNE axis by wall 27207.

On the eastern side of wall 27207, the area delimited by walls 20002, 22006, 22052 and 27207 thus forms a 2.5 x 5.5 m N-S rectangle. No clear access to it was identified: no threshold is visible, and the poor preservation of the mudbrick walls makes it difficult to identify gaps in the masonry. Wall 22052 may have had a door at the corner with wall 27207, but this remains uncertain. The surface of this area (surface 27215/20) has been described above.

On the western side of wall 27207, wall 22052 continues westwards and runs under the western baulk. Several surfaces abutting this wall have been identified. The first one lies at *c.* 777.75 m (27224). It featured a N-S U-shaped installation made of one row of irregular stones, built against the corner of walls 27207 and 22052 (27225; **fig. 22**). The purpose of this installation is unclear. It was first thought that it was a hearth or a domestic oven, but it turned out that there was no ash or charcoals in it. However, there was a wide (*c.* 1 x 1 m) and

19. See 2010 report, p. 57.

20. Although it is registered as 25021\_P01, this pot must therefore be ascribed to surface 27220.

c. 15 cm thick concentration of ash (27222) in front of it, in the southern part of the area. This may result from the cleaning of a hearth or an oven. Next to feature 27225, at the corner between the western baulk and wall 22052, there was a pit (27234) paved with stones and filled with sherds and stones (filling: 27227). The surface associated with the feature and the pit (27224) featured scattered horizontal sherds and stones.

In the northern part of the trench, north of wall 22052, a concentration of stones and a pocket of ash along the eastern baulk mark probably an occupational surface, at *c.* 777.90 m (27217).

Concerning the early occupations of this architectural phase, a preliminary study of the pottery from surface 27224 and pit filling 27227 points towards a broad “Roman / Late Roman” horizon (mid-2<sup>nd</sup> – early 4<sup>th</sup> c. AD). No other dating evidence from this season is available.<sup>21</sup>

### **Local phase C west 4: latest occupations and poorly built constructions (3<sup>rd</sup> c. AD at the earliest?)**

This phase corresponds to the latest occupations identified in the western extension of trench C, during which some architectural changes occurred. The layers corresponding to this phase were found just below the surface. East of wall 27207, surface 27220 / 15 was covered with a 5 to 10 cm thick layer of disuse (27213/14), which contained a large amount of ash in the northern half of the area (27211). This layer equals the ash layer 22002 which had been exposed in 2008.<sup>22</sup> It seems that for a certain period of time, the area was used as a dump. Right above it was a clear occupation layer made of several lenses of scattered sherds and stones, lying between *c.* 777.95 m and 778 m (27203; **fig. 23**). It is perhaps during this occupational phase that a small and poorly built L-shaped stone wall, abutting wall 20002 in the south and wall 27207 in the west, was built (27018; **figs 24-25**). This wall is founded at *c.* 777.98 m and it is abutted by the uppermost lens of artefacts of occupation layer 27203. West of wall 27207, surface 27224 and the U-shaped feature 27225 were covered with a layer of silt and clay (27212 / 18 / 19), mixed with ash in the southern part of the area (27222). It is not sure whether these layers reflect a phase of disuse, during which the area was used as a dump, an episode of destruction or a continuous occupation of the area (see layer 27212 under excavation, **fig. 26**). The next clear surface (27206) lay at an average altitude of 777.85 m (**fig. 27**). It featured scattered sherds and stones, with pockets of ash. It is probably during this occupational phase that a feature made of two large flat stones was set at the corner of walls 27207 and 22052 (27210; **fig. 28**). The largest stone, right in the corner, rested on a foundation made of small stones packed together. The bottom of the small stones was at *c.* 777.95 cm. Although the base of this feature lay 5 to 10 cm higher than surface 27206, it seems to be contemporary with it: some sherds abut it, and there are no artefacts under the stones (see **figs 27-28**). This feature forms a small platform probably meant to support objects of an unknown nature. In the southern part of the trench, some small stones were lined on the western edge of wall 27207 (27259; **fig. 24**). They were obviously linked with the small wall 27017 located outside the trench to the west. This feature, built at *c.* 777.95 m over wall 27207, is probably contemporary with occupation 27206. This would imply that wall 27207 was levelled during this phase.

However, the architectural layout of this phase remains very uncertain. Since the remains of this phase are located just under the surface, and given the proximity of the western wadi, it cannot be ruled out that the small walls (27018 and 27259) and the corner feature (27210) belong in fact to a later phase, the occupation layers of which have been washed away by water-induced erosion. These walls rest slightly higher than the artefacts found on the surfaces, and their relationships with them is far from clear: they may have been built either during this phase, or afterwards.

21. There is little numismatic evidence and it is not very useful: a coin from surface 27220 seems to be a city coin from Gaza or Antioch, minted in the 1<sup>st</sup> BC or AD (27220\_C01).

22. See 2008 published report, p. 127 and fig. 33.

The same uncertainty prevails as to the dating of this phase, since pottery coming from its *loci* has not been studied this year. Two coins discovered in the ash layer 22002 (which equals 27211) during the previous field seasons provide a *terminus post quem* in the last third of the 2<sup>nd</sup> c. AD for the episode of ash dumping in the south-eastern area.<sup>23</sup> However, these coins may have been in use for quite a long time when they were dumped – as is often the case in Madâ'in Sâlih. A later dating (3<sup>rd</sup> / 4<sup>th</sup> c. AD?) is therefore to be considered.

### Local phase C west 5?

In the northern extension of trench C, excavated in 2008, we observed that a stone wall was superimposed to wall 22052 in a later phase (22034).<sup>24</sup> This wall lay just under the surface and was founded at c. 778.20 m. No associated occupation had been identified.

No remains of this latest phase were certainly identified in the western extension of trench C, which is closer to the western wadi and has been more subject to water-induced erosion. The surface of the extension was sloping towards the south-west and lay under the level of the foundations of wall 22034: its highest point was at 778.13 m in the north-east, and its lowest point at 777.98 m in the south-west. However, as mentioned above, the poorly built stone walls (27018, 27259) and stone features (27210) ascribed to phase C west 4 may belong to a later phase.

## TRENCH I

The aim of trench I – a small 5 x 2.5 m sounding – was to check whether wall 27016 continued northward up to this area, and to search for the north-west angle of the courtyard delimited by walls 20002, 22006 and 27016. Between 10 and 20 cm below the surface, A. as-Suhaibani uncovered a c. 75 cm wide segment of wall, made of mudbrick and partly covered with a course of reused stones (**fig. 1**). This segment is aligned with wall 27016. It is obviously the continuation of wall 27016 *in its latest phase*. However, the excavations did not go down enough to see how deep this wall continued and determine if it had the same kind of foundations as wall 27016. Therefore, it cannot be said with certainty that the *initial* state of wall 27016 continued northward into trench I. Further excavations in this area will be needed to clarify this point.

Surfaces were identified west and east of this wall, but the pottery and coins they contained have not been studied yet. They are probably contemporary with the uppermost surfaces (27004/6; 27009/10) abutting wall 27016 in sounding H1. For the moment, these occupations cannot be safely connected with the general phasing of Area 2.

## IMPLICATIONS ON THE GENERAL PHASING OF AREA 2

The discoveries of the 2011 season allow us to understand better the general phasing of Area 2.<sup>25</sup> Some changes may be brought to the phasing suggested in the 2010 report.

### General Phase 1 (9 BC - early 1<sup>st</sup> c. AD)

Local phases F east 1 and C west 1 belong to the very first occupational phase of the area (**fig. 29**). An important discovery made during this season is that this phase is not earlier than the beginning of the reign of Aretas IV in 9 BC.

23. The first, 22002\_C01, is a city coin of Lucilla, wife of Lucius Verus (161-169 AD). The second, 22002\_C02, is probably a city coin from Neapolis / Samaria minted in the 2<sup>nd</sup> or 3<sup>rd</sup> c. AD.

24. See 2008 published report, p. 124 and fig. 32.

25. See 2010 report for the latest version of this phasing.

### General Phase 2 (1<sup>st</sup> c. AD)

The most prominent feature of this phase is the construction of the stone walls 22006 and 20002 in trench C, in the course of the 1<sup>st</sup> c. AD (**fig. 30**). In the western extension of trench C, local phase C west 2 obviously belongs to general Phase 2.

In the eastern extension of trench F, this architectural overhaul is probably related to the levelling of walls 25437 and the construction of wall 25075, which also took place during the 1<sup>st</sup> c. AD (local phase F east 2).

### General Phase 3 (2<sup>nd</sup> / early 3<sup>rd</sup> c. AD?)

This phase must be completely reconsidered in view of the discoveries made this year (**fig. 31**). The hallmark of general Phase 3 is the disuse of water channel 22018 / 20014 and the construction of a stone pavement in the northernmost room east of wall 22006 (22010). This phase ended with a brutal abandonment, as shown by the complete or nearly complete pots found over the pavement in 2008. Unfortunately, this group of pots, exclusively made of coarse ware, could not be dated precisely between the “Roman” and “Late Roman / Early Byzantine” period.

The connection of these architectural changes with the eastern part of the trench, east of wall 22061, is problematic. As the pavement abutted to the east a levelled mudbrick wall located under wall 22061 (25035), all layers abutting wall 22061 in trench F were considered to be later than the pavement and ascribed to phase 4.<sup>26</sup> This led us to conclude that in trench F, the mudbrick walls of Phase 2 were still in use when the pavement was built. As there was solid evidence that these walls were levelled at the turn of the 1<sup>st</sup> and 2<sup>nd</sup> c. AD, we chose the highest possible dating (beginning of the 2<sup>nd</sup> c. AD) for the group of pots lying over the pavement (22010), although ceramic evidence from other *loci* corresponding to the destruction / disuse of the paved room (22099, 25023, 25017) rather pointed towards a “Late Roman” (mid-2<sup>nd</sup> / 3<sup>rd</sup> c. AD) horizon.

The discoveries made in 2011 lead us to make a new hypothesis. Indeed, there is a striking parallel between the destruction of the paved room in the western part of the area (22010) and that of the courtyard in trench F (25416, phase F east 3). Indeed, it would be surprising if the wholesale destruction / disuse attested in the paved room of trench C (22010) did not find any echo in the other trenches, and *locus* 25416 is the only destruction level in trench F which may its equivalent: both are major episodes of destruction which caused the buildings to collapse. Furthermore, the preliminary dating of the jar found *in situ* in the south-eastern corner of the courtyard (25422\_P01, 2<sup>nd</sup> / 3<sup>rd</sup> c. AD) seems to match that of the destruction layers found in the paved room (22099, 25023, 25017). Therefore, both destructions must probably be ascribed to one and the same event, which affected the whole trench.

Assuming this, the pavement 22010 should be contemporary with surface 25416 and occupation layer 27417. The problem is that the continuation of these layers in central trench F, *locus* 25012 (alt. between 778.10 and 778.20 m), clearly abutted the threshold of wall 22061 (base: 777.98 m / top: 778.15 m), while the pavement clearly abuts what seems to be the predecessor of wall 22061 (25025; **figs 1, 32**).<sup>27</sup> How can these two facts be reconciled? One has to assume that when 22061 was built, wall 25025 was still protruding by one course over the level of the pavement, forming a kind of small step at the base of the new wall. This is all the more possible since the threshold (22014) of the southern wall of the room (22005), which is bonded to the pavement through coating, is partly inserted into the preserved course of wall 25035 and seems to abut wall 22061 (**figs 1, 33**). Furthermore, the two blocks inserted in wall 25035 in the north-eastern corner of the paved room (25026) are most certainly contemporary with wall 22061, since they abut wall

26. See 2009 report, p. 91.

27. See 2009 report, p. 89.

22056 which in turn abuts wall 22061. They should therefore be considered as a small step leading to the threshold of wall 22061.

This would not be the only spot where an earlier mudbrick wall was partly protruding under wall 22061. In the southern room of trench F (between walls 22061, 25009, 25028 and 25042), which was originally ascribed to phase 4, mudbrick wall 25039 (which is probably the southern continuation of 25035) was also slightly protruding over the “Late Roman” surface 25022: the stone foundation of the southern wall of this room (25042) clearly stops against the face of this mudbrick wall and not against 22061 (see **fig. 1**).

Consequently, the paved room is most probably contemporary with local phase F east 3 in the eastern extension of trench F, i.e. with the first phase of the large courtyard. All the features of trench F ascribed to general Phase 4 in the 2010 report (including the first phase of the small square room which communicates with it in the south) should in fact be ascribed to general Phase 3.

The connection with the western extension of trench C is more problematic, since there is no clear surface between 27235, at *c.* 777.55 m (local phase C west 2), and 27215 / 20, at *c.* 777.85 m (local phase C west 3).<sup>28</sup> Surface 27235 belongs to general Phase 2, and it probably did not continue into Phase 3 since its pottery is dated to the 1<sup>st</sup> c. AD. Surface 27215 / 20 could fit chronologically,<sup>29</sup> but it lies slightly higher than the floor of the paved room and it abuts the blocking of the door in 22006.<sup>30</sup> This is problematic because the door was probably still in use when the pavement was built (a flagstone is neatly inserted between the door jambs). We have to assume that the door in 22006 was blocked not long after the pavement was built, during the same occupational phase. Local phase C west 3 should therefore belong to general Phase 3.

The dating of this phase (2<sup>nd</sup> / early 3<sup>rd</sup> c. AD) has been discussed above (see local phase F east 3).

### General phase 4 (3<sup>rd</sup> / 4<sup>th</sup> c. AD)

General Phase 4 corresponds to a reoccupation of the area after the destruction of Phase 3 (**fig. 4**). It includes local phase F east 4 in the eastern extension of trench F and local phase C west 4 in the western extension of trench C.

The global layout of the area seems to have been preserved, but minor architectural changes were made in certain places, such as:

- in the large courtyard of trench F: construction of the stone buttress 25111 and of the “cupboard” 25113 in the north-western corner, blocking of the door in 25009 leading to the south-western square room (25001), construction of stone feature 25444 on top of wall 25134 (restoration of the wall or blocking of a door?);
- in the western extension of trench C: building of the small stone wall 27018 and 27259 (after levelling of wall 27207?) of the corner feature 27210.

It is difficult to say whether the walls from Phase 3 were fully preserved or if they were partly levelled during the final destruction of Phase 3. In the western extension of trench C, wall 27207 may have been levelled, if the small wall 27259 is indeed to be ascribed to this phase. In some places, where the remains of Phase 4 lie just under the surface (for instance in the western extension of trench C), it is difficult to distinguish the layers.

28. An intermediate surface was registered at *c.* 777.70 m (27231), at the level of the base of an *in situ* cooking pot (27231\_P01) laid against wall 27207. However, it is probably arbitrary since this pot is likely to have been buried from surface 27220 (see above local phase C west 3). At any rate, this surface would already abut wall 27207.

29. The pottery from this layer was not studied but the contemporary layer 27224, on the western side of wall 27207, is dated to the “Roman / Late Roman” period.

30. To be more precise, this surface abuts wall 27207 which in turn abuts the blocking of the door of 22006.

This phase can be dated to the second half of the 3<sup>rd</sup> or the first half of the 4<sup>th</sup> c. AD (see above local phases F east 4 and C west 4).

General phase 5 (6<sup>th</sup> – early 7<sup>th</sup> c. AD)

No remains belonging to this phase have been uncovered in the western extension of trench C. In the eastern extension of trench F, local phase F east 5 must be ascribed to this general phase.

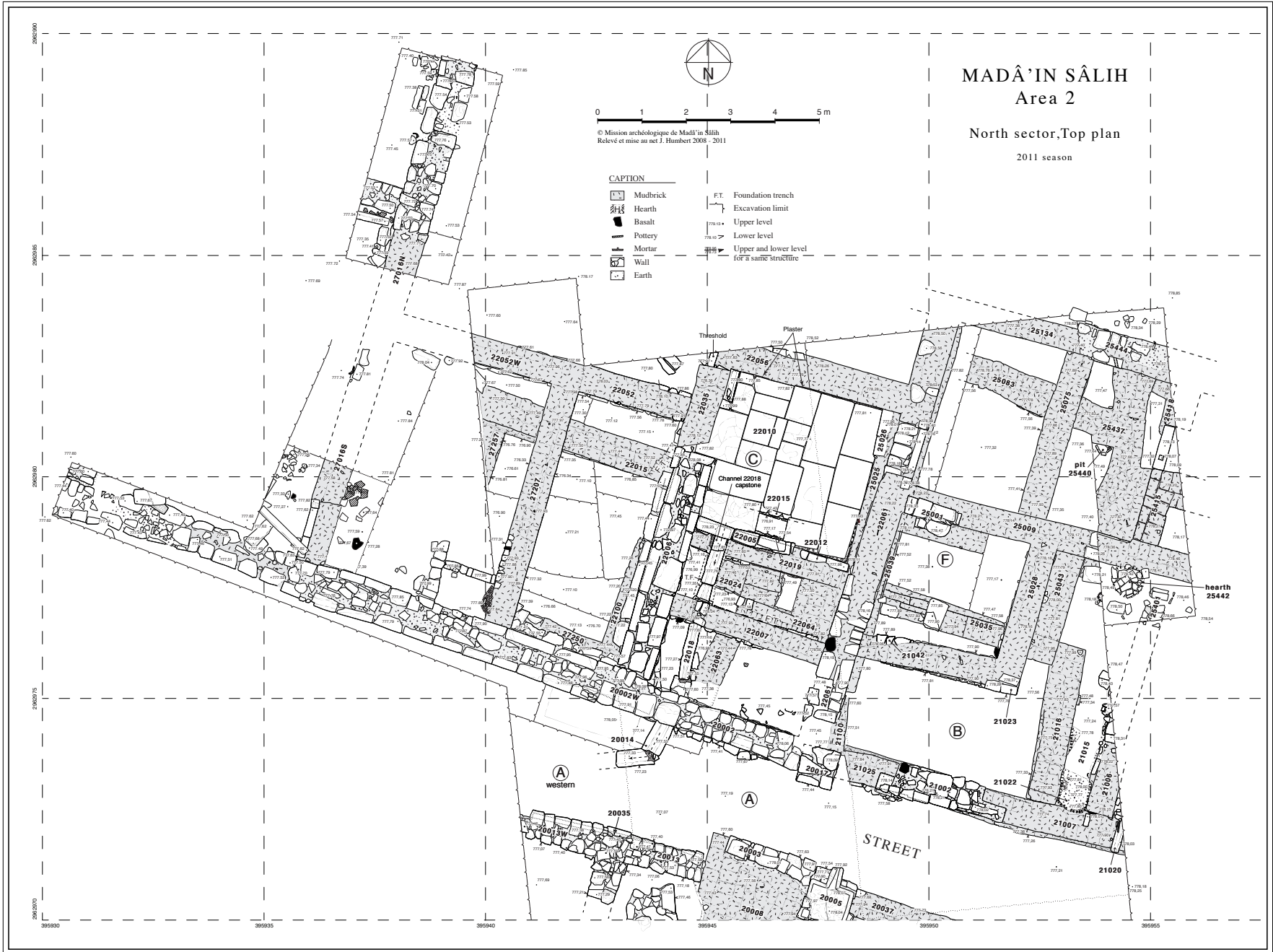
## CONCLUDING REMARKS

The results of the 2011 excavations have enabled us not only to widen the exposure of the architectural remains of Area 2, but also to reconsider the stratigraphical relationships between trenches C and trench F and to overhaul our general phasing.

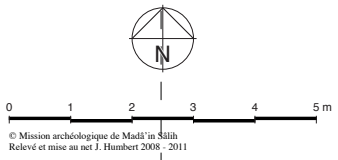
One of the most important discoveries of this season is that the occupation of the area began during the reign of Aretas IV (9 BC – AD 40). This conclusion was drawn from the preliminary reading of several coins from key *loci*, and will have to be confirmed by an exhaustive study of the ceramic and numismatic evidence.

The second significant result is that the major episode of destruction or disuse reflected by the complete pots found in 2008 in the paved room of trench C concerned the whole area, and that it probably took place in the late 2<sup>nd</sup> c. AD or the early 3<sup>rd</sup> c. AD (end of Phase 3). Yet, however violent was this episode of destruction, the occupation of the area seems to have resumed not long afterwards, since Phase 4 is dated to the 3<sup>rd</sup> / early 4<sup>th</sup> c. AD.

This leads us to a third important conclusion: contrary to our previous hypotheses, it seems that in spite of several architectural changes, the occupation of the area was relatively continuous at least until the early / mid-4<sup>th</sup> c. AD. The area seems to be abandoned after Phase 4, and there is no evidence of any human activity between the mid-4<sup>th</sup> c. and the 6<sup>th</sup> / early 7<sup>th</sup> c. AD. Pending further analysis of the pottery finds, we may therefore assume that the area was deserted – or very scarcely occupied – in the late 4<sup>th</sup> and 5<sup>th</sup> c. AD.



MADÂ'IN SÂLIH  
Area 2  
North sector, Top plan  
2011 season



- CAPTION
- Mudbrick
  - Hearth
  - Basalt
  - Pottery
  - Mortar
  - Wall
  - Earth
  - F.T. Foundation trench
  - Excavation limit
  - Upper level
  - Lower level
  - Upper and lower level for a same structure

Fig. 1 General plan of area 2



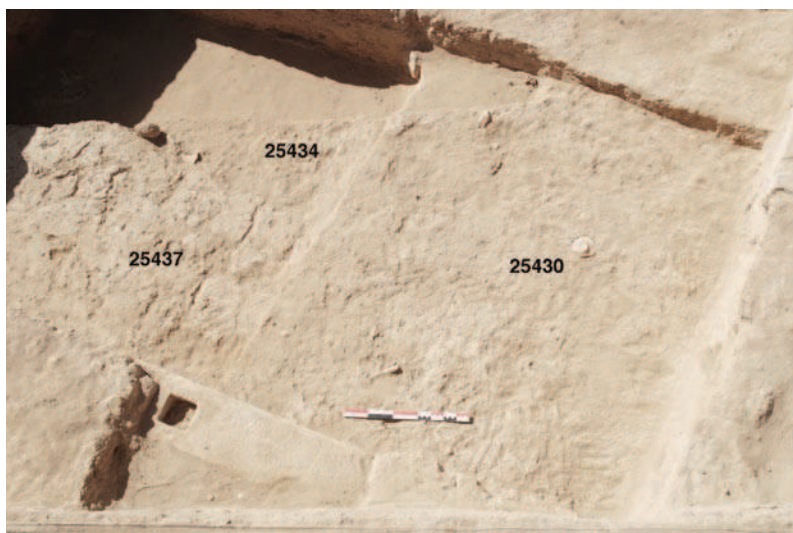
**Fig. 2** Eastern extension of trench F after excavation, viewed from the east. In the foreground, wall 25415 and threshold of door 25419. Below, in the centre, mudbrick walls (?) 25437 and stones delimiting pit 25440. In the background, wall 23075 and, behind, it wall 25083 continuing 25437a



**Fig. 3** Surface 25434 abutting the mudbricks of wall 25437



**Fig. 4** Eastern extension of trench F, viewed from the east. On the left: mudbrick walls 25437 and surface 25434. On the right, surface 25432



**Fig. 5** Eastern extension of trench F, viewed from the east. On the left: mudbrick walls 25437 and surface 25434. On the right, surface 25430



**Fig. 6** Eastern part of trench F after excavation, viewed from the northeast. Behind the meter, wall 25075 abuts wall 25087



**Fig. 7** Eastern extension of trench F, viewed from the east. Surface 25416 with fallen architectural blocks and ash. On the left, in the corner of walls 25009 and 25415, *in situ* jar 25422\_P01. On the right, platform 25424



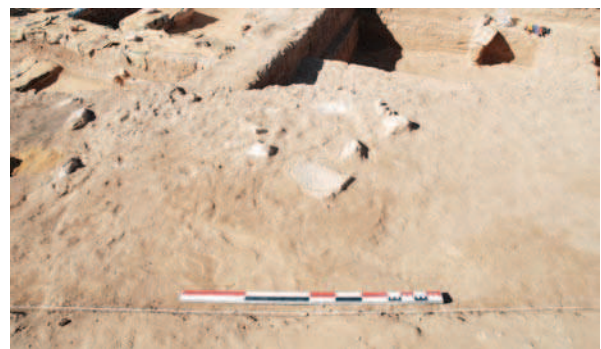
**Fig. 8** *In situ* jar 25422\_P01



**Fig. 9** Surface 25408 viewed from the north. In the foreground, stone restoration (or door blocking?) 25444. In the background, on the right, top of pit 25045/25409



**Fig. 10** Surface 25411, abutting stone restoration (or door blocking?) 25444, viewed from the north



**Fig. 11** Concentration of sherds, stone objects and stones (25402), in the centre of the eastern extension of trench F

**Fig. 12** Stone wall 25401 and bottom of hearth 25442, abutting mudbrick wall 25009 on the right



**Fig. 13** Ash pockets (hearths?) 27251 and surface 27253 (= top of sand layer 27249), viewed from the north



**Fig. 14** Western extension of trench C viewed from the west. On the lower level: ahead of next the meter, wall 27257; right of it, hearth 27256; to the left, wall 22015. Upper level: in the background, wall 27207



**Fig. 15** Wall 27250 and its door (blocked with stones), under stone wall 20002 (view from the north)



**Fig. 16** Intersection of walls 27257 and 22015, viewed from the south



**Fig. 17** Surface 27247 viewed from the north



**Fig. 18** Surface 27240, viewed from the north



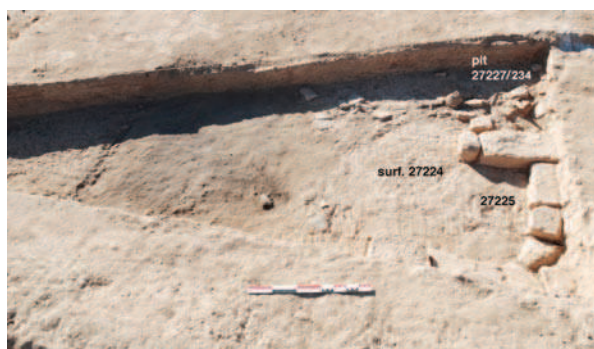
**Fig. 19** Western extension of trench C viewed from the north. Concentration of artefacts 27235 in the background



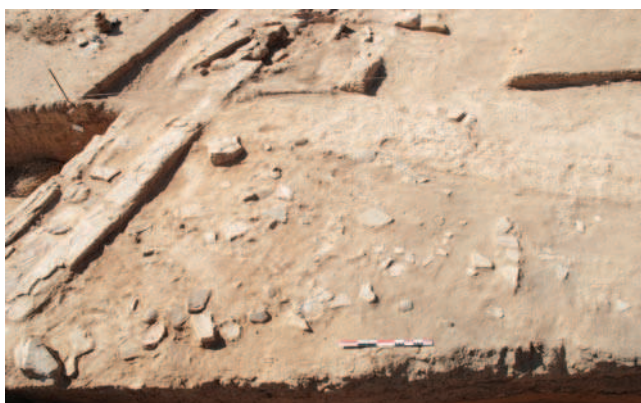
**Fig. 20** Western extension of trench C viewed from the north. Possible (arbitrary?) surface 27231 at the base of an *in situ* cooking pot along wall 27207 (in the background on the right)



**Fig. 21** Surface 27220 viewed from the east. Under the meter, wall 27207



**Fig. 22** Surface 27224, U-shaped stone feature 27225 and top of pit 27227/234, viewed from the east. Under the meter, wall 27207



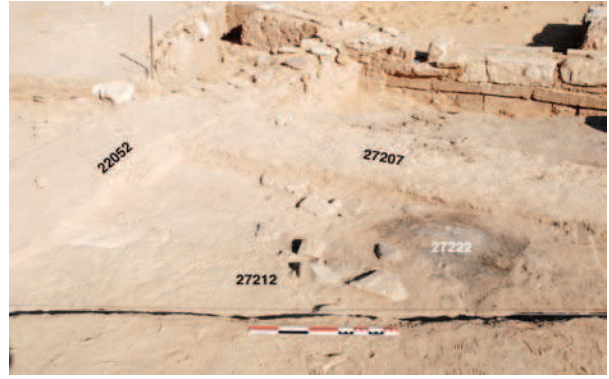
**Fig. 23** Lower part of occupation layer 27203 after the removal of the small stone wall 27018 (view from the east)



**Fig. 24** Upper part of occupation layer 27203 with small stone wall 27018 in the background (view from the north). In the background, on the right, small line of stone 27259 over the levelled mudbrick wall 27207



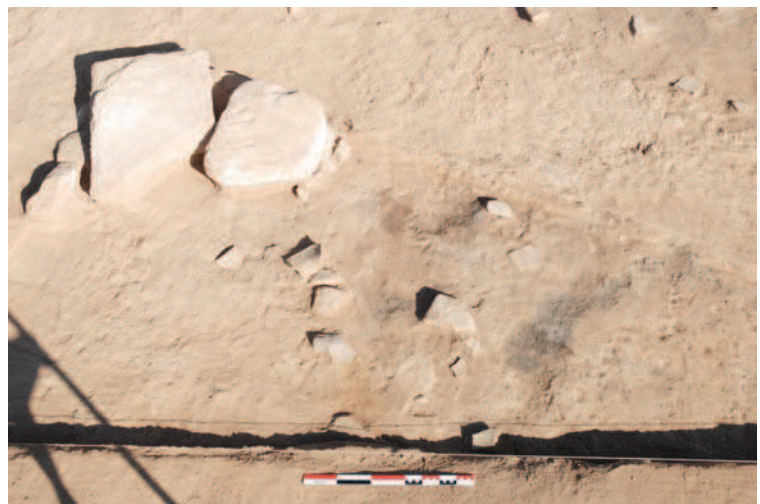
**Fig. 25** Wall 27018 abutting by surface 27007/27209 (= upper part of occupation 27203). View from the north



**Fig. 26** Layer 27212 under excavation, viewed from the north. On the right, concentration of ash 27222. On the left, the two blocks along the walls are part of the U-shaped feature 27225



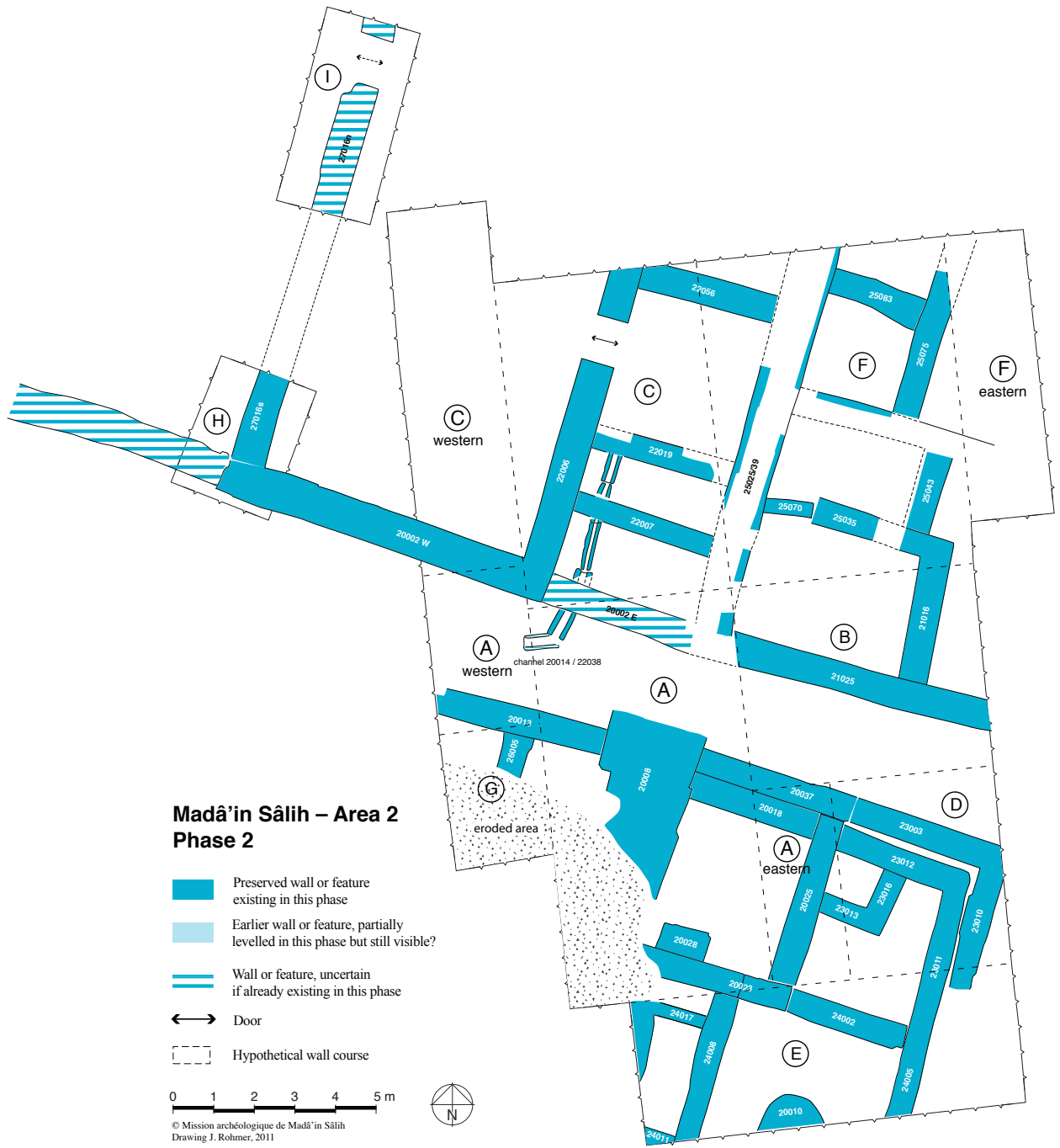
**Fig. 27** Surface 27206 viewed from the west, after the removal of stone feature 27210. In the background on the left, in the corner of walls 22052 and 27207, heap of stones serving as a foundation for stone feature 27210



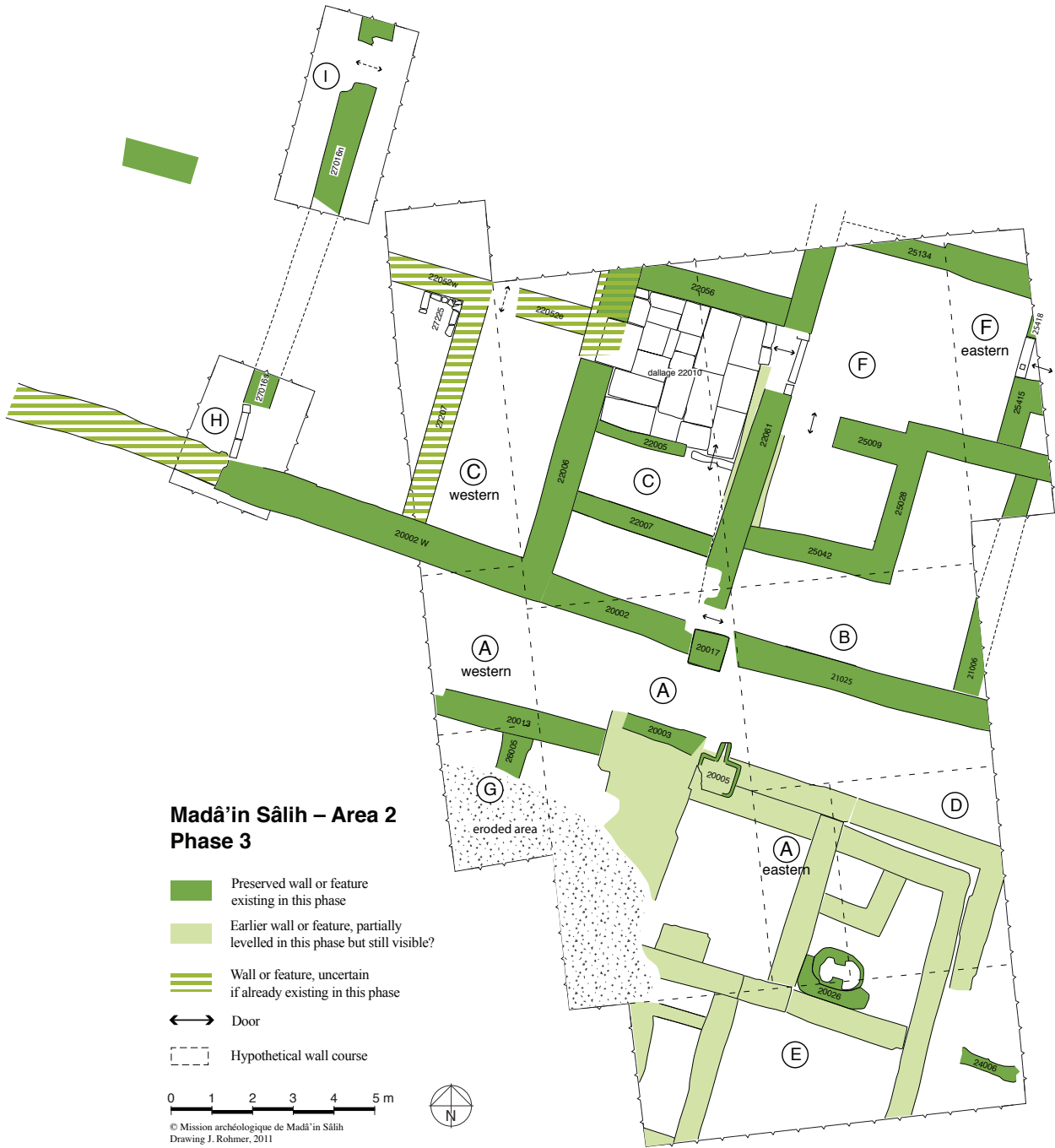
**Fig. 28** Surface 27206 viewed from the west. In the background on the left, stone feature 27210 in the corner of walls 22052 and 27207



**Fig. 29** Plan of Phase 1



**Fig. 30** Plan of Phase 2



**Fig. 31** Plan of Phase 3



**Fig. 32** Wall 22061, with its door fully excavated, viewed from the north. It is built over mudbrick wall 25025 which forms a protruding step. Below the threshold, two stones (25026) have been inserted in wall 25025 (perhaps as a step to access the threshold?). View from the north



**Fig. 33** Threshold of wall 22005 (22014) inserted in mudbrick wall 25025 and abutting the stone course of wall 22061. View from the north-west

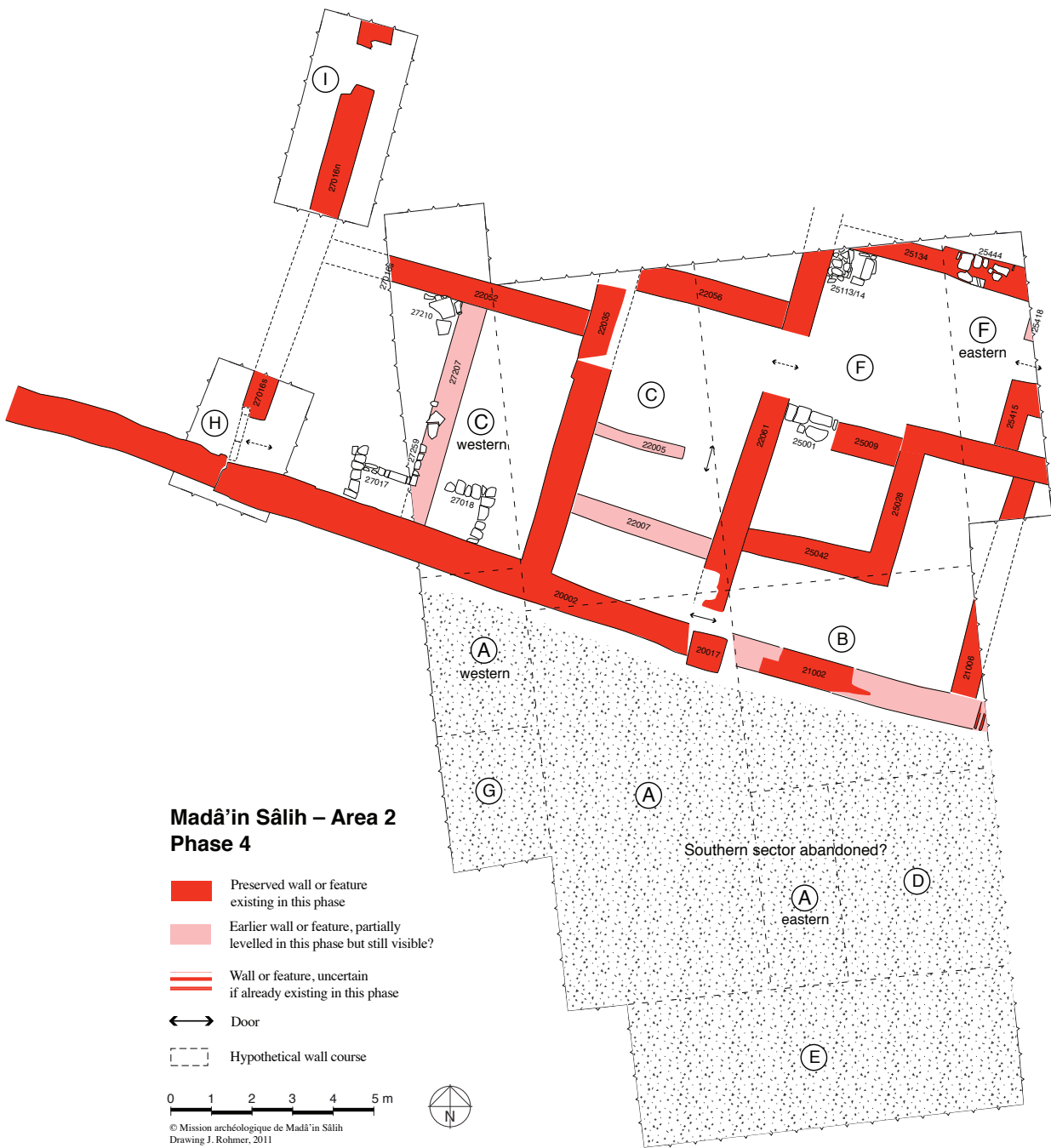


Fig. 34 Plan of Phase 4



Fig. 35 The four phases of Area 2

## **Monumental Tombs, Area 5**

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# Monumental Tombs, Area 5

Nathalie DELHOPITAL and Isabelle SACHET

## INTRODUCTION: HISTORY OF EXCAVATION

In 2008, three tombs were excavated: IGN 20, IGN 125 and part of IGN 117. These excavations showed that the large tombs in Madâ'in Sâlih, which were thought to be empty, still contained remains of burials from the Nabataean period. They have been largely reworked and disturbed but their study has nonetheless produced a lot of archaeological material, comprising bones, textile, leather, wood, pottery, glass etc. The material is dated to the 1<sup>st</sup> century AD, but in IGN 20 also includes some later finds, up to the 4<sup>th</sup> century AD.

In 2009, N. Delhoptal and I. Sachet continued to excavate in tomb IGN 117. N. Delhoptal concentrated on digging the Area A, where the oldest phase was identified in 2008 (**fig. 1**). This contained homogenous levels very rich in bones, leather, textile and wood, all in very good condition. The end of a coffin was revealed in 2008 but it had not been entirely exposed. Still in 2009, Isabelle Sachet continued to excavate the sandy layers in the bottom of the chamber, which led to the discovery of a pit-tomb filled with bones, called Area B. This pit-tomb, 2 x 1 m and 1.35 m deep, is cut into the back right (north-west) corner of the chamber. No doubt it was originally closed with large covering slabs of sandstone resting on the carved grooves on each side of the pit. The upper part of the pit-tomb contained only bones in a secondary position. Thus, the pit-tomb was probably used as an ossuary – the older bones being pushed towards the pit in order to make room for new inhumations – at a time of the occupation of the tomb when the floor of the chamber could no longer receive new burials. It should be noted that the lowest fill contained a lot of wooden planks, the rotting of which could have encouraged the deterioration of the rest of the archaeological material. Four burials in primary positions were found placed in the bottom of the pit-tomb (*locus* 50238). They were in a very black layer of wood in an advanced state of decomposition. These four individuals had no doubt been placed in wooden coffins in the bottom of the pit-tomb.

## Physical anthropology results 2008-2009

The study of the human bones in 2008 and 2009 showed that the excavation of tomb IGN 117 exhumed sixty-four individuals, including thirty-eight adults (thirteen males, thirteen females) and twenty-six immature individuals. The under-representation of young children might be due to a different burial practice for those aged 0 and 1–4 years. The study of discrete traits demonstrated the existence of family links between individuals buried in this tomb. We were also able to determine that the stature of the individuals varied between 1.45 and 1.71 m. Some pathology was noted, including some which could have caused a handicap.

## **TOMB IGN 117: 2011 SEASON**

### **Excavation methodology**

As in 2009, scaffolding has been put up above the area of excavation to enable work without damaging the archaeological material. To clean certain layers, in particular those where the bones, leather, wood and sand were very mixed, we used a vacuum cleaner with a narrow end to avoid sucking up the small bones.

In 2008, the plan of the bones was drawn on millimetre paper. In 2009 and 2011, the bones were drawn based on photographs calibrated using known survey reference points. In addition, for greater accuracy, each *locus* was triangulated. It must be pointed out that this method is less accurate and less direct than the classic method of planning using a theodolite. Finally, the methods for collecting the bones and archaeological material, as well as the data processing, were the same as in 2009 (see the 2009 report, p. 174-175).

We would like to draw attention to the fact that the excavation in 2011 (in Areas A and D) was more meticulous than in 2009. In 2009, 620 pieces of bone (as well as the four individuals identified at the bottom of the pit-tomb) were numbered, whereas in 2011, 1,584 pieces of bone were numbered. This work is important because all the numbered bones were drawn using the programme Adobe Illustrator, and it is therefore possible to make observations on the movements suffered by the bones and to detect homogenous groups.

### **Physical anthropology results for the 2011 season**

#### ***Preservation of the material***

The preservation of the bones varies depending on their location in the burial chamber. In Area A, the bones were very well preserved and many of them were mummified. In Area D (see fig. 1), the preservation was good on the whole. The bones were sometimes fragmentary, no whole skulls were found, but they were not as friable as those in Area B (the pit-tomb), except on the floor (*locus* 50332).

#### ***The demography***

The results presented below are preliminary because the study of the bones is not complete. A part of Area A remains to be studied (particularly the majority of the immature individuals), as well as the bones from Area D.

#### **Minimum number of individuals (MNI)**

In 2009, about 2,536 pieces of bone (not including teeth) were studied, to which must be added the skeletons in primary position in the pit-tomb. In 2011 about 1,839 bones (not including teeth) were studied. The difference can be explained by the poor state of preservation of the bones from the pit-tomb, which need a lot of identification and consolidation before it is possible to study them. In addition, the fact that twice as many bones were collected and numbered in 2011 reduced the time that we had to study them properly.

During the 2011 season, we chose not to study the bones from the immature individuals, with the exception of those from *loci* 50291 and 50295 / 50314. Therefore, the demographic study was not carried out, since its results would have been preliminary. We will have to wait until the end of the 2012 season to have the final results. The minimum number of individuals by exclusion (of adults and immature) will also be determined in 2012.

In 2009, the MNI by frequency for the adults in tomb IGN 117 was thirty-eight. The MNI by frequency for the immature individuals was seventeen. Since the MNI obtained by age exclusion was twenty-six immatures, the minimum number of individuals buried in tomb IGN 117 was counted, in 2009, as sixty-four.

After the 2011 season, the MNI for the adults reached forty-three, but the study undertaken to obtain this figure does not take into account the bones from Area D. In this latter area, the field observations counted three adult individuals. However, it should be noted that we have not yet done the matching up of the bones between different areas, nor done a MNI by exclusion. Therefore, we cannot exclude the possibility that certain bones found in Area D came from the pit-tomb, and vice versa.

As mentioned above, the study of the immature bones will be dealt with during the 2012 season. That study will probably make grouping of bones possible, because it is easier to ‘reconstitute’ immature individuals than adult ones. Based on field observations, we can already say that at least two immature individuals (of which at least one belongs to the age class 0/1–4 years) were found in Area D.

### ***Observations on the anthropology of death (archaeoethanatology)***

The excavation of Area A was taken up again mainly by I. Sachet and that of Area D by N. Delhopital (**figs 1 and 2**).

#### **Area A**

The 2008 and 2009 seasons produced many bones mixed with archaeological material (wood, textile, leather etc.). In 2008, we discovered the end of a wooden coffer against which three individuals (*loci* 50085, 50086, 50087) had been laid out. This coffer (coffin 1) was excavated during the 2011 season, along with another, smaller, coffer (coffin 2) (**fig. 3**).

#### • Coffin 1 (*locus* 50314) (**fig. 4**) :

1/ **in** the coffin: many bones were found inside the coffin (**figs 5-6**), not all of which have yet been studied. They seem to belong to at least four individuals (**fig. 7**):

- an adult (hands, vertebrae, forearm, sternum, ribs), that might have been oriented east-west, head to the west. Some textile was found on the hand, which was level with the southern side of the coffin. The discovery of an articulated hand and of a forearm with a loosely articulated hand suggests that this is a primary burial;
- an adolescent, represented by a left leg (the maturity of the femur needs to be checked in 2012), which might have been laid head to toe on the adult. We noted the presence of resin and leather on and under the femur;
- a foetus, represented by at least two bones (a femur and a tibia). Since these bones have not been studied, we cannot say anything more precise. It is difficult to determine whether the foetus was buried in the coffin (with or without its mother) or if the presence of the bones is due to disturbance;
- an immature individual of the age group 0–1 year (1 year  $\pm$  4 months), whose skull and other bones were found in the western part of the coffin. The child’s skull was flattened and was covered with a black resin and some leather. Under the skull, there were some very fragile fragments of textile. The leather found on the skull could have come from the ‘wrapping’ of another individual. It may be a shroud since the leather extends across part of the coffin. Also, numerous ties were found that might have been used to close the wrapping.

During the excavation, we noticed a group of bones belonging to a young child at the foot of the coffin (*locus* 50295 and a few bones from *locus* 50291) (**figs 8-9**). The bones were no longer articulated but the majority of them were present. The laboratory study showed that the bones from *locus* 50295, the skull and a few bones found in the coffin belonged to the same individual.<sup>1</sup> It is very possible that during a robbing

1. For reference: individual 50295 is a child whose bones were found mostly in *locus* 50295, in the coffin (*locus* 50314) and in *locus* 50291. Individual 50291 is another child whose bones were found mostly in *locus* 50291 and the coffin *locus* 50312.

episode, part of the body of the child, perhaps wrapped in a shroud, or even mummified, was taken out of the coffin. Indeed, we noticed in this area a large concentration of leather.

2/ **under** the coffin: the bones found under the coffin belong to an infant of the age group [0] years, as well as to a foetus of about 6 months (mandible and humerus). One can ask whether these bones belong to one or several of the individuals found in the coffin, but it would be difficult to explain how the bones came to be found *below* the coffin. The most reasonable hypothesis is that some individuals were buried on the floor before the coffin was put in place. The bones would have been pushed aside to place the coffin, but a few would have remained on the floor.

Other bones, found near the coffin, might belong to one of the individuals (adult or adolescent) buried inside it. These are bones which came from *locus* 50293 (mandible and four cervical vertebrae) and some scapulae found in *loci* 50278 and 50281 (**fig. 10**, at the bottom on the right). A more detailed study is needed to verify this. It is possible that all the bones found at the foot of the coffin – amongst which are bones from adolescents – belong to individuals found in the coffin. This will need to be checked in 2012.

• Coffin 2 (*locus* 50312) (**fig. 11**) :

Few bones were found in coffin 2. No individuals are clearly identifiable, but two iliums that could have belonged to the same immature individual (0 years) were found on the south end of the coffin.

Immature individual 50291 (see note 1 and **fig. 12**), who was younger than individual 50295, is more difficult to interpret. Indeed, the bones are much more scattered. They are spread over more than a metre, whereas the bones of individual 50295 were grouped together over an area of 50 cm (if we do not count the bones in the coffin). It is possible that individual 50291 came from the second coffin since the maturity of the two iliums found on its south end (in 50312) corresponds with that of the bones found in *locus* 50291. Nevertheless, it is necessary to check whether another individual, found during earlier seasons, might not also correspond to the maturity of the two iliums. In addition, two femurs (one right and one left), which most probably belonged to the same individual, were quite far away from the two iliums and from the other bones found in *locus* 50291, and were found in higher levels than the rest of the bones (**fig. 12**). Thus, it will be necessary to compare these two femurs with the immature bones found during earlier seasons.

**General observations in the rest of Area A**

Several bones that could have belonged to adolescents were found (**fig. 13**). They represent at least three individuals. There are only upper limbs but it is very likely that the bones from the lower limbs were found during the 2009 season. Compatible bones will be looked for in 2012.

Several adult bones might also belong to the same individual (for example two humeri in *locus* 50308) (**fig. 10**). In so far as we have not yet looked for matches in the laboratory, this remains hypothetical.

A particularly interesting discovery was made in Area A (*locus* 50283): a mummified left hand (50283\_B01) with a ring on the ring finger (**figs 14-15**). All the carpal bones were found, as well as the unfused distal end of the radius. However, distal phalanges 4 and 5 were missing, as well as middle phalanx 5. On the proximal end of metacarpal 1, on metacarpals 2 and 4 and on the phalanges, the fusion line was still visible. This hand probably belonged to an individual aged between 15 and 20 years. The only other ring found 'in situ' is the one that was found at the level of the left hand of individual 50238, a young woman aged between 20 and 30 years.

Some feet were found in several places, in *loci* 50304 and 50309 (**fig. 10**).<sup>2</sup> In *locus* 50309, both feet are present and some textile was noted on and under them (**fig. 16**). The right foot is less disturbed than the left, and the feet were found with their soles facing up. It is, therefore, possible that the individual was buried

2. With no trace of mummification, but it does not mean that there had not been any.

face down, but it is equally possible that the feet, wrapped in textile or perhaps even mummified (which would explain the fact that they are ‘articulated’), were displaced during robbing.

A spine with pathology was found in *locus* 50291 (figs 10 et 17). The many ribs found around the spine were no doubt associated with it. The search for pathology on the rest of the bones would help in identifying the rest of this body.

In addition, a skull, pieces of which were scattered in different *loci*,<sup>3</sup> and three cervical vertebrae were found. The cervical vertebrae are arthritic. We cannot exclude the possibility that the skull and the vertebrae belong to the pathological spine since arthritis was recorded on the vertebrae of that spine (50291-2 / 50303-7, see below, “Biological characteristics”), which was found near to the skull and the three vertebrae. On the floor (*loci* 50253, 50254, 50298 and 50311):

Many small bones were found on the floor in the south-west corner of the tomb (*loci* 50253, 50254, 50298 and 50311) (fig. 18). In 2009, we had put forward the following hypothesis:

“It is highly likely that the first individuals to be buried in the tomb were those that were buried on the bottom of the pit tomb (individuals 50238, 50245, 50246, 50247). In fact, we noted that the mixed bones were found on top of these individuals and that they disturbed the skeletons, particularly in the southern part of the pit. During the same period, some individuals were deposited on the floor of the chamber (Area A). Subsequently, the bones of these individuals could have been pushed into the pit (Area B) which, in such a case, would have served as a dump. Indeed, we noted that **small bones were more numerous in Area A** and long bones more numerous in Area B. It is, therefore, possible that when the bones were pushed into the pit, **the small bones remained on the floor of the chamber.**”

The discoveries made in 2011 tend to confirm this hypothesis.

Other finds in Area A:

The finds from Area A are richer than those from Areas B, C and D. Since they were often found on the bedrock, they probably represent pieces that fell to the floor from the burial clothing of the dead buried in the tomb, whose graves were disturbed by successive reworking and robbing. Several metal objects are of interest: a ring (fig. 19), an ear or nose ring (fig. 20), some small nails (fig. 21), two arrow heads (figs 22-23) and two Nabataean coins (50261\_C01 and 50302\_C01). This material is not worth much and that is probably why it has survived successive robberies. The dead must have been buried dressed, accompanied by objects that they carried every day: a finger ring that was too big and had been roughly adjusted, a ring (which was found alone, so it is not possible to say if it is an earring) and some weapons which could have been used for hunting or war. Arrow head 50297\_M01 is of good quality and is comparable with the one represented on a relief in Kerak castle in Jordan (fig. 24).

The coins were not found placed in a mandible, but under disturbed bones. We cannot exclude an offering of the ‘obole to cross the Styx’ type. The presence of coins in the tomb demonstrates a particular intention with regard to the dead.

The animal bone that was found in 2009 was collected in 2011. It is the scapula of a young camel (identified by J. Studer) which might represent the remains of a food offering.

3. 50308-8 = face, 50303-10 = fragment of left parietal, 50291-20 = small fragment of right parietal, 50304-3 = fragment of right parietal and right part of the occipital, 50308-1 = fragment of left parietal and part of the left occipital, 50303-OB = fragment of frontal, 50304-1 = fragment of right parietal, 50302-41 = fragment of the occipital articulation with the atlas, axis and third cervical vertebra.

### Area D

Area D is in the north part of the tomb (**fig. 1**). It must be remembered that the bones were not analysed in the laboratory and so the identifications on the figures were made in the field and will need to be confirmed.

Upper levels:

In the upper sandy levels (*locus* 50277), we found a fragment of textile (**fig. 25**) which was coarser looking than the textiles found in tomb IGN 20. This one contained many dates, a sample of which was taken for Ch. Bouchaud. At first sight, it looks like modern cloth. In any case, it is later than the occupation of the tomb because its deposition disturbed the bones (**fig. 26**).

In the east of Area D, we found a lot of bones, amongst which were many lower limb bones (**fig. 27**). However, even if these groups are relatively homogenous, there were no fully articulated bones. The textile stuck to one of the calcaneums (heel) could be part of a wrapping, but it is not certain.

In the western part of the area, many bones were also found (see **fig. 26**). These mostly belong to the upper part of the body. The majority of the vertebrae – including three loosely articulated vertebrae – were found in the central part of Area D.

We can state that the individuals found in Area D were oriented east-west, with head to the west. Indeed, very few lower limb bones were found in the western part and very few skull bones in the eastern part.

At least two immature individuals (one of 1–5 years and the other older) were found (**fig. 28**). These are most probably disturbed primary burials, with one of the bodies buried against the north wall of the tomb and the other in the south part of Area D. Their orientation cannot be determined. The study of the bones is not yet finished, and it is very likely that there were more than two immature individuals in this area.

Only two fragments of stone vessels were found.

Lower levels:

Very few bones were found between the upper level and the floor (*locus* 50332) (**fig. 29**). The finds from the floor level were more abundant than in the upper levels: a badly made bowl, glass, Nabataean pottery (**fig. 30**) and some stones. The few bones found were two clavicles (we do not yet know if they were from the same individual), some hand and foot bones, and some ribs and vertebrae. It is probable that an individual was buried on the floor and that it was disturbed by robbing or preparations for later burials.

### Interpretation of Areas A and D

#### Area A

Two coffins were found in Area A. Coffin 1 was probably used to bury at least four individuals, including some immature ones. Robbing disturbed the bones in the coffin and caused many of them to be thrown out of it. The individuals in the coffin were probably buried in leather shrouds. The second coffin might have been used to bury a young child, but this remains hypothetical.

The discovery of small bones on the floor of the tomb and under coffin 1 tends to support the hypothesis put forward in 2009, that is: an initial phase of use on the floor of the tomb, then an emptying followed by a new use, with the placing of the coffins, the deposition of the three individuals (50085, 50086 and 50087) and finally, one or more robbing events.

#### Area D

In this area, two funerary occupations were noted: the first, with at least one individual buried on the floor with some objects (*locus* 50332); the second, with at least five individuals, the adults being oriented east-west, heads to the west (unlike the individuals found in the bottom of the pit tomb or near to coffin 1, these are not head to toe) and few objects (or robbed objects). Only a few femurs were found in this area and it is possible that these bones are to be looked for in the upper fill of the pit tomb (Area B).

### ***Biological characteristics***

The detailed report on the biological characteristics will have to await the study season in 2012. However, we can make a few preliminary remarks here. We were able to observe, both in the field and in the laboratory, a limited number of long bones. During the course of the 2009 season, fifteen complete humeri were found, and in 2011, only three. This can be explained by the condition of the bones in the pit tomb as well as by the limited discovery of long bones in Area A. The same observation can be made for the pelvic bones: thirty were studied in 2009 and only one in 2011.

#### **The pathological spine 50291-2 / 50303-7 (fig. 17)**

Only one case of pathology has been described in this report, that of the spine found in *locus* 50291 (thoracic vertebrae 5 to 12 and lumbar 1 to 5) and partly also in *locus* 50303 (thoracic vertebrae 5 and 6). Some osteophytes are visible on thoracic vertebrae 5 and 6. Some bony bridges can be seen between thoracic vertebrae 7 and 8, 8 and 9, 10 and 11, and between lumbar vertebrae 1 and 2, 3 and 4, and 4 and 5. We can note that the bony bridges are particularly attested on the lower thoracic vertebrae and the lumbar and that they are on the anterior face of the vertebrae. The articular surfaces are not fused and the intervertebral space seems to be preserved between the different vertebrae. The body of lumbar vertebra 5 seems to be crushed. We note an internal incurving of the spine.

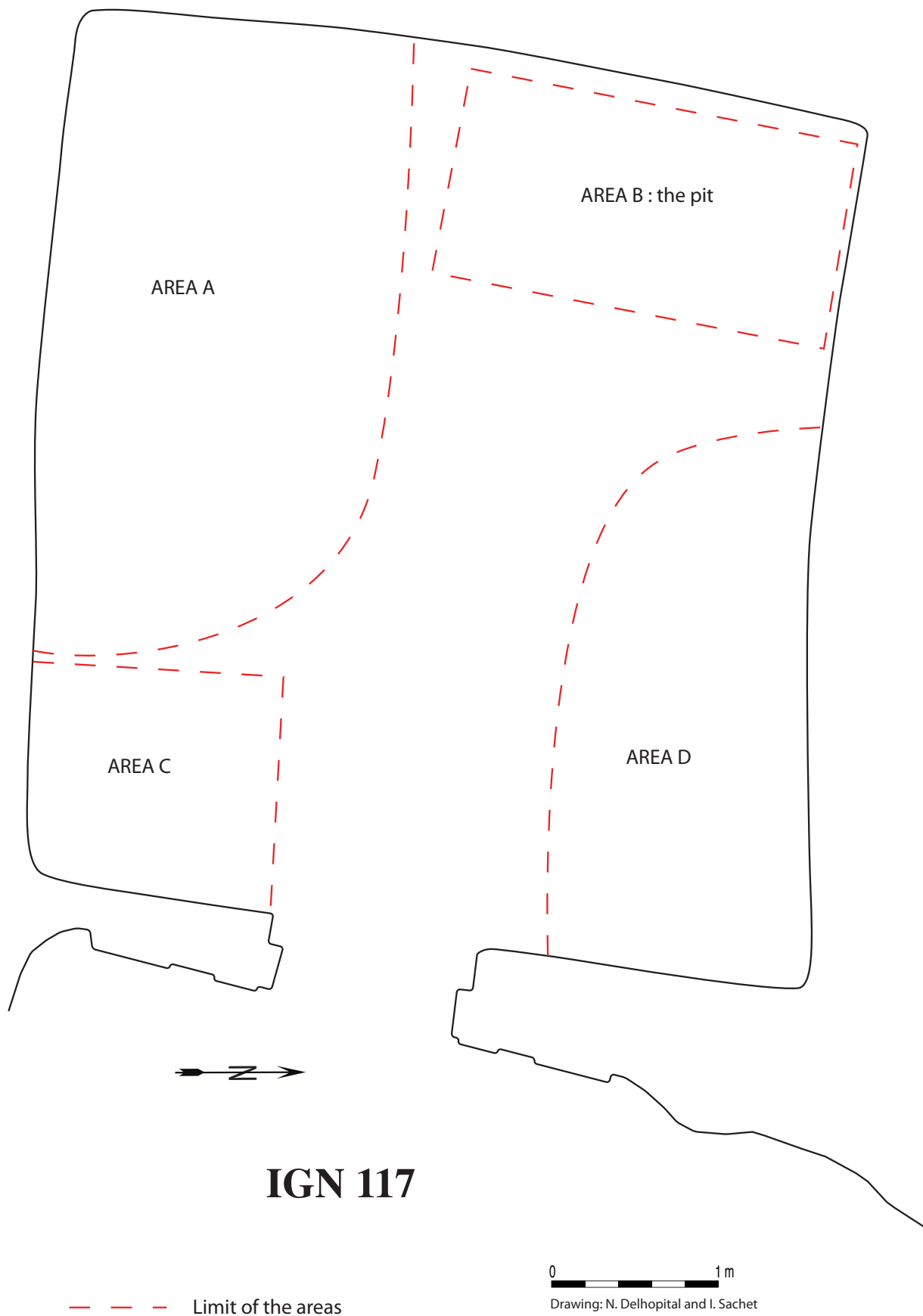
This part of the ankylosed spine seems to bear witness to an inflammatory (?) type of pathology such as ankylosing spondylitis (?). The ankylosis limited the flexibility and ability to move the back and thorax, which must have caused a certain difficulty in breathing.

## **CONCLUSIONS FOR THE STUDY OF TOMB IGN 117**

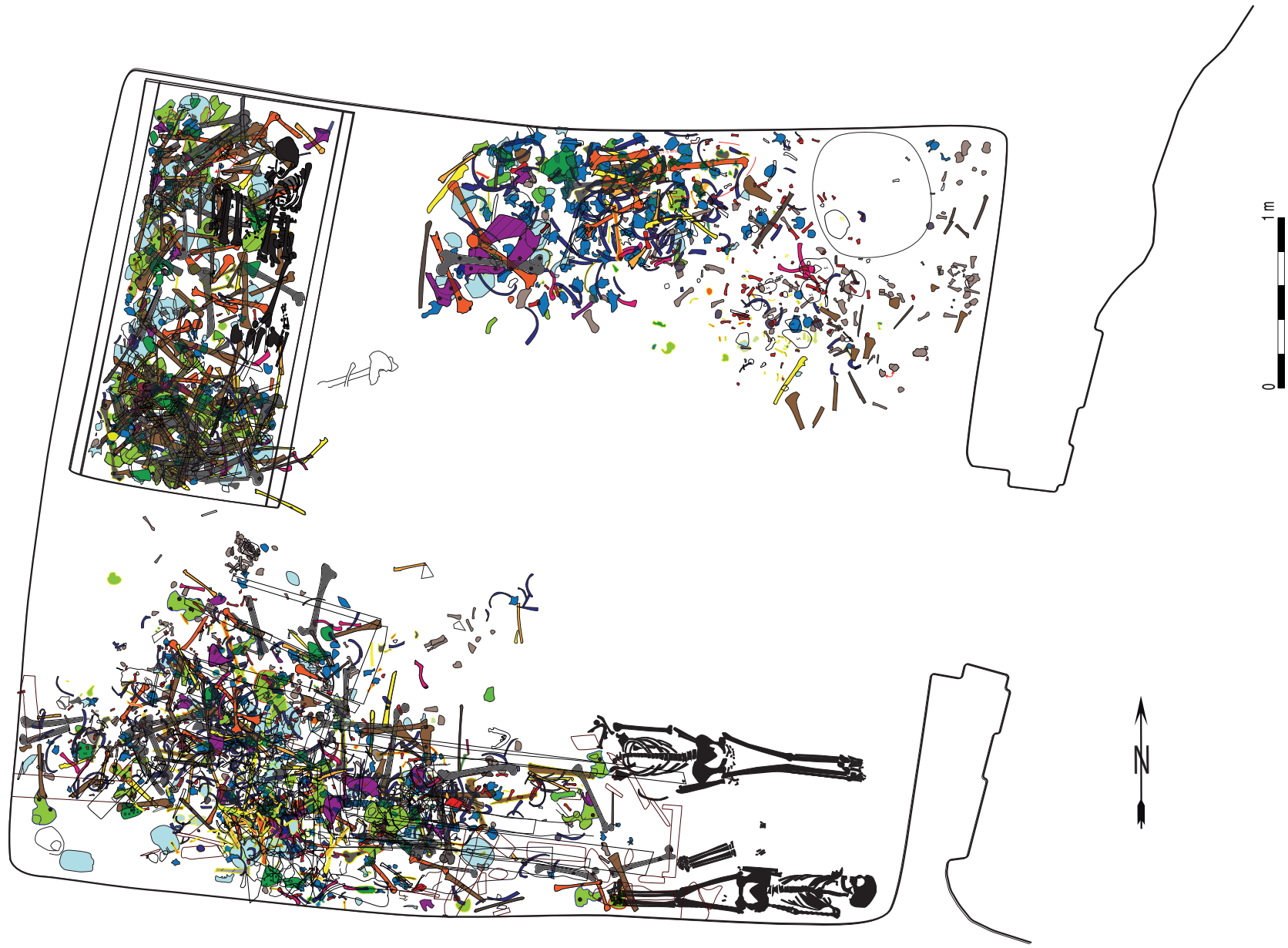
The 2011 season allowed us to confirm our hypotheses. Some individuals were placed on the floor of the chamber (Area A). Subsequently, the bones of the individuals placed on the chamber floor were pushed into the pit tomb (Area B), which would have acted as a dump.

The 2011 season led to the discovery of two coffins. The first was disturbed, but contained at least four individuals, three of which were immature. The second was too disturbed to develop any hypotheses but it is possible that an immature individual was buried in it.

Area D seems to constitute a homogeneous group. We were able to demonstrate that at least five individuals were buried in this part of the tomb. The three adult individuals were oriented east-west, heads to the west. The 2012 season will allow us to complete both the biological studies of the individuals and the archaeo-anatomical analysis.



**Fig. 1** Layout of the different areas in tomb IGN 117



Drawing: N. Delhospital

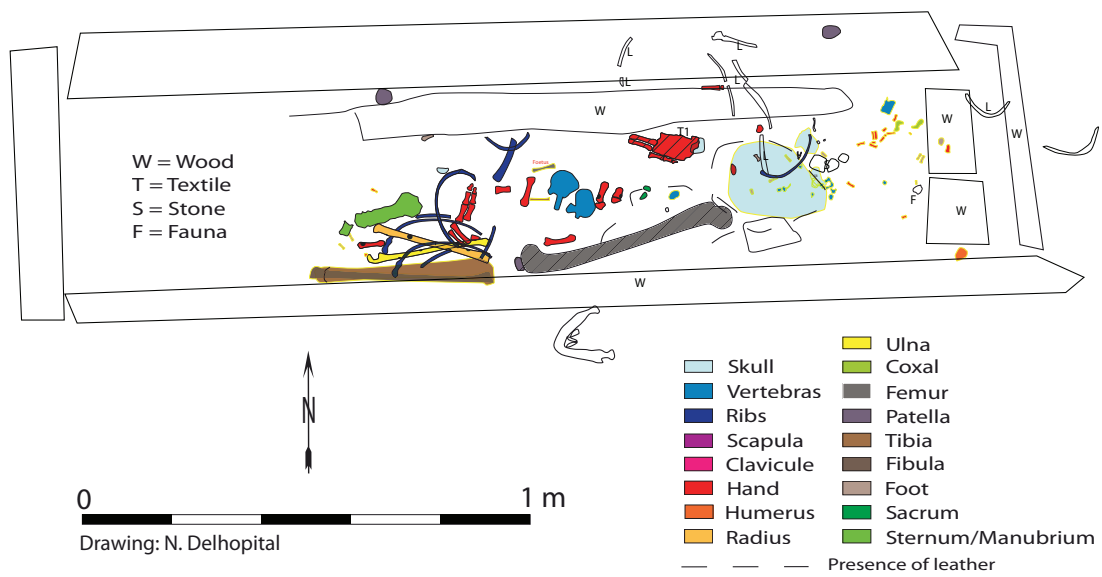
**Fig. 2** All the material found in tomb IGN 117



**Fig. 3** The two coffins found in tomb IGN 117



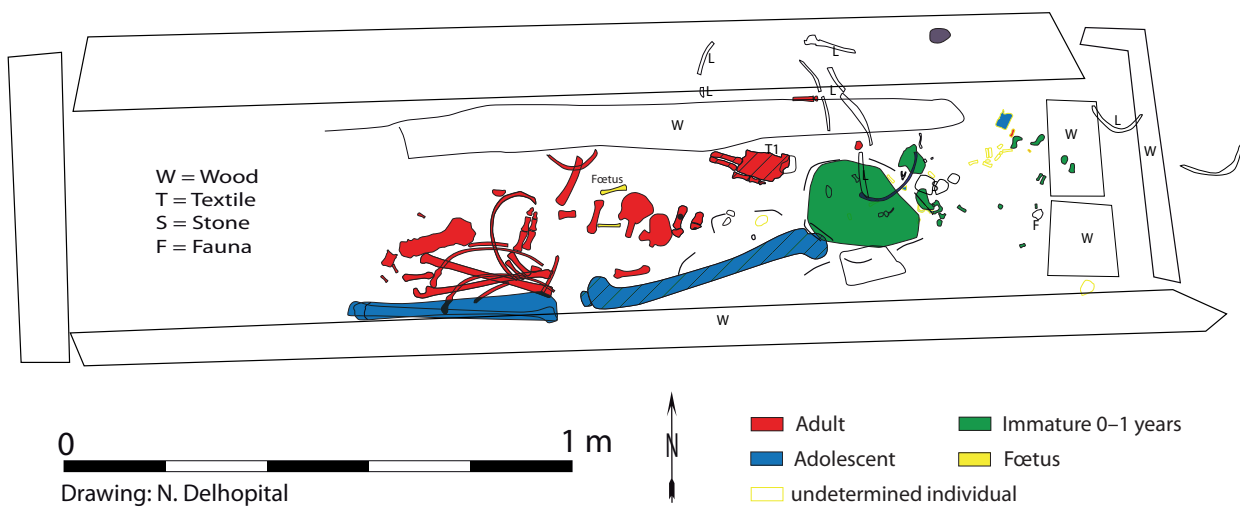
**Fig. 4** Coffin 1 (*locus* 50314)



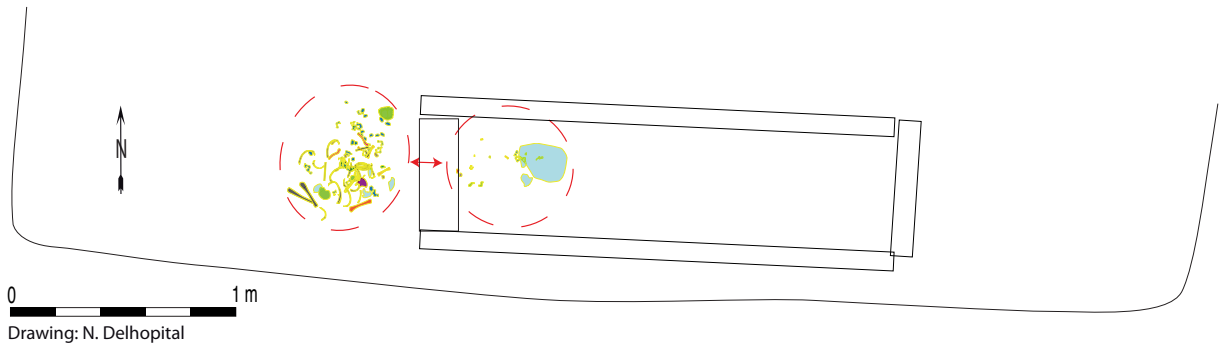
**Fig. 5** Bones found in coffin 1



**Fig. 6** Bones found in coffin 1



**Fig. 7** Identification of the different individuals found in coffin 1

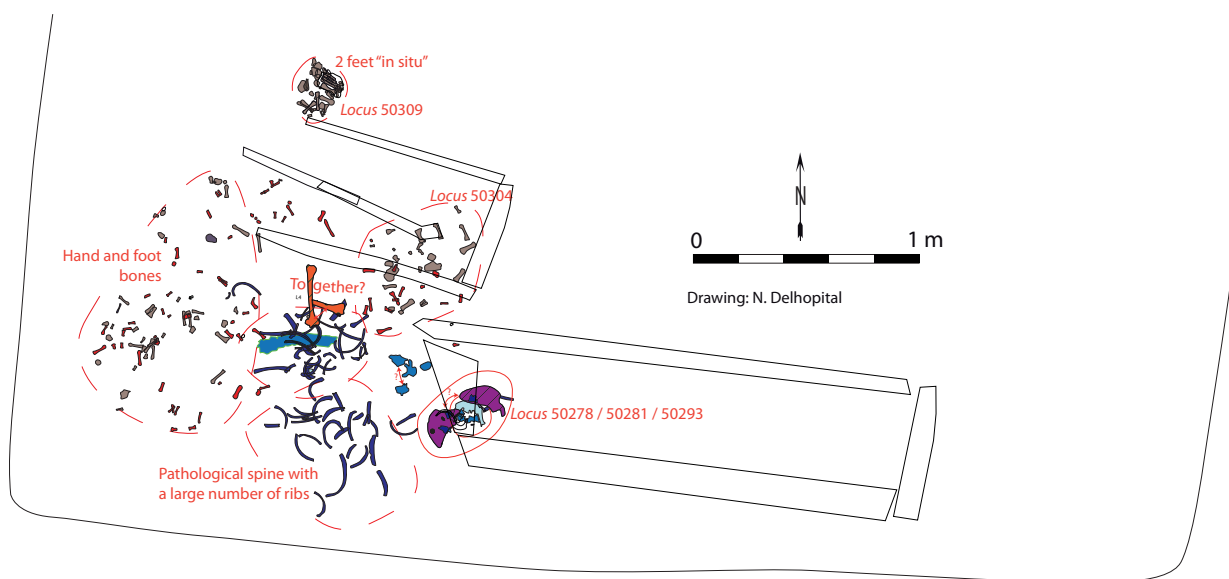


**Fig. 8** Immature individual 50295



- Skull
- Vertebras
- Ribs
- Scapula
- Clavicule
- Hand
- Humerus
- Radius
- Ulna
- Coxal
- Femur
- Patella
- Tibia
- Fibula
- Foot
- Sacrum
- Sternum/Manubrium
- — — Presence of leather

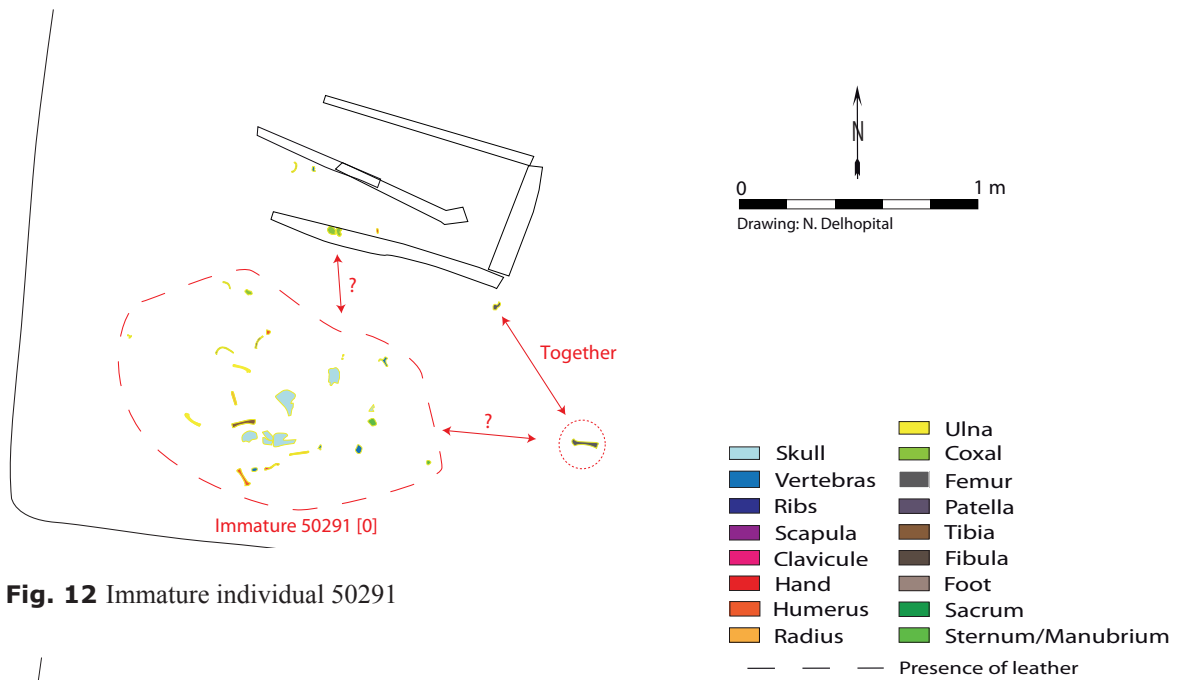
**Fig. 9** Immature individual 50295



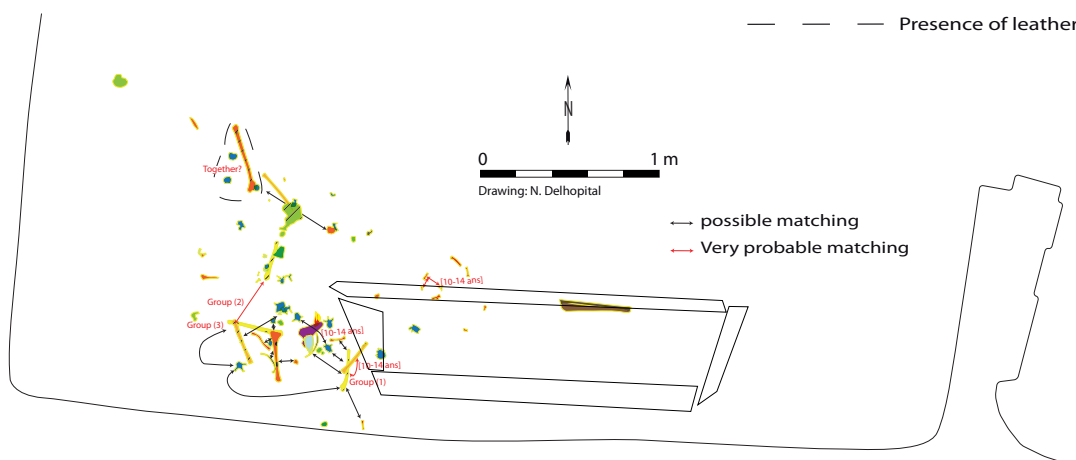
**Fig. 10** Matching of the adult bones



**Fig. 11** Coffin 2



**Fig. 12** Immature individual 50291



**Fig. 13** Immature bones found in Area A



**Fig. 14** Mummified hand with a ring



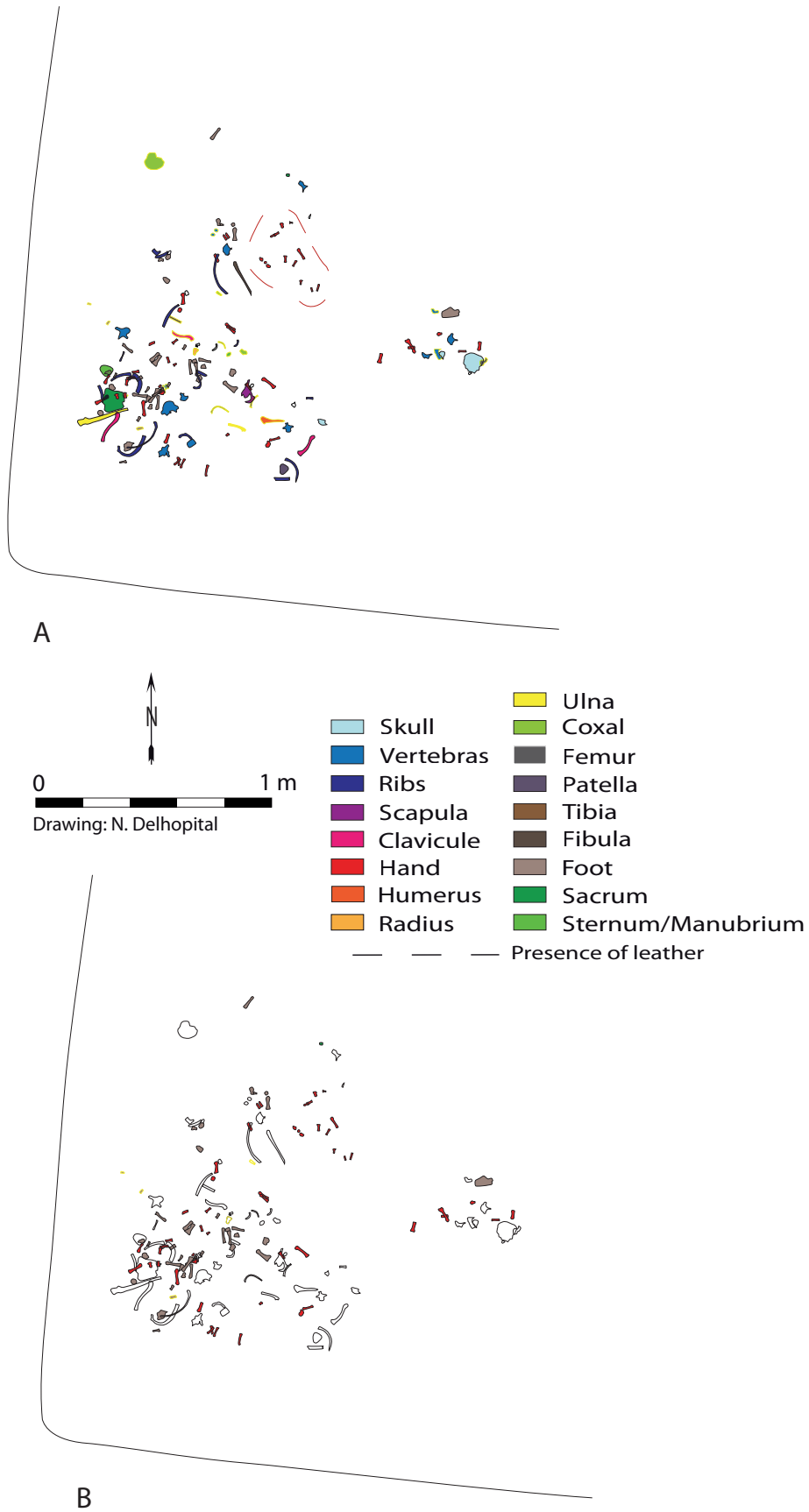
**Fig. 15** Mummified hand with a ring



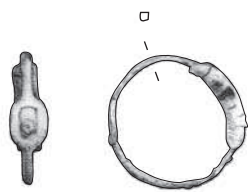
**Fig. 16** Articulated feet,  
*locus 50309*



**Fig. 17** Pathological spine



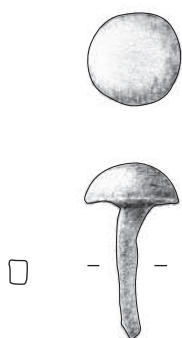
**Fig. 18** Bones found on the floor in the western part of Area A



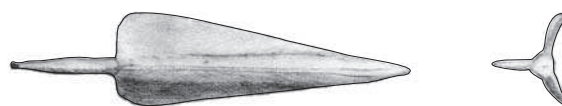
**Fig. 19** Ring



**Fig. 20** An ear or nose ring



**Fig. 21** Nail



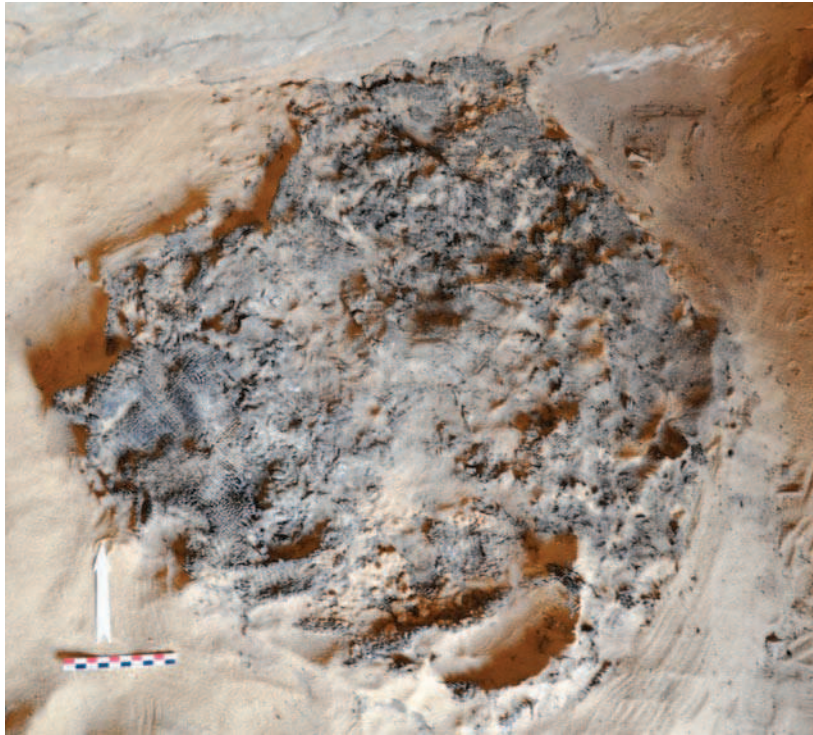
**Fig. 22** Arrow head



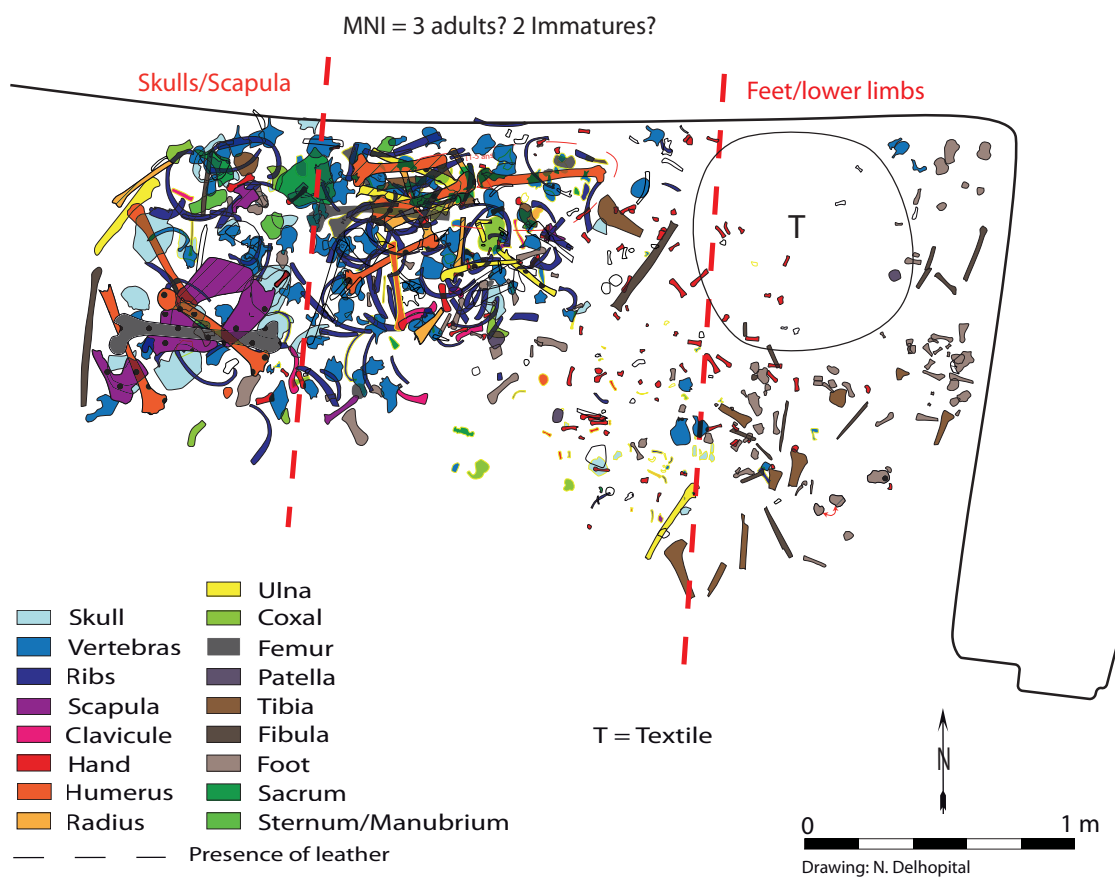
**Fig. 23** Arrow head



**Fig. 24** Relief of weapons from Kerak castle (Jordan). Photo I. Sachet.



**Fig. 25** Textile found in the upper levels of Area D



**Fig. 26** Bones found in the upper levels of Area D

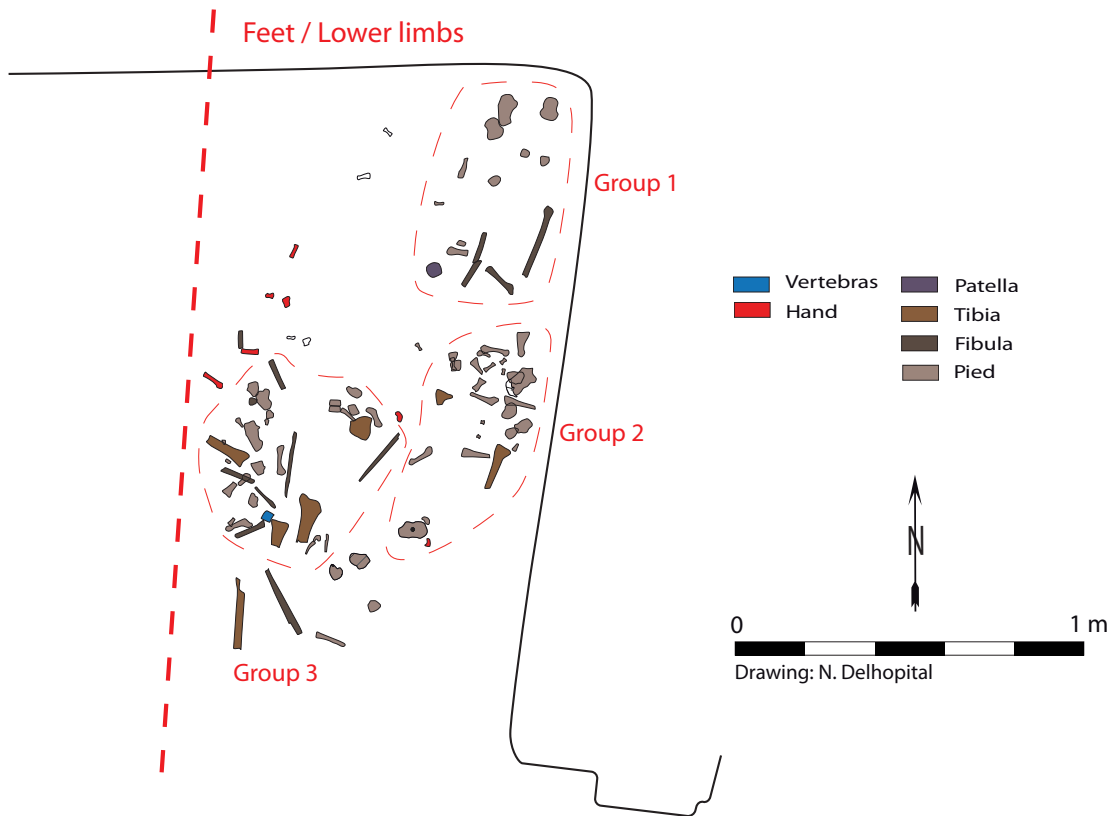


Fig. 27 Lower limb bones found in Area D

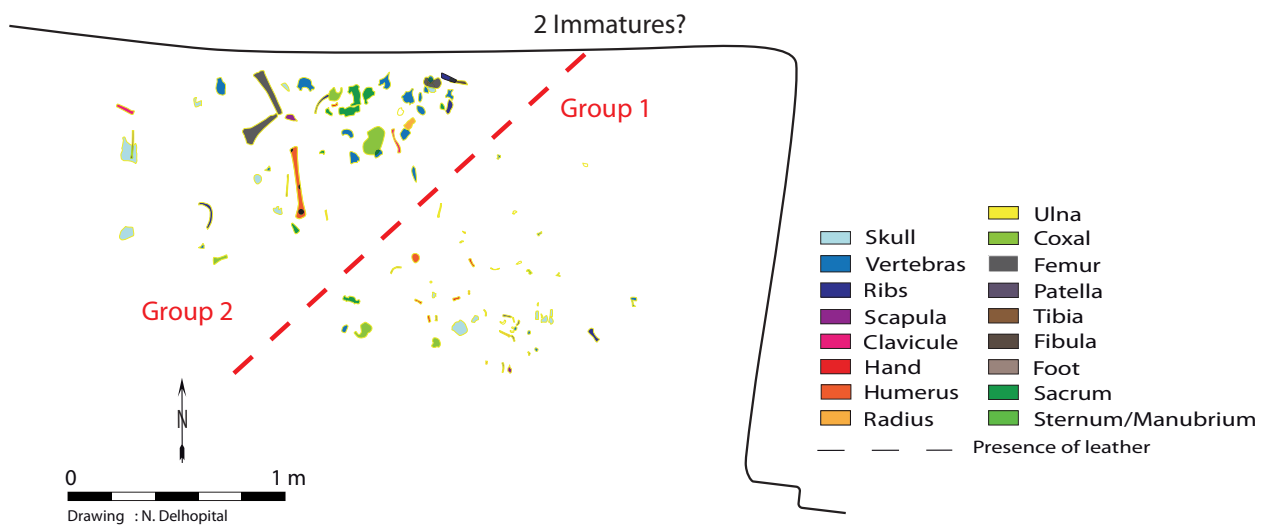
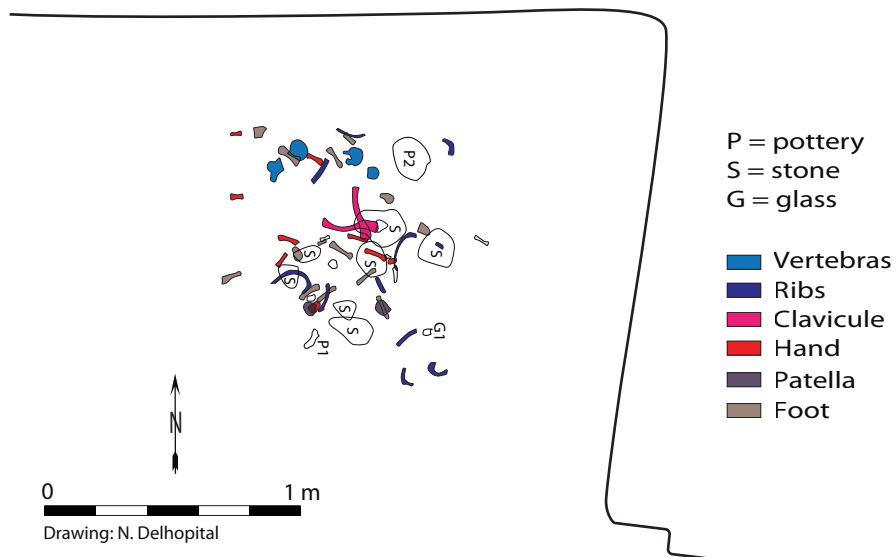
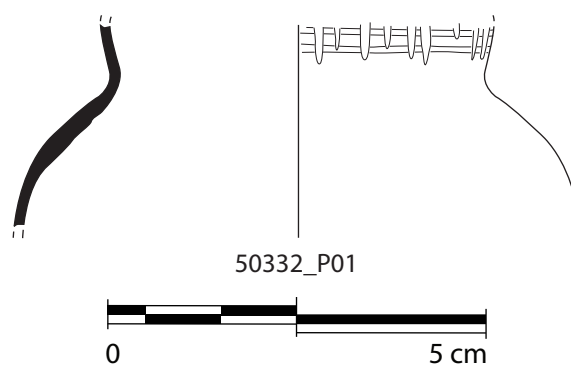


Fig. 28 Bones from immature individuals found in Area D



**Fig. 29** Material found on the floor (Area D, locus 50332)



**Fig. 30** Nabataean pottery



## **Area 6 (IGN 132)**

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



## Area 6 (IGN 132)

Laila NEHMÉ

During the 2011 season, work continued on top and at the foot of the outcrop IGN 132, which stands in the north-eastern part of the residential area (**fig. 1**). The excavations in this area have started in 2010 (see the 2010 report p. 114-126) and have put to light a monumental complex, part of which certainly had a religious function. It is composed of the following features (**figs 2-3**): a courtyard (a *temenos*?) delimited by two terrace walls, a rock-cut chamber, niches with betyls, a monumental access to the summit of the outcrop, various structures related to water, among which several stone basins, and a well. The rock-cut chamber (IGN 132a), the niches (IGN 132b-d), the courtyard and the stone basins were fully described in the report of the 2010 season. In 2011, the work progressed in three directions: north of the stone basins and north of the wall which was interpreted as a protective wall for them (60676), around the stone basins, where we probably reached the layer in which they were installed, south of the stone basins, where an unexpected well was discovered, and finally on top of the outcrop, where a paved platform, in the centre of which stood a *tetrapylon*, was found.

This report will present successively the results obtained on top of the outcrop and those obtained at its foot. One difficulty is the total absence of stratigraphic link between the bottom and top parts of the excavated area. Another one lies in the fact that the pottery from the 2011 season has not been studied yet. It is therefore difficult to propose a chronology for the occupation of the area and this report remains provisional.

### THE HIGH PLACE

#### Means of access

It was thought initially (see the 2010 report, p. 117) that access to the summit of IGN 132 was given primarily through a ramp built parallel and against the north-west face of the outcrop, up to chamber IGN 132a. It was also thought that the two groups of stones cleared in front of the chamber (see p. 125 and **fig. 89** in 2010 report) belonged to NW-SE walls which remained to be uncovered. The area around these stones was excavated in 2011 (for the stratigraphy, see **fig. 4**) and it appeared that the blocks put to light in 2010 belong in fact to the basis of two “pillars”, 1.90 m distant from each other, resting directly on the bedrock (**fig. 5**). Two courses are preserved only and the stones used to build them are of friable white sandstone. Moreover, they are carelessly assembled (**fig. 6**). Two blocks, one in each pillar base, bear traces of tool marks, some of them made by a drill spindle. The bedrock on which they are laid is pulverulent and forms on the surface wavelets shaped by the erosion. All this gives the feeling of a work undertaken in haste. Despite this, it is probable that these two “pillars” were part of the initial access to the top of IGN 132. Indeed, they are on the western side of IGN 132 (overlooking the city) and in front (at a distance of 8 m) of what is left of the rock-cut staircase, traces of which are visible above the entrance to the rock-cut chamber. It should be noted that the top of IGN 132 could be reached only from the western side, the other sides being too steep. Apart from the very faint traces of the rock-cut staircase, the original aspect of the access cannot be reconstructed. However, one can assume that when the chamber IGN 132a was dug, part of the ceiling collapsed (**fig. 7**), destroying at the same time

the access to the top. At this time, the sanctuary there was still in use and a new access (the ramp, **fig. 8**) was to be quickly built, using the splinters resulting from the digging of the chamber. Both events – digging of the chamber and building of the ramp – are therefore almost contemporary.

### **The sanctuary on the top**

The religious installation on top of the outcrop is composed of an open-air enclosure (the only feature which had been put to light in 2010) and a paved platform on which stood a *tetrapylon*.

#### *The open-air enclosure*

As we have said in 2010, the enclosure is defined by a probably low wall made of a single row of sandstone blocks carefully laid in a trench dug in the bedrock. The blocks are fixed in the trench with wedging stones and mortar (**fig. 9**). The best preserved parts of the wall are on the north side but traces of it are visible on the three other sides as well, which allows to give relatively exact dimensions for the enclosure: 16 m N-S and 13.50 m E-W. The builders clearly made the best use they could of the space which was available to them and gave the enclosure the maximum possible size. This is particularly visible in the north-west corner, where the edge of the cliff is only half a meter away from the angle (**fig. 10**). It must have been rather acrobatic to build a wall so close to the cliff, but it is true that the Nabataean builders and stone-cutters were used to these situations, at least those who cut the monumental tombs. They also made very good use of the bedrock, following the variations of its level and carving it only when necessary (**fig. 11**). Layers of mortar and wedging stones were systematically employed, in a very pragmatic manner.

#### *The paved platform*

The paved platform was probably a square, the sides of which were *c.* 4.50 m.<sup>1</sup> Seventeen slabs, made of white and soft sandstone, are preserved. They are very thin (3 to 4 cm) and therefore extremely fragile, disintegrating when one walks on them, forming 1 to 2 mm thick leaves which then crumble away. They are laid on a preparatory layer made of compact clayish earth with small stones, the thickness of which varies according to the irregularities of the bedrock (**fig. 12**). Two portions of this preparatory layer were excavated: 60698 in the area of the south-eastern column (**fig. 13**) and 60693 in the area north of the south-western column. The slabs are carefully assembled and no mortar was used to join them to each other, except on the edges of the platform, where a fine grey mortar was used to fix together the slabs and the wedging stones which link them to the bedrock. Whenever it was possible, i.e. when the bedrock was at the right level (it slopes gently from west to east), the builders saved putting slabs on the platform, as can be seen in its southwestern angle, where the bedrock was simply cut down to the level of the top of the slabs (**fig. 14**). Faint traces of grey mortar on the bedrock show, however, that the latter was probably coated in order to give it a better aspect. The form and size of the slabs varies considerably: the two smallest are 36.5 x 69 cm and 40.5 x 66 cm while the two largest are 88 x 66 cm and 1.30 x 53 cm.

Apart from the slabs and the wedging stones, the only feature *in situ* is a rectangular block of good quality white sandstone, 95 x 30 cm and 14 cm high, fixed to the bedrock and to the slabs below it with a 3.5 cm thick layer of grey mortar mixed with small stones to facilitate the wedging (**fig. 15**). Its upper surface does not bear traces of tool marks but its front and right (west) faces bear traces left by a drill spindle. This block cannot be part of a wall which may have surrounded the platform because there is no space available to the right (west) of it. It is therefore better to assume that it was some sort of pedestal for an altar or other religious device.

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1. It is difficult to determine its exact dimensions because the western and northern parts of it are missing and the reconstruction is based on the principle of symmetry (the same space on each side of the columns).

### **The tetrapylon**

At about 0.75 m from the edges of the paved platform, the negative of four columns was observed. They are visible either because slabs were clearly cut in order to make them fit in (four slabs were cut), because the bedrock was cut deeper to embed them or because there are still traces of the white mortar which was used to fix them firmly to the substrate (**figs 16-17**). The best preserved column negative is the south-western one and its diameter is 55 cm, as is that of the south-eastern one.

Not a single fragment of column drum was found, neither at the top nor in the destruction layers below, which shows that they have all been taken away when the building was dismantled, and probably reused somewhere else. The hollow of the south-western column negative contained a very ashy layer, *locus* 60687, of which a sample was taken.

There is no indication as to what the structure around the *tetrapylon* looked like but it reminds us of the central platform of the *cella* of several temples (Baalshamîn and Sûr in southern Syria, Khirbat Tannûr in Jordan, etc.) as well as of the tower of Mashnaqa in Lebanon.<sup>2</sup>

### **The stratigraphy on top of IGN 132**

The top of IGN 132 was excavated in two halves. The eastern part was excavated first, leaving a N-S section. After a general scraping of the area, the layer down to the level of the slabs forming the pavement of the platform was given *locus* number 60667 (**fig. 18**). However, when excavating the western part, this *locus* was subdivided into several *loci*: the abandonment layer above the rectangular block on the southern edge of the platform was given *locus* number 60679. Below it, there was a very ashy layer (in places composed of ash only), which contained quite a lot of pottery (*locus* 60683, **fig. 19**). Finally, just above the slabs, there was 60684, which is therefore the first layer deposited on the slabs after the platform was abandoned.

North of the paved platform, between the end of the pavement and the bottom of the gentle slope which joins the enclosure wall, there is layer of soft earth, with patches and spreadings of ash in places, *locus* 60688. This layer was deposited after the site was abandoned.

In the north-western area of the top of IGN 132, there is a large spreading of ash mixed with fragments of charcoal, *locus* 60690 (**figs 20-21**). This spreading has always been visible (below the rubble which covered the top of the outcrop), even before excavation. It was thought to be the result of modern fires made by visitors on top of the outcrop. This spreading becomes thicker as one goes down the slope (north), which is logical, and it goes under layer 60688. No modern artefacts were found in it and its antiquity is almost certain. It contains a few sherds, a fired rounded stone (diameter 14 cm, 2.5 cm thick) and a fragment of basin (diameter 37 cm). This spreading of ash may come, at least partly, from a pit surrounded by a raised ring, 60 x 45 cm and 5 thick, which contained almost pure ash (*locus* 60700) (**fig. 22**).

It seems that the area with this spreading of ash was separated from the rest of the platform through a very roughly built wall, *locus* 60708 (see **fig. 22**). Below the southern part of 60690, a compact grey layer, which contains a lot of vegetal remains and breaks up in clods, may be interpreted as fuel waste (**fig. 23**). Finally, two dump layers, thrown immediately above bedrock, were excavated at the north-western end of the platform (*loci* 60702 and 60703). They contained a large amount of very small fragments of Nabataean fine and painted pottery bearing two diagonal lines, which belong to the “2 red lines type”, a decorative pattern found on bowls which may be attributed to Schmid’s phase 1 or decor phase 2a. As the ceramicists have pointed out,<sup>3</sup> the profile of the bowl seems to be characteristic of Schmid’s decor phase 2b (last quarter of the 1<sup>st</sup> century BC)

2. Aliquot 2009, fig. 132, 134.

3. Durand and Gerber 2010, p. 292.

while the painted decoration seems to belong to Schmid's decor phase 1 (first half of the 1<sup>st</sup> century BC). These two layers are stratigraphically above 60701, which was not fully excavated in 2011.<sup>4</sup>

## THE AREA EAST OF IGN 132

In the area east of the outcrop, the excavations went on, more or less successfully, in three areas: north of wall 60676, which is supposed to have protected basins no. 3-5; in the area of the basins themselves; in the area south of the basins, i.e. between them and wall 60649.<sup>5</sup>

### The area north of wall 60676

This area is characterized by a mass of heterogeneous material which was probably used to fill in the gap caused by the sloping of the bedrock from north to south. The latter was clearly visible, at a distance of about 4 m north of wall 60676, but it slopes strongly and it was therefore necessary to level it up (**fig. 23 bis**). That is how we finally interpreted the layer of earth mixed with stones which was excavated there until we realized that this area was perhaps not a very promising one. The excavated *loci* are 60652, 60656 and 60658 (unexcavated):

- 60652: soft reddish earth, a little bit clayish, white spots of sandstone. It contained small fragments of basins as well as a fragment of cornice (**fig. 24**). It abuts wall 60676;
- 60656: red to brown earth with still quite a lot of rather small stones, not very different from 60652. What is interesting is that it seems to go *under* the lower course of wall 60676, at least under the second to fifth blocks counted from the western end of the external face of the wall;
- 60658: yellow to beige sandy layer which is probably just above the bedrock. It is mixed with blocks which are more or less laid flat.

### The area between the basins and the well

The excavation of this area had begun in 2010 (see the 2010 report, p. 120-121). Several destruction layers (60604, 60606, 60617, 60627) were removed in 2010, the first one clearly postdating basin no. 1 and 60627 containing *c.* fifty sandstone ashlar, some of which bearing very fine toolmarks. Below 60627, there was 60648, starting just above the upper level of the second course of wall 60649. It is roughly 30 cm high and is a mixture of compacted red to brown clayish layer. It contains charcoal fragments, few sherds only and a lot of stones of various sizes (8-10, 20-30 cm) as well as large blocks (*c.* 10 units) of the same type as those found in 60627. The largest block is 75 x 33 cm and 24 cm high. It bears toolmarks on one face only (**fig. 25**), presumably the one which remained visible when it was inserted into a wall. There are two types of toolmarks: fine ones (0.5 to 0.8 spaced grooves) and rough ones on top of the previous. A 5 cm wide chiselling was made on one side of the stone. Two other blocks (65 x 30 by 25 cm high; 52 x 50 by 32 cm high) also bear interesting toolmarks (**fig. 26**). The *c.* sixty blocks which have been found in 2010 and 2011 must have been used in different contexts (stretchers and headers) and bear toolmarks of different kinds, some of them very fine.

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4. Apart from these layers, the following *loci* were excavated on top of IGN 132: 60999 is the cleaning of the north-west angle of the enclosure wall and 60704 is the cleaning of one section of wall 60708. It yielded a small bronze figurine representing a standing eagle (60704\_M1, see the section on the finds below).

5. This wall was numbered 60638 in 2010.

Below 60648, there is 60653, which is less compact, more sandy than 60648 and has smaller blocks (bottom at 784.2 m). It contains charcoal, a fragment of a basin and another of a millstone. It also yielded a small but incomplete sandstone incense burner, on which see the section on the finds below (and **figs 65-67**).

60648 and 60653 clearly abut wall 60649 and are therefore later. One should also note that the ashlar of which wall 60649 is made are clearly not of the same quality as the blocks which were retrieved from 60648 and 60653. The latter did clearly not come from the elevation of this wall, if there was ever any.

In the north-western corner of the area, abutting wall 60666, there was a small heap of ash (*locus* 60678, **fig. 27**) which covered – and may in fact be part of – a large pit of irregular shape, next to the bedrock of IGN 132 and extending from wall 60666 to the south, over *c.* 4 m. The filling of the large pit (*locus* 60682) was extremely soft and ashy and contained a lot of animal bones.

## The area around the basins

### *The basins*

Four basins, numbered 1 to 4, had been observed in 2010, and three had been described (see the 2010 report, p. 119-120). Two more have been uncovered in 2011 and the fourth one has been described (**fig. 28**):

- no. 4: the bottom of the basin leans strongly from west to east (difference of 37 cm). The internal side of the wall was finely cut with a drill spindle, with 1 cm spaced grooves, whereas the external side seems to have been pointed. The wall is 8 cm thick and the original height of the basin is not known. Its external diameter is 1.07 m;

- no. 5: this basin is laid flat on a layer of clayish earth (*locus* 60691), just a little higher than the level on which rest some of the blocks of wall 60676. The bottom of the basin bears irregularly spaced traces of pick. The original height of the basin is not known. Its external diameter is 80 cm and the thickness of its wall is 10 cm;

- no. 6: this basin is leaning from east to west (therefore in opposite direction compared to basin no. 4). It has probably fallen from its original position. The bottom is broken into three parts and it rests on the same clayish layer as basin no. 5. The only visible tool marks were left by a drill spindle (*c.* 2 cm spaced grooves). The preserved height is 11 cm, the external diameter is 86 cm and the thickness of the wall is 5 cm.

It is possible that some of the basins were made in reused drums. Indeed, in one of the squares of the 2003 excavations, we found a drum, 70 cm in diameter, the upper part of which had been partly hollowed out, as if the intention had been to make a basin from it (**fig. 29**). One may think that the hollow is due to erosion but there seems to be traces of pick in it. Moreover, the presence of this drum at this spot in a domestic unit would be difficult to explain, unless it was meant to be used as a utilitarian object. It is certain that it is a column drum because it has mortar on its base, because it is chiselled on its edge and because it bears a mason's mark (**fig. 30**).<sup>6</sup> The traces of a very thin and homogeneous white layer which can be seen in various places at the bottom of the basins (rarely on the walls) may have been interpreted as the remains of a coating which would have covered the basins to make them waterproof. In fact, this layer is natural: it is too homogeneous, without any inclusions, to be hydraulic mortar. Moreover, in basin no. 5, it was found at the place where the wall of the basin stood (**fig. 30 bis**).<sup>7</sup> Finally, when a thin layer of stone bearing traces of pick breaks away from its substrate under the action of erosion, it puts to light a white layer similar to the one which has been observed on the basins. It is probable, therefore, that this white smooth layer results from the natural degradation of the sandstone.

6. This is, to our knowledge, the first mason's mark found at Madâ'in Sâlih.

7. The basins were not made of two separate parts (a cylinder and a base), they are made of one piece.

### *The excavation*

A pit surrounding the northern part of basin no. 3 was filled with very soft orange sand, *locus* 60650, bottom 784.090 m). It is possible that the western end of wall 60676, which was built immediately north of the basin, was partly dismantled in order to dig the pit around the basin, whatever its function was (**fig. 31**). Another pit, also containing sand, was excavated around the northern part of basin no. 1 (*locus* 60651, bottom 784.275 m). The date of these pits is not known but they may be late. Of basins 1-3, only the middle one, no. 2, was not bordered by a pit.

The excavation in this area started with *locus* 60657 (top 784.70-75 m, bottom 784.50-55 m), which seems to be later than the destruction layer 60627. It is clearly later than the destruction of basin no. 4 since it covers the fragments of this basin.

Below it, but not very different from it, there was 60665 (top level 784.67 m, bottom 784.40 m), which is a relatively compact layer of fine sand. After the removal of 60665, there are thus only 13 centimeters difference between the layer uncovered (60668, see below) and the bottom of the pit bordering basin no. 1, which is 784.275 m).

The removal of 60665 has put to light four blocks of different size and shape, which are aligned in a WNW-ESE direction (**fig. 32**, left of 60666). Their upper surface is not at the same level (east to west 784.62, 784.53, 784.41 m). They are thus not likely to be part of a wall. May they form steps?

Below 60665, there was 60668 (**fig. 33**), top level 784.40, bottom between 784.21 and 784.24 m, i.e. more or less at the same level as that of the foundation trench made in order to install basin no. 3, which is at 784.15 m. It is probably not the floor associated with the basins but a clayish deposit. Below it, 60691 has the same characteristics but it is clearly the layer in which are laid the basins and on which some bottom fragments of basins rest.<sup>8</sup> *Locus* 60691 is therefore just above of or equivalent to 60656, seen in the pit around basin no. 3. *Locus* 60691 was excavated down to the level of the foundation trench of basin no. 3.

The removal of 60665 and 60668 has put to light a well built wall with two facings, *locus* 60666 (top level 784.32). Its function in the general plan of the area is not clear yet. It is almost but not completely parallel with wall 60676, which is much more irregularly built. The cleaning of the section at the eastern end of the exposed part of 60666 made us wonder whether (as suggested to us by J. Rohmer) there was a mudbrick superstructure above this wall. The mudbricks are however far from clear and it would be necessary to excavate further east in order to make them appear if they exist. This may be done in a future excavation season.

Another feature appeared at 784.27, i.e. five centimeters below the top level of wall 60666. From above, it looked very much like a metallic pulley wheel (see **fig. 27**). It is wedged between basin no. 1, wall 60666, and the stones which are aligned north of it. It is set into a hard clayish layer, 60681, and it is clearly not in a fallen position. Rather, it was placed there on purpose, at a time when wall 60666 was still standing. It was carefully removed from its clayish gangue and revealed itself to be a tripod casket (on which see below, the section on the finds, 60681\_M01). The layer on which it rested, 60681, was partly excavated (the space is very narrow).

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8. The bottom of the basins is between 5 (basin no. 6) and 13 cm thick (basin no. 4). One may expect that the lids, if there were any, which is likely (at least one lid has been found *in situ* in Area 1, in room 10136, see Report 2009, fig. 14 p. 34), would be as thick as the walls of the basins (5-8 cm). The fragments of basins which have been recorded between basins no. 2 and 3 have therefore been interpreted as bottoms.

## Conclusion

The relative chronology between the basins and the layers which have been excavated north of wall 60676 is not certain (there is no stratigraphic link between them). However, since *locus* 60652 abuts wall 60676 and since this wall has been interpreted as a protective wall for the basins, it is likely that 60652 has been deposited *after* the basins were installed, unless the wall belongs to a later phase of use of the basins. On the other hand, 60656 seems to have been deposited *before* wall 60676 and this layer may be the one on which the basins themselves rest (this will be checked in coming seasons). By overexcavating the pit around the northern part of basin no. 3, it was possible, without too much damage, to go down and observe the stratigraphy of wall 60676, layer 60656 and basin no. 3 (**fig. 34**). It can be seen that wall 60676 rests on layer 60656 which was cut by the foundation trench (top level 784.15 m) made in order to set in basin no. 3 (bottom of basin at 783.87 m). Both the basin *and* the wall are therefore later than *locus* 60656 and it is probable that the basin was installed before the wall.

As for the destruction layers south of basins no. 1-6 (*loci* 60627, 60648, 60653 etc.), it seems (but this remains to be confirmed), that they are later than the basins (although they did not affect them directly). Before the whole area between wall 60649 and basin no. 1 is fully excavated (which was not the case at the end of the 2011 season), the only reason to suggest this is the presence of the basin at the outlet of the overflow of the well (see below). It is, indeed, logical, to assume that this small basin was part of an entire system of water management east of IGN 132, of which basins no. 1-6 are likely to be part. Since the destruction layers are clearly *above* the overflow basin, they are likely to be later than the basins themselves.

## The well

The well is located on the south-eastern side of IGN 132, at the foot of the large crack which divides the outcrop in two parts leaning against each other (**fig. 35**). It is dug between two E-W walls, 60649 to the north and 60661 to the south, and it is almost certain that the masonry of these walls and that of the wells were built at the same time. The distance between the internal facing of the walls is 2.40 m. On the west, both walls reach the rock face of IGN 132 and are almost built against it. Small blocks of white sandstone were used as wedging stones in wall 60661 to bring it to the level of the rock face but there is still a small gap (a few centimeters) between the end of the wall and the rock face. Since these two walls do not continue beyond the well to the east, it is probable that they were built as protective and retaining walls associated with it. It is also possible that they were used to support some sort of water lifting device, but no archaeological evidence confirms this hypothesis.

On its western external side, the masonry of the well is strengthened by blocks of irregular size and shape which form a crude masonry laid directly against the masonry of the well, thus forming an abutment.<sup>9</sup> The crack made this strengthening necessary because the water which runs down from the top would have damaged very quickly the masonry of the well. West of the well, between the abutment and the bedrock of IGN 132, the gap was probably deliberately filled with rubble, at least up to the level of the top of *locus* 60662. There is indeed a difference between the two *loci* excavated there, 60660 and 60662 (**fig. 37**). The former contains almost exclusively blocks of friable yellow sandstone which are very similar to the sandstone of which IGN 132 is made, whereas the latter contains many blocks of white sandstone mixed with a few yellow ones. 60660 is thus probably the result of the collapse of parts of IGN 132, with a few

9. The fact that this abutment is earlier or was built at the same time as wall 60661 is shown by the fact that its top course was laid before the upper course of wall 60661, since it goes under it (fig. 36).

stones coming perhaps from the building on its top<sup>10</sup> as well as a block covered with a friable, bad quality hydraulic mortar which was perhaps part of the water supplying system.

Eight coins were found in 60660: they still have to be cleaned and read but it seems, according to a preliminary reading by Chr. Augé, that some of them are Nabataean while others would belong to the owl, so-called 'Himyarite' group. The two coins found in 60662 may be Nabataean.

### *Comments on the location*

This well was installed in the most inadequate place, as is shown by the fact that it lies well beyond the diagonal line, running NE-SW, which marks the limit of the area where Nabataean wells were dug (**fig. 38**). If one considers only the wells dug inside the residential area, the new well, which has luckily received no. 132, is more than 400 m south-east of well no. 22 and almost 600 m north-east of well no. 23. Moreover, it is built in a rather high position: the highest spot of the wall surrounding the well is at the altitude of 785 m whereas, by comparison, the altitude of the top of the so-called Bîr Nabatî, no. 9, is at 780.65 m. Considering that the water table at the Bîr Nabatî well was at 761 m in 2005, water should be expected at 24 m in well no. 132. Of course, the water table in antiquity was much higher but it was several meters further down in this well than in most of the other wells (for comparison, the summit of well no. 12 is at 778.20 m, of well no. 27 at 775.95 m and of well no. 42 at 774.44 m).<sup>11</sup>

The reasons which may explain why a well was installed in this place are twofold: there was a need for water in this particular place (possibly because of the sanctuary on top, which required water); its very specific position at the foot of the crack allowed it to be filled directly from the top. If there had been no sanctuary above, it would be difficult to explain why the Nabataeans chose this very specific position and if it was not for the crack, there would be no point digging it at this relatively high altitude. There are domestic quarters around IGN 132 (as shown, in particular, by the 2003 excavations west of IGN 132) but if the Nabataeans had needed a well to supply them with water, there were plenty of other, more appropriate, locations to dig one.

### *Typology*

This well belongs to the category of wells which have been called "mixed" because they are partly dug in the bedrock and partly dug in the sediment above it. Thirty-four wells belong to it in Madâ'in Sâlih. The internal diameter of the well being 2.05 m (taken 4 m below the coping), it is one of the smallest wells of the site. Three wells only are smaller: no. 55 (1.48 m), no. 57 (square well, each side measuring 1.27 m) and no. 70 (2 m).

It is possible, due to its position at the foot of the crack, that the well was supplied with water from both the top (rain water collected on top of IGN 132 and directed to the well through a short canal)<sup>12</sup> and the bottom (through the water table). It can be compared to the Bîr Nabatî (no. 9), which was dug, entirely in the bedrock, at the foot of a crack in the Jabal al-Mahjar (**fig. 39**). In the case of Bîr Nabatî, it is certain that the well received water from the top. These two wells are therefore the only ones, in Madâ'in Sâlih, which may also be called cisterns.

In the part of the well which is cut in the bedrock, on the eastern side, small notches were cut in staggered rows. As in many other wells, they were used to facilitate the descent to the well when it needed to be cleaned. At the end of the 2011 season, three notches were visible (**fig. 40**).

10. One block bearing toolmarks left by a drill spindle was found in this *locus*.

11. See the section of these wells in Courbon 2008, fig. 16, 17, 18, 21.

12. The distance between the enclosure wall at the top of IGN 132, through which the canal may have run, and the mouth of the well, is 3.5 m.

### *The filling*

In 2011, we emptied the well down to 4 m below the highest preserved stone forming the coping. The filling contained earth mixed with a large number of very roughly cut blocks of white sandstone, of irregular shape and size, contrary to most of the blocks which were found in the destruction layers north of wall 60649 (*loci* 60604, 60606, 60617, 60627, 60648, 60653). It seems as if the blocks had been sorted in order to separate the good ones from the bad ones, the latter being thrown into the well after it fell into disuse (or to destroy it purposely). There are two notable exceptions to this:

- a large cube-shaped block of white sandstone, 40 x 40 x 40 cm, found in *locus* 60686 (**fig. 41**). Four faces are very finely cut, with a 3.5 cm wide surrounding chiseling (**fig. 42**), while two, one face and its opposite (faces 1 and 6), are more roughly cut, with irregular traces of pick and a coarser chiseling (see **fig. 41**). The particularity of this block is that one angle was cut in order to form a 7 cm wide gutter. Moreover, on each of the adjacent faces of the gutter, a notch, 10 x 6 cm and 12 cm high, was roughly cut on the edge of the stone. It is clear (because it cuts both the chiseling and the tool marks left by the drill spindle) that the notches were made at a later stage, when the block was reused for utilitarian purposes;
- a flat trapezoid ashlar, 67 cm long in the front, 50 cm long at the back, 40 cm wide and 23 cm high. Its front face, the only one visible, is finely cut, with a 2.5 cm wide chiseling running at its top (**fig. 43**).

The level which was reached in 2011 inside the well is characteristic of the layers of disuse: white-spotted fine, sandy and rather soft earth with very small fragments of charcoal. The white spots correspond to the natural degradation of the sandstone. Indeed, when the sandstone disintegrates, it crumbles away and the specks of dust getting mixed with the sand give the earth this spotted aspect.

### *The stratigraphy*

A layer of brown earth (*locus* 60663) mixed with a lot of small stones (15-20 cm) covered the whole area above the well (before the stones of the upper course of its coping appeared), except the central part, where it was more sandy. The first filling layer inside the well was *locus* 60664, sandy with with small stones (10-20 cm). The removal of 60664 has put to light two masses of a hard and compact layer, *locus* 60670 (**fig. 44**). They have fallen there after the destruction of the upper courses of the masonry of the well but their origin is not known. Their removal showed 60671, soft earth with small stones. Below, in part of the well only, there was a hard layer of earth mixed with stones, *locus* 60674 (see **fig. 44**). Below it, there was again soft earth with mixed stones (60677), the removal of which made apparent another hard layer with blocks (60680, top level 784.09 m) which forms a roughly E-W line (**fig. 45**).

Below 60680, the well was emptied in a rather mechanic way:

- from 782.99 to 782.49 m: 60686 (50 cm thick). The large block described under the section on the filling of the well (see **figs 41-42**) was found in it. This layer and the next contain a large amount of large shapeless blocks;
- from 782.49 to 782.19 m: 60689 (30 cm thick);
- from 782.19 to 781.49: 60692 (70 cm thick). This layer contains fewer blocks and the earth is softer. It yielded one fragment of stone basin (note that the level of the bedrock in the well is at 782.09 m).
- then follow 60694 and 60696, down to 781.09 m, where the excavation stopped in 2011.

### *The masonry of the well*

The masonry of the well is made of courses of white sandstone blocks which are of much higher quality at the top than at the bottom, with much larger blocks in the first four courses (**fig. 46**). The join between the blocks is made of more or less hard earth mortar and there is no trace of coating, which is not surprising. On the west side of the well, we have counted fifteen courses. None of the blocks bears toolmarks and those of the upper part of the masonry are homogeneous, which shows they are probably not reused blocks taken from another building. At the junction between the lining and the bedrock, some grey mortar was used in places (**fig. 47**).

### *The overflow*

The well was equipped, on its northern side, with an overflow. It is made of a single flat stone, 28 cm high, with raised edges, thus forming a canal (**fig. 48**). It slopes from south to north and the difference of level between its southern and northern ends is 6.5 cm. It is laid on wedging stones, on top of a block which protrudes a little bit from the masonry of the well (**fig. 49**). This shows that the overflow was probably part of the initial building project of the well. The upper surface of the block (in the middle of it) is at 784.27 m, i.e. 0.82 m below the preserved top level of the well (it is laid on the fifth course of the masonry). It seems as if the block used for the overflow was broken and repaired, as shown by the traces of mortar on the surface of its southern part. Note that the destruction layer which covered the overflow, *locus* 60697, was excavated only at the end of the season.<sup>13</sup> A coin, 60697\_C01, was found immediately above the surface of the overflow. According to the reading by Chr. Augé, it belongs to the owl, so-called ‘Himyarite’ group (late Hellenistic).

The overflow leads to a finely carved basin (the space between the grooves left by the drill spindle is between 1 and 1.5 cm). Its dimensions are the following: external diameter 71 m, internal diameter 61 cm, thickness of the wall 5 cm, preserved height 31 cm. It contained (*locus* 60705) soft ash mixed with a few stones (fragments of basin, of basalt millstone, pebble), which means that it was probably used as a dump pit.

## THE FINDS

The finds are presented below according to the material with which they were made.

### **Metallic objects**

60667\_M01: bronze ring with a point of attachment (**fig. 50**). Its external diameter is 2.5 cm and internal is 1.8 cm. The section of the ring is circular on one side and oval on the other side.

60704\_M01 (**figs 51-52**): small bronze figurine representing a bird of prey (see the characteristic eyebrows) in “imperial” posture, probably an eagle, with hooked beak, projecting chest and opened wings (not spread wings). The left leg thrusts out and the head is slightly turned to the right. The wings are symmetric and join each other at the back to form the tail which in turn joins the stand. This small object, found on top of IGN 132, was probably a votive offering.

60681\_M01 (**figs 53-56**): bronze casket which had been fitted into the small space left between wall 60666, basin no. 1 and a stone laid flat (see **fig. 27**). It was certainly put there on purpose, possibly to hide it, if not just to put it away in the right place. It was laid flat, resting on its feet. It is a casket with six compartments radiating out from a central circular space (diameter 17.5, height 12.3 cm). The thickness of the walls is 0.6 cm inside and 0.7 cm for the outside wall. Three compartments show on their bottom a black deposit (ash? see **fig. 53**) while the others still contain earth.<sup>14</sup> The walls between the compartments were made of plaster, except for their upper part, which was made of a metallic stem, 0.8 to 1.4 cm high and 0.6 cm wide (however, in one case at least, the plaster covers also the stem). It is difficult to say whether the plaster covered also the bottom of the compartments. In some of them, the metal appears, in others it is covered with earth.

13. We are not sure to which *locus* this corresponds in the well.

14. The compartments have not been cleaned because we thought it was preferable to leave this to a professional restorer.

The casket rests on three feet (5.3 cm high) which were originally decorated with human heads, only one of which is relatively well preserved. When one looks at the casket from above, the feet are invisible. The head is probably male and it is framed with a crenellated motif which reminds us of the crowsteps of the tomb façades (**fig. 57**). The hair appear like a flat band which comes down to the level of the ears. The pupil of the left eye is marked by a circle in relief. The outline of the mouth is not very clear and it is not certain whether both lips are represented. The bust is protruding forward but nothing is visible on it.

The closer parallels to this casket are to be found in three regions of Yemen:

- Jawf (illegal excavations, photograph M. Arbach in 2004): ‘Aqîl and Antonini 2007, no. II.C.a.6, p. 200 (**fig. 58**): casket with two compartments, ring-shaped base, lid decorated with feline head. Date: 1<sup>st</sup>-3<sup>rd</sup> c. AD? Private collection.
- Awsân (provenance necropolis and temple?):
  - ‘Alî ‘Aqîl and Antonini 2007, no. II.C.a.1, p. 198 (**fig. 59**): casket with four compartments, three lion paw shaped feet, lid. Diam. 16 cm; h. 7.7 cm. Date: 1st-3rd c. AD? Aden National Museum 2627;
  - ‘Alî ‘Aqîl and Antonini 2007, no. II.C.a.2, p. 199 (**fig. 60**): casket with four compartments, ring-shaped base, lid. Diam. 13.9 cm; h. 6.7 cm. Aden National Museum 1446;
  - ‘Alî ‘Aqîl and Antonini 2007, no. II.C.a.3, p. 199 (**fig. 61**): casket with two compartments, three bull paw shaped feet, lid. Diam. 8.5 cm; h. 5 cm. Aden National Museum 28;
  - ‘Alî ‘Aqîl and Antonini 2007, no. II.C.a.4, p. 199 (**fig. 62**): casket with one compartment, three bull paw shaped feet, lid. Diam. 8.5 cm; h. 5 cm. Aden National Museum 543;
- north of San‘â, site of al-Huqqa: Rathjens and von Wissmann 1932, p. 86, fig. 44 (**fig. 63**) incense-burner made of a flared tripod on three lion’s head shaped feet (or bull-hoofed shaped feet? See Avanzini). Diam. 11.8 cm; h. 8.7 cm;
- Zafâr, Khor Rori: Avanzini 2008, p. 394, 396, pl. 33 p. 446, no. 868 (**fig. 64**): incense-burner made of a hammered tripod on three lion paw shaped feet soldered to the bowl. Three triangular openings in the base, clogged by ash, were used for ventilation. It contained remains of burnt substance. It may have had a perforated lid. Diam. 12 cm; h. 8 cm. According to A. Avanzini, bronze incense-burners are quite rare in South Arabia and less than a dozen are preserved.

There are thus, it seems, two categories of objects which have the same form as our object: compartmented caskets (with one to four compartments) and incense-burners. The fact that 60681\_M01 has six compartments and no holes for ventilation in its base makes it likely that it was used as a casket rather than as an incense-burner, despite the traces of burnt material in some of the compartments. It may have been used, however, to store incense or cosmetics. The marks visible on the top may be the traces of the soldering of a lid but this is not certain. Other parallels to these caskets, according to ‘Alî ‘Aqîl and Antonini (2007, p. 68) are to be found in Egypt, in Neo-Babylonia but mainly in Hellenized Asia: Bactria (Aï Khanoum for example).<sup>15</sup> It is the first object of this kind found in the Nabataean realm and, in this respect, it deserves attention and care. It would be interesting that the burnt material which can be seen inside is analysed before it is cleaned. Several small bronze fragments of rings or plaques were also found in various layers.

### Stone objects

60653\_S01 (**figs 65-67**): incense-burner in white sandstone. Its preserved height is 28 cm and its maximum width is 23 cm. Its original thickness was probably 18 to 20 cm, which makes it more or less square in section. Three sides (the fourth is broken) are decorated with horns and it has a small cavity on the top.

15. References in ‘Alî ‘Aqîl and Antonini 2007, p. 68.

60682\_S01 (**fig. 68**): small mortar in polished sandstone, probably used to mix products in small quantities. Its maximum diameter is 5.5 cm and it is 2.9 cm high.

60682\_S02 (**fig. 69**): small rounded weight made of polished stone. It is 3.2 cm in diameter and 1.1 cm thick. The edges of the central hole are not very worn and the diameter of the latter varies from 0.8 to 1 cm.

### Coins

Sixteen coins were found in the area of IGN 132 in 2011. They have not been cleaned yet and only a preliminary reading was given by Chr. Augé. Six coins belong to the owl, so-called ‘Himyarite’ group, which may be dated to the late Hellenistic period (2<sup>nd</sup> c.-1<sup>st</sup> half of the 1<sup>st</sup> c. BC?),<sup>16</sup> one belongs to the H/O Nabataean group (1<sup>st</sup> c. BC?)<sup>17</sup> and one is a still unclear Roman provincial coin (60648\_C01). The others are Nabataean, some possibly attributed to Aretas IV.

## INTERPRETATION

At the turn of the christian era, perhaps at the end of the 1<sup>st</sup> c. BC or at the beginning of the 1<sup>st</sup> c. AD, a high place was installed on top of IGN 132, in the northern part of the residential area of ancient Hegra. The date, which is still provisional, is given by the pottery which was found in a pit in the north-western angle of the rectangular platform defined by the enclosure wall: the painted sherds found in the two layers excavated in the pit – *loci* 60702 and 60703 – are characteristic of the so-called “2 red lines type” Nabataean fine painted ware. The entrance to the open-air courtyard was probably on the northern side of the enclosure wall, but it is not certain whether it was in the center (there is no trace of threshold). The access to the high place was originally given through a rock-cut staircase which was destroyed when the ceiling of the rock-cut chamber IGN 132a collapsed. This access was marked, at the foot of the outcrop, on the west, by two “pillars” which are all that remains of a possible monumental gateway to the sanctuary. When the ceiling of IGN 132a collapsed, the access was replaced by a ramp which met up with what was left of the staircase.

Roughly in the middle of the rectangular enclosure, a paved platform was protected by a *tetrapylon* which is visible only through the traces of the imprints of four columns. Apart from the slabs of the pavement, the only element *in situ* is a rectangular ashlar, fixed to the slabs with mortar on the southern edge of the platform. The whole installation is orientated almost exactly north-south, which is most probably not a coincidence.<sup>18</sup> Considering that this is the best orientation to follow the course of the sun, it is possible that this high place was devoted to the cult of the Sun God. Indeed, the whole installation reminds us of Strabo’s text (Geography, XVI.4.26): ἥλιον τιμῶσιν ἐπὶ τοῦ δώματος ἰδρυσάμενοι βωμόν, σρένδοντες ἐν αὐτῷ καθ’ ἡμέραν καὶ λιβανωτίζοντες, “they worship the sun, building an altar on the top of the house, and pouring libations on it daily and burning frankincense”. The discovery of a stone incense burner and of a casket which may have been used for storing incense, are arguments in favour of this interpretation, despite the fact they were not found directly associated with the platform. A portable betyl, an altar or an offering table may have been installed on or near the rectangular ashlar. The three niches with betyls which are carved on the western and southern faces of IGN 132 are most probably linked to the presence of the high place on the top, but the relative chronology between these installations is impossible to determine. The cult of the sun god among the Nabataeans was recently given attention by J. Healey<sup>19</sup>, who mentions a

16. 60648\_C02 (destruction south of basin no. 1), 60660\_C02, C04 and C08 (collapse west of the well), 60668\_C01 (around basins, above layer on which they are installed), 60672\_C01 (destruction).

17. 60682\_C01 (fill of pit south of wall 60666).

18. There is a difference of 12° to the east.

19. 2011, no. XXI, p. 41-45.

Greek inscription from Suwaydâ', in southern Syria,<sup>20</sup> in which Dûsharâ is called ἀνικῆτοι, “unconquered”, and this epithet is characteristic of the sun deity (*Sol invictus*).

The hypothesis of the existence of a monumental building on top of IGN 132 is valid only if one considers that the blocks which were found in the destruction layers at the foot of the eastern site of the outcrop come from it. Moreover, one has then to assume that the building, whatever its form, was dismantled deliberately, possibly with the view of reusing the blocks, most of which are of very good quality. If such was not the case, one would have to explain why the blocks would have fallen on one side of IGN 132 only. This deliberate destruction was done in a thought out way: the blocks were sorted (“bad” ones in the well, “good” ones north of the well) and the destruction did not affect very much the area where basins no. 1 to 6 were installed. It is certain, however, that as soon as the building was destroyed, the well was no longer in use, unless the blocks which were found in it came from somewhere else, i.e. from the lining of the well itself. The estimated number of blocks which have been extracted from the well reaches *c.* fifty units, to which should be added the small blocks which were thrown away in the excavation dump. If one considers that the last preserved course of the lining of the well (at the top) is the original upper course (which is probable but difficult to prove), 29 blocks are missing in the upper three courses of the lining.<sup>21</sup>

In theory, there is no need to reconstruct a building on top of IGN 132 and one has to imagine the difficulty of dragging up the blocks, which came from a distant quarry.<sup>22</sup> In addition, the platform was self-sufficient and had the requested installations for a place of worship: open-air platform, part of which was protected by some sort of baldaquin supported by four columns, altar in the south. Nevertheless, the hypothesis of an upper building is the only one we found so far to explain the presence of the blocks in the destruction layers excavated in 2010 and 2011 and we think it is quite safe to assume that there was indeed a monumental structure there, of which very little is left.

One parallel to our installation may be found in Petra. It is around and on top of an outcrop standing on a large terrace, in the M'aysrah ridge, and it bears number 520 in G. Dalman's catalogue<sup>23</sup> (figs 70-73). The bottom part of the outcrop is occupied by several rock-cut chambers (Dalman no. 519). Two partly destroyed staircases lead to the top, one in the north (a) and in the south (m). The latter, which has several flights, was very well cut. On the top of the outcrop, several installations were recorded: a bench (d), a block interpreted as an altar (c), basins (g, h), cup holes (j, k), a possible *stibadium* (l), etc. The surface is covered with sediments and it would be worth clearing it. It is indeed most probable that other features will appear. The relative chronology between the installations at the top and those at the bottom is difficult to determine but if the hypothesis that the top building was dismantled and that the blocks were thrown down and sorted out is correct, it means that the well is earlier than the destruction of the building. It is also probable that the presence of the well is closely linked to that of the sanctuary and that both were installed more or less at the same time. As for the relationship between the well and the basins to the north, it is difficult to be more precise for the moment. At least some of the basins were filled with water by hand (basins no. 1-3 may have received rain water directly from the top, although this is not sure) and if such was the case, the nearby well would have been a very good source of water. This would mean, in turn, that the well and the basins are more or less contemporary.

20. Waddington 1968, *IGLS*, no. 2312.

21. Considering that each course contains 12 or 13 blocks and that 2, 3, and 5 blocks are preserved in the three upper courses (thus  $3 \times 13 = 39$ , minus  $10 = 29$ ).

22. The closest quarries which such white sandstone are on the slopes of the Jabal Ithlib.

23. Dalman 1908, p. 286 fig. 231.

## PERSPECTIVES

The area around and on top of IGN 132 is very interesting because it yielded both a religious monument and a complex water management system. The chronology of these installations still needs to be precised but the general layout is now understood.

Apart from the chronology, the orientations for future excavation seasons are the following:

- it would be good to go on emptying the well, at least until one reaches the abandonment layer which was deposited after it was last used in antiquity. This requires preliminary strengthening of the lining in order to prevent any collapse of the masonry while the workmen are in it;
- the area between the well and the northern protective wall, 60676, needs to be fully excavated, down to the bedrock, in order to understand the relation between the structures;
- the north-western area on top of the outcrop still needs to be excavated down to the bedrock. This will be done rather quickly;
- it may be worth doing a sounding south of the outcrop in order to determine whether the structures there are of religious nature or whether they are, as is the case in the west, domestic;
- finally, it may be worth determining what happens between the south-western rock face of IGN 132 and the domestic quarters excavated in 2003.

The area east of the well, which slopes down rather sharply, was probably filled in with rubble after the well was built. This area is therefore probably not a very interesting one to excavate.

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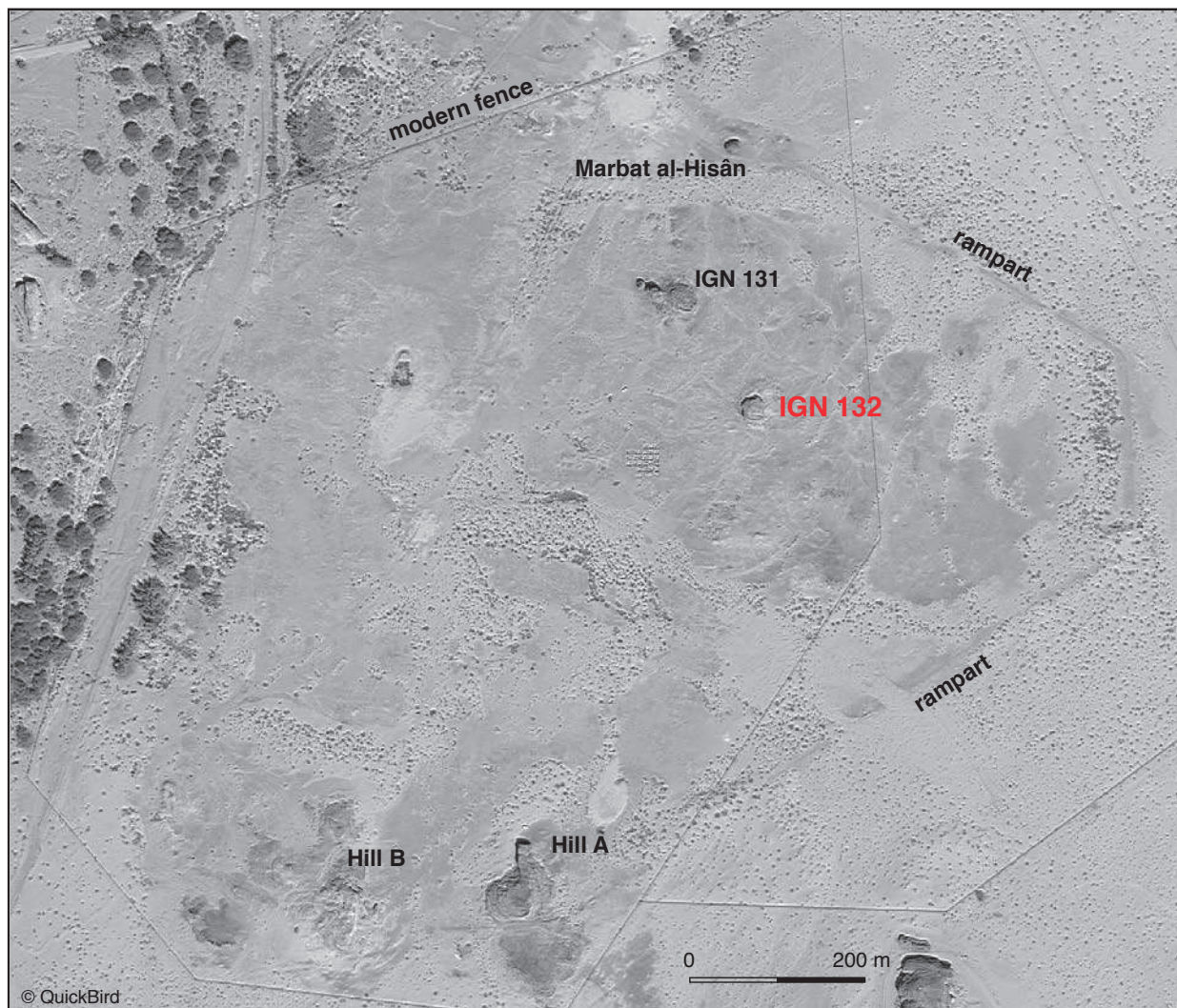
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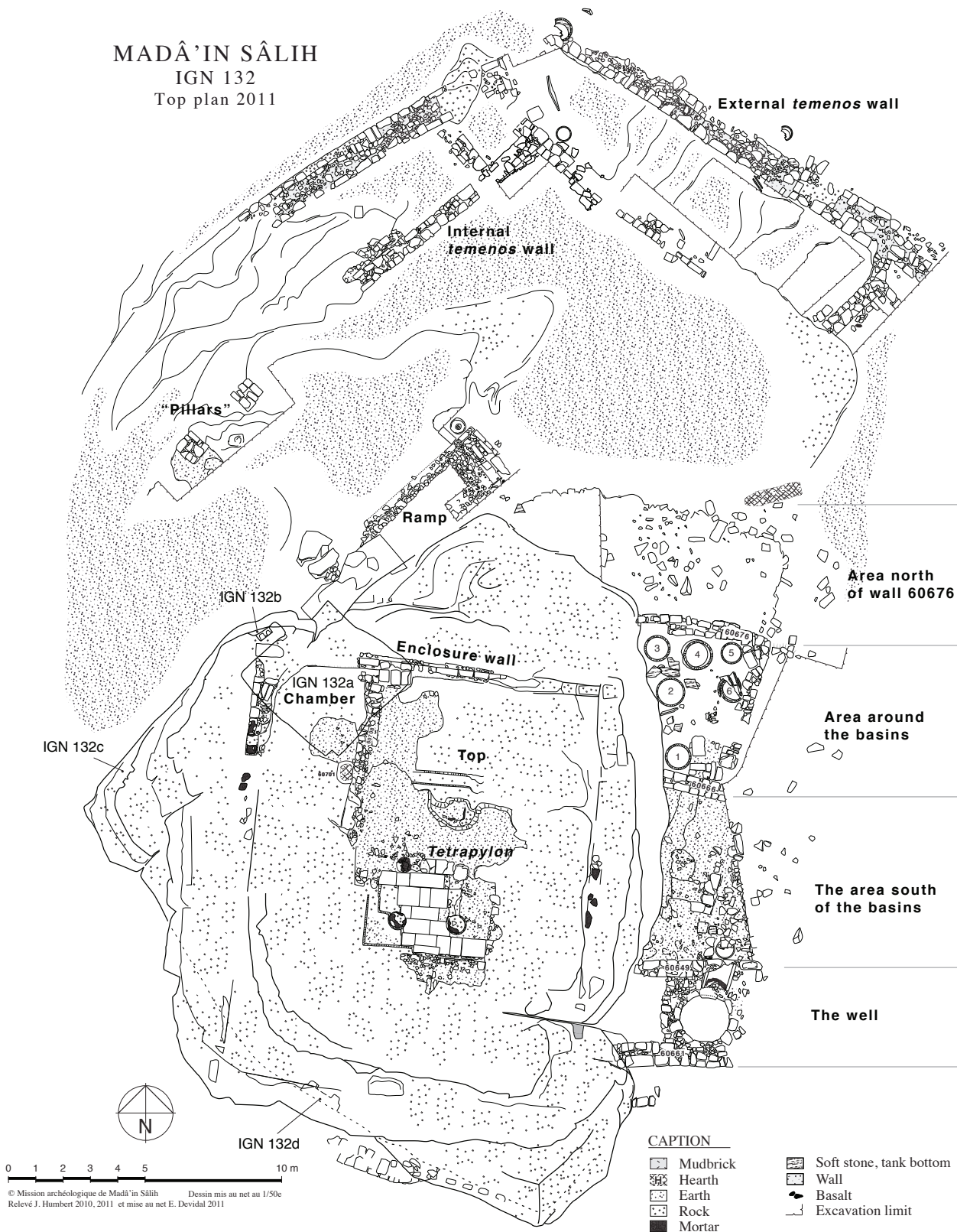
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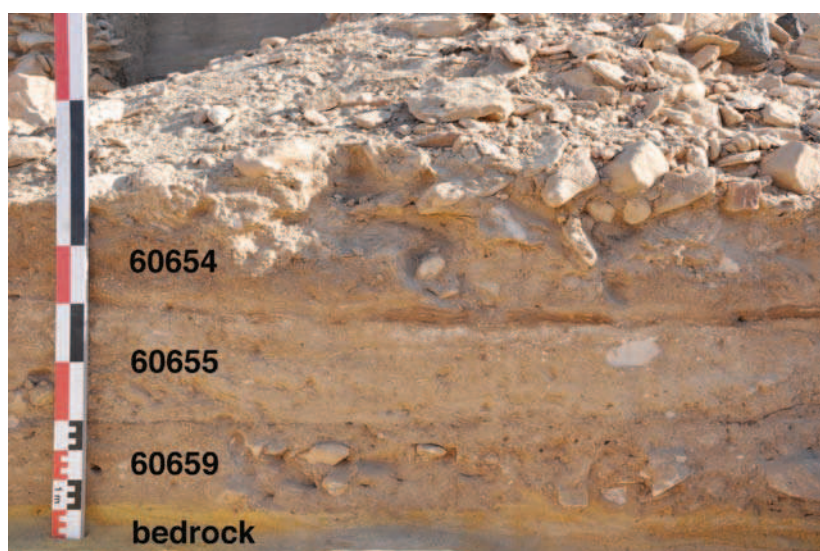
**Fig. 1** Satellite image of the residential area showing the location of IGN 132



**Fig. 2** General plan of IGN 132 after the 2011 excavation season



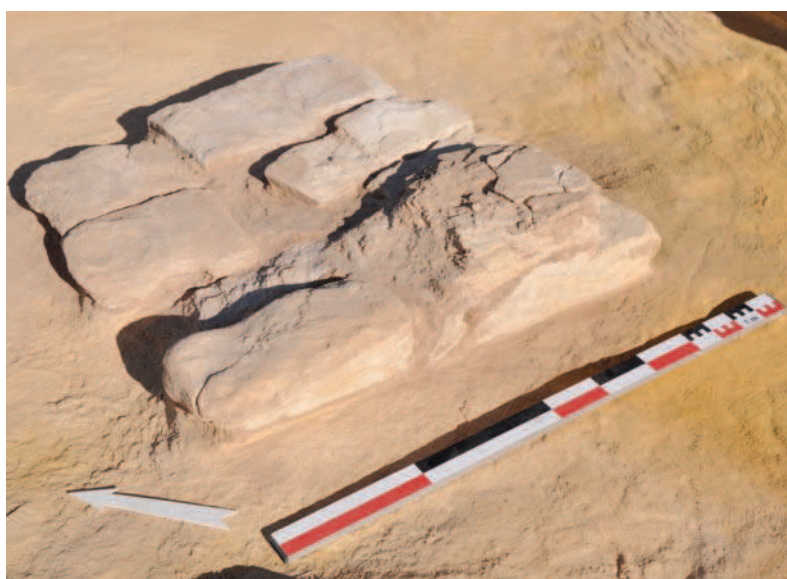
**Fig. 3** Kite view of IGN 132 at the end of the 2011 excavation season (photo W. Abu-Azizeh)



**Fig. 4** The stratigraphy of the layers which covered the two "pillars" west of the outcrop



**Fig. 5** General view, from the west, of the “pillars” which marked probably the original entrance to the sanctuary

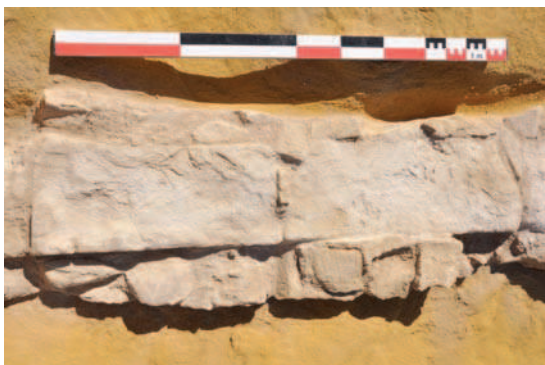


**Fig. 6** The north-eastern “pillar”

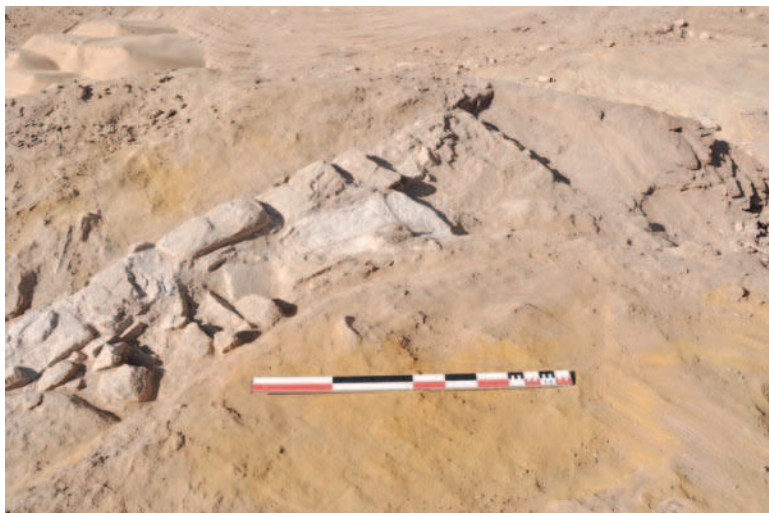


**Fig. 7** View of the rock-cut chamber IGN 132a showing the collapse of the ceiling

**Fig. 8** Part of the ramp which was installed to the left of the rock-cut chamber IGN 132a after the ceiling collapsed



**Fig. 9** A small portion of the northern enclosure wall on top of IGN 132, showing how the wall was built

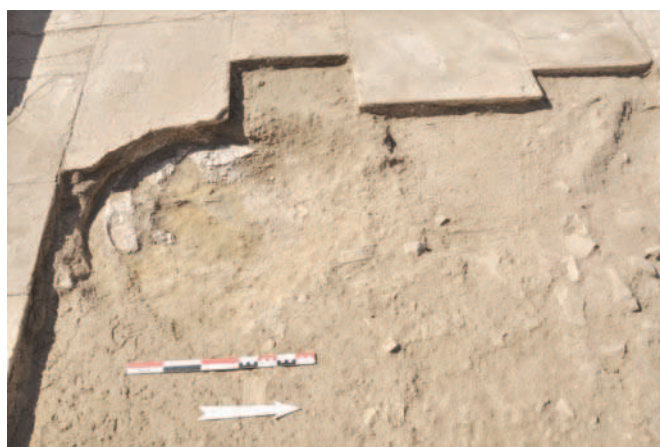


**Fig. 10** The north-western angle of the enclosure on top of IGN 132, showing how close to the edge of the outcrop it was built

**Fig. 11** The building techniques used for the western enclosure wall on top of IGN 132: the blocks and wedging stones make the best possible use of the bedrock and carefully follow its level



**Fig. 12** IGN 132, paved platform. The preparatory layer on which the slabs are laid. Here in the area of the south-western column of the *tetrapylon*



**Fig. 13** IGN 132, paved platform. The preparatory layer on which the slabs are laid. Here *locus* 60698, in the area of the south-eastern column



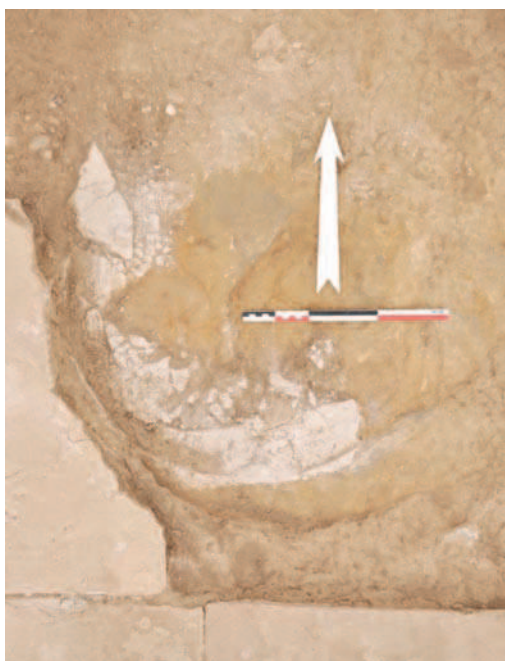
**Fig. 14** The paved platform from above, showing the area where the bedrock was not covered with slabs. The north is on the top of the photograph



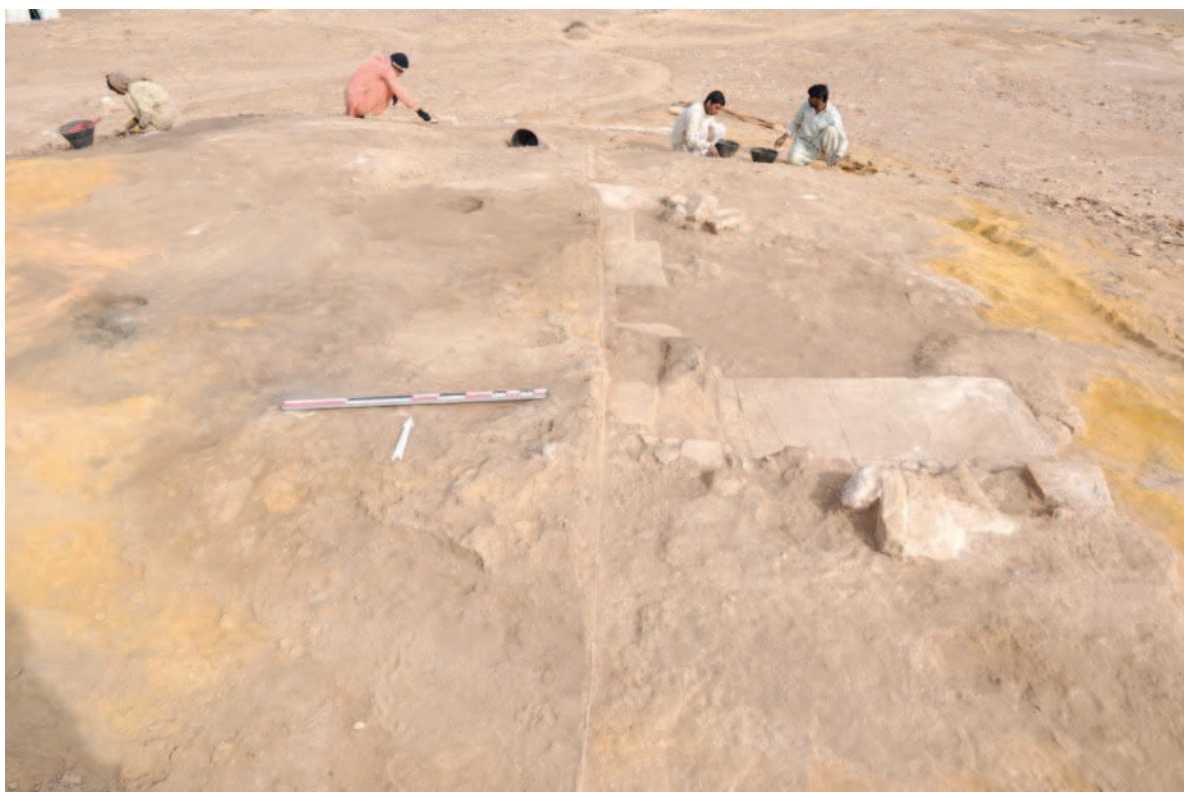
**Fig. 15** The rectangular block *in situ* on the southern edge of the paved platform



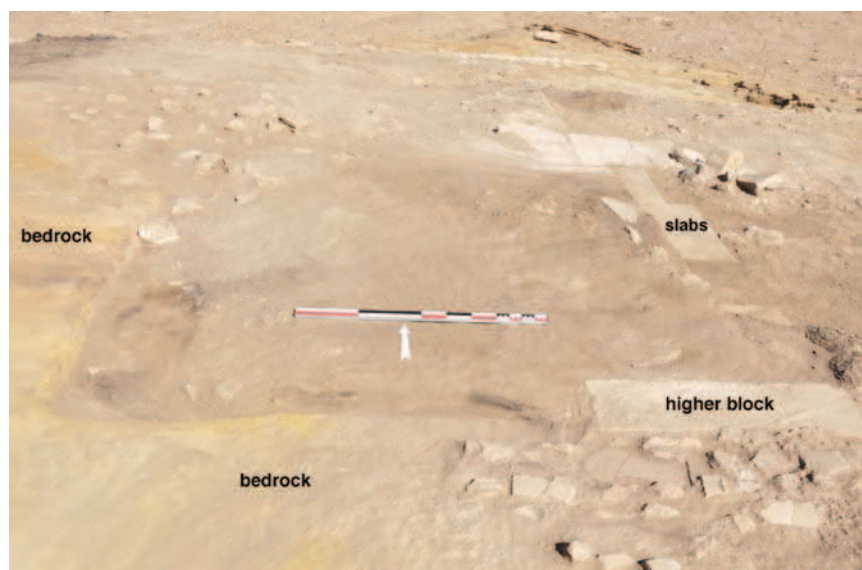
**Fig. 16** The "pit" of the south-western column. Note the traces of mortar



**Fig. 17** Detail of the mortar which was used to fix the column drums in the “pit”



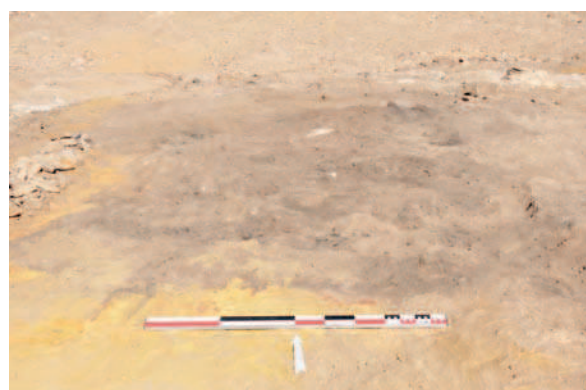
**Fig. 18** The eastern part of the top of IGN 132 with the north-south section, after the removal of *locus* 60667



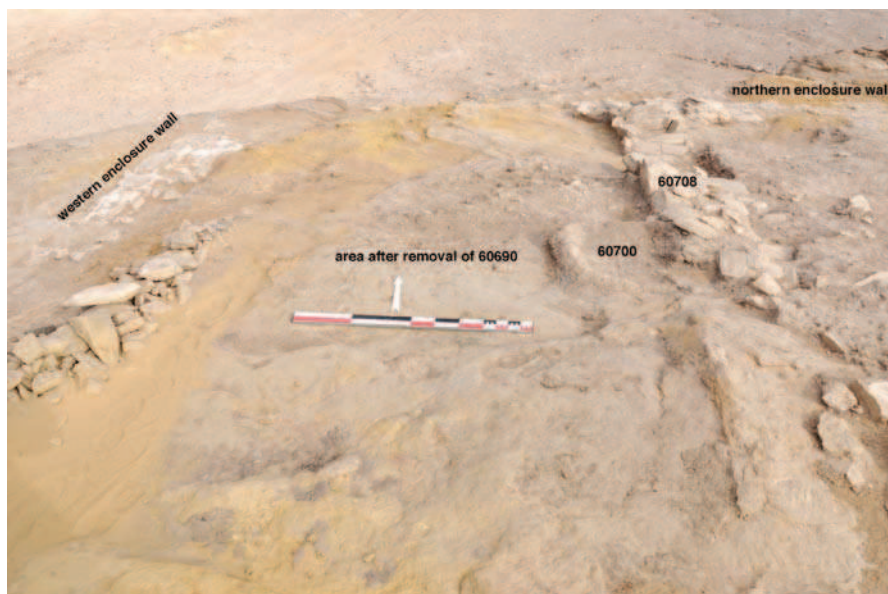
**Fig. 19** The top of IGN 132 after the removal of *locus* 60679



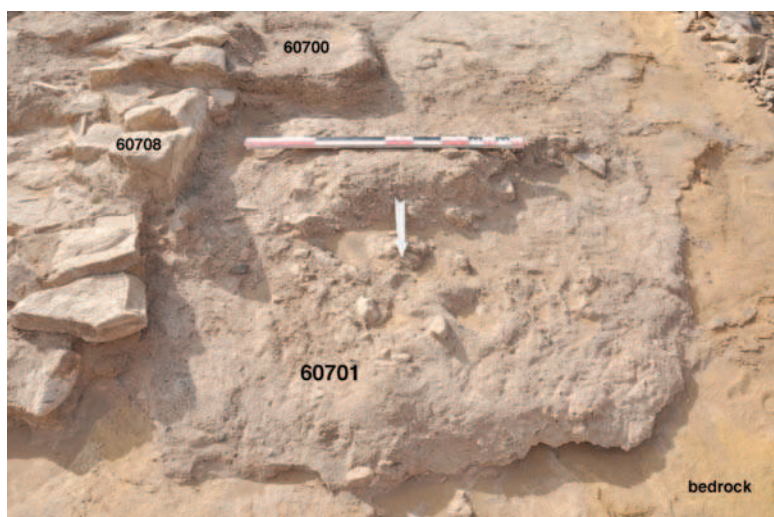
**Fig. 20** Top of IGN 132. Location of the spreading of ash, *locus* 60690, in relation to the other features



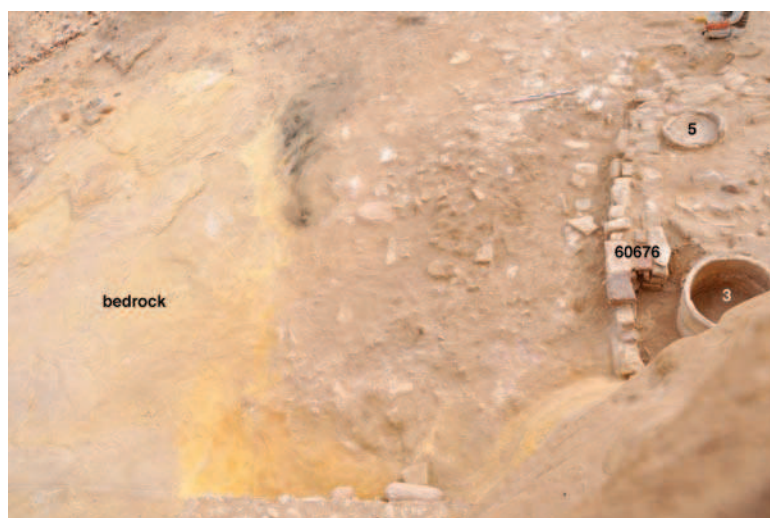
**Fig. 21** Top of IGN 132. Detail of the spreading of ash 60690 before excavation



**Fig. 22** Top of IGN 132. The area of *locus* 60690 after its removal and pit 60700



**Fig. 23** Top of IGN 132. *Locus* 60701 and pit 60700. To the east, wall 60708



**Fig. 23 bis** General view of the area north of wall 60676 after the removal of *locus* 60652



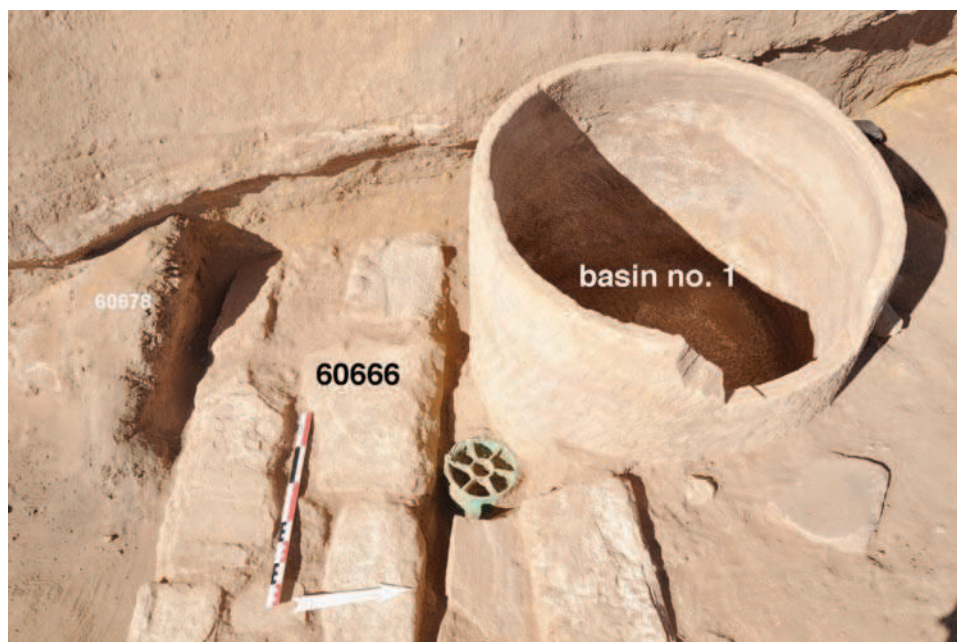
**Fig. 24** Area north of wall 60676. Fragment of cornice from *locus* 60652



**Fig. 25** Area between the basins and the well. Face of block bearing toolmarks, from *locus* 60648



**Fig. 26** Area between the basins and the well. Another face of block bearing toolmarks from *locus* 60648



**Fig. 27** Area between the basins and the well. Location of *locus* 60678 and original position of casket 60681\_M01



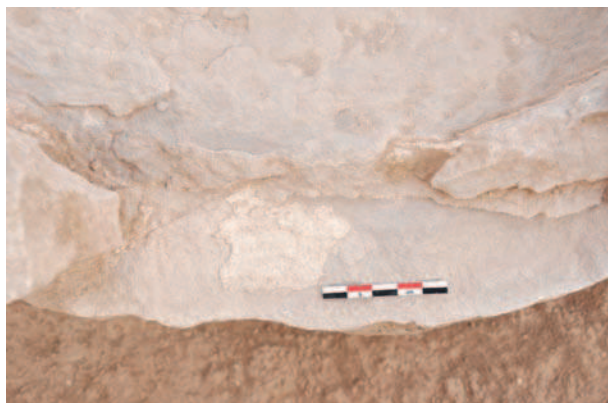
**Fig. 28** Area around the basins after the removal of *locus* 60668



**Fig. 29** Column drum with hollowed top from the 2003 excavations



**Fig. 30** Mason's mark on the column drum shown in fig. 29



**Fig. 30 bis** White layer resulting from the natural degradation of the sandstone in basin no. 5



**Fig. 31** Pit north of basin no. 3. Wall 60676, on the left, has probably been dismantled to create this pit



**Fig. 32** Basin no. 1, wall 60666 and the four blocks, roughly aligned, which may have formed steps



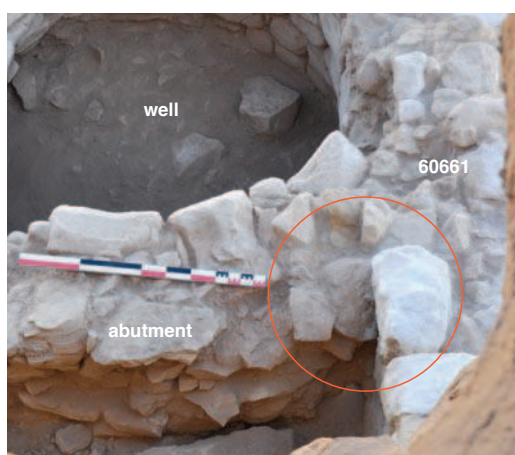
**Fig. 33** Area around the basins after the removal of locus 60665



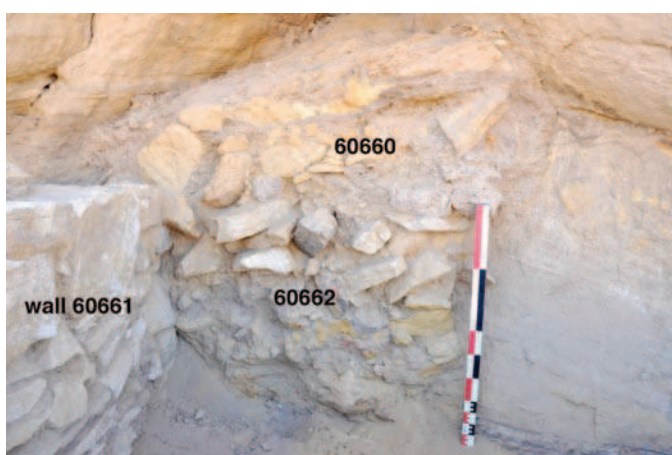
**Fig. 34** Pit north of basin no. 3 after the removal of *locus* 60650. In the section, one can see the foundation trench of the basin as well as the reddish layer 60656 which was cut by the trench



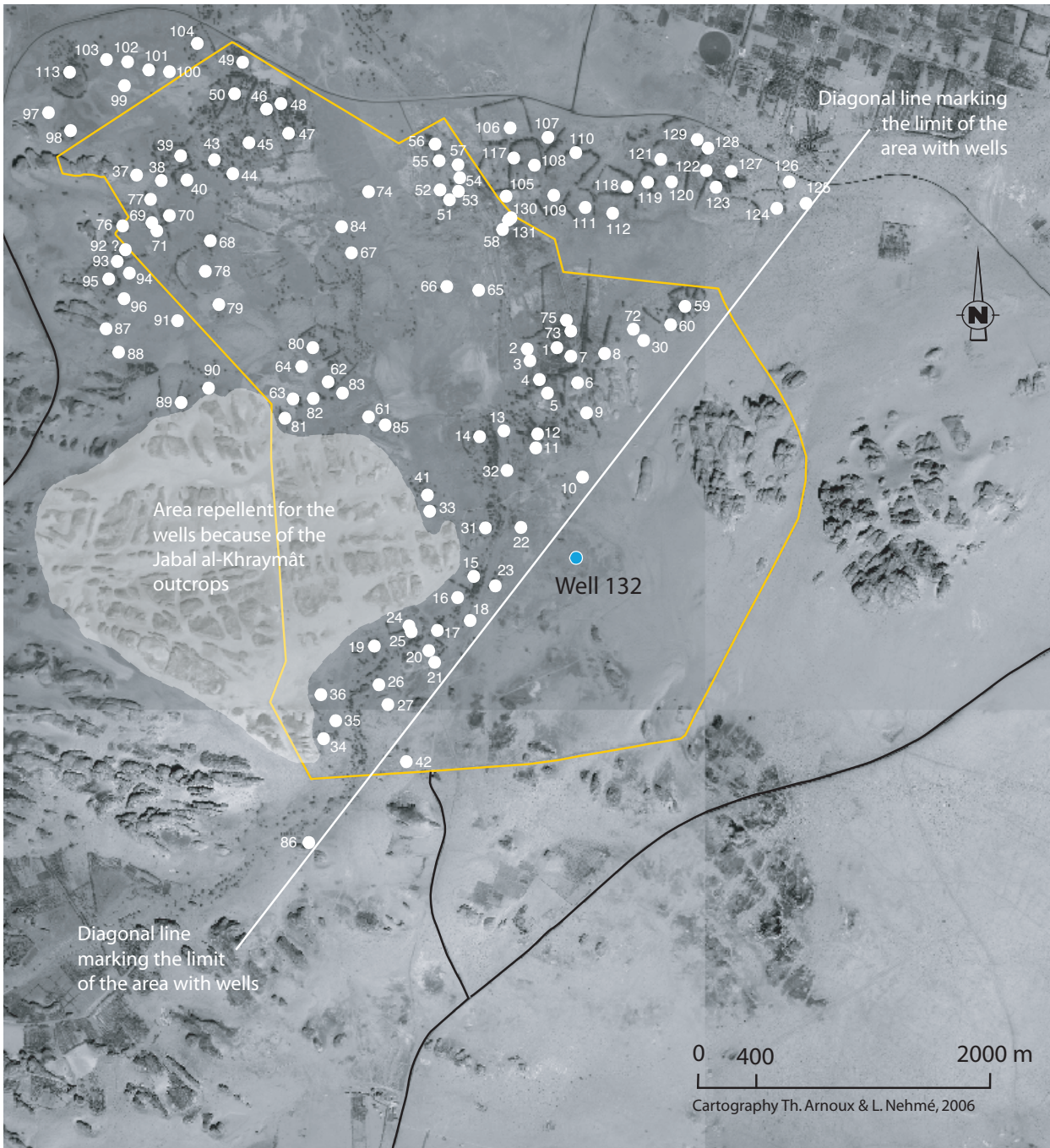
**Fig. 35** Eastern flank of IGN 132. The well was found below the crack which divides the outcrop in two



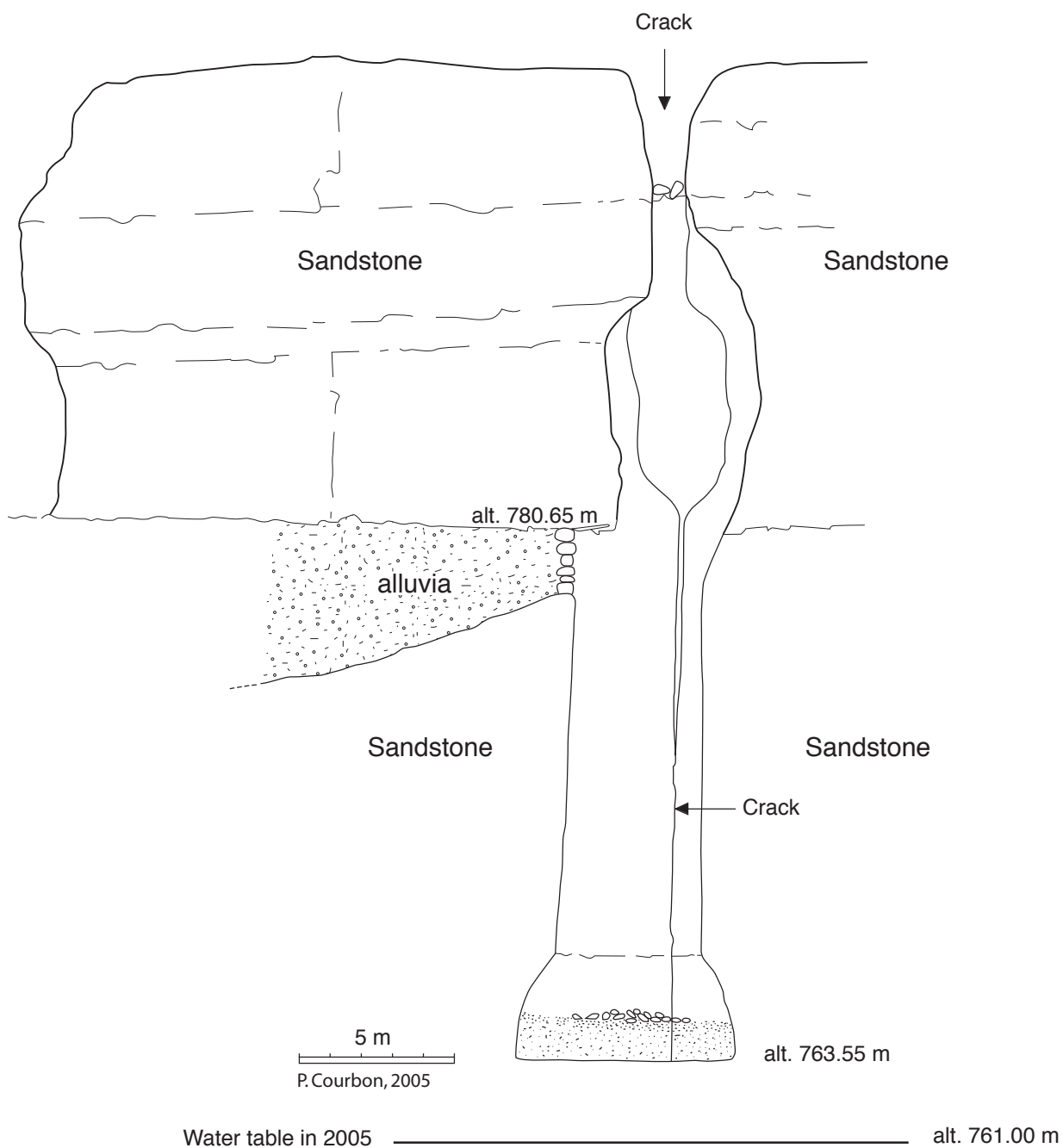
**Fig. 36** The stone in the centre of the red circle, which belongs to the abutment of the well, clearly goes under the boulder which forms the upper course of wall 60661



**Fig. 37** The filling of the space at the back (west) of the well



**Fig. 38** Distribution of the wells in Madâ' in Sâlih. Note that the new well is beyond the diagonal line which defines the limit of the area where they have been dug



**Fig. 39** Section of Bir Nabaṭī in the Jabal al-Mahjar (after Courbon 2008, fig. 16)



**Fig. 40** Notches carved in the bedrock on the eastern side of the well



**Fig. 41** Square shaped block with gutter found in the filling of the well



**Fig. 42** Carefully cut face of the square shaped block shown in fig. 41



**Fig. 43** Front face of a flat trapezoid ashlar found in the filling of the well



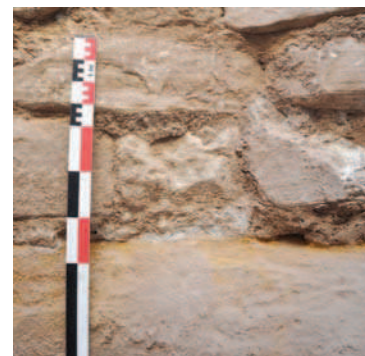
**Fig. 44** Filling of the well, *loci* 60670 and 60674



**Fig. 45** Filling of the well, *locus* 60680



**Fig. 46** The masonry of the well on the western side. Note the size of the ashlar, which are much larger at the top than at the bottom



**Fig. 47** The join between the masonry and the bedrock in the well



**Fig. 48** General view of the overflow of the well. The north is to the left



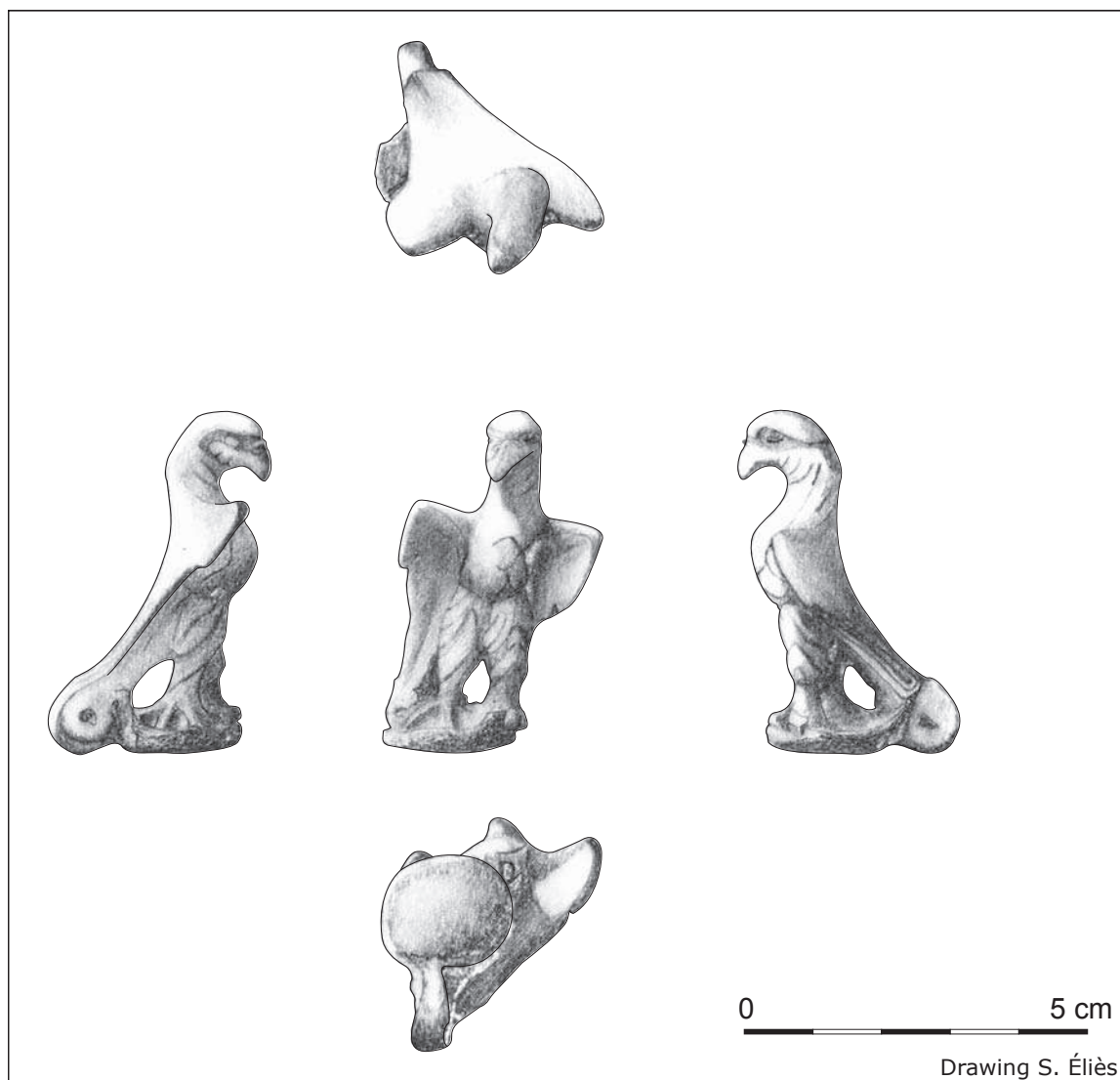
**Fig. 49** The overflow rests on a stone which is slightly protruding from the masonry



**Fig. 50** Bronze ring, 60667\_M01



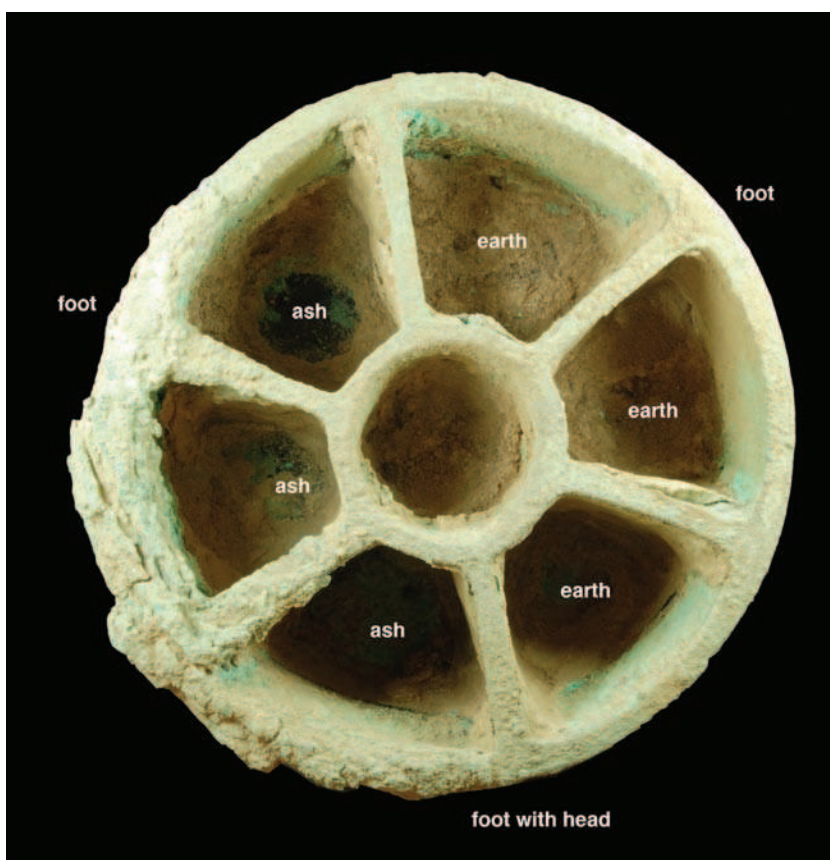
**Fig. 51** Bronze figurine representing an eagle, 60704\_M01



**Fig. 52** Drawing of 60704\_M01



**Fig. 53** Casket 60681\_M01, general view



**Fig. 54** Casket 60681\_M01, top view

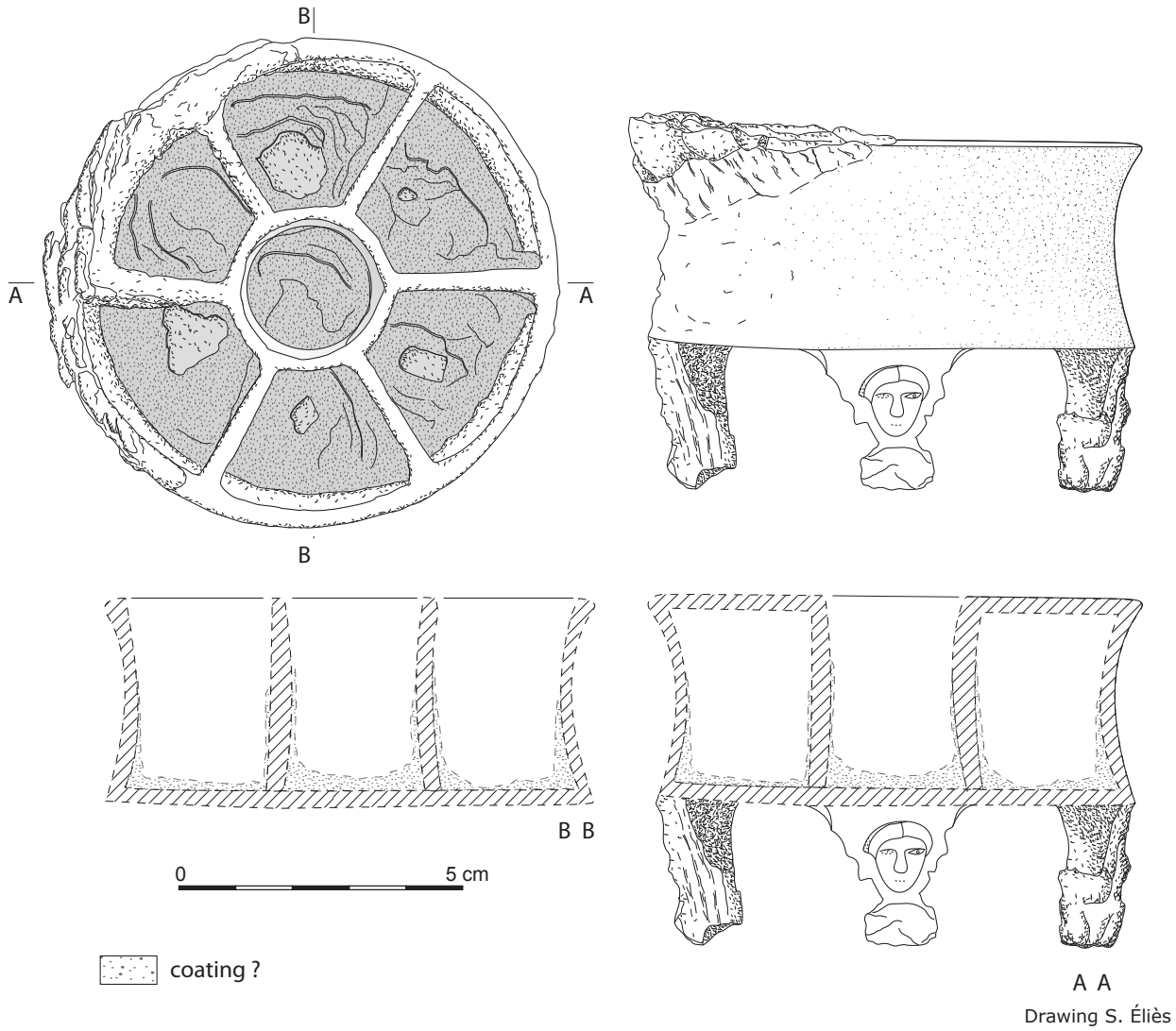


**Fig. 55** Casket 60681\_M01, lateral view

For **Fig. 56**, see opposite page



**Fig. 57** Detail of figure represented on one of the feet



**Fig. 56** Drawing of casket 60681\_M01



**Fig. 58** Bronze casket II.C.a.6 from the Jawf region  
(after 'Alî 'Aqîl & Antonini 2007, p. 200)



**Fig. 59** Bronze casket II.C.a.1 from  
Awsân (after 'Alî 'Aqîl &  
Antonini 2007, p. 198)



**Fig. 60** Bronze incense burner II.C.a.2 from Awsân  
(after 'Alî 'Aqîl & Antonini 2007, p. 199)



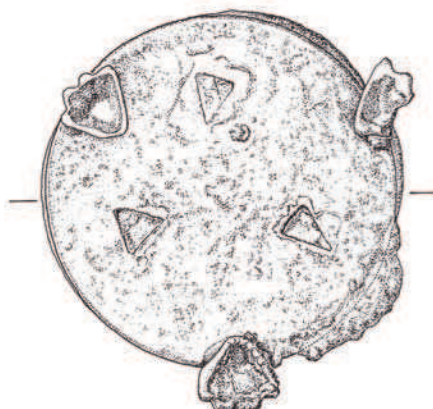
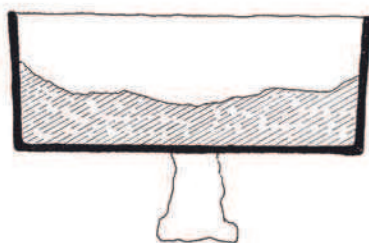
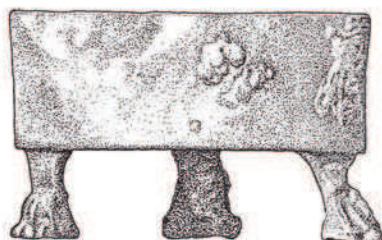
**Fig. 61** Bronze incense burner  
II.C.a.3 from Awsân  
(after 'Alî 'Aqîl &  
Antonini 2007, p. 199)



**Fig. 62** Bronze incense burner II.C.a.4 from Awsân  
(after 'Alî 'Aqîl & Antonini 2007, p. 199)



**Fig. 63** Bronze incense burner from al-Huqqa (after Rathjens & von Wissmann 1932, fig. 44)



**Fig. 64** Bronze incense burner from Khor Rori (after Avanzini 2008, pl. 33)



**Fig. 65** Stone incense-burner 60653\_S01, side



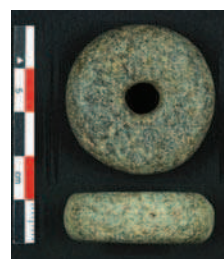
**Fig. 66** Stone incense-burner 60653\_S01, face



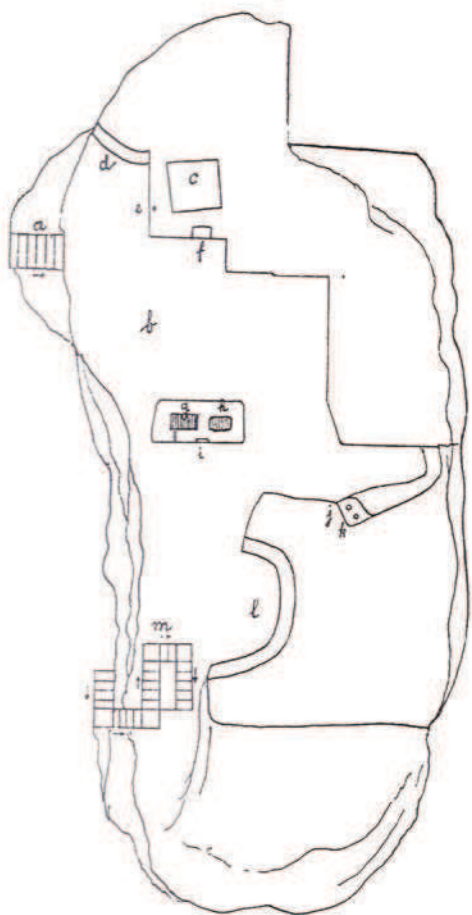
**Fig. 67** Drawing of stone incense-burner 60653\_S01



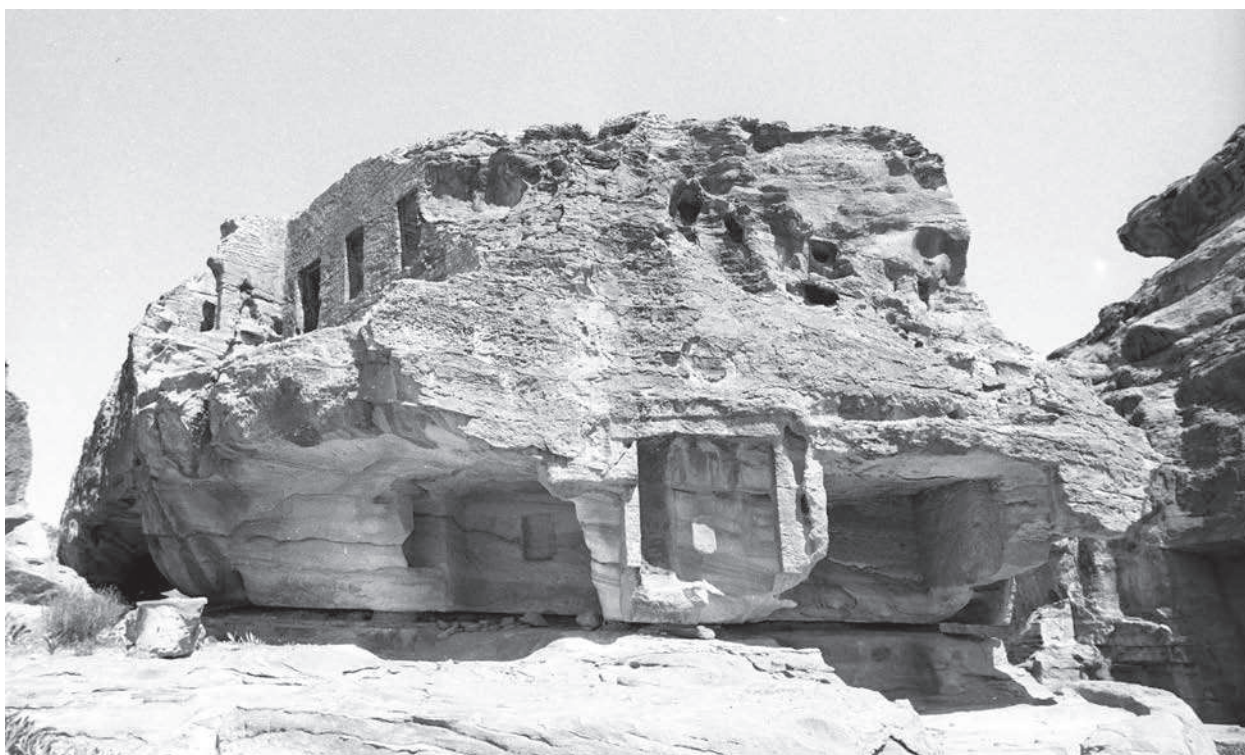
**Fig. 68** Stone mortar  
60682\_S01



**Fig. 69** Stone weight  
60682\_S02



**Fig. 70** Sketch plan of Dalman no. 520 in Petra (after Dalman 1908, fig. 231)



**Fig. 71** General view of Dalman no. 520 from the south



**Fig. 72** The southern staircase leading up to the top of Dalman no. 520, from the west



**Fig. 73** General view of the top of Dalman no. 520, from the north



## **Area 8**

Solène MARION DE PROCÉ (PhD student, University of Paris 1)



## Area 8

Solène MARION DE PROCÉ

The 2011 excavation season is the third and last one undertaken in Area 8. It was carried out between January 29<sup>th</sup> and February 25<sup>th</sup>, 2011.

The main goals of this season were to establish a more precise chronology of the different buildings identified and, if possible, to determine their function. Therefore, we decided to focus on specific phases, particularly the most ancient ones, in some of the soundings.

Since we concentrated our attention on areas in which we had previously been working, we did not continue the excavation of the northern part of Area 8, which had been roughly scraped at the end of the 2010 season in order to obtain a larger plan of the structure.

In the present report, we shall present the work done in each sounding in 2011 before providing a summary on the chronology of the area.

### **NORTH-EASTERN AREA (FIG. 1)**

First, we wanted to reach the bedrock in the small sounding west of wall 80122 and north of 80180. We discovered an E-W oriented mudbrick wall abutted by sand containing some burnt artefacts. It seems likely that this is the eastern continuation of wall 80157 (see **figs 1-2**). It is difficult to say whether this wall 80157 continues further to the east because of the poor condition of the remains. The clayish layer (*locus* 80205) discovered east of stone wall 80122 may be understood either as melting of wall 80238 or as a continuation of wall 80157 that has almost disappeared (**fig. 3**). Nevertheless, it is clear that wall 80157 turns to the south, as has been evidenced by mudbricks following the same axis as wall 80122 (wall 80238, see **fig. 4**). *Locus* 80203 appears to be the result of the melting of the elevation of wall 80122, and this melting may be contemporary with or just later than the blocking of the door 80176. Melting 80203 has been covered with *locus* 80201, composed of sand, some clayish spots and silt. *Locus* 80201 may point to a period of abandonment just prior to Phase 2. It should be noted that the different phases are laid almost directly on top of each other, which makes it difficult to identify the floors associated with them. *Locus* 80205 consists of powdery soil. As it goes under 80122 and 80180, it may also indicate a short time of disuse after the levelling / destruction of wall 80157, just before the building of 80122 (alt. 778.27-778.33 m). North of wall 80157, we dug deeper and found the same layer of yellow sand that surrounds the mudbrick walls of Phase 1. The bedrock was only a few centimeters below this loose earth and below wall 80018 (alt. 778.03 m).

### **SOUNDING H (FIG. 1)**

This sounding, a 6 x 5 m rectangle, was opened to try to link soundings G and F. The few stones which were showing on the surface quickly turned out to be part of an E-W wall (80211, see **figs 5 and 6**). In order to obtain more manageable surfaces, we decided to divide the rectangle in two (sounding “H north” and “H south”) (see **fig. 1**). Note, however, that this is relevant only for the upper layers of the sounding.

The first *locus* we encountered is 80204 (over *locus* 80207) (alt. 778.78 m to 778.59 m). It is a thick layer of silty earth with broken and rare sherds (see **fig. 7**). This *locus* may belong to Phase 4, i.e. the last phase of occupation in Area 8. We recorded the presence of sherds belonging to a type which was dated by the ceramicists to the 4<sup>th</sup>-5<sup>th</sup> centuries AD. The last wall which seems to have been standing in this sounding is wall 80211 (60 cm wide, top 778.85 m, bottom 778.56 m). Wall 80211 has been attributed to Phase 2. The melting of the mudbrick elevation of 80211 has covered the last occupation levels associated with it. One of the features of these last occupation levels is 80217, where small to medium blocks and mudbricks have been gathered (alt. 778.60 m, bottom 778.57 m, see **figs 8-9**), perhaps to provide building material. The elements of *locus* 80217 were glued together by the melted clay coming from wall 80211.

In sounding F, we had encountered wall 80119, crudely built and badly damaged. In sounding “H south”, there are more artefacts in the western part of the square (where it was protected by 80211), than in the eastern part, where the soil is more clayish. Therefore, it seems that this building material was gathered at a time when 80119 did not exist yet. It may also be that wall 80119 was more exposed to the wadi flow and carelessly built, which explains why it suffered more when exposed to heavy rainfall. Next to feature 80217, on a surface of fine earth surrounding it immediately (*locus* 80216), we discovered a coin (80216\_C1) which was dated by Chr. Augé to the beginning of the 4<sup>th</sup> c. AD (reign of Constantinus). The other *loci* uncovered in “H south”, contemporary with feature 80217 and *locus* 80216, did not produce any complete pottery and few elements allowing for a dating apart from the Constantinus coin and the gathering of stones, both of which point to a late phase of occupation.

In “H north”, the occupation is clearly represented, in the corner of walls 80211 and 80118, by *locus* 80210 (778.73 m, see **fig. 10**), a 90 x 60 cm heap of broken sherds, pieces of fauna surrounded by very fine soil (*locus* 80218). It looks very much like a junk “pit” in a domestic context. All the successive occupations are of the same type: heaps of broken sherds and fauna. Only two courses of walls 80211 and 80118 were preserved and the first occupation *locus* associated with walls these walls is 80231 (alt. 778.57 m).

Under these walls, the type of pottery is strikingly different from the sherds in the occupation layers associated with walls 80211 and 80118. Luckily enough, after a short period of disuse (thin sand layers are visible in sections), mudbrick walls appeared which we were able to link them to those of soundings G and F (see **fig. 11**). Indeed, wall 80234 is the continuation to the north of wall 80192. Wall 80234 is running north-south along the western baulk of soundings G and H. In both soundings, G and H, this wall 80234 / 80192 is made of mudbricks only. In the eastern part of sounding “H north”, a course of mudbricks (top alt. 778.49 m, hence the same level as walls 80156 and 80157 in sounding F) protrudes from wall 80118. These mudbricks present the same curvature that had been noted in sounding F for wall 80156. Thus, it is almost certain that these mudbricks are the western face of wall 80156. It was not clear, from last year’s excavation, whether the stones we had seen in wall 80156 were a proper wall course or wedging stones placed here and there. The discovery of the western face confirmed that it is a stone course under a mudbrick elevation (three courses in section). Moreover, it became clear that this curved wall had been built in two phases (see **fig. 12**). The first one, Phase 1a, with walls oriented almost N-S and E-W, is laid directly on the bedrock, and only two courses remain of this initial building phase. Concerning the type of artefacts, we noted the same kind of soil as the *loci* surrounding the first courses of walls of Phase 1a. These *loci* consist of sand, heaps of big pebbles, small stone blocks, broken sherds and fauna in large quantity from bones of small animals to large dromedary bones. *Locus* 80235 is the first occupation layer of Phase 1b (see **fig. 13**). The *loci* associated with Phase 1b include fine Nabataean painted ware which can be dated to the third quarter of the 1<sup>st</sup> century AD (if the pottery study confirms that there are sherds belonging to Schmid’s phase 3a). A few sherds of *terra sigillata* also point to that period. This suggested dating concerns structures which had been attributed to Phase 2 in the report on the 2010 season.

At the level of the stone course of Phase 1b, we noted a possible foundation trench (humid yellow sand was abutting the wall).

The layers associated with Phase 1a no longer consist of clayish earth soil (as was the case for Phase 1b) but of plain sand with some clayish spots, very few sherds and stones either laying around or wedging the mudbrick walls of Phase 1a (**figs 14-15**). We extended sounding H to the east in order to find the eastern face of wall 80156. As we proceeded, we uncovered several hearths, with ashes and reddened earth or clay just under the level of the stone course of Phase 1b of 80156 (**figs 16-17**). Parallel to that, we discovered several similar hearths in hardened sand in the northern part of sounding H. These ones were also right under the stone course of the wall (**figs 18-19**). The hearths mentioned above are roughly at the same level (80266: 778.20 m; 80261 and 80262: 778.13 m; 80278: 778.10 m).

In order to get a better idea of the plan of the area during Phase 1, we had to remove wall 80119. We were then able to excavate south of wall 80157 and east of wall 80156. For this restricted area, we chose to focus on Phase 1 and reached it rather quickly (**fig. 11**). What struck us was the apparent width of wall 80156. Indeed, it seems to have been given an additional row of mudbricks, making it reach a maximum width of 1.10 m (see again **fig. 11** for top plan, and **fig. 20**). In the southern angle of 80157 and 80156, one row of mudbricks is protruding from the angle and follows a curved path to the south. At this level, we also found hearths at the same level as the ones mentioned just above. Parallel to wall 80157, there seems to be another one going east (80287), as suggested by a couple of bricks abutting 80156 on its eastern face (visible in **fig. 20**, bottom left). The stones used to reinforce the angle of later walls 80211 and 80118 were laid on top of blocks inserted in a mudbrick course of 80156. The stone blocks inserted in wall 80156 happen to be located at exactly the same distance from wall 80157 to the north and wall 80287 to the south. We stopped excavation at the level of the hearths east of wall 80156. West of it, we dug down to the bedrock: up to the level of the two remaining courses of Phase 1a, there was only sand with some spots of clay. Some of these spots caught our attention because they were circular in shape and a few centimeters deep (**fig. 21**). These may be the remains of former postholes. Finally, a white crust covered the bedrock in some places but it is most likely to be an alteration of the bedrock (**fig. 22**).

## SOUNDING I (FIG. 1)

Sounding I is located west of wall 80002, just north of sounding E (**fig. 23**). The aim there was to find out whether there were some other walls belonging to Phases 2 and 3, in order to complete the top plan of these phases. No additional walls which may be associated with walls 80001 and 80002 were discovered (note that these two walls have been attributed to Phase 3). Given their length, we expected to find walls which would have divided the space defined by them (see **fig. 1**). No new data related to these two walls was discovered. The *loci* associated with walls 80001 and 80002 consist of hardened mudbrick that seems to have flowed over the level of occupation. Feature 80239 (alt. 778.39-778.50 m, **fig. 24**) resembles feature 80217 encountered in sounding “H south” and is roughly at the same altitude. The first course of wall 80002 (**fig. 25**), near 80239, is founded just above the level of feature 80239 (778.55 m and 778.50 m). What comes to mind is that the building material was gathered in order to build walls 80002 and therefore 80001 as well. Feature 80239 shows fragments of basalt millstones, mudbricks and small blocks, i.e. the same kind of material used to build walls 80001 and 80002. Feature 80239 is therefore likely to be a heap of building material, as suggested for feature 80217. The *terminus post quem* for this phase is the 4<sup>th</sup> AD, given by the Constantinus coin found next to 80217 (see above). We also found what looks like cob, a spot of 42 x 42 cm (*locus* 80280, **fig. 26**), from an older mudbrick wall (wall 80146 most probably).

In the little time we had left, smaller soundings were made in the northern part of sounding I to check a hypothesis concerning Phase 1. We did find a course of mudbrick in the alignment of 80287 (see **fig. 1**) and it may be its southern face, but it is not certain.

## BUILDING PHASES IN AREA 8

The phases we had established after the 2010 season have been abandoned after reexamining the data in 2011. Indeed, it makes more sense to divide the occupation into four major phases, with subphases. We have given up the idea that there was no sustainable architecture in the first phase. Rather, it seems that the first occupation of the area was made of mudbrick walls (formerly Phase 2 in the 2010 report).

### Phase 1 (fig. 11)

Phase 1 is mostly made of mudbrick walls, often laid directly on the bedrock. The orientation of the walls is NE-SW and NW-SE. Some of them may have been covered with cob, as we have seen in sounding I (*locus* 80280). Considering wall 80234 / 80192, it is a very long structure, with no clearly attested door. Most of the preserved walls are surrounded by yellow sand with very rare artefacts. The division in two subphases, based on the excavation of the area west of wall 80156, is clear. This wall was built over older walls, only two courses of which were left when Phase 1b was laid, with a course of stone below the mudbrick elevation (fig. 27). The material associated with this phase in this sounding included fine Nabataean painted ware, which may date to the 1<sup>st</sup> century AD. It will be necessary to confirm this dating through the analysis of the pottery. As for the plan, it is rather unusual. If we proceed from west to east, we have a long roughly NE-SW wall (80192 / 80234), c. 1.5 m from another wall, 80156. The latter is probably almost as long, but it is either L-shaped or U-shaped. In this part of 80156, orientated NE-SW, the width of the wall ranges from 0.70 m to 1.10 m and mudbricks have been added against its eastern face. Walls 80157 and 80287 are parallel and abut 80156 on its eastern face. On the top plan, we have suggested that we found the eastern part of 80287, but only its southern face. There, it seems to be linked to wall 80146 in sounding E. Running almost in the axis of later wall 80122, wall 80238 seems to be linking walls 80157 and 80287.

No function can be attributed, for the moment, to the structures which belong to Phase 1.

### Phase 2 (fig. 28)

From the disposition of the walls following Phase 1, it seems that Phase 2 is mainly represented by wall 80122 and by the walls cleaned in the northern part of Area 8 in 2010. They do not follow exactly the same axis as the walls of Phase 1 (a few degrees to the east). Wall 80018 may also belong to this building phase. In the absence of any clear back wall chained with 80122 in the south, we must admit that wall 80039 was slightly reoriented to fit the new plan, and built over 80287. This first subphase, 2a, is also represented by walls 80118 and 80211 in the western part of the area.

In Phase 2b, the door 80176 in wall 80122 was blocked. The space north of 80039 was paved with roughly cut slabs, and wall 80008 became the northern limit of this pavement (80029). Wall 80008 is linked to 80118 with a couple of stones. Wall 80018 seems to have been cut at that time. Hence, in the southern part of the square, it seems either that everything was washed off or destroyed on purpose, or that no structures were built in Phase 2 in that part of Area 8.

Our hypothesis is that at the end of Phase 2, building materials were gathered here and there according to the will of the builders, in order to erect a wider structure. This would explain features 80217 and 80239.

### Phase 3 (fig. 29)

As we just explained, it seems that, at the end of Phase 2, building material was gathered in order to build – rather crudely – a large monument, with the same orientation as the one in Phase 2.

The slightly different orientation of wall 80002 may be due to bad building techniques. 80122 and 80118 were reused to build a larger complex extending south and opening to the south with walls 80001 and 80002. Walls 80004 and 80005 and large threshold 80160 were also built in Phase 3. The function of this

building is difficult to determine because of the washing off of all surface layers associated with it. The difference of orientation of wall 80002 has caused a deviation that seems to have been “corrected” with cobbles and blocking stones at the point of contact between 80002 and 80118. Moreover, wall 80008 has been elongated to the east to meet 80002, but this added part does not have the same axis as the original wall 80008. West of 80122, wall 80180 / 80119 has the same axis as 80008 to link walls 80122 and 80118. One coin, dated to the reign of Roman emperor Constantinus dates this phase after the 4<sup>th</sup> century AD. All that can be said is that this is a large, crudely built structure.

#### **Phase 4**

This phase is the last one in Area 8. The data concerning it is scarce and no new structure were attributed to it. Feature 80187 (an oven built over 80122) shows that it was an opportunistic occupation, reusing ancient buildings to establish little settlements here and there, with an elevation that is most likely to have been made of mudbricks. One feature is worth noting. Laid in the northern corner of walls 80119 and 80118, we found a heap of blocks, including a column base turned upside down and recarved to serve perhaps as an oil press, less likely as an altar cobbled with unused architectural blocks (feature 80114, see the 2009 report).

After the 2011 season, we are finally able to produce a new chronology for Area 8, specifically for Phases 1 and 3. With the confusing plan of this square, we have tried to give the clearest picture possible, and unfortunately, we still have to rely on several fragile hypotheses.

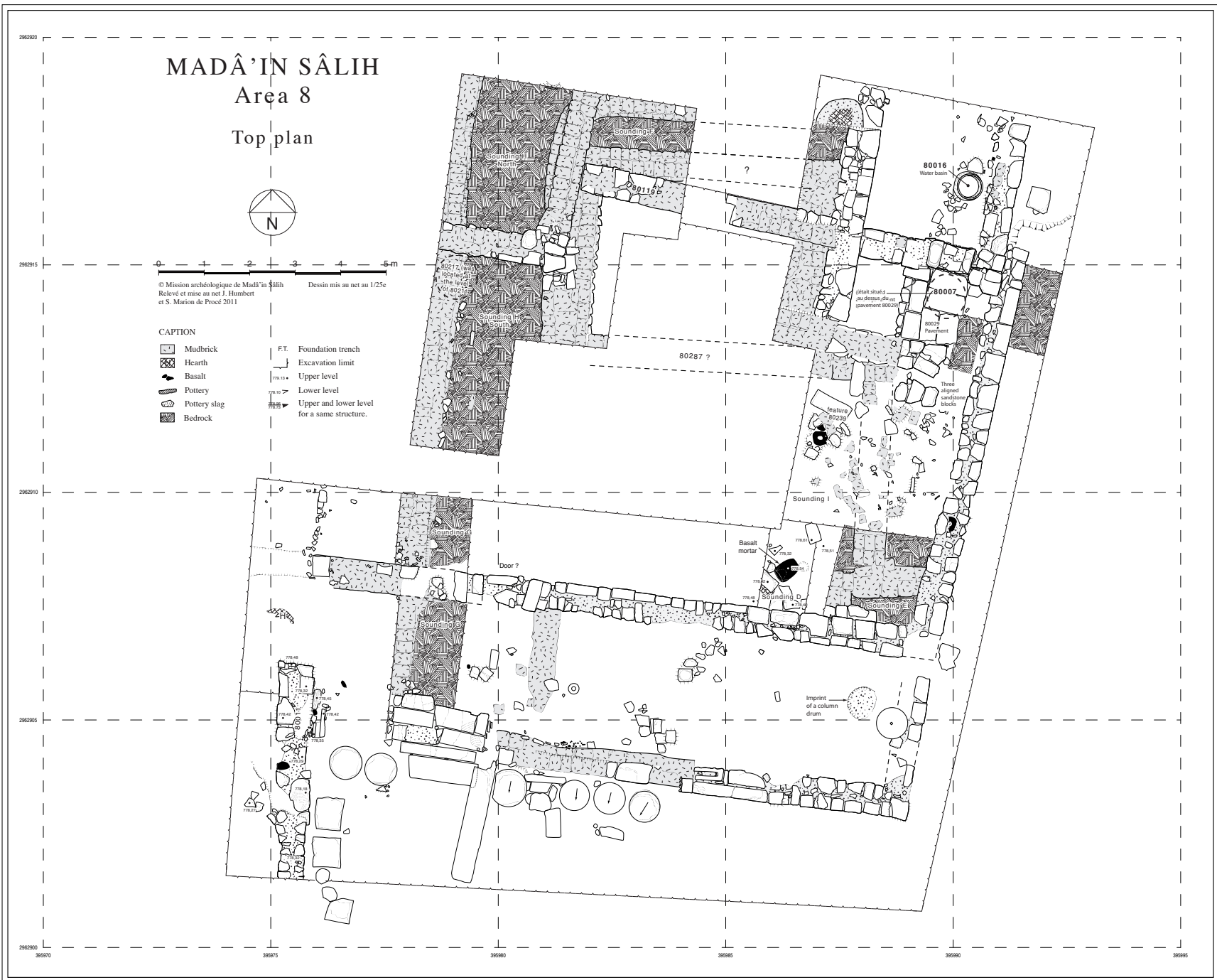


Fig. 1 Top plan of Area 8 at the end of the 2011 season

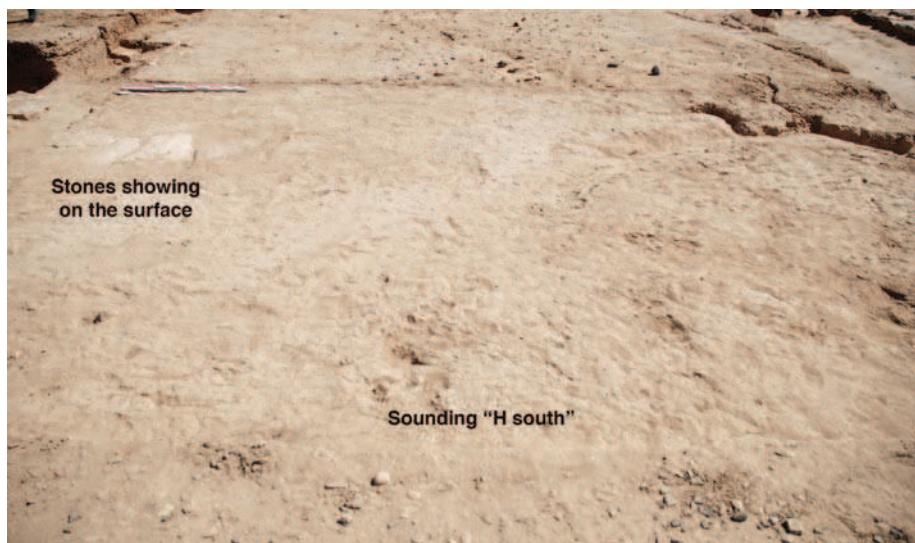
**Fig. 2** The mudbricks in the center are likely to be the eastern part of the north face of wall 80157. Wall 80122 is laid a couple of centimeters on top of it. North of 80157, one can see the yellow sand which surrounded all the mudbrick walls of Phase 1



**Fig. 3** View of the area east of wall 80122 and north of wall 80008 (in the background). Note the presence of sand in the foreground and of a powdery clayish layer in the center, with no identifiable mudbricks



**Fig. 4** Wall 80238. In the foreground, wall 80122



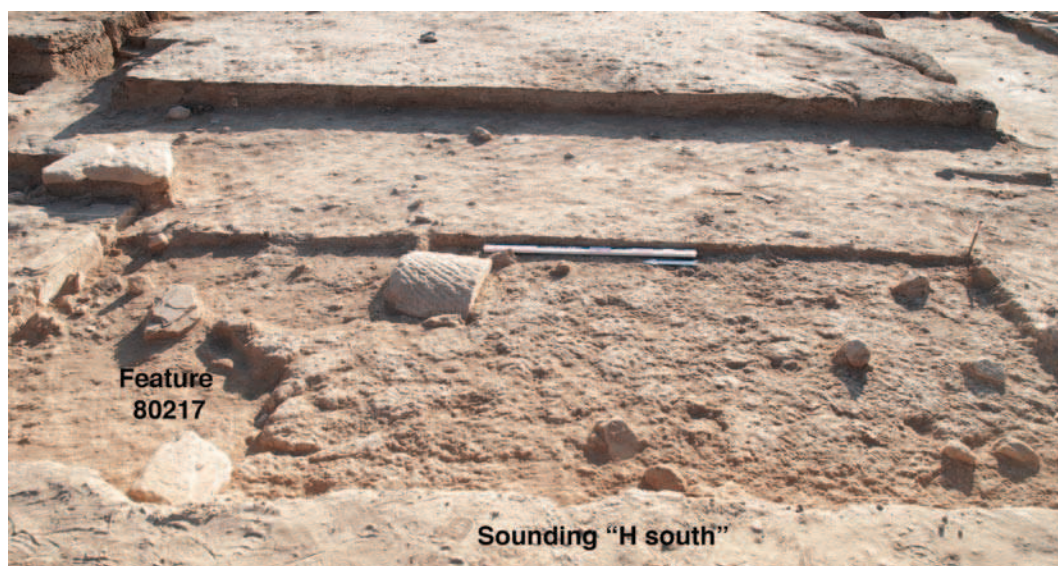
**Fig. 5** Sounding H, southern part, at the beginning of the excavation. Stones show on the surface on the top left

**Fig. 6** Wall 80211 seen from the west. Note that the angle is built of stones and that the mudbrick elevation is visible



**Fig. 7** Part of *locus* 80204 around the corner of wall 80211. Note the clayish texture of the soil and the few sherds on the surface

**Fig. 8** In sounding “H south”, feature 80217, a heap of small blocks, mudbricks and artefacts



**Fig. 9** General view of sounding “H south” from the west. Feature 80217 is being removed. Note the hard clayish layer that surrounds it

**Fig. 10** Locus 80210, in 80218, a heap of broken sherds and faun, possibly a junk pit in a domestic context



# MADÂ'IN SÂLIH Area 8

## Top plan

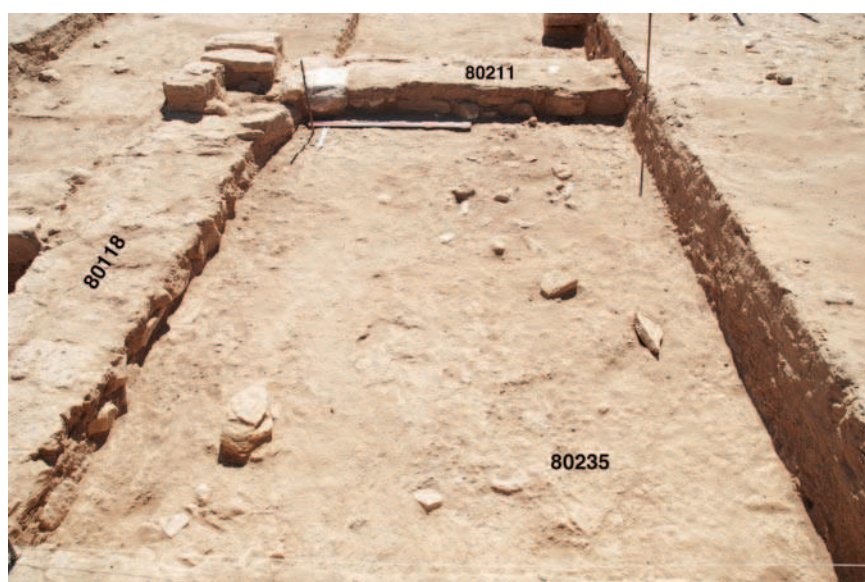


**Fig. 11** Top plan of Phase 1



**Fig. 12** Phase 1a and 1b of wall 80156, and wall 80118 belonging to Phase 2

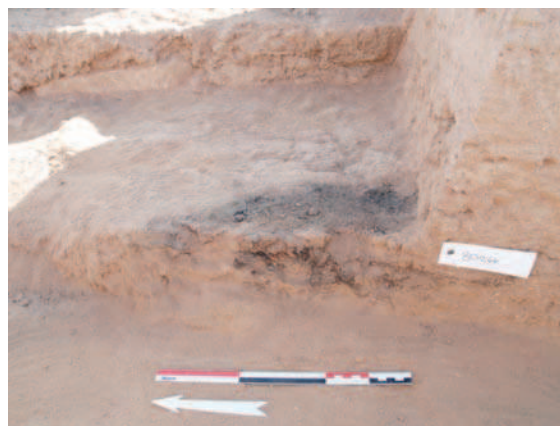
**Fig. 13** View of sounding H to the south. It shows *locus* 80235, which is the last one belonging to Phase 1 in this sounding



**Fig. 14** Facing of wall 80156, with layer of sand



**Fig. 15** View of sounding "H south", some wedging stones of wall 80234 are showing on the surface. The soil consists of sand with some clay spots



**Fig. 16** View of hearth 80266 during excavation, located west of wall 80156 in sounding "H south"

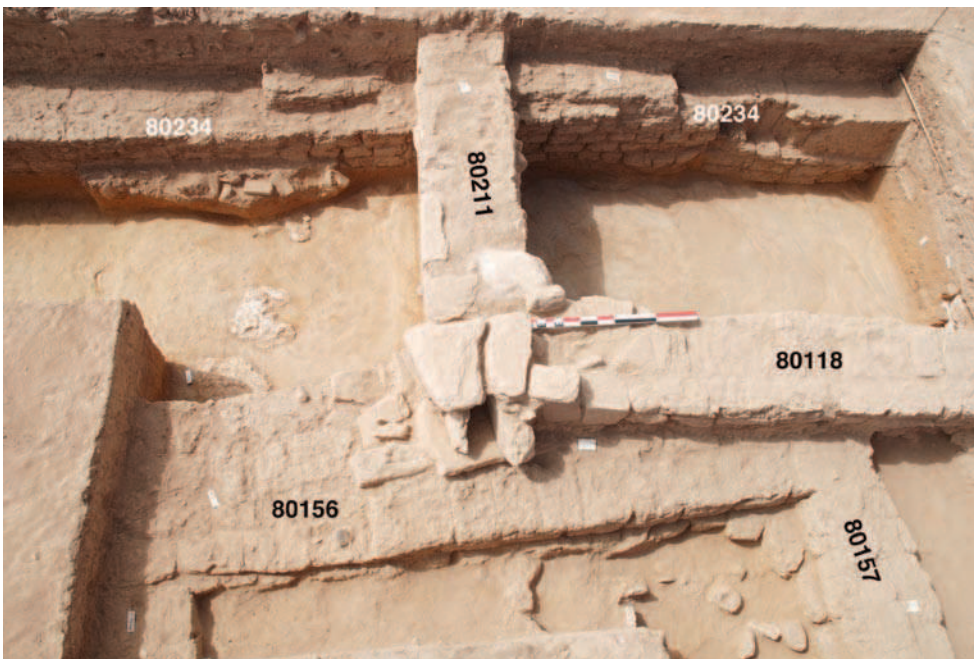


**Fig. 17** Hearth 80278 during excavation, located east of wall 80156 and just south of wall 80157



**Fig. 18** View of the western face of 80156, hearth 80261 on the left, and hearth 80262 after excavation on the right, hardened sand and reddened earth

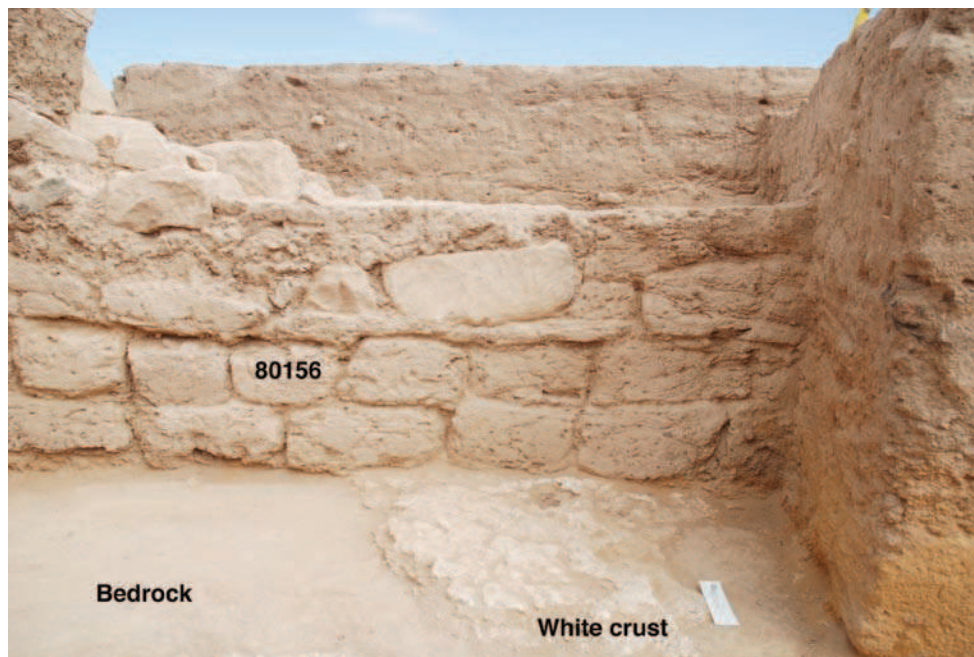
**Fig. 19** Hearth 80162 during excavation, under the level of the stone course of wall 80156, hardened sand and earth below it



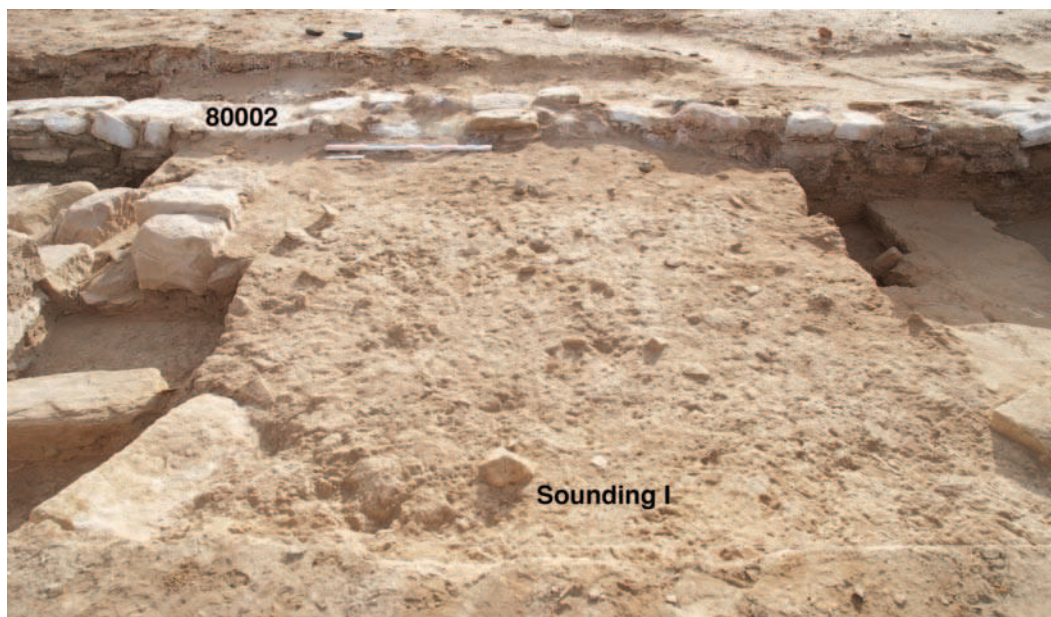
**Fig. 20** View of sounding H, and eastern face of wall 80156



**Fig. 21** Supposed postholes in “H north”, where clayish earth seems to form circles in the sand



**Fig. 22** White crust over bedrock in sounding “H south”, west of wall 80156



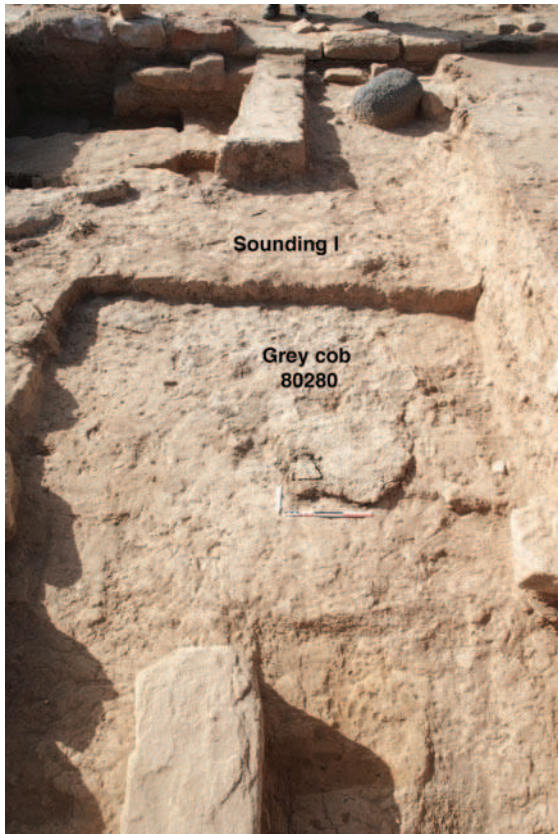
**Fig. 23** View of sounding I, to the east, at the beginning of the excavation



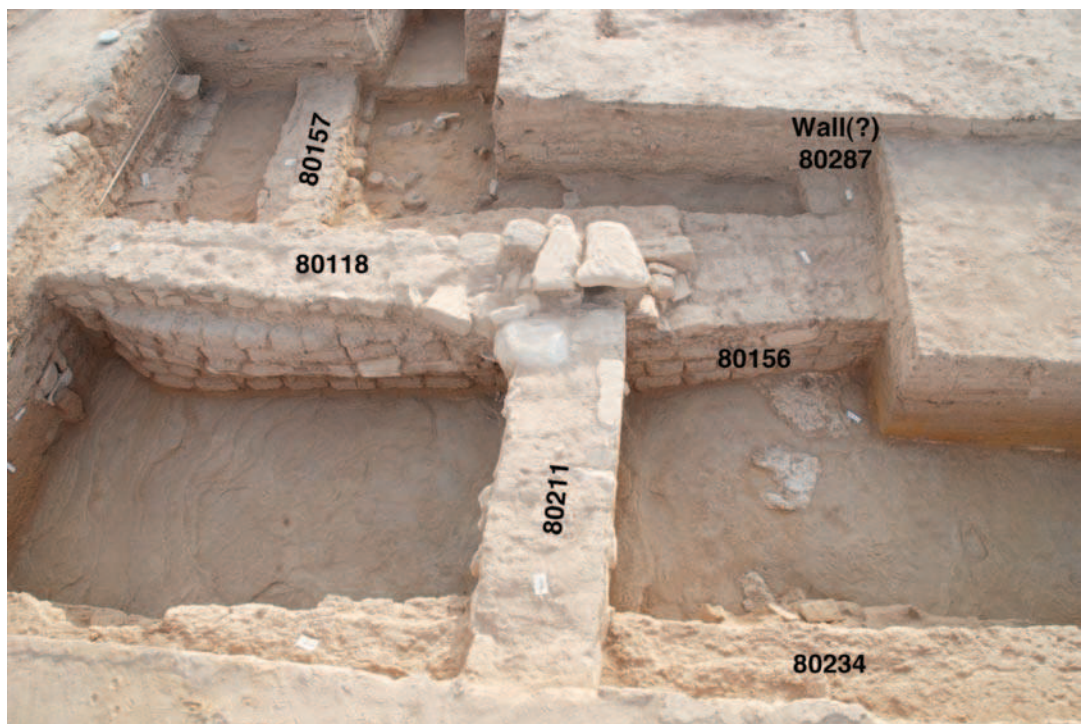
**Fig. 24** Feature 80239, in the northeast corner of sounding I



**Fig. 25** Sounding I from the west. Note feature 80239 in the bottom left and wall 80002 in the foreground



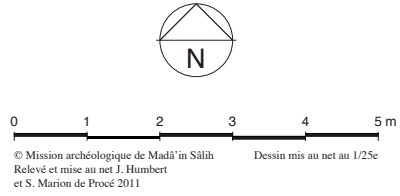
**Fig. 26** Sounding I to the south, after the removal of feature 80239. A large spot of greyish organic cob lies in the middle



**Fig. 27** View of sounding H towards the east. L or U-shaped wall 80156, with 80157 abutting its eastern facing, wall 80287 parallel to 80157 on the right, and stone feature in wall 80156 between 80157 and 80287. In the foreground, wall 80234

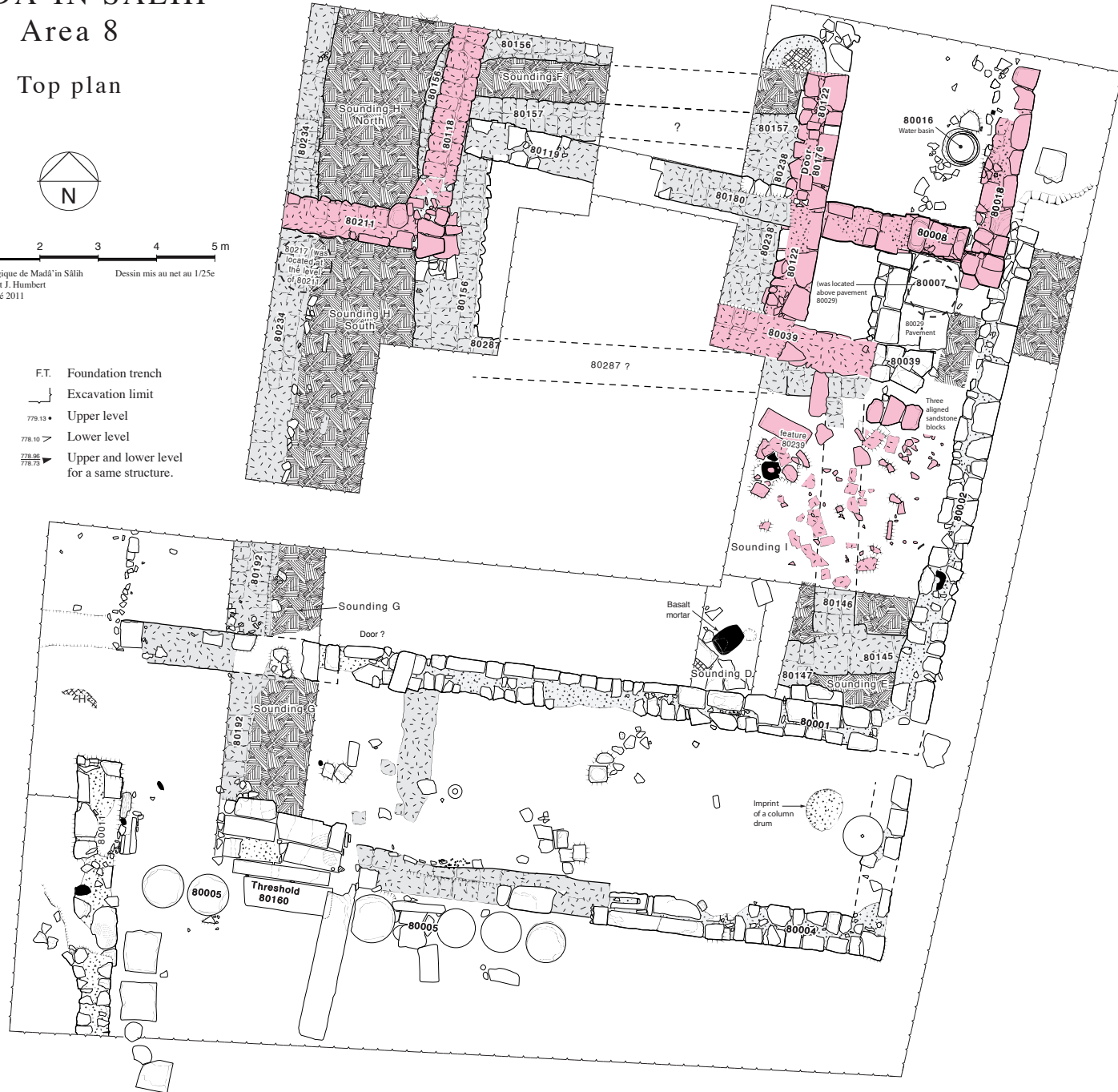
# MADĀ'IN SĀLIH Area 8

## Top plan



### CAPTION

- |  |              |  |   |
|--|--------------|--|---|
|  | Mudbrick     |  | F.T. Foundation trench                      |
|  | Hearth       |  | Excavation limit                            |
|  | Basalt       |  | Upper level                                 |
|  | Pottery      |  | Lower level                                 |
|  | Pottery slag |  | Upper and lower level for a same structure. |
|  | Bedrock      |  |   |



**Fig. 28** Top plan of Phase 2

# MADĀ'IN SĀLIH

## Area 8

### Top plan



0 1 2 3 4 5 m

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 Relevé et mise au net J. Humbert  
 et S. Marion de Procé 2011

**CAPTION**

- Mudbrick
- Hearth
- Basalt
- Pottery
- Pottery slag
- Bedrock
- F.T. Foundation trench
- Excavation limit
- 779.13 Upper level
- 778.10 Lower level
- 778.10 structure.
- 778.10 Upper and lower level for a same



## **Area 9 – Preliminary Report on the 2010 and 2011 Seasons**

Zbigniew T. FIEMA (Academy of Finland)



# Area 9 – Preliminary Report on the 2010 and 2011 Seasons

Zbigniew T. FIEMA

## INTRODUCTION

During the 2010 and 2011 fieldwork seasons at Madâ'in Sâlih, two trenches (A = 90000 and B = 91000) were opened in Area 9. Following is the combined 2010 and 2011 report of activities including a tentative phasing of the occupational history at the site. This report does completely supersede the report submitted in 2010. While the work in trench A has been completed in 2011, trench B may need to be expanded in the subsequent season. Considering this fact as well as a particularly complicated stratigraphic situation at the site, the phasing offered here should be considered as tentative and preliminary. For convenience, the abundant illustration material has been divided into plates (**pl.**) which include top plans and elevation / section drawings, and the fieldwork photos (**fig.**). Furthermore, it needs to be added that upon the reexamination in 2011, some *locus* numbers of excavated structures have been changed (**pl. 1**).<sup>1</sup>

## Site description

Area 9 is located in the south-western part of the residential area. It is *c.* 50 x 70 m and is relatively higher in relation to the surrounding areas. 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 relatively lower ground surrounding Area 9 on the eastern and southern sides is cut by shallow and wide wadis which are part of the main north-south natural drainage at the site. Area 9 has also its own depressions and higher points. The ground is relatively hard, although silty-sandy, and generally deprived of vegetation except for small shrubs. There are also some cobbles and pebbles on the surface.

The most important feature in the area is the presence of wall lines visible on the surface (**fig. 1**). Altogether, there are at least thirty spots where wall lines are well visible, in some places running for the distance of more than 5 m. Generally, many walls follow roughly E-W direction but some with a N-S direction were also observed. Area 9 lay on the very edge – south-east corner – of the previously conducted geophysical survey. The new geophysical survey, conducted in 2010-2011, has covered the entire space of Area 9. However, the resulting imagery is not very clear to interpret due to the unexpectedly poor resolution. Surprisingly, mostly the E-W walls can be noted on the new imagery (**fig. 1A**). The aerial photos, using the kite, which were taken by Wael Abu-Azizeh in 2011, turned out to be very useful as these document the presence of wall lines in the area of trenches A and B (**figs 2-3**). Trench A, excavated in 2010 and 2011, is located in the north-east part of the area, in the place where wall lines were particularly well visible. The trench was 5 x 5 m. In 2011, trench B was opened directly on the eastern side of trench A. The dimensions of the former are 5.5 x 5 m but the trench is staggered northwards in order to reach a deposit of several (at least 10) column drums, placed in an E-W line (**fig. 4**). Finally, in order to achieve a better spatial connection between trenches A and B, a small extension (*c.* 1.8 x 1.8 m)

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1. ATTENTION: on all existent top plans of Trench A, the southernmost E-W wall is erroneously marked as *locus* 90014. The correct *locus* number is 90011.

of the latter was located in the northern corner between these two trenches. The numbering of *loci* in that extension follows the numbering in trench B.

### General characteristics and problems

It needs to be noted that the stratigraphic situation encountered in these trenches was particularly complex and resulted from the periods of intensive occupation, disuse, reconstruction, dumping of debris and abandonment. For certain stratigraphic situations, no easy interpretive solution could be found. There is no doubt, however, that the many structures and strata in trenches A and B shared the common history and thus the presentation of a separate phasing for these trenches would be largely meaningless and thus counter-productive. The major difficulty was that the border area (running N-S) between the trenches is currently occupied by stone wall 90002 which runs on the surface. In order to fully understand the connection between the history of occupation in trenches A and B, a partial or total removal of wall 90002 would be necessary, a solution not feasible at this point of time. Furthermore, the nature of occupation in trench B is diverse. The excavations of its northern half (north of wall 900029 / 91004 and threshold 91009), could progress down only by less than 1.0-1.5 m due to a very dense accumulation of paving stones, ceramic midden and other installations. Conversely, the occupation in the southern half of this trench is deprived of any structures and characterized by a sequence of relatively featureless soil strata. It would have been beneficial to note how these strata compare with the deposition inside trench A but again, the presence of wall 90002 prevents such observations.

It has been decided not to retain the original 2010 designation of the “Lower / Upper House” and replace it with “Lower / Upper Complex” representing Phases 7 (A, B) and 9 in trenches A and B. It is evident that structures related to these phases remained in a meaningful relationship but the nature of occupation cannot be fully determined. Therefore, a designation “house” might be somewhat misleading. Furthermore, it is certain that other, related rooms, existed around the area of both trenches and were somehow associated with these uncovered inside. For example, there were rooms to the south of trench A, but only very small parts of these were uncovered in trench A, mainly the south-west corner (space between walls 90011 and 90012), and the southern space (between walls 90012, 90011 and 90002). Generally, without the expansion southward, it is difficult to fully understand the sequence of events in these spaces or to tie the deposits there to the phasing of the house. Therefore, these spaces are omitted from this narrative, with the exception of the south-western corner of the trench. Similarly, the intense occupation encountered in trench B, especially as related to the “Lower Complex” phase, is difficult to interpret without further expansion of the trench east- and westward and the removal of some installations located in the northern half of this trench. Generally, the following will tend to combine the evidence into one, interpretive narrative, with the “leading” evidence provided by trench A. However, wherever necessary, a clear distinction will be made between the remains as found in trench A vs these from trench B.

One should also mention here a certain discrepancy occurring sometimes between the ceramic readings and the general stratigraphic situation. The ceramic notes mention a possibility of “redating” of some specific ceramic types. However, since no subsequent, firm information concerning the redating was available, the “Dating” sections here will include (wherever necessary):

- the actual dating of recovered ceramics, as done during the 2010 season, preliminarily updated in 2011 and quoted as recorded on the “Pottery sheets per *locus*”;
- the excavator’s (ZTF) suggestions concerning the dating of specific phases.

## PHASING

### Phase 1. The earliest occupation in the area

The excavations in trench A have reached the depth of 775.82 m, thus almost 3.75 m below the surface (**fig. 4 bis**). At this depth (and slightly above), *locus* 90053 was encountered – a sterile, aeolian sand of very

light brown color and totally deprived of any finds. On top of 90053, there was another soil, *locus* 90050, a somewhat harder sandy deposit, equally without finds (**pl. 2**). Notably, both 90053 and 90050 clearly slope down eastward, forming a depression occupying the entire eastern part of trench A. In the south-eastern corner of this trench, on top of 90050 and partially dug into this *locus* was *locus* 90051, at 777.70-.75, an irregular deposit of ash mixed with sand (**fig. 5**). It can be basically described as a small area with ash pockets and lenses. The main part of this *locus*, c. 0.84 m long (E-W), 0.24 m wide and 0.15 m deep, is almost a pure ash pocket which appears as a E-W running “fosse”. This *locus* probably represents a casual occupation, although it may also be associated with wall 90052, which is built almost directly on top of 90051.

### **Walls 90052 and 90027**

At any rate, it must have been very soon after the deposition of 90051 that the first structures appeared at the site – the mudbrick walls 90052 (bottom at 776.92, top at c. 777.80) and 90027 (bottom at 776.90-777.10, top at c. 778.32-.37), both seemingly standing on top of *locus* 90050, although surface 90049 cannot be excluded. Wall 90052 (**pl. 4, fig. 6**) is known from a very limited exposure because it lay directly under the later deposits which have wall 90002 on top of it. The visible length of wall 90052 is c. 0.60 m, the width is undetermined and the maximum height is 0.88 m, with 8 courses of mudbricks visible. Notably, this wall seems to have the same orientation as the later wall 90002, i.e., NNE-SSW. Possibly, at this early stage in the history of the area, wall 90052 separated the occupation in trench A from that in trench B, although the latter is poorly known as the excavations in that trench did not progress to that depth.

Wall 90027 (**pl. 4, fig. 7**), running NNE-SSW, is one of the major structures at the site, which dominated the area of trench A until the construction of the Lower Complex (Phase 7). The wall is exceptionally well preserved and it is c. 2.80 m long, 0.44 m wide with two rows of mudbricks, c. 1.21 m high (max) with 9 courses of mudbricks visible. Therefore, the earliest phase of occupation in trench A features two, roughly parallel walls with the space in-between either little used or used for dumping, until the the construction of the Lower Complex. Probably, the main occupation associated with wall 90027 was located to the west of it while that associated with wall 90052 to the east of it, i.e., in the area of trench B.

### **Dating**

*Locus* 90051 has yielded the earliest ceramic found so far at the site – the so-called Khurayba / Dedanite ware, dated to the 3<sup>rd</sup>-4<sup>th</sup>? century BC.

### **Phase 2. Later mudbrick structures and limited occupation**

The area between walls 90027 and 90052 became gradually filled up with very sandy deposit 90049 (**pl. 6**) which, although possessing small lenses of ash, was totally deprived of finds. Considering the existence of a depression in the entire eastern part of trench A, mentioned above, the deposit of sandy 90049 is mainly located in that depression, while the western part of the space between the walls is occupied by silty-sandy *locus* 90048, also without finds only with occasional ash lenses.

### **Structure 90035**

Meanwhile, another mudbrick structure was constructed on top of sandy deposit 90049, i.e., the structure 90035 (**pl. 3, fig. 8**). It might be termed as a “platform” or a “buttress”, and most possibly it was abutting wall 90052, but this relationship cannot be fully determined. The structure is 1.20 m long (N-S) and 0.80 m wide (3 rows of mudbricks visible), with the maximum height of 0.72 m in 5 courses of mudbricks. The current top layer – *locus* 90039 – belongs to the later phase (Phase 4), when the platform was connected by this *locus* with other mudbrick structure, i.e., 90040. Unfortunately, it could not be determined whether or not buttress 90035 continued northwards or if it really abutted wall 90052.

### ***Postholes 90043***

During this phase, some kind of activity took place in the space between walls 90027 and 90052. *Locus* 90047, at *c.* 777.25-.38, is a layer of lightly compacted silt, the surface of which hardens towards the south-western corner of the area (through tramping?). In that corner, a series of 5 pits (*locus* 90043) have been dug from the surface of 90047 (**fig. 9**). Four pits are set in a row stretching north-eastwards from the very corner of the trench while the fifth is located close to the eastern face of wall 90027. The pits in the row are spaced *c.* 0.1-.24 m apart and all are round or oval, neither larger than 0.2 m in diameter and of the depth ranging from 0.08 to 0.14 m. Because the contents of the pits range from almost pure ash to ash mixed with silt, it was thought that they must represent postholes originally holding some kind of wooden poles which burned *in situ*. This hypothesis still stands, although it should also be noted that a few small bone fragments were laying inside some of these pits (perhaps accidentally). More disturbing is the total absence of charcoal. If these are indeed postholes representing a wooden construction, their pattern of location is puzzling as they run diagonally to the eastern face of wall 90027 and one of the pits is located no further than 0.1 m from that face. Either, a light wooden construction supported by the poles extended to the south-east of the row of four pits, or these represent postholes which held vertical poles in a manner of a “palisade” (?). At any rate, this phase marks the beginning of activities in the space between walls 90027 and 90052.

### ***Walls 91036 and 91028***

Possibly the earliest structures in trench B are the walls 91036 and 91028 (**pl. 1** for their location among all other structures in trench B, see also **fig. 10**). Their chronological association is virtually unknown. Suffice to say that they may be as early as Phases 1 / 2, must have preceded Phase 6 and were probably partially levelled during that phase. However, they do not show any possible connection with any other structures at the site.

Currently, wall 91028 can be seen as a mudbrick surface yet it most probably was a wall running E-W. Its top is at 778.26 and it features at least two rows of mudbricks. Its total length is *c.* 1.10 m and width 0.60 m. Wall 91036 (top at 778.04) is even more enigmatic because it is seriously damaged and visible only in a very restricted space. Basically, only 3-4 bricks could be recorded (total space size 0.45 m N-S and 0.65 m E-W) and it is possible that if it was indeed a wall, it could have run N-S. If so, it is not inconceivable that it formed a corner with wall 91028 and thus that the entire structure was L-shaped. But none of that can be proven without further excavations.

### ***Dating***

The ceramics from *locus* 90047 can be dated to the Hellenistic period, i.e., to the 2<sup>nd</sup> century BC or earlier.

### **Phase 3. The early dumping operations**

This phase marks the beginning of puzzling activities taking place inside the space of trench A. While dumping of ash, broken sherds, bones and other debris is not necessarily a strange occurrence, the variable intensity of dumping, the nature and localization of deposits and the variable diversity of contents of these dumping strata is significant and must hide some meaningful reason. Also, during this phase, the first attempt was made to organize the dumping space, by constructing a barrier (**pl. 2**, as visible in the southern baulk).

### ***Deposits 90044 and 90046***

The earliest deposit which represents such activities is *locus* 90044 (at *c.* 777.46-.53), a silty layer which is mainly located in the western and south-western part of the space between walls 90027 and 90052 (**fig. 11**). It is largely absent from the eastern and northern part where the stratum 90046 (a wind-blown layer) was

deposited (**pl. 5**), also covering some extremities of 90044. The deposit 90044 is heterogeneous: areas of mixed silt, sand and ash lenses, the latter substantially increasing in amount in the west and directly against wall 90027. Broken pottery and bones, many charred, are present, although not abundant as in the dumping strata further up. It appears that 90044 is not a result of a one-time operation: rather it seems to be a haphazard, diverse dumping over a period of time. The location of most dense ash accumulation indicates that ash was dumped across wall 90027 and from somewhere further south of trench A, also possibly across the southern part of wall 90052.

The northern area of the interior of trench A, where *locus* 90046 is predominant, is almost totally deprived of any ash. Some very small clusters and rows of stones (mostly cobbles) are located there, west and north-west of platform 90035. Stone vessel (90046\_S01) was found associated with one of these clusters.

### **Barrier 90045 and deposit 90042**

The sequence of events is not entirely clear at this point of history of occupation in trench A but it appears that some attempt has been made to delimit the area of dumping by constructing a stone barrier, 90045 (**fig. 11**). This barrier was built either on top of the first dumping (90044) or, more likely, when the next major dumping period, represented by stratum 90042, already began. *Locus* 90042 is equally heterogeneous, with much more ash in the south and west (like in 90044), little ash in the north while small, irregular cobble clusters and rows (like in 90046) continue in the north. A fragment of a bone pin or stick (90042\_BO01) was found in this *locus*. The main difference, as compared with 90044, is that *locus* 90042 contains very large quantities of bones (some charred). Thus, the barrier actually appears to stand on top of deposit 90044 but this is probably due to the weight of stones embedded in soft, ashy soil of *locus* 90042. Most likely, deposit 90042 and barrier 90045 are contemporary, and it was decided to build the barrier when the dumping of 90042 was already taking place.

The barrier is clearly an attempt to “organize” the space between walls 90027 and 90052 through limiting the area where the actual dumping of ashy soil took place. The barrier (top at *c.* 777.66-.72), consists of six large stones, some close in appearance to ashlar, and at least five small ones. Undoubtedly, the larger, ashlar-like stones, which range from 0.32 x 0.22 x 0.15 to 0.40 x 0.27 x 0.15 m, are reused from some dismantled structures. Some larger stones stand upright while other are laying flat. At the south-eastern *terminus*, one stone appears like a drum – it is currently visible under the later mudbrick wall / platform 90040 although separated from it by the ashy layer 90041. The barrier forms an articulated row. It begins in the south-eastern corner of the trench, proceeds diagonally in a north-western direction and then turns westward, stopping *c.* 1 m away from the eastern face of wall 90027. In this way, almost the entire southern and south-western part of the interior was separated from the rest of the space between walls 90027 and 90052.

### **Deposit 90041**

Into the space south and south-west of the barrier, the remaining part of *locus* 90042 has been dumped which here contains quantities of ash. Again, the ash is not deposited in definable layers but is rather mixed with silt and sand. Nevertheless, the quantities of ash are noticeably more substantial than in the northern part of *locus* 90042. It is evident, however, that the barrier also served to contain the following dumping deposit, i.e., *locus* 90041, which filled up the limited space and partially covered the top of the barrier (**fig. 12** shows the remains of 90041 after the partial removal of the barrier). This *locus* is restricted only to the area south and south-west of barrier 90045. Layer 90041 is relatively thin (max depth *c.* 0.12 m, starting from the top at *c.* 777.78) but it contains almost 90% of ash, completely burnt and with no charcoal present. What is most interesting is that, as opposed to *loci* 90044 and 90042, ash deposit 90041 contains very few finds of bone and pottery.

### *Comments on early dumping operations in Trench A*

Although the dumping will have continued in the following phases, it is perhaps worth, at this point of time, to comment on the nature of these operations in trench A. What puzzles most is their irregular and diverse character. While *loci* 90044 and 90042 may represent a haphazard dumping of ash over longer periods of time (thus much mixed with wind-blown sand and silt), *locus* 90041 is very homogeneous and seems to represent one major dumping episode. Equally, *loci* 90044 and 90042 have produced large quantities of pottery and bones (many charred), but *locus* 90041 is largely deprived of finds. While it is certain that the dumping represents the relocation of debris from a fireplace or oven located outside of trench A, the variation in intensity and contents of these dumpings is curious at least. These may represent periodic clearances of domestic cooking installations but it is not impossible that the debris might, at least partially represent the refuse from some sort of a cultic context. It will be instructive to study the bone material from these and following strata in order to note if the bones preserve traces of any specific manner of cutting, characteristic either of domestic consumption or representing cultic offerings (see the report of J. Studer). It is also notable that while the deposit 90041 effectively covered a major part of the barrier 90045, the following episodes of dumping deemed it necessary that such barrier is reinstated in the form of *locus* 90036 (*infra*).

### *Dating*

This phase abounds in datable material. *Locus* 90046 yielded ceramics datable to the Hellenistic period (or earlier?). *Locus* 90044 had also Hellenistic sherds (2<sup>nd</sup> century BC?) and *locus* 90042 had sherds datable to the later 2<sup>nd</sup> century BC. Three coins were found in 90042. The first is the tetradrachm of Alexander which remained in production between the 3<sup>rd</sup> and the 2<sup>nd</sup> centuries BC. The second is the imitation of Athenian coin which was produced between the 3<sup>rd</sup> century BC and the 1<sup>st</sup> century AD, and the third is perhaps a coins of Aretas IV. *Locus* 90041 provided sherds which might be dated to the late Hellenistic period, possibly the late 2<sup>nd</sup> century BC. Notwithstanding the presence of the coin of Aretas IV (perhaps intrusive? if indeed of Aretas IV), it is probably safe to assume that Phase 3 should be dated to the 2<sup>nd</sup> century BC, with possible extension into the early 1<sup>st</sup> century BC.

### **Phase 4. Structural additions**

This phase is particularly enigmatic as it features activities in the south-eastern corner of the space between walls 90052 and 90027. This small area witnessed major modifications in the following phases and thus some vital evidence must have been obliterated.

### *Structure 90040*

The major new addition was structure 90040 the orientation of which – NE-SW – is unique in the entire area of trenches A and B (**figs 13, 14**). It is difficult to describe and interpret this structure. Currently, it presents itself as a triangle of mudbricks, *c.* 1.05 m (NE-SW) long and 0.68 m (SE-NW) wide, and with its top at *c.* 778.04. The mudbricks themselves are either squarish or even rhomboidal (average size: 0.22 x 0.2 x 0.12 m). They are set as if to specifically emphasize the NE-SW orientation of this structure. Currently, the structure is *c.* 0.25-.03 m high (two courses of bricks) and it appears as a “platform” of a kind. But if one observes the remains visible in the easternmost part of the southern baulk of the trench, the entire construction seems to have been higher by at least three more courses, *i.e.*, altogether *c.* 0.51 m in height (**pl. 2, fig. 15**). Although it is impossible to prove whether or not the mudbricks in the baulk were or were not the integral part of “platform” 90040, this remains a distinct possibility. Judging from the orientation and course of structure 90040, its continuation should be expected to emerge in trench B. However, in that area, the excavations did not proceed down to the relevant depth. It is also possible that the early wall 90052

was somewhat levelled because platform 90040 appears to run directly over its (preserved) top. More significantly, the preserved south-western edge of the platform seems to be firmly placed on top of the ash deposit 90041 which, in this place, had largely covered the stones of the barrier 90045.

### ***Buttress 90035 and the connecting part 90039***

Even more intriguing is the modification done to the buttress 90035. It is unknown how high it originally was but it seems that its top, in this phase, was on the same level as the top of wall 90052. With the construction of platform 90040, a curious situation emerged, i.e. the proximity of a NNE-SSW buttress to platform 90040 the orientation of which was diagonal to the buttress. Therefore, a connecting structure was constructed – *locus* 90039 – *c.* 1.52 m long and *c.* 0.80 m wide (**figs 13, 15-16, pl. 3**). This *locus* consists of two courses of mudbricks which were placed on top of buttress 90035 (and possibly on top of wall 90052) which then extended southwards in order to integrate with the two courses of platform 90040. Although currently it looks like the connection 90039 was always an integral part (= the top) of buttress 90035, it is not the case. Notably, the buttress continues down in five courses while in the space between structures 90035 and 90040 there are only two courses of the connecting element 90039, the top of which is on the same level as the top of the platform 90040. Furthermore, it is visible that the connection rests on top of the ash, *locus* 90041, just like the platform 90040. In summary, it appears that the sequence of operations was as follows: wall 90052 (and perhaps buttress 90035) razed down to a certain height, platform 90040 constructed and then the connection effected by the means of structure 90039 (see also **pl. 1, fig. 17**). The latter two operations may, in fact, have been effected at the same time.

Altogether, the resulting construction is somewhat peculiar. What emerged was a roughly rectangular structure along the eastern limit of trench A, consisting of 90035 / 90039 and 90040. The purpose of this combined structure is unknown. It must somehow relate to the situation in the adjacent trench B but again, the presence of wall 90002 (and the strata below) prevents further investigations. The stratum associated with this development is *locus* 90038, and possibly the lower part of *locus* 90037, both of which are heterogeneous layers of clay, silt and ash, of varying compaction (**pl. 2**). These *loci* cover the entire space of between wall 90027 and the eastern structures. Bones were abundantly found in these layer but the ceramics were scarce. Generally, *loci* 90038 and the subsequent 90037 should be considered as representing a period of very limited dumping between the major episodes of such operations represented by *loci* 90044, 90042 and 90041 below and *locus* 90032 further above.

### ***Deposits 91018, 91019***

The earliest datable strata in the southern part of trench B, across the area featuring wall 90002, are 910018 and 91019 (**pl. 6**). As there is no physical connection between these and the deposits inside trench A, the tentative phase association of these two deposits is based on the comparable absolute level and the dating of the ceramic contents. With regard to the latter, strata 91018 and 91019 belong to either Phase 4 or Phase 5. *Locus* 91018 (top at 777.91-778.01) is an uneven deposit of clay silt. Remains of a very small fireplace (?) was located in the north-western part of this *locus*, in association with a roughly oval cluster of cobbles (*c.* 1.00 x 0.7 m) located further to the south-west. On top of 91018 is *locus* 91019 (at 778.05), a very thin (*c.* 0.05 m) and very ashy deposit with a few small, blackened cobbles inside. Definitely, this *locus* must represent some kind of redeposition of ash from a fireplace / oven located somewhere else. It may probably be related to the ash dumping episodes in Phase 4 and especially in Phase 5.

### ***Dating***

This phase must have been short-lived and the pottery found in *locus* 90038 indicates a date in the late 2<sup>nd</sup> century BC while pottery in *locus* 90037 is dated to the mid-2<sup>nd</sup>-early 1<sup>st</sup> century BC and it includes one

painted Nabataean bowl, Petra Phase 1. *Locus* 91018 has clearly Hellenistic pottery, probably of the 2<sup>nd</sup> / late 2<sup>nd</sup> century BC date, and a coin, possibly an early Nabataean issue, while *locus* 91019 has yielded pottery datable to the late Hellenistic – 1<sup>st</sup> century BC. Generally, Phase 4 should be dated to the end of the 2<sup>nd</sup> – early 1<sup>st</sup> century BC.

### Phase 5. The latest dumping activities

This phase represents the latest and the most massive dumping operation conducted in the space between wall 90027 and the combined structure 90040 / 90039. Prior to this, some kind of damage (?), intentional or not, might have happened to platform 90040. Whether or not it was originally as high as the remains seen in the southern baulk is entirely unknown but, at this point of time, it is evident that some parts of this structure were detached or destroyed.

#### *Barrier 90036*

Specifically, the south-western part of the platform was “shaved off” and a barrier 90036 inserted there running in SE-NW course, just like the earlier barrier 90045 (pls 2, 11, figs 14, 17). Indeed, the location of the new barrier is not accidental. It consists of four irregular but flattish stones standing upright and backed (on the northern side) by a very large, somewhat oblong / rectangular stone (0.44 x 0.33 x 0.20 m) which partially rests on the top of stones representing the earlier barrier (90045).

At the first sight, the hypothesis that the barrier 90036 is, in fact, an integral top of earlier barrier 90045, and not a separate installation built later on, is attractive. As such, a single barrier (90045 + 90036) would have been constructed to contain all dumped deposits (90042, 90041, 90038, 90037 and at least the lower part of 90032). However, there are certain facts which prevent such interpretation. The first is that the large rectangular stone mentioned above rests not only on top of *locus* 90045 but also partially on top of ash *locus* 90041 and it leans heavily against the destroyed part of platform 90040 (fig. 16). Secondly, if a single barrier existed all the time, i.e. since the deposition of *locus* 90044, all modifying activities of mudbrick structures 90035, 90040 and 90039 would have to take place *before* the erection of such barrier, which stratigraphically is improbable. Equally, it is simply not possible to imagine that *locus* 90036 was already in place when platform 90040 was built. Therefore, one needs to accept the existence of two barriers, serving the same purpose and built roughly in the same place but representing two separate time-periods.

#### *The enigma of locus 90033*

In the meanwhile, a thin layer 90033 (top at 778.04-.14), probably a combination of very low intensity dumping with wind-blown material, characterized by little ash but quantities of bones, seems to have been deposited in the interior. This *locus* is relatively well represented in the northern and central part of the interior but is poorly evidenced in the southern part where it is seemingly located under deposit 90032, the main ash dump (see pl. 2, 3). Both stratigraphic and relative chronological placement of this *locus* are somewhat shaky and may have resulted from the erroneous recognition during the excavations. It looks like *locus* 90033 is covering the top of the combined structure 90035 / 39 and was initially recognized as the first natural deposition following the last dumping operation. Especially the latter part of this observation was considered as much less certain during the 2011 investigations as what appears to be the continuation of *locus* 90033 southward seems rather to be located directly under the latest, massive dumping, *locus* 90032. Therefore, the interpretation of this *locus* is regrettably unresolved. At any rate, it is most likely that during the latest dumping, represented by *locus* 90032, neither the platform 90040, nor the combined structure 90035 / 90039 were any longer in use. Additionally, whether the last major ash dumping operation is deposited on top of *locus* 90033 or on 90037 may be less relevant; the dumping definitely benefitted from the existence of barrier 90036 and because of its presence, it is largely restricted to the area south and south-west of this barrier.

### **Ash deposit 90032**

It is postulated that the last dumping took place in two distinct episodes. At first, the nature of this deposit needs to be considered. *Locus* 90032 is a major deposit of ash mixed with some silt and sand (**fig. 19**). Some smaller lumps of solidified clay also occur, as well as very small broken stones. Bones are relatively abundant but only few ceramic sherds were found in this deposit. However, *locus* 90032 should not be interpreted as a dump of demolished material, rather as a clearing of a large fireplace (perhaps of “industrial” or “cultic” function), probably associated with some other, structural, debris. Notable is the total absence of charcoal and only few organic elements (date seed fragments) indicating a total combustion. The amount of ash and its density exceeds any of such found in all earlier dumping *loci* already discussed.

The deposit (*c.* 1.62 m north-south, 2.42 m east-west) clearly slopes downwards towards the north (778.32 in the south, 778.04 in the north). It means that the center (highest point) of the dump must be located somewhere south, probably under the extant walls 90011 / 90020, or even further south. Its eastern extent must be marked by the still standing remains of a structure, presumably associated with barrier 90040 and visible in the southern baulk (as seen on section B-B1; **pl. 2**, see *supra* for description) while its north-eastern extent is clearly limited by the barrier, *locus* 90036. As such, ash was not found on top of platform 90040 in the south-eastern corner of the interior. This implies that the dumping took place only when the installation 90036 was already constructed. On the western side, the ash deposit is delimited by the course of wall 90027. Furthermore, the deposit (as seen on **pl. 2**) is clearly divided into two major lenses which should indicate two major episodes of dumping, separated by the short period of time during which wind-blown (?) sand deposited on top of the lower episode.<sup>2</sup>

### **Dating**

Ceramics recovered from ashy layer 90032 include two glazed (“Parthian”?) sherds (1<sup>st</sup> century AD?), sherds dated to the 1<sup>st</sup> century AD or before, and a few other sherds, one Hellenistic (based on fabric). Also one Nabataean painted bowl (1<sup>st</sup> half of the 1<sup>st</sup> century BC, if found in Petra). Generally, perhaps late Hellenistic, maybe early 1<sup>st</sup> century BC? This combination may be partially accidental.<sup>3</sup> Some ceramics from 90033 resemble Late Hellenistic forms. Others are cooking pots, locally produced and their forms still undated. Still some match with sherds in 90026 (or 90032?) dated more likely to the 1<sup>st</sup> century AD. Dating rather difficult: 1<sup>st</sup> century BC or later?

ZTF. Considering the dating of the prior and subsequent phases, it is reasonable to assume that the phase might be generally dated to the 1<sup>st</sup> century BC.

### **Phase 6. Minor activities / temporary spatial disuse (?)**

This is a rather poorly understood phase and its recognition can be a subject of debate. Suffice to say that there seem to be some evidence, both in trenches A and B, which at least stratigraphically should be recognized as succeeding the last major dumping operations and preceding the construction of the Lower Complex in trenches A and B.

2. Unfortunately, during the excavation, this distinction was missed and the deposit 90032 was excavated as a whole, without separation into its lower and upper parts.

3. Ceramic records indicate that labels related to *loci* 90032 and 90026 might have been accidentally misplaced during the pottery washing.

### ***Deposit 90026 in Trench A***

The uncertain spatial and chronological association of *locus* 90033 has already been presented above. However, the layer of brownish-grey silt – *locus* 90026 – has definitely covered the entire space of the interior (including ash layer 90032), basically up to the top of the old wall 20027 (**pl. 2, fig. 20**). *Locus* 90026 is relatively homogeneous in appearance and with very few ceramic finds and a fragment of large, flat-based stone basin (90026\_S01) although bone material is well evidenced. This *locus* 90026 was probably naturally deposited (wind-blown material) yet its top might have been intentionally evened up when the Lower Complex was constructed later on. Also, some parts of *locus* 90026 could have originated from the disintegrated and washed away remains of mudbrick walls 90027 and 90035 / 90039 / 90040. At any rate, it is possible to suggest that some time has passed between the latest major dumping of ash and the actual construction of the Lower House in Phase 7.

### ***Installations in the northern part of trench B***

There is definitely more substantial evidence for pre-monumental and post-dumping activities in trench B. However, it needs to be remembered that the assignment of this evidence to Phase 6 is mainly based on the stratigraphic fact that the installations discussed here could no longer be in active use in the following phase (Phase 7), especially with the construction of doorway, *locus* 91009 and its foundation course, *locus* 91032. It is impossible to connect these installations and associated strata with anything encountered in trench A. Furthermore, there is no clear notion as for what kind of occupation is represented by these installations but it would be an attractive hypothesis to somehow connect these with some aspects of the latest dumping operations in terms of the outcome of the latter. At any rate, it is rather clear that other remains of the Phase 6 occupation in trench B must be located to the east and north of the trench.

In the northern part of trench B, old mudbricks walls 91036 and 91028 were levelled down to the current level or it may be that the current level represents their original height. However, the first encountered deposit associated with the current tops of these walls is *locus* 91027. This layer, at *c.* 778.14, seems to abut walls 91028 and 91036, and it possibly runs under installations 91037, 91035 and 91038. It is a layer of silty soil with some ashy spots and small lenses.

### ***Installation 91037***

Not much can be said about *locus* 91037 (top at 778.37-41), located in the north-central part of trench B (**fig. 21**) except that this is a cluster of several layers of stones forming an irregular rectangle, *c.* 1.10 m (N-S) x 1.34 m (E-W). Larger stones are in two layers oriented N-S and smaller in a E-W line which tightly abuts the northern face of mudbrick wall 91028. The very large slab on top of the cluster does not belong to this *locus*. It probably is a western doorjamb section from wall 90029 / 91004 and doorway 91009, which fell on the cluster, possibly during the disastrous flooding in Phase 8.

### ***Installations 91035, 91038 and 91034***

These are located in the north-eastern-central part of the trench and are probably among the most enigmatic installations encountered at the site (**pl. 1**). What seems to be a case here is the presence of a cache of very dense deposit of broken ceramics in silty soil (*locus* 91017), which is limited (surrounded) by installations 91035 (on the southern and western sides), 91038 (on the western side) and 91034 (on the eastern side). See **figs 21, 22, 23**.

*Locus* 91035 is a construction (top at *c.* 778.50) consisting of several stones in a N-S row, with one larger stone (*c.* 0.50 x 0.39 x 0.05 m) which limits the ceramic cache on the southern end. The row includes a very long slab (0.60 x 0.16 x 0.26 m) set upright and followed by 4-5 smaller, narrow stones. The total length is *c.* 1.37 m, the width *c.* 0.54 m. The eastern counterpart of this *locus* is the N-S row of stones, *locus* 91034 (**pl. 6, fig. 25**), which cannot be fully described as it is protruding from the eastern baulk of the trench for *c.* 0.1 m.

It seems to consist of four flat stones (top at 778.40), altogether *c.* 0.9 m long. Faces of some stones below the uppermost, best visible row, indicate that the installation might have been at least 2-3 courses high. So it is impossible to determine whether it is an installation intentionally constructed to limit the ceramic cache on the eastern side or a pre-existent structure which was opportunistically used to enclose it.

Installation 91038 (top at *c.* 778.47-.51) is the most peculiar. It closely abuts the stone row, *locus* 91035, on its western side. It consists of several stones in at least two courses. The upper course consists of four longer stones, set in E-W orientation and placed one after another in a manner of capstones. The lower course features less regular stones which more or less represent a N-S orientation. It would seem, on the first sight, that the upper course should be interpreted as capstones for something hidden among the stones of the lower course. But upon lifting of some upper stones the interior was tightly packed with small cobbles, with no other finds. Thus it is virtually impossible to determine the function of this installation besides proposing that it must have somehow reinforced the stone row, *locus* 91035.

### **Deposit 91017**

The interior of the space delimited by *loci* 91035 and 91034 was filled with a very dense packed layer, *locus* 91017 (top at 778.41-.47) of broken ceramics set in a greyish silty soil (figs 24, 25). Additionally, several fragments of various stone vessels (91017\_S01 to S05) were found. Although the depth of the deposit, *c.* 0.2-0.35 m, was relatively insignificant, the deposit was excavated in 3 layers (under the same *locus* number) in order to possibly ascertain the episodes of deposition. However, the density continued to be more or less the same from the top to the bottom and one would be hard-pressed to postulate the existence of separate episodes of deposition. Notably, the cache did not feature any covering. Practically, the soil *locus* 91021 and presumably *locus* 91011, subsequently deposited, had effectively covered the top of the cache. Therefore, one should assume that deposit 91017 may probably represent an one-time disposal of broken or disused pots collected elsewhere, and their further breakage inside the cache was caused by the continuous tramping on top of the cache. Although the preliminary dating of the ceramics – 1<sup>st</sup> century BC / late 1<sup>st</sup> century BC, even some sherds from the 1<sup>st</sup> century AD – is unprecise, one might suggest that the sherds were indeed deposited inside the enclosure in one episode. Perhaps, the cache might be interpreted as a *favissa* for the final disposal of some specific ceramics (in cultic use?) but considering the fact that cooking pots predominate, such procedure would be curious at least. It is expected that the detailed examination of types of ceramics and their dating might provide further clue as for the interpretation of this find.

### **Dating**

For dating of ceramics from *loci* 90033 and 90026, see Phase 5 dating and footnote 2. Also, as for *locus* 90026, the presence of the “Parthian ware” (one glazed sherd; 1<sup>st</sup> century AD?) and Nabataean type 3a cooking pot from Petra would suggest a date in the middle of the 1<sup>st</sup> century AD. On the other hand, *locus* 91027 has yielded ceramics dated to the 1<sup>st</sup> century BC, most probably its second half. *Locus* 91021 which largely covered the installations from trench B, and which represents the subsequent phase, has ceramics dated to the early 1<sup>st</sup> century AD.

ZTF. Notwithstanding the difficulties with dating pottery from *loci* 90026 and 90033, and considering the dating of the following phase, it is most probable that Phase 6 was relatively short-lived and might be dated to the later 1<sup>st</sup> century BC.

### **Phase 7a: the lower complex**

The following phase witnessed the appearance of the first, coherent and well-defined occupation at the site – the construction and use of the so-called Lower Complex. The new mudbrick and stone walls which were built in this phase in trench A include: walls 90020, 90028, 90023, 90004 and 90030 (pl. 1). In trench B,

the new structures include wall 90029 / 91004, threshold 91009 with its foundation course 91032, and probably wall 91022 with its foundation course 91023, as well as some smaller installations. The crucial elements seem to be wall 90028 (trench A) and wall 90029 / 91004 (trenches A and B). These form the interconnecting “pivot” among various walls.

Although it is for the first time in the history of Area 9 that a firm and meaningful connection is made between the structures in trenches A and B, the interpretation of this combination of walls and occupational surfaces is not easily forthcoming. The occupation in trench A might have been domestic. Some new walls there stand directly on top of soil, *locus* 90026 (mentioned above), i.e. walls 90020 / 90023, and 90028. Only the foundations (90034) of the northern wall (90004 and 90030) appear to be dug-in deeper, to reach the top of *locus* 90033, probably due to the considerable weight of this facade wall. At the same time, all previous mudbrick structures were either abandoned (90035 / 90039 and 90040) or presumably levelled (90027).

In trench B, the occupation tends to concentrate in the central and western-central part, the latter being the eastward extension of the room / corridor in trench A. However, it appears that the main occupation there should be sought in the area further east and north-eastward from trench B. The aerial photos indicate the existence of a very large quadrangular enclosure there, of which wall 90029 / 91004 seems to be the southern limit (**fig. 26**). The finds (column drums, statuary) recovered in the post-Phase 7 deposits in trench B may indicate that the enclosure (and a structure inside?) might have had a monumental character, not unlikely of a cultic character.

The Lower Complex appears as follows: a continuous line of E-W walls in the north, i.e. walls 90004, 90030 and 90029 / 91004 (being slightly offset to the former) paralleled in the south by wall 90020 / 90023 (**pl. 1**). The space (corridor = long room?) formed by these two parallel lines was probably enclosed by a N-S wall located somewhere west of the trench A limits. On the eastern side, the space was presumably limited by an unknown N-S wall which would have existed somewhere in the western part of trench B and which would presumably make a corner with wall 90020. Such subdivision of space is suggested on the basis of opinion that the occupation in trench A was not exactly of the same character as that in trench B. Notably, in both trenches, the doorways associated with this phase are almost on the same level – 90017 is at 778.74-.76 and 91009 is at 778.69-.72 – but the Phase 7 structures in trench B appear to be part of an entity of much more monumental character than that in trench A.

### **Wall 90020**

Wall 90020 is the southern wall (top at *c.* 778.80 m, length *c.* 3.50 m, width more than 0.30 m, three courses high in the western part, one in the eastern part) of the room / corridor (**pls 1-2, fig. 27**). The eastern part of 90020 clearly stands on top of the old (levelled?) wall 90027. Wall 90020 consists of three parts: the superstructure, the western foundations and the eastern corner (?) section (*locus* 90023). The superstructure is made of mudbrick of which two rows are distinguishable. The main problem here is that directly behind wall 90020 is mudbrick wall 90011 (see **pl. 2**), and the relationship between these two cannot be determined: either the former is abutted by the latter or the former is below the latter. In any case, it is suggested that wall 90020 formed the southern limit of the Lower Complex while wall 90011 was the southern wall of the Upper Complex.

The western half of the mudbrick superstructure of wall 90020 has a foundation course made of small irregular stones. The eastern half has a different arrangement: instead of such foundation course, it features at its bottom one very long (1.14 m) slab followed by two smaller but relatively regular slabs (all as *locus* 90023, see **pl. 2**). Only one course of mudbrick is preserved on top of these slabs. It is suggested here that *locus* 90023 is the stone reinforcement of the south-east corner, i.e., the spot where wall 90020 would have met with the eastern, not evidenced, wall of the room. Such corner reinforcements are well evidenced in

the mudbrick structures of Madâ'in Sâlih, e.g., *locus* 20036 in wall 20037 (Area 2). The actual corner must be located somewhere in the western part of trench B, at the depth which was not reached during the excavations.

### **Wall 90028**

Wall 90028, located in the north-eastern corner of trench A (**pl. 1, fig. 28**), is probably one of the crucial yet difficult to interpret elements at the site and, in fact, its interpretation has completely changed in 2011 as the result of the excavations in trench B. Notably, in its extant form, this *locus* forms the eastern limit of the subsequent Upper Complex, together with wall 90002, but it is apparent that these two walls are not contemporary in date. Wall 90002 is a stone construction made of high quality ashlar, which runs NNE-WSW. Wall 90028 (top at 779.02) is a mixed stone / mudbrick construction the course of which is more northerly. Although in the Phase 9 these two walls together formed the eastern limit of Upper Complex, they do not represent exactly the same course line and thus must represent a different chronological reality. Wall 90028 is c. 1.10 m long and 0.48-0.50 m wide, with mixed alternate coursing of stones and mudbrick (four in total). Notably, the section which directly connected walls 90028 and 90002 in Phase 9 is three courses high and entirely made of stone but its specific construction relates to the reality of Phase 7.

The proposed interpretation is as follows. Wall 90028 is located in the very significant location which features the connections between three walls: 90030 (running E-W), 90029 / 91004 (running E-W) and presumably 91022 (running N-S). In fact, 90028 is not a wall *per se* but rather an offsetting element which anchors the stone wall 90029 / 91004 to other walls mentioned above. Wall 90029 / 91004 abuts / bonds with the eastern face of 90028 and then continues eastwards (**fig. 29**). The question can be posed why wall 90029 / 91004 was not constructed as an eastward extension of wall 90030, i.e., in the same line as the latter, despite the fact that both walls were constructed in the same time. The answer must lay in the existence of earlier but apparently still substantial wall 91028 which is located in the central part of trench B. That wall might have been partially razed in Phase 6 but it probably still continued down at a substantial depth. Notably, *locus* 91032, i.e. the foundations of 90029 / 91004 and of threshold 91009, was laid out directly against the southern face of that wall. Thus wall 90029 / 91004 could not be built in the same line as wall 90030; perhaps it was considered technically not feasible to build a heavy all-stone wall on top of an old mudbrick wall. Instead, wall 90029 / 91004 was constructed as slightly offsetted to the south of the line of wall 90030, and *locus* 90028 was specifically built as an anchor for that wall. The corner section formed by 90030, 90028 and 90029 / 91004 also served as a base for another wall – 91022 – which runs north from that corner section. Unfortunately, its state of preservation prevents any more enlightening commentary.

An additional proof of the scenario proposed above is the presence of stone wall 91015 (currently under mudbrick wall 91029) which bonds with 90028 exactly at the point of its stone section (**fig. 30**). Wall 91015 runs eastward in a short distance of and parallel to wall 90029 / 91004 and it might have served, in a combined fashion, as a step down from threshold 91009, being in the same time a stone frame (?) of the pavement extending south of wall 90029 / 91004 (*infra*). Therefore, *locus* 90028 never extended any further south, never formed a limit of a space between main E-W walls of the Lower Complex and its stone section served only as the actual corner with 91015.

### **The eastern and western walls**

As stated above, the eastern, N-S limit of the space between the main E-W walls of the Lower Complex was not found (due to the limited depth of excavations there) but presumably it would have been located somewhere in the western part of trench B, not unlikely near the line represented by *locus* 91007 or the ephemeral wall 91006 during the subsequent phases. The reasons for insisting on the existence of such limit are mentioned above in the introduction to Phase 7. It is probable that this hypothetical wall, if built

of mudbrick, was substantially affected by the flooding disaster in Phase 8. Similarly, the location of the wall enclosing the space on the western side cannot be established, but it was probably located just beyond the limits of trench A. Suffice is to say that the extant western wall (90005 / 90006) cannot be proposed as the limit of the Lower Complex. It abuts wall 90004 but its foundations are located much higher up. Below wall 90005 / 90006, are layers 90021 and 90019, which must be considered the occupation strata of the Lower Complex.

### *The northern wall*

The northern wall is elaborate and complex, and resembling a building technique which involves the construction of a wall in segments or sections (*infra*). The northern wall is also generally better built than some other walls, probably because the entrance located there was one of two main entrances to the Lower Complex. The northern wall consists of the foundation course (90034) for walls 90004 and 90030 located on both sides of the doorway (90017) which includes the threshold and the door jambs (**pl. 5, figs 31-32**). The description below refers to the extant appearance of these elements. However, it has to be kept in mind that as these also served as the northern limit of the Upper Complex, it is possible that they were modified / reinforced later on.

The foundation course of 90034 (top at 778.24-778.32 m) consists of the single, horizontal course (c. 2.71 m long) of at least thirteen stones of various size, one of which is part of a basalt millstone. This course has been partly dug into layer 90033, i.e. is deeper than the lowermost courses / foundations of the other walls of the Lower Complex in trench A. The reason is two-fold: to sustain the existence of a heavy construction of the door, and to protect channel 90031 located below the threshold and directly on top of foundation course 90034. This is also supported by the fact that, the stone course does not stretch all the way from the western corner to the eastern corner but it is centered upon the doorway.

Walls 90004 and 90030 form a more or less continuous line of the facade below the threshold level, but they considerably differ in appearance and construction method on either side of the door jambs. It needs to be kept in mind that the western wall of the Lower Complex, with which wall 90004 would bond (abut / be abutted) is not known; probably located further west from trench A. But is clear that wall 90004 continues further west, beyond the limit of trench A. In Phase 9, wall 90004 became abutted by the western limit of the Upper Complex – wall 90005. Perhaps during these changes, some parts (especially the corner) of wall 90004 were reinforced by stone, thus its mixed stone-mudbrick construction.

The total length of wall 90004 cannot be established due to the problems mentioned above, but it runs westward for at least 1.46 m from the western door jamb. The wall is a very irregular and composite structure of stones and mudbricks, at least six to seven courses high. The uppermost one to two courses are made of mudbrick and the following three to four courses, very irregular in coursing, of stone. However, closer towards the center and directly upon the westernmost stone of the foundation 90034, there is a regular, single “column,” in seven courses made of stone. This “column” seems to serve as the vertical enclosure of the foundation coursing (**pl. 5, fig. 32**), i.e. at least on this side, the section of wall with the foundation course, the door, the threshold and the channel is totally enclosed and separated from the rest of wall 90004. It may be due, as suggested above, to the specific technique of construction employed there, i.e. the construction of the northern limit of the Lower Complex in sections or segments and it, incidentally, very well fits the example presented by the composite character of the corner of walls 90030, 90029 / 91004 and 90028. If so, it means that after the foundations 90034 were constructed, the work continued directly above the foundations, including the channel and the door, forming a separate segment, and only then walls 90004 and 90030 were built on both sides of the door jambs. Alternatively, these irregularities might be a result of modifications / reinforcement of the northern wall when the Upper Complex was constructed in Phase 9. What is puzzling, however, is that this “separation” or “segmentalization” (through the introduction of the

stone “column”) is not reproduced on the eastern side of the door section, i.e. in wall 90030. There is no vertical stone “column” there on top of the easternmost stone of the foundation course. It may be due to the fact that wall 90030 and its corner stone section (where connecting with wall 90028 and presumably with the stone wall 91022) served in more or less unchanged form in both the Lower and Upper Complex.

As opposed to wall 90004, wall 90030, on the eastern side of the doorway, is relatively homogeneous in appearance and it consists of two separate sections: mudbrick and stone ones, and is *c.* 2.00 m long altogether. The mudbrick section (*c.* 7 courses high, two rows of mudbricks, max height 1.10 m) stands directly on the foundations 90034 and partly on *locus* 90033. The section made of stones – to reinforce the firm corner connection with wall 90028, and the partial connection with wall 90029 / 91004 – features five courses of relatively well-dressed ashlar: the uppermost stone is *c.* 0.67 x 0.30 x 0.23 m. Furthermore, the existence of the stone section there should be related to the fact that it probably served as a *terminus* for wall 91022 which runs northward from this place.

### ***Doorway 90017***

The only known access to the interior of the Lower Complex located within the boundaries of trench A is the massive doorway 90017. It consists of two large stone slabs (0.45 and 0.90 m in length, *c.* 0.16 m thick) forming the threshold, and two upright blocks standing on the western and eastern extremities of the threshold. The western block is 0.50 x 0.20 x 0.24 m and the eastern one is 0.53 x 0.30 x 0.17 m.

### ***Channel 90031***

In the space between the threshold and foundation course 90034, there is very a well-fitting stone installation consisting of a monolithic channel, its large capstone and the channel’s base (**fig. 33**). The channel is 0.12 m high, 0.37 m wide, with the roughly V-shaped trough being *c.* 0.05 x 0.06 m. A massive capstone, directly under the threshold slabs, is *c.* 0.49 x 0.08 m. Two smaller slabs, below the channel, which rest directly on the foundations 90034, are *c.* 0.18 (in total) x 0.08 m.

There are two issues with this channel which are puzzling. First, the gradient of the trough could not be established, but the dimensions of the trough indicate a very low flowing capacity. Secondly, the location of the channel would indicate that while the channel itself would have been below the surface of *locus* 90021 – the main occupation stratum of the Lower Complex south of walls 90004, 90030 and 90029 / 91004 (and presumably 91015) – the capstones would be protruding, thus allowing for drawing / discharging liquid and the maintenance. But the location of the channel makes less sense as it is located almost in the center of the threshold and below it. Not a very convenient solution for anyone entering or leaving the room. The probable solution is that there must have been a composite stone step lower than the threshold and directly to the south of it, and that the capstone(s) of the channel were somehow integrated into the structure of this step(s). An alternative proposition would associate the channel with the reality other than that of the Lower Complex (and certainly not of the Upper Complex) but in such case, the description and interpretation of the entire northern facade of the house would not make any sense. Whether the channel served to conduct water into the interior or as a drain (into the exterior) cannot be determined but, generally, neither is more plausible. The solution can only be reached through the excavation of the area north of walls 90004 and 90030.

### ***Wall 90029 / 91004, threshold 91009 and foundation 91032***

These are the main elements of the monumental architecture featured in trench B in Phase 7 (**p1s 8, 12, figs 34, 35, also fig. 23**). The constraints related to the location of 90029 / 91004 have already been presented in connection with *locus* 90028, thus this section will be more descriptive. This E-W wall (top at 779.17-.23) consists of two rows of relatively large and well-dressed blocks or ashlar, the largest of

which is *c.* 0.60 x 0.35 x 0.21 m. Some ashlar feature diagonal chiselling marks. The southern face has two visible courses while the northern face has four and each face has a layer of small chinking stones apparently serving to keep the proper height at both sides. Max length is 1.80 m, width 0.60 m and max height *c.* 0.91 m. Notably, the wall continues in the same construction manner and course eastwards of doorway 91009 but only a very short section was uncovered in the eastern baulk of trench B.

Threshold (at 778.69-.72) consists of two long slabs, one long and other short, forming a rectangle of altogether 2.25 x 0.65 m (**fig. 34**). The doorway runs flush and in line with the course of wall 90029 / 91004. The surface is worn and smooth as if walked upon for a long time.

The stone foundation, *locus* 91032, for the threshold (and the wall) is at 778.48-.50 (**pl. 6**). On the northern side, the foundation was dug from the top of *locus* 91021, a layer which largely has covered the remains of occupation in Phase 6. There is practically no foundation trench discernible; the foundation course almost abuts the southern face of the old mudbrick wall 91028. On the southern side, the foundation seems to be resting on top of *locus* 91016 but it might have been cut through the already existent *locus* 91014 located on top of 91016. The stone foundation courses (one main consisting of stone blocks and one of chinking stones separating the blocks from the threshold) are *c.* 0.33 m deep as visible on the northern side and *c.* 0.35 m deep on the southern side. On the southern side, the main layer of stones features blocks that are much more regular in shape than those on the northern side. Apparently, the stone course of the foundation started to be laid out on the southern side, thus intended to be vertically flush with the threshold to be placed on top of it and the laying out ended at the northern side where the foundation course projects slightly northwards (in relation to the edge of the threshold) towards the southern face of wall 91028. On the northern side, the foundation course can be observed to clearly continue westwards, i.e. under the western doorjamb section (collapsed) of the doorway and under the structure of wall 90029 / 91004.

### **Wall 91015 and locus 91010**

The interpretation of this E-W stone wall is difficult and the only certain evidence is that it was firmly bonding with the stone section of wall 90028 (*supra*). Currently, the western part of this wall is capped by a mudbrick wall (?) 91029 and it is hard to imagine that these are contemporary although they seem to follow the same line (**pl. 6, figs 30 and 34**). Further east, the wall is preserved in two sections of several stones each (the largest stone being *c.* 0.30 x 0.30 x 0.10 m) with a substantial gap in-between. The top of these sections is at *c.* 778.55-.60 while the top of the section below 91029 is at *c.* 778.61-.64. It is assumed that the wall line would have continued E-W from its connection with 90028 until the eastern baulk of trench B (and further?), i.e., all along wall 90029 / 91004 and threshold 91009, without any gaps. The current gap is thus unexplained. All this also means that wall 91015 must have been built only when *loci* 90029 / 91004, 91032 and 91009 were already in place.

Theoretically, a wall forming the eastern limit of the space south of the main northern E-W walls should have run southward of wall 91015 but no traces of such were ever found. Also, the function of 91015 cannot be easily established. It might have served as a step down from threshold 91009 into the southern space of trench B, i.e. the top of *locus* 91010. Equally possible is that wall 91015 was, in fact, a stone frame of the (originally paved?) surface 91010. Finally, it might perhaps be more logical to chronologically associate 91015 with the mudbrick section 91029 (*vide* the ephemeral Phase 7B) but, again, the firm connection of 91015 with wall 90028 would more indicate its construction in Phase 7A.

The occupational surface of the southern part of trench B in this phase is *locus* 91010 (**pl. 6**), probably chronologically, but not physically corresponding to *locus* 90021, the main occupational surface south of walls 90004 and 90030. The top of 91010 is at *c.* 778.50 and it is a relatively horizontal statum of medium to hard compaction, which is more or less on the same level as the top of stones in *locus* 91015.

### **Occupation north of wall 90029 / 91004**

In the northern part of trench B, *locus* 91021 had effectively covered the remains of Phase 6, together with the subsequent *locus* 91011. The former should be considered as a surface present at the initial construction period of Phase 7, from which various foundations were dug and on top of which installations 91012 and 91033 stand. *Locus* 91021, with its top at 778.41-.43 has few finds but is represented by a tight, compacted surface. The main occupational level associated with the duration of Phase 7 is, however, *locus* 91011 (top at 778.59-.61), which reached the mid-height of threshold 91009, completely hiding its foundation courses (pl. 7).

### **Installations 91012 and 91033**

These curious structures were built tight against the northern face of wall 90029 / 91004 (fig. 10). Additionally, installation 91012 was presumably located exactly in the corner formed by wall 90029 / 91004 and the assumed course southward of wall 91022 (*infra*). Installation 91012 (top at 778.73-.80) consists of two parallel (N-S) rows of small stones set upright and c. 0.19 m apart from each other and several stones which form a kind of double-level cover. Initially, it was interpreted as a capped water channel, but upon the removal of one of the “capstones”, the interior was filled with hard-beaten soil with no indication of a trough. The total length (N-S) is c. 0.70 m, width c. 0.49 m, and max. height is c. 0.37 m.

Installation 91033 (top at 778.66), which tightly abuts *locus* 91012 on its eastern side, consists of a large trapezoidal slab (c. 0.50 x 0.57 x 0.07 m), surrounded by at least eight small stones, some of which seem to go under the large slab forming a support. The total is c. 0.75 m (N-S) long and 0.69 m wide, with the max height, including the stones under the slab, being c. 0.26 m.

The stratigraphic situation indicates that both installations must be contemporary with the use of wall 90029 / 91004 in Phase 7. It may be that *locus* 91033 is a small platform on top of which something was placed (statue? basin? other portable installation?). Generally, the function of both installations is undetermined and it must be kept in mind that both were probably reused / modified (?) in Phases 9 or 10 when it appears that they might have served as crude steps leading from the area of trench B toward the new (blocked / raised) door (*infra*) in the northern wall of the Upper Complex.

### **Occupation south of the northern E-W walls**

The main occupation stratum inside the space south of the northern E-W walls is *locus* 90021 (top at 778.58-.64), a rather heterogeneous hard-top deposit of silt with some clay and sand (pl. 3, fig. 36). This deposit had completely covered the remains of old wall 90027. The *locus* yielded relatively large quantities of pottery, bone as well as a stamped amphora handle (90021\_P10, unidentified so far, fig. 37), one stone vessel (90021\_S1) and one terracota figurine of a horse (90021\_TF1, fig. 38). Notable were relatively large quantities of cereals (rachis, grain) mostly of barley but many undetermined and some date seeds.

In the north-east area of the interior, several stones were found laying without any pattern, with some relatively thick ash lenses all around. However, it would be difficult to interpret these remains as a fireplace, unless it was destroyed and dispersed by the subsequent flooding (*infra*). *Locus* 90021 was in turn covered by *locus* 90019 at least the lower part of which is probably also related to the occupation of the Lower Complex. Undoubtedly, both strata would have extended eastwards into the space of trench B. But since the exact location of the eastern wall limiting the space is unknown, this extension cannot be estimated.

### **Wall 91022 and its foundations 91023**

The final element which might reasonably be associated with Phase 7 is wall 91022 and its foundation course 91023 (fig. 10). Although only the north-eastern portion of this wall is preserved, it appears that it would have run N-S to abut the eastern section of wall 90030 made entirely of stone. Currently, what

remains of wall 91022, at 778.65-.86, are three large blocks (largest being *c.* 0.60 x 0.30 x 0.30) and some smaller stones, all arranged in two courses and one-two rows. Further north, are two much smaller stones which, however, preserve the same orientation. The total is *c.* 1.02 m long, *c.* 0.38 m long and max. 0.61 m high. Evidently, this is the eastern face of the wall, the western one having been completely obliterated. The bottom of the wall roughly corresponds to the bottom of *locus* 90011 (= top of 91021) and this is where the foundation course for the wall begins. Apparently, a foundation trench was dug in the surface of *locus* 91021, which is the surface associated with the construction activities in Phase 7, and a row of very tightly packed small stones inserted into it, measuring *c.* 0.1 m in depth. The wall was then constructed on top of these stones. What puzzles is that the general orientation of this foundation course is strangely at variance with the orientation of the wall itself. The small stones project off the eastern face of the wall by *c.* 0.26 m in the north while it is only *c.* 0.16 m in the south. It is unclear whether it is a manner of construction or if the wall itself somewhat “shifted” (tectonic movement?) during its existence. It needs to be stressed here that both the wall and its foundations much suffered during the subsequent phases and that the entire southern sections of both (= toward the junction with wall 90030) are missing. Evidently, the enigmatic activities conducted there during Phases 9 and 10 have substantially affected the preservation of these *loci*.

### Dating

The material from trench A (*loci* 90026, 90021 and 90019) is heterogeneous, with few well-datable or dominant forms. As for *locus* 90026 which covered the ash 90032 and thus most probably belongs to Phases 6 or 7, the presence of the “Parthian ware” (one glazed sherd; 1<sup>st</sup> century AD?) and Nabataean type 3a cooking pot from Petra, would suggest a date in the middle of the 1<sup>st</sup> century AD. In *locus* 90021 are present some jars which might be dated to the Late Hellenistic period, generally the 1<sup>st</sup> century BC. Also, some cooking pots which seem (late) Hellenistic but their extension into the 1<sup>st</sup> century AD is uncertain. Some cooking pots seem to date (according to fabric) to the late 1<sup>st</sup> century BC – early 1<sup>st</sup> century AD. As for *locus* 90019, it seems to contain the 1<sup>st</sup> century BC types but it is uncertain if the date range can be extended into the early 1<sup>st</sup> century AD.

In trench B, the *loci* relevant for Phase 7 are 91014 and 91010 in the south and *loci* 91021 and 91011 in the north. *Locus* 91014 had ceramics datable to late 1<sup>st</sup> century BC – early 1<sup>st</sup> century AD? while *locus* 91010 had the material dated to the 1<sup>st</sup> century AD. Additionally, a coin was found in this *locus*, probably a city issue dated to the early 2<sup>nd</sup> – 3<sup>rd</sup> century AD. *Locus* 91021, based on the presence of Nabataean painted ware (Ph. 2c / 3a?) and jar with pinched rim, might be dated to the early / mid 1<sup>st</sup> century AD?

ZTF: The presence of coin might probably be explained by the erroneous *locus* assignation in the southern area of trench B where the strata were featureless and generally difficult to separate. As for the ceramic component in *loci* generally assigned to Phase 7, the wide range of dating is disturbing. What can, however, be postulated for the Lower Complex occupation, at least from the stratigraphic standpoint, is that it must have begun at the end of the 1<sup>st</sup> century BC, and probably extended till at least mid-1<sup>st</sup> century AD, possibly later.

### Phase 7B. Addition to the lower complex?

The recognition of this phase is very tentative and not easy to justify. Basically, the only element which does not fit into the early, formative stage of Phase 7 (= 7A) yet must have been constructed sometime before the flooding of the area in Phase 8, is mudbrick wall (?) 91029. It is not even certain if this structure was a wall or a mudbrick structure / surface and the author should bear full responsibility for failing to properly assess this *locus* during the fieldwork. Currently, *locus* 91029 (top at 778.69-.75) appears as if being a single mudbrick course directly on top of stone wall 91015, featuring two rows of mudbrick. Yet, when

reviewing the documentation photos, it seems that this mudbrick structure somewhat extended southwards, i.e. beyond the limits of 91015. Apparently an over-eager worker had “trimmed” this *locus* as to appear to be entirely and exclusively on top of 91015 (compare **fig. 30** with **fig. 39**).

Anyway, currently the mudbrick structure is *c.* 1.56 m long and 0.60 m wide and it seemingly stops before (or under) the later enclosure, *locus* 91007 (Nabataean capital) which was probably built in Phase 9. Also, there were no indications of the existence of a mudbrick superstructure directly over the course of wall 91015 in the central and eastern parts of trench B. Therefore, it is difficult to make any reasonable guess concerning the function of this *locus* beyond what has been said above. It may be that 91029 served either as a wall or a surface extending over the southern area but either proposition is a pure speculation. Nevertheless, it must have been constructed before the deposition of the flood-related stratum 91008 and probably it much suffered during that disaster. Hence, it is recognized here as belonging to the later stages of existence of Phase 7, designated here as 7B.

### Dating

See dating of Phase 7A, probably toward its chronological end.

### Phase 8. Flooding destruction

A substantial flooding and the resulting destruction effectively ended the occupation of the Lower Complex. It is evident that the flood wave came from the area to east-south-east from trench B, where even currently the terrain is slightly higher, and it penetrated the interior of trench A. The flooding must have originated from a rapid and violent rainstorm which created virtual “rivers” of fast-flowing water. The main surge covered the southern area of trench B, apparently broke through and obliterated the hypothetical eastern N-S wall and thus penetrated the interior of trench A, i.e. the space between parallel E-W walls of the Lower Complex.

In the interior of trench A, certainly *locus* 90019 (upper part) was affected, as it features heavier elements carried by the surge – stones, clumps of disintegrated mudbricks, and some pebbles. As such, the surface of 90019 is much differentiated with regard to its compactness. But the main flood-related deposit is *locus* 90016 (top at 778.82-.85 m) which is a relatively homogeneous horizontal stratum of fine silt and sand of medium compaction (**pl. 4, fig. 40**). It seems that once inside the space surrounded by the walls, the surge quickly lost its strength and rapidity as no major damage appears to have been inflicted on the other walls except for the eastern one which stood directly in the way of the flooding. Probably, the southern mudbrick wall (90020) has also suffered some damage (*infra*).

The damage is even more substantial in the area of trench B, where the main flooding deposit, *locus* 91008 (top at *c.* 778.77-.88) and its equivalent, *locus* 91026 (top at *c.* 778.76) in the south-western quadrant of trench B, are generally deeper (**pls 7 and 8**) and much harder than its counterparts inside trench A. There are several reasons for that. The area of trench B was open, except for arch? lintel? over the door in wall 90029 / 91004, and in the subsequent phase (Upper Complex) it remained open and much less intensely occupied. Due to the long-term exposure, the heavily clayish-silty component has hardened to an almost concrete-like compaction. At any rate, the flooding layers in trench B have completely covered the doorway 91009 and walls 91015 and 91029. Again, the impact in the northern part of trench B was lesser and some parts of installations 91033 and 91012 seemed to have protruded over the top of 91008.

It may be possible to suggest that even a more substantial destruction has taken place in the unexcavated area to the east and north-east of trench B where, according to the aerial photos (**fig. 26**), a large enclosure (with a monumental structure inside?) exists. The appearance of large ashlar at the site, e.g., used in the construction of wall 90002 of the Upper Complex, as well as the presence of several column drums (*locus* 91001) in the northern part of trench B and on top of *locus* 91008, may indicate that a colonnaded structure presumably located there had collapsed and was never reconstructed.

### Dating

Large quantities of pottery are contained in *locus* 90016. The dating of the material from 90016 ranges from the end of the 1<sup>st</sup> century BC into sometime in the 1<sup>st</sup> century AD. *Locus* 91008 produced sherds dated to the 1<sup>st</sup> century AD, and *locus* 91026, material dated to the 1<sup>st</sup> century BC – 1<sup>st</sup> century AD, with the types predominantly representing the 1<sup>st</sup> century AD date.

ZTF: One should assume that many pots must represent the latest moments of occupation of the Lower Complex. But equally, many broken sherds could have been carried by the surge from the neighbouring areas and deposited inside the house, thus a possibility of presence of intrusive ceramics and the resulting contamination. Yet, the ceramic dating appears relatively uniform. Therefore, it is suggested that the end of the Lower Complex must have been in the 1<sup>st</sup> century AD, probably toward its end, as caused by the momentous event – the flooding.

### Phase 9. The upper complex

From this chronological point onward, the occupation of the area has mainly centered in trench A and thus the so-called Upper Complex is largely represented by the remains uncovered there. Also, in opposition to the Lower Complex, its upper equivalent consisted now of a well-defined room limited by walls on all four sides. The situation in trench B is more enigmatic and one can only pinpoint the appearance of the ephemeral installations there, difficult to date and interpret. At any rate, there is no indication that there was any substantial *hiatus* in the occupation following the flooding destruction of the Lower Complex. On the contrary, the flood deposit 90016 in trench A is directly followed by the rich occupation stratum 90003. This indicates that almost immediately after the flood, that part of the complex was restored, albeit with some major modifications. Notably, the northern walls 90004 and 90030 do not seem to have been much affected. As for the western wall, the furthest away from the surge, no information exists. Therefore, the immediate concern in the restoration was the eastern and southern limits. These were restored by constructing new walls (90011 and 90002). In the same time, the size of the occupied space was reduced by constructing a new western wall (90005 and 90006), all present within the limits of trench A (**pl. 1**). Notably, similarly to the situation of the Lower Complex, no information exists as for how the space of the Upper Complex was roofed, but this remains a possibility.

As for trench B, certainly no definite restoration was ever implemented there. Rather, a series of curious structures, such as *loci* 91005, 91006, 91007, 910024 and 91025 was built, the chronological assignment of which is exceedingly difficult. Some of these were “platforms”, other simple enclosures, crude steps or supports. The exception is *locus* 91001, which puzzles by its energy-consuming effort.

### Wall 90011

With the probable destruction of the hypothetical eastern N-S wall of the Lower Complex, its connection with wall 90020 might have been affected as well. In fact, wall 90020 itself might have been affected; after all the destructive surge of water and mud came from the east-south-east direction.

At any rate, a new wall – 90011 – was built seemingly just behind wall 90020 but their relationship cannot be fully determined: either the former abuts the latter or the former is built on top of the remains of the latter (**pl. 2**). One might also consider that the southern limit of the Upper Complex was in, in fact, made by both walls, 90020 (in whatever form and height it was still preserved in Phase 9) and the backside-reinforcing wall 90011.

Wall 90011 (top at 779.11; max. length 3.76 m; max. width 0.55 m, two to three courses high) is a mudbrick structure featuring two rows of bricks (**fig. 36**). In the western part of this wall, there is *locus* 90018 – three slabs (one more than 0.80 m long), located on the same level, which form an east-west horizontal line, at least 1.21 m long. The westernmost of these stones, in fact, “enters” the western baulk, slightly below the

lowermost course of wall 90006 (the western wall of the Upper Complex). The function of these stones which protrude *c.* 0.2 m northwards from the northern edge of wall 90011, is not clear. The most plausible interpretation is that *locus* 90018 is a stone reinforcement of the corner formed by the mudbrick wall 90011 with stone wall 90006. Notably, these protruding stones would not be visible as they are below *locus* 90003 – the occupational stratum inside the Upper House.

In this context, it is worth to briefly mention wall 90012 (top at *c.* 779.13 m; max. length 0.77 m, max. width 0.70 m, two rows, two courses high). This mudbrick wall runs N-S, abutting wall 90011 at the right angle. Most probably, wall 90012 was built simultaneously with wall 90011. This indicates that the Upper Complex would have extended southwards from the excavated interior of trench A.

### ***Walls 90005, 90006 and door 90007***

As opposed to the Lower Complex, the western limit of the Upper Complex is known, being the combined walls 90005 and 90006 (**pls 1, 4, fig. 7**). The division of the western wall into two parts, separated by the door section, is a purely artificial measure to facilitate the excavations and recording. The combined length of both walls (the top at *c.* 779.15-.30 m) is *c.* 3.25 m and both walls feature two to three courses. The width could not be determined. The coursing is roughly horizontal and the stones very roughly cut. The largest is *c.* 0.32 x 0.26 x 0.09 m but most are smaller than that. The northernmost part of wall 90005 abuts the old wall 90004 but the southernmost part of wall 90006 barely reaches the northern face of wall 90011. The connection there is not well evidenced but this must have been the south-west corner of the room.

*Ca* 0.75 m south of the north-west corner, in the spot where the section of the western wall denoted as *locus* 90005 ends, begins the door section, marked by the upright standing stone, apparently the lowermost part of the northern door jamb. Directly south of this stone, there are two flat slabs of the combined length of 1.26 m, with the top at 779.22 (see **fig. 7**). Again, the width could not be determined due to the limit of excavations. These slabs must be interpreted as the threshold of the door leading to the interior from the west. The upper edge of these slabs is clearly worn and “polished”, indicating frequent walking upon. The southern door jamb is not preserved. With the postulated blocking of the old entrance in the northern facade wall (*infra*), the door in the western wall provided the main access to the room of the Upper Complex. Perhaps, the utilization of the door-blocking in the old entrance as a makeshift threshold should not be entirely excluded, especially in light of the presence of crude step-like installations located to the north of walls 90029 / 91004 and 90030.

### ***The northern wall***

Walls 90004 and 90030 continued to serve as the northern limit also for the Upper Complex. Nothing can be added to their description, as above, beside the fact that some irregularities in their appearance might have resulted from modifications as related to the construction of the Upper Complex.

The only evident change which should most probably be associated with Phase 9 is the blocking (*locus* 90013; top at 779.27) of door, *locus* 90017 (**pl. 5, fig. 32**). The blocking was effected with two very large blocks (0.76 x 0.20 x 0.12 m and 1.0 x 0.25 x 0.20 m) standing one upon the other, and with some small chinking stones on the bottom. The blocking was done in the expertly manner, with the blocks well fitting the frame of *locus* 90017. Theoretically, the upper block in the door could have served as a threshold of an “elevated” doorway into the main room of the Upper Complex. Admittedly, the surface of that block lacks typical smoothness and “polishing” as derived from the frequent stepping onto it. But again, one should note the presence of crude steps, *locus* 91024, in the northern exterior, which may indicate that some kind of access was intended. Furthermore, one should note the presence of a flat stone standing close to the western end of the blocking and on its northern side. The stone features a circular depression which might, theoretically, be interpreted as a door-socket.

### **Wall 90002**

The main room in the Upper Complex features the entirely new, stone wall, *locus* 90002 (top at 779.18-.31), being a relatively orderly construction (pl. 3, and fig. 41). Wall 90002 consists of two parallel rows of stones, with rubble and soil in-between. The wall is two courses high; the lower consists of large blocks, some very well dressed, and as large as 1.0 x 0.25 x 0.1 m. The upper course consists of small, flat stones (average c. 0.20 x 0.1 x 0.05 m). Evidently, the construction of the wall featured courses of large blocks alternating with courses of small stones. It is obvious that if large, well-dressed ashlar became now available, they must come from some monumental structure nearby, ruined by the disaster in Phase 8.

Wall 90002 continues for several meters beyond the southern limit of trench A. This again indicates that the Upper Complex must have consisted of more than just one room excavated in trench A. The total length of the wall is 3.60 m (within trench A) and the width is 0.70 m. The length, however, has to be combined with the length of wall 90028, the survivor from the time of the Lower Complex. Because the course of wall 90028 is more northerly (= almost north-south) than of wall 90002, the entire eastern wall of the Upper Complex, when looked upon from above, presents a curious “bent” appearance (pl. 1). The chronological difference as represented by these two walls is also confirmed by the fact that the connection between these two is not exactly of high quality and featuring rather haphazardly placed stones and mudbricks.

### **Stratum 90003**

The principal occupational stratum associated with the main room of the Upper Complex is *locus* 90003 (top at 779.05-.08), a medium-compacted silty-clayish soil which covers the entire interior (pl. 3, fig. 41). The roughly horizontal surface is relatively hard and it abuts all walls mentioned in connection with Phase 9. The finds in this stratum were particularly rich and they included large quantities of ceramics and bone, several metal objects (Cu / Cu alloy and iron), including a copper ring.

### **Wall 91006 and installations 91007 and 91005**

The majority of remains associated with Phase 9 in trench B come from the south-western quadrant of the trench, directly south of wall 90029 / 91004. That wall seems to have well survived the calamity in Phase 8 and it was still prominently sticking out from the top of layers 91008 and 91026. But walls 91029 and 91015 were now fully buried and invisible. What happened next is a sequence of very poorly preserved and understood construction events there.

Directly on top of the flood deposit 91026 was “wall” 91006, an exceedingly poorly preserved structure (top at 778.89) consisting of one row of mudbricks and possibly one-two courses high (fig. 42). This structure is 1.40 m long and 0.24 m wide and it runs southwards strating from the southern face of wall 90029 / 91004. This wall must have had a very short existence as, soon after, two other installations were constructed in this area, i.e. *loci* 91007 and 91005 (fig. 43), basically on top of 91006. Installation 91007 (top at 779.17-.19) appears to be a makeshift “barrier” which was constructed in N-S orientation directly south of the spot where wall 90029 / 91004 ends and the doorway 91009 begins. The barrier basically consists of only one element – a pilaster capital of Nabataean style, broken into two halves (fig. 44) – which is reinforced on the western side by the insertion of small stones. During the removal of these small chinks in order to fully expose the capital, a coin was found which appears to be a city coin of Neapolis Sebaste (?) dated to the 2<sup>nd</sup> – 3<sup>rd</sup> century AD. Furthermore, the capital appears to lay directly on the stone wall 91015 and the mudbrick section (91029) of that wall is not visible under the capital. If there is any soil between 91007 and 91015, it must be the muddy layer 91026; the weight of the capital contributed to this element “settling” down through 91026 to the level of wall, *locus* 91015. The capital is c. 1.20 m long, 0.50-.70 (min / max) wide and of max. height being 0.50 m. The function of this barrier, which may or may not have continued further south, was to separate the south-western quadrant of trench B, close to wall 90002, from the area further to the east.

The chinking stones which surround the capital on its south-western side do merge with the most peculiar stone / mudbrick formation – *locus* 91005 – again located on top of layer 91026 and south of wall 90029 / 91004 but without the actual physical contact with the latter (**pl. 8**). This *locus* is also located east of wall 90002 but it was not certain whether or not 91005 was originally abutting that wall. Additionally, *locus* 91005 does not extend further east from an imaginary line formed by the western face of *locus* 91007, so again it is restricted within the quadrangle south of wall 90029 / 91004. *Locus* 91005 can be described as a “platform” (?), *c.* 1.72 m (N-S) and 1.20 m (E-W) with its top at 779.09-.18. Its northern part is made of mudbricks and occasional stones while in the central and southern parts, it turns into an extremely tightly packed deposit of stones, mostly broken, which feature a very rough E-W pattern of deposition. Definitely, *locus* 91005 is not a result of natural deposition. The stones in its central and southern parts were so tightly packed that in order to remove the major find inside this *locus* – a partial lion’s head made of stone – the entire *locus* had to be, regrettably, removed. In addition to the lion’s head – probably belonging to a large, engaged statue (?) of that animal (**fig. 45**, also **figs 43** and **44**) – a half of the drum was also inside 91005. Another drum is located in the southern baulk of trench B, so it is possible that *locus* 91005 might continue southwards. The function of *locus* 91005 is unknown; it may have served to even up the area by filling it up with stones and mudbrick sections. But if it was the intention, there are no remains of any occupation on top of it nor the “platform” extends all the way up to wall 90029 / 91003.

### **Occupation north of wall 90029 / 91004**

The flooding deposit 91008 has covered most of the installations in this area (**fig. 46**), including 91033 and 91012, although the tops of these still protruded and, especially in case of 91012, its top might have served as a crude step (leading westwards) of a kind. Additionally, *c.* 0.30 m west of the remains of wall 91022 (which might also have substantially suffered during Phase 8) and north-west of installation 91012, there is a puzzling N-S row of mudbricks and stones, assigned *loci* 91024 and 91025 and tentatively recognized as a wall with stepped threshold (**pl. 1**).

*Locus* 91024 (top at 778.996) is a structure consisting of one-two courses and two (?) rows of mudbricks, *c.* 0.63 m long (N-S) and *c.* 0.30 m wide. South of this structure and seemingly integrating with it is *locus* 91025 (top at 778.97, upper step and 778.82, lower step) consisting of a long slab (0.65 x 0.19 x 0.15 m) preceded on the eastern side by two parallel slabs and reinforced below by layers of small stones. The impression is that the long slab is the upper step while the other two would have functioned as a lower step. Further on, if this construction extended further south, which currently it does not, it would have abutted the stone section of wall 90030. It is difficult to interpret 91024 and 91025, but these must be late constructions related to Phases 9 or 10 and they could have served as enclosures or crude steps. Quite possibly, their appearance may have something to do with an attempt to restore (albeit in much modest form) the structure of wall, *locus* 91022.

Finally, the stratum associated with the Phase 9 occupation in trench B seems to be *locus* 91002 (top at 779.00-.08), a silty deposit the compaction of which varies from medium to hard, but the association of finds from this *locus* with Phase 9 may be misleading. Once walls and installations in trench B were largely covered by the prior flooding deposits and the area was largely abandoned, it must have experienced a significant erosion and constant redeposition of wind and water-borne sand and other material. Thus it is perhaps not surprising that while the ceramic component of *locus* 91002 was predominantly dated to the 1<sup>st</sup> century AD and included some sherds perhaps dated to the Late Roman period, a coin found in this stratum is possibly a Hasmonean / Herodian issue dated to just before the 2<sup>nd</sup> half of the 1<sup>st</sup> century BC.

In the south-western quadrangle of trench B, the soil *locus* probably associated with Phase 9 is 91003 (**pl. 8**), which partially covered the “platform” *locus* 91005. Again, the ceramics from there are mostly dated to the 1<sup>st</sup> / 2<sup>nd</sup> century AD. Quite probably, these strata are also associated with the subsequent phase, i.e. Phase 10.

### *Installation 91001*

This is an impressive “barrier” made of 10 drums and one undetermined stone or ashlar, an area measuring *c.* 3.00 x 1.65 m. max., located in the northern part of trench B, which lay directly on top of flood-related deposit 91008 (pl. 1 and 7, figs 46 and 47). Before the excavations, it was thought that these represent one column which neatly collapsed *in situ*. This is not the case. If collapsed, one would note a slight shifting of each drum element and a partial leaning of each element on the following one. Instead, the drums are largely put “upright”, i.e. on their sides, and tightly to each other, especially in the northern row.

The stone elements (top at 779.9-.36) are in two parallel rows oriented WSW-ENE. The northern row features six drums. Starting from the west there are: a drum laying flat (diam. *c.* 0.54 m) followed by five drums laying on their sides and very close to each other. Their thickness ranges from 0.54 to 0.60 m and their diameter is *c.* 0.56-.62 m. The southern row, less regular in appearance, features three large drums, one smaller and one rectangular stone. Starting from the west: a drum laying on its side but E-W oriented (diam. *c.* 0.60 m), then a drum of the same orientation (diam. *c.* 0.54 m) followed by a drum laying on its side but N-S oriented (diam. *c.* 0.53 m), then a smaller drum (diam. *c.* 0.50 m) leaning on its flat side and supported by small chinking stones, and finally a rectangular stone (possibly, a seriously damaged and chipped Nabataean pilaster capital?) being *c.* 0.90 x 0.40 x 0.30 m.

Since there is no indication of existence of a colonnade in the area of trenches A and B either during the existence of the Lower or Upper Complex, this barrier appears as a result of a considerable effort to drag the elements from some spot nearby (the large quadrangular enclosure located to the east and north-east from trench B?). It is unclear what purpose could it serve in Phase 9. Apparently, the barrier is related to some kind of occupation located further north.

### *Occupation in the south-west corner of trench A*

The presence of the walled spaces and installations described below fully justifies the application of the term “Upper Complex” to the Phase 9 remains. Undoubtedly, the complex did not consist of only one room. However, it needs to be stressed here that the chronological assignment of the remains described below, due to the limited exposure, may not necessarily be exact. Generally, from the stratigraphic perspective, the remains discussed here may be associated with the Upper Complex. But the chronological indicators found in the strata there would better fit the general date of Phase 7 (Lower Complex). Therefore, it is quite possible that some of these spaces and the associated installations were already in use during Phase 7, and perhaps survived the Phase 8 calamity to continue in Phase 9.

The space contained in this corner (between walls 90011 and 90012, west side) is very small – *c.* 0.9 (N-S) x 1.03 m (E-W) and the excavations there proceeded only for *c.* 0.8 m below the surface, ending at 778.59. Following from the top were *loci* 90000 and then 90001, i.e. the same *loci* occurring over the entire area of trench A. The appearance of the tops of walls 90011 and 90012 marked the separation of the southern area from the rest of trench A. Wall 90012, running N-S, divides the southern area into the western and eastern spaces. The excavation of the eastern space did not provide any significant information and thus the association of soil *loci* from there with the overall phasing is not possible without the extending of the excavations.

As for the western space (i.e., the south-west corner of trench A), following *locus* 90001 down was *locus* 90015 (top at 779.00), a layer of light brownish soil, probably naturally deposited. *Locus* 90015 is directly above the installation 90022 / 90025 and the soil *locus* 90024. The latter (top at 778.67-.73 m) is a very ashy deposit, with over 50% being pure ash and the rest being silt and sand. Installation 90022 has been partially dug into this *locus*. It consists of three interrelated parts: a rectangular enclosure open to the east, a pit inside this enclosure with its contents (*locus* 90025) and the three capstones (pl. 9, fig. 48).

The enclosure (*c.* 0.62 N-S x 0.35 m E-W) is made of four stones, one of which is an upright-standing slate. The largest stone is *c.* 0.3 x 0.18 x 0.1 m. This enclosure is topped by three irregular flat stones, one over

the other. The pit and its fill (*locus* 90025) is c. 0.57 (N-S) x 0.42 m (E-W). The fill consists of sand and very fine gravel. Inside the fill, three sherds were found (two of Nabataean painted fine ware) and one coin. The latter is legible – Nabataean silver coin of Aretas IV and Huldû, either year 22 of Aretas = 14 / 15 AD or year 13 = 4 / 5 AD. Also, three undetermined cerealia seeds were found in the pit as well as several date seeds. The excavation did not progress beyond the emptying of the fill.

Due to the very limited horizontal exposure of this space, it is impossible to fully interpret *loci* 90024, 90022 and 90025. The installation 90022 / 90025 is puzzling. It is not related to a fireplace, although it was dug into ash-rich *locus* 90024. The contents of the pit do not present anything special, except for the silver coin, nor include any bones. Thus, why the relatively elaborate enclosure and the capstones? Only the expansion of excavations in this area may provide an answer.

### **Dating of Phase 9**

*Locus* 90003 – the ceramic notes suggest that the date is homogeneous – 1<sup>st</sup> century BC (?) yet the added comments also suggest the redating of some types to the 1<sup>st</sup> century AD, possibly to the 2<sup>nd</sup> (?), and even turning to the 3<sup>rd</sup> century cannot be totally excluded. The isolated datable sherds include: 2<sup>nd</sup>-3<sup>rd</sup> (?) century AD, Hellenistic (?), from late 1<sup>st</sup> century BC onwards. A coin (90003\_C01) found in *locus* 90003 is a Roman provincial bronze coin struck at Antioch: “SC issue”, undetermined emperor, from Augustus to the Antonines (1<sup>st</sup>-2<sup>nd</sup> century AD). Dating of ceramic from *loci* 91002 and 91003 is presented in the text.

ZTF: From the stratigraphic point of view, Phase 9 should have begun sometime in the later 1<sup>st</sup> century AD and presumably continued well into the 2<sup>nd</sup> century AD.

### **Dating of remains in south-west corner of trench A**

*Locus* 90015, ceramics datable to some time in the 1<sup>st</sup> century AD. *Locus* 90025 – Nabataean sherds (one last quarter of the 1<sup>st</sup> century AD, and the other, second-third quarter of the 1<sup>st</sup> century AD). *Locus* 90024 – the early 1<sup>st</sup> century AD.

ZTF: Coupled with the early 1<sup>st</sup> century AD Nabataean coin, the date of these *loci* would indeed be some time in the 1<sup>st</sup> century AD, possibly extending as far as the middle / late of this century. Thus, the deposits in the south-west corner may indeed be possibly associated either with the late Phase 7 or early Phase 9.

### **Phase 10. Minor destruction (?) and casual occupation**

This phase is again very difficult to interpret. Basically, only the remains found in trench A can be associated with it and generally there are just two “installations” which fit the picture. One is a poorly constructed “activity area” (*locus* 90009) made of stones and associated with some ash deposits and located in the center of the room (**fig. 49**). The other is an exceedingly irregular, makeshift fireplace or “hearth” (*locus* 90014), also associated with stones and with quantities of ash, and located in the north-east corner (**fig. 50**). The main problem with these installations is the presence of stones. In the case of 90009, these could have been brought from outside. As for 90014, the stones around the fireplace are all in random positions, some flat, others tilted or even upright, often leaning on each other. In short, one could suggest that the fireplace 90014 was opportunistically placed among the *collapsed* stones.

Neither of these installations seem to bear any relation to the orderly arrangement of the Upper Complex. Rather, they seem to represent some kind of casual, temporary (?) occupation. If so, and considering the “collapsed» stones in the north-east corner, it would seem that the main occupation of the Upper Complex within the limits of trench A, as represented by *locus* 90003 upon these installations stand, was ended by some kind of minor destruction associated with a partial collapse of walls.

*Locus* 90009 consists of irregular deposit (c. 1.46 m N-S and 2.41 m E-W) of hard silty-clayish soil, heaped on top of *locus* 90003 and in the center of the room. In the south-east part of the heap, densely packed

quantities of ash were located. On top of the heap, there is a basalt millstone (90009\_S1) roughly encircled by four larger flat stones but without any definite pattern. The top of installation 90009 is at 779.24-.26 (stones) and 779.11-.14 (soil and ash). Some kind of activity must have been performed there but none of the stones (including the basalt millstone) shows any traces of fire or soot. Although the presence of ash is notable, the function of this installation as a fireplace cannot be supported. Some pottery and bone material were found inside the deposit. The coin (90009\_C01) which was also found inside the clayish heap is an undetermined Roman or provincial coin, undetermined empress: 3<sup>rd</sup> century AD?

Even more enigmatic is the “hearth”, *locus* 90014 (**fig. 50**). It consists of a deep and extensive pocket of ash located on the surface of *locus* 90003 as well as embedded in it. On top of the ash, there are several stones, some as if representing a collapse (*supra*). Only three stones seem to be laying in a rough triangle pattern, in a distance of *c.* 0.17-.21 m from each other. All three are blackened from the proximity of fire and covered with ash / soot. Only few centimeters away from the triangle of stones, a small juglet has been found partly crushed by a stone and still under it. If it was crushed by a collapsing stone, it seems miraculous that it was not further accidentally trampled by the individuals who utilized the fireplace. More likely, it was discarded only during the use of the stone triangle as a fireplace.

The triangle pattern of fireplace stones might or might not be accidental but at least, these three stones could be considered as a simple fireplace, probably used over a period of time. Again, however, one needs to stress the opportunistic character of this installation. It would appear as if the interior of the room had suffered a minor collapse of stones – probably from walls 90028 and / or 90030 (stone section). The collapse was not cleared but casual occupants of the place decided to use the stones laying around as a convenient fireplace, *without* rearranging their location. In addition to the juglet mentioned above, partly preserved vessels (S01 and S02), a glass piece and some sherds as well as fragments of dates were found associated with *locus* 90014.

The most probable scenario is that the Upper Complex room in trench A was damaged by some kind of disaster, albeit minor in scale, and possibly (partly?) abandoned. Either the original inhabitants or the casual newcomers used the place for temporary occupation. What is significant is that this casual occupation seemingly occurred soon after the end of the Upper Complex – there is no indication that any considerable period of time had passed between the end of Phase 9 and the beginning of Phase 10. If the coin found in 90009 is indeed dated to the 3<sup>rd</sup> century, it means that it is probably intrusive (accidentally dropped there during some later activities at the site which cannot be determined). Alternatively, Phase 10 would have to be considered rather long-lasting which remains at variance with the ceramic dating of that phase.

It is worth noting in this context that no remains of anything resembling the roof construction have ever been found in this or any other stratum in trench A. Considering the size of the room (Upper Complex phase) being *c.* 3.60 (W-E) x 3.10 m, the room could have been easily roofed by tree trunks without the necessity of installing additional supports. Presumably, with the end of the Upper Complex, all combustible material would have been used in fire.

### ***Occupation in trench B***

Not much can be added to the already mentioned soil *loci* 91002 and 91003 which have largely covered anything still visible on the surface in that trench. Some kind of very poorly defined casual or temporary occupation is attested in a very small area located in the north-western extension of trench B which, on its southern side, is limited by wall 90030. *Locus* 91013 there (top at *c.* 779.00) is a very mixed deposit of silty soil associated with disintegrated mudbricks (often in clumps), and broken sherds (**pl. 16**). An almost complete but crude basin (91013\_P02) was found there (**fig. 51**), dated to the Late Roman or even Byzantine period, just like other sherds recovered from this *locus*. Generally, nothing else can be said about this *locus* and its contents except that it may represent Phase 10 or even later period.

### Dating

As for *locus* 90009, datable sherds included Hellenistic / Late Hellenistic jars, one Nabataean painted fine ware body sherd (from the late 1<sup>st</sup> century BC onwards). Generally, the 1<sup>st</sup> century BC is suggested. Ceramic date for *locus* 90014 could not be determined, except for possible Late Hellenistic sherds. Dates received from *loci* 91002, 91003 and 91013 are presented above.

ZTF: Again, the dating of material from these *loci* is unexpected and totally at variance with the stratigraphic situation. Even with the possibility of natural redeposition at the site, following the end of Phase 9, neither of the dates seem to conform with the expected date of Phase 10 which probably is the 2<sup>nd</sup>-3<sup>rd</sup> century AD. This will become unresolved until the “redating” of that material, as suggested in “Pottery Sheet”, is done.

### Phase 11. Abandonment and natural deposition

Both installations from Phase 10 in trench A were in turn covered by *locus* 90001, a silty sandy deposit of very differing compaction; from light in the east and north to medium-hard in the center and further south. Very large quantities of pottery as well as some bone, fragments of stone vessels (90001\_S01 to S04, including a fragment of incense burner?) and one coin (90001\_C01, unread so far) were found in this naturally deposited stratum. Finally, *locus* 90000 represents the surface and the uppermost natural deposition. In addition to some pottery, one coin (so-called “Himyarite;” Late Hellenistic date?) was found there.

In the area of trench B, the uppermost *locus* which covered all remains inside that trench, except for wall 90029 / 91004 and barrier 91001, is *locus* 91000, a silty / sandy layer.

### Dating

The dating of the material from 90001 is again the 1<sup>st</sup> century BC (possibly to be extended into the 1<sup>st</sup> century AD). As for *locus* 90000, the material is mixed, as expected: Iron Age, Late Hellenistic, Early Roman and one or two Byzantine elements. In case of *locus* 91000, only few diagnostics were found which indicate the date to be possibly in the Late Roman period.

ZTF: it is indeed expected that the material from these *loci* will be mixed but with prevailing later types, i.e. 2<sup>nd</sup>-3<sup>rd</sup> century AD onwards.

### Preliminary conclusions

The overall assessment of the occupation in Area 9, trenches A and B, will have to await a possible re-examination of some ceramic datings. However, some preliminary comments can be now offered here:

1 / With regard to the ceramic dating which, at times, seems to be much at variance with the stratigraphic situation, it should be stated that the stratigraphy at the site was relatively clear and straightforward and with one exception (*loci* 90026 and 90032) no serious on-site or post-excavation contamination among the material from specific strata should be considered. Furthermore, the site did not witness any very major re-deposition of strata *inside* the trenches, extensive ancient digging into existent strata, etc. However, due to the fact that large quantities of ash mixed with soil were redeposited into the interior of trench A *from elsewhere*, this may seriously bear on the seemingly “inconsistent” dating of some *loci* there.

2 / With regard to the chronological parameter, the excavations in trenches A and B turned out to be extremely successful. Some of the earliest material known in Madâ’in Sâlih (Khurayba ware) was found in trench A and the subsequent appearance of structures indicate that a substantial occupation existed at the site already in the Hellenistic / Late Hellenistic period (3<sup>rd</sup>-1<sup>st</sup> century BC). On the other hand, trenches A and B have also yielded material datable to the 3<sup>rd</sup> century AD (if not later). Thus, it may be concluded that the occupation in Area 9 lasted, including periods of low intensity / disuse, at least 600 years. However, the main, most intensive occupation should be associated with the Nabataean period, i.e. 1<sup>st</sup> century BC –

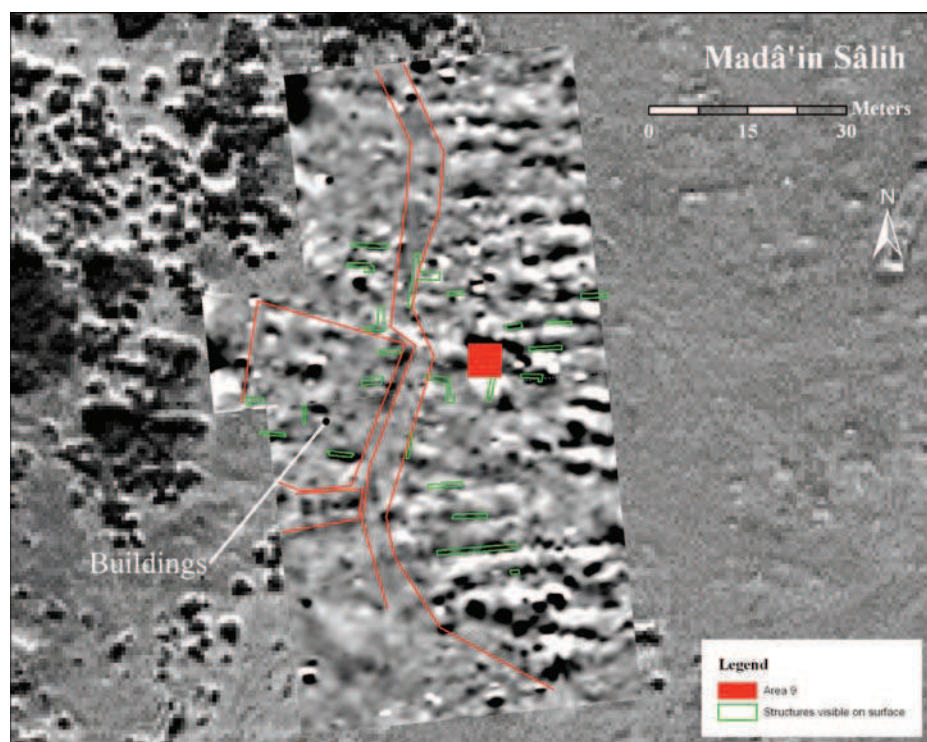
1<sup>st</sup> / early 2<sup>nd</sup> centuries AD, as represented by the Lower and Upper Complexes. Within this time-period, many changes had occurred within the relatively small space (c. 10 x 10 m) of trenches A and B, i.e. the occupation was intensive and dynamic.

3 / Similarly to the situation in Area 2, the early occupation is manifested by mudbrick constructions which, however, continued to be in use (reuse) with the appearance of stone architecture. The latter occurs at the site already in the late 1<sup>st</sup> century BC (Phase 7, Lower Complex) and is associated (in the area of trench B) with what must be conceived as a monumental (sacral?) architecture. That, however, lasted probably no longer than c. 50 years and was ended by a disastrous flood by the middle / later 1<sup>st</sup> century AD. The subsequent Upper Complex does not seem to have reached the same level of sophistication or monumentality as the Lower Complex. Notably, it also does not appear that the annexation of the Nabataean Kingdom by Rome in 106 AD bore any significant impact on the situation in Area 9. While the occupation continued in the 2<sup>nd</sup> century, its intensity had never reached the levels associated with prior phases.

4 / Generally, Area 9 shows high potential for further investigations. Perhaps the opinion (already postulated for Area 2) can be further reinforced that the settlement at Madâ'in Sâlih displays a high degree of intra-site spatial variability in occupation. Apparently, while the occupation at the settlement, in general terms, continued from at least the 3<sup>rd</sup> / 2<sup>nd</sup> century BC until the 4<sup>th</sup>, even 6<sup>th</sup> century AD, some areas were more intensively occupied, then abandoned, and the occupation would start elsewhere etc. In short, it appears that the local foci of occupation at the settlement site constantly “moved” both in spatial and temporal terms.



**Fig. 1** General view of Area 9 from the north



**Fig. 1 bis** Geomagnetic map of Area 9 (Chr. Benech, 2010)



**Fig. 2** Aerial view of Area 9.  
Photo W. Abu-Azizeh



**Fig. 3** Aerial view of Area 9.  
Photo W. Abu-Azizeh



**Fig. 4** Fallen column northeast  
of Trench A



**Fig. 4 bis** Trench A. Final view from the west



**Fig. 5** Trench A. Wall 90052 in the center. Main ash deposit, locus 90051 on the right. Platform 90035 on extreme left and wall 90040 on extreme upper right

**Fig. 6** Trench A. *Loci* from left to right: 90035, 90039, 90052, 90040





**Fig. 7** Trench A. The western section featuring walls 90027, 90006, 90005. Final view from the east



**Fig. 8** Trench A. *Loci* from left to right: 90035, 90039, 90052, 90040, 90036



**Fig. 9** Trench A. *Locus* 90047. The excavated pits, *locus* 90043, are in the upper right. View from the north



**Fig. 10** Loci 91033 and 91012 in the center; wall 91036 below, wall 91028 in upper left; foundation course 91023 to the right. View from the north



**Fig. 11** Trench A. Locus 90044 on the left, 90046 in the center right and 90045 in the center. View from the south



**Fig. 12** Trench A. Locus 90041(ash) in center right. View from the west. Locus 90042 in center left



**Fig. 13** Trench A. From the top down: platform 90035, connection 90039, wall 90040 and barrier 90036 to the left



**Fig. 14** Trench A. *Locus* 90035 left, 90040 upper center and 90036 right. View from the northwest

**Fig. 15** Trench A. Connection 90039 to the left, wall 90040 in the center and the remains of its superstructure in the southern section



**Fig. 16** Trench A. *Loci* from left to right: 90035, 90039, 90052, 90040



**Fig. 17** Trench A. From the bottom up: platform 90035; connection 90039, wall 90040 and barrier 90036 to the right. Remains of *locus* 90045 in the center right



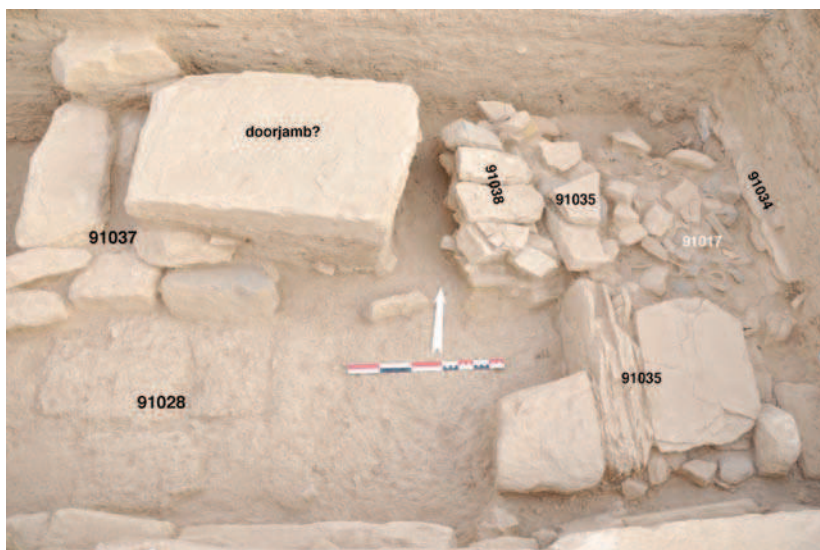
**Fig. 18** Trench A. Top view of *loci* 90036 and 90040



**Fig. 19** Trench A. Ash, *locus* 90032, from the north



**Fig. 20** Trench A. *Locus* 90026, from the west



**Fig. 21** Trench B. Central-eastern part. From left to right: *loci* 91037, 91038, 91017 and 91034. View from the south



**Fig. 22** Trench B. *Locus* 91017. *Loci* 91035 and 91038 in the central right. View from the east.



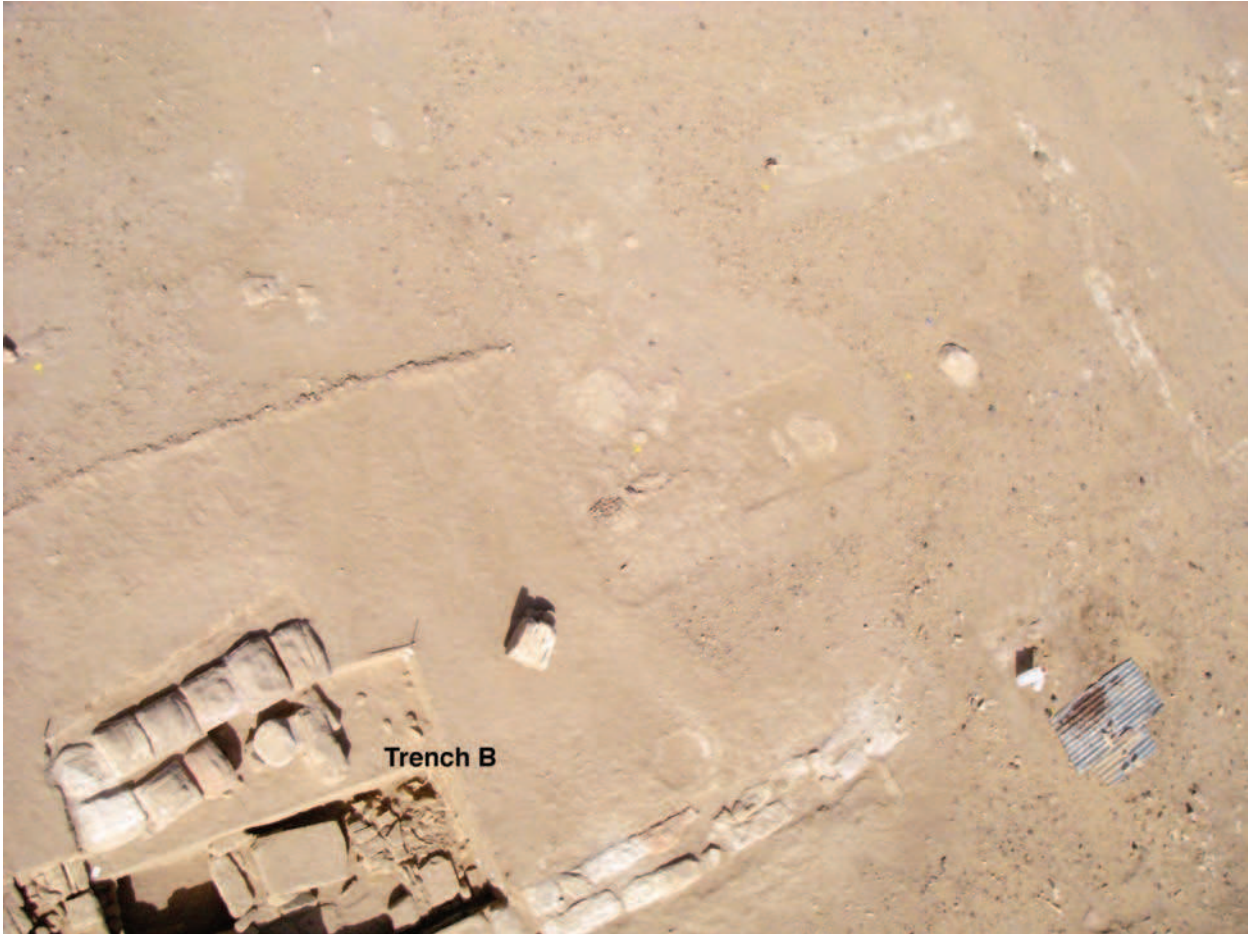
**Fig. 23** Trench B. The northern half. view from the east



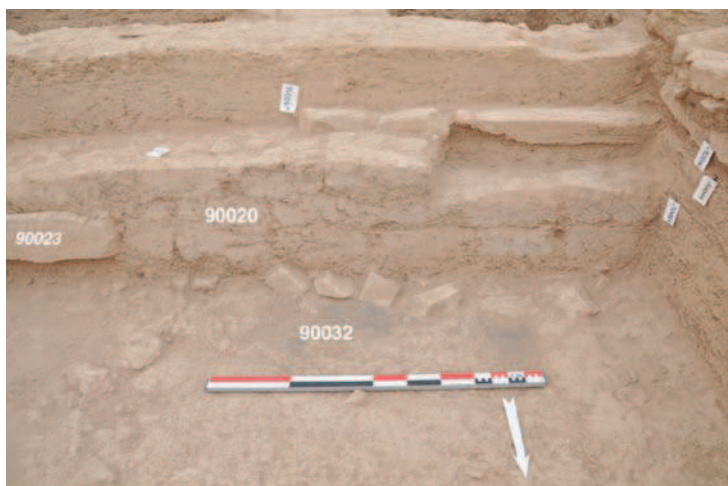
**Fig. 24** Trench B. *Locus* 91017. View from the east. Threshold 91009 in the left



**Fig. 25** Trench B. *Locus* 91017 in the bottom center. *Locus* 91035 in the center. *Locus* 91034 sticking out from the baulk in the bottom right



**Fig. 26** Aerial view of Area 9 east. Photo W. Abu-Azizeh



**Fig. 27** Trench A. Wall 90020. The top of the ash 90032 is visible

**Fig. 28** Trench A. Wall 90028, from the south-west. In the extreme left is the corner section of wall 90030



**Fig. 29** Trench B. Connection between walls 90030, 90028 and 91004. Wall 91029 in the foreground. View from the north



**Fig. 30** Trench B. *Loci* 91029, 91004 and 91007. Wall 91015 is visible under *locus* 91029. View from the south



**Fig. 31** Trench A. Final. View from the south



**Fig. 32** Trench A. *Loci* 90013, 90017, 90031 and 90034



**Fig. 33** Trench A. Channel 90031

**Fig. 34** Trench B. *Locus* 91009 in the center, foundation course 91032 below and stones 91015 on both sides. View from the south



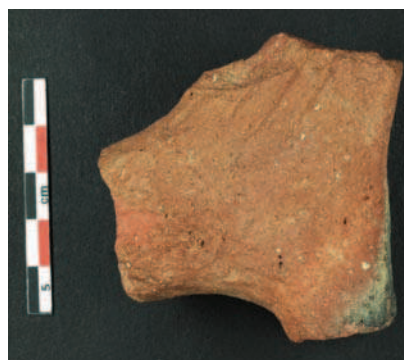
**Fig. 35** Trench B. *Locus* 91009 and wall *locus* 91004. View from the east



**Fig. 36** Trench A. *Locus* 90021. Walls *loci* 90011 and 90020 are to the right



**Fig. 37** Trench A. Stamped amphora handle 90021\_P10



**Fig. 38** Trench A. Terracotta figurine of a horse 90021\_TF01



**Fig. 39** Trench B. Wall 91029 and locus 91030. View from the south

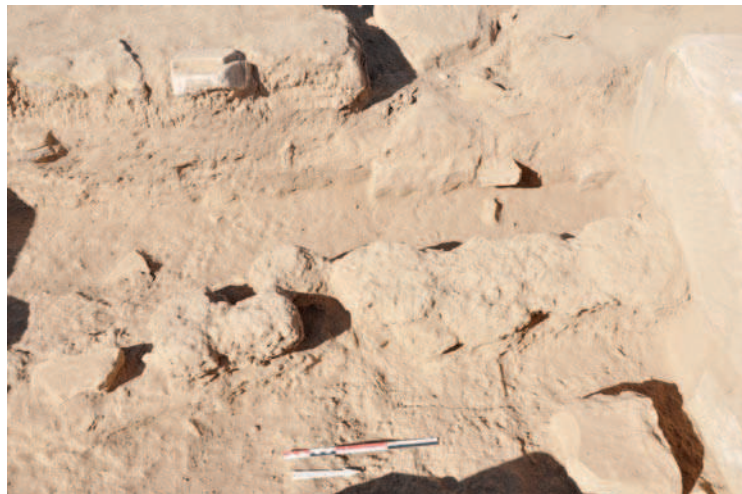


**Fig. 40** Trench A. Locus 90016, from the south



**Fig. 41** Trench A. Locus 90003. Installation 90013 in the foreground and wall 90002 to the left

**Fig. 42** Trench B. Wall *locus* 91006.  
View from the east



**Fig. 43** Trench B. South-west quadrant. *Locus* 91007 in the foreground right. *Locus* 91005 in center and left. View from the east. Lion's head in the center left

**Fig. 44** Trench B. South-west quadrant. *Locus* 91007, including the Nabataean capital. View from the east. Lion's head in the upper left



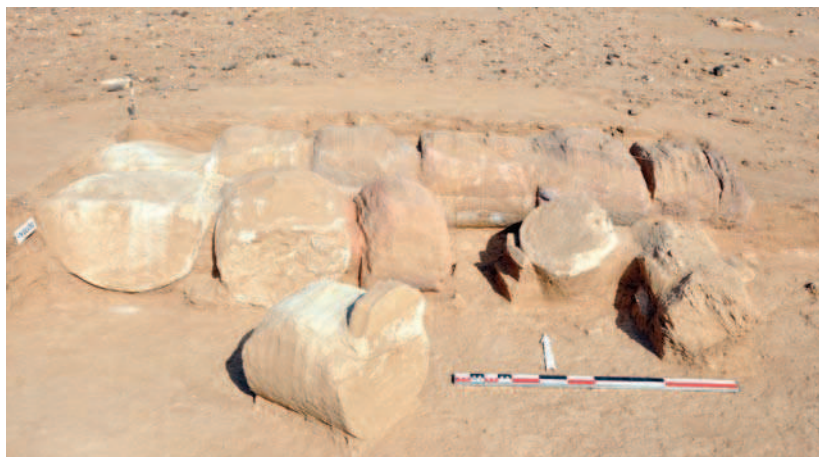
**Fig. 45** Trench B. South-west quadrant. *Locus* 91005. Lion's head in the center right. View from the west





**Fig. 46** Trench B. *Locus* 91008. View from the north. *Locus* 91001 in the foreground

**Fig. 47** Trench B. *Locus* 91001. View from the south



**Fig. 48** Trench A. *Loci* 90022 (installation), 90024 (surrounding soil) and 90025 (fill)

**Fig. 49** Trench A. *Locus* 90009, from the northeast



**Fig. 50** Trench A. *Locus* 90014, from the east

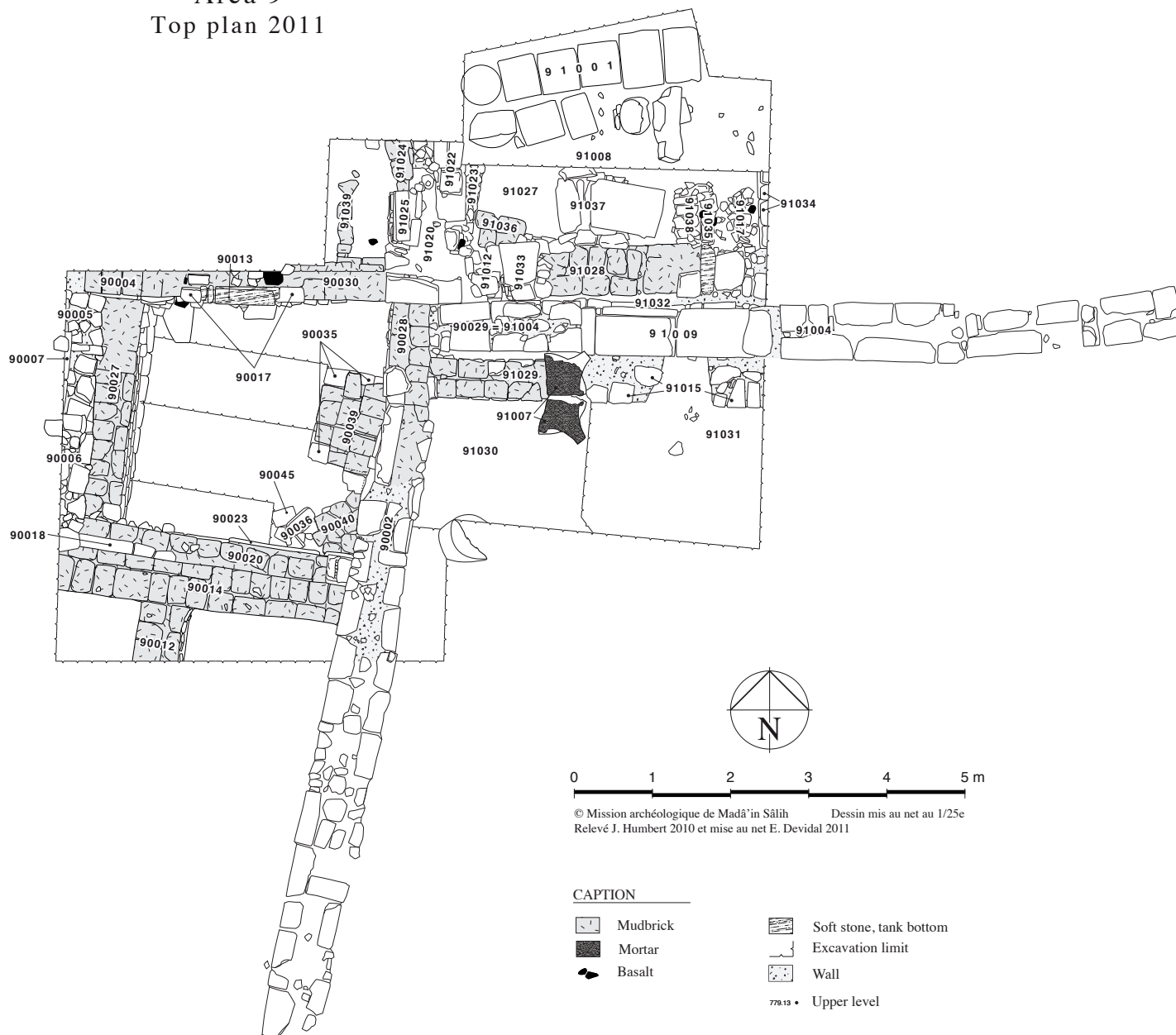
**Fig. 51** Trench B. The situation following the removal of *locus* 91013, before the removal of the large jar



# MADÂ'IN SÂLIH








## Area 9

### Top plan 2011

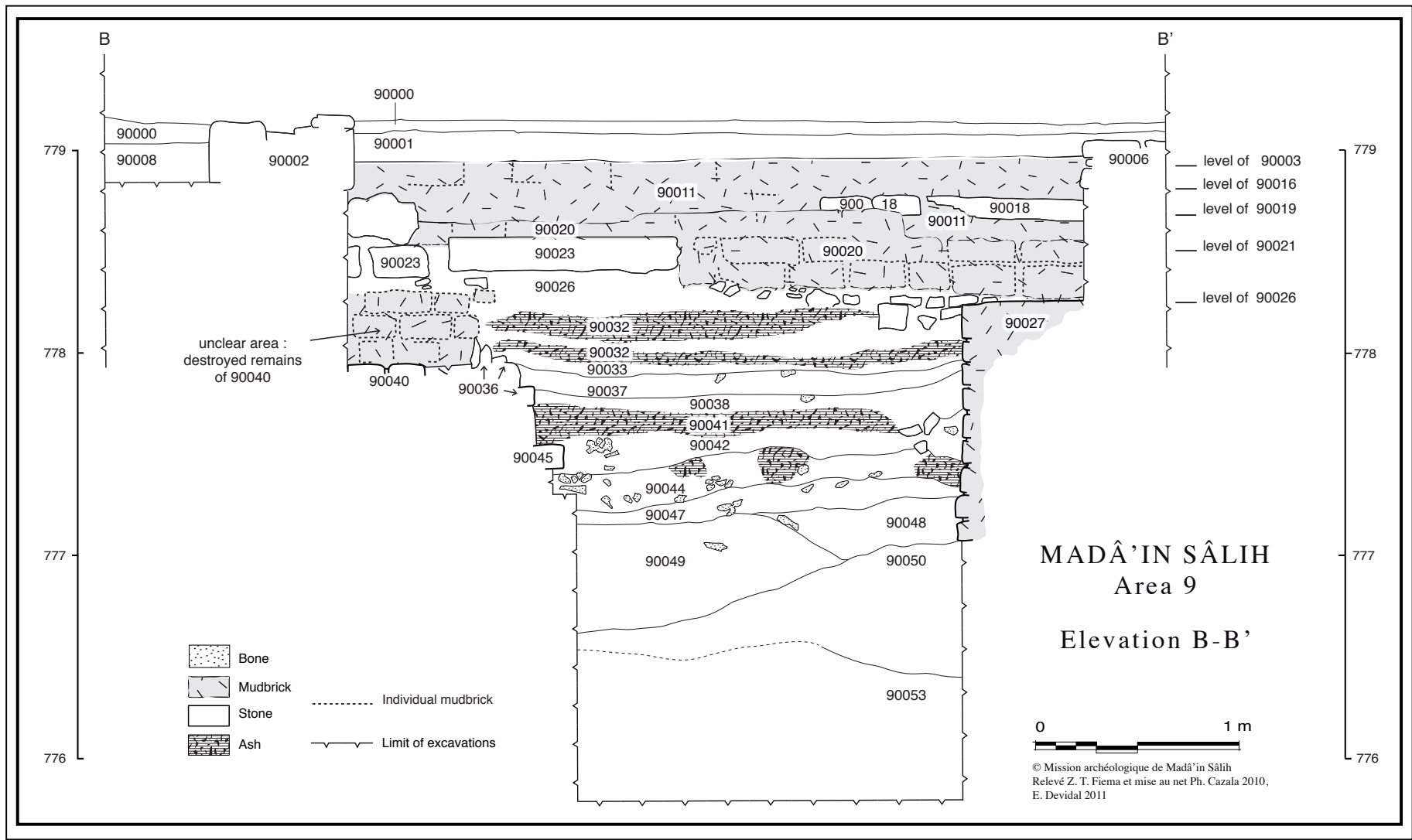


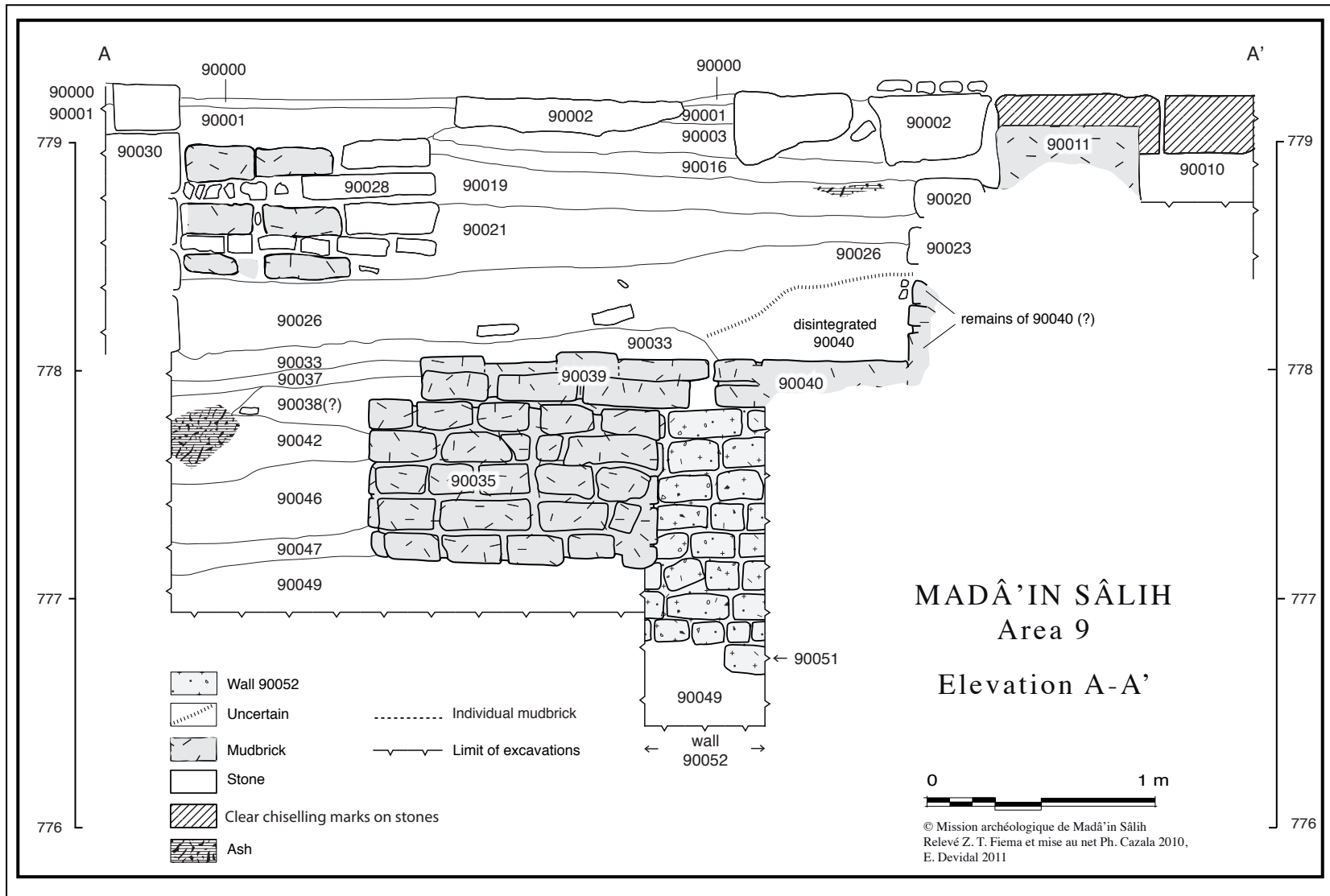
© Mission archéologique de Madâ'in Sâlih Dessin mis au net au 1/25e  
 Relevé J. Humbert 2010 et mise au net E. Devidal 2011

CAPTION

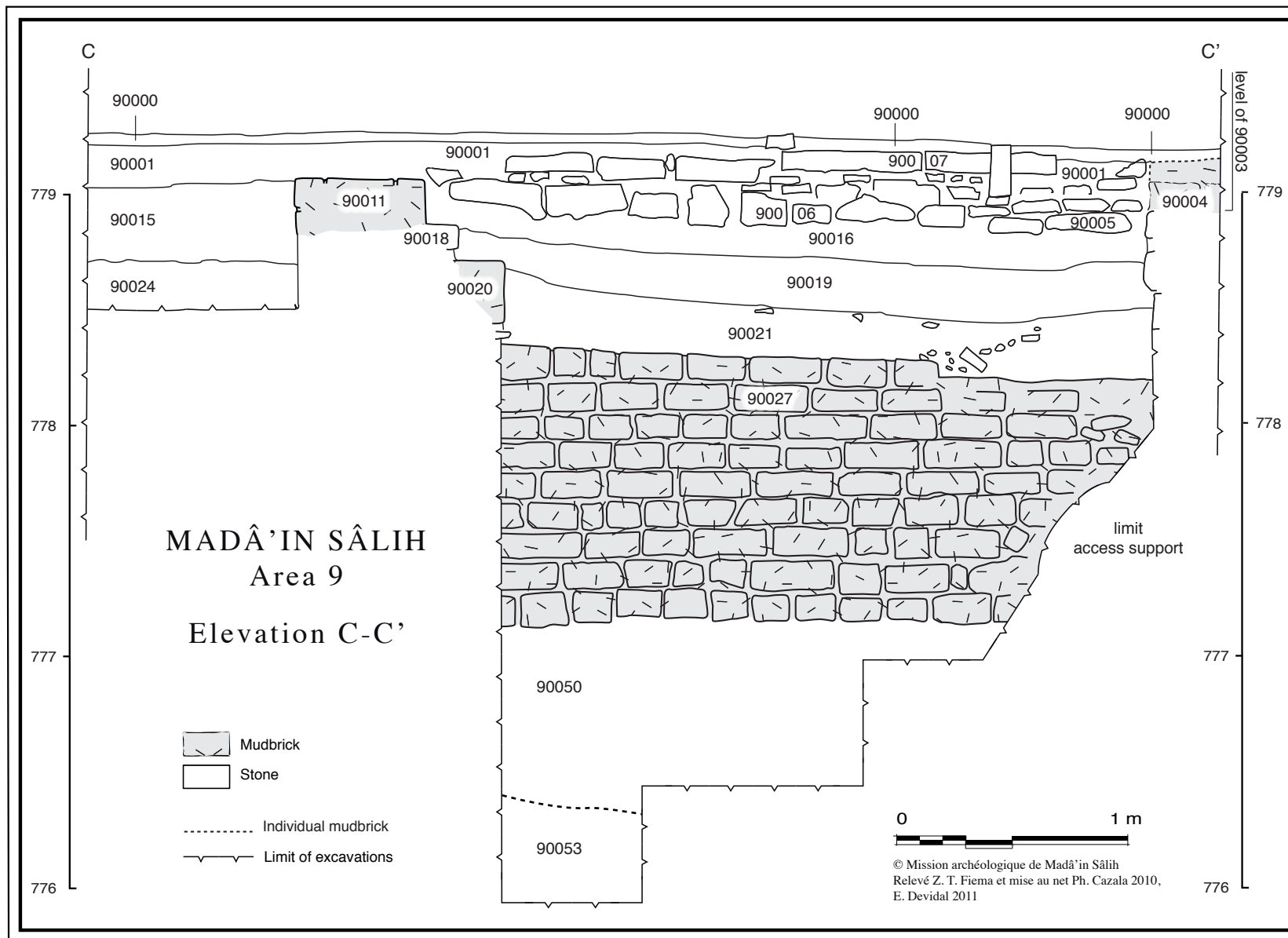
-  Mudbrick
-  Mortar
-  Basalt
-  Soft stone, tank bottom
-  Excavation limit
-  Wall
-  778.13 • Upper level

Pl. 1 Trench A

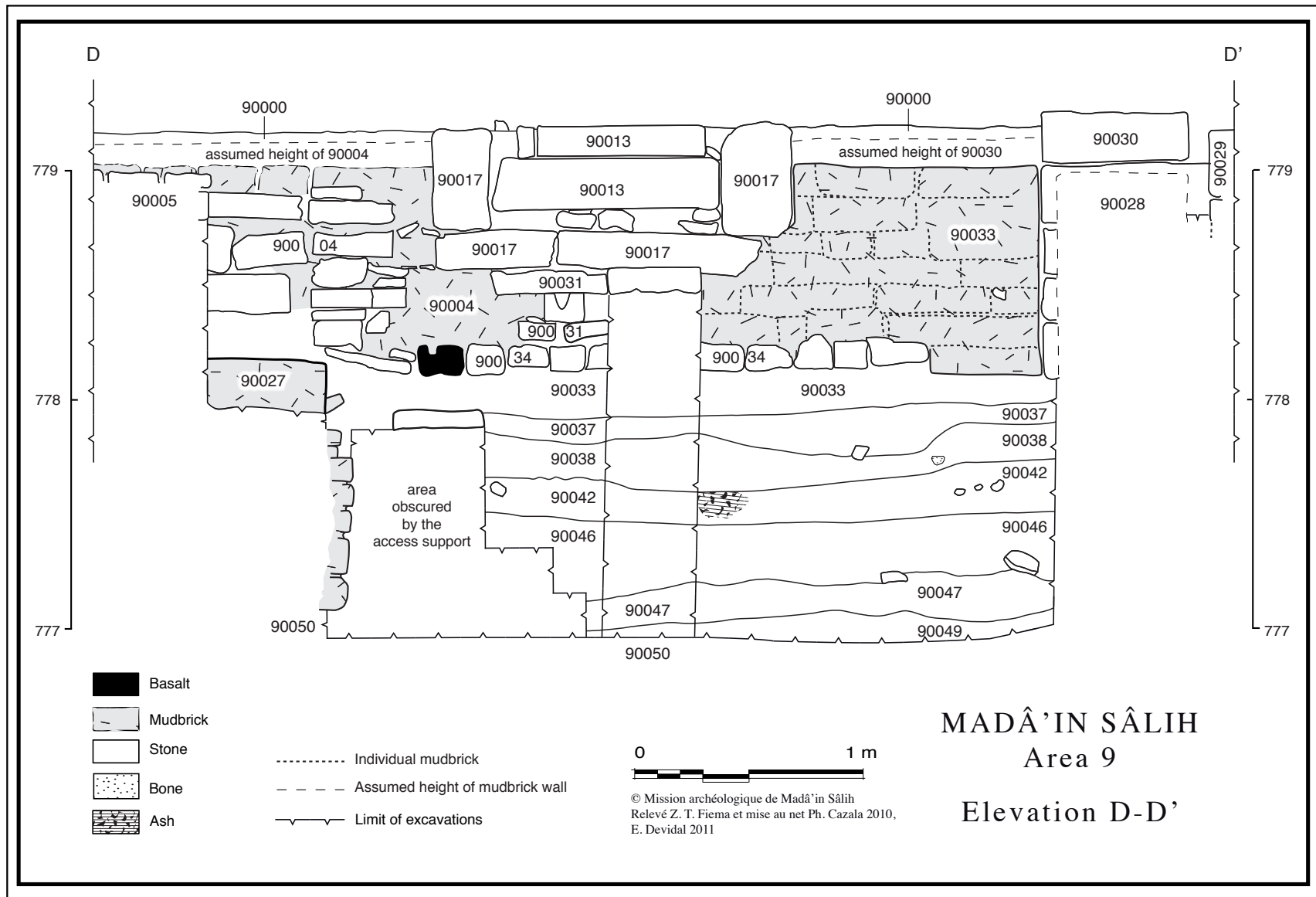




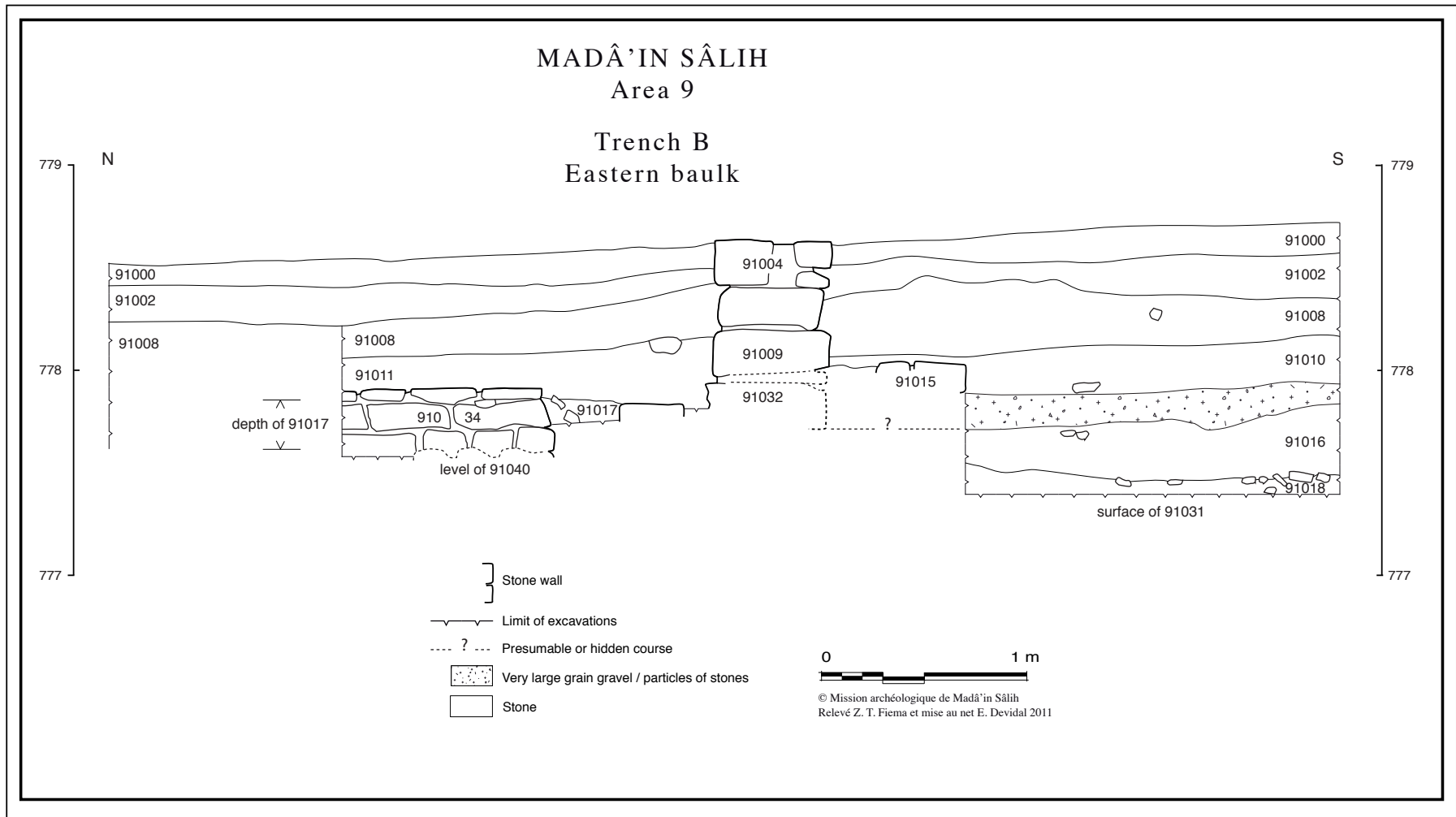
Pl. 3 Trench A. Elevation A-A' (east)



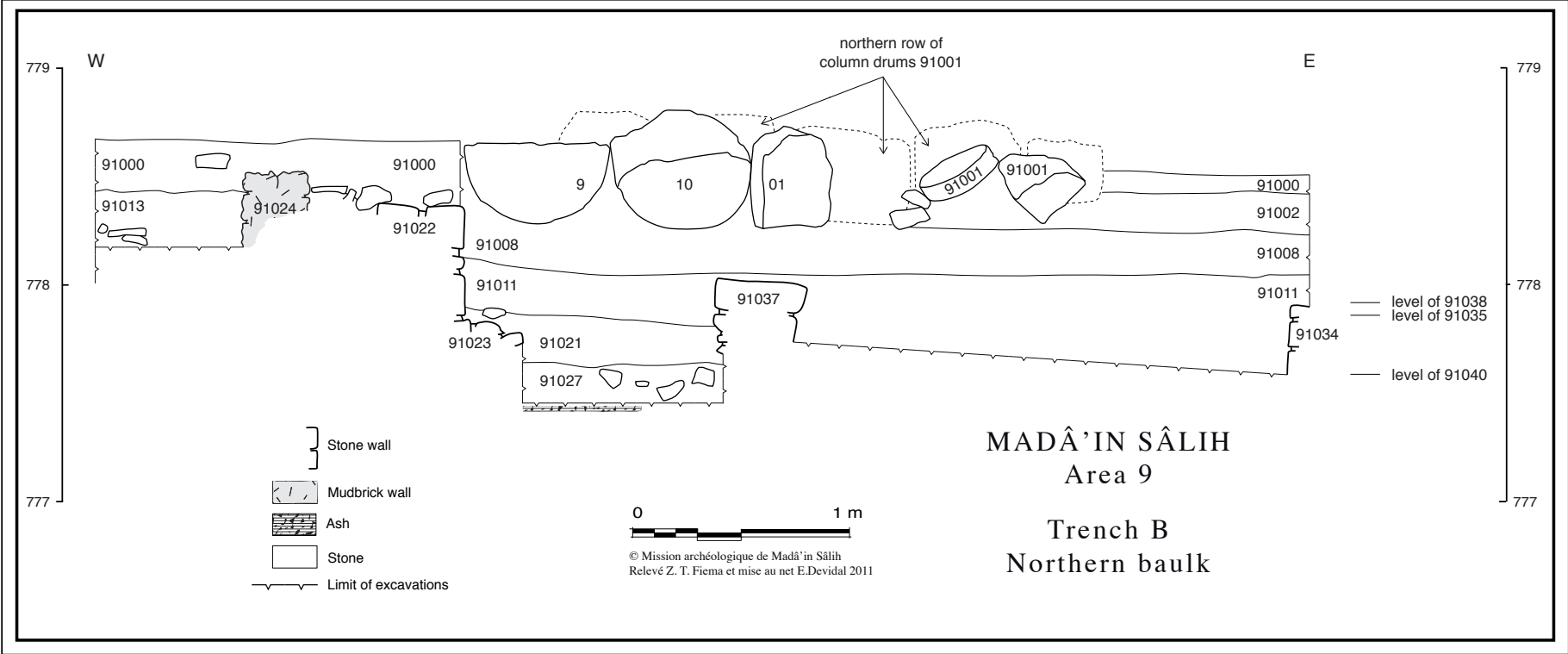
**Pl. 4** Trench A. Elevation C-C' (west)



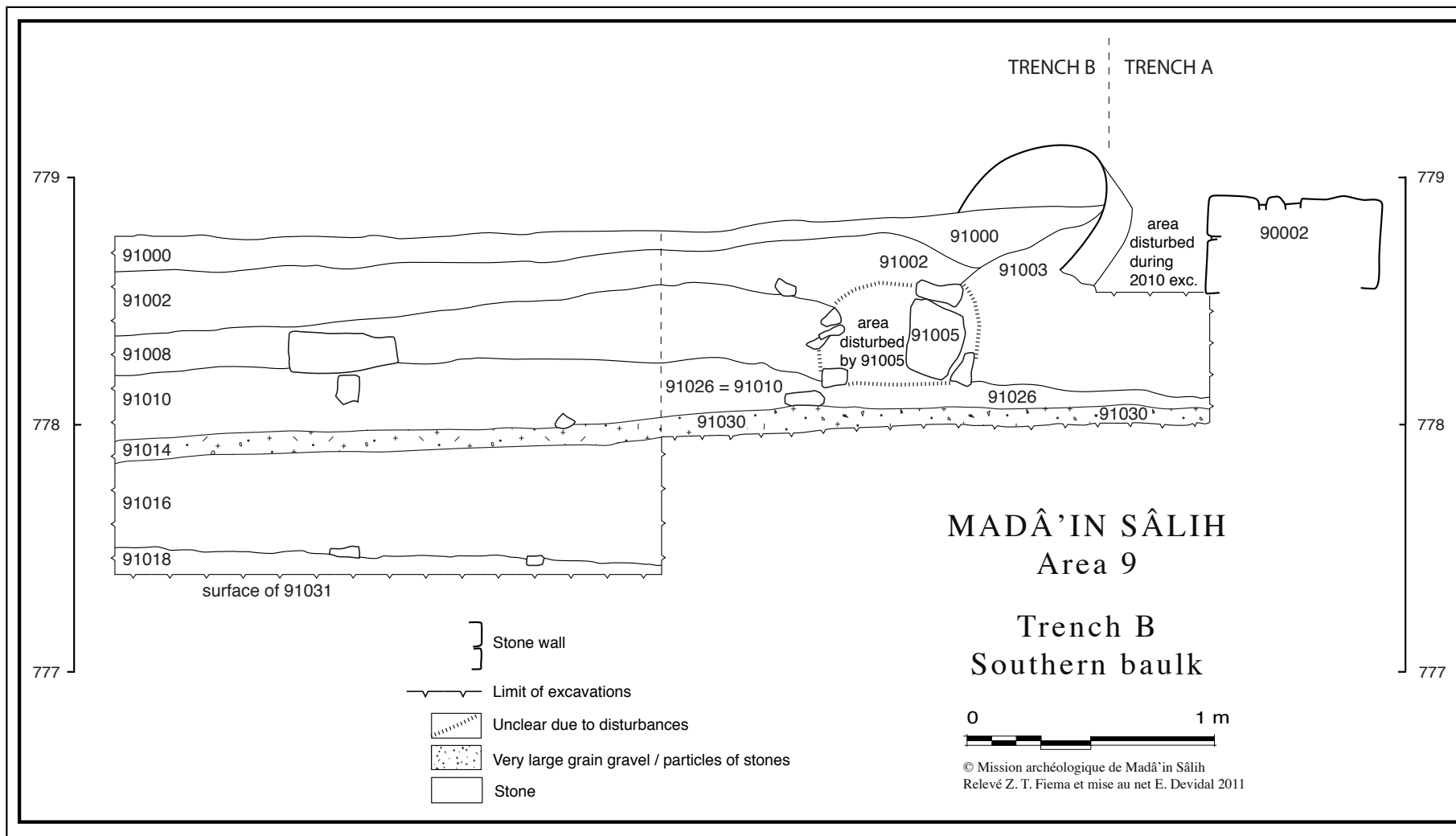
Pl. 5 Trench A. Elevation D-D' (north)



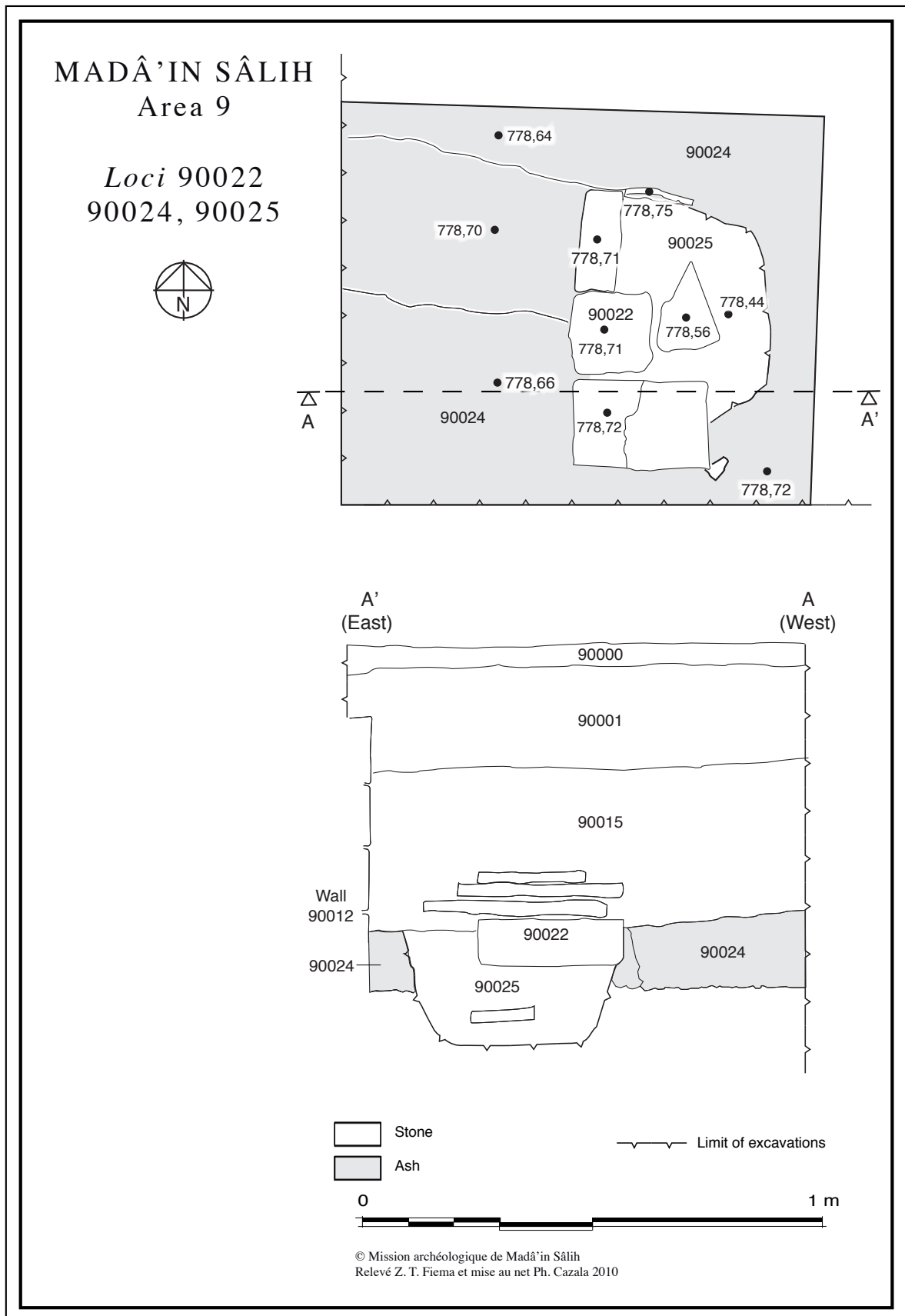
**Pl. 6** Trench B. Eastern baulk



Pl. 7 Trench B. Northern baulk



**Pl. 8** Trench B. Southern baulk



**Pl. 9** *Loci 90022, 90024 and 90025.*  
Top view and east-west section

## **Study of the cairns**

Wael ABU-AZIZEH (post-doctoral researcher, CNRS / IFPO)



# Study of the cairns

Wael ABU-AZIZEH

## THE DATA AND RESEARCH QUESTIONS

In 2008, a study programme of the large number of cairns or *tumuli* present on the site of Madâ' in Sâlih was initiated. The first stage of this programme was a test excavation of a cairn that was already recorded on the top of one of the massifs that make up Jabal al-Khramât.<sup>1</sup>

That excavation (*locus* 40000) produced important information regarding the methods of construction of this burial structure. Under the formless mass of the stone mound visible on the surface were the unsuspected remains of some remarkably well built architecture. They comprised an elongated grave in the middle of a circular internal tower built of dry stone, 3.90 m in diameter, surrounded by an exterior ring of white sandstone blocks. This complex formed an elaborate funerary construction, a tower tomb, which is very different from the monumental rock-cut monuments of the Nabataean period; this was the first example of its type identified on the site.

The excavation changed our understanding of the numerous cairns already noted on the site, particularly from the architectural point of view, yet the question of their dating remains unresolved. The <sup>14</sup>C dating of three lots of human bones, sampled during the excavation of the tower tomb and the partly excavated rectangular structure nearby, produced calibrated dates between the 1<sup>st</sup> century BC and the beginning of the 3<sup>rd</sup> century AD.<sup>2</sup> However, the date of these bones, which survived an ancient robbing (as shown by their stratigraphic location in disturbed contexts), does not answer the question of the dating of the original construction. In fact, one cannot exclude the possibility that a pre-Nabataean tomb was emptied out and re-used during the Nabataean and Roman periods, before being robbed once again.

One of the major obstacles in the study of these conspicuous tombs is that they have been more or less systematically robbed. For example, only a few fragmentary artefacts from disturbed contexts were obtained from the excavated cairn. Equally, a rapid examination of the structures on the top of the massif revealed that

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1. See Abu-Azizeh 2010.

2. The samples were given to J.-F. Saliège to be analysed in the LOCEAN laboratory of the Université Pierre et Marie Curie, UMR 7159, CNRS. The three samples needed accelerator mass spectrometry (AMS), which was carried out at the University of Arizona, Department of Physics, by the NFS Arizona AMS Facility, Tucson. The results are presented in the following table:

Sample	Paris Lab No.	Tucson AMS Lab No.	Material, provenance	Age <sup>14</sup> C BP	Age Cal (1σ)
40012_B1	P 769	AA85537	Human bones from the destruction level of the tower tomb	2028 ± 44	92 BC – AD 46
40011_B1	P 770	AA85538	Human bones from the fill of the tomb	1894 ± 38	AD 58 – 208
40009_B1	P 771	AA85539	Human bones from the fill of the rectangular structure ( <i>locus</i> 40008) near the tower tomb	1927 ± 27	AD 29 – 125

they all show evidence of disturbance. Thus, before continuing the study, it is necessary to evaluate the level of disturbance and to attempt to identify some better preserved structures with a view to their future excavation. At the end of the 2008 season, the results suggested that there is some diversity of type amongst the remains present. Indeed, to the south of the excavated cairn, the remains of a rectangular structure of stonework bonded with a clayey mortar were exposed under what appeared on the surface to be a fairly formless mound of earth. Also, the dimensions of the cairns recorded show great differences, both in the preserved height of the stone mounds, their dimensions at ground level and the size of the stones used. Therefore, it seems that certain structures should be considered more as installations associated with tombs (hearths, rectangular rooms of undetermined function) than as actual tombs. As a result, one of the main objectives of this additional study was to provide an overview of the structures present in order to attempt an initial classification of them.

## OBJECTIVES OF THE SEASON AND LOCATION OF THE STUDY AREA

Bearing in mind the results of the 2008 excavations and the need to organize an efficient study of the cairns, it was deemed necessary to re-evaluate in detail the structures recorded during previous survey seasons (between 2002 and 2005) at the site.

The targets of this re-evaluation can be summarized as follows:

- to identify all traces of preserved architecture visible on the surface, using detailed survey;
- to make an inventory of the types of constructions represented by the cairns recorded. As mentioned above, the excavation in 2008 showed that cairns are the result of the deterioration of what could, at least in some cases, have been carefully built stone structures;
- to note the better preserved structures that might still contain intact burials, whose excavation might provide dating through finds or by using the  $^{14}\text{C}$  method;
- to collect surface finds and bones left by the frequent robbing in order to obtain additional dating evidence;
- to document the different types of constructions identified using photographs and sketches;
- to complete the database of the Madâ'in Sâlih archaeological project by registering the structures that had not been identified by the surveys carried out during the first research project.

In order to address the objectives in the time allocated, the study undertook the systematic re-evaluation of the structures in certain areas. An ideal study area consisted of the massifs of Jabal al-Khramât, stretching out to the west of the fence which surrounds the residential area and on which a large number of cairns had already been noted. A test area, stretching east-west for 1.3 km over a width of 700 m, was drawn up across the massifs. It includes a series of sandstone massifs separated by strips of ground. For the purposes of description, these massifs were arbitrarily numbered "Kh Massif 1" to "Kh Massif 22" (**map 1**). At the same time, two massifs in Qasr as-Sâni', further south, were chosen for comparison.

## PROVISIONAL TYPOLOGY

A total of 276 cairns were examined during the 2011 season. The study was based on the map of the cairns recorded during previous surveys. In order to be consistent, the numbering of the structures was retained, but with the addition of a letter after the number in order to differentiate various structures within one particular group (e.g. F 19\_a, F 19\_b, etc.). A new number was assigned to previously known structures which did not yet have one and to newly discovered structures. These new numbers are as follows: AZ xx\_a, AZ xx\_b, etc. A summary table of all the cairns examined during the 2011 season is presented with this report (**table 1**), in which the following details are systematically entered:

- the dimensions of the cairn or structure (diameter for circular cairns, length and width for elongated stone piles, extant height);

- a short description, in particular mentioning the presence of any architecture or stonework visible on the surface, as well as any traces of robbing;
- a short preliminary description of any finds from the surface collection in the immediate vicinity of the structures (pottery, stone objects, bones);
- the photograph numbers in the project's archives.

Based on the field examination, a typology of the different structures attested in Madâ'in Sâlih can be put forward. Insofar as it is the result of surface inspection only, this typology remains preliminary, but it allows limits to be set for future work. It will need to be verified by the excavation of well preserved structures. A broad diversity of remains has already been noted, along with the recurrent nature of a few characteristic structures, facts which had not been observed until now. A general description of each type of structure and its characteristics is presented below, illustrated through examples.

## **I. Tower tombs (n. = 50)**

The presence of tower tombs was already known through the excavation of cairn 40000 in 2008. The 2011 season not only confirmed the existence of other structures of this type, which can be described as “circular tower tomb with outer ring of white stones”, but also the existence of several sub-types such as simple circular tower tombs and rectangular tower tombs with or without an enclosure.

### **a. Circular tower tombs (n. = 26)**

A large number of simple circular tower tombs were recorded on several massifs of Jabal al-Khraymât (Massifs 4, 7, 10, 11, 16, 17, 18 and 22). There are perhaps slightly more of them as one goes westwards (**maps 2–4**), and also on the two massifs surveyed in the area of Qasr as-Sâni' (**map 5**).

These towers are characterized by dry stone construction using hard sandstone that alternates large blocks with small chinking stones. Their diameter varies from 2.50 m for the smallest to 5 m for the largest. In several cases, the outer facing of the towers was well preserved and the bedrock base was clearly visible in the immediate surroundings of the structure. This means that an external ring similar to the one seen in 2008 could never have existed (**fig. 1**). These towers cover rectangular graves, 2 m long and an average of 90 cm wide, the edges of which were marked by facing stones. In one case only (AZ 13\_c, **sketch 1**), it was possible to see an entrance giving access, from the south, to the burial chamber, which was oriented east-west. Several corbelled superstructures topped with a large capstone were noted whenever the burial chamber, after robbing, was left open with part of its structure intact.

These circular tower tombs are usually not isolated. There is often one or several other constructions of the same type standing nearby. Seven cairns set out in a “chain”, comprising at least four circular tower tombs and one circular tower tomb with outer ring of white stones (see below), were recorded on a rocky spur that dominates Massif 10 of Jabal al-Khraymât (**sketch 2**).

Two particularly well preserved examples of this type of tomb were recorded less than 800 m outside and to the west of the site's enclosure.<sup>3</sup> Their western half has been destroyed by robbing but the outer facing of the towers, as well as the stonework of the corbelled superstructure, are preserved to their full height on the east side (**figs 2-4**). They allow an accurate reconstruction of the building method of these tombs (**sketch 3**).

3. These circular tower tombs were first identified using binoculars.

### ***b. Circular tower tomb with outer ring of white stones (n. = 20)***

Tower tombs with an outer ring of white stones, like the one excavated in 2008, have been identified on several massifs of Jabal al-Khraymât (Massifs 4, 8, 10, 11, 13, 17 and 22). However, no examples of this type has been found in the area of Qasr as-Sâni<sup>4</sup>.

These tombs seem to belong to the same architectural tradition as the simple circular tower tombs, the main difference being the presence of the outer ring, built of stones carefully selected from amongst the softest and most friable of the white sandstone blocks. This ring acted as an outer facing that retained a fill of stones piled against the outer face of the central tower.

In many cases, the destruction of the cairns does not allow to see on the surface the stonework of the outer ring. However, the presence of disorganized white stones scattered around the edges of the mounds is an indication of their existence. This is the case for cairns AZ 43\_q and F 17\_a and b (**fig. 5**), and very strikingly for cairn AZ 10\_f (**fig. 6, sketch 4**). These white stones, seen in the collapse of the cairns, often have a characteristically rounded face, which bears traces of tool marks (**fig. 7**).

Because of the presence of the outer rings, this type of cairn consists of a more significant mound of stones than that for the simple circular tower tombs. Their diameter is noticeably larger, being an average of 7 m, which corresponds to the diameter of the outer ring of cairn 40000 excavated in 2008. In the middle of these rock piles, the stonework of the outer facing of the central tower is usually more easily identified because it is protected by the tumble. This is particularly the case with cairns AZ 10\_h and AZ 10\_i (**fig. 8**). The method of construction of the burial chamber and the corbelled superstructure is identical with that of the simple circular tower tombs.

The majority of tower tombs with an outer ring of white stones are built, like cairns in general, on the flat tops of the sandstone massifs. Only one possible example (E 18\_a) is at the bottom, in the sandy wadi bed. Since this structure is mostly covered with sand, it is necessary to confirm by excavation that it is indeed a tower tomb with an outer ring of white stones.

### ***c. Rectangular tower tombs (n. = 1)***

A single example of a possible simple rectangular tower tomb was identified: AZ 35\_b. It is at the top of Massif 7 (**map 3**). The cairn is about 4 m in diameter and about 60 cm high. Even though the burial chamber is open and destroyed by robbing, a rectangular stone facing preserved for five courses and for a height of 40 cm, suggests the presence of a rectangular tower (**figs 9-10**).

### ***d. Rectangular tower tombs with enclosure (n. = 3)***

Three rectangular tower tombs with enclosure have been recorded, all three in the western part of Massif 8 of Jabal al-Khraymât (**map 3**).

They are characterized by the presence of a main rectangular construction, with clearly recognizable corners preserved up to a height of 70 to 80 cm (**figs 11-12**). The best preserved one (AZ 17\_a) is 4 m long and 2 m wide. It consists of a well built wall 60 cm thick (**sketch 5**). A lower surrounding ridge of stones, in which it is possible to recognize rectangular stonework, suggests the presence of some sort of lateral enclosure that, at least partly, surrounded the tower. A similar layout, although less well preserved, is attested in cairn AZ 23\_c, where the central tower protects a rectangular burial chamber, 2.20 m long and 90 cm wide, topped by large, partly preserved covering slabs (**sketch 6**).

## **II. Tombs under mounds of stones (n. = 18)**

### ***a. Rectangular tomb under a mound of stones (n. = 11)***

This type of tomb has been recorded on the west part of Jabal al-Khraymât, with a concentration of them on Massif 8, but also on Massifs 5, 13, 17 and 21 (**maps 3-4**).

These tombs are characterized by large cairns made of stones which are larger and have more irregular outlines than those used to build the tower tombs. The construction method for the burial chamber is different from that of the tower tombs: the rectangular grave is marked out by a stone facing onto which long, narrow covering slabs are placed side by side. It was possible to recognize several of the covering slabs that had been displaced during robbing (fig. 13, sketch 7). These graves were covered with a pile of stones forming a mound. Cairn F 16\_a is a good example, being fairly well preserved in spite of the traces of robbing (fig. 14, sketch 8). At least five long slabs composed the superstructure, resting on the facing stones of the rectangular grave: two of them were tipped over during robbing, another collapsed under the weight of the mound and the last two (or perhaps three) are still in situ.

Apart from these examples, where the remains of construction leave no doubt as to the type to which these graves belong, it is often difficult to differentiate between a rectangular grave under a mound and a ruined tower tomb.

#### ***b. Rock-cut grave under a mound of stones (n. = 7)***

The seven tombs of this type were found on Jabal al-Khraymât, on Massifs 5, 7, 10, 13 and 22 (maps 3-4). They are characterized by the presence of a mound of stones abutting a rock slope, in which natural cavities in the softer layers of sandstone could form a grave (AZ 01\_a : figs 15-16, sketch 9). In one instance, instead of taking advantage of such a cavity, a simple step in the otherwise flat surface of the ground was covered with a mound of stones.

These graves seem to represent opportunistic structures, with a limited investment in terms of construction.

### **III. Rectangular pit-tombs (under mounds?) (n. = 13)**

Rectangular pit-tombs were recorded in the western part of Jabal al-Khraymât, on Massifs 2, 4, 5 and 8 (maps 2-3). Apart from AZ 25\_d, which is isolated, tombs of this type are grouped close together.

Rectangular pit-tombs had already been identified during earlier surveys and there are many of them on the site of Madâ'in Sâlih.<sup>4</sup> Those on the tops of the massifs that face the residential area of the site have often been emptied, clearly revealing the cut of the pit. In other cases further away, on Massifs 4, 5 and 8, one can occasionally see a row of stones on the surface of the ground marking the pit (figs 17-18). This stonework would sometimes have served to level the area in order to support a superstructure composed of elongated stone slabs, no trace of which was found in the examples studied during this season.<sup>5</sup> Surrounding the pits, a few dispersed stones suggests the presence of a low pile of stones above the grave rather than a proper mound.

### **IV. Wall with rectangular, internal, faced compartments (n. = 14)**

This type of structure was recorded on the massifs in the southern part of Jabal al-Khraymât (Massifs 8, 9, 11 and 22, maps 3-4), and also on the top of the eastern massif of Qasr as-Sâni' (map 5).

These structures form low (30 to 40 cm), elongated (from 7 to 11 m long and 2 to 3 m wide) heaps of stones. Despite the rather disorganized surface appearance of these structures, a detailed look revealed a construction method that had not yet been recorded.

They all fit the same construction model: a wall composed of two parallel faces of carefully positioned stones, inside which there are rectangular compartments defined by a stone facing. According to the configurations observed, there are either two or three compartments of fairly consistent size. They are between 60 cm and

4. Nehmé *et alii* 2006, p. 84-87.

5. *Ibidem*, fig. 46.

1 m wide inside, and about 2 m long. The most characteristic examples of these structures fall into two groups on two of the massifs of Jabal al-Khraymât.

The first group is on Massif 11 (**map 3, sketch 10**). It is made up of five walls with rectangular, internal, faced compartments divided into three distinct groups. In complex AZ 06, both structures of this type seem to be associated with cairns whose nature could not be determined from a surface examination (**sketch 11**). The stonework defining three compartments is clearly identifiable in AZ 06\_b (**figs 19-20**), whereas AZ 06\_c is more disorganized. In addition, it is in an unusual position topographically, stuck against a talus, on the tip of a rocky spur. In AZ 10, the two structures with walls with rectangular, internal, faced compartments are associated with two circular tower tombs with outer ring of white stones (**sketch 4**). They were well enough preserved so that, for both AZ 10\_b and AZ 10\_g, it was possible to see, in places, the stonework of the outer face of the wall, as well as that of the inner face of some compartments (**fig. 21**). Finally, AZ 13, located at the very south-western tip of the massif, was of an unusual configuration (**sketch 1**). There, the wall with rectangular, internal, faced compartments (AZ 13\_b), which seems to be associated with a tower tomb (AZ 13\_c), is sealed below the construction of a cairn of undetermined nature (AZ 13\_a). This provides an interesting instance of relative dating since the cairn is obviously later than the wall with compartments.

The second group, F 19, is on Massif 22 (**map 4**). It is made up of three walls with compartments divided into two distinct groups. The configuration of F 19 is particularly interesting because it seems to associate, in a perfectly straight line oriented NE-SW, two structures of walls with rectangular, internal, faced compartments, with cairns (**sketch 12**). F 19\_b is indeed aligned with a circular tower tomb with outer ring of white stones (F 19\_a) and with a simple circular tower tomb (F 19\_c). Three compartments could be identified in F 19\_b. To the south, a second wall (F 19\_d) is stuck onto the simple circular tower tomb, which maintains the alignment of the group that ends in a smaller cairn of undetermined nature F 19\_e (**fig. 22**). The presence of compartments in F 19\_d and e could not be verified but, by analogy with F 19\_b to the north-east, it seems probable. Complex F 17, located less than 150 m to the east, in a similar topographic position, is organized in a similar way (**sketch 13**). Indeed, there is a wall with rectangular, internal, faced compartments (F 17\_c, with two compartments), aligned with two circular tower tombs with outer ring of white stones (F 17\_b and F 17\_a). A third circular tower tomb with outer ring of white stones stands a few metres further north and helps to maintain the general NE-SW alignment of the group.

The most striking thing about the examples mentioned here is the reoccurring association of structures with walls with rectangular, internal, faced compartments and tower tombs, especially those that have an outer ring of white stones. This preferred association has also been checked on the eastern massif of Qasr as-Sâni', in the AZ 48 complex, which is composed of a circular tower tomb with outer ring of white stones (AZ 48\_a) and a long wall with rectangular, internal, faced compartments (AZ 48\_b, **sketch 14**). Even though it is often difficult to state that structures located near each other are associated, the perfect alignment of the structures in the F 17 and F 19 complexes is certainly intentional. What meaning should be given to this association is unclear, but one can imagine a certain chronological relationship between the structures with a wall with rectangular, internal, faced compartments and the tower tombs. However, we do not know if these are another form of grave, or structures annexed to the tombs, perhaps of symbolic value.

## V. Rectangular structures (n. = 13)

Some of the cairns studied are the remains of more or less ruined rectangular structures. They have been recorded on Massifs 4, 5, 8, 9 and 10 of Jabal al-Khraymât (**maps 2-3**) as well as in more unusual places such as the sandy bed of a wadi to the east of Massif 12 (**map 4**). Two others were found in the eastern massif of Qasr as-Sâni' (**map 5**).

These rectangular structures generally form a low mound of stones and earth, no more than 30 cm high. They often accompany cairns. Such is the case for AZ 02\_g, represented by a careful construction 7 m long and 1.70 m wide, defined by a facing of white stones that can be clearly identified in several places (**sketch 15**). Partition walls seem to subdivide the construction into three unequal compartments. In complex AZ 14, a series of rectangular or square structures are found next to each other (AZ 14\_l, m, n and o : **sketch 16**). Two of these (AZ 14\_m and n) have a partition wall, thus forming two compartments. The preferred use of white sandstone in the stonework of these structures is attested several times: other than AZ 02\_g, mentioned above, it is the case for AZ 25\_c, AZ 41\_b and very clearly for B 15\_c (**fig. 23**) and B 17\_a (**fig. 24, sketch 17**). This characteristic brings to mind what was noted in the rectangular structure excavated in 2008 beside the circular tower tomb with outer ring of white stones (AZ 43\_b, **sketch 18**). These seem to be the same sort of construction, but we still do not know if these structures constitute another type of burial arrangement, or rather if they are annexes, perhaps of a cultic nature, aimed perhaps at commemorating the dead buried in the nearby cairns.

Two rectangular structures stand out from the others due to their topographic situation and their construction method: E 11\_a and E 12\_c. They are both in the sandy bed of a wadi to the east of Massif 12 of Jabal al-Khraymât (**map 4**). The first consists of a mound, largely covered in sand, in which one can suppose the existence of a quadrangular structure (**fig. 25, sketch 19**). In the second, the rectangular stonework is clearly visible on the surface (**fig. 26, sketch 20**). It marks out a completely razed construction, 4 m long and 1.70 m wide. At the present stage of the project, it is impossible to say whether these constructions are funerary monuments or if they served a different purpose.

## VI. Complex compartmented structures (n. = 6)

In a few cases, it was possible to identify large surfaces covered in small heaps of stones that seem to be ruined architectural units. These complex compartmented structures were found on Massifs 2, 5 and 9 of Jabal al-Khraymât (**maps 2-3**) and on the western massif of Qasr as-Sâni' (**map 5**). Other than structure AZ 41\_n, all the structures of this type are found on the tops of massifs in which there are monumental rock-cut tombs.

A very characteristic example is AZ 45, which is above tombs IGN 63 to IGN 78 (**sketch 21**). The whole massif seems to have been worked in order to host two distinct architectural groups, located on high promontories (AZ 45\_a and AZ 45\_b). In both cases, a series of abutting depressions surrounded by rims of stones and earth, seem to mark the presence of adjacent rooms whose walls were identified in several places (**fig. 27**). It was also possible to identify the following: a series of rectangular pit tombs cut on the edge of the sandstone massif, a rectangular tomb under a mound of stones, access routes consisting of steps cut in the west slope of the massif (**fig. 28**) and the remains of a ramp made of tumbled stones that led to the highest point of the massif, where architectural complex AZ 45\_b is located.

Complex AZ 15 is on the massif above tombs IGN 97 to IGN 100 (**sketch 16**). Apart from structures of various types, two architectural complexes were recorded (AZ 15\_e and AZ 15\_g). These are large mounds of small stones and earth, only about 30 cm high, in which it is possible to identify a series of depressions which indicate the presence of internal subdivisions (**fig. 29**).

Complex AZ 39 is located on the massif of Qasr as-Sâni', which is above tomb IGN 102. The architectural group seems to have covered an area of flat ground on the edge of the massif (**fig. 30**). Amongst the mounds of stone and earth, it was possible to identify preserved stretches of stonework. The use of white sandstone blocks for the construction is confirmed by the preserved walls and by the stones scattered on the surface of the ground.

The shape of the structures and their systematic location at the top of massifs containing monumental tombs might suggest that these constructions are attributable to the Nabataean or Roman period. But there

is nothing to confirm this, and the function of these structures remains undetermined. Given their dominant position, at the top of massifs that are difficult to access, one may imagine a cultic function. If the dating of these structures to the Nabataean or Roman period is confirmed, one may interpret them as small open-air sanctuaries, perhaps high places associated with the monumental tombs.

The only example of an architectural complex recorded that is not near to monumental tombs is located less than 50 m west of a large concentration of rectangular pit tombs, on the flat top of Massif 5 of Jabal al-Khraymât (**map 3**: AZ 41\_n). This association with ordinary tombs attributed to the Nabataean period is one more argument in favour of the hypotheses suggested above on the date and function of these structures.

### **VII. Cairns and structures of an indeterminate nature (n. = 118 + 44)**

A large number of destroyed cairns were identified. Based only on surface inspection, it is not possible to attribute them to one or other of the types defined. Apart from their dimensions, which are presented in table 1, there is no other information with which to classify them.

Apart from the cairns, smaller piles of stones and groups of stones in particular arrangements were identified. It is impossible to determine the exact function of these structures, but they do not seem to have been graves. In a few cases only, a special arrangement seems to emerge from these tenuous remains. For example AZ 10\_c, d and e, form an arc-shaped stone alignment which might be the remains of hearths (**sketch 4, fig. 31**). They are generally composed of small, low heaps of scattered stone, less than 2 m in diameter. AZ 27\_b, AZ 28\_b, and AZ 34\_a are some examples amongst many of such structures (**fig. 32**). All these features suggest the presence of non-funerary structures, perhaps associated with tombs, but whose function is impossible to define.

## **SURFACE COLLECTION AND FINDS**

The following remarks are preliminary because the study of the finds is not complete. The very poor condition of the surface material collected, both the bones and the pottery, and their limited number impose serious limitations on the analysis. In addition, the mixture of finds from the tomb robbing with those resulting from the occupation of the site over time ('background noise') means that some caution must be applied to the use of this material for dating the structures.

### **Pottery**

The fact that the surface material is different from that found in the excavations in the residential area is interesting. It might be explained either because of different dates, or different functions. Burial goods formed perhaps a particular group within the material assemblage.

Apart from Nabataean and Roman pottery, which was clearly identified only in a few cases, two broad pottery categories were distinguished. The first is represented by wheel-made pots with thin walls, very fine mineral temper and a creamy-beige exterior surface. It has been called Hellenistic, but this dating is not confirmed. The second category is represented by much coarser pottery, which contains a lot of mineral temper and traces of plant material. The colour of the pottery is a range of more or less dark reds. Currently we cannot date this material.

Along with these two main categories, which need to be better defined, a particular form of pottery has been identified near to the structures with walls with rectangular, internal, faced compartments. The sherds collected, very characteristic, are made of a pink to dark red fabric with a fairly coarse temper, and are always decorated with a variety of small, incised dots. This type of pottery was recorded four times in complexes with walls with rectangular, internal, faced compartments. For example, in AZ 10\_b, where sherds from a collarless globular jar with a spout were collected in the internal space of a compartment and

in a structure of undetermined nature nearby (**figs 33-34**). The incised dots were made on applied bands that form squares. In F 19, many sherds with a simple decoration of incised dots were also collected (**fig. 35**). Similar pottery came from AZ 48 and AZ 14, where walls with compartments were recorded. This type of pottery was found in only one complex without walls with compartments, F 07, which has two simple circular tower tombs and a structure of undetermined nature. These sherds are from a globular jar with pinched rim, with a vertical lug handle, and decorated with small incised dots on small circular impressed bumps (**fig. 36**).

Notwithstanding the differences in the details of the forms of this pottery, it seems clear that it all belongs to the same stylistic tradition. There are no parallels so far, and no date can be suggested for this pottery. The fact that it is systematically associated both with structures with walls with rectangular, internal, faced compartments and circular tower tombs provides an interesting avenue for further research.

### Human bones remains

Bones were frequently found in the ruins of cairns or next to tombs. Most of the time, however, these remains were only splinters or small fragments in very poor condition, scattered across the surface of the ruins. Dating these bones using  $^{14}\text{C}$  does not seem worthwhile, given their weathering and the limited relevance of dates from material collected on the surface.

Preliminary analysis has shown that assemblages are generally from the remains of a minimum number of one individual (MNI). In only one case, the collection of bones from the ruins of cairn F 07\_a, the remains of at least three adults and two children were identified. However, these figures do not provide any information on the methods of inhumation in the graves since they could be the result of the mixing of remains from several graves scattered across the ground surface.

### Various artefacts

Numerous fragments of sea shells were collected. They were probably used on clothing since some examples of whole perforated shells were found. The reoccurrence of these objects fits well in the funerary context of the cairns, and they are probably objects that survived the tomb robbing. A bead of a interesting type was identified in structure AZ 14\_m. It is a flat, discoidal bead, with a central hole (**fig. 37**). It was made by cutting and polishing the edge of a large, conical shell of a type found unworked in other cairns. This single example has parallels with objects found on the site of Taymâ', where they have been dated to the first half or the middle of the 1<sup>st</sup> millennium BC.<sup>6</sup>

Stone objects are also well represented. They are mostly very fragmentary calcite containers. A few stone beads should also be noted, and two instances of more common tools such as axes of worked stone (hard sandstone). Finally, a tripod support of dark sandstone, similar to those found in the residential area, was found near to cairn AZ 20\_b.

## CONCLUSION

Having completed the overview of the structures present and having established a provisional typology, what is immediately clear is the diversity of structures represented by the word "cairn", which until now has been used to describe them. The excavation in 2008 had already indicated this diversity, but we now understand its extent thanks to the survey carried out in Jabal al-Khraymât and Qasr as-Sâni'.

6. Al-Ghabban *et alii* 2010, p. 251.

The tower tombs (Type I) are the best represented constructions, with a total of fifty structures. Their study has demonstrated that the construction uncovered in the 2008 excavations is not an isolated example, and also that several sub-types exist, characterized by the presence or absence of an outer ring of white stones, as well as the existence of rectangular tower tombs with or without an enclosure.

It has also been possible to recognize structures that seem to belong to different architectural traditions. The rectangular or the rock-cut tombs under mounds (Type II), although less numerous than the tower tombs, constitute another characteristic form of inhumation, as do the rectangular rock-cut pit tombs (Type III), which had already been identified during earlier studies on the site.

There is no doubt as to the funerary function of these structures, but the diversity of types and architectural traditions expressed through them suggests different dates.

Equally, the identification of specific structures such as the walls with rectangular, internal, faced compartments (Type IV), the rectangular structures (Type V) and the complex compartmented structures (Type VI), raises the question of differences in function. We can put forward the hypothesis, at least provisionally, that the complex compartmented structures had a cultic function.

Apart from the rare cases where relative dating can be established, the absence of stratigraphy and the fact that the constructions were built directly on the bedrock does not allow the relative chronology of structures located near to each other to be determined. Only the dating of sufficiently well preserved examples of each type would allow them to be arranged chronologically.

However, by observing various associations between structures, it is possible to suggest a few hypotheses. The tower tombs and the walls with rectangular, internal, faced compartments seem to be clearly associated, as shown by their repeated occurrence in complexes, which was certainly intentional. The identification of a specific pottery type found in close association with these structures is also something to be taken into consideration. Equally, the fact that the complex compartmented structures were systematically built on the tops of massifs which also have Nabataean rock-cut tombs, or near to rectangular pit tombs, is certainly not a coincidence. It could indicate a chronological and functional link between these different structures. It is now possible to consider the excavation of a few chosen examples of cairns, in order to determine their date and function more accurately.

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<i>Str. No.</i>	Description	Finds	Photo archive	Sketch / Fig.
	<b>Rock-cut grave under a mound of stones</b> (Ø: 6 m; h: 1. 50 m)			
<i>AZ 01_a</i>	Pile of stones in an arc abutting a natural step in the bedrock with natural undercut recesses. Presence of an outer face similar to that of the tower tombs		385-389 gen. view 390-394	Sketch 9 Fig. 15
<i>AZ 01_b</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 60 cm) Pile of stone in an arc up against AZ 01_a		395-402	Sketch 9
<i>AZ 01_c</i>	<b>Cairn of undetermined nature</b> (L: 4 m; w: 3 m; h: 30 cm) Cairn or pile of stones with two circular depressions in the centre (double burial chamber?)		403-406	Sketch 9
<i>AZ 01_d</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm) Very disorganized traces of a structure (tomb?)		407	Sketch 9
<i>AZ 01_e</i>	<b>Tower tomb with outer ring of white stones</b> (Ø: 6 m; h: 50 cm) Very disorganized construction		408-415	Sketch 9
<i>AZ 01_f</i>	Traces of robbing: several depressions in the centre <b>Cairn of undetermined nature</b> (Ø: 4 m; h: 40 cm)		416-421	Sketch 9
<i>AZ 01_g</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 20 cm)		422-424	Sketch 9
<i>AZ 02_a</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 40 cm)		425-437 gen. view	Sketch 15
<i>loc. 41016</i>	Circular pile of stones with a large circular central depression	- 2 undetermined sherds	438-439	Sketch 15
<i>AZ 02_b</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 50 cm)		438-439	Sketch 15
<i>AZ 02_c</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 40 cm)		440-441	Sketch 15
<i>AZ 02_d</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 40 cm)		442-443	Sketch 15
<i>AZ 02_e</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 80 cm)		444-445	Sketch 15
<i>AZ 02_f</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 80 cm) <b>Rectangular structure</b> (L: 7 m; w: 1. 70 m)		447-448	Sketch 15
<i>AZ 02_g</i>	Careful construction defined by a facing of white stones clearly identifiable on the surface in several places (south-west and north-west corners + along the whole length of the east side) Partition walls that subdivide the length of the construction into three unequal compartments		449-450 452-469	Sketch 15
<i>AZ 02_h</i>	<b>Cairn of undetermined nature</b> , destroyed		451	Sketch 15
<i>AZ 03_a</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 40 cm) On the top of a rocky spur, no identifiable stonework on the surface, very disorganized structure		480-482 470; 471-472	Sketch 15
<i>AZ 03_b</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)		473-474	Sketch 15
<i>AZ 03_c</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 30 cm)		475	Sketch 15
<i>AZ 03_d</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)		476	Sketch 15
<i>AZ 03_e</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 30 cm)		477	Sketch 15
<i>AZ 03_f</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm)		478-479	Sketch 15
<i>AZ 03_g</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)		478-479	Sketch 15

<b>AZ 04_a</b>	<b>Circular tower tomb</b> (Ø: 3 m; h: 1 m) Tower facing is well preserved in the SW: 14 courses of flat sandstone slabs, small irregular stones. Traces of robbing: west part entirely emptied	375-384/483-484/565 485-501	Sketch 2
<b>AZ 04_b</b> <i>loc. 41040</i>	<b>Circular tower tomb</b> (Ø: 4 m; h: 80 cm) <b>Rectangular burial chamber</b> identifiable (L: 2 m; w: 90 cm): orientation NW/SE Presence of bones (human?) in the chamber. Blocks of dressed stone scattered around	- 41040_B1: Small collection of human bones including 1 fragment of a hand phalange and 1 fragment of a foot phalange 502-528	Sketch 2
<b>AZ 04_c</b>	<b>Circular tower tomb (?)</b> , very disturbed construction, presence of dressed stone blocks	529-538	Sketch 2
<b>AZ 04_d</b>	<b>Cairn of undetermined nature</b>	539-540	Sketch 2
<b>AZ 04_e</b>	<b>Circular tower tomb</b> (with outer ring of white stones?)	541-542	Sketch 2
<b>AZ 04_f</b>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 1.40 m) Presence of dressed stone blocks	543-556	Sketch 2
<b>AZ 04_g</b>	<b>Circular tower tomb with outer ring of white stones</b> Burial chamber identifiable (L: 2 m; w: 90 cm) Traces of robbing	557-561	Sketch 2
<b>AZ 05_a</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 60 cm) Looks like a <i>tumulus</i> with a corbelled roof (presence of large, flat slabs) Traces of robbing	566-574 562-564	
<b>AZ 06_a</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm), badly eroded and destroyed Double burial chamber (?)	613 575-578	Sketch 10, 11
<b>AZ 06_b</b> <i>loc. 41020</i>	<b>Wall with rectangular, internal, faced compartments</b> (L: 9 m; w: 2 m) Slightly off-line from the central line of associated cairn AZ 6_a, orientation SE/NW At least three compartments visible	- 6 undetermined sherds - 41020_Sh1: fragment of conical shell 579-603	Sketch 10, 11 Figs 19-20
<b>AZ 06_c</b>	<b>Wall with rectangular, internal, faced compartments (?)</b> (L: 7 m; w: 2 m) Construction up against a slight step in the bedrock, has some similarities with structure AZ 2_g	604-607	Sketch 10, 11
<b>AZ 06_d</b>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 80 cm)	608-609	Sketch 10, 11
<b>AZ 06_e</b>	<b>Cairn of undetermined nature</b> (nearly completely destroyed)	610-612	Sketch 10, 11
<b>AZ 07_a</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm) Looks like a <i>tumulus</i> , presence of large, flat unworked slabs from the dismantling of the roof Traces of robbing: central depression	614-616	
<b>AZ 08_a</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 50 cm) Looks like a <i>tumulus</i> , presence of large, flat slabs from the dismantling of the roof	617-620	

	<b>Cairn of undetermined nature</b> (Ø: 7 m; h: 1. 40 m) No identifiable stonework		621-622 gen. view 623-626	Sketch 10
<i>AZ 09_a</i>	Burial chamber visible, elongated shape: oriented E/W, presence of large, flat slabs from the roof To the north, a small abutting feature of stones in an arc (Ø: 3 m; h: 30 cm)			
<i>AZ 09_b</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 40 cm) Burial chamber: internal face visible, orientation E/W		627-631	Sketch 10
<i>AZ 09_c</i>	<b>Structure of undetermined nature</b> (Ø: 80 cm; 30 cm): hearth?		632-633	Sketch 10
<i>AZ 10_a</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 5 m; h: 50 cm)		633-646/667	Sketch 4, 10
<i>AZ 10_b</i> <i>loc. 41001</i>	<b>Wall with rectangular, internal, faced compartments</b> (L: 7 m; w: 3 m) Orientation: NW/SE. Two identifiable compartments (L: 2 m; int. w.: 60 cm): good stonework on the internal and external face, presence of pottery in the south-eastern compartment	- 25 sherds of red and white fabric with an applied band decorated with small incised dots Recognizable parallel forms: rim fragment with crossed bands decorated with dots, rim fragment with spout decorated with small incised dots (figs 33-34) - 41001_Sh1: group of 4 shell fragments and one perforated shell bead - 11 sherds of jar bases in a white fabric, from against the “hearth”, semi-circular structure “c”.	647-664	Sketch 4, 10 Figs 21, 33-34
<i>AZ 10_c</i> <i>loc. 41002</i>	<b>Structure of undetermined nature</b> (Ø: 90 cm; h: 20 cm) Horse-shoe shaped, open to the north	- 26 thin sherds of red fabric, blackened on the outside, decorated with small dots, no recognizable form, perhaps a base	668-670/671	Sketch 4, 10
<i>AZ 10_d</i>	<b>Structure of undetermined nature</b> (Ø: 80 cm; h: 20 cm) Horse-shoe shaped, open to the north-west		672	Sketch 4, 10
<i>AZ 10_e</i>	<b>Structure of undetermined nature</b> (Ø: 80 cm; h: 20 cm) Horse-shoe shaped, open to the north		673	Sketch 4, 10
<i>AZ 10_f</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 6 m; h: 80 m) The white stones of the ring visible at the base of the cairn but also in situ in the N Burial chamber identifiable: orientation E/W. Traces of robbing		665/674-679 681-682	Sketch 4, 10 Fig. 6
<i>AZ 10_g</i>	<b>Wall with rectangular, internal, faced compartments</b> (L: 12 m; w: 2 m; h: 40 cm) Stonework of the exterior wall face very clear in the north; interior face in one of the compartments also visible in places		666/706-707	Sketch 4, 10
<i>AZ 10_h</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 6 m; h: 1. 50 m) Stonework of the tower is well preserved (Ø tower: 4 m) Burial chamber visible: orientation: E/W		683-691/680	Sketch 10

<b>AZ 10_i</b> <i>loc. 41038</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 8 m; h: 1. 50 m) Stonework of the tower is well preserved (Ø tower: 5 m), traces of dressing on the rounded face of some very pale white stones Burial chamber completely open	- 41038_B1: undetermined diaphysis	692-705	Sketch 10 Figs 7-8
<b>AZ 11_a</b> <i>loc. 41005</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 5 m; h: 1. 40 m) Well preserved stonework in the tower: visible corbelled vault Presence of a sherd concentration from one pot broken on the destruction level of the cairn	- 123 sherds almost all from the same carinated jar of fine fabric (very fine temper), creamy beige outside with a pink core, said to be Hellenistic	708-733	Sketch 10
AZ 11_b	<b>Circular tower tomb</b> (?) destroyed (Ø: 4 m; h: 60 cm)		734-735	Sketch 10
<b>AZ 11_c</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 40 cm) Badly ruined		736-737	Sketch 10
<b>AZ 12_a</b> <i>loc. 41048</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 1. 40 m) <i>Tumulus?</i> Visible corbelled roofing	- 41048_B1: 1 skull fragment	744/738-739	Sketch 10
<b>AZ 12_b</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 80 cm) Traces of robbing: central depression		740-742	Sketch 10
AZ 12_c	<b>Structure of undetermined nature</b> (Ø: 2 m; h: 30 cm) Circular shape (non funerary?) abutting the west side of AZ 12_a		743	Sketch 10
<b>AZ 13_a</b>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 1 m) Completely open to the south <b>Wall with rectangular, internal, faced compartments</b> (L: 7 m; w: 2 m; h: 30 cm)		744-745 746-747	Sketch 1, 10
<b>AZ 13_b</b>	An element of relative stratigraphy because the wall seems associated with tower tomb AZ 13_c and it is covered by the construction of the later cairn AZ 13_a <b>Circular tower tomb</b> (without outer ring of white stones?) (Ø: 5 m; h: 1. 20 m)		748-749	Sketch 1, 10
<b>AZ 13_c</b>	Stonework of the tower very clear on the east side Burial chamber well preserved: orientation of the grave E/W (L: 2 m; w: 90 cm), presence of an entrance oriented to the south		750-762	Sketch 1, 10
<b>AZ 14_a</b> <i>loc. 41003</i>	<b>Cairn of undetermined nature</b> (average Ø: 3 m; average h: 30 to 40 cm) Large concentration of structures and constructions of different sorts, located on the northern tip of the eastern massif Very disorganized group of sub-circular stone features forming a ring at the foot of rise to the summit Presence of many fragments and splinters of bone (human?) all around these features	- From a, b, c, d and e: 2 sherds with traces of white paint 1 sherd of fine cream-coloured ware said to be Hellenistic 10 sherds of coarse ware with much mineral temper and traces of plant material - 41003_S1: 2 fragments of a stone container (calcite) including one piece of base	764-765/770/779 766-769 782-785 786-793 831-838	Sketch 16

<i>AZ 14_b</i>	<b>Cairn of undetermined nature</b>			Sketch 16	
<i>AZ 14_c</i>	<b>Cairn of undetermined nature</b>			Sketch 16	
<i>AZ 14_d</i>	<b>Cairn of undetermined nature</b>			Sketch 16	
<i>AZ 14_e</i>	<b>Cairn of undetermined nature</b>			Sketch 16	
			- From f and g: 48 sherds from different vessels		
			18 sherds of fine cream-coloured fabric said to be Hellenistic; several sherds of red/black coarse ware, including one jar rim		
<i>AZ 14_f</i>	<b>Structure of undetermined nature</b> , destroyed (Ø: 2 m; h: 20 cm)			794	Sketch 16
<i>loc. 41009</i>	Sub-circular shape				
			- 41009_S1: carved axe of black stone (hard sandstone or basalt)		
			- 41009_Sh1: shell fragment		
<i>AZ 14_g</i>	<b>Wall with rectangular, internal, faced compartments ?</b>				
	Installation with very disturbed stonework, long, narrow shape with a rectangular niche or alcove to the west			795-803	Sketch 16
	<b>Cairn of undetermined nature</b> (Ø: 7 m; h: 40 cm)				
<i>AZ 14_h</i>	It is not clear whether this is a stone-covered grave forming a cairn or a quadrangular installation defined by a stonework construction not visible on the surface			804-808	Sketch 16
<i>AZ 14_i</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm)			809	Sketch 16
<i>AZ 14_j</i>	<b>Structure of undetermined nature</b> , circular			810-811	Sketch 16
<i>AZ 14_k</i>	<b>Structure of undetermined nature</b> , circular				Sketch 16
<i>AZ 14_l</i>	<b>Rectangular structure</b> (5 x 5 m; h: 30 cm)			812-816	Sketch 16
<i>loc. 41017</i>	Interior flat and open, presence of stonework defining the structure			771-773	
			- 8 undetermined sherds		
			- 8 sherds (from m, n, o and p), including a very interesting jar handle that is black on the surface with a pink core, in a fairly thick and coarse fabric, decorated with small incised dots	817-819	Sketch 16
<i>AZ 14_m</i>	<b>Rectangular structure</b> (4 x 2 m; h: 30 cm) with a partition wall creating two compartments			776	Fig. 37
<i>loc. 41019</i>			- 41019_Sh1: fragments of shell beads, including a flat, discoidal one, with a central hole (fig. 37)		
			- 41019_S1: fragment of bead in veined stone		
<i>AZ 14_n</i>	<b>Rectangular structure</b> (4 x 2 m; h: 30 cm) with a partition wall creating two compartments			776/820-821	Sketch 16
<i>AZ 14_o</i>	<b>Rectangular structure</b> (1.5 m x 80 cm; h: 20 cm)			822-826	Sketch 16
	Only one course preserved, presence of bone splinters inside				
<i>AZ 14_p</i>	<b>Wall with rectangular, internal, faced compartments (?)</b>			827-831	Sketch 16
	Abutting a slight step in the topography			774-775	

AZ 14_q	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm) On the top of a high point in the massif	780-781	Sketch 16	
AZ 15_a <i>loc. 41024</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 50 cm)	- From a, b, c, d and e: 9 sherds, including one jug rim - 41024_S1: three worked stone tools (dark, hard sandstone). Traces of wear, polishing of the used surface on two of the three tools	839-841/888-889 842	Sketch 16
AZ 15_b	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm)	843	Sketch 16	
AZ 15_c	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm) <b>Structure of undetermined nature</b> , circular (Ø: 6 m; h: 40 cm)	843	Sketch 16	
AZ 15_d	Defined by large stone slabs stuck upright in the ground (some have fallen) Presence of a basalt block (imported). The surface of the bedrock is visible inside <b>Complex compartmented structure</b> (L: 13 m; w: 5 m; h: 30 to 40 cm)	844-851	Sketch 16	
AZ 15_e	Represented by a pile of stones, presence of hollow areas and depressions which suggest internal subdivisions in the construction, which could be a room with compartments or a building	852-855	Sketch 16	
AZ 15_f	<b>Structure of undetermined nature</b> , circular (Ø: 1 m; h: 30 cm) <b>Complex compartmented structure</b> (L: 7 m; w: 5 m; h: 30 cm)	856	Sketch 16	
AZ 15_g <i>loc. 41014</i>	Represented by a pile of stones, presence of depressions which suggest subdivisions at the heart of the structure (compartmented room of the same type as AZ 15_e)	- 1 pot sherd of coarse red to black ware (base of a jar?)	857-859	Sketch 16 Fig. 29
AZ 15_h	<b>Wall with rectangular, internal, faced compartments (?)</b> Longitudinal pile of stones (L: 8 m; w: 3 m; h: 30 cm)	861-865	Sketch 16	
AZ 15_i	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 50 cm)	866-869	Sketch 16	
AZ 15_j	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 40 cm)	866-869	Sketch 16	
AZ 15_k	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 30 cm)	870-871	Sketch 16	
AZ 16_a <i>loc. 41007</i>	<b>Rectangular tower tomb (with enclosure?)</b> (L: 4 m; w: 2 m) Visible stonework: outer face of the rectangular structure, north-west corner still has eight courses standing (h: 70 cm)	- 28 sherds from one jar of coarse and thick fabric, red to black coloured	890-902	Fig. 11
AZ 17_a <i>loc. 41012</i>	<b>Rectangular tower tomb with enclosure</b> (L: 4 m; w: 2 m) Well preserved stonework: outer face of the rectangular structure and the south-west corner still has nine courses standing (h: 75 cm), presence of stones to the east marking a sort of enclosure	- 17 sherds from one jar of coarse and thick fabric, red to black coloured - 41012_Sh1: shell fragment	903-923	Sketch 5 Fig. 12
AZ 18_a	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 40 cm)	924		
AZ 19_a	<b>Rectangular tomb under a mound of stone</b> (Ø: 6 m; h: 1. 20 m) No identifiable stonework for the tower, nor for a ring Burial chamber open, but well preserved: rectangular in shape (L: 1. 50 m; w: 1 m; h: 80 cm), covered by corbelling of large flat slabs on the top	925-933	Fig. 13	

<i>AZ 20_a</i> <i>loc. 41022</i>	<b>Cairn of undetermined nature</b> , destroyed (Ø: 6 m; h: 60 cm)	- 41022_S1: two fragments of a white stone container (alabaster or calcite)	934-938	
<i>AZ 20_b</i> <i>loc. 41023</i>	<b>Rectangular tomb under a mound of stone</b> (Ø: 4 m; h: 1. 20 m) Cut by erosion, the elevation of the west half well preserved, large covering slabs (Ø: 80 cm)	- 41023_S1: fragment of tripod base in dark sandstone	939-947	
<i>AZ 21_a</i>	<b>Rectangular tomb under a mound of stone (?)</b> (Ø: 4 m; h: 1. 50 m) Superstructure of collapsed covering slabs		948-954	
<i>AZ 22_a</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 60 cm) <b>Rectangular tomb under a mound of stone (?)</b> (Ø: 9 m; h: 2 m)		955-962	
<i>AZ 23_a</i>	Presence of very large stone blocks from the superstructure that covered the tomb Burial chamber clearly identifiable: internal stonework, enormous covering slab (L: 1.20 m) which must have rested on the fallen uprights of the facing <b>Rectangular tomb under a mound of stone (?)</b> (Ø: 8 m; h: 2 m) No identifiable external stonework		963-986	
<i>AZ 23_b</i>	Burial chamber well preserved (L: 1. 50 m; w: 60 cm): internal stonework facing still standing to six courses (h: 70 cm), orientation E/W, one covering slab still in situ on two longitudinal uprights of the grave (L: 80 cm)		987-1000	Sketch 7
<i>AZ 23_c</i> <i>loc. 41008</i>	<b>Rectangular tower tomb with enclosure</b> External stonework visible to the west and south, destroyed to the east Burial chamber well preserved (L: 2. 20 m; w: 90 cm), orientation N/S	- 9 sherds, two of which are rims - 41008_S1: two fragments of a stone container (calcite)	1001-1042	Sketch 6
<i>AZ 24_a</i>	<b>Rectangular tomb under a mound of stone (?)</b> (Ø: 4 m; h: 1 m) Similar to a <i>tumulus</i> with large, flat slabs, no visible stonework, corbelled covering visible		1043-1052	
<i>AZ 25_a</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 6 m; h: 60 cm) Burial chamber visible (L: 2 m; w: 1 m): orientation E/W, superstructure of large covering slabs still partly in situ, large size of covering slabs (L: 1 to 1. 20 m; average w: 50 cm), some are broken, others have been displaced		1085-1095	
<i>AZ 25_b</i>	<b>Wall with rectangular, internal, faced compartments (?)</b> (L: 6 m; w: 2 m) Low, longitudinal mound of stones, no discernable stonework		1096-1097	
<i>AZ 25_c</i>	<b>Rectangular structure</b> <b>Grave in rectangular pit</b> (under mound of stones?), completely open		1098-1101	
<i>AZ 25_d</i>	Burial chamber visible (L: 2 m; w: 90 cm): on one side it is cut into the bedrock against a small step in the bedrock and the other side is a stonework face Covering slabs have been displaced		1102-1111	
<i>AZ 25_e</i>	<b>Cairn of undetermined nature</b>		1112-1115	
<i>AZ 26_a</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm)		1116-1117	
<i>AZ 26_b</i> <i>loc. 41013</i>	<b>Cairn of undetermined nature</b> Burial chamber visible (L: 2 m; w: 90 cm): orientation EW, internal stonework face, covering slabs have been displaced (L: 1 m; w: 40 cm)	- 3 sherds: two of coarse ware with large mineral inclusions and plant temper and one of a finer ware with white slip on the outside	1118-1122	

<i>AZ 26_c</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 7 m; h: 1. 20 m)		1123-1126
<i>AZ 26_d</i>	<b>Cairn of undetermined nature</b> (Ø: 7 m; h: 1. 20 m) Traces of robbing: central depression		1127-1130
<i>AZ 26_e</i> <i>loc. 41010</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 7 m; h: 1. 20 m) Stonework face of the tower discernable on the north-east side Burial chamber visible: orientation N/S, corbelled covering partly preserved on the lateral uprights of the tomb	- 40 sherds of fine, pink-coloured (slipped?) fabric, small jug or phial and a base fragment	1131-1141
<i>AZ 26_f</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 60 cm) Burial chamber visible: orientation E/W, poorly preserved		1142-1143
<i>AZ 26_g</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 30 cm)		1144-1146
<i>AZ 26_h</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 80 cm)		1147-1149
<i>AZ 27_a</i>	<b>Rectangular tomb under a mound of stone</b> (Ø: 4 m; h: 1 m) Only the capstone has been displaced and one can see the row of corbelled slabs below Potentially intact tomb(!)		1150-1159
<i>AZ 27_b</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm) Pile of stones with a low surrounding ridge of stones, with the bedrock appearing in the centre		1160-1161
<i>AZ 27_c</i>	<b>Structure of undetermined nature</b> , circular (Ø: 3 m; h: 20 cm)		1162
<i>AZ 27_d</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 40 cm) <b>Cairn of undetermined nature</b> (Ø: 3 m; h: 1 m)		1163
<i>AZ 27_e</i>	Defined by two or three courses of very large blocks of stone covered with pebbles Traces of robbing: open towards the NE <b>Cairn of undetermined nature</b> (Ø: 3 m; h: 1 m)		1164-1173
<i>AZ 27_f</i> <i>loc. 41018</i>	Burial chamber visible (L: 2 m; w: 60 cm): orientation E/W, internal stone face preserved four courses high, the covering slabs on the uprights of the grave have fallen Traces of robbing: numerous fragments and splinters of bone (human?) to the NE in the area where the cairn is open	- 1 coarse pottery sherd in red to black fabric	1174-1183
<i>AZ 28_a</i> <i>loc. 41037</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 60 cm) Western half entirely eroded away, coherent concentration of human bones in the destruction rubble	- 41037_B1: many human bones including numerous skull fragments, as well as bones from the mandible, scapula, vertebrae, right ulna, hand (phalanges and metacarpals), pelvis, fibula, tibia, femur, left talus, metatarsal MNI = 1; Bones datable by C <sup>14</sup> - 41037_P1: fragment of pottery phial decorated with small incised squares	1184-1188
<i>AZ 28_b</i>	<b>Structure of undetermined nature</b> , circular (Ø: 1 m; h: 20 cm)		1189-1190

Fig. 32

<i>AZ 29_a</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm), destroyed	1191-1192	
<i>AZ 30_a</i> <i>loc. 41021</i>	<b>Cairn of undetermined nature</b> , destroyed Concentration of human bones in the rubble	1193-1204	- 7 sherds, all in fine, creamy beige fabric said to be Hellenistic - 41021_B1: concentration of human bones including fragments of skull, scapula, sternum, metacarpal, fibula, navicular MNI = 1
<i>AZ 31_a</i>	<b>Rock-cut grave under a mound of stones</b> No identifiable stonework: mound of stones abutting a natural undercut cavity in the slope of the hill	1205	
<i>AZ 32_a</i>	<b>Rock-cut grave under a mound of stones</b> Abutting the natural topography, large stone blocks around it	1206-1209	
<i>AZ 33_a</i>	<b>Structure of undetermined nature</b> , circular (Ø: 3 m; h: 20 cm)	1210-1211	
<i>AZ 34_a</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm)	1212-1214	
<i>AZ 35_a</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 40 cm) Burial chamber visible: orientation E/W, visible stonework, large displaced covering slabs	1215-1217	
<i>AZ 35_b</i>	<b>Rectangular tower tomb (?)</b> (Ø cairn: 4 m; h: 60 cm) Burial chamber visible: orientation N/S, identifiable stonework	1218-1224	Fig. 9-10
<i>AZ 35_c</i>	<b>Circular tower tomb</b> (Ø: 7 m; h: 1.40 m) External face of the tower very well preserved on the east side (Ø tower: 5 m), presence of rounded dressed stone blocks for the outer face of the tower	1225-1238	Fig. 1
<i>AZ 35_d</i>	<b>Rock-cut grave under a mound of stones</b> , very destroyed	1239-1241	
<i>AZ 36_a</i>	<b>Cairn of undetermined nature</b> (L: 7 m; w: 5 m; h: 1 m) Large mound with three internal depressions suggesting the presence of internal subdivisions, no visible stonework on the surface	1246-1249	
<i>AZ 36_b</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 40 cm)	1250-1251	
<i>AZ 37_a</i>	<b>Circular tower tomb</b> (Ø: 5 m; h: 1 m) External stone face of the tower visible on the west side, very disturbed	1252-1260	
<i>AZ 38_a</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 20 cm)	1264	
<i>AZ 38_b</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 40 cm)	1265	
<i>AZ 38_c</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 50 cm)	1266-1267	
<i>AZ 38_d</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 60 cm)	1268-1270	
<i>AZ 39_a</i>	<b>Complex compartmented structure</b> Large, spread out mound of stones with depressions which suggest the presence of internal subdivisions Presence of numerous dressed stone blocks which could have been the stonework of the destroyed structure	1271-1283	Fig. 30

<i>AZ 40_a</i>	<b>Rectangular tomb under a mound of stone</b> (Ø: 4 m; h: 1. 10 m) Burial chamber visible	1584-1587	
<i>AZ 40_b</i>	<b>Cairn of undetermined nature</b>	1588	
<i>AZ 41_a</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 80 cm) Burial chamber open	1591-1592	
<i>AZ 41_b</i>	<b>Rectangular structure</b> (L: 2 m; w: 1. 50 m; h: 30 cm) Presence of white stones from destroyed stonework	1593-1597	
<i>AZ 41_c</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 20 cm)	1600-1601	
<i>AZ 41_d</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm)	1602-1603	
<i>AZ 41_e</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 20 cm)	1604-1605	
<i>AZ 41_f</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 20 cm)	1606-1607	
<i>AZ 41_g</i>	<b>Cairn of undetermined nature</b> (Ø: 1. 50 m; h: 40 cm) Burial chamber visible: corbelled superstructure	1608-1610	
<i>AZ 41_h</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm)	1611-1612	
<i>AZ 41_i</i>	<b>Rock-cut grave under a mound of stones</b> (Ø: 3 m; h: 50 cm) Mound of stones abutting a natural undercut cavity in the hill slope	1613-1615	
<i>AZ 41_j</i>	<b>Cairn of undetermined nature</b> (Ø: 3. 50 m; h: 40 cm)	1616-1617	
<i>AZ 41_k</i>	<b>Cairn of undetermined nature</b> (Ø: 6 m; h: 90 cm)	1618-1628	
<i>AZ 41_l</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 90 cm) Burial chamber visible: orientation E/W, corbelled covering	1629-1633	
<i>AZ 41_m</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm) <b>Complex compartmented structure</b> (L: 30 m; w: 20 m)	1634-1635	
<i>AZ 41_n</i>	Floor littered with spalls of white sandstone, presence of structures represented by piles or ridges of stones from 20 to 30 cm high Organization difficult to discern on the surface	1756-1760	
<i>AZ 41_o</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 50 cm)	1761-1763	
<i>AZ 41_p</i>	<b>Grave in rectangular pit</b> Cut into the bedrock, defined by a row of worked stones, some white ones	1764-1777	
<i>loc. 41029</i>	The small number of stones scattered around suggests that the grave was covered by a small, low pile rather than a proper, imposing mound	1780-1783	Fig. 17
<i>AZ 41_q</i>	<b>Grave in rectangular pit</b> Cut into the bedrock, defined by a row of worked stones, some white ones, small number of stones scattered around		Fig. 18
<i>AZ 41_r</i>	<b>Grave in rectangular pit</b> Like the previous one		
<i>AZ 41_s</i>	<b>Grave in rectangular pit</b> Like the previous one		

- From p, q, r, s, t and u:

16 sherds from various pots. The wares are thick with large temper with plant inclusions, black surface, beginning of a handle present; fine ware, a maximum of 3 mm thick, fabric with very fine temper

<i>AZ 41_t</i>	<b>Grave in rectangular pit</b> Like the previous one		
<i>AZ 41_u</i>	<b>Grave in rectangular pit</b> Like the previous one		
<i>AZ 41_v</i>	<b>Cairn of undetermined nature</b> (Ø: 6 m, h: 30 cm)		1778-1779
<i>AZ 42_a</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 60 cm)		1784-1785
<i>AZ 43_a</i> <i>loc. 41032</i>	<b>Circular tower tomb with outer ring of white stones</b> (= <i>loc.</i> 40000). See the report for the 2008 excavation	- 43 sherds of various vessels (some fine with fine temper and others from larger forms of thick-walled jars with coarse temper). Nabataean and Roman period?	1786 Sketch 18
<i>AZ 43_b</i>	<b>Rectangular structure</b> (= <i>loc.</i> 40 008) cf. report for the 2008 excavation		1787 Sketch 18
<i>AZ 43_c</i>	<b>Cairn of undetermined nature</b> (Ø: 8 m; h: 1. 10 m) Possibly of rectangular shape, presence of white stones in the lower part of the stone mound		1788-1792 Sketch 18
<i>AZ 43_d</i>	<b>Circular tower tomb</b> (with outer ring of white stones ?) (Ø tower: 3 m; h: 40 cm) The presence of white stones surrounding the mound suggests the existence of an outer ring		1793-1798 Sketch 18
<i>AZ 43_e</i>	<b>Cairn of undetermined nature</b> , destroyed (Ø: 4 m; h: 30 cm)		1799-1801 Sketch 18
<i>AZ 43_f</i>	<b>Rectangular structure (?)</b> (L: 4 m; w: 3 m; h: 20 cm) Low mound of small stones, internal surface uncovered, similar to AZ 43_b, the rectangular structure excavated in association with cairn 40000		1802-1803 Sketch 18
<i>AZ 43_g</i>	<b>Cairn of undetermined nature</b> (Ø: 6 m; h: 40 cm)		1804-1806 Sketch 18
<i>AZ 43_h</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 40 cm)		1809-1810 Sketch 18
<i>AZ 43_i</i>	<b>Grave in rectangular pit</b> (L: 2 m; w: 60 cm) Small number of stones around		1811-1813 Sketch 18
<i>AZ 43_j</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 8 m; h: 1 m)		1814-1817 Sketch 18
<i>AZ 43_k</i>	<b>Grave in rectangular pit</b> (L: 2 m; w: 50 cm) Orientation NW/SE		1818-1821 Sketch 18
<i>AZ 43_l</i>	<b>Grave in rectangular pit</b> (L: 2 m; w: 50 cm) Orientation NNW/SSE		1822-1824 Sketch 18
<i>AZ 43_m</i>	<b>Grave in rectangular pit</b> (L: 2 m; w: 60 cm) Orientation NW/SE, presence of stones indicates that the edges of the grave were of stone laid on the ground surface		1825-1826 Sketch 18
<i>AZ 43_n</i>	<b>Grave in rectangular pit (?)</b>		1827-1828 Sketch 18
<i>AZ 43_o</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm)		1829-1830 Sketch 18
<i>AZ 43_p</i>	<b>Grave in rectangular pit (?)</b>		1831-1832 Sketch 18

<i>AZ 43_q</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 7 m; h: 80 cm) Stonework of the exterior face of the tower partly visible on the north side. The presence of white stones surrounding the mound suggests the existence of an outer ring	1833-1836	Sketch 18	
<i>AZ 43_r</i>	<b>Structure of undetermined nature</b> , in an arc (Ø: 3 m; h: 30 cm) Open to the west	1837-1840	Sketch 18	
<i>AZ 43_s</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 30 cm) Presence of a partition which divides the structure in two halves	1841-1842	Sketch 18	
<i>AZ 43_t</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 80 cm)	1843-1846	Sketch 18	
<i>AZ 43_u</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 20 cm)	1847-1848	Sketch 18	
<i>AZ 43_v</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 20 cm)	1849-1850	Sketch 18	
<i>AZ 44_a</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 50 cm)	1851-1853	Sketch 18	
<i>AZ 44_b</i>	<b>Cairn of undetermined nature</b> Continuous chain of adjoining mounds of stone Destroyed adjoining cairns of such density that it is impossible to identify and define each structure on the surface It is possible to count at least twelve depressions which indicate the presence of destroyed cairns	1854-1866	Sketch 18	
<i>AZ 44_c</i>	<b>Cairn of undetermined nature</b> (Ø: 6 m; h: 40 cm)	1867-1870	Sketch 18	
<i>AZ 44_d</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm)	1885-1886	Sketch 18	
<i>AZ 44_e</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 50 cm)	1887-1888	Sketch 18	
<i>AZ 44_f</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 40 cm)	1889-1890	Sketch 18	
<i>AZ 44_g</i>	<b>Structure of undetermined nature</b> , circular (Ø: 2 m; h: 30 cm)	1891-1893	Sketch 18	
<i>AZ 45_a</i> <i>loc. 41033</i>	<b>Complex compartmented structure</b> Located at the top of a massif of Jabal al Khraymât, an ancient accessway was noted, consisting of five steps carved into the western slope of the hill in the gentlest part of the slope. Large cleared space, edged on the east side by a pile of stones (NS) in which there are spaces with no stones: a series of adjoining spaces defined by ridges of stones which could indicate the presence of stone walls. Some traces of this stonework are visible on the surface in places. Presence of seven rectangular pit tombs on the top of the rocky spur in the south of the massif, as well as six similar tombs to the east, at the foot of the hill.	- 38 sherds (Nabataean or Roman period?) - 41033_S1: two fragments of a stone container (calcite?), including one rim 41033_S2: fragment of spherical stone bead (calcite?) 41033_Sh1: perforated shell bead	1969-1972 1966 1952-1968	Sketch 21 Fig. 28

### Complex compartmented structure

Dominates from top of the hill, traces of an access ramp consisting of a stone scree on the hill slope and a step cut into the rock at the top

Series of square structures (2 to 3 m per side) built with some white stones, along SE edge of the escarpment, with flat areas in the centre, and some stonework visible

*AZ 45\_b*  
(= *Khr 22*)  
*loc. 41034*

Presence of a circular cairn of undetermined nature (Ø: 3 m; h: 40 cm)

To the north of the rocky spur there is a large pile of stones with depressions that indicate the presence of something which, from a surface examination, is difficult to distinguish

To the west, a rectangular tomb defined by large stone blocks, perhaps robbed, oriented E/W

1973-1974  
1975-1991  
- 14 sherds (Nabataean or Roman period?)  
1997-1999  
1992-1996  
2000-2007

Sketch 21  
Fig. 27

*AZ 46\_a*

**Cairn of undetermined nature** (Ø: 8 m; h: 1 m)

2009-2011

*AZ 46\_b*

**Cairn of undetermined nature** (Ø: 6 m; h: 30 cm)

2012-2013

*AZ 46\_c*

**Cairn of undetermined nature** (Ø: 4 m; h: 50 cm)

2014-2019

Presence of an elongated mound oriented eastwards

*AZ 46\_d*

**Cairn of undetermined nature** (Ø: 5 m; h: 50 cm)

2020-2021

*AZ 46\_e*

**Structure of undetermined nature**, circular (Ø: 2 m; h: 30 cm)

2022-2029

*AZ 46\_f*

**Structure of undetermined nature**, circular (Ø: 3 m; h: 40 cm)

*AZ 46\_g*

**Structure of undetermined nature**, circular (Ø: 2 m; h: 30 cm)

*AZ 46\_h*

**Structure of undetermined nature**, circular (Ø: 2 m; h: 30 cm)

*AZ 47\_a*

**Cairn of undetermined nature** (Ø: 6 m; h: 30 cm)

2030-2032

Sketch 17

*AZ 48\_a*

**Circular tower tomb** (Ø tower: 4 m; h: 40 cm), levelled

2069-2077

*AZ 48\_b*

**Wall with rectangular, internal, faced compartments** (L: 11 m; w: 1.20 m; h: 30 cm)

- 29 sherds, including several red to dark red coarse wares. 1 sherd with decoration of incised dots

*loc. 41047*

Orientation N/S. The outer face of the wall and the inner face of the compartments is visible in places; three compartments identified

- 41047\_B1: human bones, including skull fragments and a tooth

2078-2089

Sketch 14

- 41047\_Sh1: one undetermined shell fragment

*AZ 49\_a*

**Cairn of undetermined nature** (Ø: 4 m; h: 30 cm)

2096-2097

*AZ 49\_b*

**Cairn of undetermined nature** (Ø: 5 m; h: 40 cm)

- 41046\_B1: several fragments of human bones, including skull, radius and vertebrae

2098-2102

*loc. 41046*

*AZ 49\_c*

**Cairn of undetermined nature** (Ø: 4 m; h: 30 cm)

2103-2104

*AZ 49\_d*

**Circular tower tomb** (Ø tower: 5 m; h: 20 cm), completely flattened

- 5 different sherds

- 41044\_Sh1: a group of four fragments of conical shell

2105-2113

*loc. 41044*

<i>AZ 49_e</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 30 cm)		2114-2116	
<i>B 07_a (= QS15)</i> <i>loc. 41042</i>	<b>Structure of undetermined nature</b> (Ø: 10 m; h: 30 to 40 cm)	- 34 varied sherds, 6 of which were bowl fragments with thin walls in a pink fabric and a black slipped surface (Hellenistic?)	2039-2044	
<i>B 08_a (= QS 16)</i>	<b>Wall with rectangular, internal, faced compartments (?)</b> Tenuous traces, concentration of stones elongated N/S, one compartment potentially identified		2090-2092	
<i>B 09_a (= QS17)</i>	<b>Cairn of undetermined nature</b> (Ø: 7 m; h: 60 cm)		2093-2095	
<i>B15_a (= QS 18)</i>	<b>Circular tower tomb</b> (Ø tower: 4. 50 m; h: 40 cm) External stonework of the tower clearly visible on east side, levelled		2045-2052	
<i>B 15_b</i> <i>loc. 41041</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 30 cm)	- 8 sherds of so-called Hellenistic white-beige fabric with thin walls and fine temper	2053-2056	
<i>B 15_c</i> <i>loc. 41043</i>	<b>Rectangular structure</b> (L: 5 m; w: 4 m; h: 30 cm)	- 15 varied sherds of so-called Hellenistic white-beige fabric with thin walls and fine temper	2057-2063	Fig. 23
<i>B 15_d</i> <i>loc. 41045</i>	<b>Cairn of undetermined nature</b> (Ø: 10 m; h: 70 cm)	- 1 sherd from a jug rim of red ware with plant inclusions - 41045_Sh1: 1 fragment of conical shell	2064-2068	
<i>B 17</i> (= QS19)	<b>Rectangular structure</b> (L: 5 m; w: 4 m; h: 30 cm) Defined by very clear stonework in white stones on the north side		2033-2037	Sketch 17 Fig. 24
<i>E 11_a</i> <i>loc. 41026</i>	<b>Rectangular structure</b> (L: 10 m; w: 8 m; h: 60 cm) Unusual situation in the sandy wadi bed, structure largely covered with sand	- 1 sherd of coarse ware with temper of large inclusions of white gravel and a little plant matter. Jar. Polished and mineralized by weathering (pink to red on the outside with a black core)	1537 1568-1583 1589-1590	Sketch 19 Fig. 25
<i>E 12_a</i>	<b>Cairn of undetermined nature</b> (Ø: 5 m; h: 50 cm)		1521/1522-1524	
<i>E 12_b</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 40 cm)		1525-1530	
<i>E 12_c</i> <i>loc. 41027</i>	<b>Rectangular structure</b> (L: 4 m; w: 1. 70; h: 20 cm) Unusual situation in the sandy wadi bed, structure largely covered with sand	- 13 sherds of coarse ware, temper of large inclusions of white gravel and a little plant matter. Polished and mineralized by weathering. Fabric pink to red, slightly blackened on the outside	1548-1567 1536	Sketch 20 Fig. 26
<i>E 13_a</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)		1531-1532	
<i>E 13_b</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 20 cm)		1533-1535	

<i>E 14_a</i>	<b>Circular tower tomb</b> (Ø: 3 m; h: 40 cm) Destroyed by erosion (robbing?)	283
<i>E 14_b</i>	<b>Circular tower tomb</b> (Ø: 3 m; h: 80 cm) 3 m to the south of E14_a Fairly well-preserved architecture: no outer ring, corbelled superstructure	284-291
<i>E 14_c</i>	<b>Circular tower tomb</b> (Ø: 5 m; h: 60 cm) Perhaps a double burial chamber (?) Destroyed	292-296
<i>E 15_a</i> <i>loc. 41025</i>	<b>Cairn of undetermined nature</b> (Ø: 3. 50 m; h: 20 cm) Unusual situation in the sandy wadi bed, structure largely covered with sand	1538-1544
		- 11 sherds of coarse ware (pink to red on the outside and black inside), temper contains large inclusions of white gravel and a little plant matter. Polished and mineralized by weathering, these sherds have been exposed for a long time to the elements
<i>E 16_a</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 40 cm) Presence of a low mound of stones abutting the southern part of the cairn (L: 3 m; w: 1. 50 m; h: 20 cm)	1467-1468 1470-1472
<i>E 16_b</i>	<b>Rectangular tomb under a mound of stone</b> (Ø: 3 m; h: 60 cm) Burial chamber visible (L: 2 m; w: 60 cm): corbelled construction very clear, orientation N/S	1473-1480
<i>E 16_c</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)	1481-1482
<i>E 16_d</i>	<b>Rock-cut grave under a mound of stones</b> (Ø: 4 m; h: 50 cm) Mound of stones in an arc against the slope of the hill	1483-1491
<i>E 16_e</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)	1492-1495
<i>E 16_f</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 30 cm)	1496-1498
<i>E 16_g</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm)	1499-1501
<i>E 16_h</i>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 30 cm)	1502-1503
<i>E 16_i</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 6 m; h: 90 cm) Burial chamber visible: orientation E/W, internal stone face, completely open to the south No traces of outer stonework for the tower, but presence of surrounding white stones suggests the existence of an outer ring	1504-1513
<i>E 18_a</i> <i>loc. 41031</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 11 m; h: 70 cm) Unusual situation in the sandy wadi bed, presence of white stones with one characteristically rounded face. The stonework of the outer face of the tower seems identifiable on the south side and an alignment of white stones in an arc marks the location of the other ring Traces of robbing: three depressions in the mound	1733-1750
		- Fragment of container (phial or miniature jar) of very fine pottery: rim with incised decoration

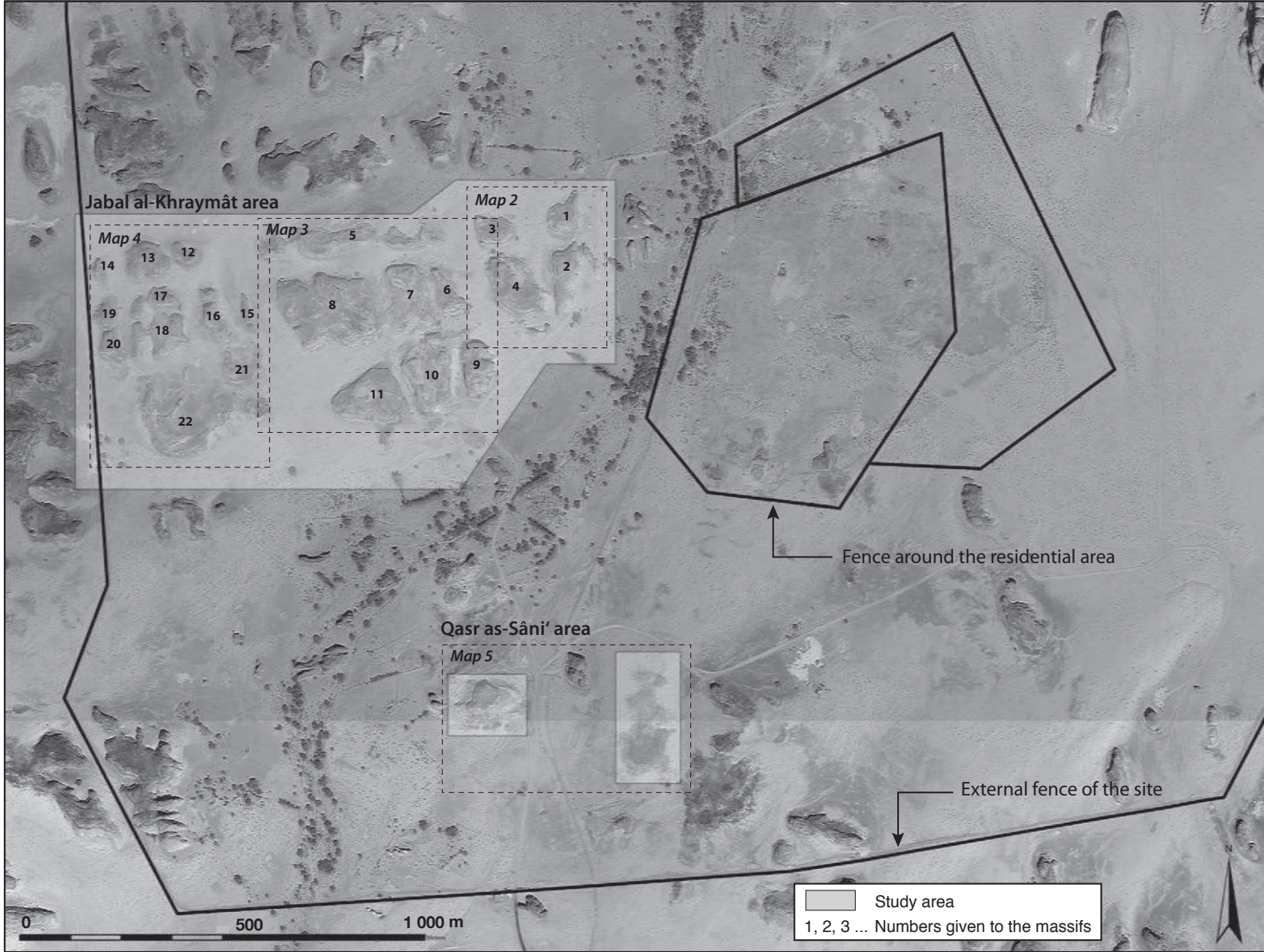
<b>E 18_b</b>	<b>Structure of undetermined nature</b> (L: 7 m; w: 5 m; h: 30 cm) Mound of stones in the sandy wadi bed, similar to G12_b, E11_a and E19	1751-1755	
<b>E 19_a</b>	<b>Structure of undetermined nature</b> (L: 10 m; w: 7 m; h: 30 cm) Mound of stones in the sandy wadi bed, structure mostly covered with sand, presence of stones which suggests the existence of stonework under the mound of sand	1721-1732	
<b>F 07_a</b> <i>loc. 41006</i>	<b>Circular tower tomb</b> (Ø: 4 m; h: 1. 20 m) Large covering slabs collapsed into the central depression Destroyed	297-327	Fig. 36
<b>F 07_b</b>	<b>Structure of undetermined nature</b> Remains of the structure levelled	328-329	
<b>F 07_c</b>	<b>Circular tower tomb</b> (Ø: 5 m; h: 1 m) Well preserved architecture: no outer ring Traces of robbing: central depression	330-341	
<b>F 08_a</b>	<b>Circular tower tomb</b> (Ø: 3 m; h: 80 cm) Bedrock showing all around; architecture and stonework of the construction very well preserved Traces of robbing which clearly reveal the corbelled superstructure (the large slabs were moved to the north during the robbing)	215-251	
<b>F 08_b</b> <i>loc. 41011</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 8 m; h: 1. 40 m) (Ø tower: 4 m) Traces of robbing	252-270	

- 51 sherds, essentially of red to black fabric with very characteristic decoration of small incised dots on applied(?) hemispherical protrusions. Presence of a miniature, perforated vertical lug handle (fig. 36)  
- 41006\_B1: localised concentration of human bones, one assemblage comprising the remains of at least three adult individuals and two children (MNI = 5)  
Adults: fragments of skull (temporal), vertebrae (axis, 2 cervicals, 1 upper vertebra), humerus, hand (hamate, metacarpal), ulna, femur, foot (3 calcaneus, 2 right talus, 1 navicular, 1 cuneiform)  
Children: humerus, hand phalanges (individual aged between 15–20 years), ischium (individual aged between 1–5 years)  
Bones datable by C<sup>14</sup>

F 08_c	<b>Rectangular tomb under a mound of stone (?)</b> (Ø: 5 m; h: 50 cm) Small number of tumbled stones Presence of large slabs indicates a corbelled superstructure Traces of robbing		271-282	
<b>F 09_a</b> <i>loc. 41035</i>	<b>Cairn of undetermined nature</b> (Ø: 6 m; h: 80 cm) Possible corbelled covering slabs on the top of the cairn Traces of robbing: central depression and presence of human bones	- 41035_B1: many human bones, including fragments of femur, skull and calcaneus (MNI: 1 adult)	196-201	
<b>F 09_b</b>	<b>Circular tower tomb</b> , destroyed (Ø: 3 m; h: 30 cm) Evidence of major robbing		202-204	
<b>F 09_c</b>	<b>Circular tower tomb</b> (Ø: 7 m; h: 1. 20 m) (Ø tower: 4 m), identifiable corbelled covering Traces of robbing		205-214	
<b>F 13_a</b>	<b>Structure of undetermined nature</b> , circular (Ø: 60 cm; h: 40 cm)		190-195	
<b>F 13_b</b>	<b>Structure of undetermined nature</b> , circular (Ø: 60 cm; h: 40 cm)			
<b>F 13_c</b>	<b>Structure of undetermined nature</b> , circular (Ø: 60 cm; h: 40 cm)			
<b>F 16_a</b> <i>loc. 41036</i>	<b>Rectangular tomb under a mound of stone</b> (Ø: 6 m; h: 1. 20 m) Traces of robbing, which allowed the method of construction to be observed: elongated burial chamber (L: 2 m; w: 90 cm), covered by long slabs placed on the upright facing of the grave, a mound of smaller stones covers the grave	- 41036_B1: a few human bones including fragments of mandible and femur - 41036_Sh1: fragment of shell	349-371	Sketch 8 Fig. 14
F 16_b	Cairn of undetermined nature Tumbled, fallen away due to the collapse of the edge of the hill		372-374	
<b>F 17_a</b> <i>loc. 41015</i>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 7 m; h: 1. 30 m) Elongated burial chamber (L: 2 m; w: 1 m): orientation N/S, defined by an internal stone face Traces of robbing	- 1 sherd of coarse, red to black fabric	148-159	Sketch 13
<b>F 17_b</b>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 5 m; h: 80 cm) Elongated burial chamber (L: 2 m; w: 1 m): orientation N/S (?) Traces of robbing		160-168	Sketch 13 Fig. 5
<b>F 17_c</b>	<b>Wall with rectangular, internal, faced compartments</b> (L: 8 m; w: 2 m) Presence of two compartments (L: 2 m; w: 1 m)		169-177	Sketch 13
<b>F 17_d</b>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 8 m; h: 1 m) Traces of robbing: circular central depression		178-187	Sketch 13
F 17_e	<b>Structure of undetermined nature</b> , circular (Ø: 3 m; h: 20 cm) (non-funerary structure?)		188-189	Sketch 13
<b>F 18_a</b>	<b>Circular tower tomb with outer ring of white stones</b> (Ø: 8 m; h: 1. 20 m) Internal stonework of the tower visible in the north-west Burial chamber visible: elongated shape (L: 2 m; w: 90 cm), defined by a stone facing Traces of robbing and presence of bones (humans?) scattered on the cairn		25-46	

<b>F 19_a</b> <i>loc. 41004</i>	<b>Circular tower tomb with outer ring of white stones (?)</b> (Ø: 7 m; h: 1. 20 m) Traces of robbing (central depression) and presence of bones (humans?) nearby	- 91 sherds, mostly from the same vessel of red to black ware (on the outside) decorated with a double row of incised dots (fig. 35) - 41004_Sh1: three shell fragments	80-82 gen. view 51-55	Sketch 12 Fig. 35
<b>F 19_b</b>	<b>Wall with rectangular, internal, faced compartments</b> (L: 10 m; w: 1. 5 m) At least three compartments identifiable		56-64	Sketch 12
<b>F 19_c</b>	<b>Circular tower tomb (?)</b> (Ø: 4 m; h: 60 cm) 2 m south of F 19_b Traces of robbing		65-70	Sketch 12
<b>F 19_d</b>	Burial chamber visible: rectangular shape (L: 1 m; w: 90 cm), orientation NE/SW, perfectly aligned with F 19_b <b>Wall with rectangular, internal, faced compartments (?)</b> (L: 4 m; w: 1 m) Abutting cairn F 19_c, following the general orientation and aligned with F 19_b North-west external wall face very clear		71-76	Sketch 12 Fig. 22
<b>F 19_e</b>	<b>Cairn of undetermined nature</b> (Ø: 2 m; h: 40 cm) Abutting the southern tip of wall F 19_d		77-79	Sketch 12
<b>F 20_a</b>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 90 cm) No visible stonework Traces of robbing and disturbances		115-125	
<b>F 21_a</b> <i>loc. 41049</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 60 cm) Against hill slope, no visible stonework Traces of robbing: central depression and presence of human bones	- 41049_B1: two small human bones, one being the capitata bone of the hand (?)	126-142	
<b>F 22_a</b>	<b>Circular tower tomb</b> (Ø: 7 m; h: 1. 40 m) Stonework of the tower still standing for 8 or 9 courses on the north side (Ø tower: 4 m) Elongated burial chamber: orientation W-NW/E-SE, defined by a facing of seven courses Traces of robbing		83-95	
<b>F 22_b</b>	<b>Circular tower tomb</b> (Ø: 8 m; h: 1; 30 m) Stonework of the tower visible on west side Traces of robbing: large central depression		96-104	
<b>F 23_a</b> (E9-05)	<b>Rock-cut grave under a mound of stones</b> Mound of stones abutting the foot of a hill slope that has natural undercut cavities Traces of robbing: very disorganized structure		143-147	Fig. 16
<b>G 03_a</b>	<b>Structure of undetermined nature</b> , circular Small, circular pile of stones (Ø: 2 m; h: 30 cm) Traces of robbing (central depression) and disturbances		105-108	

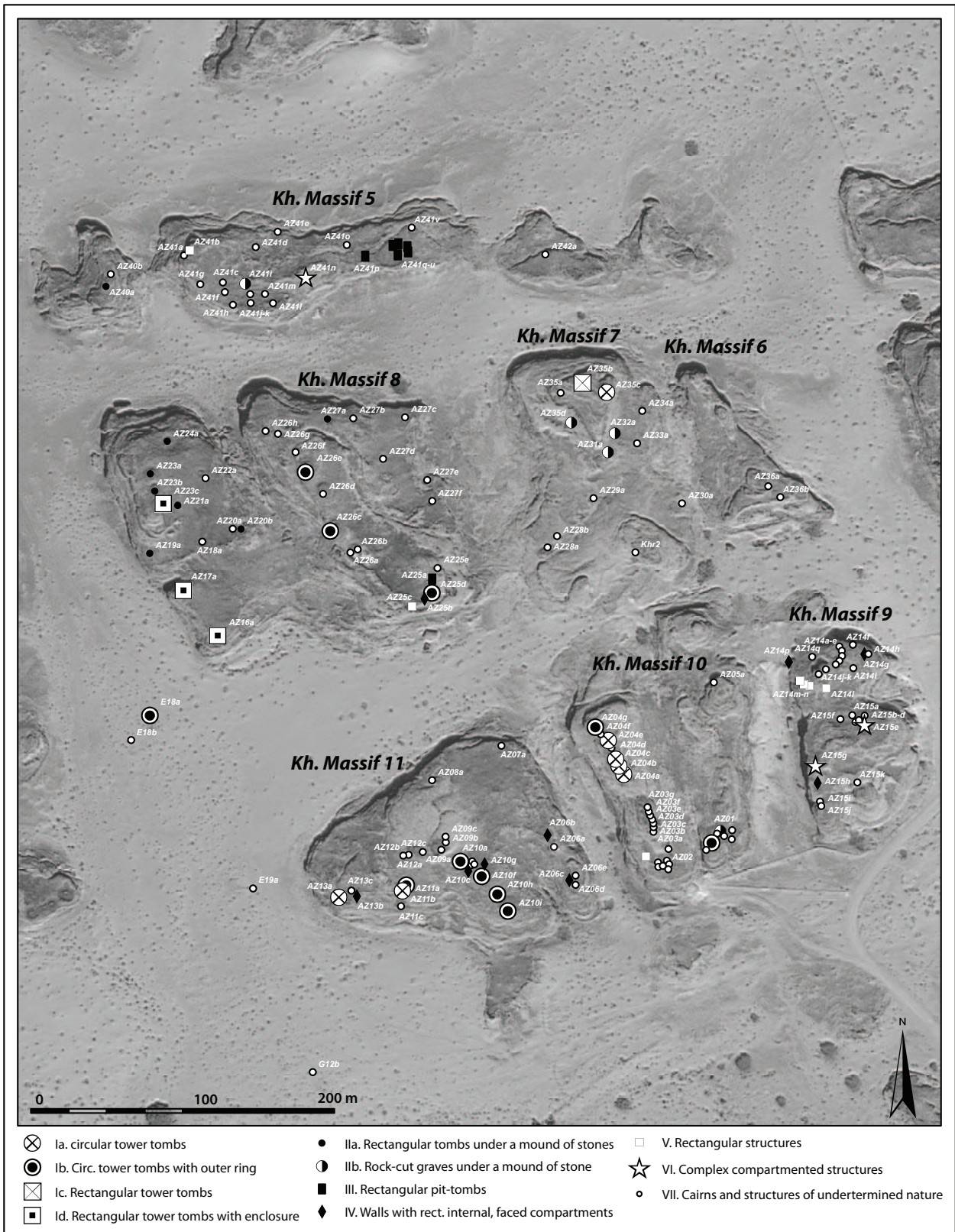
<i>G 03_b</i> <i>loc. 41039</i>	<b>Cairn of undetermined nature</b> (Ø: 3 m; h: 50 cm) No identifiable stonework Traces of robbing: central depression and scattered presence of human bones	- 41039_B1: very small number of undetermined bones	109-114	
<i>G 12_a</i> <i>loc. 41030</i>	<b>Structure of undetermined nature</b> (Ø: 4 m) Concentration of finds in the sandy wadi bed, mound of sand with many sherds on the surface	- 61 sherds attributed to the Nabataean and Roman period, of various forms. Many rims. One sherd of sigilata with partial impressed design	1698-1706	
<i>G 12_b</i> <i>loc. 41028</i>	<b>Structure of undetermined nature</b> (L: 10 m; w: 8 m; h: 40 cm) In the sandy wadi bed, presence of a feature in the centre of the mound in which it is possible to identify a stretch of stonework in an arc	- 1 sherd, coarse temper, pink on the outside with black core, plant inclusions	1708-1720	
<i>HZ 01_a</i>	<b>Circular tower tomb</b> Intact construction on the east side: no stones on the ground surface, outer face of tower preserved to its full height (h: 1,60 m), slight thinning in the construction of the outer face, so that the diameter of the tower is smaller at its top than at its base (Ø tower base: 3. 35 m; Ø tower top: 2. 85 m) Burial chamber open to the west (L: unknown; w: 90 cm): orientation E/W, internal face is exposed, corbelled construction with a cap stone at the top, height below the cap stone: 90 cm		1636-1674	Sketch 3 Figs 2-3
<i>HZ 01_b</i>	<b>Circular tower tomb</b> Intact construction on the east side (Ø tower base: 2. 45 m; Ø tower top: 1. 95 m; h: 1. 30 m) Burial chamber open to the west (L: unknown; w: 80 cm): orientation E/W		1675-1695	Fig. 4
<i>Khr 02_a</i>	<b>Cairn of undetermined nature</b> (Ø: 4 m; h: 50 cm) Burial chamber visible: orientation E/W, defined by stonework of large blocks and, in the eastern part, by a natural step in the hillside; covering of large, displaced, stone slabs		1242-1245	



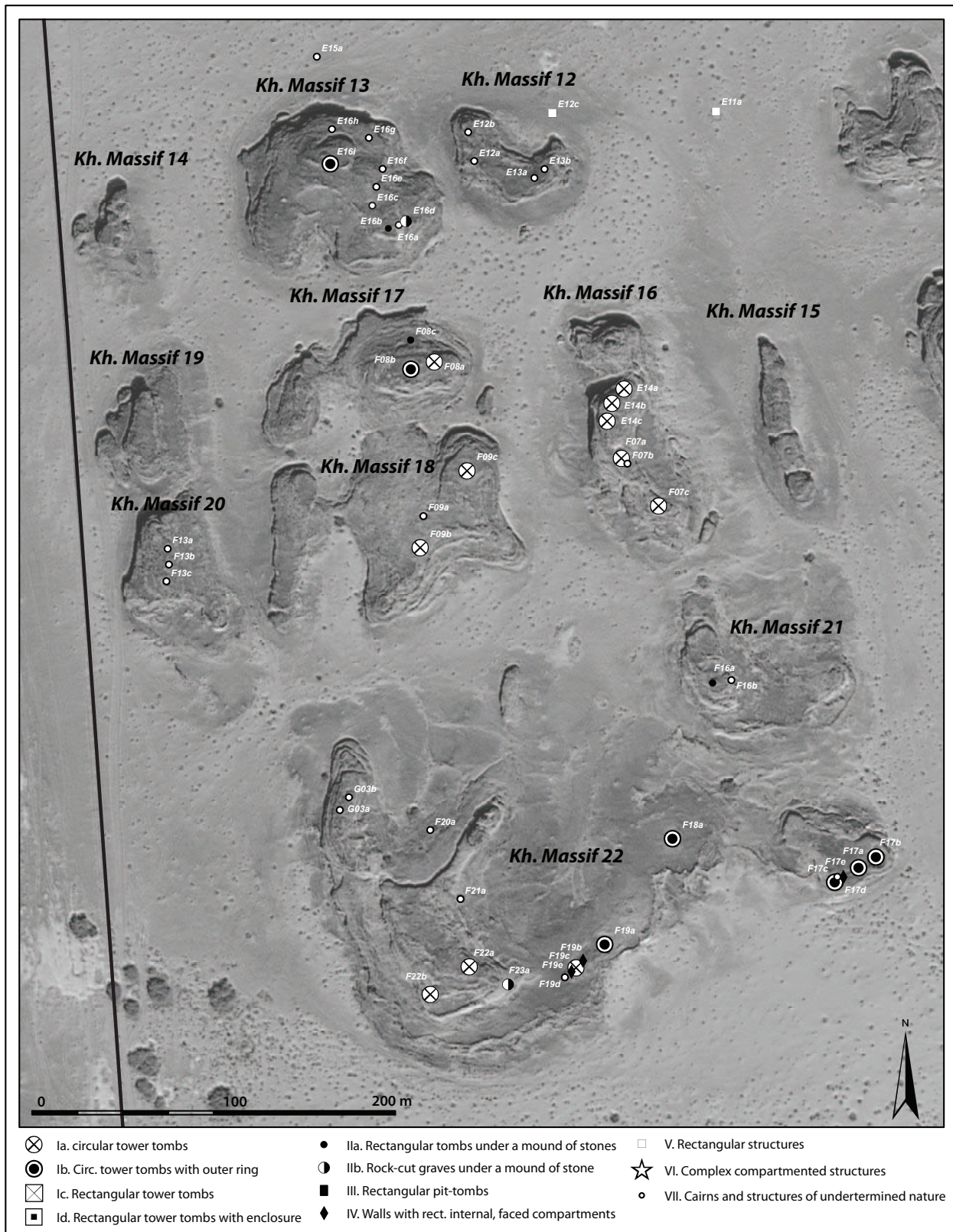
Map 1



Map 2



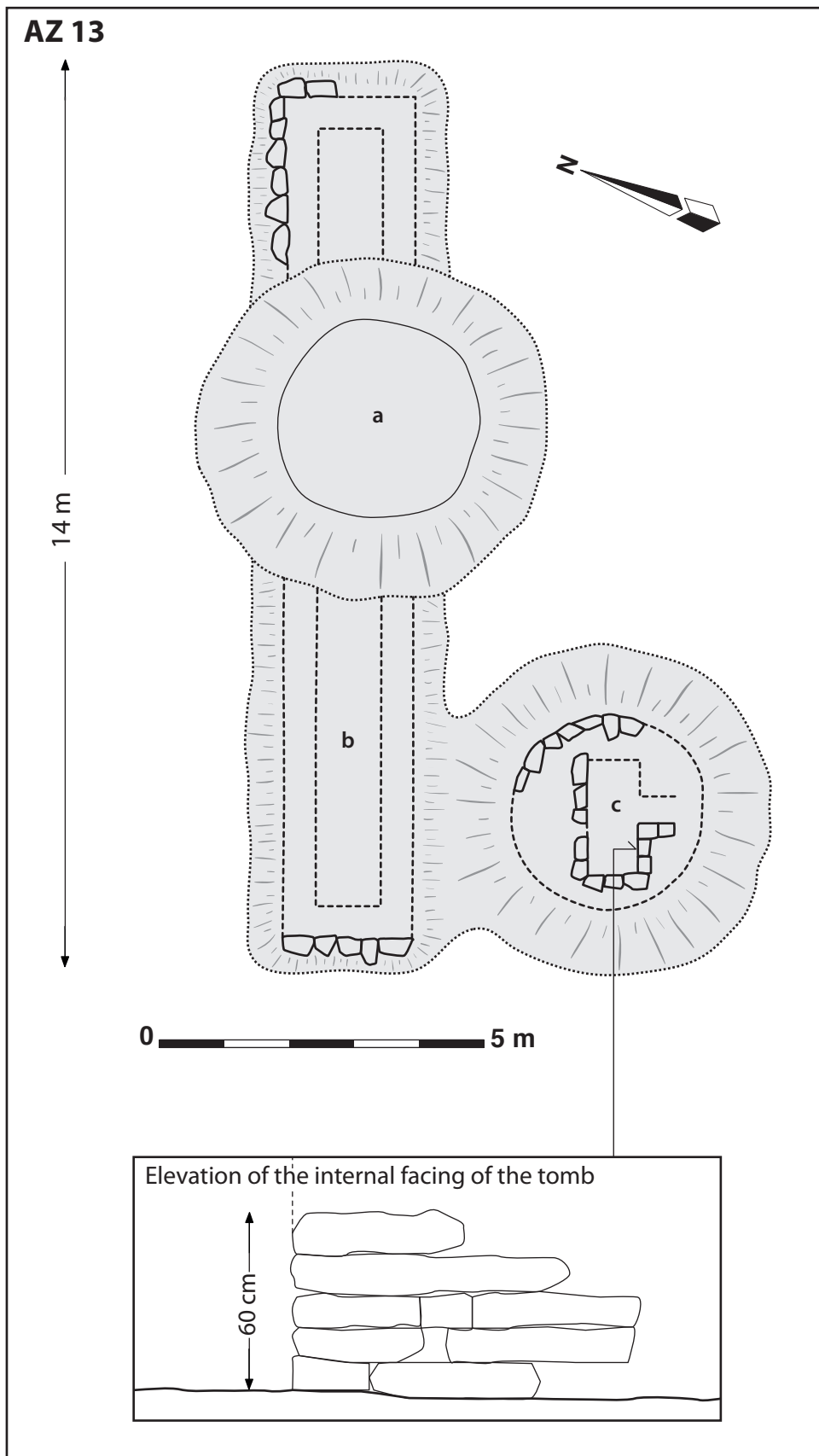
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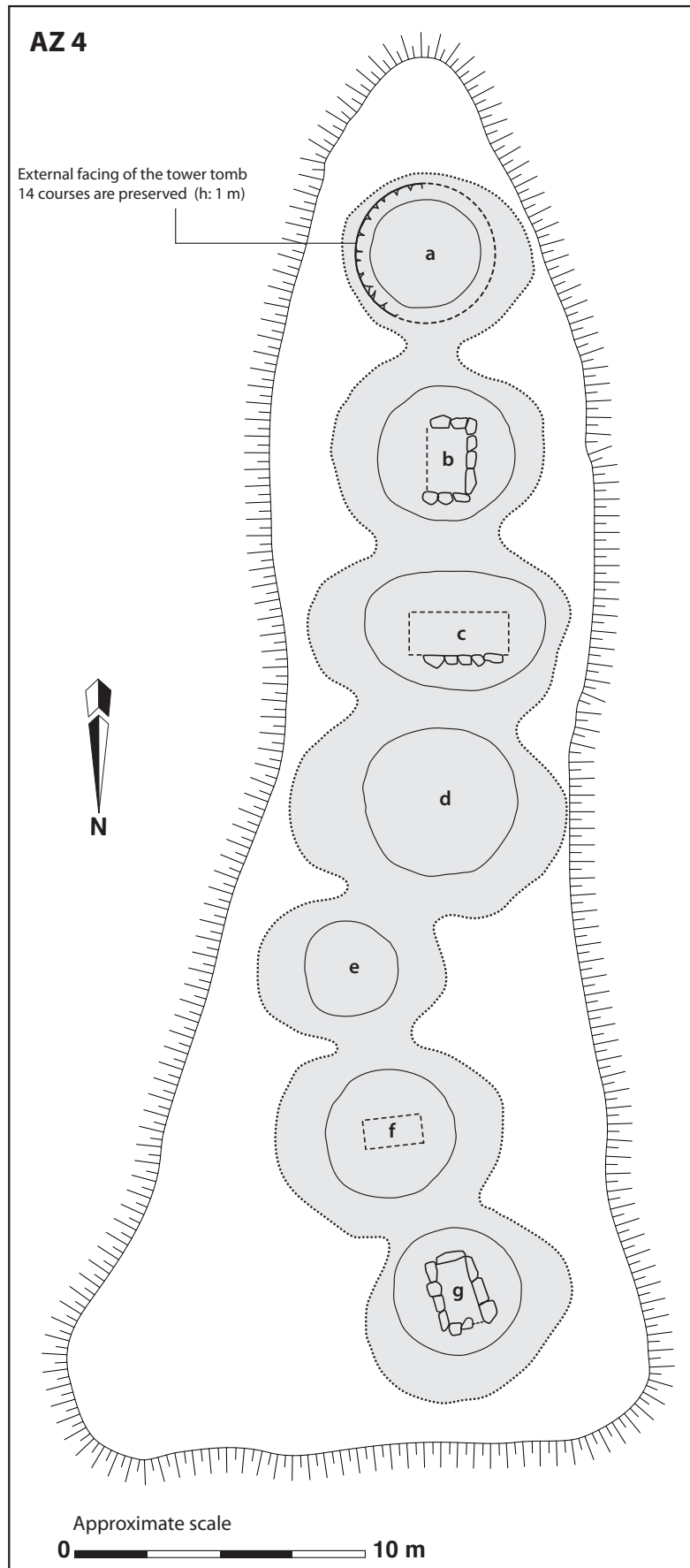
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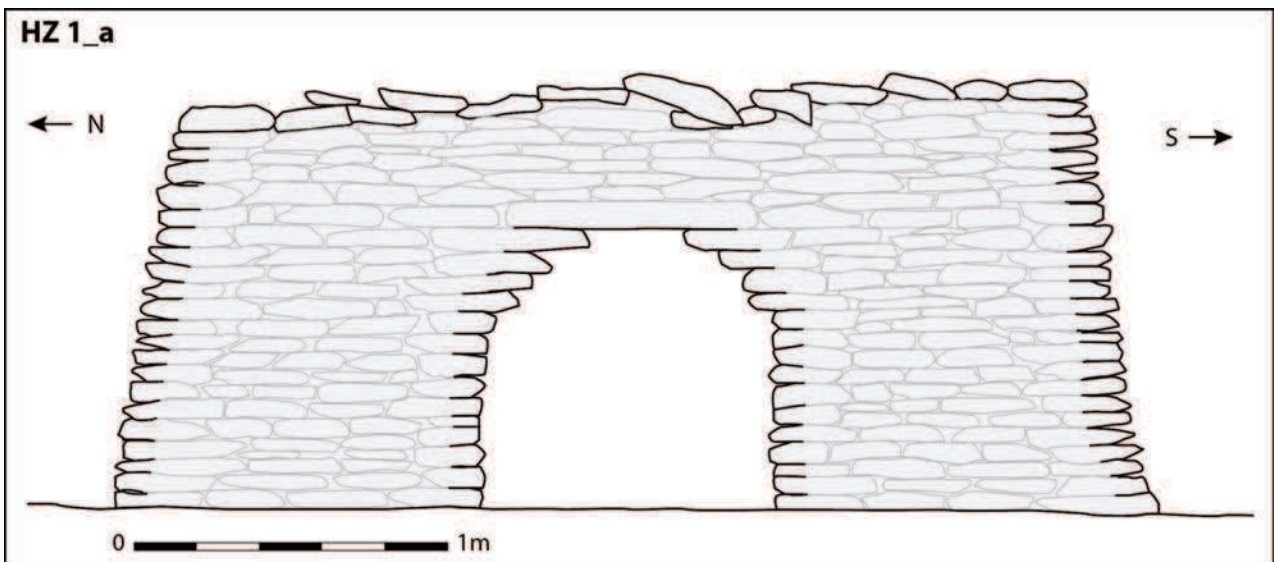
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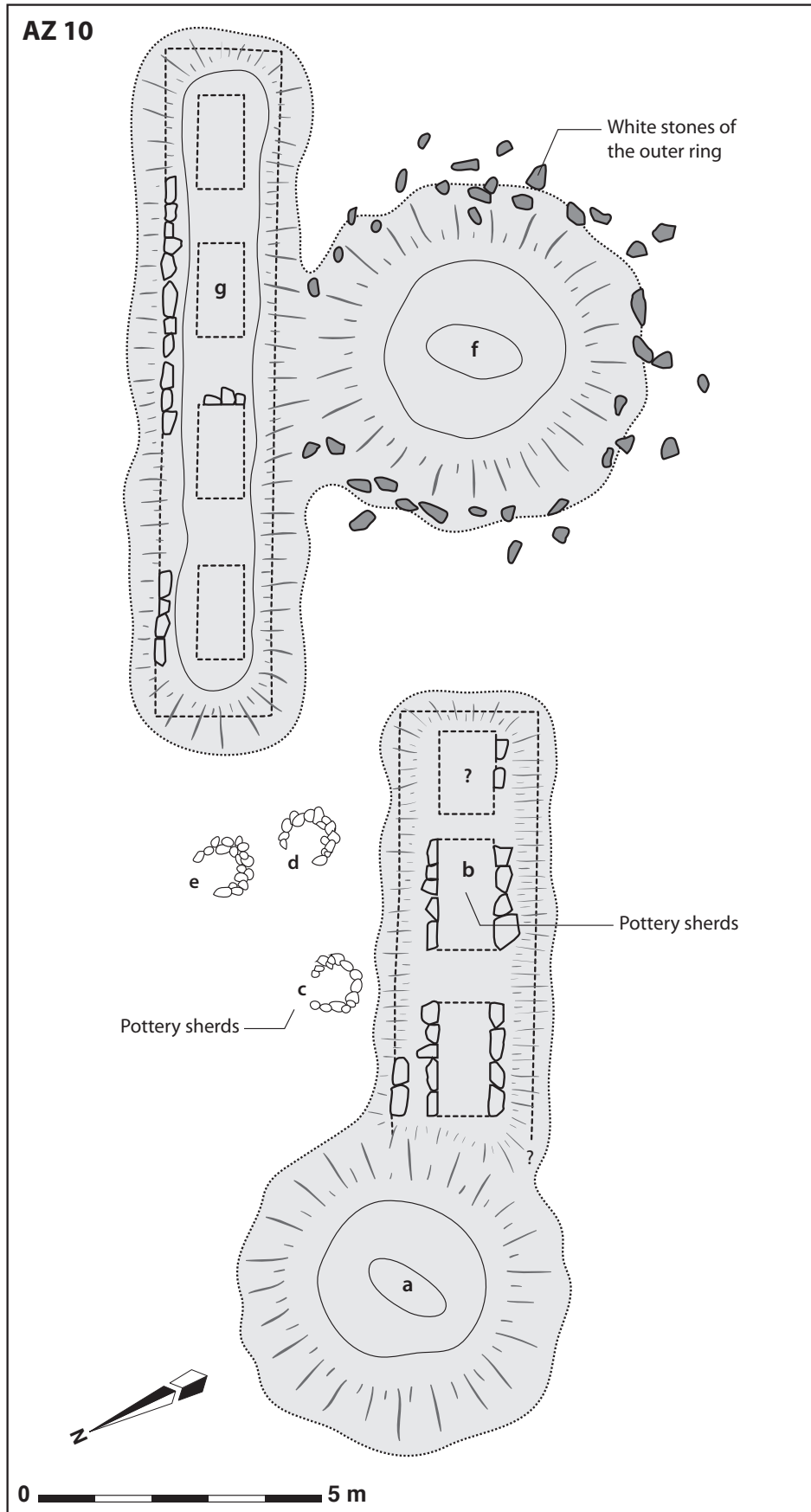
Sketch 1



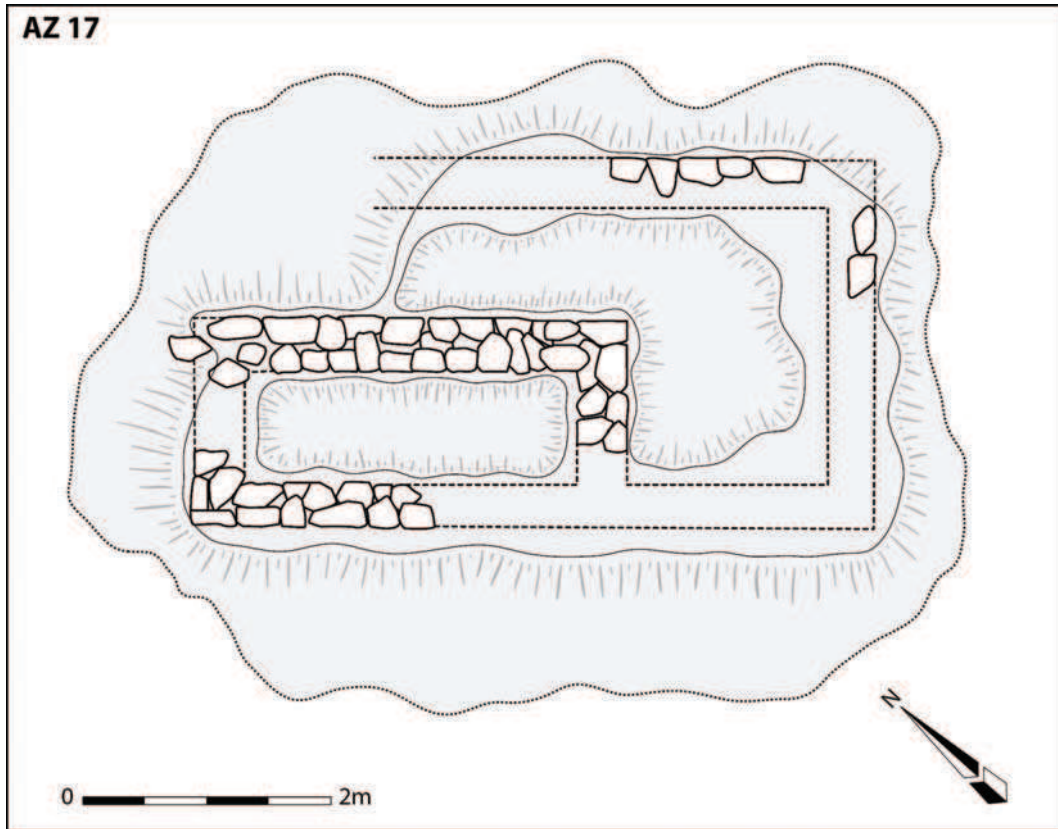
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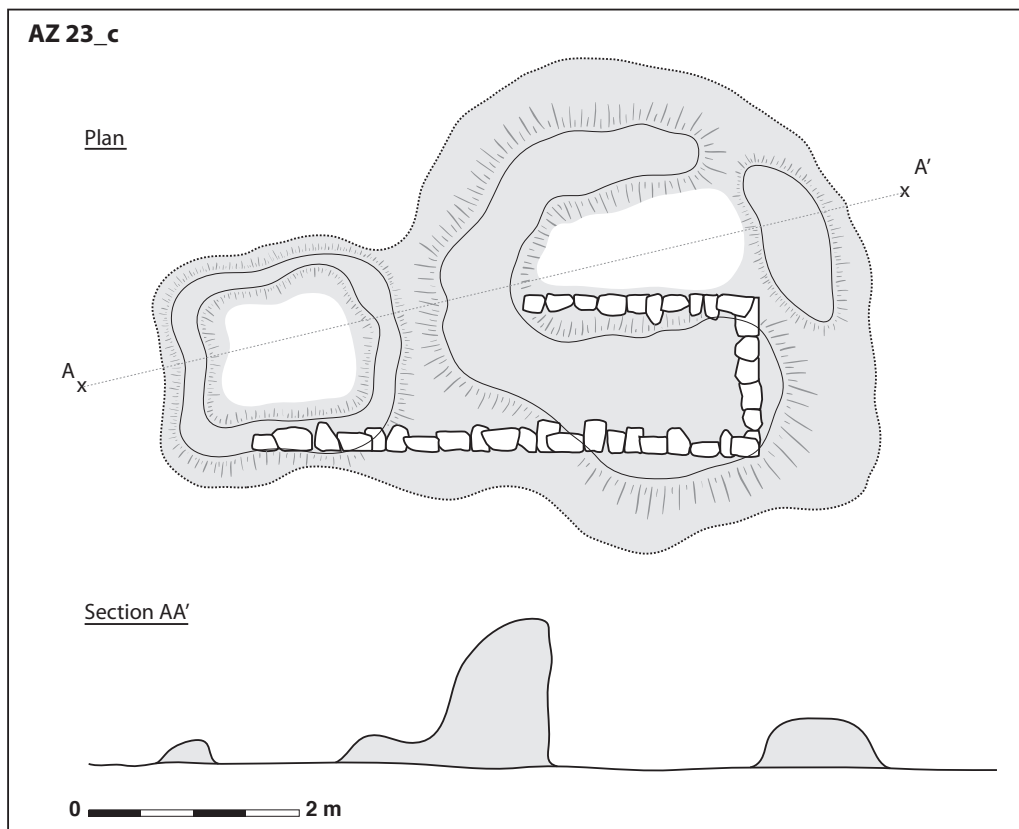
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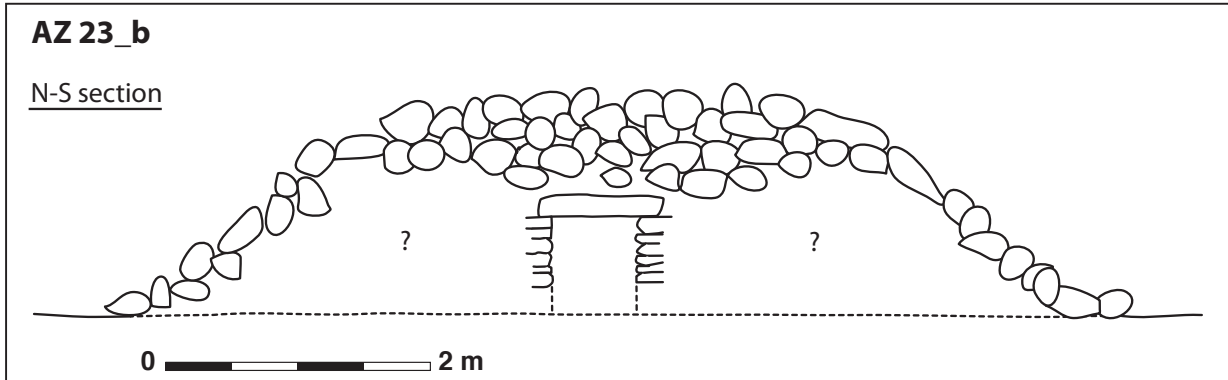
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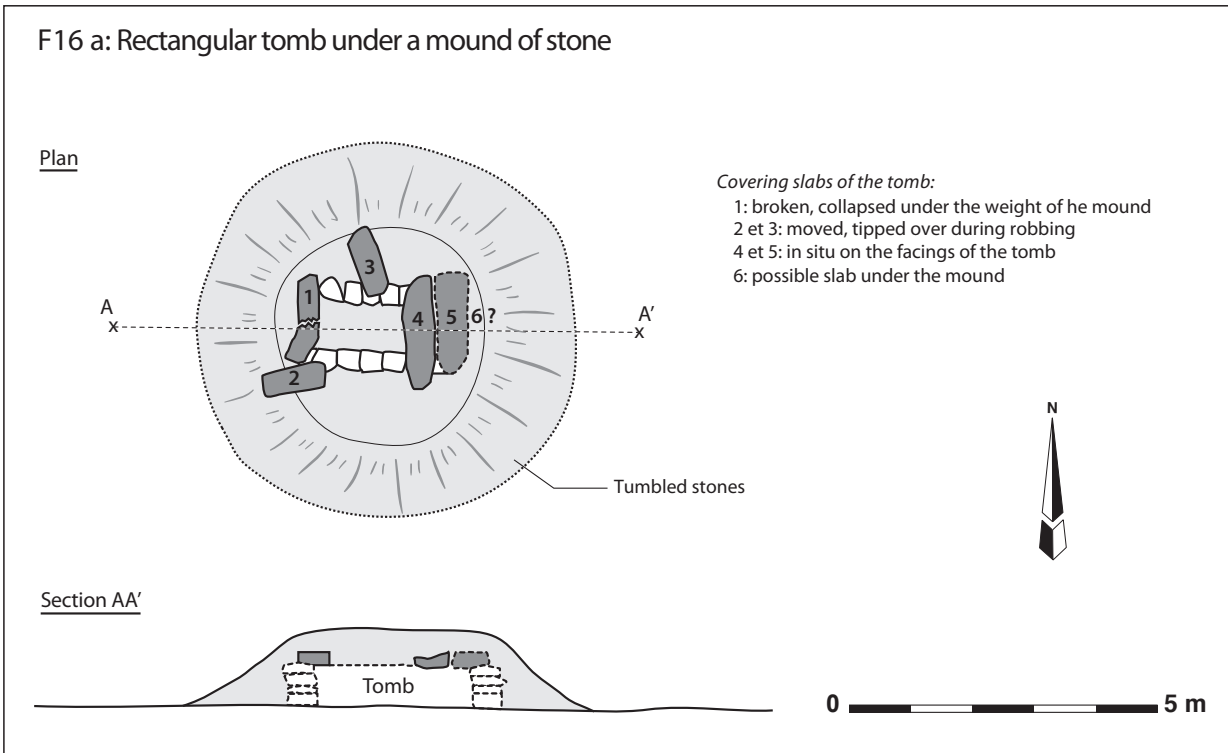
**SKetch 5**



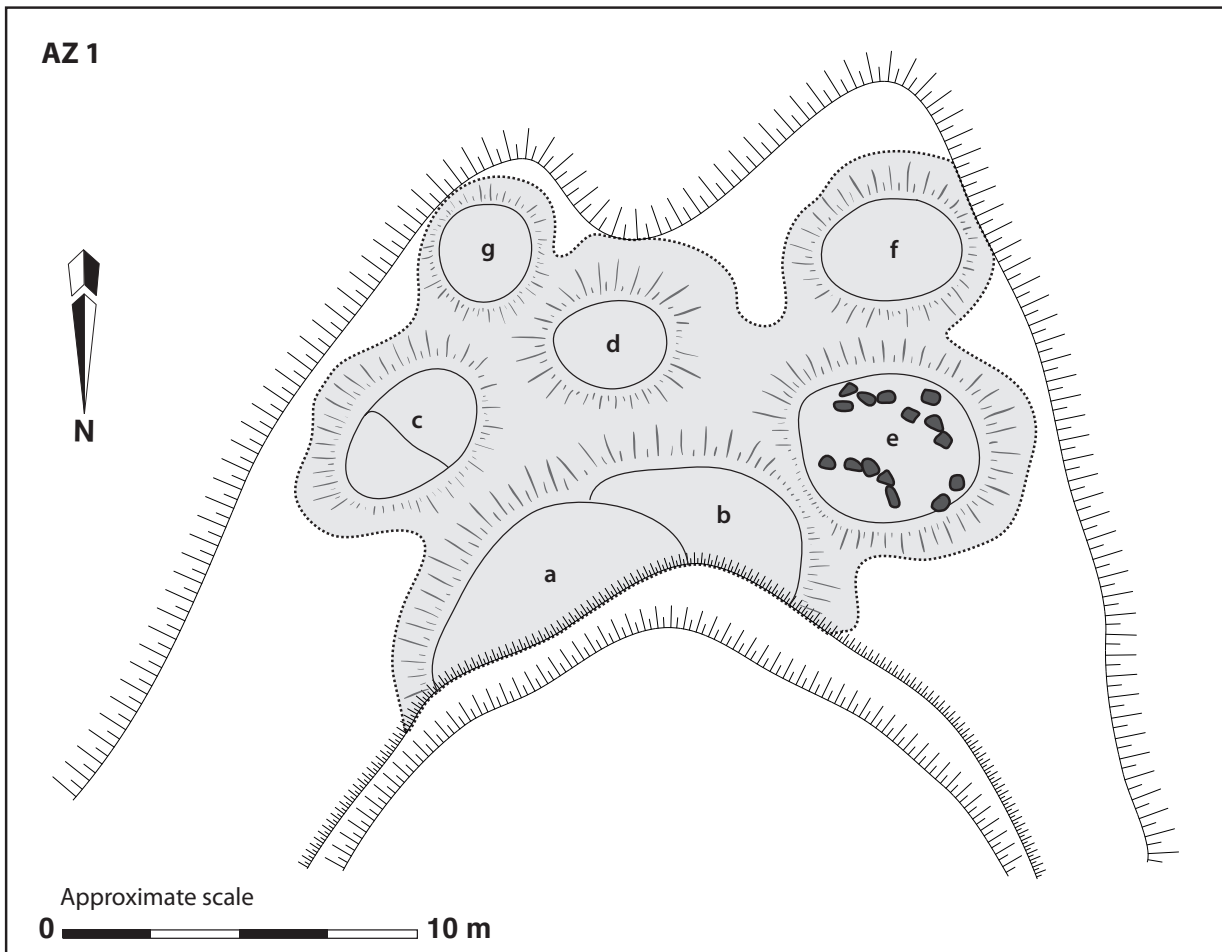
**Sketch 6**



**Sketch 7**

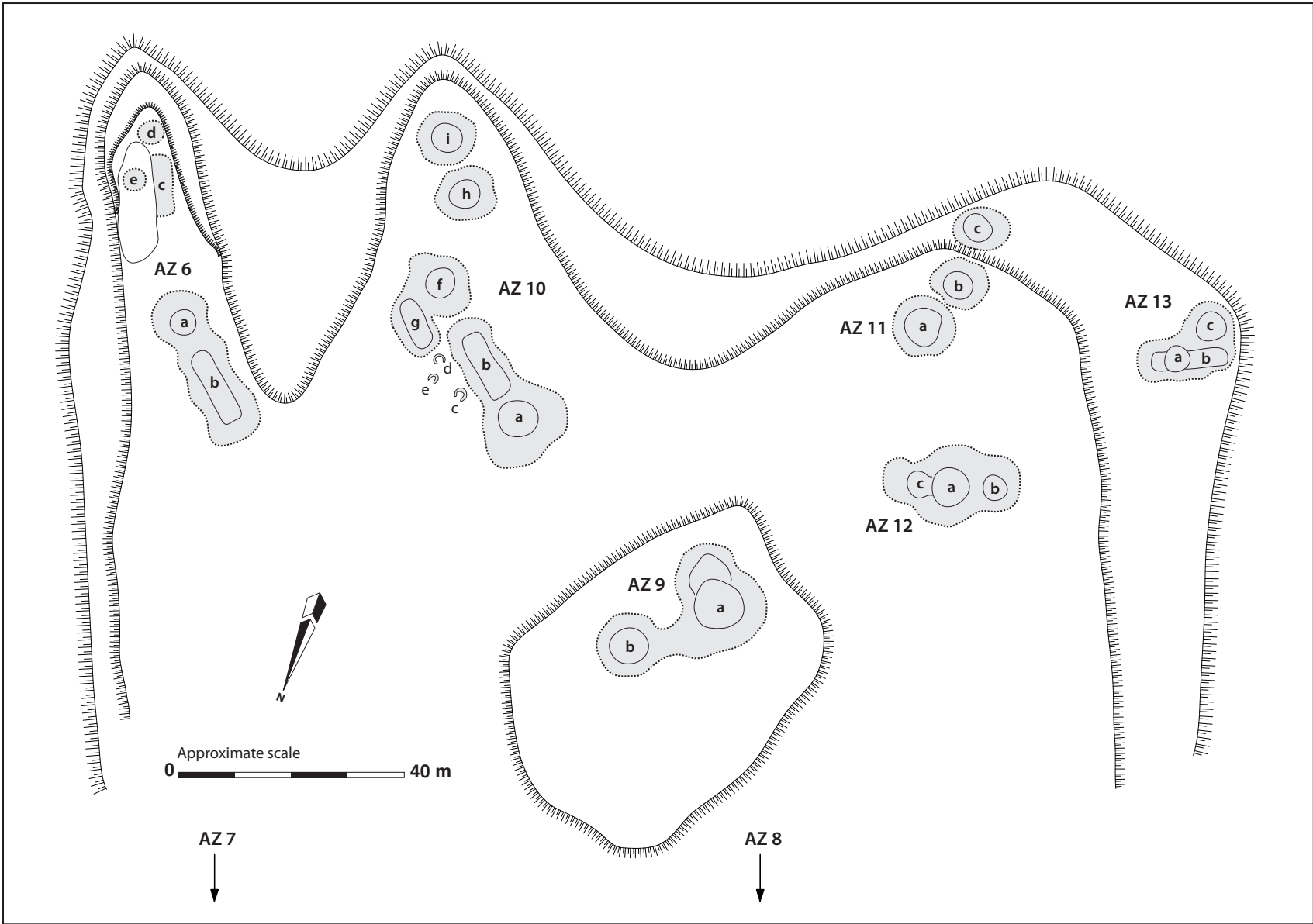


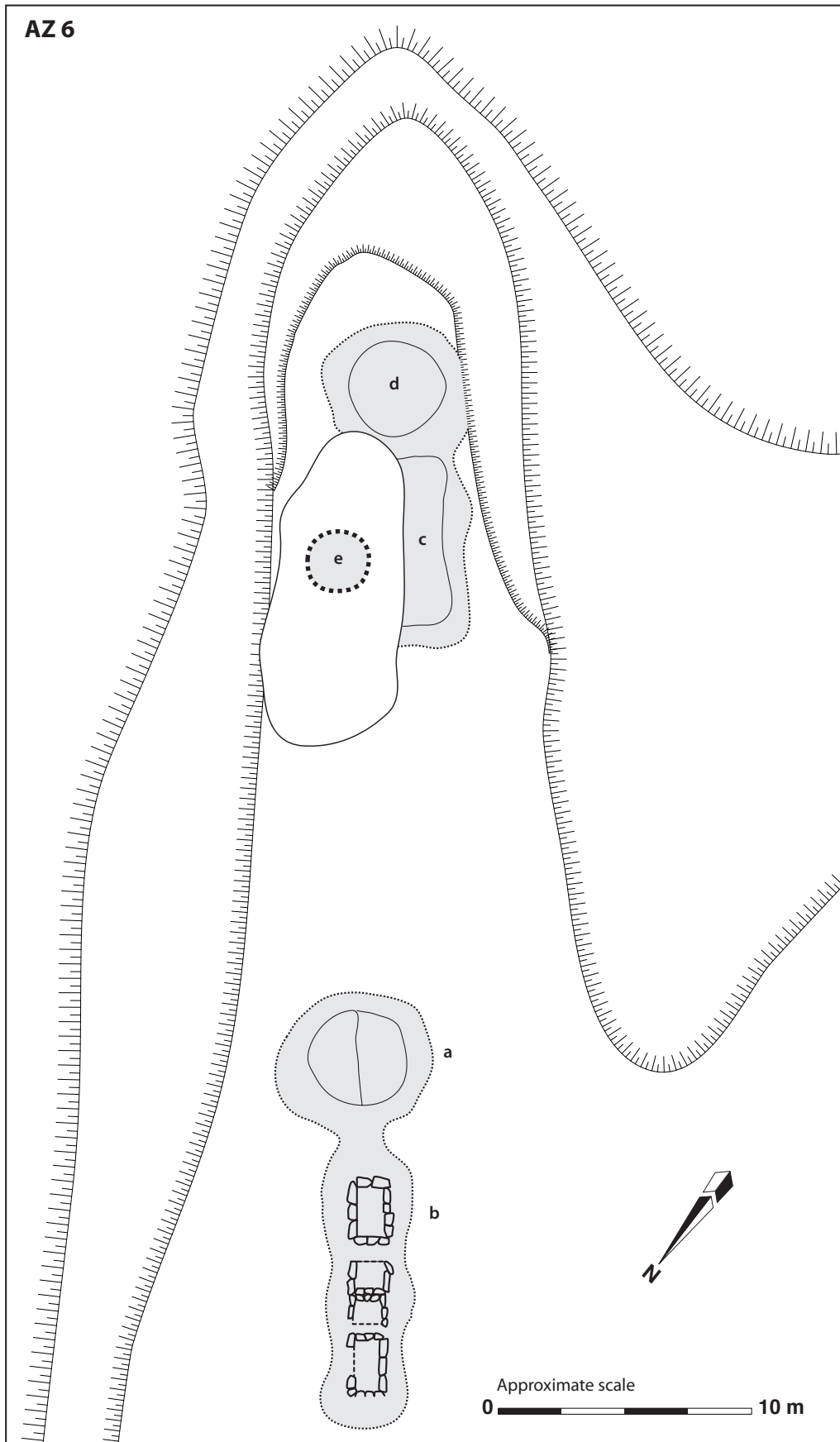
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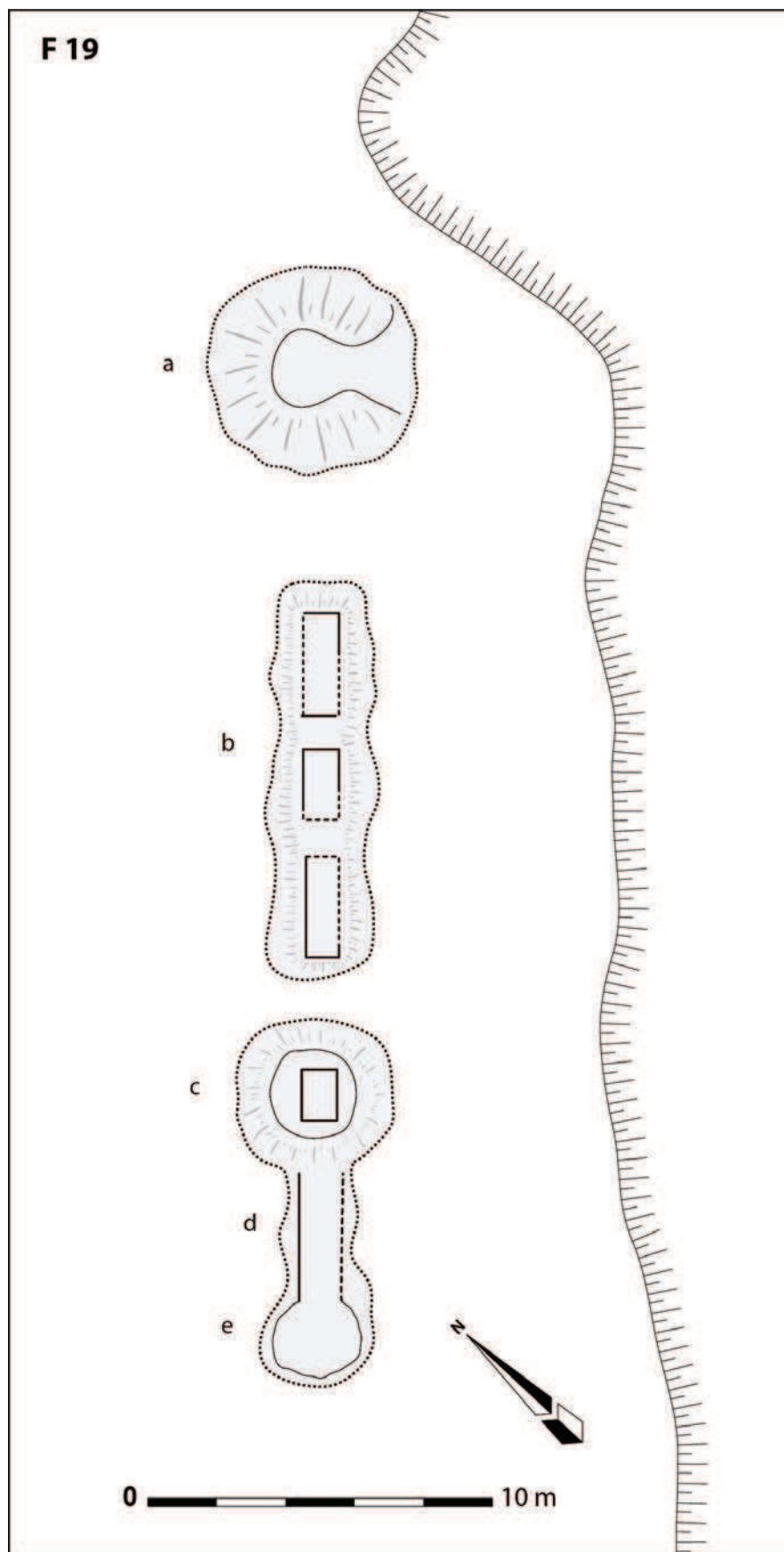
Sketch 9

Sketch 10

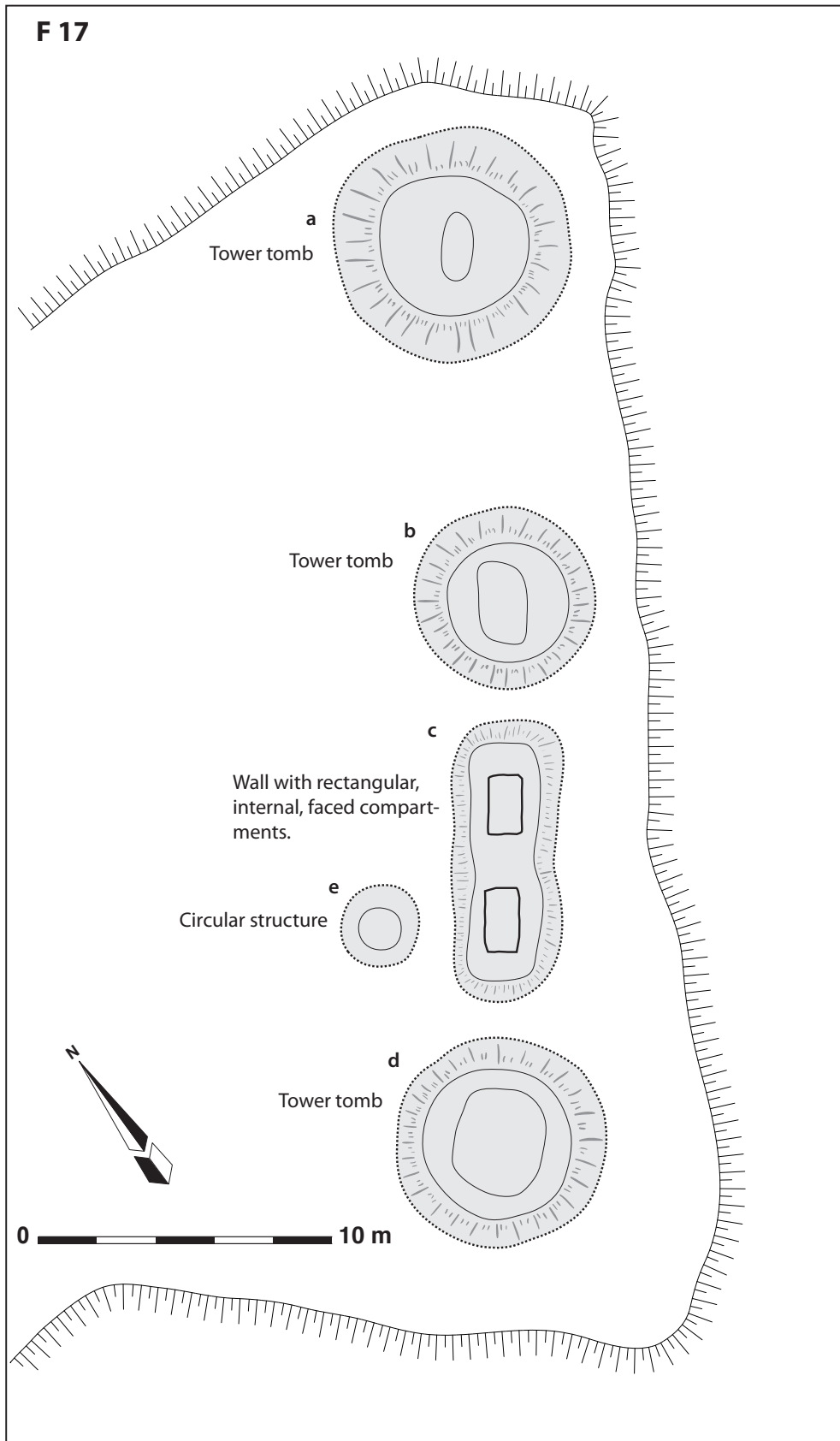




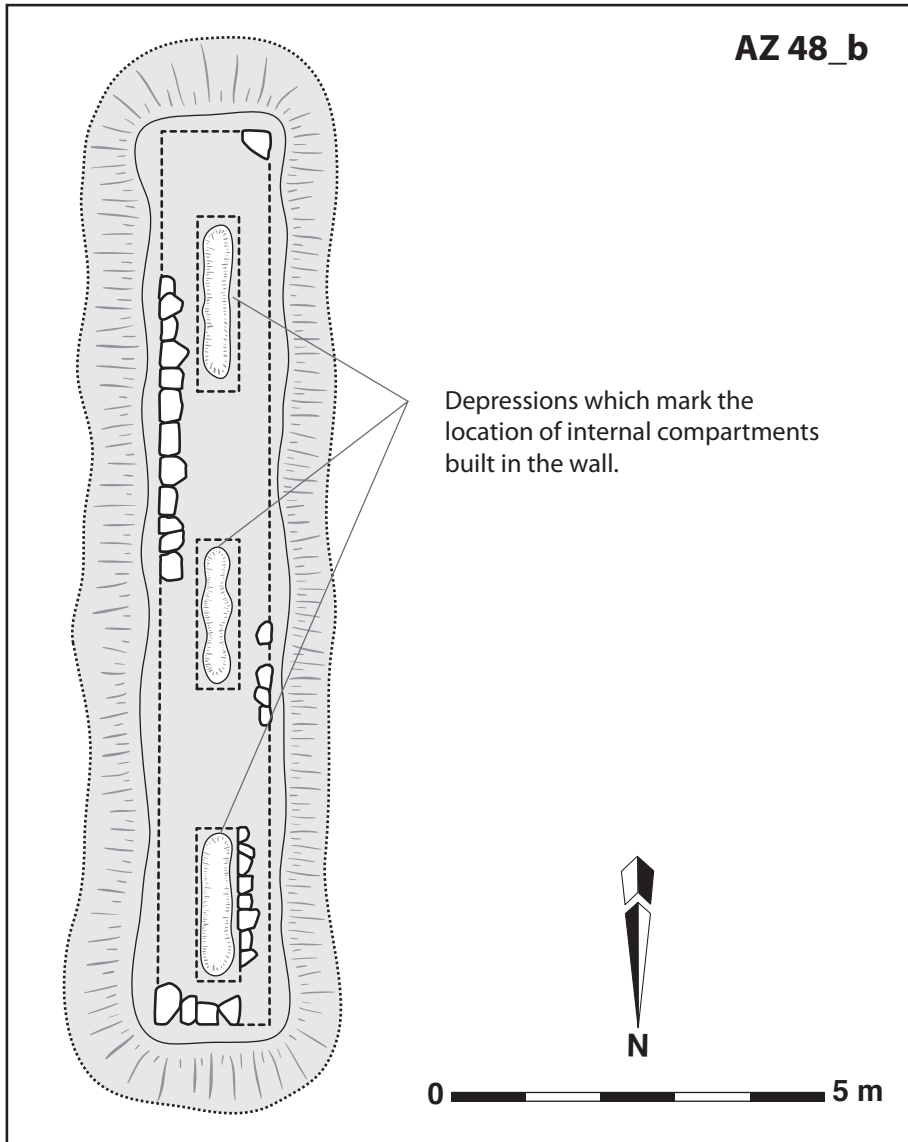
**Sketch 11**



Sketch 12

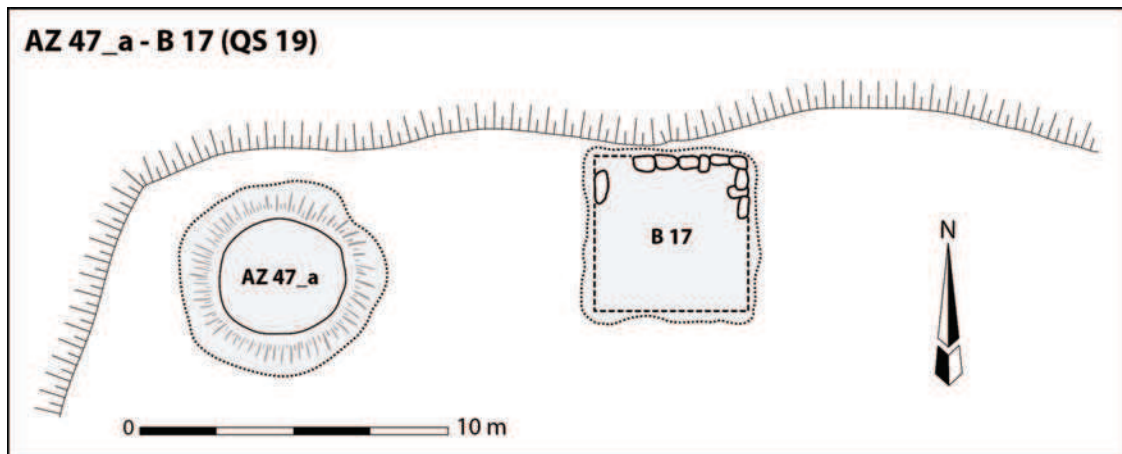


**Sketch 13**

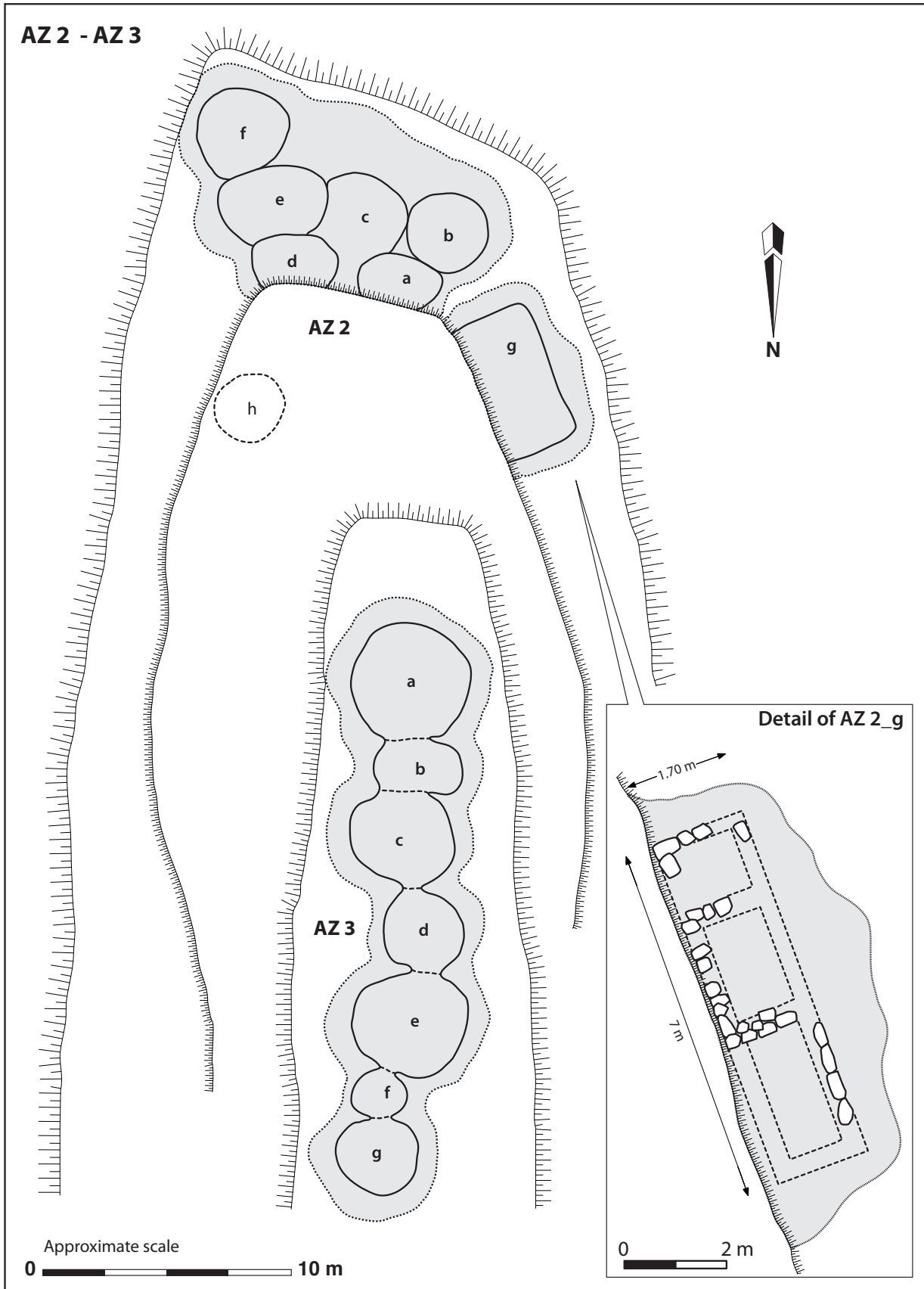


Sketch 14

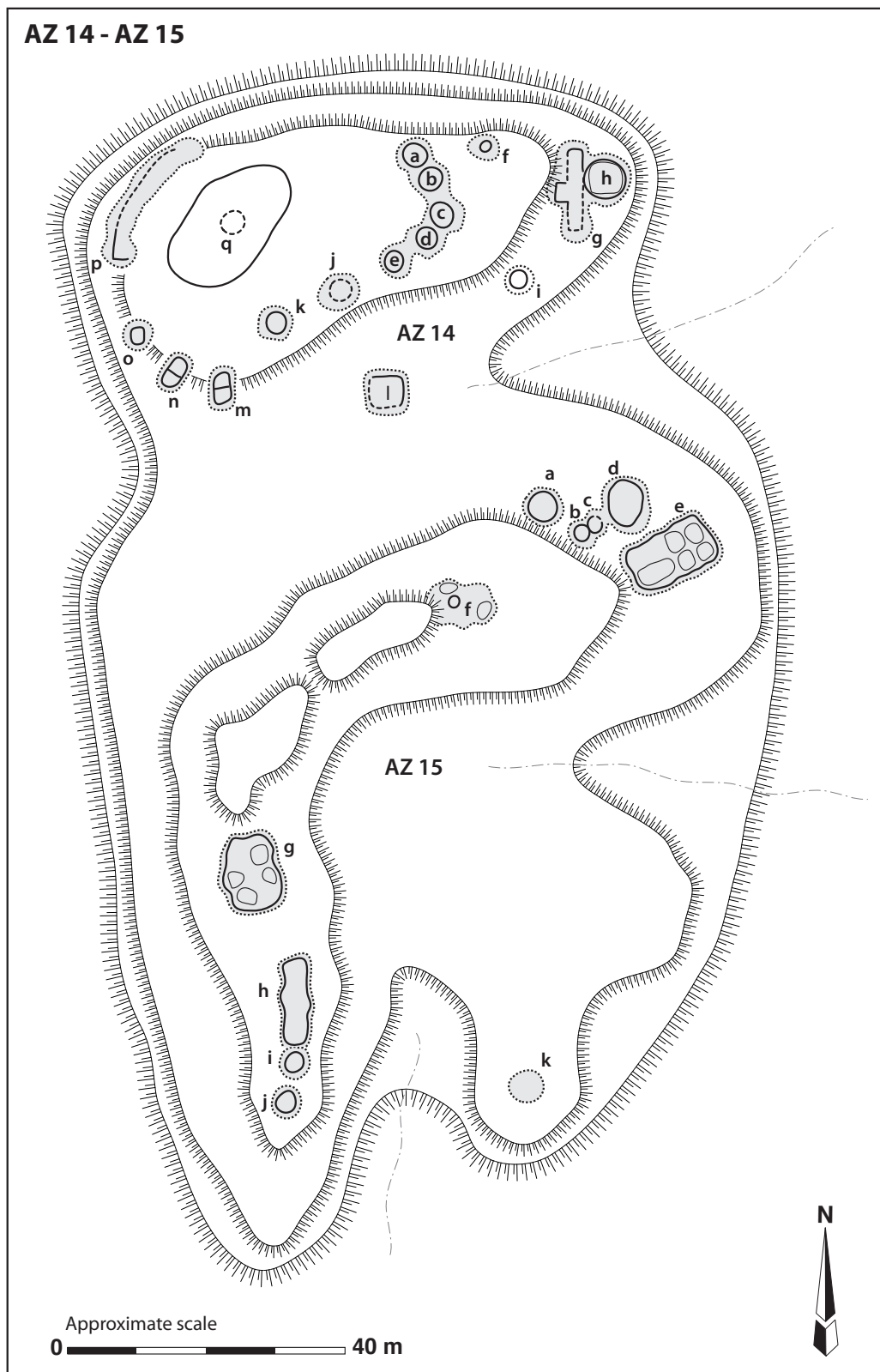
Sketches 15 and 16 see following two pages



Sketch 17

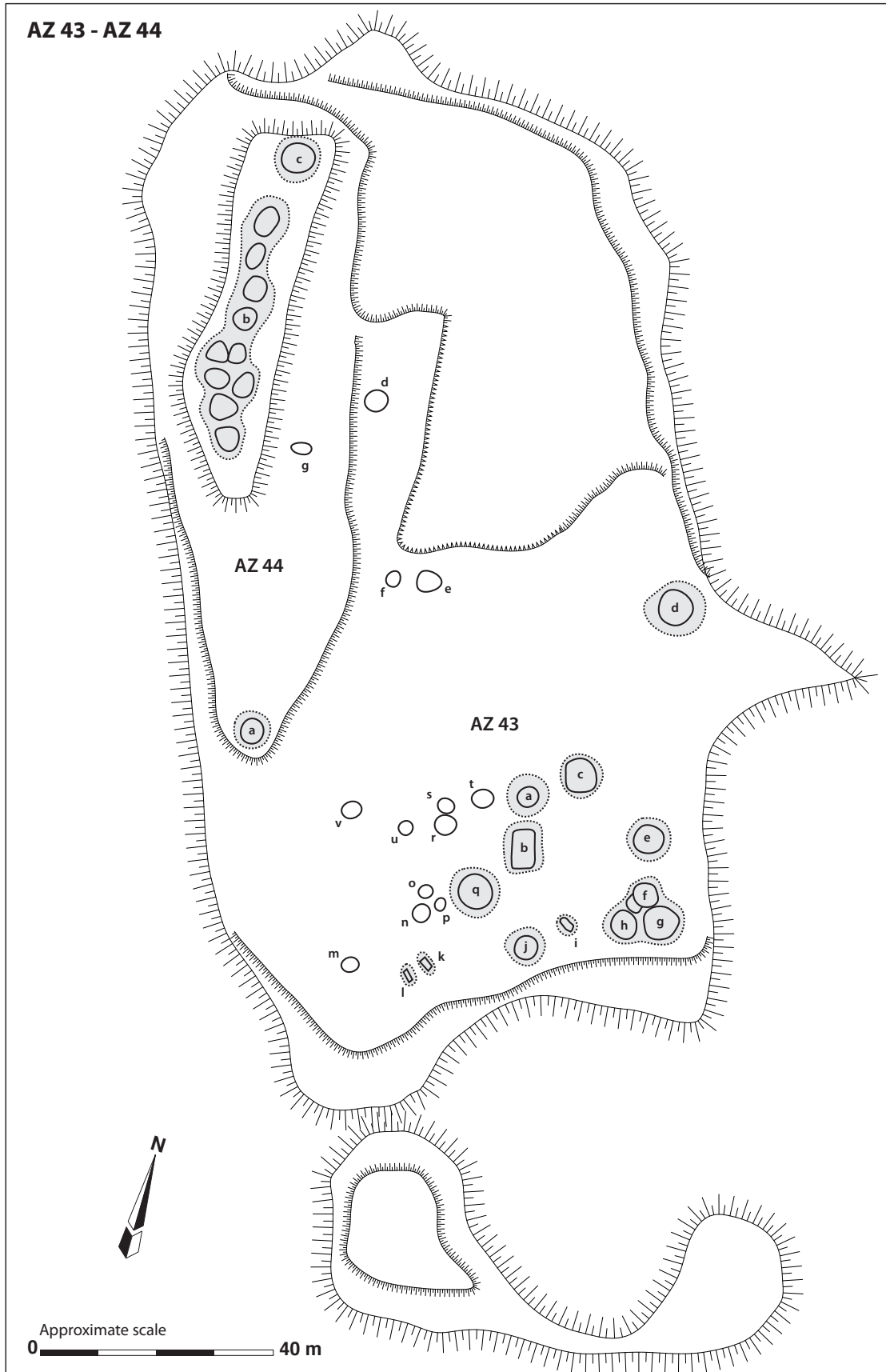


Sketch 15

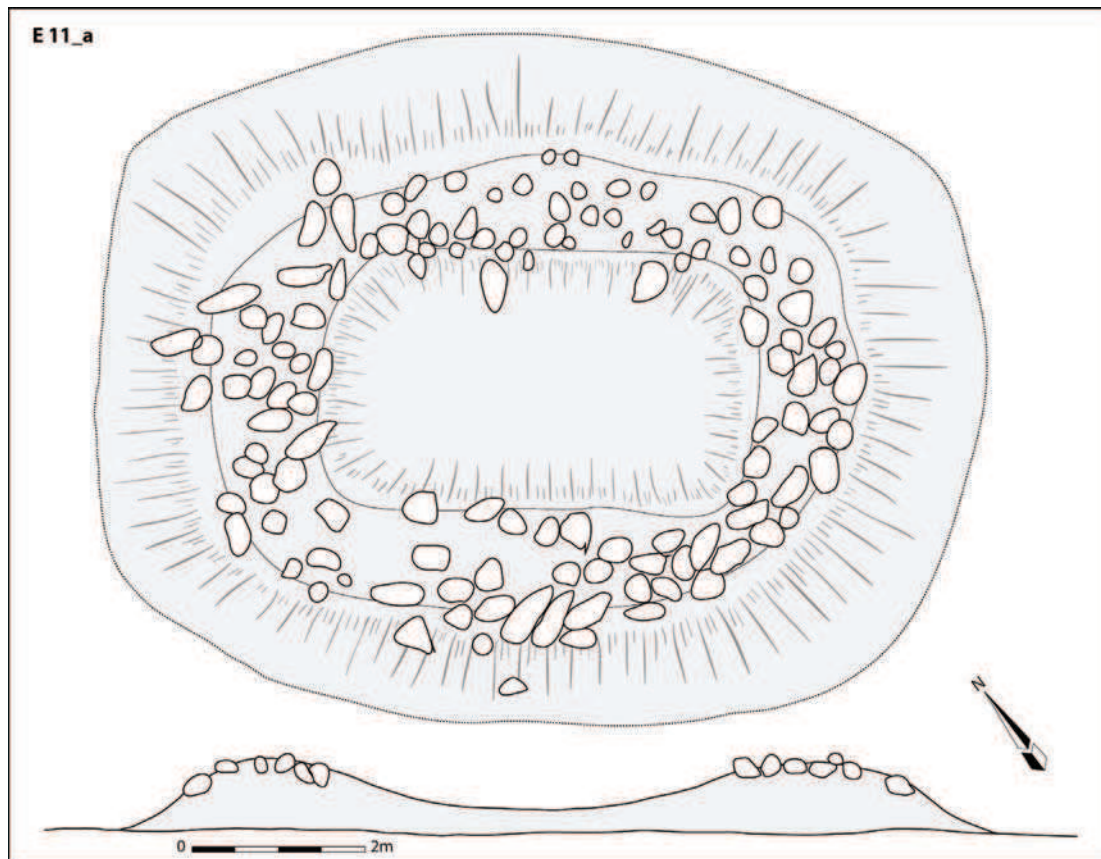


Sketch 16

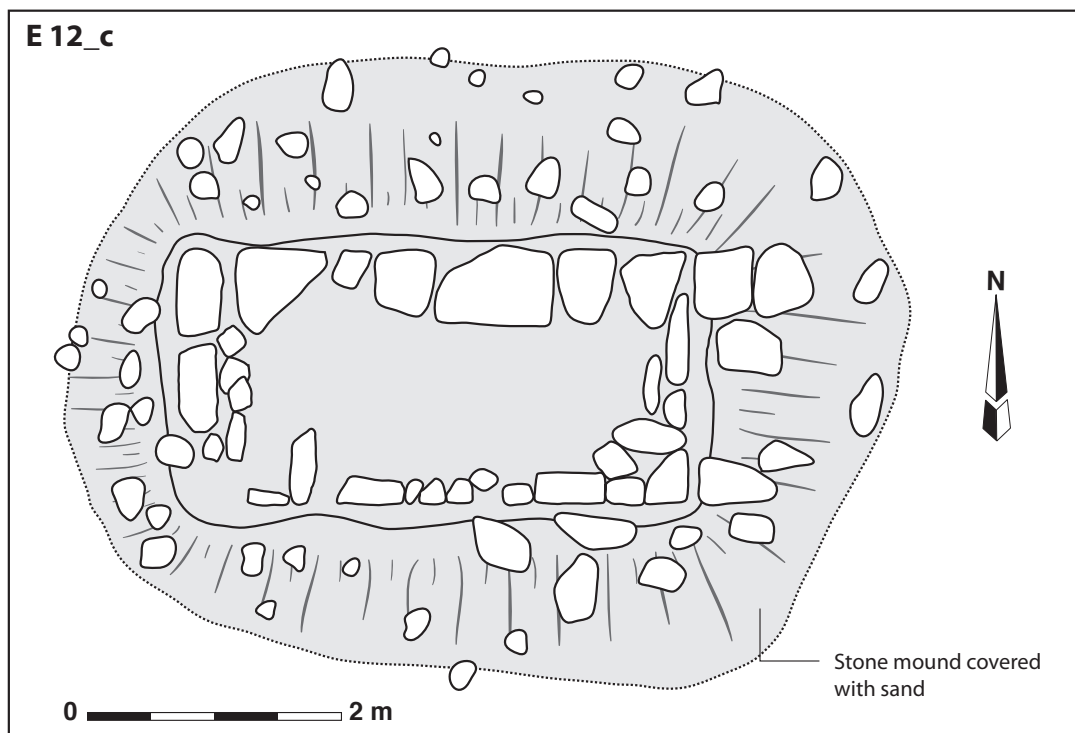
Sketch 17 see p. 270



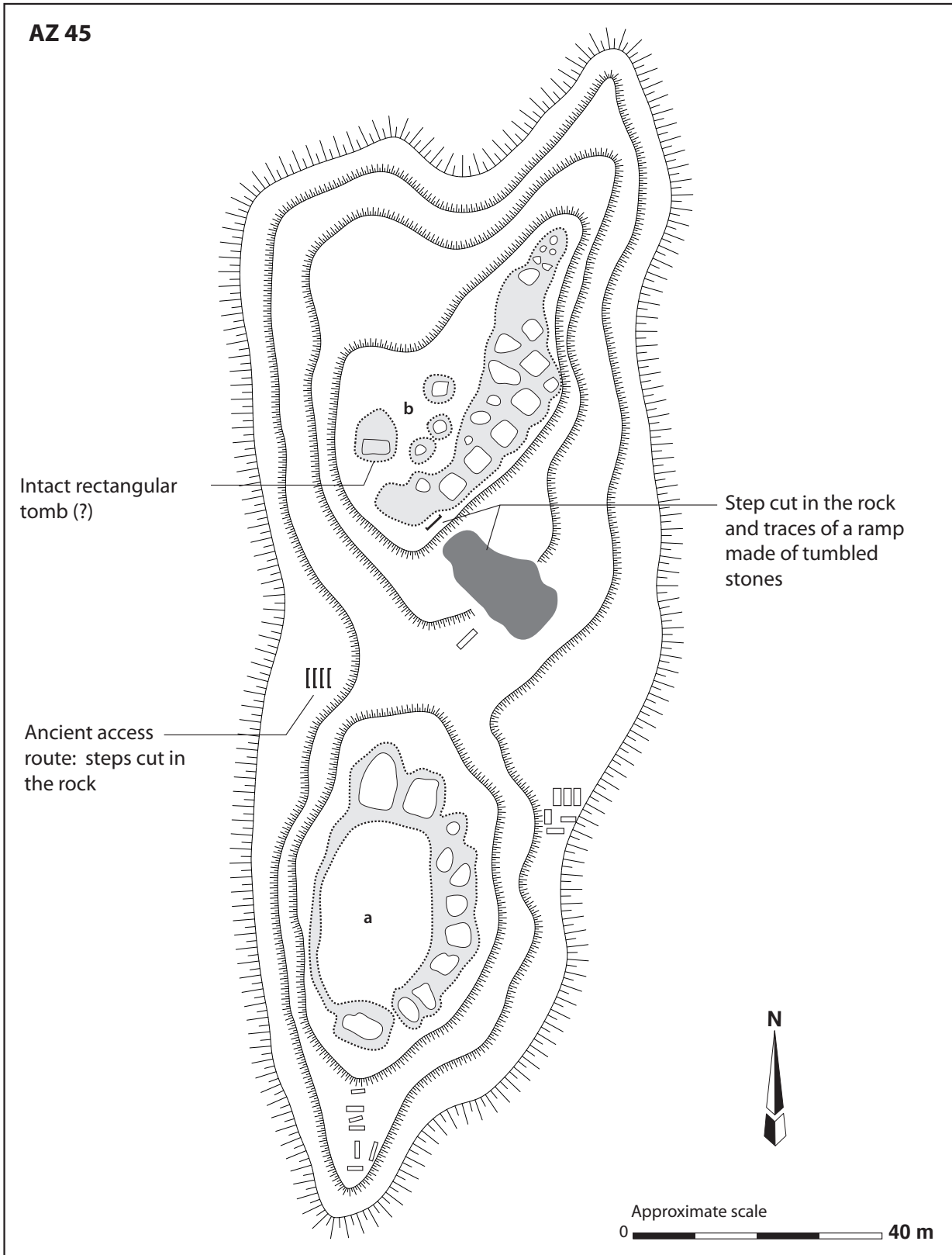
Sketch 18



**Sketch 19**



**Sketch 20**



**Sketch 21**



**Fig. 1** Simple circular tower tomb AZ 35\_c

**Fig. 2** Simple circular tower tomb HZ 01\_a



**Fig. 3** Detail of the corbelled superstructure of tower tomb HZ 01\_a



**Fig. 4** Simple circular tower tomb HZ 01\_b

**Fig. 5** Circular tower tomb with outer ring of white stones F 17\_b



**Fig. 6** Circular tower tomb with outer ring of white stones AZ 10\_f



**Fig. 7** Detail of the circular tower tomb with outer ring of white stones AZ 10\_i

**Fig. 8** Circular tower tomb with outer ring of white stones AZ 10\_i



**Fig. 9** Rectangular tower tomb AZ 35\_b



**Fig. 10** Detail of the stonework of the rectangular tower tomb AZ 35\_b



**Fig. 11** Rectangular tower tomb AZ 16\_a



**Fig. 12** Rectangular tower tomb AZ 17\_a



**Fig. 13** Rectangular tomb under a mound of stones AZ 19\_a



**Fig. 14** Rectangular tomb under a mound of stones F 16\_a



**Fig. 15** Rock-cut tomb under a mound of stones AZ 01\_a



**Fig. 16** Rock-cut tomb under a mound of stones F 23\_a



**Fig. 17** Rectangular pit-tomb AZ 41\_p



**Fig. 18** Rectangular pit-tomb AZ 41\_q



**Fig. 19** Wall with rectangular, internal, faced compartments AZ 06\_b



**Fig. 20** Detail of the wall with rectangular, internal, faced compartments AZ 06\_b



**Fig. 21** Wall with rectangular, internal, faced compartments AZ 10\_b



**Fig. 22** Wall with rectangular, internal, faced compartments F 19\_d



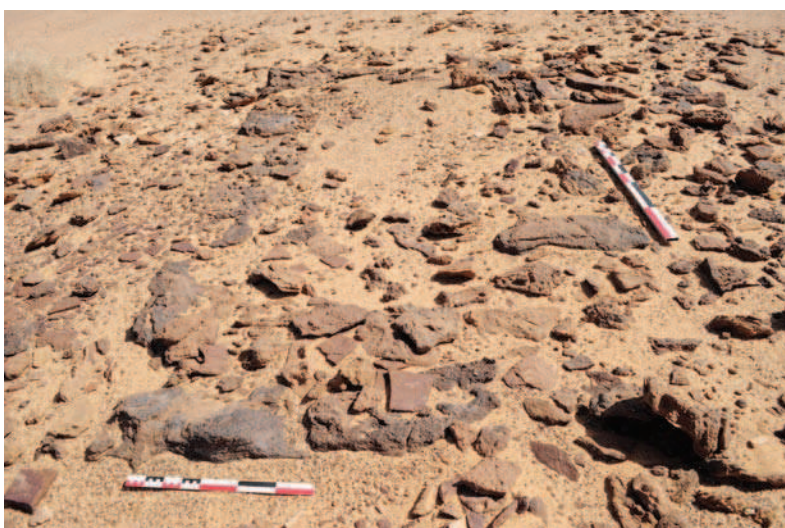
**Fig. 23** Rectangular structure B 15\_c



**Fig. 24** Rectangular structure B 17\_a



**Fig. 25** Rectangular structure E 11\_a



**Fig. 26** Rectangular structure E 12\_c



**Fig. 27** Complex compartmented structure AZ 45\_b



**Fig. 28** Ancient access to complex AZ 45 (steps cut in the bedrock)



**Fig. 29** Complex compartmented structure AZ 15\_g



**Fig. 30** Complex compartmented structure AZ 39\_a



**Fig. 31** Structure of an undetermined nature AZ 10\_e



**Fig. 32** Structure of an undetermined nature AZ 28\_b

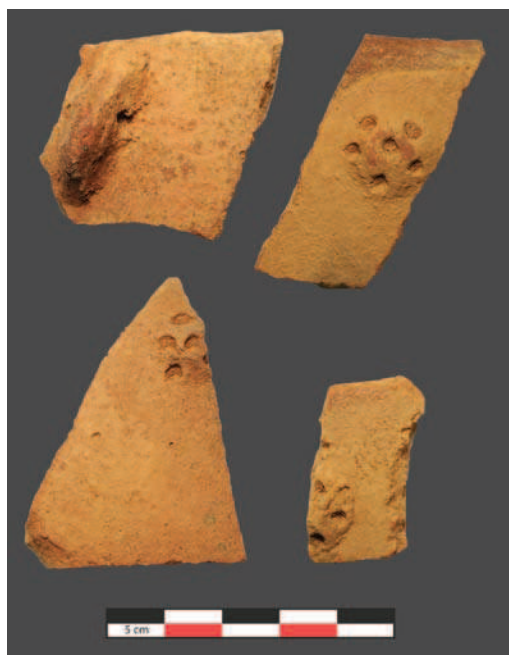


**Fig. 33** Pottery decorated with incised dots from the wall with rectangular, internal, faced compartments AZ 10\_b

**Fig. 34** Pottery decorated with incised dots from structure AZ 10\_c, near the wall with rectangular, internal, faced compartments AZ 10\_b



**Fig. 35** Pottery decorated with incised dots from the circular tower tomb with outer ring of white stones F 19\_a, near the wall with rectangular, internal, faced compartments F 19\_b



**Fig. 36** Pottery decorated with incised dots from the circular tower tomb F 07\_a



**Fig. 37** Fragment of a discoidal shell bead, from the rectangular structure AZ 14\_m

# **Geomagnetic Survey**

Christophe BENECH (UMR 5133, Archéorient)



# Geomagnetic Survey

Christophe BENECH

The second season of geomagnetic survey on the site of Madâ'in Sâlih took place between 25 January and 11 February 2011 during which 9.75 ha were covered (figs 1-2). The aim of this season was to begin the study of the spatial organization of the residential area by extending the geophysical coverage beyond the areas tested in 2010. Last year's results demonstrated the usefulness of a geomagnetic reconnaissance in the study of the urbanization of the town. The quality of the geomagnetic response varied according to the environmental conditions and the state of preservation of the structures, but it was possible to identify built-up areas as well as to define their orientation and their extents. Equally, the streets appeared clearly enough, even if the narrowest alleys were sometimes difficult to follow along their whole length. Only the internal organization of the buildings remained difficult to define in most cases.

The geophysical coverage in 2011 covered the spaces between the excavated areas, and thus it was possible to place them in one overall plan. In addition, a band 100 m wide was covered between Area 7 and the so-called south-eastern gate of the rampart, which was excavated during this season. Once the study of the trenches is completed, they will provide some important comparative information for the interpretation of the geomagnetic maps. Finally, it should be noted that it was not possible to cover certain areas, either because they are too dissected, or because of the presence of excavation dumps. Nevertheless, the geomagnetic map shows broadly the organization of the residential area of ancient Hegra.

The geomagnetic survey was carried out using the same equipment as in 2010 and using the same methodology: the measurements were made using a G-858 Cesium magnetometer (Geometrics) measuring a vertical gradient. The recording speed along the lines was 0.1 seconds, in other words a measurement about every 10 cm along parallel lines spaced 1 m apart.

The environmental conditions are largely the same as those in the areas tested in 2010, with the exception of the transect in the southern part, to which we will return. The erosion gulleys show up as a strong signal on the geomagnetic maps, and it can be seen that they often follow the line of the ancient streets, which is not surprising. Their sometimes more twisted path is often due to the presence of more resistant buildings which have not been eroded.

## **ZONE AROUND AREAS 2 AND 8 (FIGS 3-4)**

In 2010 the geomagnetic survey revealed two important buildings in this area, one of which was partly uncovered by the excavations in Area 8. The line of a street was also clearly visible. These elements formed an organized complex, all with the same orientation of  $11.10^\circ$  east.<sup>1</sup> The extension of the survey in this zone

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1 . In order not to make the text too heavy, we will use the terms 'north-south' and 'east-west' to describe structures on this orientation.

confirms this organization, as well as an urban planning according to this same orientation, even though it was clearly subjected to many modifications and additions.

### The Streets

The north-south street which had been identified in 2010 (“a” on fig. 4) follows its course northwards for about 157 m. Its eastern side is perfectly straight, whereas the line of its western edge is less regular. Thus, the width of the road is not even: about 5.80 m wide at north and south ends and about only 3 m wide near Area 8. As we mentioned in the 2010 report, some buildings seem to have encroached on the western part of the street.

A few cross-streets, oriented east-west, also appear on the map: some are perpendicular to the north-south street, but their line remains difficult to follow for any distance and it is much disturbed. More particularly, we should mention the intersection near Area 2 (“b” on fig. 4), which clearly corresponds to the street excavated in this area. It is not perpendicular to the north-south street but forms a  $76.3^\circ$  angle with it. The buildings constructed on either side of this street are all on the same orientation.

On the eastern side of the north-south street, one can see the beginnings of several side streets, but their lines are difficult to follow because of erosion. Nevertheless, their beginnings seem more or less perpendicular to the north-south street.

On the east side of the geomagnetic map, between IGN 131 and 132, the organization of the buildings is radically different. In the southern part, we are dealing with a fairly well delineated neighbourhood, which follows the same orientation as the structures further west.<sup>2</sup> Its boundaries are marked by two streets: the first runs north-south and is 3.50 m wide (“c” on fig. 4), and the second runs east-west and is nearly 7 m wide (“d” on fig. 4). This latter marks the transition to the buildings located further north, which follow a completely different orientation. On the east side, this street ends on the south-western side of massif IGN 132. At its other end, it seems interrupted – or at least narrowed – by later constructions. The connection with the buildings and streets further west is unfortunately masked by an erosion gully which passes through here.

In the block with the completely different orientation, there seem to be two streets (“e” on fig. 4), one of which goes up the slope towards massif IGN 132.

### The Buildings

Numerous buildings appear throughout this area, which seems to have been densely built in Antiquity. One part was destroyed by erosion gulleys. Near to massif IGN 131, a lot of sand has accumulated and thus, there too, masks the probable presence of archaeological structures.

In this part of the town (and we will see that it is also the case elsewhere) the orientation of the buildings is not necessarily the same as that of the streets (**fig. 5**). To the north, near Area 2, and on the west side of the north-south street (“a”), one can see that the buildings are all on the same orientation (the same as that observed in Area 2), and that they are thus slightly at an angle to the north-south street. As far as one can judge according to the lines of visible walls, these buildings do not seem to have been cut by the alignment of the north-south street “a”, and therefore do not pre-date it. At this point in the analysis, it is still difficult to define whether they are contemporary with or later than the street. On the opposite (east) side of the street, the orientation of the structures shows a difference of about  $16^\circ$  relative to the perpendicular of the north-south street. One should also note the presence, immediately to the east of Area 2, of a strong magnetic anomaly which corresponds on the ground to a large concentration of slag. These could be the

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2 . This area was excavated by the Saudi team.

remains of a kiln. This anomaly is on the side of the north-south street, but it is difficult to say if this location is a coincidence (in which case it could be later) or if it belongs to a building used for a craft industry that was part of this complex.

In the eastern part, the block which lies between the two perpendicular streets (“c” and “d”) is made up of buildings which follow the alignment of the streets. Further north, however, a series of buildings are oriented in line with the slope. At the bottom of the slope, the structures seem better preserved than those at the top, the walls of which are difficult to follow. The line where they meet the orthogonal plan is along the east-west street (“d”), but the very disturbed data in this area do not allow the relative chronology of these two units to be determined.

## TO THE WEST OF AREAS 2 AND 8 (FIGS 6-8)

Between this sector and the preceding one, the ground is disturbed by a large wadi which, during rain, drains the water that accumulates in the centre of the residential area to the north.<sup>3</sup> Immediately to the west of Area 8 (this area is located beyond the lower right corner of **fig. 6**), one can see several structures aligned parallel or perpendicular to the north-south street.

This orthogonal organization extends further to the west, across a whole quarter, with a few stretches of streets visible. The clearest is a north-south street (“f” on **fig. 7**), with a particularly clear line over about 35 m and an average width of 3.80 m. At its southern end, the map is still difficult to analyse and it will be necessary to extend the geomagnetic survey westwards in order to understand properly the organization in this area. Nevertheless, it would seem that the street turns towards the south-east: its line is then superimposed over buildings, which shows its later date, then it is lost in an area where the geomagnetic signal is much too disturbed. At the point where it changes direction, one can see the beginning of another street at right angles going west (“g”). Its line is then difficult to follow because it crosses a disturbed area, but it seems that it appears again a bit further along with a slight deviation to the north.

At its northern end, the north-south street (“f”) turns north-eastwards and gets narrower (no more than 2 m wide), and then it continues beyond the area surveyed. Before changing direction, there is a major intersection (“h”) with perfect right angles. Towards the east, the street goes in a direction perpendicular to the north-south street, and is then lost in the disturbances caused by the wadi. However, it is clear that this is the same street that we find in Area 2. The presence of the excavation dump from that trench did not allow us to look for it between the wadi and the trench, but the geophysical map produced by A. Kermorvant before the excavation began shows its continuation and probably junction with the intersection (“h”).

The street which leaves the intersection going west (“i”) is the most winding one noted so far on the site. Its edges are sometimes difficult to follow, its width varies between 1 and 2 m, but its general outline can be followed quite easily. It is lost though, to the north-west, where the works for the Hijâz railway caused major disturbances. This street has many intersections that are more or less difficult to follow. Those that go northwards are the least well marked. It should be noted that all the area in the north is characterized by a relatively disturbed geomagnetic signal and the relatively weak response of the structures as compared to the rest of the site.

One of the clearest intersections is the one that goes up towards Area 1 and which probably joins the crossroads revealed by the excavation at the edge of that area. The matching up of the plan of the excavated structures with the geophysical maps will allow a better understanding of the organization of the street

3 . See the 2010 report, fig. 1 p. 310.

network in this area, and also the better identification of the geophysical signature of different archaeological structures.

The anomalies recorded so far show that there is no preferred orientation for the buildings in this area.

## WESTERN PART (FIGS 9-11)

This area consists of a long transect 400 m long and 100 m wide, that was extended a further 50 m at the level of Area 9 in order to obtain an overview of the context of the excavation (**fig. 9**).<sup>4</sup>

The northern part of this band is relatively difficult to interpret, partly because it has been disturbed by the proximity of the railway line. Immediately to the south, however, we can see a clear complex (**figs 10-11**) the orientation and orthogonal arrangement of which are the same as those observed in the two preceding areas. This complex is crossed by a north-south street (“j”) the outline of which can be followed for about 80 m, its width varying between 2 and 3 m. To the south it continues beyond the area surveyed;<sup>5</sup> to the north, the street seems to veer slightly to the east to join the very winding street (“i”) which we described above.

A few intersections are visible: the largest one is in the north (“k”), where a street goes off to the north-west and presumably joined up with the winding street (“i”). A second street goes eastwards, perpendicular to the street (“j”) then its line changes slightly and more or less corresponds to the position of a modern erosion gully. The intersection (“k”) is partly masked by a strong magnetic anomaly which, on the ground, is a large pile of slag. Two other strong anomalies are also visible a little further south and might represent some craft activity in the area. The organized orthogonal plan does not extend very far. Further west, the buildings are once again relatively disordered, with different orientations.

Further south, in the part that includes Area 9, a large complex centres around a street (“l”) which, in its northern part, forms a large arc (convex side to the west), before straightening out in its southern part (**figs 12-13**). It can be followed for about 175 m and it certainly continues southwards beyond that, perhaps bending again, as do the buildings in this part. These buildings are by far the most visible ones in this part of the site. The other constructions, further north, are mostly detected by their east-west walls, the north-south walls rarely being visible. All these buildings seem to be organized in the direction of slope, perhaps in order to allow better drainage of water towards the centre of the town. At the western edge of the map, there are a few buildings that fall into the orthogonal plan (**fig. 14**). It is unfortunately impossible to continue the survey further to the west.

Finally, at the southern tip of the surveyed transects, several buildings show up particularly well on the geomagnetic map. The survey needs to be extended in this direction in order to understand better the organization of the buildings in this area.

## SOUTH OF AREA 8

A transect was surveyed in the southern part of the site, about 300 m long and either 50 or 100 m wide according to what the terrain allowed. This transect begins at the Saudi excavations carried out between 1986 and 1990 (Area 7) and extends to the so-called south-eastern gate of the rampart (**fig. 15**).

4 . Area 9 falls outside fig. 9.

5 . There remains, in this part, an area of 0.7 ha that can be surveyed to the east of the railway. It would allow the line of the streets to be followed and to show the orthogonal organization of the urban plan over a wider area.

This part of the site does not, at first sight, present good conditions for geophysics: the shrubs and sandy areas mask large erosion gulleys which have greatly affected the ground. Nevertheless, some more resistant islands remain, around which run the erosion gulleys and on which numerous archaeological structures are visible on the surface. Even though it was clear that the results of the geomagnetic survey would be disturbed, it was important to attempt a reconnaissance of this area in order to link the centre of the urban area with the rampart.

The geomagnetic map obtained is indeed disturbed, but the results are interesting because the majority of the structures visible fit into the orthogonal organization found in the different parts of the site (**figs 16-17**). However, a few isolated buildings do not follow this orientation. One can also note a slight change in orientation in the southern part, near the south-east gate. In the middle of these disturbances, the streets are difficult to follow. An east-west street (“m”) appears relatively clearly, the line of which has been followed in part by an erosion gully. Its southern limit can be seen reasonably well but its northern side is less distinct. A few rectilinear anomalies could correspond to north-south streets, but it is difficult to reconstruct their line for any distance and thus to extract any coherent organization.

At the southern tip of this transect, the survey covered the area of the so-called south-east gate. The map is partly disturbed by the presence of the metal fence, which saturates the magnetic signal. The particularly large amount of sand that has accumulated against the rampart also prevents any possible archaeological structures against it from being found. The rampart, built of mud bricks, shows up well, as does the gate, where one can guess the presence of towers, the edges of which do not appear clearly. In the line of the gate, nothing suggests the presence of streets, but there is a group of buildings, one of which is a well marked rectangle with a fairly weak signal.

The results in this area remain limited, but they show that the orthogonal urban organization continues into the most southerly quarters of the town.

## CONCLUSION AND FUTURE WORK

This second season of geomagnetic survey has covered sufficiently large an area to provide information on the urbanization of the residential area. Even though this initial interpretation does not take into account all the information visible on the geomagnetic map, it does show a diverse urban organization (**fig. 18**). A preferred orientation (which can vary by a few degrees) associated with an orthogonal organization of buildings, appears in various parts of the site. It shows that at a given period at least, a part of the site was the subject of a uniform urban plan. Next to this well ordered organization, one can see many areas of winding streets and buildings that do not follow any given orientation (which does not prevent them from being coherent).

Currently, it is difficult to say if the orthogonal plan is an original plan that has partly disappeared or if it results from a later initiative which did not involve all the quarters of the town. The connections between the two organizations are not always easy to grasp on the geomagnetic map, which does not yet allow us to decide between these two hypotheses. The extension of the survey and comparison of its results with those from the excavations near to the surveyed areas will help in going a little further with the interpretation.

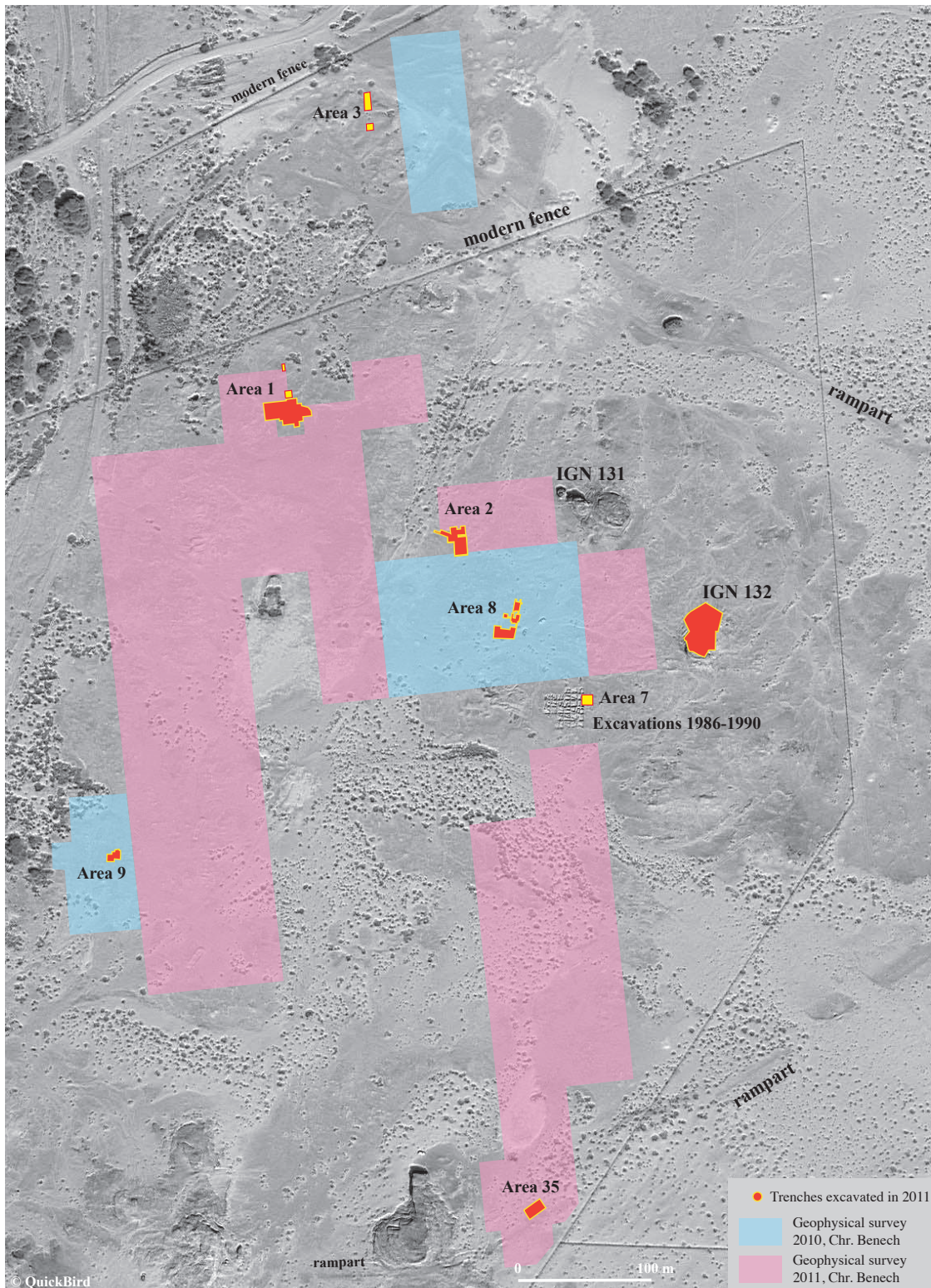
The results from the 2011 season will help define the areas which remain to be explored during a final geomagnetic survey season in the residential area. As we have seen, the areas covered by thick sand cannot be surveyed. This is also true for areas covered in shrubs, which often hide large erosion gulleys that have heavily eroded the buildings. Only the open areas, which are the parts that have best resisted erosion, deserve to be surveyed.

A few stretches would be worth extending slightly, notably to the south-west of street “f” (see **fig. 7**) and south of Area 9 (see **fig. 9**).

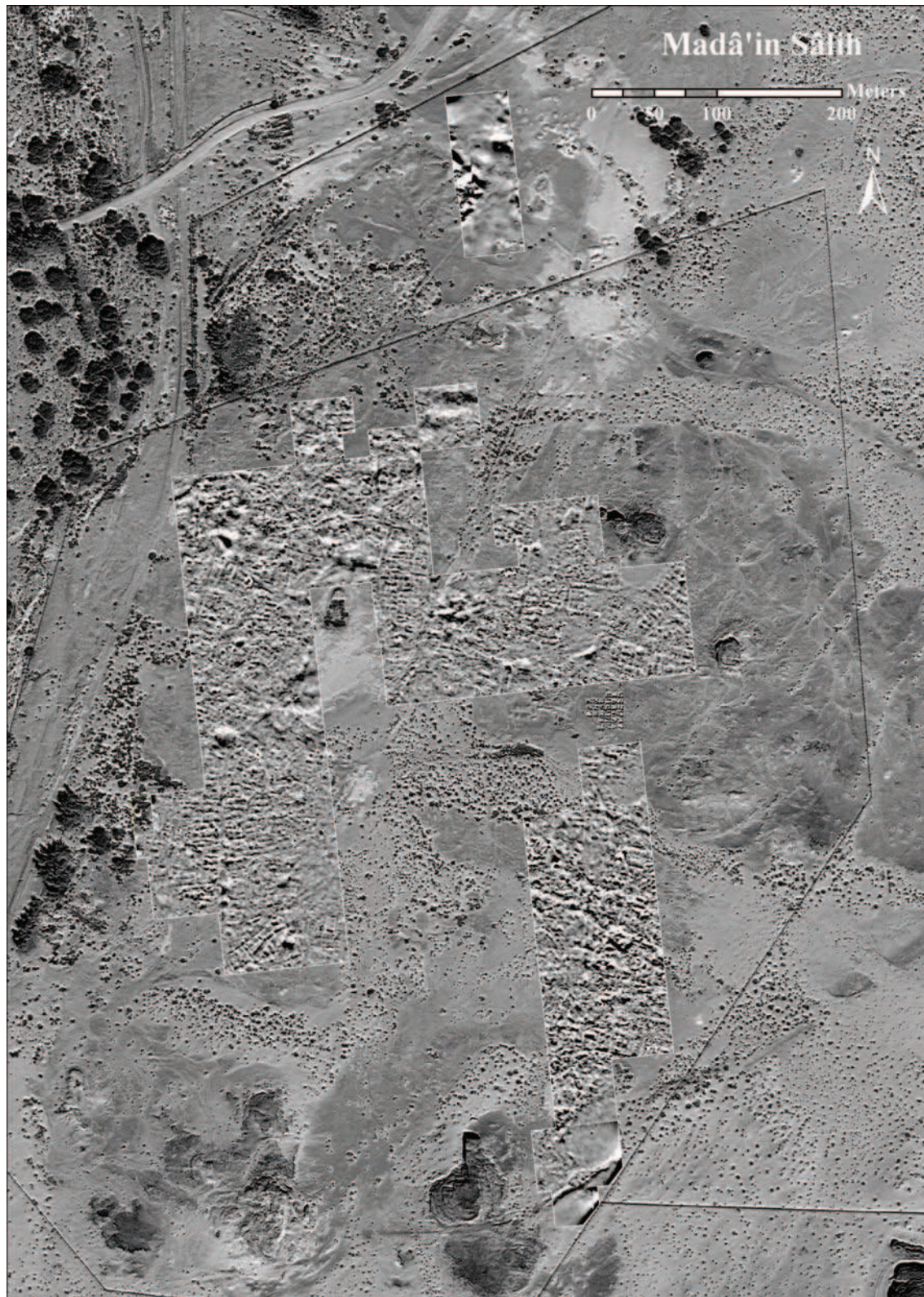
Finally, at very southern end of the site, a few large areas (about 3 ha in total) at the foot of the hills over which the rampart passes, would be interesting to study.

To the north-east, all the area to the east of massifs IGN 131 and 132 remains to be explored (about 3 ha) and should give some interesting results if the quality of the geomagnetic map is the same as it is near to Areas 2 and 8. It would also mean that coverage of the space around IGN 131 could be completed.

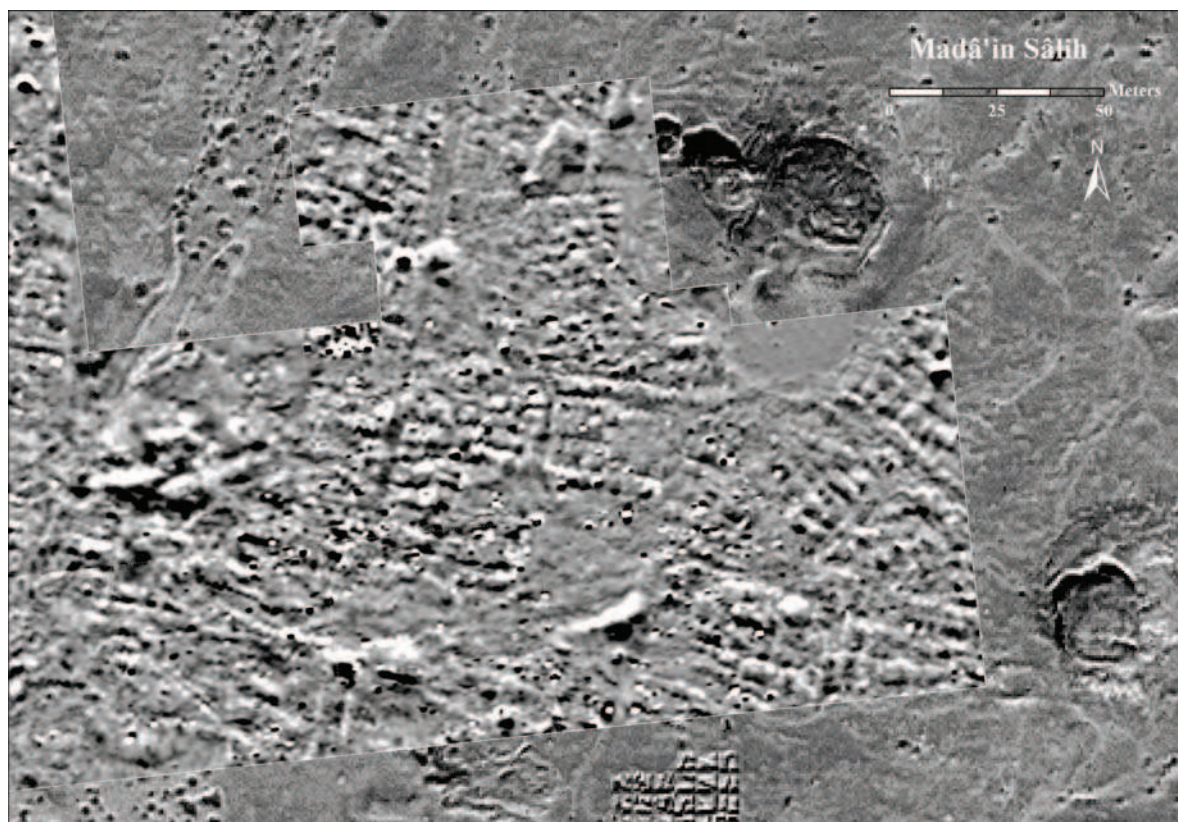
Further east, between the two modern barriers, a less sandy area of about 2 ha would provide information on the easternmost part of the site. The presence of the metal fence has unfortunately cut off this part from the rest of the survey.



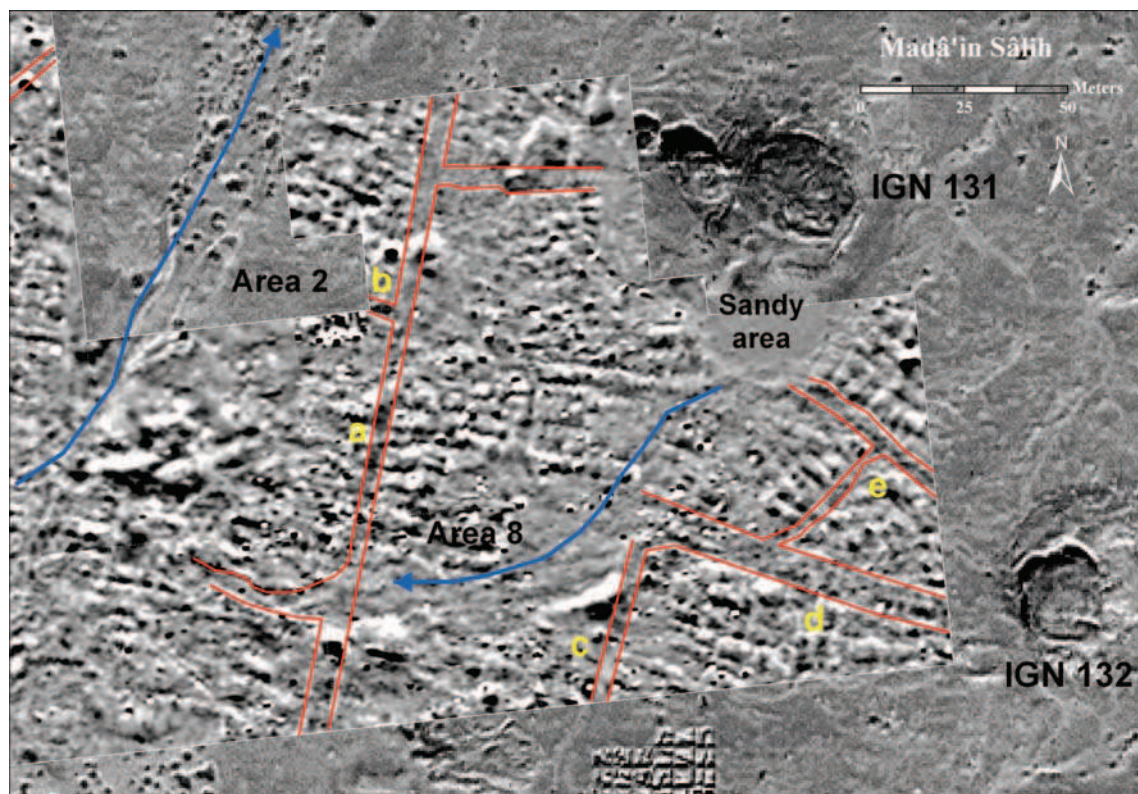
**Fig. 1** The areas surveyed in the residential area



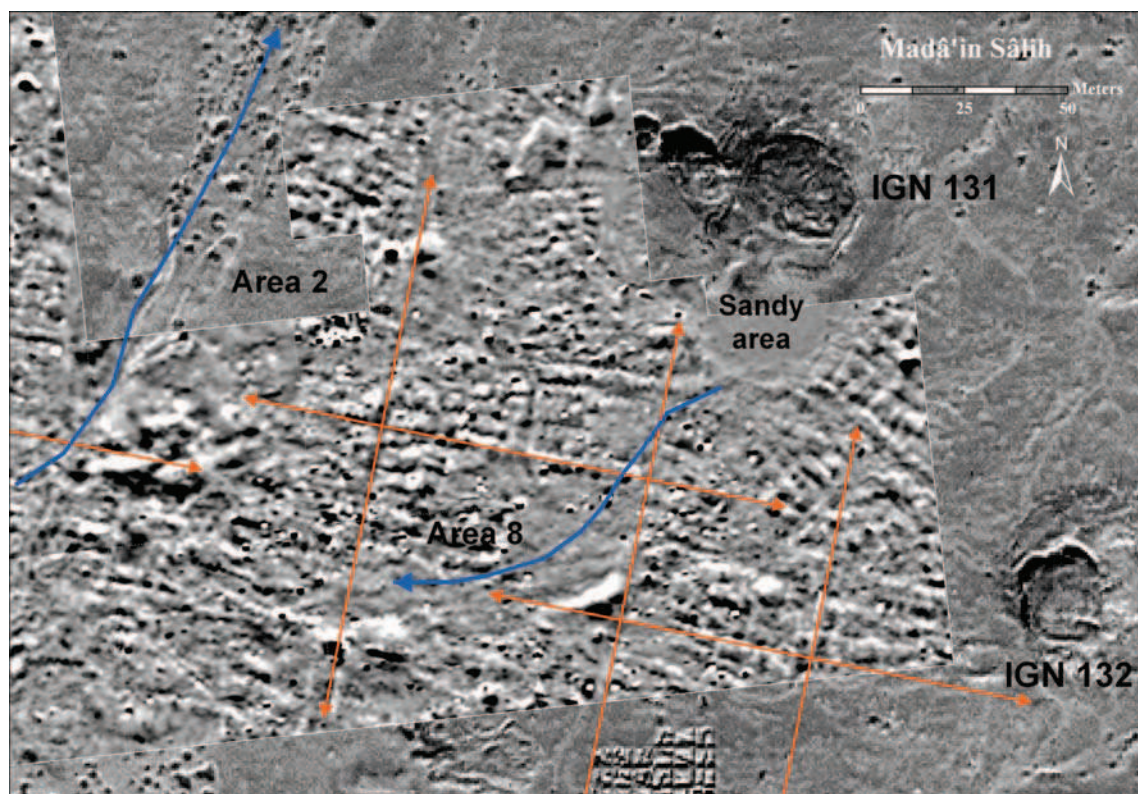
**Fig. 2** Results of the geomagnetic survey overlaid on the satellite image



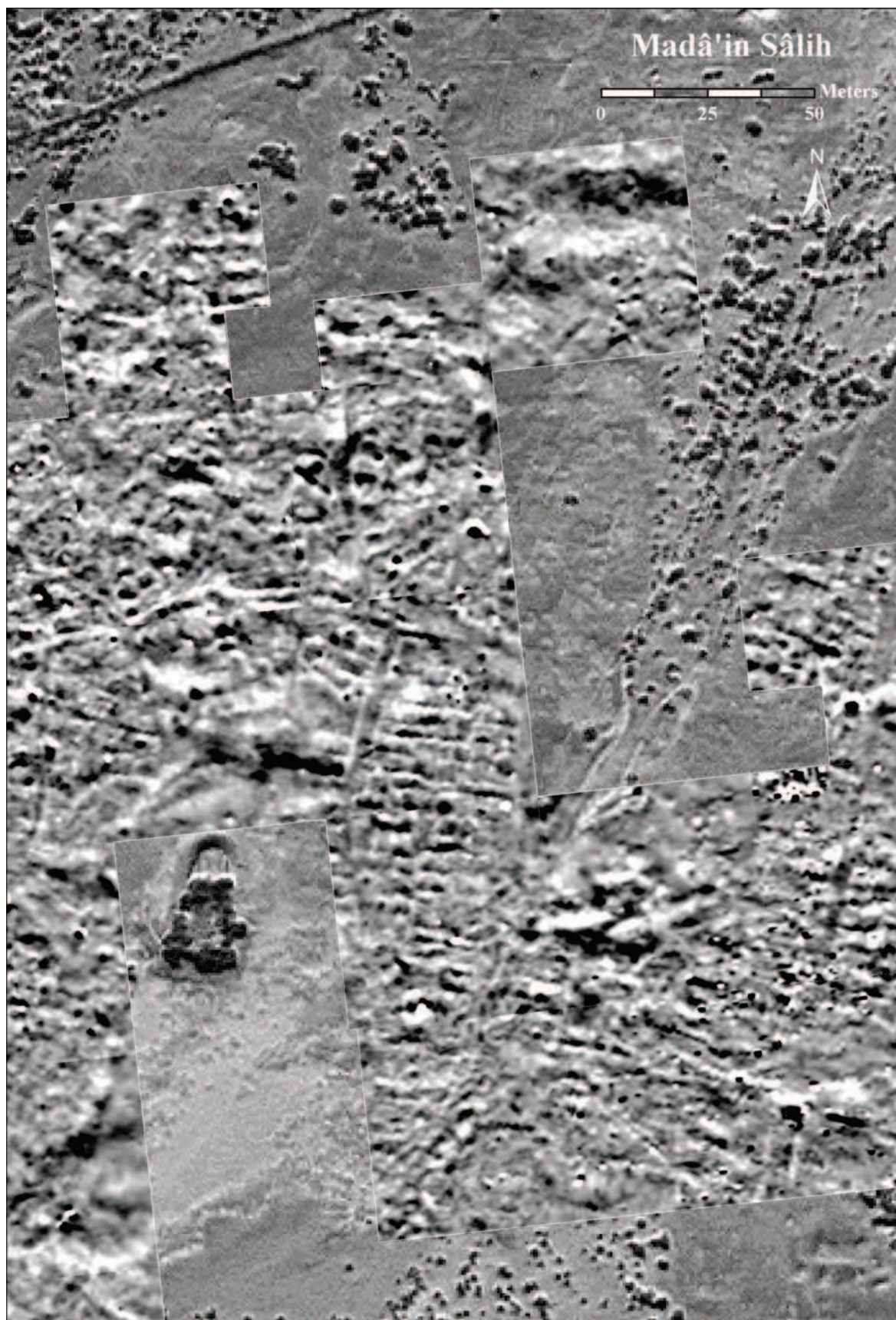
**Fig. 3** Geomagnetic survey around Areas 2 and 8. Unworked results



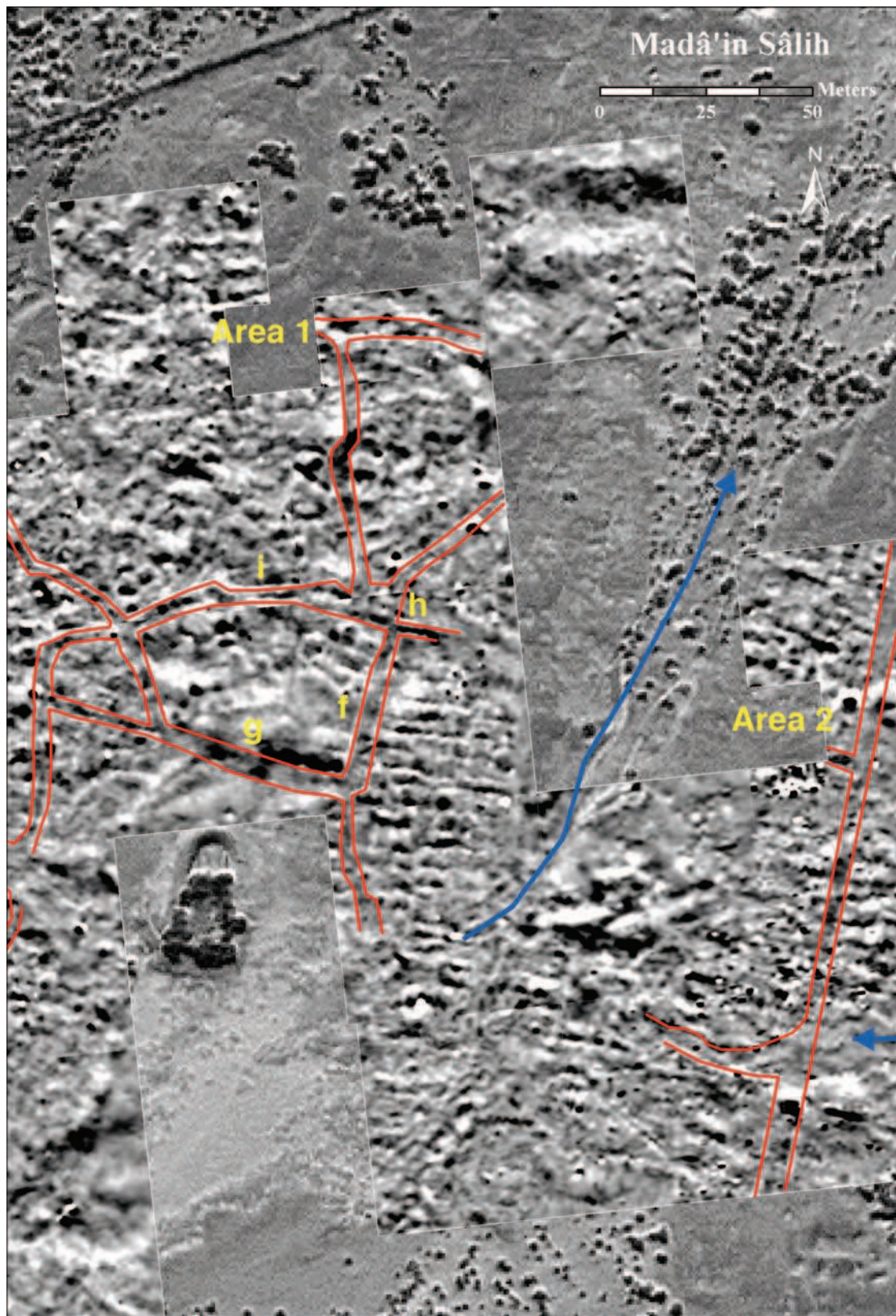
**Fig. 4** Geomagnetic survey around Areas 2 and 8. The streets



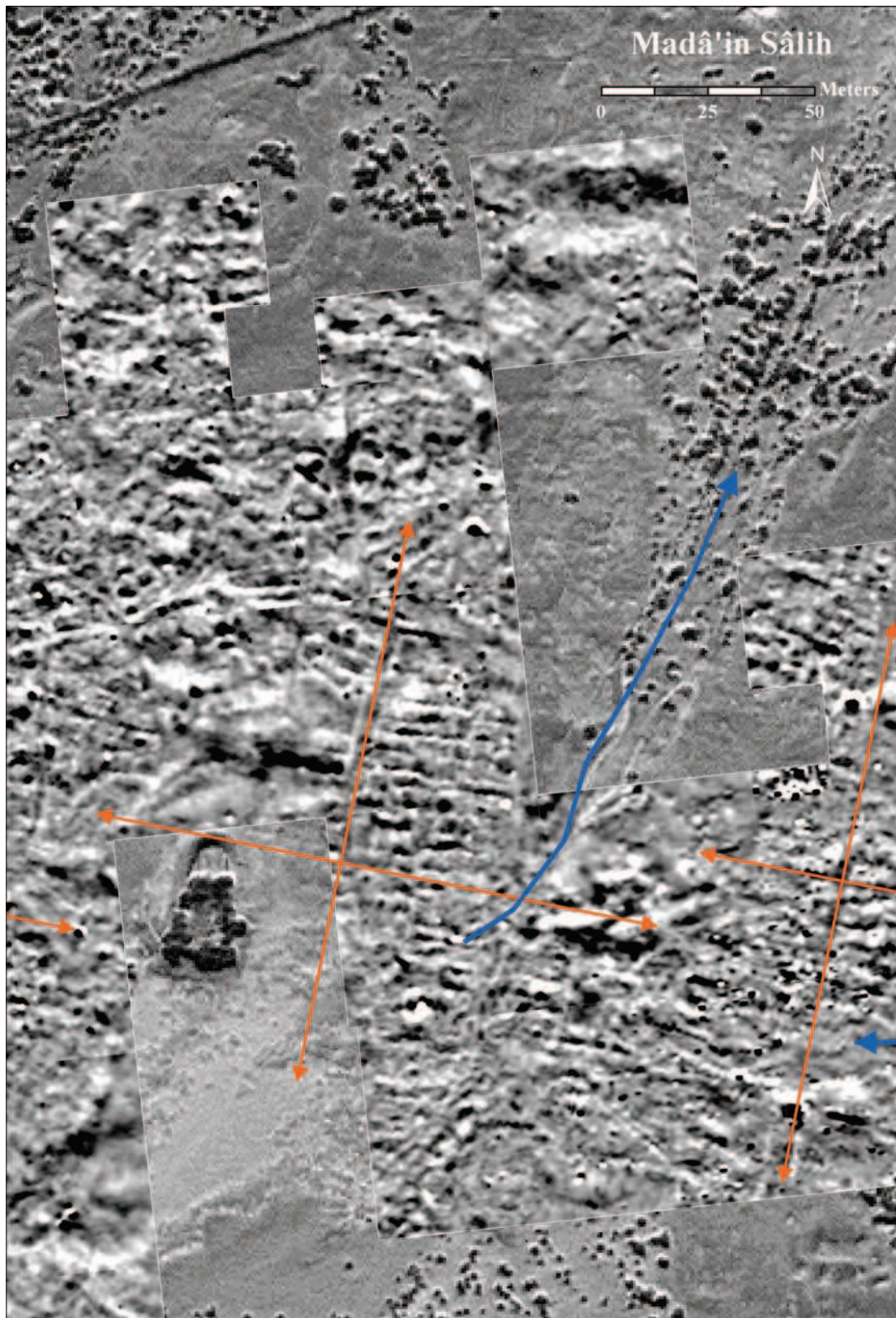
**Fig. 5** Geomagnetic survey around Areas 2 and 8. Orientation of the buildings



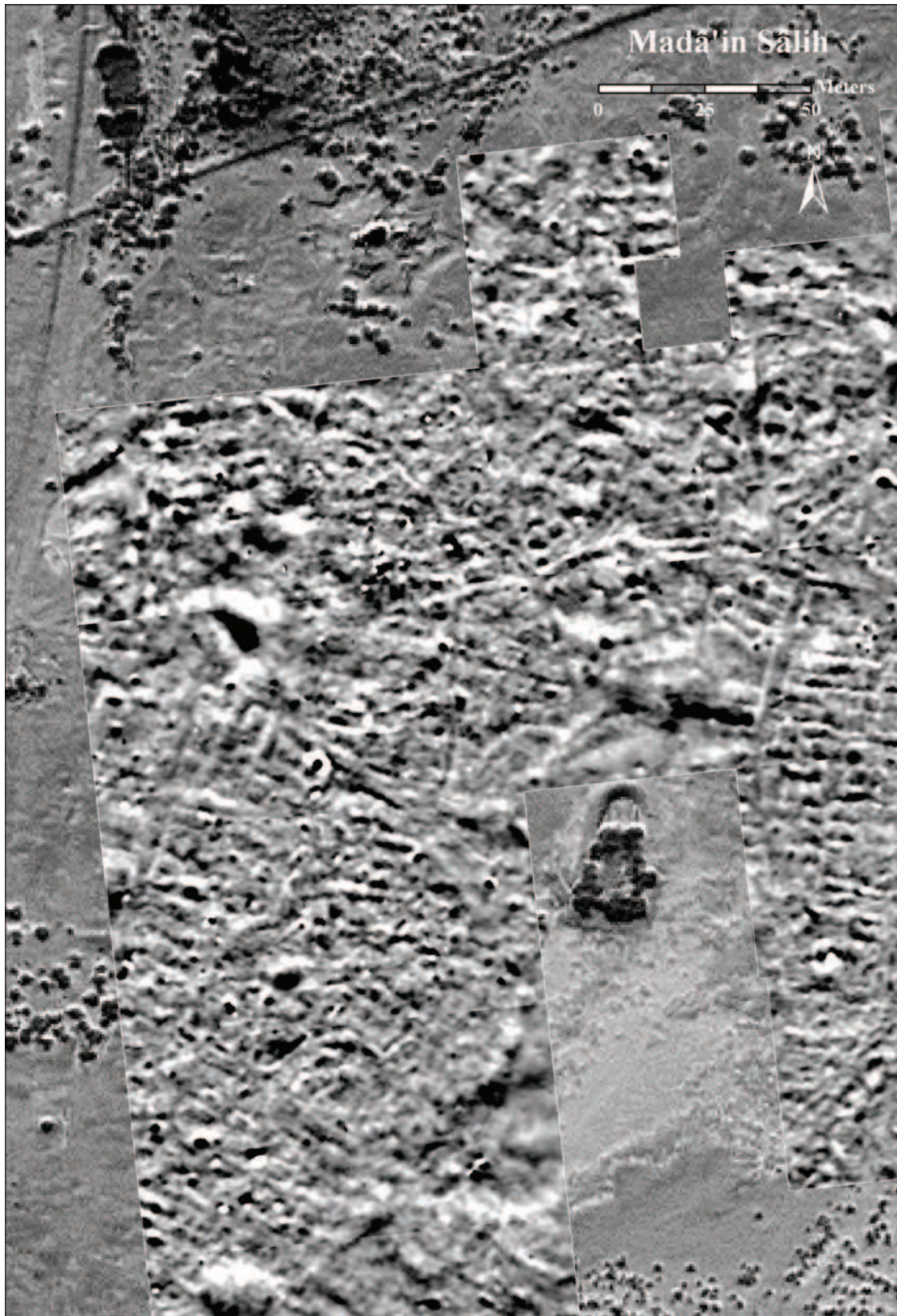
**Fig. 6** Geomagnetic survey to the west of des Areas 2 and 8. Unworked results



**Fig. 7** Geomagnetic survey to the west of des Areas 2 and 8. The streets



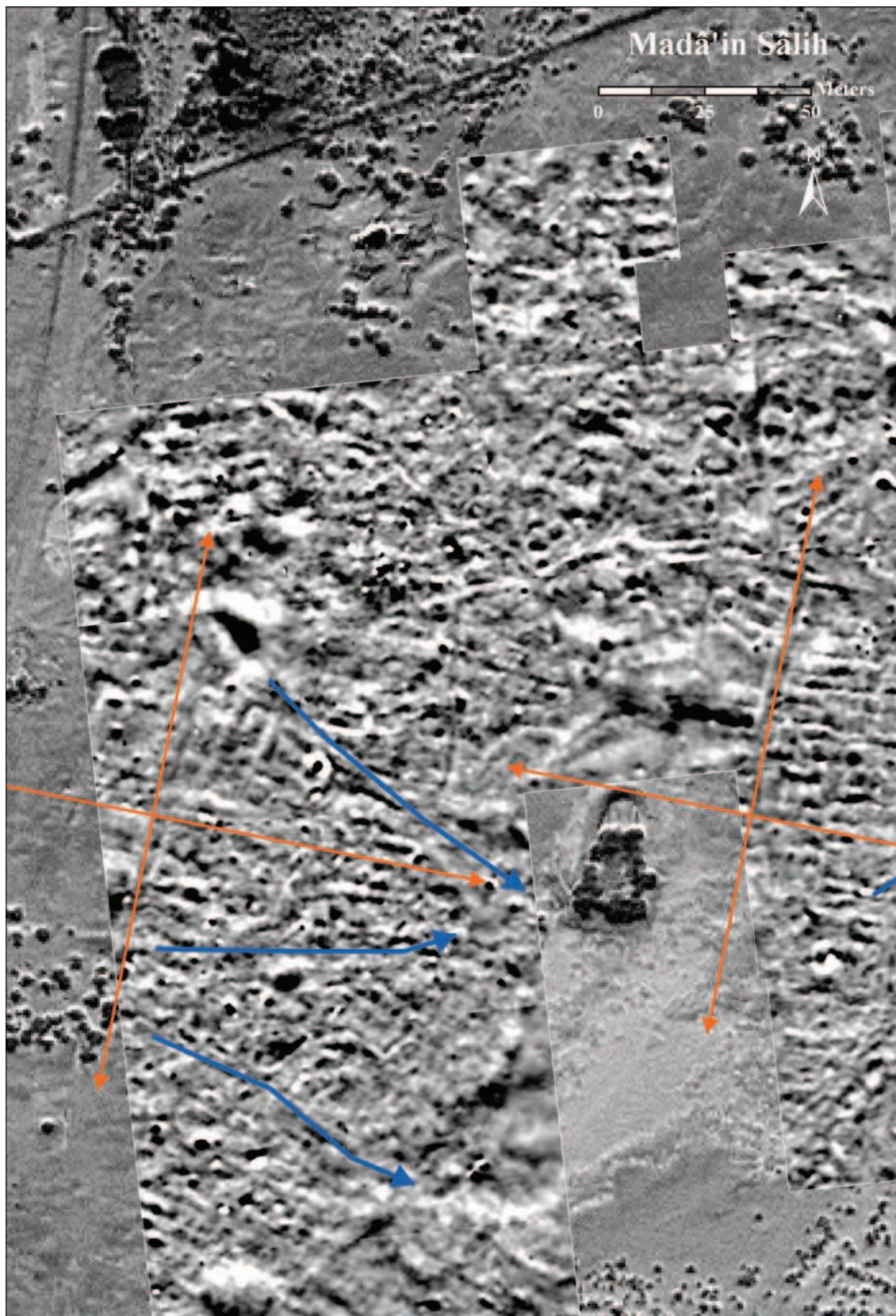
**Fig. 8** Geomagnetic survey to the west of Areas 2 and 8. Orientation of the buildings



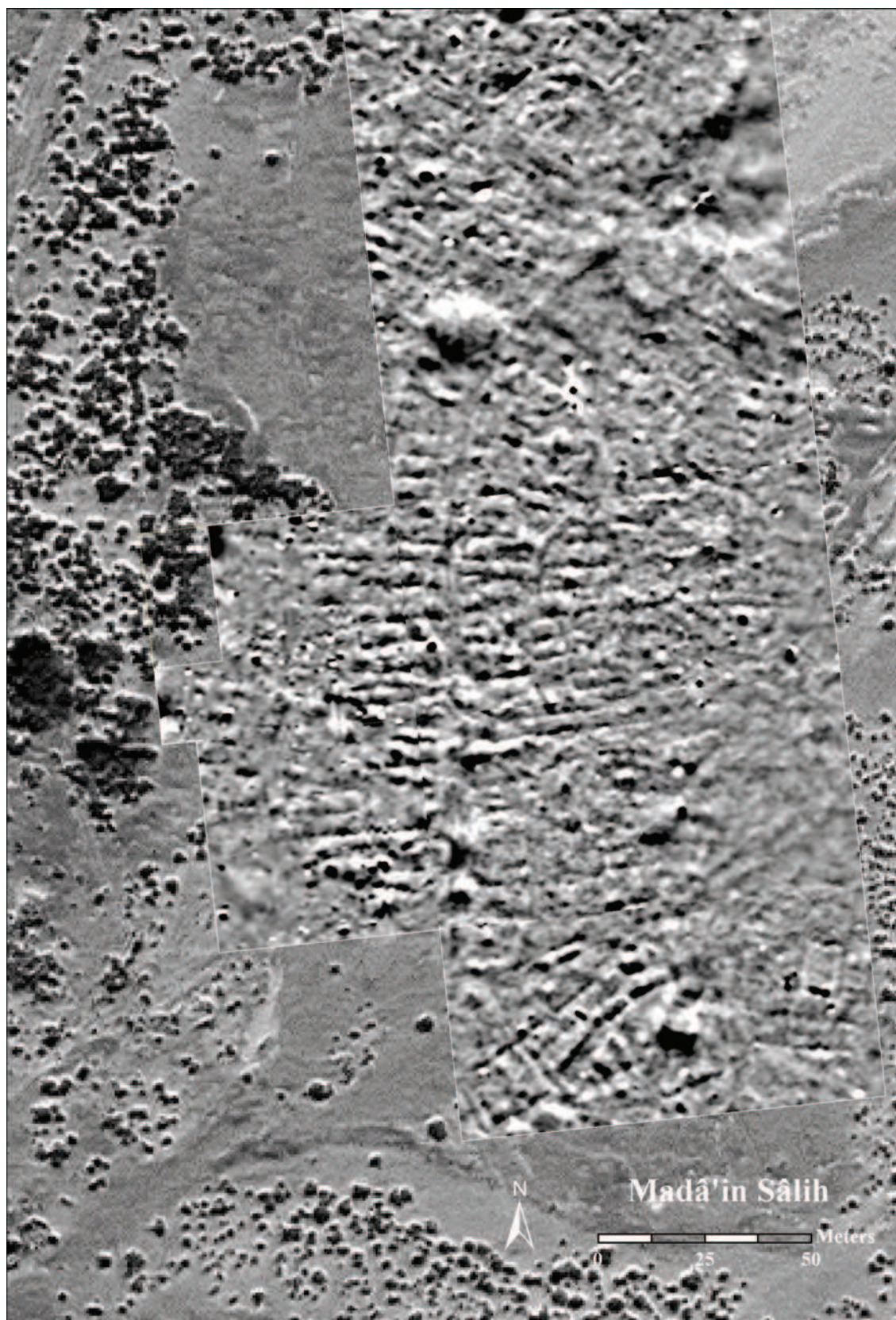
**Fig. 9** Western part of the residential area. Unworked results



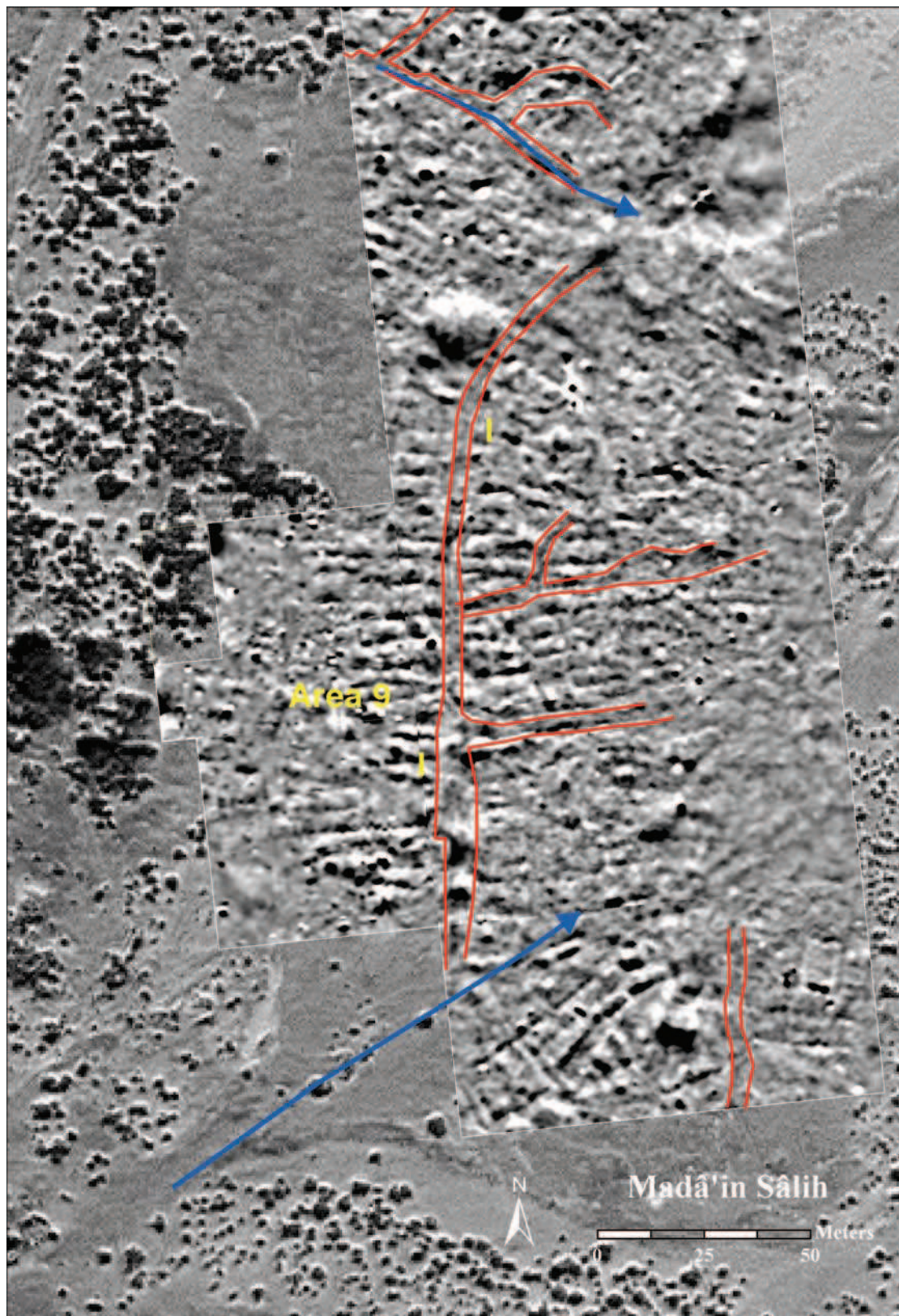
**Fig. 10** Western part of the residential area. The streets



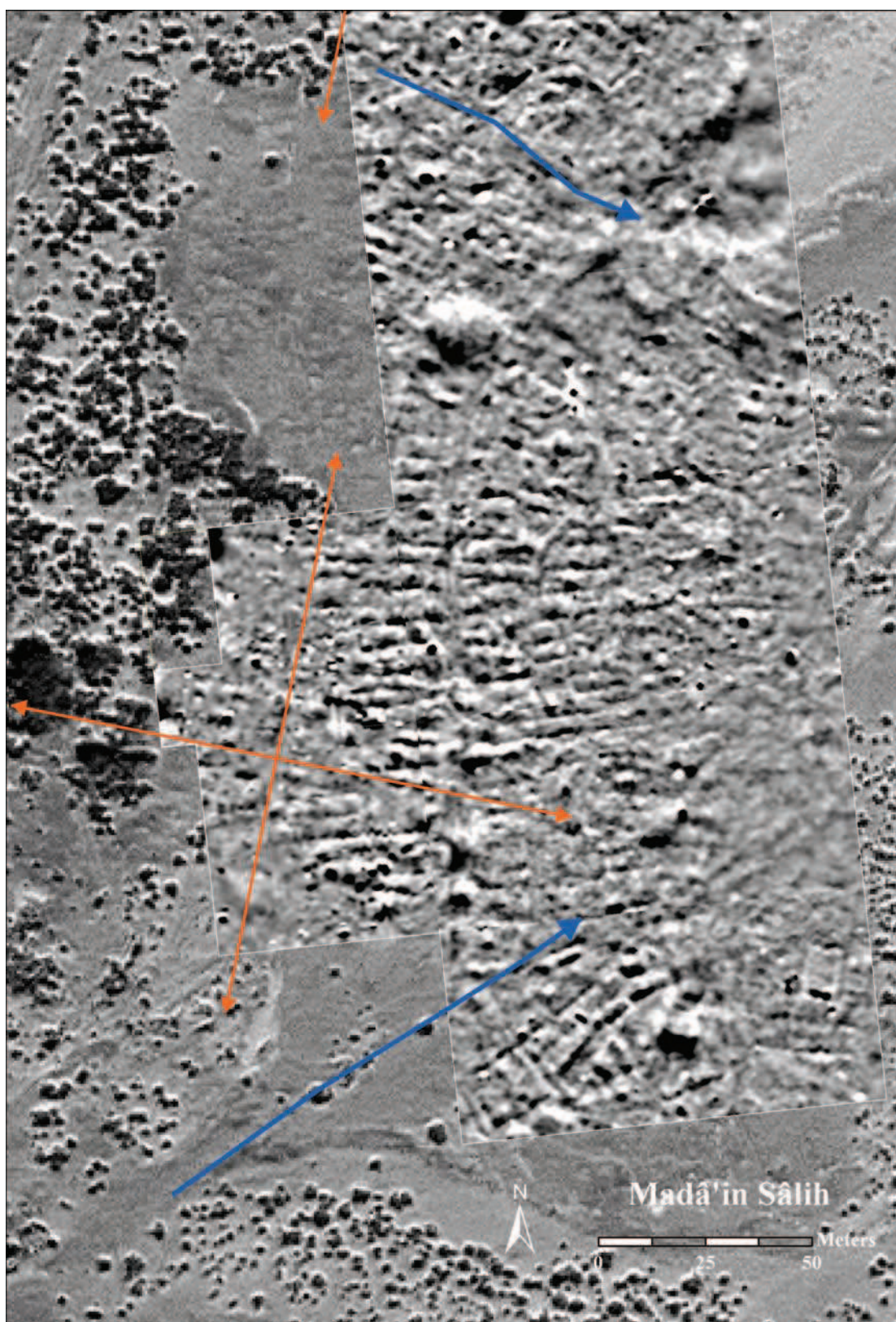
**Fig. 11** Western part of the residential area. Orientation of the buildings



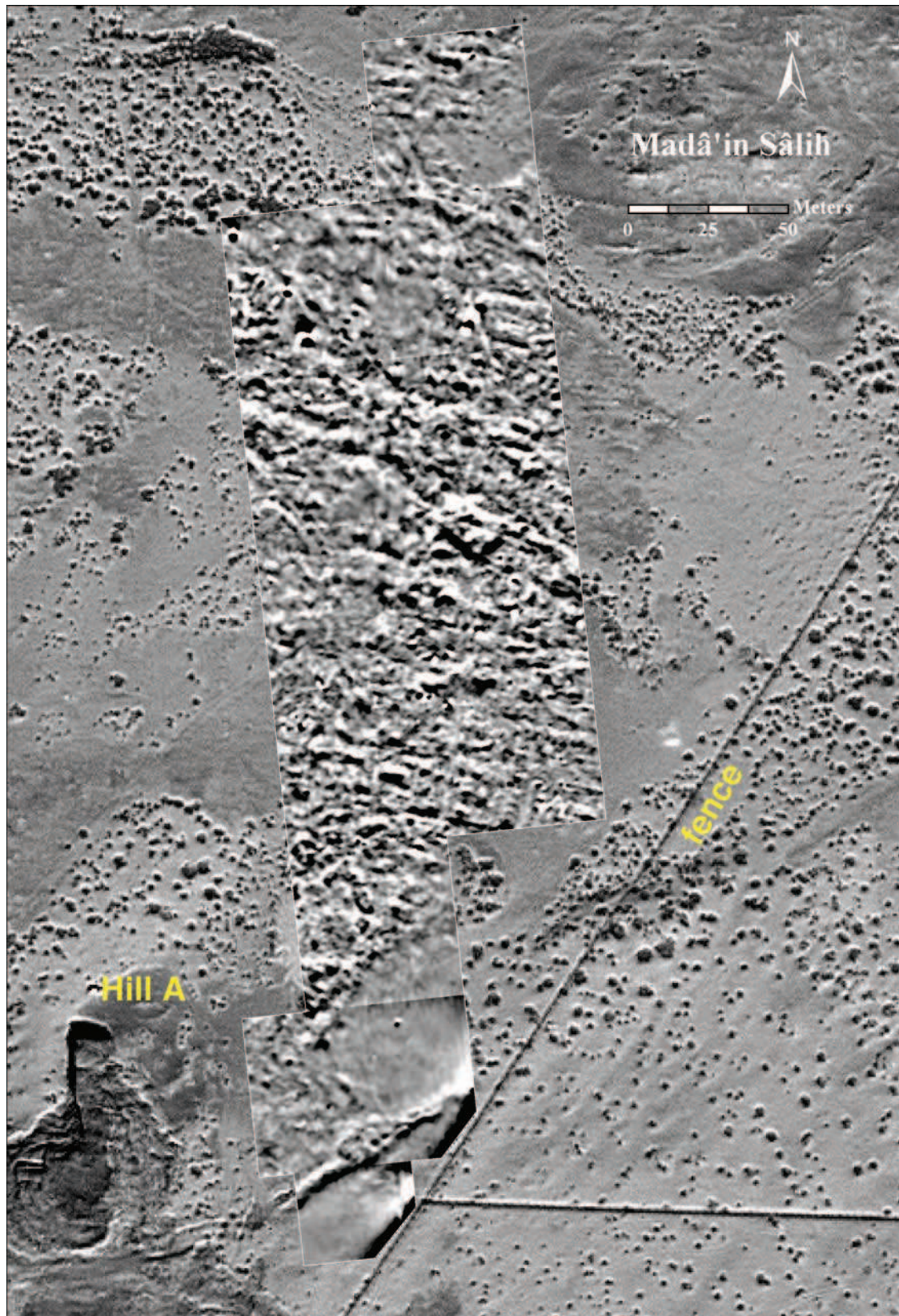
**Fig. 12** Around Area 9. Unworked results



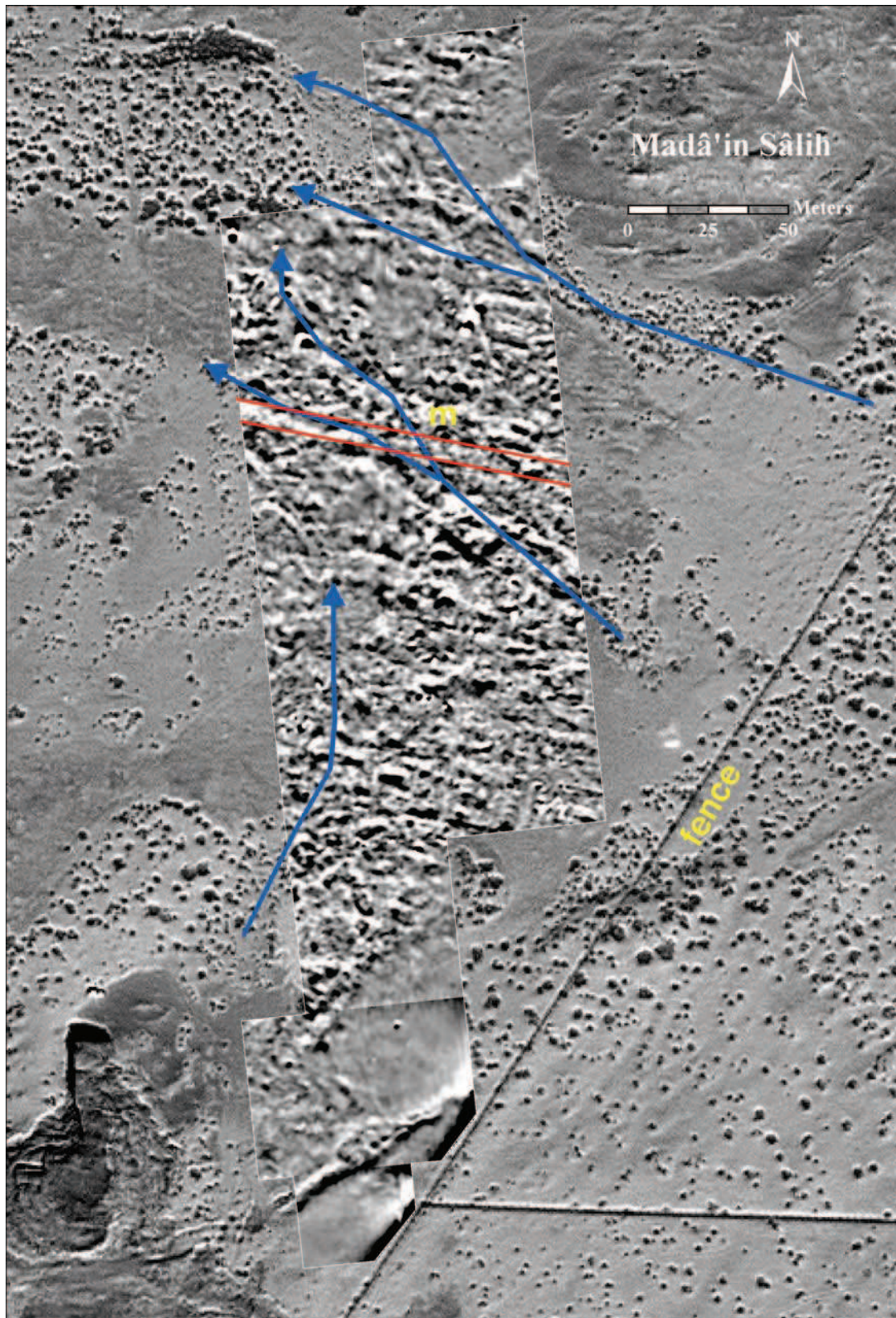
**Fig. 13** Around Area 9. The streets



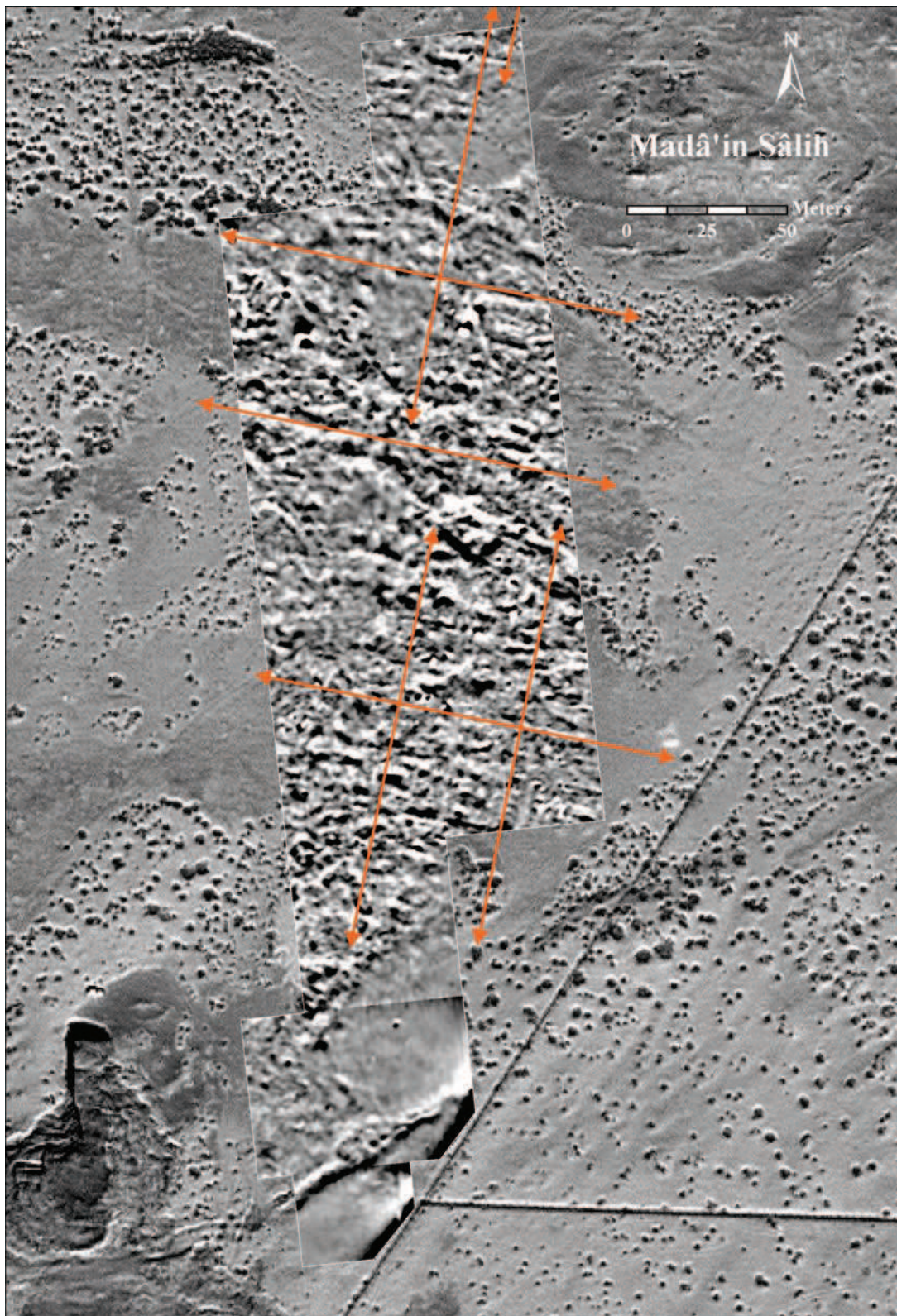
**Fig. 14** Around Area 9. Orientation of the buildings



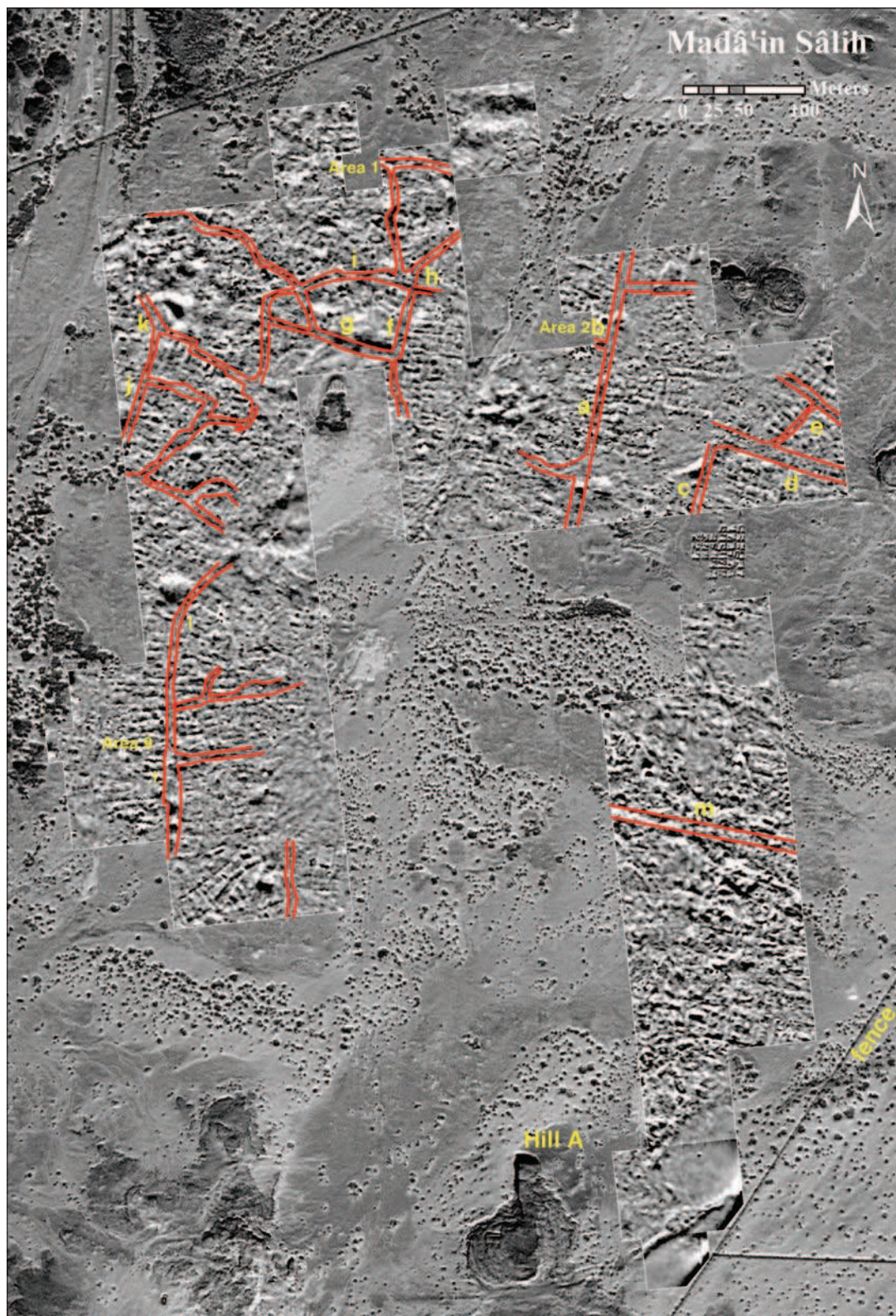
**Fig. 15** From the south of Area 8 to the south-eastern rampart. Unworked results



**Fig. 16** From the south of Area 8 to the south-eastern rampart. The streets



**Fig. 17** From the south of Area 8 to the south-eastern rampart. Orientation of the buildings



**Fig. 18** Synthesis of the interpretation of the magnetic map data



**Preliminary study of the animal bones  
analysed in 2011**

Jacqueline STUDER  
(Museum of Natural History, Geneva, Switzerland)



# Preliminary study of the animal bones analysed in 2011

Jacqueline STUDER

The 2011 season began with a few days devoted to completing the collection of fish skeletons from the Red Sea. The richness of the fish market in Jeddah was the perfect place to acquire some of the species still missing from our reference collection (numbering nearly 250 individuals), which has been patiently gathered over the past fifteen years. The reference collection of fish skeletons is an essential tool for identifying the fish fauna found on archaeological sites in the region, and also allows an estimate of the size of the individuals consumed. Thanks to the logistical support given by the project and to François Bernel, incomparable interpreter, guide and chaperone, we were able to acquire and prepare a few large fish, including the much sought-after *Bolbometopon muricatum*, the green humphead parrotfish (**fig. 1**). So far, this species has not yet been recognized amongst the fish eaten by the inhabitants of Madâ'in Sâlih.

During the 2011 season 2,708 pieces of animal bones were analysed, with a total weight of 15.5 kg (**fig. 2**). This year we chose to concentrate on the fauna from Area 9, from which more than 2,000 bones were studied (**figs 2, 3 and 4**). Smaller collections were also examined at the end of the season: 120 animal bones from tomb IGN 117, the faunal assemblages from *loci* 10146 and 10196 from Area 1 (525 bones), sieving of the sediments contained in the jar from Area 2 (42 bones) and the laboratory cleaning of a donkey mandible in very poor condition, taken from Area 8.

## AREA 9

The stratigraphy of this area testifies to pre-Nabataean and Nabataean occupations (see Fiema's report). In consultation with the excavator of this area, we initially selected about fifteen *loci* rich in faunal material. The interesting results obtained incited me to carry out a rapid examination of all the lots from this area and, according to their relevance, either to remove a few bones (e.g. the Cape hare, *locus* 90004 and the buzzard, *locus* 90008) or to undertake a complete analysis of the lot.

The distribution of species per *locus* studied is presented in **fig. 3** and a preliminary estimate of frequency of species, by number and weight for all the remains from the different phases of occupation (pre-Nabataean and Nabataean periods together) is presented in **fig. 4**. The grouping of the faunal material by occupation phase will be carried out in the future. For now, only a few particular cases described below will be linked to the chronology.

## Domestic animals

From a total of 2017 pieces analysed, 1346 pieces were identified (67%). Sheep and goats are omnipresent in terms of number of specimens (83% of the identified bones) and remain the majority of bones by weight (54% of the domestic mammals). Using the weight method highlights the importance of the meat provided by mammals. Thus, sheep and goats are not only the most numerous animals, but also those which provided the greatest quantity of meat. The predominance of the caprines seems less marked in

certain *loci* (**fig. 3**): a quantitative study by occupation phase or by specific deposits will certainly show some differences. The caprine remains show numerous man-made marks which allow the reconstruction of the different stages of carcass exploitation, from slaughter to consumption. One example of the carving of a part of the spine is shown in **fig. 5**.

Less frequent than the sheep and goats, the camel was nevertheless an animal that was exploited just as regularly since its remains are present in each collection from Area 9 (**fig. 3**). The intentional fragmentation of the bones, as well as the many traces of cutting tools, testify to the regularity of the consumption of camel meat, generally from mature individuals, but also from a few sub-adults about 3-4 years old (**fig. 6**).

Equid remains are rare, numbering only four pieces (**fig. 2**). Already known to be an animal eaten at Hegra between the 4<sup>th</sup> and 7<sup>th</sup> centuries AD (Area 1, see the 2010 report, p. 285), there were three phalanges from the front leg of a donkey (*locus* 91016) which can be considered as waste from the preparation of a carcass. The dimensions of the fourth piece, a fragment of the diaphysis of a femur, are consistent with those of a horse or large mule. Unfortunately, there is nothing diagnostic that allows the determination of the species. It comes from *locus* 90026, probably dating to between the end of the 1<sup>st</sup> century BC and the beginning of the 1<sup>st</sup> century AD. There is a clear cut mark on this diaphysis, which most probably resulted from the exploitation of the thigh, suggesting that this discarded piece is evidence for the consumption of horse (or mule) meat. It should be noted that hybridization between horses and donkeys was practiced during antiquity and that mules (sterile animals) were used to carry heavy burdens in military and commercial convoys (Peters 1998). Therefore, it is not impossible to imagine the presence of mules at Madâ'in Sâlih, even though these animals are rarely attested.

Pigs are represented by three fragments from a single individual aged 10-12 months: a maxilla, a radius with butchery marks and an ulna. The pieces were found in *locus* 90019, which probably dates to between the end of the 1<sup>st</sup> century BC and the beginning of the 1<sup>st</sup> century AD. Was this animal killed locally or was it imported food? Our data are too incomplete to answer this question clearly.

Dogs, which are known for gnawing bones, were represented in Area 1 only by their destructive activities (see the 2010 report, p. 288). However, their presence is now confirmed by the discovery of a partial skeleton comprising nineteen bones (*loci* 90021, 90026, which probably date to between the end of the 1<sup>st</sup> century BC and the beginning of the 1<sup>st</sup> century AD). It is an adult animal about 45 cm high at the withers.

Domestic fowl is represented by a single species, the chicken. The few chicken remains show butchery marks characteristic of consumption.

### Wild animals

Area 9 produced a varied selection of wild animals, all of which were brought there by humans. There were two species of mammals (a large antelope and a Cape hare), four species of diurnal raptors, one mollusc and at least four species of fish. Several bones were used as objects and the only mollusc shell was worked in such a way as to be used as a clothing ornament (**fig. 7**).

All the fish were marine species and most probably came from the Red Sea, even though the Persian Gulf is not excluded *a priori*. Either salted or dried where they were fished, the fish were then transported for at least 120 km. The species identified fall into three families: the emperors (Lethrinidae), parrotfish (Scaridae) and groupers (Serranidae). The majority of fish prepared and transported inland in Jordan during the Nabataean period came from these same families (Studer 2008).

## Ritual practices?

The fauna from Area 9 is unusual because it reflects an exploitation of animals that contrasts with traditional consumption in a domestic context. However, let us add that these differences affect only part of the assemblage, which is nonetheless dominated by the ordinary butchery marks. These differences are the man-made marks found on the following species, individuals and bones:

1/ the limbs of several three-year old rams were carefully disjointed from the body with the help of a knife (*locus* 90042). Pieces of meat were then removed whilst taking care not to fracture any of the bones and to keep the segments articulated;

2/ all the caprine tibias from *locus* 91003 were burned (**fig. 8**). The assemblage from this *locus* comprises 119 pieces and, apart from the tibias, only one fragment of humerus, one patella and two splinters of vertebrae show traces of burning;

3/ the skeleton of a dog shows the characteristic marks of being cut into quarters, of disarticulation of some segments and of defleshing;

4/ some bones of wild animals (mammals and birds) were used as hand-held objects;

5/ wild birds are represented by a variety of raptors (common buzzard, long-legged buzzard, lammergeier, and a probable northern goshawk).

At least some of the points above, notably points 1/ and 2/, are usually recognized as practices associated with a ritual context (in ancient Greece for example, see Davis 1996, Vila 2000, Chenal and Studer 2003). This interpretation might be confirmed by the archaeological context (see Fiema's report "Comments on early dumping operations in Trench A").

## AREA 1

The data acquired in 2010 have been completed by the analysis of two new *loci* (10146 and 10196). The dump 10196 produced 518 remains, mostly of caprines, but also some camel, donkey and chicken bones, and some fish (groupers and parrotfish). The accumulated waste testifies to at least two stages in the exploitation of sheep and goats: the preparation of the carcass and the traces of meals. The cut marks found on a caprine femur show that a kid or lamb was eaten (**fig. 9**). Compared to the other collections already studied from this area, assemblage 10196 is special because it contains many horn cores, which are relatively cumbersome whilst they still retain their horn covering. The twelve horn cores belonged to six rams and two billy goats, and three intact pieces show traces of cutting at the base of the horn core. Removal of the horn covering was done during the butchery of the head in order to facilitate its cooking. This removal of the horn covering is not necessarily linked to a craft usage or to the use of the complete horn as an architectural element. Mixed with the kitchen waste, these horn cores do not stand out: they seem to be the result of a similar exploitation process.

## AREA 2

The faunal material from this area has not yet been analysed, with the exception of the remains of rodents which I collected by sieving the sediments from a large jar (25422\_P01). One spiny mouse and one house mouse, two commensal species, seem to have ended their days at the bottom of this container, but this hypothesis still needs to be confirmed by the study of the bones collected from the contemporary layers.

## AREA 8

The cleaning and analysis of a donkey maxilla covered in a coating of sediments, along with two fragments of camel, are the only archaeozoological data from this area so far (**fig. 10**).

## TOMB IGN 117

The 120 animal bones collected in the burial chamber are mostly from rodents and they are currently being analysed. Their presence is natural and represents either intrusive animals or the prey of a predator which spent time inside the tomb. The other faunal remains will be studied in collaboration with the anthropologists.

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**Fig. 1** Buying a green humphead parrotfish at the fish market in Jeddah. Photo F. Bernel

MADĀ'IN SĀLIH 2011		AREA					IGN 117	Total
		1	2	3	8	9		
<b>MAMMALS</b>		<b>502</b>	<b>42</b>	<b>1</b>	<b>3</b>	<b>1984</b>	<b>102</b>	<b>2634</b>
Sheep, goat	<i>Ovis aries, Capra hircus</i>	75	-	-	2	1117	2	1194
Camel	<i>Camelus dromedarius</i>	19	-	1	2	174	3	199
Donkey	<i>Equus asinus</i>	2	-	-	1	3	-	6
Horse	<i>Equus caballus</i>	-	-	-	-	1	-	1
Pig	<i>Sus domesticus</i>	-	-	-	-	3	-	3
Dog	<i>Canis familiaris</i>	-	-	-	-	19	1	20
Antelope	<i>Addax/Alcelaphus</i>	-	-	-	-	2	-	2
Cape hare	<i>Lepus capensis</i>	-	-	-	-	1	-	1
House mouse	<i>Mus musculus</i>	-	5	-	-	-	-	5
Spiny mouse	<i>Acomys cf. cahirinus</i>	-	37	-	-	-	-	37
	Identified	96	42	1	5	1320	6	1468
	Unidentified	406	-	-	-	664	96	1166
<b>BIRDS</b>		<b>10</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>14</b>	<b>8</b>	<b>32</b>
Chicken	<i>Gallus gallus f. domestica</i>	1	-	-	-	5	-	6
Rock dove	<i>Columba livia</i>	-	-	-	-	-	2	2
Northern goshawk ?	<i>cf. Accipiter gentilis</i>	-	-	-	-	1	-	1
Common buzzard	<i>Buteo buteo</i>	-	-	-	-	2	-	2
Long-legged buzzard	<i>Buteo cf. rufinus</i>	-	-	-	-	1	-	1
Buzzard ?	<i>cf. Buteo</i>	-	-	-	-	1	-	1
Lammergeier	<i>Gypaetus barbatus</i>	-	-	-	-	1	-	1
Barn owl	<i>Tyto alba</i>	-	-	-	-	-	2	2
Passerines	<i>Passeriformes</i>	-	-	-	-	-	3	3
Ostrich	<i>Struthio camelus</i>	7*	-	-	-	3*	-	10*
	Identified	8	-	-	-	14	7	29
	Unidentified	2	-	-	-	-	1	3
<b>REPTILES</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6</b>	<b>6</b>
<b>MOLLUSKS</b>								
Cowrie	<i>Cypraea sp.</i>	-	-	-	-	2	-	2
<b>FISH</b>		<b>8</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11</b>	<b>-</b>	<b>19</b>
Emperor	<i>Lethrinus sp.</i>	-	-	-	-	1	-	1
Parrotfish	<i>Scaridae</i>	-	-	-	-	1	-	1
	<i>Scarus sp.</i>	1	-	-	-	2	-	3
Grouper	<i>Serranidae</i>	-	-	-	-	1	-	1
	<i>Epinephelus sp.</i>	1	-	-	-	4	-	5
	<i>Plectropomus sp.</i>	2	-	-	-	1	-	3
	Identified	4	-	-	-	10	-	14
	Unidentified	4	-	-	-	1	-	5
Unidentified Class		5	-	-	-	6	4	15
<b>TOTAL</b>		<b>525</b>	<b>42</b>	<b>1</b>	<b>3</b>	<b>2017</b>	<b>120</b>	<b>2708</b>

**Fig. 2** Quantification of the faunal remains from Madā'in Sâlih analysed in 2011. Number of identified specimens NISP. \* = egg shell

SECTEUR 9	90004	90008	90019	90021	90026	90037	90038	90041	90042	90044	90046	90047	90051	91003	91011	91016	91017	91018	91021	91027	91031	Total
<b>Domestic animals</b>																						<b>NISP</b>
Sheep, goat			74	9	77	59	76	18	369	70	47	88	2	81	15	28	44	25	13	11	11	1117
Camel			1	2	8	19	13	3	28	9	8	9	3	1	5	8	13	19	6	2	17	174
Donkey																3						3
Horse					1																	1
Pig			3																			3
Dog				6	13																	19
Chicken								1	3	1												5
<b>Wild animals</b>																						
Antelope									2													2
Cape hare	1																					1
Bird (raptor)		1									1						1		3			6
Bird (ostrich)						1*		2*														3*
Mollusc (cowrie)				1		1																2
Fish (emperor)			1																			1
Fish (parrotfish)				1													2					3
Fish (grouper)			4	2																		6
Unidentified			50	68	28	94	20	21	93	49	50	108	5	37	4	15	7	3	13	2	4	671
TOTAL	1	1	133	89	127	174	109	45	495	129	106	205	10	119	24	54	67	47	35	15	32	2017

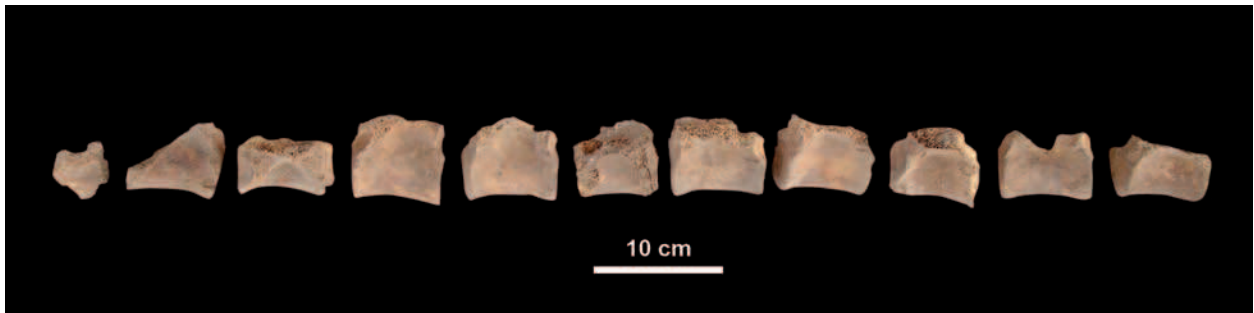
**Fig. 3** Quantification of the faunal remains from Area 9. Number of identified specimens by *locus*. \* = egg shel

AREA 9	NISP	% NISP	Weight [g]	% Weight
<b>Domestic mammals</b>				
Sheep and goat	1117	85%	6000	54%
Camel	174	13%	4910	44%
Donkey	3	<1%	70	1%
Horse	1	<1%	33	<1%
Pig	3	<1%	29	<1%
Dog	19	2%	100	1%
<b>Total</b>	<b>1317</b>	<b>100%</b>	<b>11142</b>	<b>100%</b>

**Fig. 4** Frequency of domestic mammals in Area 9. Number of identified specimens and weight



**Fig. 5** Butchering of sheep/goat vertebral column (*locus* 90042). Cervical vertebrae (upper left corner), thoracic vertebrae (on the two upper lines), lumbar vertebrae (on the two lower lines). Two parallel cracks along the body of the thoracic vertebrae allowed the ribs to be detached. This cut differs from the one used on lumbar vertebrae, which are split into two halves by hitting them in the middle of the vertebral body. Photo J. Studer



**Fig. 6** Camel (dromedary) vertebrae (*locus* 91031). Thoracic vertebrae and one lumbar vertebra. Remains of butchering. Photo J. Studer



**Fig. 7** Claw of *Cypraea* sp. used as an ornament, dorsal view (*locus* 90037). The back of the shell was deliberately cut.  
Photo J. Studer



**Fig. 8** Burnt sheep/goat tibiae (*locus* 91003). Photo J. Studer



**Fig. 9** Femur of a two-month old sheep/goat, caudal view (*locus* 10196). Defleshing marks attesting to the consumption of a lamb or kid goat. Photo J. Studer



**Fig. 10** Donkey mandible, lingual view (*locus* 80218). The remains of large animals are sometimes poorly preserved: the bones turn to dust and the tooth enamel cracks. In spite of the poor state of preservation of this mandible, it was possible to take twenty measurements on the six cheek teeth. Photo J. Studer

# **Pottery Study**

Caroline DURAND (post-doctoral researcher, USR 3439, MOM)



# Pottery Study

Caroline DURAND

The fourth excavation season of the French-Saudi archaeological project in Madâ'in Sâlih / Hegra took place between 14 January and 12 February 2011. The following trenches were opened in the residential area: 1/ continuation of the excavations in Areas 1, 2, 8 and 9;<sup>1</sup> 2/ in the area of the supposed south-eastern gate of the city-wall; 3/ around massif IGN 132.<sup>2</sup> Outside the residential area, the excavation of tomb IGN 117, begun in 2008, was completed<sup>3</sup> and surveys were carried out in the western and southern sectors of the site to study the cairns.<sup>4</sup> Since Yvonne Gerber was unable to join the team this year, the study and registration of the pottery were my responsibility. Initially, the work addressed the pottery from the 2010 season which had not yet been registered, followed by the study of part of the material from the 2011 season. The following report provides an overview of the results obtained, by area and sector, for the 2010 and 2011 seasons. As in previous years, the pottery was registered using the project's *FileMaker Pro* database, which now contains 708 studied *loci* and 1,774 individual sherds. These latter were photographed by Serge Gaiani and drawn by Sylvie Éliès.

## 2010 SEASON

### Residential area

#### *Area 1 – loci 10200*

Due to lack of time, it was not possible to register in 2010 the abundant pottery found Area 1 during that season. Nor was it possible to complete the registration in 2011 and five crates still need to be registered. Twenty-seven *loci*, numbered between 10200 and 10262, were studied and entered into the database during the 2011 season. A stratigraphic sequence covering Phases 1 to 5, as determined by the excavator, from the south-eastern half of trench C, was studied first.<sup>5</sup> We present this in detail here.

*Locus* 10218, which belongs to Phase 5 (**fig. 1**), contains a large amount of material, essentially coarse wares used for utilitarian purposes and cooking. The majority of vessels are made of the brownish fabric characteristic of local productions, notably a small bottle with a ring base (10218\_P05), a casserole with inward sloping rim (10218\_P02) and two cooking pots (10218\_P03, 10218\_P04), the last three being covered with a whitish slip. The two cooking pots have a short, straight neck with a flat rim, as does a third, complete, cooking pot, made of a greenish fabric that is also typically local (10218\_P01). These productions can be dated to between the Late Roman and the Early Byzantine period (mid 2<sup>nd</sup> – early 4<sup>th</sup> century).

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1. See the reports by G. Charloux (Area 1), J. Rohmer (Area 2), S. Marion de Procé (Area 8) and Z. T. Fiema (Area 9) in this volume.

2. L. Nehmé, in this volume.

3. I. Sachet and N. Delhopital, in this volume.

4. W. Abu-Azizeh, in this volume.

5. See the stratigraphy in Charloux 2010, fig. 7, p. 36.

Phase 4 is directly below Phase 5 (*loci* 10228 and 10244, **fig. 2**), and also contains a lot of material. It contains mostly locally produced coarse wares, including many vessels made of reddish-brown fabric covered with a whitish to greenish slip on the outside. These include cooking pots (10228\_P01\*, 10244\_P01, 10228\_P05), a casserole (?) with a reddish interior slip (10228\_P06), a jar with a small, everted grooved rim (10228\_P03), incurved bowls (10228\_P04, 10244\_P04, 10244\_P05) and open bowls (10244\_P03). Certain vessels, such as a jug with an everted bevelled rim (10244\_P02), or a carinated bowl with a groove on the outside of the rim (10244\_P06), are similar to products from Petra.<sup>6</sup> Amongst the material from this level, there are also some sherds of painted bowls of Nabataean fine ware made in Petra, dated to phase 3b (10244\_P09).<sup>7</sup> Taken altogether, this pottery suggests a date of around the end of the 1<sup>st</sup> century or the early 2<sup>nd</sup> century AD. This phase overlies another, Phase 3 (*locus* 10253, **fig. 3**), in which one finds typically Nabataean-period productions. Some are clearly imported from Petra: fragments of painted fine ware bowls made in Petra belonging to phases 2b/c<sup>8</sup> (10253\_P07) and 3a<sup>9</sup> (10253\_P08), and probably a pale red fine ware bowl with a greyish-white slip on the outside of the rim (10253\_P05). Others seem to be local imitations of Petra productions: a bowl or cooking pot (?) with a band of dark red paint on the inside of the rim, made of reddish fabric and covered with a pinkish-white slip (10253\_P03); a pot or jar with everted rim (10253\_P01), made of brownish fabric; small pot (10253\_P06) and carinated bowl (10253\_P09) of brownish fine ware with red slip outside and on the inside of the rim, with a rouletted decoration. On the inside of bowl 10253\_P09, two painted red lines seem to begin at the rim. The decoration on this bowl could perhaps be that known as “2 red lines”, common at Hegra.<sup>10</sup> There is also an everted bowl with a rounded rim of local reddish-brown fabric covered with a slip that forms white to violet-coloured patches (10253\_P02), a few fragments of an imported amphora in a fine, pale brown fabric (10253\_P10), probably Mediterranean (Rhodian?), as well as a sherd of so-called Parthian glazed ware with a decoration in relief (10253\_P04). This assemblage can probably be dated to the period between the late 1<sup>st</sup> century BC and the early 1<sup>st</sup> century AD.

Under *locus* 10253, another occupation phase, Phase 2 (*locus* 10257, **fig. 4**), can be dated to the 1<sup>st</sup> century BC, probably to the first half of that century. This *locus* contains local productions made of brownish fabric, including an everted bowl (10257\_P06), a jar with pinched rim (10257\_P03), a jar with a flat, grooved rim (10257\_P02), a bowl with a small everted rim and horizontal handle (10257\_P05) and a rounded bowl with a flat rim covered with a greyish-brown slip (10257\_P04). There are also a few sherds of reference fabric no. 9 (10257\_P01, 10257\_P08, not illustrated), which are characteristic of the older periods on the site (see below), as well as a fragment of imported amphora with a rolled rim, probably Rhodian, of pale brown fabric containing a few small white inclusions, with a pinkish-white slip covering both sides (10257\_P07). Finally, in the lowest levels, which belong to Phase 1 (*loci* 10259, 10262 and 10268, **fig. 5**), there was not much pottery and few profiles, so that the dating relies mainly on the fabric types. There is a lot of reference fabric no. 9, which is characterized by a pale beige to pinkish fabric containing large inclusions (grey, white and/or red) and usually has a reddish to greyish slip. Considering the large volume of some of the vessels, it is possible that they were produced locally. The forms registered, mostly from *locus* 10262, are the following: a fragment of flat rimmed *pithos* with dark grey slip on the outside and reddish-grey on the inside (10262\_P01); a fragment of storage jar with a banded rim and rounded lip (10262\_P02); a rim of an everted basin (10262\_P03) with red slip inside and greyish slip outside; and two fragments of undetermined

6. Schmid 2000, fig. 61, group 9 for the carinated bowl.

7. Phase 3b: c. 70-100 AD (Schmid 1996).

8. Phase 2b/2c: c. 20 BC-20 AD (*ibidem*).

9. Phase 3a: c. 20-70 AD (*ibidem*).

10. Gerber and Durand 2009, figs 6, 7, 9, 11, p. 289 ; Durand and Gerber 2010 a, fig. 20, p. 356; 2010 b, figs 9, 10, p. 264 ; fig. 68, p. 274.

vessels, both with everted rims (10262\_P04, 10268\_P01). This same *locus* 10262 also produced five sherds of fine, pale beige to whitish fabric (reference fabric no. 41);<sup>11</sup> one sherd from a jar of red fabric with a grey centre, that has white inclusions and voids and is covered with a white slip on the outside, which was registered as reference fabric no. 42 (10262\_P05); two cooking pot sherds of dark grey fabric with small white inclusions, slightly ribbed and burnished on the outside (10262\_P06), registered as reference fabric no. 43; and one sherd from a Nabataean fine ware bowl made in Petra, of pale red fabric covered with a red slip on the outside of the rim, which probably dates to the first phase of production identified by S. Schmid<sup>12</sup> (10262\_P07). These lower levels thus seem quite homogeneous and date to the Hellenistic period, probably around the second half of the 2<sup>nd</sup> century BC. It is possible that fabric nos 41 and 43 are slightly older and date to the early 2<sup>nd</sup> century BC.

### **Area 2, loci 27000 (trench H)**

In trench H in Area 2, opened in 2010 in the north-west of the area, the surface had been removed in order to expose the wall that bordered the north side of the ancient street (wall 20002).<sup>13</sup> These upper levels (*loci* 27000, 27001, 27003, 27005 and 27007) are disturbed and produced a mix of material from the Nabataean and Late Roman periods (**fig. 6**). Amongst the oldest material, we should note several fragments of so-called Parthian glazed ware, such as the ring base of a very damaged cup (?) which probably dates to the 1<sup>st</sup> century AD (27007\_P05), and some fragments of Nabataean fine ware in *locus* 27003 (a carinated bowl from the late 1<sup>st</sup> century BC/early 1<sup>st</sup> century AD). The rest of the material, locally produced, seems to be slightly later. It includes open forms in a reddish-brown fabric covered with a whitish to greenish slip such as: a basin with a small everted rim (27007\_P01); a large bowl with everted rim (27007\_P01); two deep bowls with rounded rim, one of which is complete (27001\_P01, 27007\_P03); and a bowl of relatively fine ware with everted rim (27003\_P04) which is similar to productions from Petra.<sup>14</sup> The closed forms comprise notably: a fragment of storage jar in a reddish fabric with an incised decoration of two vertical lines (27003\_P01); a jar with a straight rim in pale greenish fabric (27007\_P02); a fragment of bottle with a small ring base, in local brownish fabric and greenish slip (27007\_P04); a cooking pot with thickened rim, in a reddish-brown fabric and whitish slip (27003\_P03).

The lower levels were reached in a small sounding opened at the western end of wall 20002 (**fig. 7**). The first occupation level (*loci* 27004, 27006, 27009 and 27010) contained mainly locally produced storage vessels (jars and *pithoi*), generally made of a brownish fabric covered with a whitish slip, such as a fragmentary jar with a straight rim and slightly ribbed body (27004\_P01) and a storage jar or *pithos* with flattened rim and an incised decoration of wavy lines (27004\_P02). This occupation level probably belongs to Phase 3 as identified by the excavator in the north-eastern part of this area (paving 22010) and dated to between the middle of the 1<sup>st</sup> century and the early 2<sup>nd</sup> century AD.<sup>15</sup> This level also produced a fragmentary storage jar, in local porous greenish fabric, with an incised decoration of three bands of wavy lines (27004\_P03) and a cooking pot with a short, incurved rim (27010\_P01), made of reddish fabric with a greyish-white slip that resembles the productions in Petra from the 1<sup>st</sup> century AD. The *loci* immediately below this level (*loci* 27011 and 27008) contain few datable pieces. Two fragments of cooking pots with short, slightly incurved neck and rounded rim (27011\_P01), made of local brown fabric covered with a greenish-white slip, as well as fragments of Nabataean fine ware from 27008, suggest a date between the late 1<sup>st</sup> century BC and

11. See below, Area 9 – 90000.

12. Phase 1: c. 150-100 BC (Schmid 2000).

13. Rohmer 2010, on the excavations of Area 2.

14. Schmid 2000, fig. 126.

15. Rohmer 2010, p. 58-59 and figs 21-22, p. 78-79.

the early 1<sup>st</sup> century AD which could belong to Phase 2 found in the rest of the area.<sup>16</sup> Perhaps the small decorated jar 27008\_P01, made of local reddish-brown fabric with a whitish slip should also be dated to this period, even though it somehow resembles productions of the Islamic period.

Finally, the small amount of pottery from the lower occupation level, made up of *loci* 27012 and 27013, is not sufficient to date this phase. It includes a circular ‘token’ made of the common local reddish-brown fabric with white slip (27013\_P01) and a lamp base of fine grey fabric, probably imported (27013\_P02). The fabrics of the sherds from *locus* 27015, located directly below 27013, suggest a late Hellenistic date (late 2<sup>nd</sup>–early 1<sup>st</sup> century BC). The productions from this period are characterized by a red to pale red fabric, with small white inclusions and voids visible both in the section and on the face of the sherd (fabric no. 42, see Area 1 above). They are usually covered with a white slip on the outside (for example the rim of a large bowl or basin with rounded rim, with two grooves on the outer body, 27015\_P01).

### **Area 3 – loci 33000**

The *loci* 33000 (fig. 8) belong to the area of the so-called ‘north gate’ of the city-wall, near to the Marbat al-Hisân massif, which was investigated between 2009 and 2011. *Loci* 33004, 33006, 33007 and 33008 were in the sounding opened to the west of the ‘gate’ and cross-sectioning the city-wall. What little material was found appears relatively homogenous and can be dated to the 1<sup>st</sup> century AD. It includes several bowls with ring bases of fine or coarse ware (33008\_P02, 33008\_P04), a bowl of local fabric with inward-folded rim (33008\_P03), and a cooking pot of local brownish fabric and greenish slip with a profile resembling the productions from Petra (33008\_P01). *Locus* 33101 represents the surface scraping of a sounding opened across the city-wall, to the east of the supposed gate, and *locus* 33200 represents a surface collection made on and around the two rectangular structures that make up this gate. The pottery from these two *loci* is mixed, going from the Hellenistic period (several sherds of fine beige to whitish fabric, no. 41, 33101\_P01) to the Nabataean period. Finally, *locus* 33300 corresponds to the material from two pit-tombs cut into the top of the Marbat al-Hisân massif. Some pieces can be dated to the Nabataean period, but others seem to be slightly later (jar 33300\_P01).

### **Area 3 – loci 34000**

The *loci* 34000 (fig. 9) represent a series of surface collections from the so-called ‘military camp’ located south of the residential area.<sup>17</sup> *Loci* 34020, 34021 and 34022 are in the rocky ‘quarry’ located a few dozen metres north-west of this camp. *Locus* 34020 represents the surface scraping. This assemblage contains both modern and ancient pieces, but the latter seem to be limited to a time between the late 1<sup>st</sup> century BC and the middle of the 2<sup>nd</sup> century AD. They consist of a few fragments of unpainted Nabataean fine ware, a sherd of so-called Parthian glazed ware (34020\_P04), and some locally produced pieces (jars/cooking pots 34020\_P02, 34020\_P03, 34022\_P02; everted bowl 34020\_P01). The few fragments of local productions registered for *locus* 34021, which represents a compact surface with traces of hearths, to the west of this space (thought to be a courtyard in the final analysis), cannot be accurately dated. The presence of a Nabataean coin from Aretas IV (34021\_C01) might suggest an occupation during the 1<sup>st</sup> century AD. *Locus* 34022, which represents a clayey layer in the south-east corner of this ‘courtyard’, contains material that seems to date to the late 1<sup>st</sup> century or early 2<sup>nd</sup> century AD. In particular, it contains a plate of oriental

16. Rohmer 2010, p. 52-54 and fig. 3, p. 69.

17. For a preliminary assessment of the material from this area, see Durand and Gerber 2010 b, p. 259.

sigillata (34022\_P02) of the Hayes type 55 or 58<sup>18</sup> and a sherd of a jar with many biotite inclusions, which could be a production from the Aqaba region (34022\_P01).

## 2011 SEASON

### Residential area

The study of the material found in 2011 concentrated on Area 9. This area was opened in 2010 and its stratigraphy is slightly different from that in the areas studied so far in the residential area. Thus it seemed to us to be the most likely to provide new information. We will also present the material from tomb IGN 117 and the preliminary study of the material picked up on the survey around the cairns. The rest of the material (Areas 1, 2, 3, 6 and 8) will need to be studied and registered as soon as possible.

### Area 9 – loci 90000

In 2011, excavations continued in Area 9, located in the south-west part of the residential area (figs 10-11).<sup>19</sup> The first season, in 2010, revealed a more limited period of occupation than in Areas 1 and 2, mainly covering the late Hellenistic and Nabataean periods and not going beyond the 2<sup>nd</sup>–3<sup>rd</sup> centuries AD.<sup>20</sup> *Locus* 90037, which lays immediately below the last *loci* excavated in 2010, can be dated to the second half of the 2<sup>nd</sup> century BC or to the early 1<sup>st</sup> century BC by a sherd of a painted Nabataean bowl (90037\_P04) made in Petra, which is characteristic of the phase 1 established by S. Schmid.<sup>21</sup> The rest of the material is mostly made up of coarse wares in a brownish to reddish fabric, including a jar with a short, narrow neck and flat rim (90037\_P01), a cooking pot with rounded rim (90037\_P02) and a jar with rounded rim that seems to have been handmade and the provenance of which is not clear (perhaps local?) (90037\_P03).

A similar or slightly earlier date is proposed for *loci* 90038 and 90041, which are directly below 90037. These contain local productions characterized by their reddish fabric, covered with a red or greyish-white slip, including two bowls (90038\_P02, 90038\_P03), a jar (90038\_P04) and cooking pot with a short neck and flat rim (90038\_P01), and the rim of an everted bowl with internal grooves, in a so-called Parthian glazed ware (90038\_P05). The presence of a tetradrachme of Alexander the Great in *locus* 90042 suggests a date between the late 3<sup>rd</sup> century and the 2<sup>nd</sup> century BC. The pottery from this level is relatively homogeneous. The coarse wares, probably local, have the following characteristics: a red to grey fabric containing white inclusions and numerous vacuoles, often covered with a red slip (inside and outside), and/or a white/grey slip outside. These are mostly open forms (bowls and basins), with rounded profiles (90042\_P01, 90042\_P02, 90042\_P05), sometimes burnished on the inside (90042\_P03). There is also a closed form, without neck (90042\_P06). A sherd (of a jar?) has an incised decoration in two horizontal lines above a wavy line (90042\_P07). Another, thicker, fragment (storage jar) has a stamped decoration of a row of concentric circles framed by two rows of small triangles (90042\_P04). This *locus* also had a sherd of so-called Parthian glazed ware (90042\_P08) and a sherd from an imported amphora (Rhodian?), made of a fine light brown fabric covered with a pinkish-white slip (90042\_P09).

The lower *loci* (90044, 90046, 90047 and 90051) have very little pottery. The fabrics present are characteristic of the older periods at the site (2<sup>nd</sup> century BC at least): they are mostly reddish-brown fabrics with vacuoles (lid? 90047\_P03), sometimes burnished (bowl 90047\_P01), and some vessels in fabric no. 9 (storage jar

18. Hayes 1985, Pl. VII, no. 6 or 11.

19. Fiema, in this volume.

20. Fiema 2010; Durand and Gerber 2010 b.

21. See note 14.

with a small everted neck and rounded rim 90046\_P01; an incurved bowl with a flat rim and burnished red slip inside 90046\_P02). *Locus* 90047 also produced about a dozen sherds of fine, pale whitish to beige fabric, registered as no. 41 in our reference collection. This type of pottery is recurrent at Madâ' in Sâlih in the deeper levels. Its provenance remains unknown, but it is clear that it is a Hellenistic-period production, even early Hellenistic (3<sup>rd</sup> century to early 2<sup>nd</sup> century BC?). About a dozen sherds of the same production came from *locus* 90051 (including one 'token': 90051\_P02), which marked the bottom of the excavation. They are associated with a fragment of painted bowl (90051\_P01) identical to the sherds that are found in large quantities on the neighbouring site of Khurayba / Dedân, dated at the latest to the early 2<sup>nd</sup> century BC.<sup>22</sup> This fragment bears witness to contacts that might have existed between the two places at the end of the Dedanite period.

### **Area 9 – loci 91000**

In order to understand better the organization of Area 9, a second square was opened in 2011, immediately to the north-east of the first (figs 12-15).<sup>23</sup> The surface levels (*loci* 91000, 91002, 91003 and 91013, fig. 12) contain material that seems to date mostly to the 1<sup>st</sup>-2<sup>nd</sup> centuries AD, including numerous local productions characterized by the reddish-brown fabric with white inclusions and covered with a greenish-white slip, such as: a jar with pinched rim (91003\_P01); a jug with rounded rim (91003\_P02); a cooking pot with bevelled rim (91003\_P03); and a jar with short neck and everted rim, grooved on the top (91002\_P01). Certain fragments might be imported from Petra, including a jar or globular pot with small rounded rim (91002\_P02) and a cooking pot with short, straight neck and horizontal, grooved rim (91002\_P03). Others might come from elsewhere: a lamp fragment of fine light brown fabric with a trace of dark red slip, 91003\_P04. A few pieces seem to be more recent (Late Roman or Early Byzantine): a lid with cut rim made of local brownish fabric (91013\_P01), a flat-bottomed basin (complete profile) with an incised decoration of wavy lines between two bands of horizontal lines, made of local greenish fabric (91013\_P02) and a *pthos* with flat rim, made of brown fabric covered in greyish slip, with a lightly incised decoration of oblique lines on the outside of the rim (91000\_P01).

Below these surface levels, there is an occupation phase that goes back to the 1<sup>st</sup> century AD (*loci* 91005, 91008, 91010, 91011, 91020, 91021, 91026 and 91030, figs 13-13a). The majority of the material is composed of local productions in pale brownish fabric covered in greenish-white slip, such as: jars with rounded rims (91008\_P02, 91011\_P02, 91030\_P01), or flattened rims (91011\_P03) or pinched rims (91021\_P01); jugs (91020\_P01, 91021\_P03);<sup>24</sup> cooking pots (91011\_P01, 91026\_P03, 91021\_P02) and a casserole (91010\_P01); a lid with incised decoration (91011\_P04); and bowls of different sizes and types (91021\_P04, 91021\_P05, 91026\_P01, 91026\_P02, 91026\_P04). Amongst the imported products there are several fragments of fine wares: a Nabataean painted bowl made in Petra, dating to phase 2c or 3a (91021\_P07), incurved bowls in grey fabric (91011\_P05, 91021\_P06), juglet (?) with rouletted decoration in beige fabric covered with a red polish (91030\_P03, possibly an imitation of sigillata vessels). There are also a few sherds of so-called Parthian glazed ware (91005\_P01), a bifid handle of a Mediterranean amphora (91026\_P05), probably of the Dressel 2-4 ("pseudo-Coan") type,<sup>25</sup> in a reddish-brown micaceous fabric

22. This late date is suggested by the preliminary studies carried out on the pottery from Khurayba / Dedân (al-Said 2010, p. 268-269).

23. Fiema, in this volume.

24. Same profile in Petra: Schmid 2000, no. 306-309.

25. This type of amphora was widely distributed in the Roman East between the 1<sup>st</sup> century BC and the 1<sup>st</sup> century AD. Notably, it is found in Petra and Aqaba (Parker 1996, p. 244, fig. 8).

covered in a light brown slip, as well as a fragment of a lamp with pierced handle in a red fabric covered in red slip (91008\_P03).

*Loci* 91014, 91016 and 91027 (**fig. 14**) seem to be slightly older. They can be dated to the late 1<sup>st</sup> century BC and the early 1<sup>st</sup> century AD. The material includes several fragments of Nabataean fine ware of the “2 red lines” type (91027\_P04, 91027\_P02, 91027\_P03), some cooking pots with short necks and rounded rims (91014\_P01, 91027\_P05) or with everted rims (91027\_P03, 91027\_P06, 91027\_P07), a thick-bodied bowl with a horizontal handle (91014\_P02), an incurved bowl (91014\_P03) and an everted bowl (91027\_P01) made of local reddish-brown fabric and whitish slip, as well as a jar with a small ring base of red fabric with a grey core, covered with reddish slip (91016\_P01). There is also a small sherd of eastern sigillata (closed form), produced in Asia Minor (91014\_P04).

*Locus* 91017 corresponds to the pottery dump found in the north-east corner of the square.<sup>26</sup> A lot of material came from this *locus*, which must be subdivided into three sub-levels. Only a part of the material from this dump was studied in 2011, the rest will need to be studied in 2012 after restoration of the complete vessels. For now, we can note the presence of a few fragments of Nabataean painted fine ware bowls manufactured in Petra during phase 3b (late 1<sup>st</sup> century AD) and some local productions (cooking pots and jars) with profiles that seem to date rather to the 1<sup>st</sup> century BC (perhaps late 1<sup>st</sup> century BC).

Finally, the lower levels (*loci* 91018, 91019 and 91031, **fig. 15**) appear to be late Hellenistic (late 2<sup>nd</sup>–early 1<sup>st</sup> century BC). In particular, they contain coarse wares made of reddish to brownish fabric with white inclusions, some with vacuoles, such as: a storage jar or *pithos* with slightly flattened rim (91019\_P01); a jar with pinched rim, covered with white slip (91018\_P03); several cooking pots with short necks and rounded rims (91031\_P02, 91018\_P02, 91018\_P04); a krater decorated with small incised vertical lines on the rim (91031\_P01); and a large bowl or basin with white slip inside and rounded rim (91018\_P01). There is also a fragment of a deep bowl with a horizontal rim with grooves near the rim, made of black glazed Hellenistic pottery probably imported from the Aegean region (91018\_P05), and a fragment of a Nabataean fine ware bowl with red slip, which fits into the Petra productions of phase 1 (91018\_P06).

### **Tomb IGN 117 (*loci* 50000)**

The excavation of tomb IGN 117, which began in 2008 and continued in 2009, was completed this year.<sup>27</sup> As might be expected, very little pottery was found. The few fragments found can be dated to the second half of the 1<sup>st</sup> century AD, which is the date of the construction of the tomb<sup>28</sup> (**fig. 16**). Amongst the pottery, there is some Nabataean fine ware imported from the Petra region: a fragment of a ring base (50315\_P01) which probably came from the globular juglet previously registered as number 50120\_P01<sup>29</sup>, and two sherds of a small globular pot with an incised decoration of horizontal and vertical lines on the neck (50332\_P01). One sherd of so-called Parthian glazed ware (50288\_P01) perhaps dates to the same period even though the profile of the vessel remains unclear. However, two local productions can be dated to the Nabataean period: a small fragment of a bowl with an incurved rim (50336\_P01), and a complete bowl with everted sides and flat base, with traces of fire and a whitish residue in the bottom (50332\_P02). This latter was removed from the collection and taken to France for analysis.

26. Fiema, in this volume.

27. Sachet and Delhopital, in this volume.

28. Delhopital and Sachet 2009, p. 169-170.

29. Delhopital and Sachet 2009, fig. 29, p. 206 ; Gerber, Durand 2009, figs 47-48, p. 297.

### The tumuli (*loci* 41000)

The survey carried out in the Jabal al-Kharymât and Qasr as-Sâni‘ areas<sup>30</sup> included collecting surface pottery around the structures recorded (figs 17-18). Only those fragments with an interesting form or decoration were documented and registered in the database in 2011. In general, the pottery is characterized by fabric that ranges from red to brown, containing black, white, red or pink inclusions, sometimes covered in grey or red slip. This production (fig. 17) covers a series of small jars with slightly everted rims (41004\_P01, 41004\_P02, 41004\_P03, 41004\_P04, 41024\_P01, 41045\_P01, 41047\_P01), a collarless jar with vertical, pierced, lug (41006\_P01), and a few fragments with an impressed decoration of small circles, generally aligned along two parallel lines: 41001\_P01 and P02 (undetermined form, with a spout (?), 41002\_P01, 41004\_P05, 41004\_P06, 41047\_P02). This impressed decoration of small circles is also found as a line on each side of a handle (41019\_P01), and on small circular lugs where the small circles form bunches (41006\_P02, 41006\_P03). These decorated pieces made of reddish fabric are probably the oldest productions found so far on the site of Madâ‘in Sâlih and, even though their exact date remains unknown for the moment, without doubt they date back to the pre-Hellenistic period.

Part of the material picked up seems to be more recent (Hellenistic?) (fig. 18). It is characterized by a fine, light brown fabric and includes: several ring bases that probably come from the same pot (41010\_P01); a juglet with horizontal rim covered with red slip (41010\_P02); and a jar with small rounded rim and a smooth surface (41042\_P04). A large bowl of brownish fabric with voids and covered with a violet slip inside and pinkish-white slip outside (41009\_P01) could also date back to the Hellenistic period, as well as a bowl fragment 41042\_P02, made of brownish fabric covered with red slip. A series of black glazed sherds manufactured in the Aegean (41042\_P03) belong to the same period. The Mediterranean imports also include a sherd of western sigillata (probably Italian, 41030\_P01) and two amphora fragments of undetermined provenance: the first, probably from the Hellenistic period, is made of a brown fabric covered in light brown slip (41042\_P05); the second, of undetermined date (Hellenistic or Roman?), is made of a pale brown fabric covered in a yellowish-white slip (41030\_P02). The ring base of a bowl (41009\_P02), in a fine pale red fabric, is probably a Nabataean-period import from Petra. Finally, a jar with an everted, grooved rim (41042\_P01), made of local reddish-brown fabric, could date to the late 1<sup>st</sup> century BC.

There are two small, undetermined fragments (41037\_P01, 41031\_P01), made of a fine pale grey fabric, bearing traces of burning on the outside. These are very small, closed forms, with a rouletted decoration or vertical lines on the outside. It is possible that these are fragments of Ottoman pipes, which were produced in large numbers in the Mediterranean basin and the Near East between the 17<sup>th</sup> and early 20<sup>th</sup> centuries.

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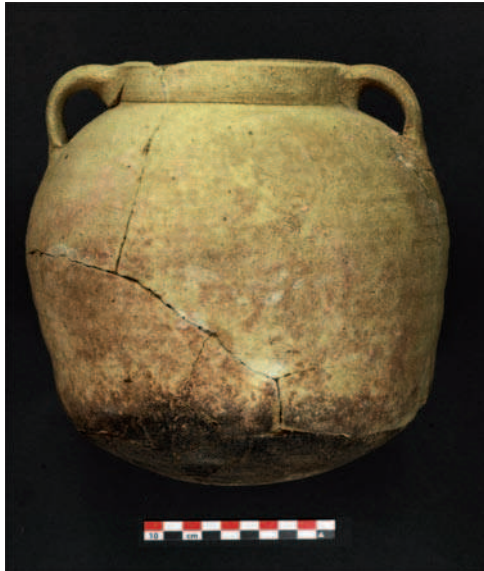
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30. Abu-Azizeh, in this volume.

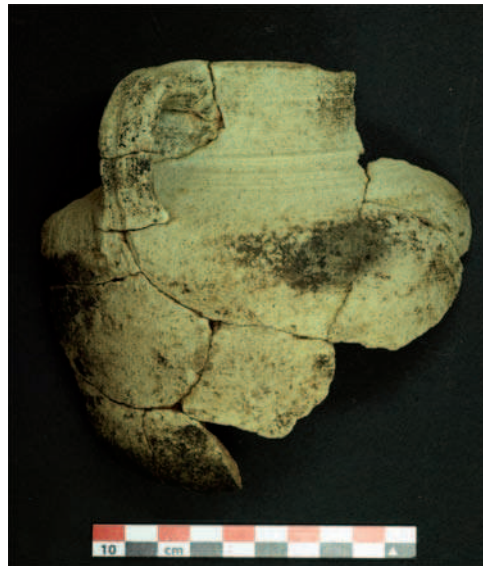
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**Fig. 1**

**Area 1 – loci 10000  
Phase 5: locus 10218**



10218\_P01



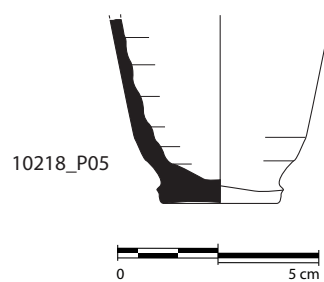
10218\_P03



10218\_P02



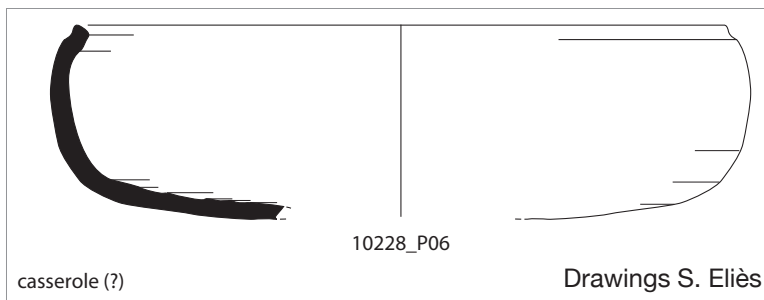
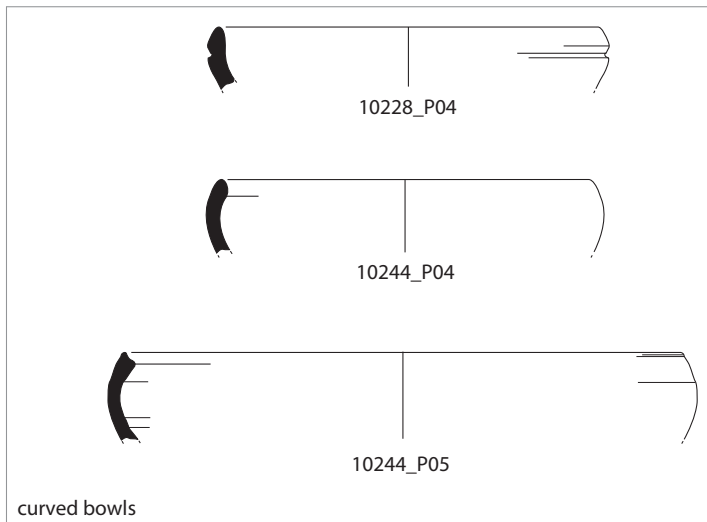
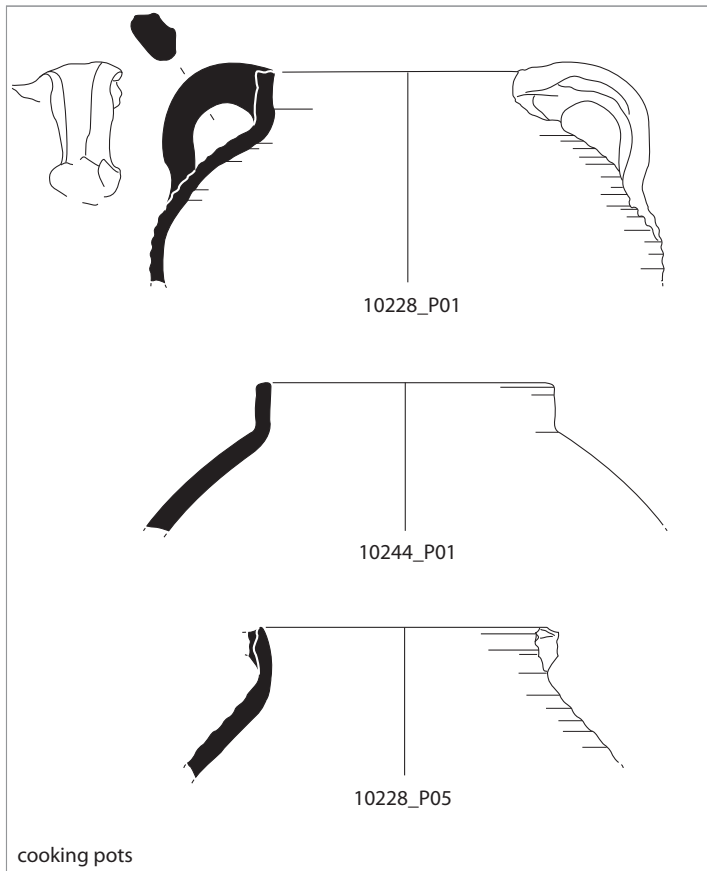
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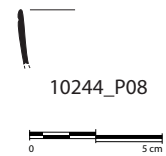
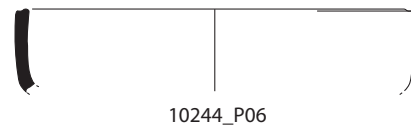
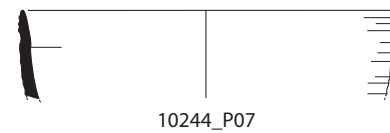
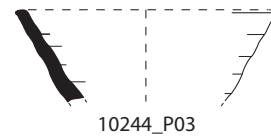
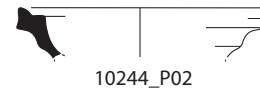
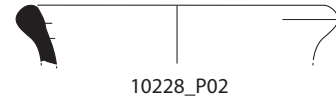
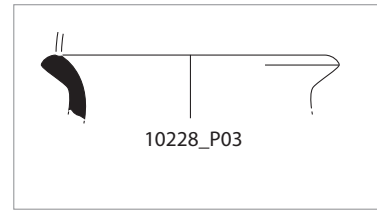
10218\_P05

Drawing S. Eliès

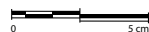
Fig. 2



Area 1 – loci 10000  
Phase 4 : loci 10228 and 10244



Drawings S. Eliès

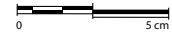
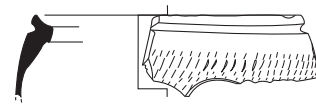


**Fig. 3**

**Area 1 – loci 10000  
Phase 3**



10253\_P01



10253\_P06



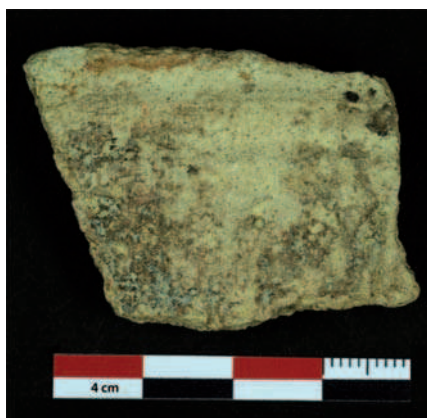
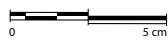
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10253\_P07



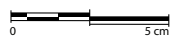
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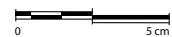
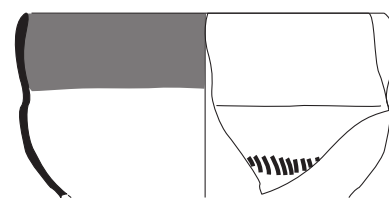
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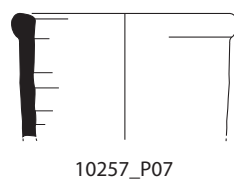
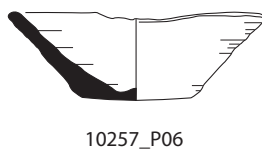
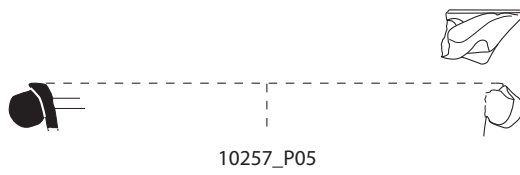
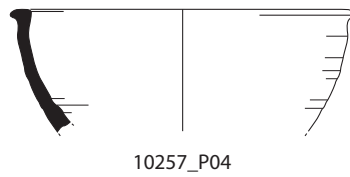
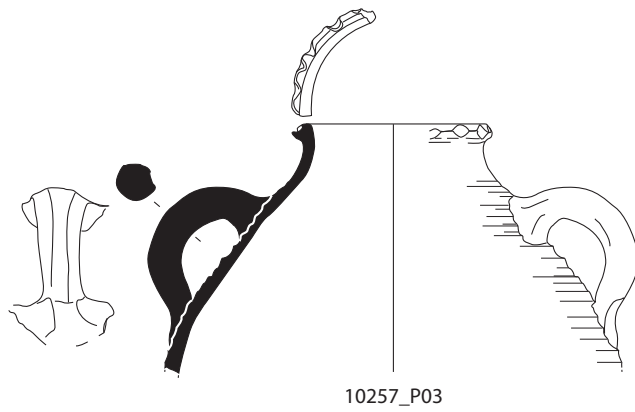
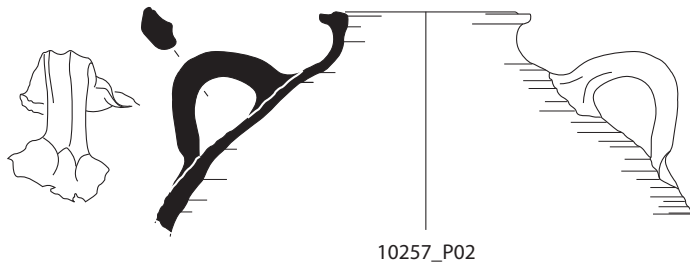


10253\_P09

Drawings S. Eliès

Fig. 4

Area 1 – loci 10000  
Phase 2: locus 10257



Drawings S. Eliès

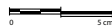
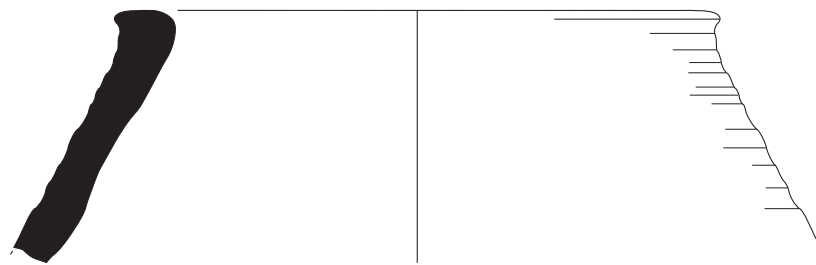


Fig. 5

Area 1 – loci 10000  
Phase 1: loci 10262 and 10268



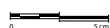
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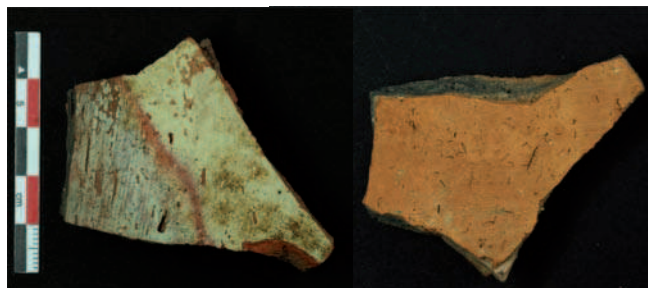
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10262\_P03



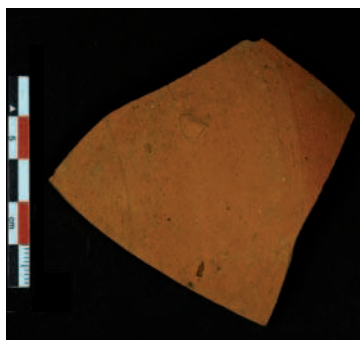
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10262\_P05



10262\_P06



10262\_P07

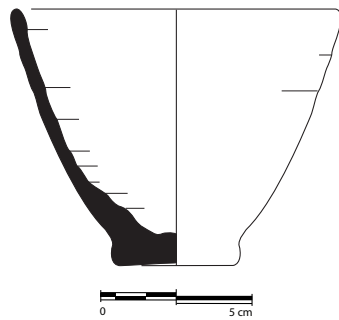


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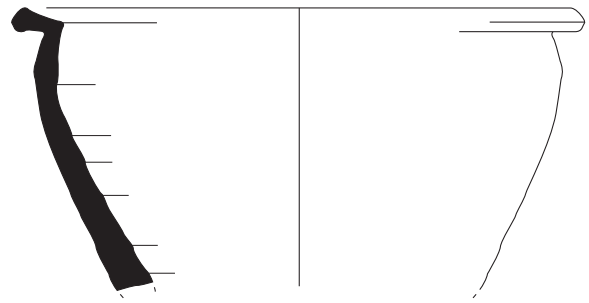
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Fig. 6

Area 2 (trench H) – loci 27000



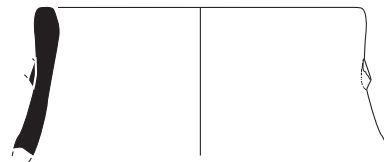
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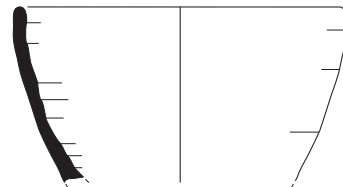
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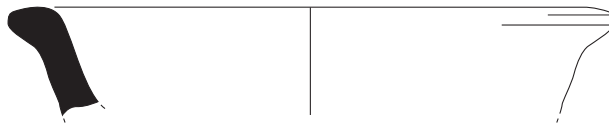
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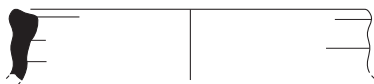
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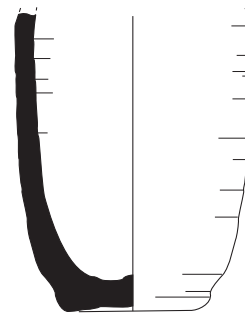
27007\_P03



orientation  
27003\_P02



27003\_P03



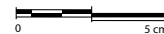
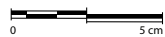
27007\_P04



27003\_P04



27007\_P05



Drawings S. Eliès

Fig. 7

Area 2 (trench H) – loci 27000



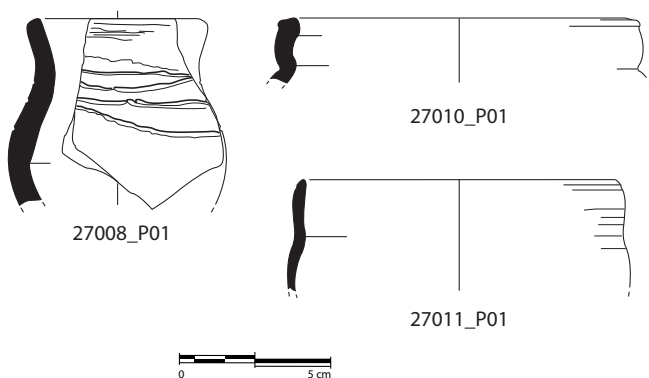
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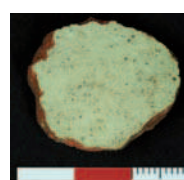
27004\_P02



27004\_P03



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27013\_P01



27013\_P02



27015\_P01

**Fig. 8**

**Area 3 (“northern door” of the rampart) – loci 33000**



33008\_P01



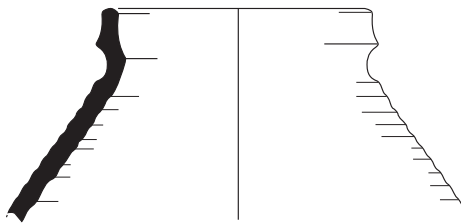
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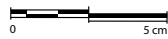
33008\_P03



33008\_P04

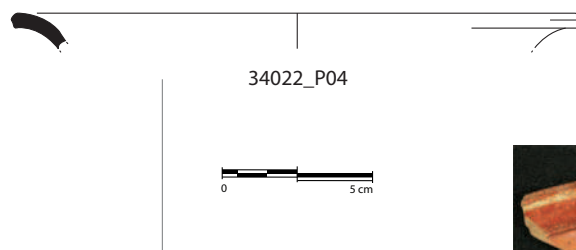
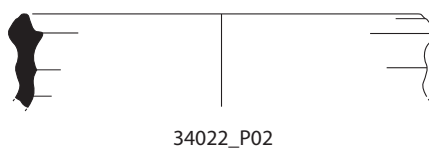
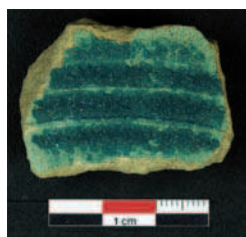
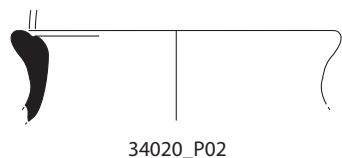
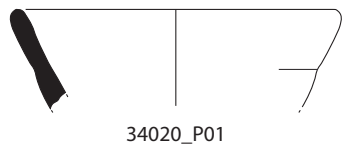


33300\_P01



**Fig. 9**

**Area 3 (“military camp”?) – loci 34000**



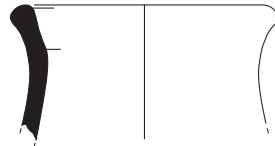
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**Fig. 10**

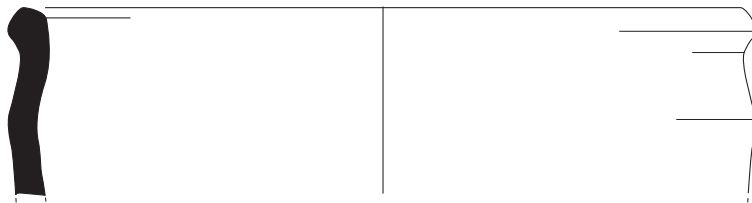
**Area 9 – loci 90000  
(loci 90037 and 90038)**



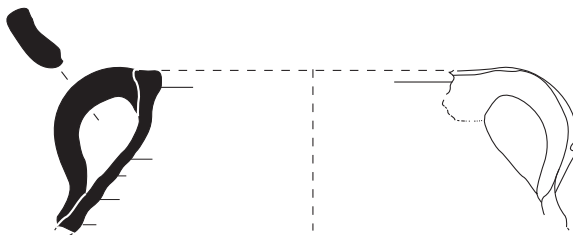
90037\_P01



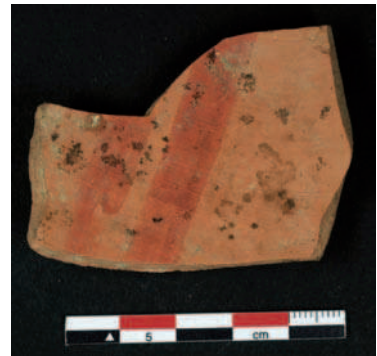
90037\_P02



90037\_P03



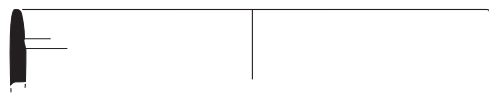
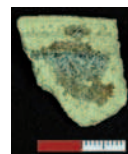
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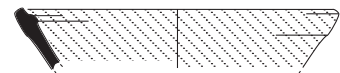
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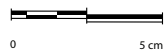
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90038\_P05

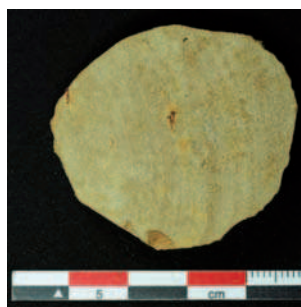
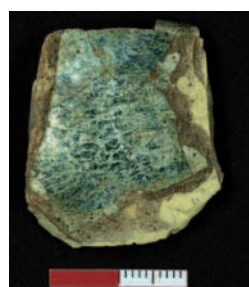
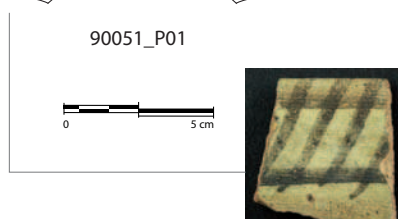
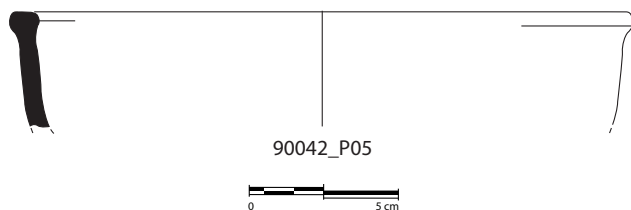
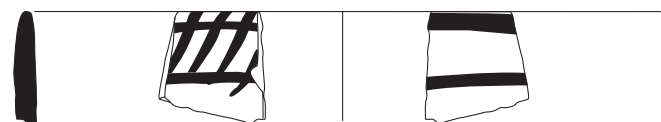
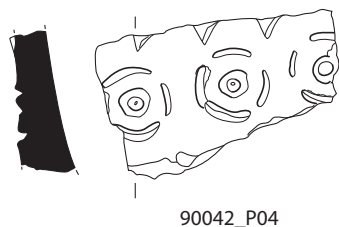
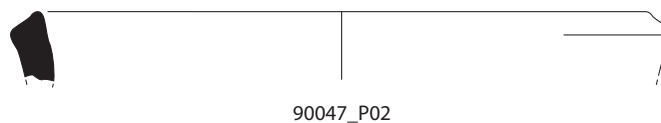
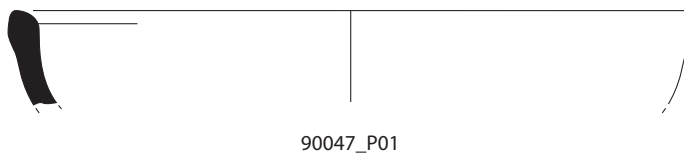
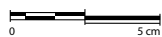
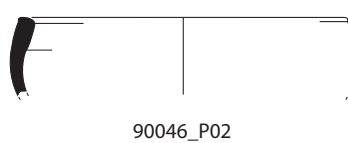
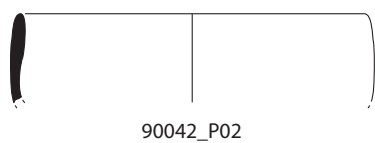
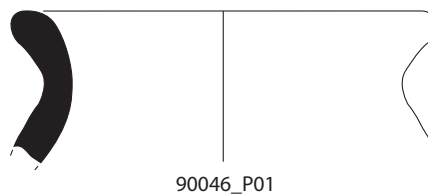
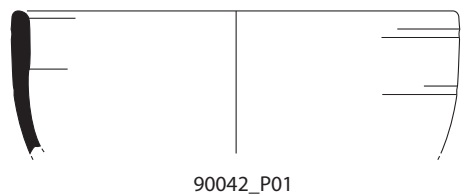


90038\_P04



Drawings S. Eliès

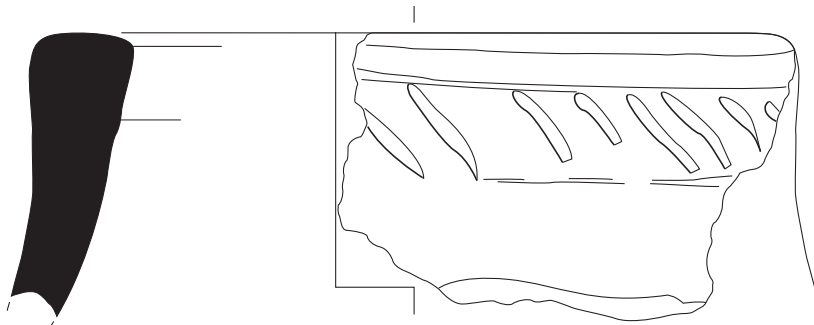
**Fig. 11**  
**Area 9 – loci 90000**  
**(loci 90042, 90046, 90047, 90051)**



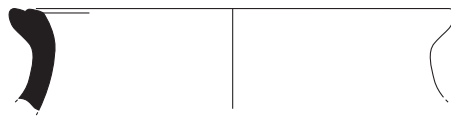
Drawings S. Eliès

Fig. 12

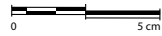
Area 9 – loci 91000  
(loci 91000, 91002,  
91003, 91013)



91000\_P01



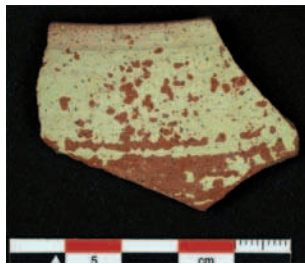
91002\_P01



91003\_P03



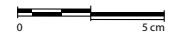
91003\_P04



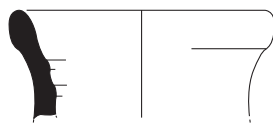
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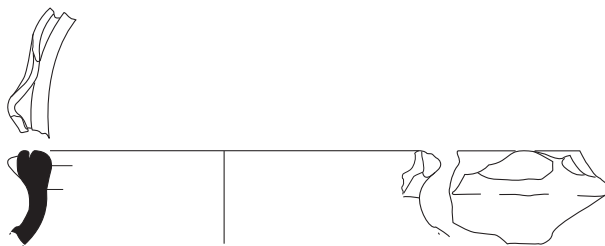
91013\_P01



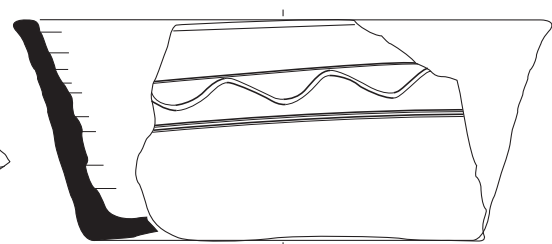
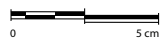
91002\_P03



91003\_P02



91003\_P01

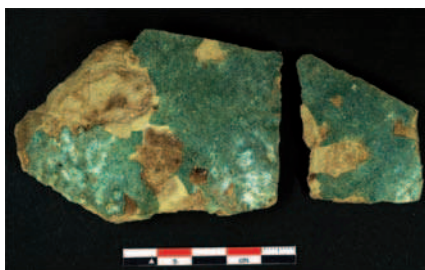


91013\_P02

Drawings S. Eliès

Fig. 13

Area 9 – loci 91000  
(91005, 91008, 91010, 91011)



91005\_P01



91008\_P02



91008\_P03



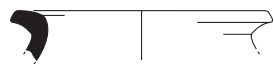
91010\_P01



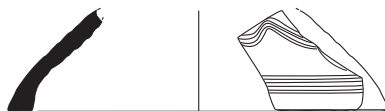
91011\_P01



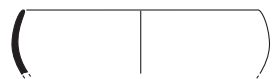
91011\_P02



91011\_P03



91011\_P04



91011\_P05

Drawings S. Eliès

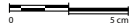
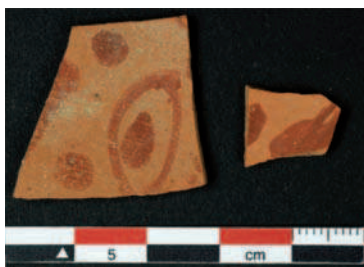
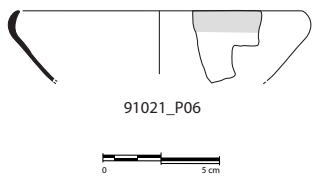
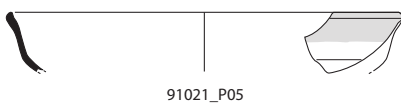
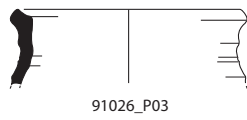
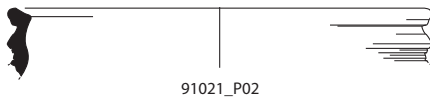
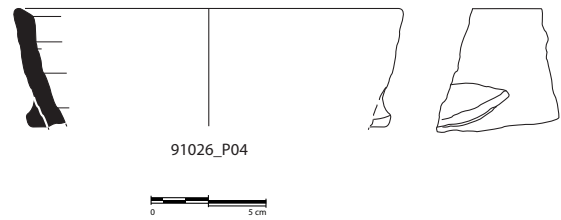
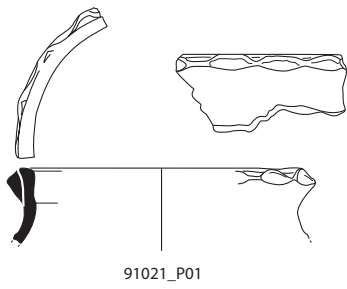
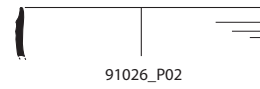
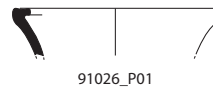
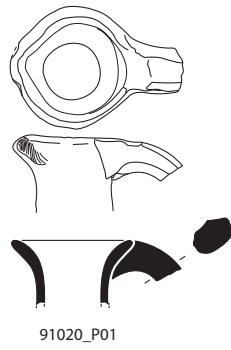


Fig. 13 bis

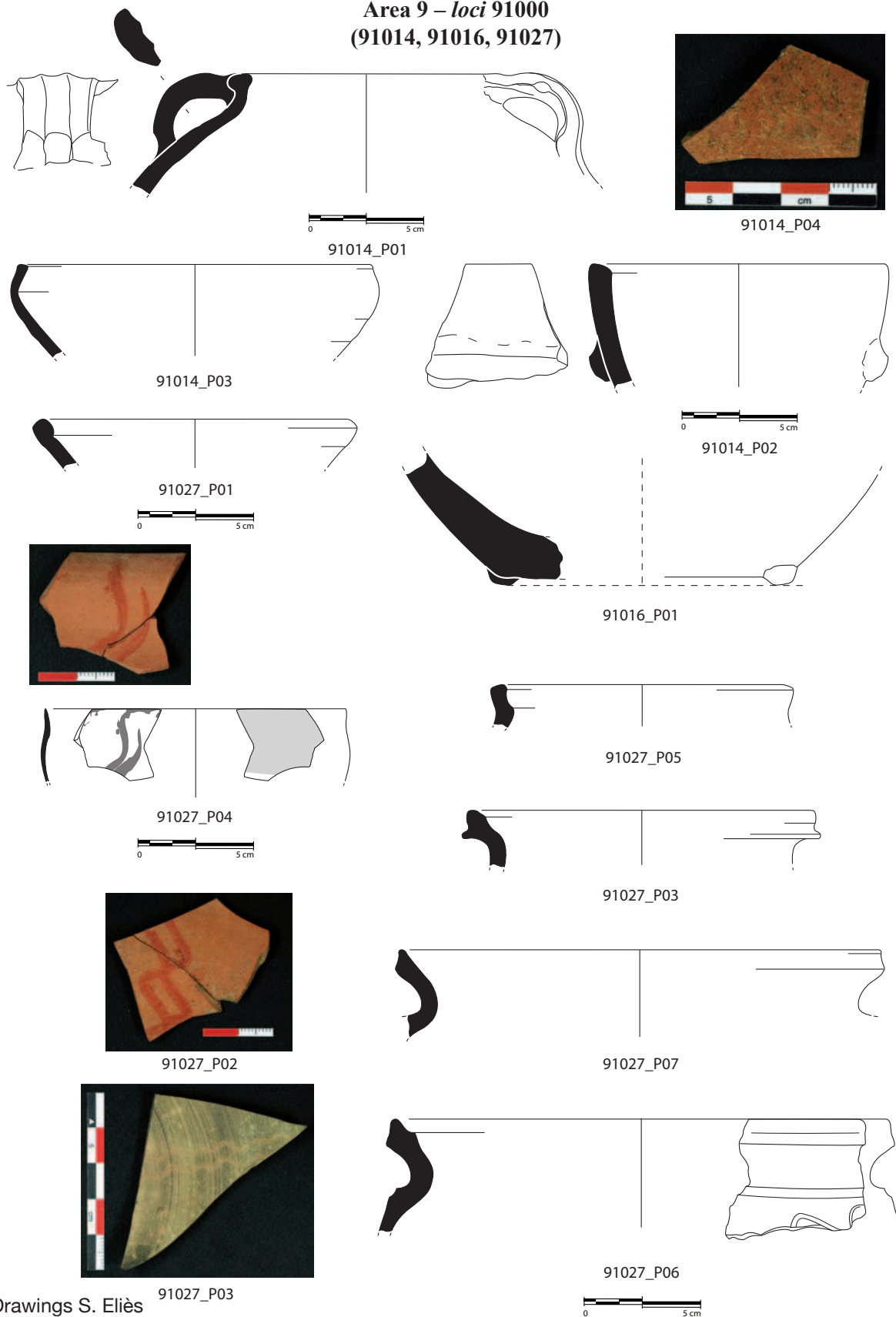
Area 9 – loci 91000  
(91020, 91021, 91026)



Drawings S. Eliès

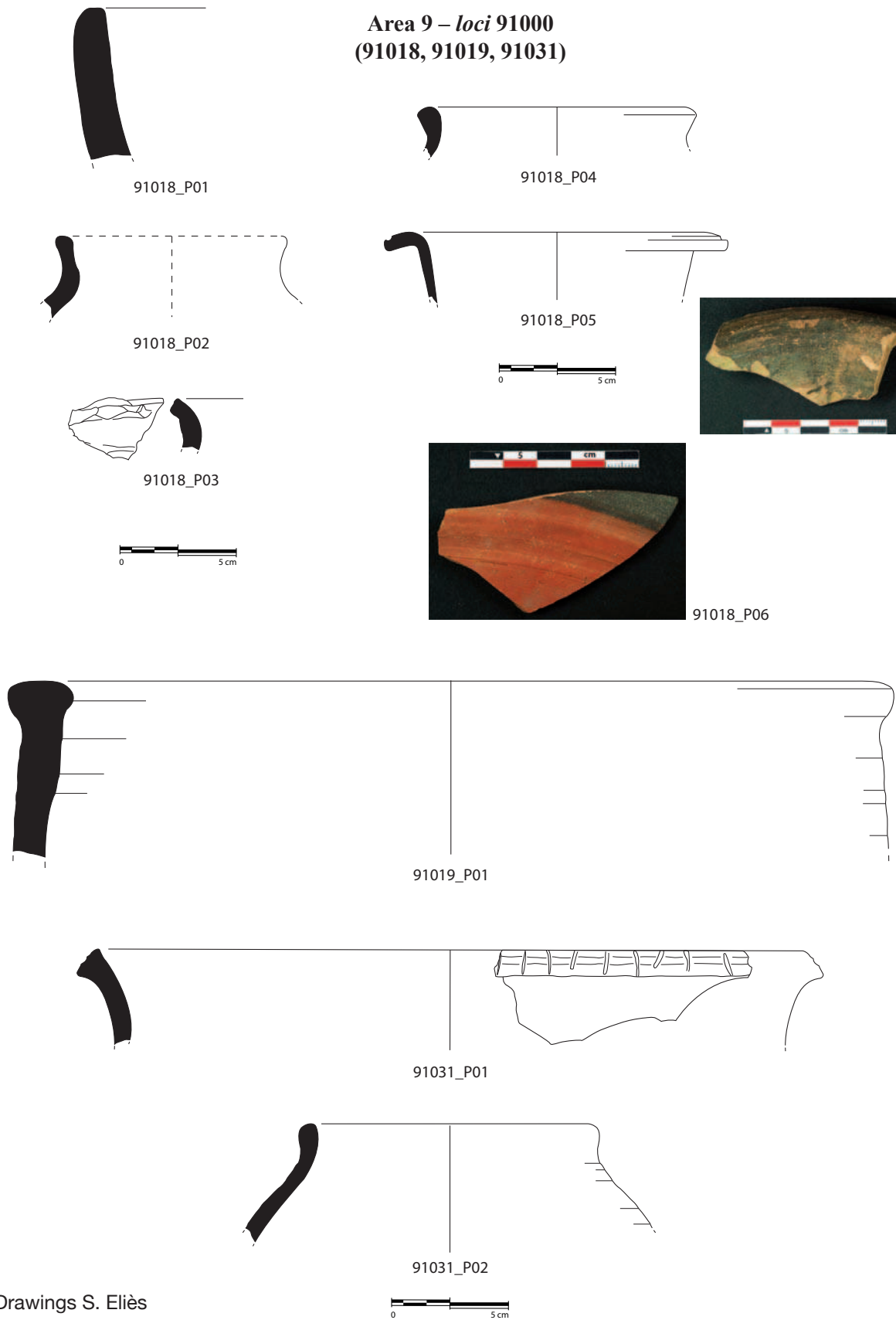
Fig. 14

Area 9 – loci 91000  
(91014, 91016, 91027)



**Fig. 15**

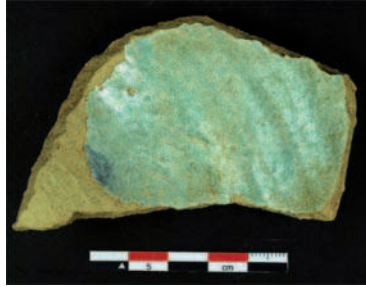
**Area 9 – loci 91000  
(91018, 91019, 91031)**



Drawings S. Eliès

Fig. 16

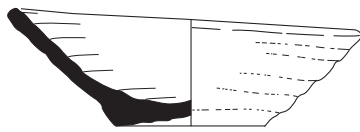
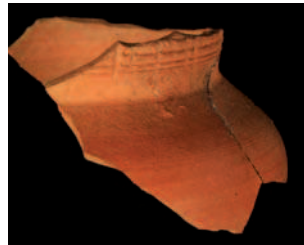
*Loci 50000*



50288\_P01



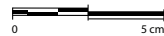
50332\_P01



50332\_P02



50336\_P01

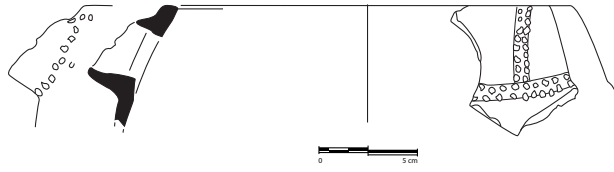


50315\_P01

Drawings S. Eliès

Fig. 17

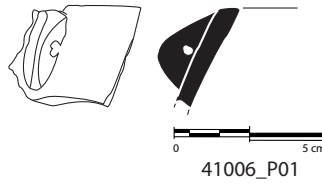
*Loci 41000 (first plate)*



41001\_P01 (beak)  
41001\_P02



41002\_P01



41006\_P01



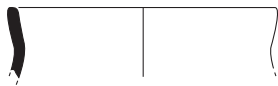
41006\_P03



41004\_P01



41006\_P02



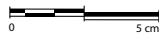
41004\_P02



41004\_P03



41004\_P04



41019\_P01



41019\_P01



41004\_P05



41024\_P01



41004\_P06



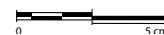
41047\_P02



41045\_P01



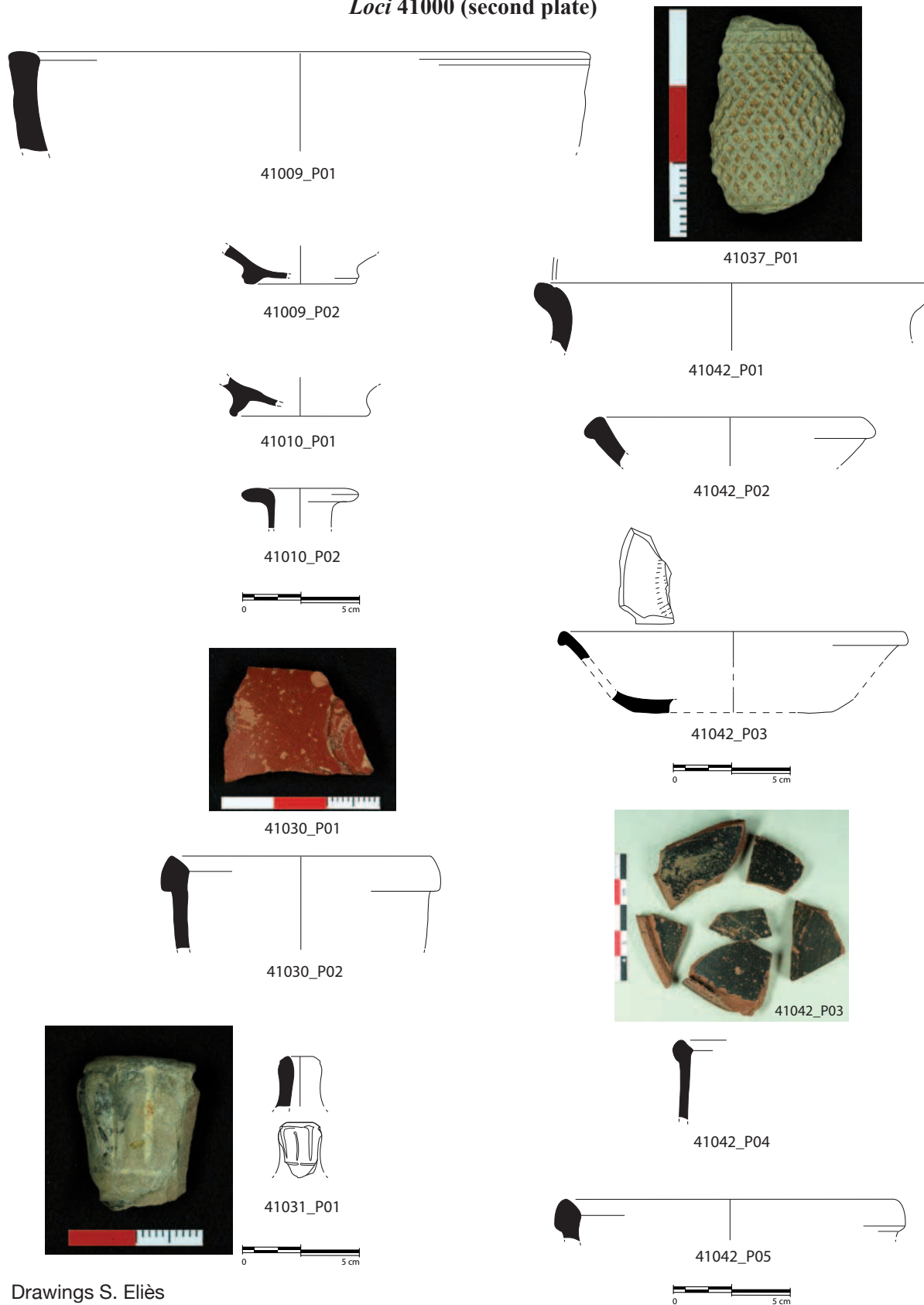
41047\_P01



Drawings S. Eliès

Fig. 18

Loci 41000 (second plate)



Drawings S. Eliès

## APPENDIX: A COMPARATIVE STUDY BETWEEN TAYMÂ' AND MADÂ'IN SÂLIH

**By Francelin Tourtet and Nina-Ann Müller, with additions by C. Durand**

On the 8<sup>th</sup> and 9<sup>th</sup> of February 2011, two members of the Saudi-German Joint Archaeological Project at Taymâ',<sup>1</sup> Nina-Ann Müller and Francelin Tourtet, visited the team at Madâ'in Sâlih. Being pottery specialists, their visit aimed at comparing the ceramic evidence (shapes and fabrics)<sup>2</sup> of these two sites. The following remarks are taken from the report they kindly submitted after their visit.<sup>3</sup>

**General summary:** certain similarities in fabric and shape between pottery from Taymâ' and from Madâ'in Sâlih have been observed for the Late Antiquity, suggesting close relations between these sites, and possibly also with the Southern Levant, during the early centuries of the 1<sup>st</sup> millennium AD. The pottery at both sites originates mainly from domestic contexts.

**Fabrics:** some fabrics from Taymâ', considered as not being of local production, may be macroscopically matched with Madâ'in Sâlih fabrics<sup>4</sup> as is summarized in the following table. Note that storage jars / *pithoi* seem to be of similar fabrics at these two sites.

Madâ'in Sâlih	Area / Context	Date	Taymâ'	Area / Context	Date
Fabric type 9 (local?) <b>(fig. 1):</b> coarse fabric, pink ware with many coarse mineral inclusions: white, large black angular inclusions, red (chamotte?)			Fabric 3 (local) <b>(fig. 2):</b> coarse fabric with many coarse mineral inclusions (argilleous rock fragments, sandstone, siltstone)		
<i>Pithoi</i> / jars	Residential area, Areas 1, 2, 8, 9	Late Hell.	Large storage vessels (" <i>pithos</i> ")	Area F, residential quarter, Bldg. F-bl West, Room 3 <sup>5</sup>	3rd – 4th cent. calAD / Occupational Level F:3
Basin?	10262_P03	Hell./Late Hell.	Open vessels	Area S / Tal'a, burial ground south of settlement <sup>6</sup>	? 9 <sup>th</sup> to 5 <sup>th</sup> cent. calBC <sup>7</sup>

1. The Saudi-German Joint Archaeological Project at Taymâ' (cf. [www.dainst.org/project/tayma](http://www.dainst.org/project/tayma)) is a cooperation project of the SCTA and the Orient Department of the German Archaeological Institute at Berlin.

2. Macroscopic comparison, based on a physical comparison of sherds from both sites.

3. The authors wish to express their warmest thanks to the Saudi-French expedition at Mada'in Sâlih for hosting them. The travel was funded by the German Research Foundation (DFG), Bonn.

4. The comparison of the fabrics is based only on macroscopical examination. For Taymâ', complementary chemical analyses have been carried out by the Department of Mineralogy of the University of Padua, allowing the identification of the inclusions.

5. Purschwitz in Eichmann, Hausleiter, al-Najem and al-Said 2010, 131-132.

6. Beuger in Eichmann, Hausleiter, al-Najem and al-Said 2010, 133-137 and Lora, Petiti and Hausleiter 2010.

7. Results of the <sup>14</sup>C dating in Eichmann 2008, 62-63, footnote 14

Bowl	90046_P02	Hell./Late Hell.	Bowls	Square W41, tower of the City Wall	? Late Bronze Age and later / Tayma Occupational periods 5 to 3
Fabric type 13 (local) ( <b>fig. 3</b> ): light red ware, a few small white and grey inclusions			Fabric 5 (local): sandy fabric with many large rounded quartz grains		
Jar with pinched rim	31011_P01	Nabataean/Roman	All kinds of shapes	Public and domestic buildings in the centre of the settlement	Mainly during Taymâ' Occupational Period 3 (Hell. to post-Nabataean / Late Antiquity periods)
Fabrics 40 and 101 (local) :  40 : light red ware, many small grey inclusions ( <b>fig. 4</b> )  101 : light reddish brown ware, small grey and small and large white inclusions ( <b>fig. 5</b> )			Fabric 6 (not local) ( <b>fig. 6</b> ) Fabric with mainly feldspath inclusions		
Cooking-pots (fabric 40)  Mainly jars and cooking-pots, a few bowls (fabric 101)	60607_P02 (fabric 40)  Residential area, tombs (fabric 101)	Byzantine? (fabric 40)  Roman to Byzantine? (fabric 101)	Mainly open vessels	Public and domestic buildings in the centre of the settlement	Mainly during Taymâ' Occupational Period 3 (Hell. to post-Nabataean / Late Antiquity periods)

**Shapes:** there are parallels between the pottery inventory of the domestic Building F-b1 / West, Room 3 (SU 1969) at Taymâ' and pottery from domestic contexts or surface collections at Madâ'in Sâlih. These parallels refer to household pottery, such as “cooking jars” with triangular rim (TA 3742.23 / MS\_34000\_P12, **fig. 7**), “Roman casseroles” (TA 3964.7 / MS\_21001\_P07 & MS\_21003\_P05, **fig. 8**) and large hand-made *pithoi* (TA 3742.47, **fig. 9** / MS\_10104\_P02, **fig. 10**). At Madâ'in Sâlih such shapes, at least the *pithoi*, are considered to belong to between the 2<sup>nd</sup> and the 4<sup>th</sup> centuries AD, thus globally Late Roman (for the cooking pots and casseroles, see n. 12), while at Taymâ', based on a <sup>14</sup>C date of crop

remains from the last floor of Building F-b1 / West's Room 3,<sup>8</sup> the abandonment of the inventory has been dated to the 3<sup>rd</sup> – 4<sup>th</sup> centuries AD.

However, these dates should not be considered as totally inconsistent: if the analysed crops belong to one of the latest phases of building F-b1 / West, they constitute a *terminus post quem* for the abandonment of the building. In addition, pottery vessels of this type (at least the *pithoi*) may have been in use over a long time. Furthermore, some sherds belonging to the *pithos* mentioned above have been found in an older floor dated between the late 1<sup>st</sup> and mid-3<sup>rd</sup> centuries AD,<sup>9</sup> what should be a date closer to the production date than the former sample.

According to Y. Gerber, “cooking jars” and “Roman casseroles” at Madâ'in Sâlih are made of a fabric similar to that of such vessels from Petra and may thus have been imported from there, where they are well attested.<sup>10</sup> Comparative petrographic analysis of the material from Taymâ' and Madâ'in Sâlih, and, if possible, also from Petra would help to verify this hypothesis. If all these vessels were imports from Petra, it would be the first attestation of a direct link between Taymâ' and Petra.

The similarities in fabric and shape of the *pithoi* at both sites (see above) raise the question whether such large and heavy vessels, which have often been found partly sunk into the floor, both in Taymâ' and in Madâ'in Sâlih, may have been transported from one site to the other. On the other hand, the apparently similar geological environment of the entire region (sandstone mountains), does not exclude the hypothesis that the *pithoi* have been locally produced at both sites, reflecting common technological and stylistic characteristics. Also in this case, further petrographic analysis is needed.

### Prospects

Comparative analysis of pottery from Taymâ' and Madâ'in Sâlih suggests the existence of contacts between the two sites in the early centuries of the 1<sup>st</sup> millennium AD, after the end of the Nabataean domination of the region. Further investigation of pottery production techniques is needed to better understand distribution patterns and mechanisms of exchange between northwest Arabian oases during this period.

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8. Sample TA 3285 from SU 2063; <sup>14</sup>C date 215–363 calAD (2 sigma range); analysis by the Leibniz Laboratory for Radiometric Dating and Stable Isotope Research at the Christian-Albrechts-University of Kiel, Germany, (Sample no. KIA 30892); calibration with CALIB Rev. 4.3.

9. Sample TA 8333 from SU 2982, <sup>14</sup>C date 92-245 calAD (2 sigma range), analysis by the Center for Applied Isotopes Study, University of Georgia, Athens (GA) (UGAMS 5540); calibration with OxCal v. 4.1.7.

10. See for these shapes at Petra in domestic contexts Fellmann Brogli 1996, p. 237-238, 245, ill. 738 (cooking jar), p. 257, ill. 773-774 (“Roman casseroles”).

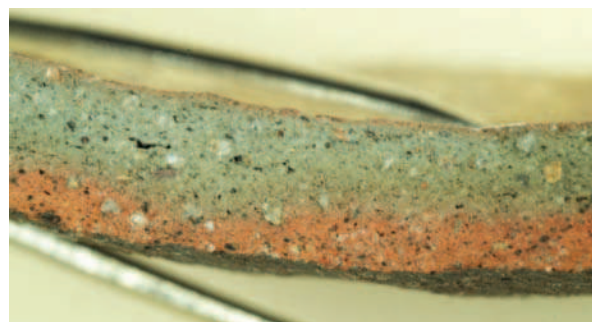


**Fig. 1** Madâ'in Sâlih: Fabric type 9



**Fig. 2** TA 7273.64, polished break of a jar rim, Fabric 3 (DAI Orient-Abteilung, S. Castelli)

**Fig. 3** Madâ'in Sâlih:  
Fabric type 3



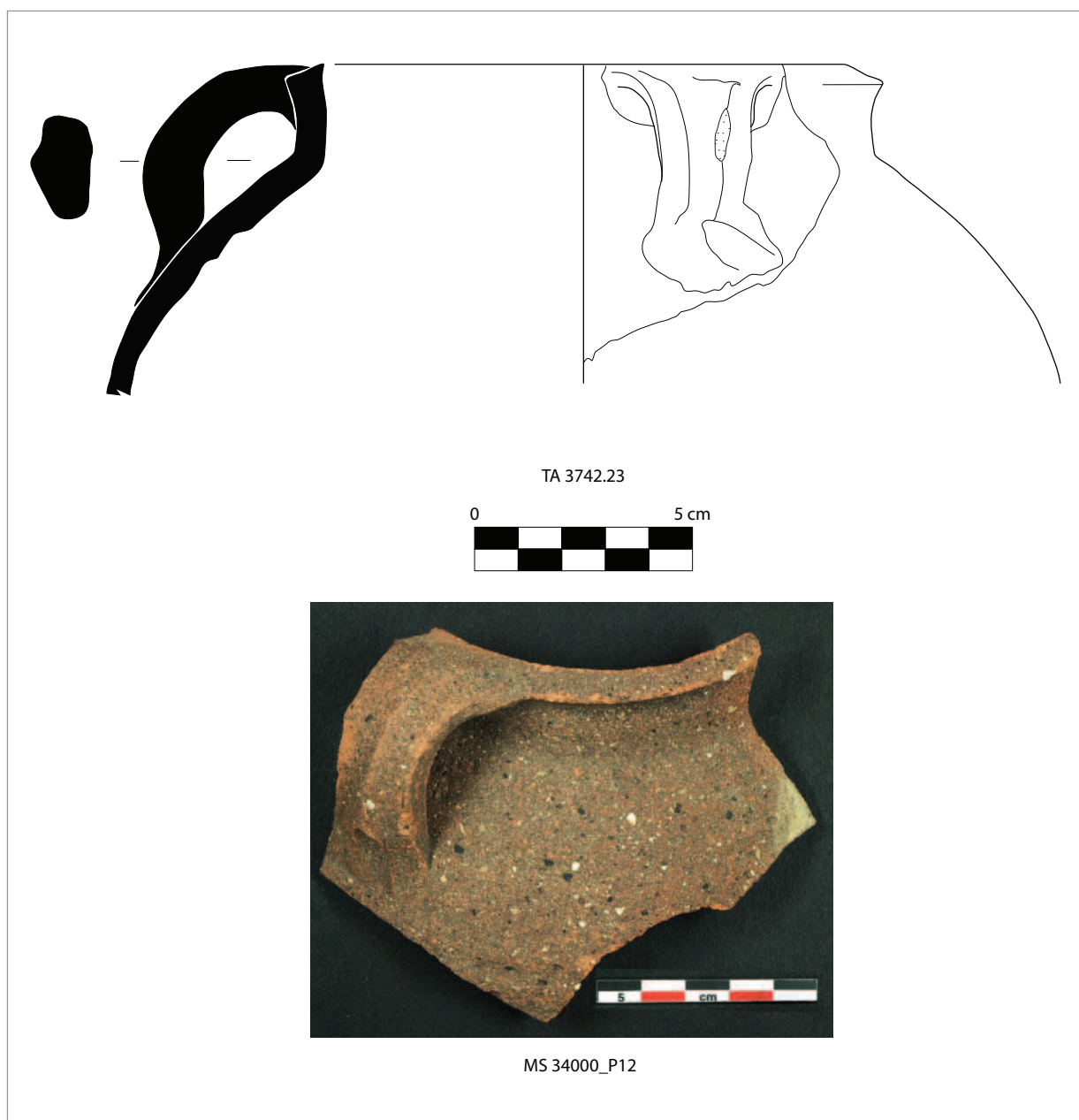
**Fig. 4** Madâ'in Sâlih: Fabric type 40



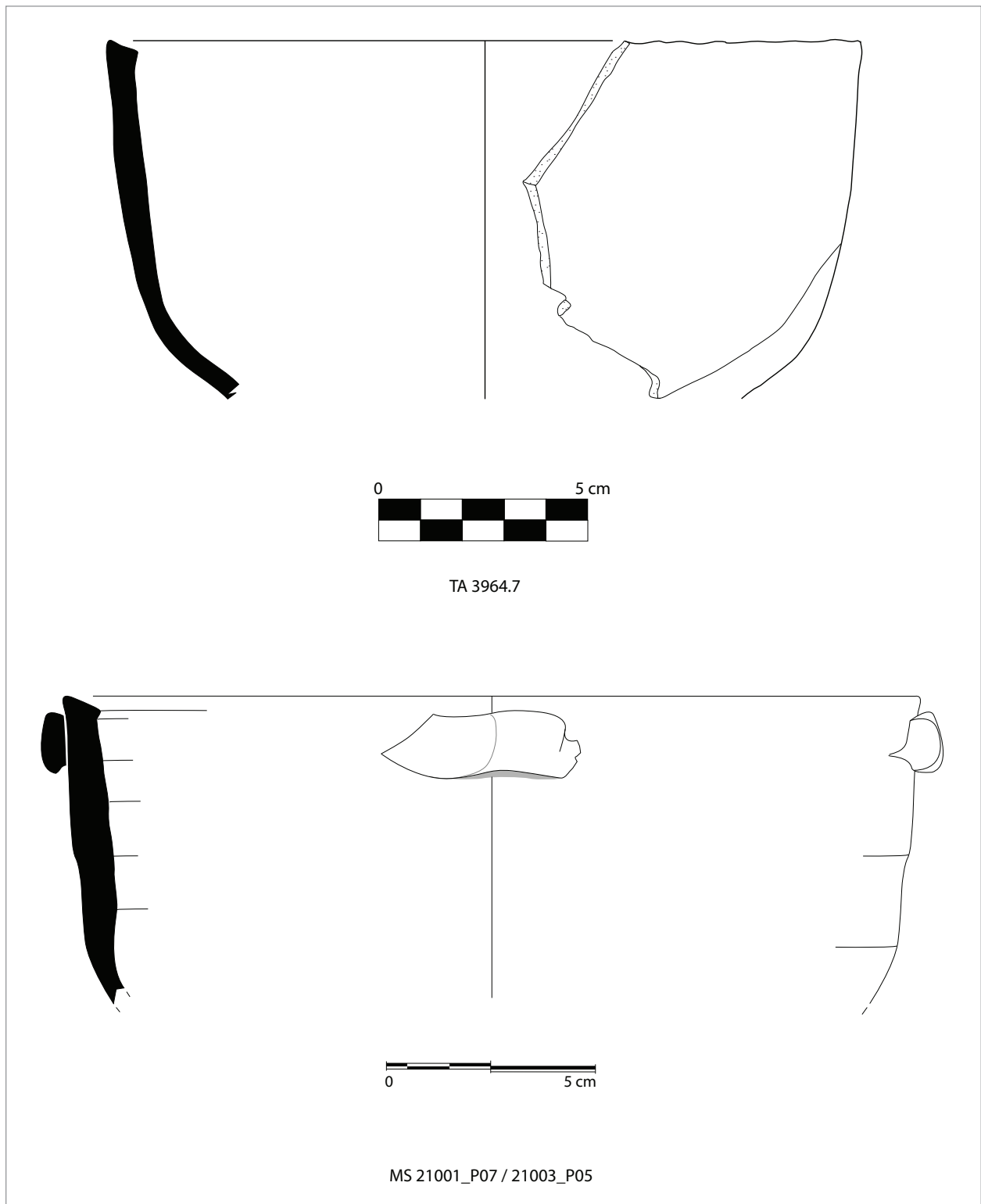
**Fig. 5** Madâ'in Sâlih:  
Fabric type 101



**Fig. 6** TA 7958.57, polished break of a body sherd, Fabric 6 (DAI Orient-Abteilung, S. Castelli)



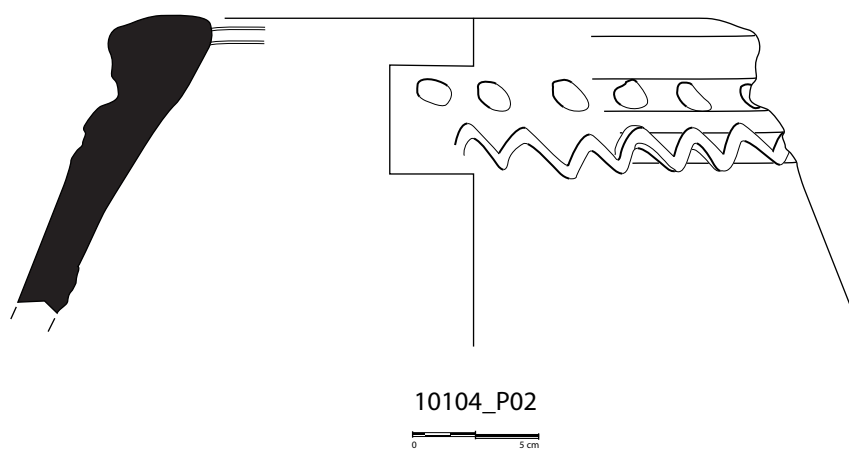
**Fig. 7** Globular jar with triangular rim, TA 3742.23, late 1<sup>st</sup> – mid 3<sup>rd</sup> centuries AD, and MS 34000\_P12. Drawing by H. Wirsing and F. Tourtet



**Fig. 8** “Roman casseroles”, TA 3964.7, late 1<sup>st</sup> – mid 3<sup>rd</sup> centuries AD, and MS 21001\_P07 / 21003\_P05.  
Drawing Taymâ’ by H. Wirsing and F. Tourtet and Madâ’in Sâlih by S. Eliès



**Fig. 9** TA 3742.47, pithos, late 1<sup>st</sup> – mid 3<sup>rd</sup> centuries AD ( Deutsches Archäologisches Institut, Orient-Abteilung, M. Cusin



**Fig. 10** Pithos MS 10104\_P02. Drawing S. Eliès



## Conclusion and perspectives

After four years of excavation, the Madâ'in Sâlih archaeological project has collected an enormous amount of information on the organisation of the urban space and on the chronology of the occupation in the various areas which have been explored so far (the Jabal Ithlib, the monumental tombs and the *tumuli*, the residential area). Moreover, several studies have been undertaken on aspects of the material culture, mainly the pottery, the vegetal and faunal remains, the coins, the textile and leather fragments discovered in the tombs as well as the organic substances which were used in order to delay the decomposition of the bodies. The latter were analysed by a bio-organic chemistry laboratory in Avignon and the analysis showed the presence of a fat substance but also of a resinous mixture which contains elemi gum and incense (*Boswellia* spp). Other categories of the material culture have not been dealt with yet and will need to be studied in the future, such as the glass and stone objects. Fortunately, they do not represent vast quantities of material. Parallel to the excavations and studies, two surveys were carried out in a systematic way: a geophysical survey of the residential area, made at a much finer resolution than the survey which had been undertaken during the first exploration programme of the Saudi-French team by A. Kermorvant, and a survey of the structures known as cairns or *tumuli*. Finally, it is important to mention the anthropological analysis of several thousands of human bones which were discovered in tomb IGN 117, which belong to at least sixty-four individuals and probably more.

At this point of the project, it is necessary to undertake a study season in order to prepare the publication of the trenches the excavation of which has been completed. This concerns the work done in the Jabal Ithlib area and its surroundings: Ith 23-25 (*triclinium*), Ith 68 (tower?), Ith 78 (*triclinium*), Ith 105 (remains of a monumental structure), QB 6 (remains of an unidentified structure) but also the monumental tomb IGN 117 as well as Areas 1, 2 and 8 within the city rampart. We shall probably divide this publication into two volumes. One will be devoted to the tomb IGN 117, and will contain the excavation report, a detailed anthropological study as well as a study of the material found in the tomb, mainly the textile and leather fragments but also the pottery and the arrow heads. The other will probably be devoted to the structures of Jabal Ithlib and to Areas 1, 2 and 8 of the urban centre, along with a detailed study of the results of the geophysical survey.

Apart from this immediate perspective, it will be necessary, in a second excavation programme, which has to be established and decided in common with the Saudi Commission for Tourism and Antiquities and the French Ministry for Foreign Affairs, to finish the excavation of the areas which are still under work: Area 3 (which concerns several trenches opened along or near the rampart of the city), IGN 132 (which is one part of Area 6), and Area 9. Other possibilities of new excavations which need to be examined are: the excavation of a Nabataeo-Roman (?) camp touching the southern part of the rampart; the excavation of pre-Nabataean tomb, i.e. one of the tombs which are carved at a high level on some of the cliffs, on condition that we find one which is not completely disturbed; the excavation of a number of cairns chosen in a way to be representative of the types which have been identified in 2011.

As far as the 2011 season is concerned, the following achievements are worth recalling :

In **Area 1** (domestic quarter), six phases have been identified (Phase 1: 3<sup>rd</sup>-2<sup>nd</sup> c. BC (?); Phase 2: 2<sup>nd</sup>/1<sup>st</sup> c. BC - mid. 1<sup>st</sup> c. AD; Phase 3: mid.- end 1<sup>st</sup> c. AD; Phase 4: 2<sup>nd</sup>-3<sup>rd</sup> c. AD; Phase 5: 4<sup>th</sup>-5<sup>th</sup> c. AD; Phase 6, 6<sup>th</sup>-

7<sup>th</sup> c. AD). What is interesting is that there is now clear evidence for a long use of the same urban planning system. Indeed, from at least Phase 2 until Phase 6, this residential district seems to have been framed by streets which always follow the same line. The architectural changes which took place inside this district were therefore limited, at least since the 2<sup>nd</sup> century BC, by an existing communication network.

In **Area 2** (domestic quarter), the 2011 season enabled us to determine that the occupation of the area began during the reign of Aretas IV (9 BC – AD 40). The results obtained this year also showed that the major episode of destruction or disuse which had been observed in 2008 in the paved room of Trench C concerned in fact the whole area and took place at the end of Phase 3, probably in the late 2<sup>nd</sup> or early 3<sup>rd</sup> century AD. It was followed by a new occupation, attributed to Phase 4, which is dated to the 3<sup>rd</sup> / early 4<sup>th</sup> century AD. Thus, it is now possible to say that the occupation of the area was relatively continuous at least until the early to mid-4<sup>th</sup> century AD. The area seems to be abandoned after Phase 4, and there is no evidence of any human activity between the mid-4<sup>th</sup> and the 6<sup>th</sup> / early 7<sup>th</sup> century AD, contrary to what happened in Area 1. In **Area 8**, it was possible, for the first time, to identify four phases of occupation: Phase 1 (mudbrick walls): possibly 1<sup>st</sup> century AD; Phase 2, subdivided into Phase 2a and 2b (several stone walls which do not have the same orientation as those of Phase 1); Phase 3 (reuse of building material in order to erect – crudely – a monumental structure which has the same orientation as the structures of Phase 2): possibly post 4<sup>th</sup> century AD; Phase 4 (late (?) opportunistic occupation). In this area, we are facing two problems: the chronology, for which we have to wait until all the pottery is studied, and the function of the buildings identified for Phases 1 to 3, for which we have no clue.

**Area 9** yielded some of the earliest material known in Madâ' in Sâlih (Khurayba ware). Moreover, the earliest structures identified indicate that a substantial occupation existed at the site already in the Hellenistic / Late Hellenistic period (3<sup>rd</sup>-1<sup>st</sup> century BC). At the other end, the area has also yielded material datable to the 3<sup>rd</sup> century AD (if not later). The main occupation is however associated with the Nabataean period, 1<sup>st</sup> century BC – 1<sup>st</sup> / early 2<sup>nd</sup> centuries AD. It is represented by what the excavator named the Lower and Upper Complexes, within which, during the Nabataean period, many changes occurred which show that the occupation was intensive and dynamic.

On and around **IGN 132**, one of the rocky outcrops which stand in the middle of the residential area, a major discovery was made in 2011: a Nabataean high place, possibly devoted to the sun god, made of a paved platform surrounded by a probably low enclosure wall. In the middle of the platform, a *tetrapylon* was built. At the foot of the outcrop, on its eastern side, a complete water collection system combining a well and several stone basins, three of which are complete, were probably associated to the sanctuary. Among the objects which were found in 2011 are a complete bronze casket and a small bronze eagle figurine.

The **survey** of the areas in which *tumuli* have been recorded allowed us to propose a new typology for these structures. The tower tombs (some of which are rectangular, with or without an enclosure) are the most common type of structure and are sometimes surrounded by an external ring of white stones. In the tower tombs, the tomb itself is rectangular and has a corbelled superstructure on top of it. Another important type is represented by large cairns made of stones which are bigger and of more irregular shape than those of the tower tombs. The tomb itself, the sides of which are built in masonry, is covered with several covering slabs laid side by side. On top, there is a mass of stones forming a mound. The third main type is characterized by a wall formed of two parallel faces inside which there are two or three compartments separated by stones. There are other types of structures, for which the reader should refer to W. Abu Azizeh's report. Most of these structures clearly have a funerary function but a religious function for some sub-types should not be excluded. The **geophysical survey** has shown that at a certain time, a homogeneous urban planning system was used at least in parts of the city. However, beside this well organised urban plan, characterized by structures built orthogonally, several areas are composed of tortuous streets and buildings which do not follow a pre-determined orientation. It is not known yet whether the orthogonal plan is the original plan or whether it is

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a late initiative which would not have concerned all the areas of the city. It is now necessary to compare the results of the survey with the structures unearthed during the excavations.

One of the main achievements of the 2011 season is the completion of the excavation of tomb **IGN 117**, which required three excavation seasons (2008, 2009, 2011). The anthropological study will hopefully be finished during the 2012 study season but the general chronology of the burials can already be given : first, individuals (including a woman, possibly Hînat, the founder of the tomb in AD 60) have been buried – in coffins – in the pit which was dug in the back-right corner of the funerary chamber (Area B). Probably at the same time or almost, individuals have been deposited on the floor of the chamber (in Area A). Then, the bones of the latter have been pushed back in the pit which was thus, at some stage, used as a waste. Two wooden coffins, one of which contained four individuals (three adults and one immature), were then placed in Area A. The precise chronology of the burials has not been determined yet, partly because the C<sup>14</sup> dates we have obtained so far are not very accurate. This is however a very important issue which will need to be addressed in the final report.

Two reports, which have not been mentioned in this conclusion, on the faunal remains and on the pottery, have presented the results obtained in each trench and are therefore very useful for the excavators. Finally, we should mention the restoration work done by the Saudi part of the team as well as the very successful mudbrick factory established by our colleague I. as-Sabhân.

Thus, all in all, this 2011 was particularly rich both in discoveries, achievements and information gathered on the chronology and organisation of the site between the 3<sup>rd</sup> century BC and the 6<sup>th</sup> / 7<sup>th</sup> century AD.



**Fig. 1** Jean Humbert drawing structure 91017 in Area 9



**Fig. 2** Solène Marion de Procé and a workman in Area 8

**Fig. 3** Laïla Nehmé and a workman photographing basins in IGN 132



**Fig. 4** Wael Abu-Azizeh flying his kite to make aerial photographs of the site