



HAL
open science

Preliminary report. Fifth season of the Saudi-French mission in al-Kharj, Province of Riyadh. 5 January-5 February 2016

Jérémie Schiettecatte, Anaïs Chevalier, Christian Darles, Fabien Lesguer, Laetitia Munduteguy, Thomas Sagory

► **To cite this version:**

Jérémie Schiettecatte, Anaïs Chevalier, Christian Darles, Fabien Lesguer, Laetitia Munduteguy, et al.. Preliminary report. Fifth season of the Saudi-French mission in al-Kharj, Province of Riyadh. 5 January-5 February 2016. [Research Report] CNRS, UMR8167 Orient & Méditerranée; Ministère des Affaires étrangères; Saudi Commission for Tourism and National Heritage; Université Paris Sorbonne, Paris IV; Labex Resmed; Evéha International. 2016, pp.129. halshs-01485741

HAL Id: halshs-01485741

<https://shs.hal.science/halshs-01485741>

Submitted on 9 Mar 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

PRELIMINARY REPORT

FIFTH SEASON OF THE SAUDI-FRENCH MISSION IN AL-KHARJ

- PROVINCE OF RIYADH -

5 JANUARY - 5 FEBRUARY 2016



Preliminary report

Fifth season of the Saudi-French mission in al-Kharj

- Province of Riyadh -
5 January - 5 February 2016

Prepared under the supervision of
Jérémie SCHIETTECATTE

With contributions by
Anaïs CHEVALIER, Christian DARLES & Fabien LESGUER

Drawings by
Laetitia MUNDUTEGUY

Aerial photographs by
Thomas SAGORY

PARIS
2016

INTRODUCTION	7
Preamble	7
Geographic setting	10
Archaeology in al-Kharj: past research and present issues	11
Purpose of the 5th season, programme, schedule	12
Recording system	13
‘AYN AL-ḌILA’ 1 A BRONZE AGE NECROPOLIS	17
Protohistory of Al-Kharj: The bronze Age necropolis ‘Ayn al-Ḍila’ 1	19
Introduction	19
Choice of the excavated area	19
Map and DEM of the investigated area	21
Methodology	23
Grave AD1-06	24
Grave AD1-07	28
Grave AD1-08	30
Grave AD1-09	32
Grave AD1-10	33
Grave AD1-11	36
Grave AD1-12	39
Grave AD1-13	42
General considerations concerning the tapered structures.....	45
AL-YAMĀMA A LATE PRE-ISLAMIC & ISLAMIC SITE	47
Al-Yamāma - an introduction	49
Description of the site of al-Yamāma	49
Previous works (2011-2015)	49
Four seasons of excavation of the Great Mosque	50
Purpose of the 5th season	50
Al-Yamāma - Trench D (Area N6): pre-Islamic and Islamic settlements	53
Location and aim of the sounding	53
Stratigraphy and chronological phases	53
Pottery assemblage and chronological assignment to local productions.....	78
Al-Yamāma - La grande mosquée (Area N6): étude architecturale	97
Déroulement de l'étude	97
Plans et numérotation des structures et des espaces architecturaux	97
Description sommaire de la mosquée bâtie sur le sol F. 015 (Building 1).....	99
Description de la mosquée associée aux sols F. 182 et F. 192 (Building 3)	100
Description d'un bâtiment antérieur au Building 3.....	105
Dispositions des éléments architectoniques.....	107
Dispositifs architecturaux.....	107
Hypothèses de restitutions	107
Al-Yamāma - Sounding 3 (Area G17): a pottery workshop	111
Location and aim of the sounding	111
General description.....	111
Phasing and architectural description (figs. 6-7).....	111
Preliminary interpretations	125
Date.....	125
References	127

Preamble

Al-Kharj area is one of the major oases of the Najd, in the very heart of the Kingdom of Saudi Arabia. Specific environmental conditions made this area one of the most attractive regions of Central Arabia for settled communities. And as a consequence, the region of al-Kharj appears as an obvious stopping place and main crossroad on the commercial routes that linked Yemen and the Ḥijāz to the Gulf and Mesopotamia.

Stimulated by this prospect, a Joint Cooperative Agreement for Archaeological Surveys and excavations in the oasis of al-Kharj was signed in September 2011 between the Saudi Commission for Tourism and National Heritage (SCTH), Riyadh, and the Centre National de la Recherche Scientifique (CNRS), Paris. A scientific team was formed under the supervision of Abdalaziz al-Ghazzi (King Saud University, Riyadh) and Jérémie Schiettecatte (CNRS, Paris).

The aim of the research is to characterize the diverse prehistoric, protohistoric, pre-Islamic, and Islamic archaeological remains as well as to illustrate the environmental context that made it possible for people to settle in such an arid region.

For the past five years, the archaeological study of this region has opened up new horizons for the comprehension of the peopling and settlement process, and of circulation and contacts within the Arabian Peninsula, from prehistory down to the Islamic period.

The fifth season of survey and excavation was carried out from January 5 to February 5, 2016.

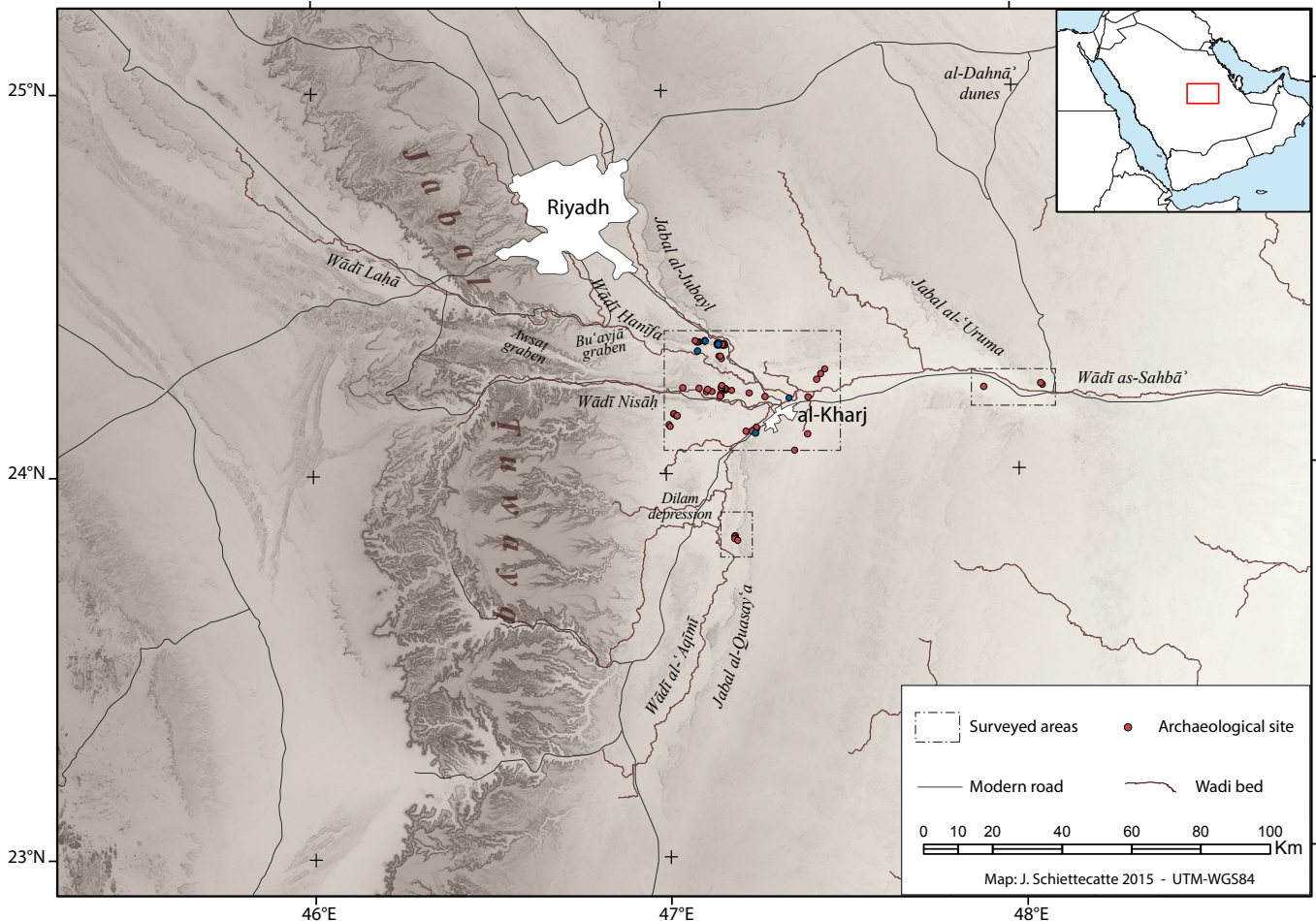


Figure 1 - The location of the oasis of al-Kharj and its setting (J. Schiettecatte – Saudi-French Archaeological Mission in al-Kharj).

Team

Saudi Part

- Abdallah Sulayman AL-HADLAQ (SCTH, Riyadh) – archaeologist
- Abdalaziz AL-HAMMAD (SCTH, Riyadh) – archaeologist, head of the Saudi part
- Sultan Muhammad al-Rashid (SCTH, Riyadh) – archaeologist
- Khalid al-‘Utaybī (SCTH, Riyadh) – archaeologist
- Dr Sa‘īd bin Dubays al-‘Utaybī (SCTH, Riyadh) – archaeologist
- Dr Abdalaziz b. Fahd b. Nafīssa (SCTH, Riyadh) – archaeologist

French Part

- Dr Mounir Arbach (CNRS-CEFAS, Riyadh) – epigraphist
- Anaïs Chevalier (Paris-Sorbonne University, PhD candidate) – archaeologist
- Prof. Christian Darles (Ecole Nationale Supérieure d’Architecture de Toulouse, UMR 5608 TRACES, Toulouse) – architect
- Fabien Lesguer (Evéha, Paris) – archaeologist
- Laetitia Munduteguy – drawer
- Alexia ROSAK – archaeologist
- Thomas SAGORY (Ministry of Culture, Paris) – photographer
- Dr Jérémie SCHIETTECATTE (CNRS, Paris) – archaeologist, head of the French part
- Chloé Schmidt – archaeologist
- Dr Stefan Tzortzis (CNRS, Marseille) – palaeo-anthropologist

Support

The scientific issues dictating our field activities address those set out in four research programmes. These funded the major part of the field activities:

- Programme ‘Oasis d’Arabie déserte’, conducted by G. Charloux (UMR 8167 ‘Orient & Méditerranée’, Paris), funded by the Ministry of Foreign affairs, Paris; this programme also supports field activities in Dumat al-Jandal and Najran;
- Laboratoire d’excellence ‘Resmed – Religion et Société en Méditerranée’, conducted by B. Caseau (UMR 8167 ‘Orient & Méditerranée’, Paris), funded by the Agence Nationale pour la Recherche in Paris [ANR-10-LABX-72];
- Programme ‘EmOAD – Emergence des Oasis de l’Arabie Déserte’, conducted by J. Schiettecatte (UMR 8167 ‘Orient & Méditerranée’, Paris), funded by the Idex SUPER (Sorbonne Universités à Paris pour l’éducation et la recherche) of Sorbonne Universités.
- Regular activities of the Research Centre from the Saudi Commission for Tourism and National Heritage (SCTH), Riyadh, headed by Abdallah al-Saud.

Besides, several institutions and programmes contributed by their financial and technical support to the field activities:

- Airbus Defense and Space, Riyadh (logistics);
- Centre français d’archéologie et de sciences sociales, USR 3031, Kuwait City - Riyadh, (researcher);
- CNRS through the research centres UMR 8167 ‘Orient & Méditerranée’, Paris, and UMR 7268 ‘Anthropologie bio-culturelle, Droit, Éthique & Santé’, Marseille (researchers and logistics);
- Ecole Nationale Supérieure d’Architecture de Toulouse, UMR 5608 TRACES, Toulouse (researcher);
- Evéha international, Paris (researcher);
- Service de Coopération et d’Action Culturelle of the French Embassy, Riyadh (logistics).

Acknowledgments

We would like to thank these institutions most warmly for their support. We are also most grateful to

people who put their trust in our work and did their best to make fieldwork possible and easier in Riyadh and Paris: HRH Prince Sultan bin Salman bin Abdalaziz (President of the SCTH), Dr. Husayn Abu al-Hasan (Vice-President of SCTH for Antiquities and Museums, Riyadh), Abdallah al-Saud (Head of the Research and Excavation Centre, SCTH, Riyadh), Jean-Louis Laveille (Cultural Advisor, French Embassy, Riyadh), Cyrille Le Déaut (Cooperation Attaché, French Embassy, Riyadh), Marie-Véronique Diamant (CNRS, Ivry-sur-Seine).



'Ayn al-Ḍila' necropolis: team and field workers



Al-Yamâma site: team and field workers

Geographic setting

Al-Kharj area is located 70 km south-west of the capital of the Kingdom of Saudi Arabia, Riyadh. The area lies between latitude 23.8° and 24.4° N. and longitude 46.9° and 48° E. (**fig. 1**).

The Najd region is characterized by a hot, dry climate. Modern annual rainfall rarely exceeds 100 mm: for the period 1980–2007, the annual mean was 94.6 mm and the amount of rainfall was irregular throughout the year, with rain occurring mainly from November to April. The hydrological network includes a large wādī system, with no permanent river. However, water resources from several of the largest aquifers of the Arabian Peninsula have allowed agriculture and farming to develop (SANLAVILLE 2000: 73–75, 210–211).

Al-Kharj is the main city in this area. The rapid growth of the city makes it sprawl into the former palm groves and absorb older villages in its neighbourhood (al-Yamāma, al-Salmiyya, etc.). The second city of the oasis is al-Dilam. This huge agglomeration has more than 376,000 inhabitants. A well-developed road network connects the city of al-Kharj with the capital Riyadh to the north-west, with the United Arab Emirates to the east, and the Wādī al-Dawāsir to the south-west.

Geological background

The geological context explains the location of al-Kharj area in the Arabian platform. Large units of limestone and sandstone of Jurassic and Cretaceous form more or less eroded plateaus, dissected by valleys (wādīs). Nowadays there is very little flow in them, but in the past it was sufficient to incise them several tens of metres. The major part of wādīs within the oasis of al-Kharj is influenced by series of grabens originating from the opening of the Red Sea, marked by west-east faults.

In the valleys, more recent sedimentary cover includes both fluvial deposits (silt, clay, etc.) and eolian deposits, with barkhan fields in numerous places. Current erosion comes mainly from wind, since the very low rainfall has minimal impact on the ground. Because of the sedimentary context, karst morphologies are common in the oasis of al-Kharj: the most impressive features are swallow holes south-west of al-Kharj (VASLET *et al.* 1991: 35–36) (**fig. 2**). Three swallow holes are located in ‘Ayn al-Ḍila’, with a diameter of 60 to 80 m, and an average depth of 50 m. These features were formed by the phenomenon of dissolution in calcareous layers.

Topography

The simple geological context provides an easy explanation of the topographical context of the area of al-Kharj.

The oasis is a large, funnel-shaped valley in sandstone and limestone plateaus incised by many wādīs. The joint action of drainage and uplift of the crystalline basement in depth led to the formation of cuestas with escarpments north, north-west and south-west of the oasis.

The area is bounded on the west by a Jurassic mountain, the Jabal Ṭuwayq, through which flows the Wādī



Figure 2 - The two major swallow holes in ‘Ayn al-Ḍila’, looking north-west (photograph: Th. Sagory – Saudi-French Archaeological Mission in al-Kharj).

Nisāḥ from west to east inside grabens. The Wādī Ḥanīfa comes from Riyadh in the north-west, along the cuesta of the Jabal al-Jubayl, and this escarpment forms the northern boundary of the oasis. South-west, the Wādī al-‘Ayn comes from the slopes of the Jabal Ṭuwayq, and then follows the escarpment of the Jabal al-‘Uruma, on the south side of the oasis. These three main wādīs reach the centre of the oasis and join to form the Wādī al-Sahbā’, which crosses the whole oasis from west to east in the valley bounded by the Jabal al-Jubayl and the Jabal al-‘Uruma. It continues toward the east and is lost in the sands of al-Dahnā’ desert.

The three mountain massifs located around the oasis are almost parallel and bound it to the north, west, and south. The confluence of the wādīs within these mountains forms the cluse of al-Kharj, thus cutting the Jabal al-Jubayl and the Jabal al-‘Uruma into two parts. In this area, the Jabal Ṭuwayq reaches 1,050 m, while the Jabal al-Jubayl and the Jabal al-‘Uruma have average maximum altitudes around 550 m north of the oasis and 500 m south of the oasis.

The central valley with the wādīs slopes gently from west (mean altitude ca. 470 – 480 m a.s.l.) to east (mean altitude ca. 380 m a.s.l.). The oasis ends at the gates of al-Dahnā’ desert.

The confluence of the main wādīs is unclear within the oasis, partly due to the expansion of the city of al-Kharj and the development of infrastructure (road network, farms, etc.). The wādīs are also partly disturbed by other human activities.

The largest archaeological site, al-Yamāma, is near a heavily altered wādī. It is located within the valley but is several metres higher than the surrounding area, which preserved the site from potential flash floods.

Archaeology in al-Kharj: past research and present issues

The favourable environment which made this oasis so promising for archaeological and historical studies should have been all the more inviting given that this area is frequently mentioned in pre-Islamic poetry and Islamic tradition (WÜSTENFELD 1874, THILO 1958, BIN KHAMIS 1978, AL-ASKAR 2002, AL-JUHANY 2002).

In spite of this, archaeological remains in Central Arabia have rarely been noticed. Philby mentioned the presence of tumulus fields, underground water channels and a large ancient settlement, al-Yamāma, during a journey in the Najd in 1917–18 (PHILBY 1919; 1920). In 1945, Col. G. de Gaury reported the presence of tumulus fields nearby al-Kharj (DE GAURY 1945). A few years later, Philby completed the description of the oases of al-Kharj, al-Aflāj and the Wādī Dawāsir (PHILBY 1949). In 1978, a comprehensive archaeological survey of the Kingdom of Saudi Arabia was carried out in Central Arabia and identified sixteen sites in the oasis of al-Kharj alone (ZARINS *et al.* 1979), confirming the potential of the area. Consequently, in the late 1980s and the 2000s, Abdalaziz al-Ghazzi initiated soundings at four sites in the oasis: on the settlement of Ḥazm ‘Aqīla (AL-GHAZZI 1996, 2009), on that of al-Yamāma (AL-GHAZZI 2010), in the necropolis of al-‘Afja (AL-GHAZZI 2011a), and on the water channel of Abraq Farzān (AL-GHAZZI 2011b).

Although limited by their duration or by their scope, these previous studies registered the existence of a variety of sites where one could expect to find answers to several of the current research issues in the Arabian Peninsula.

Regarding PREHISTORY, one of the main current research issues in the Peninsula concerns the dispersal of the first Anatomically Modern Humans (AMH) during the Palaeolithic. A debate also exists about trying to understand where the Arabian Neolithic comes from: Levantine influence or local developments from autochthonous populations? Recent palaeo-environmental and palaeo-climatic studies revealed the possible influence of the wet phases in the development of a production economy. If much has been done in South and East Arabia, the centre of the Peninsula remains unexplored. Environmental studies combined with lithic analysis have therefore been carried out since 2011 in order to address these issues.

The PROTO-HISTORICAL OCCUPATION of the oasis is obvious, through the presence of several necropolises that struck all the travellers and archaeologists passing by in the past. At two of them, al-‘Afja and ‘Ayn al-Dīla’, hundreds of dry-stone turret graves or tumuli are visible. The main issues are the date of their building, and

the time span of their use. In Yemen, these tombs delivered artefacts from the third and first millennium BC. Is this indicative of long-lasting funerary practices, or of the reuse of these tombs much later on? Another question regards the cultural affiliation of these funerary practices and people who built the tombs. In West and South Arabia, these tombs were collective and are generally associated with (semi)nomad or pastoralist groups; contrarily, along the Persian Gulf coast and in the Bahrain and Dhahran area, these tumulus tombs were designed for a single body and were the practice of sedentary people. Al-Kharj area is the buffer zone between these two cultural spheres; the study of the burial practices here could be indicative of the very nature of people, of their origin and their way of living. One of these necropolises was investigated in 2013 (see SCHIETTECATTE & AL-GHAZZI [ED.] 2013).

Ascribing a time-span to the sedentarisation process in al-Kharj area is also crucial. Did this process begin right from the third millennium BC, as it can be observed in the Oman Peninsula during the Hafit period, or in Bahrain area during the Dilmun period? Or are we to observe in al-Kharj area an alternate and specific model? Is the sedentarisation process linked to the domestication of the palm tree, as in the Oman Peninsula, or to other criteria such as long-distance trade?

Another issue concerns the LATE IRON AGE AND EARLY CHRISTIAN ERA, a transitional period in the Arabian Peninsula. New populations appeared in historical sources and archaeological contexts; they settled in the Oman peninsula (e.g. Mleiha), in South Arabia (penetration of Arab groups in the Jawf valley), in North-west Arabia (Nabataeans). They all shared common features, particularly in their funerary practices. And yet, the origin of these groups is still unknown. The study of a site in Central Arabia could throw new light on this process.

Finally, issues regarding the LATE PRE-ISLAMIC AND THE ISLAMIC PERIOD are numerous. A sharp decline of the settlement density can be observed in South, West and North Arabia from the 4th century onwards and accelerated during the 6th century. This process might have been partly linked to changes in the environment. Is this process to be observed in Central Arabia? Arab-Islamic sources and preliminary fieldwork results indicate a different trajectory for this region, which might have been continuously occupied from the Late Pre-Islamic period until the end of the 12th century. Finally, a deep sounding on the site of al-Yamāma indicates a temporary abandonment of the site at the end of the 12th century. One wonders what might have led to such a situation.

As one can see, archaeological research in the oasis of al-Kharj is driven by many questions, and preliminary results are raising new issues. This prompted us to set up complementary field investigations, dealing with the long term, from Palaeolithic to modern times, from the environmental, archaeological and historical point of view.

Purpose of the 5th season, programme, schedule

During the previous field seasons (2011-2015), the aim has been to provide a comprehensive view of the evolution of regional occupation from the Palaeolithic to the Islamic era. This has been achieved through the creation of archaeological and geomorphological maps of the oasis (**fig. 3**), the study of significant sites: AK-22, AK-31 (Palaeolithic); 'Ayn al-Ḍila', Umm al-Sha'al (protohistoric necropolis), and al-Yamāma (Late Pre-Islamic / Early Islamic settlement); and environmental studies (geomorphology, sedimentology, palynology, anthracology and faunal remains) in the site of al-Yamāma and on the palaeolake of al-Hayāthim.

The fifth season resumed the exploration of two of these sites: 'Ayn al-Ḍila' (protohistoric necropolis) and al-Yamāma (Late Pre-Islamic / Early Islamic settlement), the aim being:

- To start the excavation of tapered structures and tumuli south of the protohistoric necropolis at 'Ayn al-Ḍila';
- To continue the excavation at al-Yamāma in areas N6 (the mosque and its surrounding) and G17 (pottery workshop).

- To realize the architectural study of the Great Mosque (Building 1) at al-Yamāma (area N6).

1. The Bronze Age in al-Kharj region: excavation at ‘Ayn al-Ḍila’

From January 7 to February 4, 8 dry-stone GRAVES ASCRIBED TO THE BRONZE AND IRON AGE have been excavated on the north-western edge of the limestone plateau of Jabal al-Qusay‘a, at ‘Ayn al-Ḍila’. The excavation was conducted by Anaïs CHEVALIER, Abdallah Sulayman AL-HADLAQ, Abdalaziz b. NAFĪSSA, Sultan Muhammad AL-RASHID Chloé SCHMIDT, and Stéfan TZORTZIS.

2. The Late Pre-Islamic and Early Islamic periods: excavation at the site of al-Yamāma

The excavation of the DWELLING AREA WEST OF THE MOSQUE partly unearthed during the fourth season was resumed and achieved: enlargement of Trench D, sounding under the Islamic occupation, uncovering of pre-Islamic dwellings. This operation was taken in charge by Jérémie SCHIETTECATTE and Alexia ROSAK from January 7 to 31, they were accompanied by Abdalaziz AL-HAMMAD and Sa‘īd bin Dubays AL-‘UTAYBĪ.

To the south of the site (area G17), Sounding 3 initiated in 2012 was resumed and widened by Fabien LESGUER and Khalid AL-‘UTAYBĪ. A pottery workshop was uncovered and explored from January 16 to February 2.

3. Architectural study of the Great Mosque at al-Yamāma

The architectural study of the Great Mosque (Building 1) and of the levelled monumental building lying under the Great Mosque (Building 3) was carried out by Christian DARLES. It revealed at least 5 architectural phases each corresponding to a different mosque superimposed one above the other, from the Umayyad/Abbasid period until the 18th century.

Besides, the DRAWINGS of pottery were done by Laetitia MUNDUTEGUY, the completion of the TOPOGRAPHIC MAP of al-Yamāma was done by Jérémie SCHIETTECATTE with a D-GPS Trimble R4, and an AERIAL PHOTO COVERAGE has been completed thanks to the use of a kite by Thomas SAGORY from January 30 to February 4. These photographs allowed to proceed, through the photogrammetry, to the reconstruction of a 3D model of the different excavated areas.

Recording system

The nomenclature adopted for the recording of sites is as follow:

- Prehistoric sites are named AK (for al-Kharj) followed by a number in the order of their discovery, e.g. AK-01, AK-02, etc.
- Protohistoric and historic sites are named by their location, followed by a number if several sites have been discovered in a single area, e.g. al-‘Afja, ‘Ayn al-Ḍila’ 1, ‘Ayn al-Ḍila’ 2.

The nomenclature we adopted for recording stratigraphic units and structures during the excavation at al-Yamāma and ‘Ayn al-Dila’ 1 is as follow:

- Stratigraphic units (called UF for *unité de fouille*) are numbered continuously, from 001 to n. Series of numbers have been attributed to the different excavated areas: UF.001 to UF.299 and 500 to 504 in areas N6-07 at al-Yamāma; 300-399 in areas G17-H17 at al-Yamāma; 400-499 in area K17 at al-Yamāma; 1000 to 1099 in areas H9-H10 at ‘Ayn al-Dila’ 1 and 1100 to 1213 in areas A28-B28 & B27-D27 at ‘Ayn al-Dila’ 1.
- Structures are numbered continuously, from 001 to n, preceded by a letter indicative of the nature of the structure (W = Wall; F = Floor; P = Pit; H = Hearth; Ni = Niche; R = Room; A = Access; Po = Posthole; Co = Column; St. = other structure). For example, W.001, W.002, W.003, Co.004, etc. The series of number attributed to the different excavated areas are identical to that used for the UF, a single number being either used for a UF or a structure but not for the two of them at the same

time.

The nomenclature we adopted for recording artefacts, pottery and samples from protohistoric and historic sites is as follow:

14

- Artefacts: initials of the site + number of the stratigraphic unit or 'surf' when sampled on surface + number from 1 to *n*.
Example 1: WH1.surf.3 for the third artefact collected on surface on the site of Wādī al-Hayāthim 1.
Example 2: Y.022.5 for the fifth artefact collected in layer no 22 during the excavation at al-Yamāma.
- Pottery: a specific number was attributed to each sherd indicative of a pottery shape (base, rim, handle, etc.). The number is written in the same way as those of artefacts. The only exception concerns sherds sampled on the surface of the site of al-Yamāma, where the abbreviation 'surf' (for surface) is preceded by a square number – the site of al-Yamāma has been divided in squares of 50 × 50 m identified by a letter (A to R from west to east) and a number (1 to 21 from north to south).
Example 1: Y.001.1 for the first sherd from the first stratigraphic unit during the excavation at al-Yamāma.
Example 2: Y.P6.surf.1 for the first sherd collected on the surface of the site of al-Yamāma, in the square P6.
- Samples: this category includes non-manufactured material (e.g. ash, bone, charcoal, date stone, eggshell, mother of pearl, shell, slag, plant), building material (baked brick, earthen coat, earthen floor, mudbrick, plaster) or pieces of unidentified artefacts (fragments of bronze, flint, glass, iron and steatite). They are all numbered S (for sample) + number of the stratigraphic unit or 'surf' when sampled on the surface + number from 1 to *n*.
Example: S.005.1 for the first sample (here bones) collected in the stratigraphic unit no 5 during the excavation at al-Yamāma.

All these data are recorded within a homogeneous recording system which has been set up to meet the requirements of both the survey of al-Kharj area and the excavation of the sites of al-Yamāma and 'Ayn al-Dīlā' 1. It is constituted of several related databases designed using FileMaker Pro 13 software. It has been created by J. Schiettecatte and G. Charloux and is based on databases used by the past on previous projects. It has been completed by a photographic database based on the one used by the Saudi-French Mission in Madā'in Šālīḥ (dir. L. Nehmé, Fr. Villeneuve, D. al-Talhi) and designed by Jérôme-François Haquet (engineer at the UMR 8167 of the CNRS). These related databases are:

- Database of archaeological sites of al-Kharj area;
- Database of photographs taken during survey and excavation;
- Database of stratigraphic units;
- Database of archaeological structures;
- Database of archaeological artefacts;
- Database of pottery;
- Database of samples.

The database of archaeological sites has been designed so as to be exported and used on a GIS (Geographic Information System), the software being used is ArcGis Desktop 10 designed by ESRI (**fig. 3**).

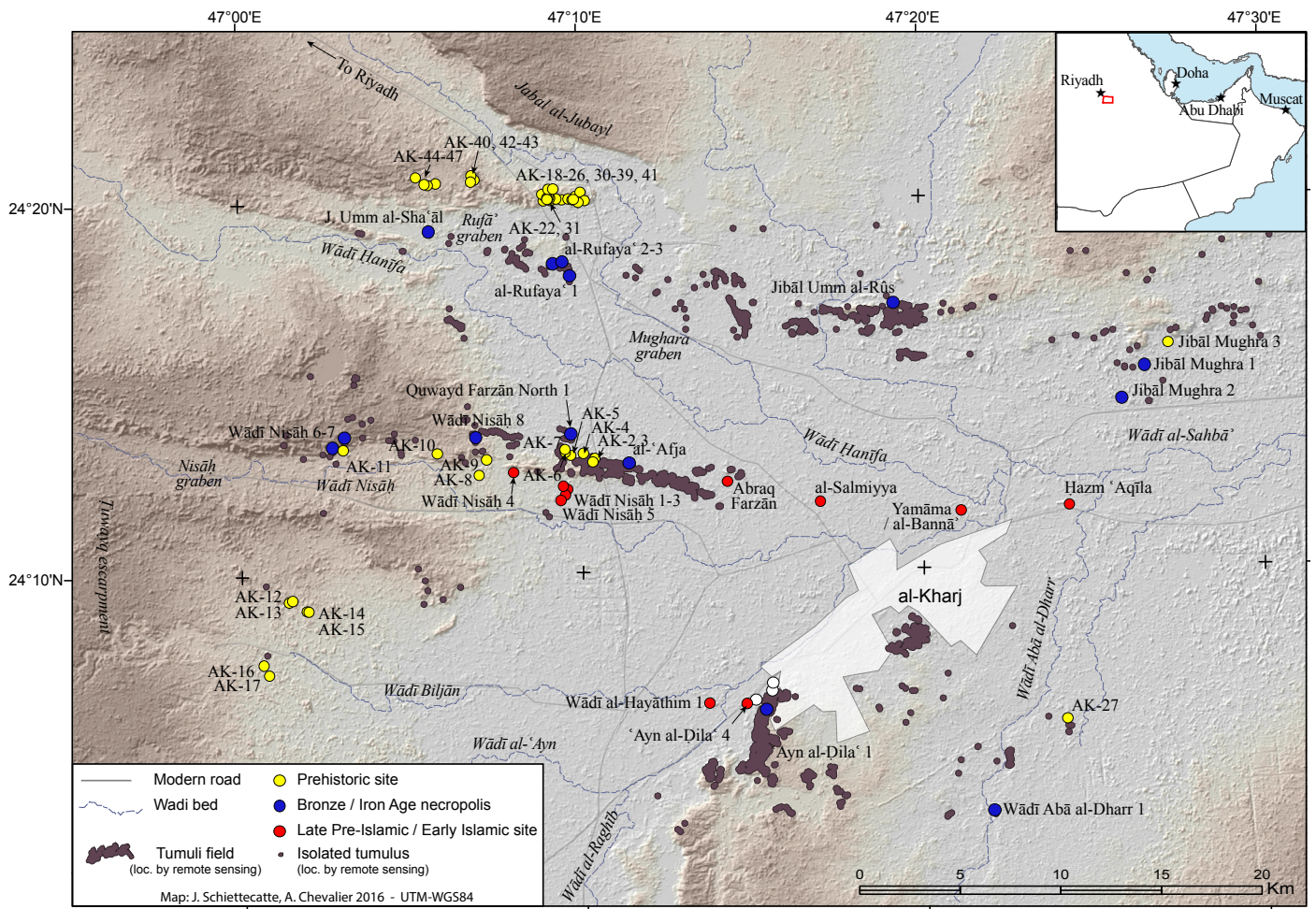


Figure 3: Archaeological map of the oasis of al-Kharj (J. Schiettecatte – Saudi-French Archaeological Mission in al-Kharj).

**‘AYN AL-ḌILA’ 1
A BRONZE AGE
NECROPOLIS**

PROTOHISTORY OF AL-KHARJ: THE BRONZE AGE NECROPOLIS ‘AYN AL-ḌILA‘ 1

Anaïs CHEVALIER (Université Paris 1 Panthéon-Sorbonne) & Jérémie SCHIETTECATTE (CNRS, UMR 8167 Orient et Méditerranée, Paris)

With the participation of Abdallah Sulayman AL-HADLAQ, Abdalaziz b. NAFĪSSA, Sultan Muhammad AL-RASHID, Chloé SCHMIDT, and Stéfan TZORTZIS

Introduction

‘Ayn al-Ḍila‘ 1 (AD1) is 4.4km long and up to 0.5km wide (fig. 4). It spreads on the western and northwestern edge of the Jibāl al-Qusay‘a, a clayey limestone plateau bordering al-Kharj valley to the south (fig. 3). The three large water sinkholes of the oasis are located at the foot of the plateau, immediately to the northwest of the necropolis (fig. 2). Most of the site has been fenced off by the Saudi Commission for Tourism and National Heritage. It comprises c.3,000 tumuli.

Philby described the site as ‘a rocky ridge called Qusaia [Jibāl al-Qusay‘a], whose summit is surmounted by a vast concourse of cairn-like mounds’ (Philby, 1920, p. 169). G. de Gaury visited the site in the early 1940s (de Gaury, 1945, p. 152). In 1978, archaeologists taking part in the Comprehensive Survey of the Kingdom of Saudi Arabia registered this site with the number 207-20 (Zarins et al., 1979, pp. 23–25).

One can essentially distinguish between circular/rectangular tombs and tapered structures. The former are the most numerous (de Gaury’s type 1 and Zarins’s type A). They include a peripheral wall made of vertical slabs and a filling of rubble and stones between the peripheral wall and that of the funerary chamber. When visible, the walls of the funerary chamber are either made of standing slabs or horizontal stone courses. Most of these tombs have been plundered, as attested by a funnel-shaped crater on the top. Some fifteen tombs are considerably taller, with larger stones and a flat earth-covered top (de Gaury’s type 2). To the southeast of the necropolis, Zarins mentions the same kind of tombs encircled by a wall of well-laid stones (Zarins’s type B). One of these was excavated (Zarins et al., 1979, p. 24). The funerary chamber had already been plundered. The Saudi-French Mission excavated 5 tombs of this type in 2013 and 2 in 2016.

The tapered structures (de Gaury’s type 3) are about 1m high and 9 to 41m long. At least twenty-four of these tombs are visible on satellite imagery; they are all concentrated south of the necropolis, together with the other types of tombs. One of these had been previously excavated (Zarins et al., 1979, p. 25) and reported to be looted and empty. The Saudi-French Mission has excavated five tombs of this type in 2016.

In the past sherds sampled on the ground have been indiscriminately attributed to the pre-Islamic period (Zarins et al., 1979, pp. 27, 34).

During its third field season (2013), the Saudi-French archaeological mission chose to excavate five tombs labelled AD1-01 to AD1-05 to the north of the necropolis (area H10), where the tomb density is the highest and their shapes homogeneous. The tombs were lined up along the edge of the plateau and built along a gully.

During the fifth field season, the excavation at AD1 was resumed to the south of the necropolis in areas A28, B27, C27, and D27 (fig. 5). Eight tombs were excavated and labelled AD1-06 to AD1-13. They are all located on the very edge of the limestone plateau.

The main characteristics of the thirteen tombs excavated so far are summed up in Table 1.

Choice of the excavated area

The eight tombs excavated this season are located in the southern part of the site. In this area, the graves were distributed along the edge of the plateau; their density is lower than in the central part of the necropolis (figs. 4-5).

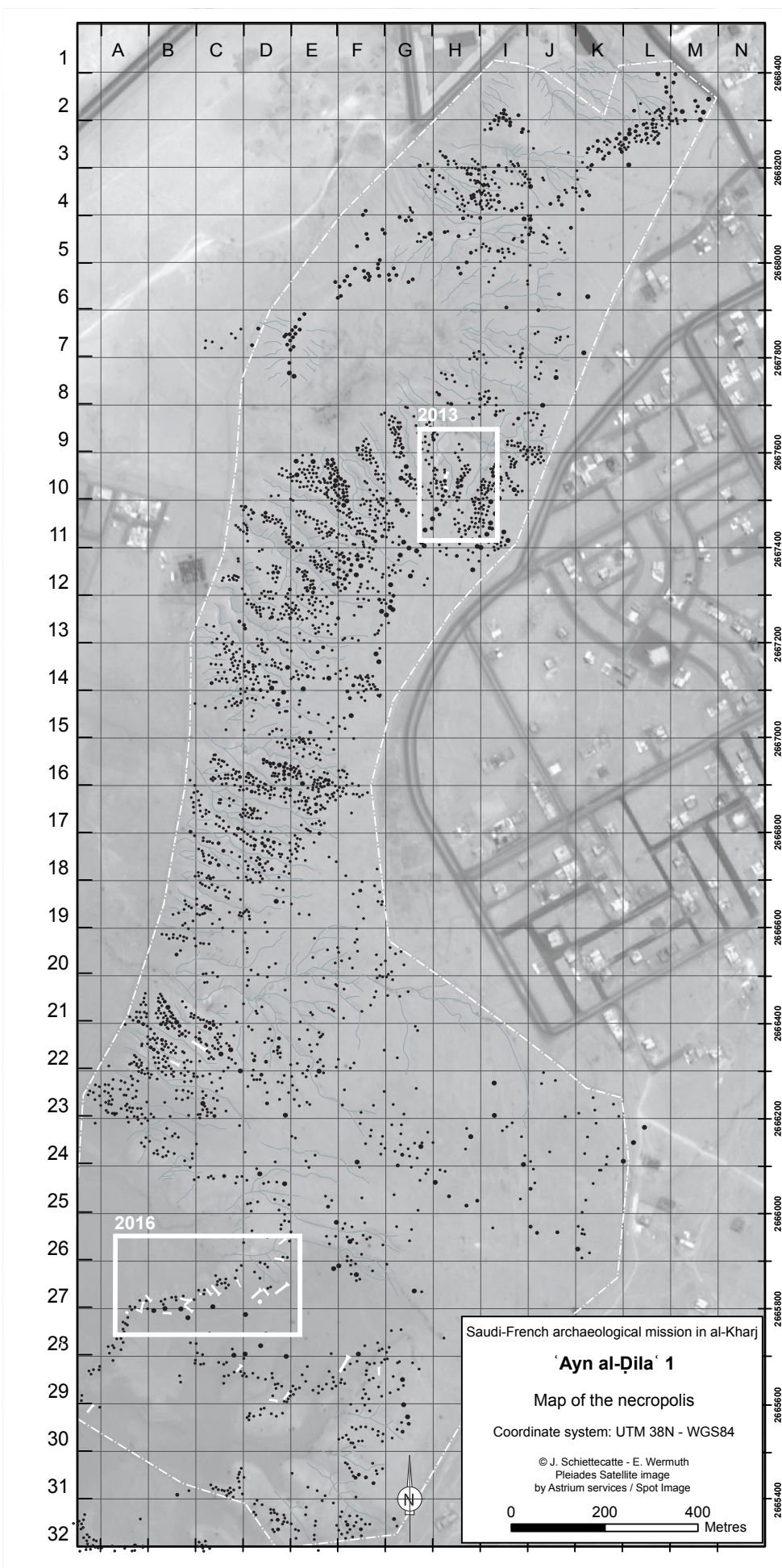


Figure 4: 'Ayn al-Dīla' 1: Map of the necropolis AD1 (J. Schiettecatte - E. Wermuth - Saudi-French Archaeological Mission in al-Kharj - include content © CNES 2013, Distribution Astrium Services / Spot Image S.A., France, all rights reserved).

Tomb number	Type	Dimensions	Human bones	Artefacts
AD1-01	Rectangular	4.7 × 3.3m	Presence	Beads (carnelian, seashell, stone); Bronze ring; Iron object; Pottery sherds; Stone tool
AD1-02	Rectangular	4.5 × 2.9m		Bronze object; Pottery sherds
AD1-03	Circular	Diam.: 3.9m	Presence	
AD1-04	Circular	Diam.: 1.5m		
AD1-05	Circular	Diam.: 4.4m	Presence	Bronze sword; Pottery sherds; Seashell
AD1-06	Tapered structure	17.9 × 3.5m		Bronze object
AD1-07	Tapered structure	17.7 × 4m		
AD1-08	Tapered structure	12.2 × 1.8m		
AD1-09	Tapered structure	12.5 × 3.9m		
AD1-10	Circular	Diam.: 3.1m		Pottery sherds
AD1-11	Cairn + ring wall	Diam.: 2.9m Diam. of the ring wall: 13m		
AD1-12	Circular	Diam.: 4.5m	Presence	Animal bones; Bronze objects
AD1-13	Tapered structure	17 × 2.1m		Shell beads

Table 1: Tombs excavated at AD1 in 2013 (AD1-01 to AD1-05) and 2016 (AD1-06 to AD1-13).

The choice to move southward is the consequence of the taphonomic processes observed in the central part of the necropolis in 2013: the limestone decay and its chemical dissolution drastically slowed down the excavation; it impacted bone remains and modified the architectural appearance of the graves. Such a process was not visible in the southern part of the necropolis, where sand aeolian deposits are thicker and have probably preserved the tombs.

The second reason for this shift was the unique presence to the south of a specific type of tombs, the tapered structures (**fig. 4**: in white). Our interest in characterizing and dating this kind of structure has been determining. We firstly focused on tombs AD1-06, AD1-07 and AD1-08 (areas B27-28). They form a group of three tapered structures with different orientations (**fig. 6**). The other tapered structures excavated are AD1-09 (area A28) and AD1-13 (area D27). These two were chosen because they were seemingly better preserved than the others: important aeolian accumulation, few collapsed stones, no signs of looting.

Another grave (AD1-11) with specific architectural features was also excavated in this area: a circular tomb surrounded by a ring wall. This is the only one known so far in the necropolis.

Moreover, two circular tombs (AD1-10 and AD1-12) were also excavated in order to see the compare their preservation and content with those excavated further north in 2013. The presence of the capstone on AD1-10 made it possible to excavate an inviolate grave.

Map and DEM of the investigated area

An accurate map of the excavated area was done by implementing aerial photographs taken by kite within the photogrammetry software Agisoft Photoscan. A 3D model of the area was then computed and orthorectified thanks to landmarks located with a D-GPS. A DEM was derived from this 3D-model and used on the ArcGis software for the computing of the isolines and the map edition (**fig. 5**).

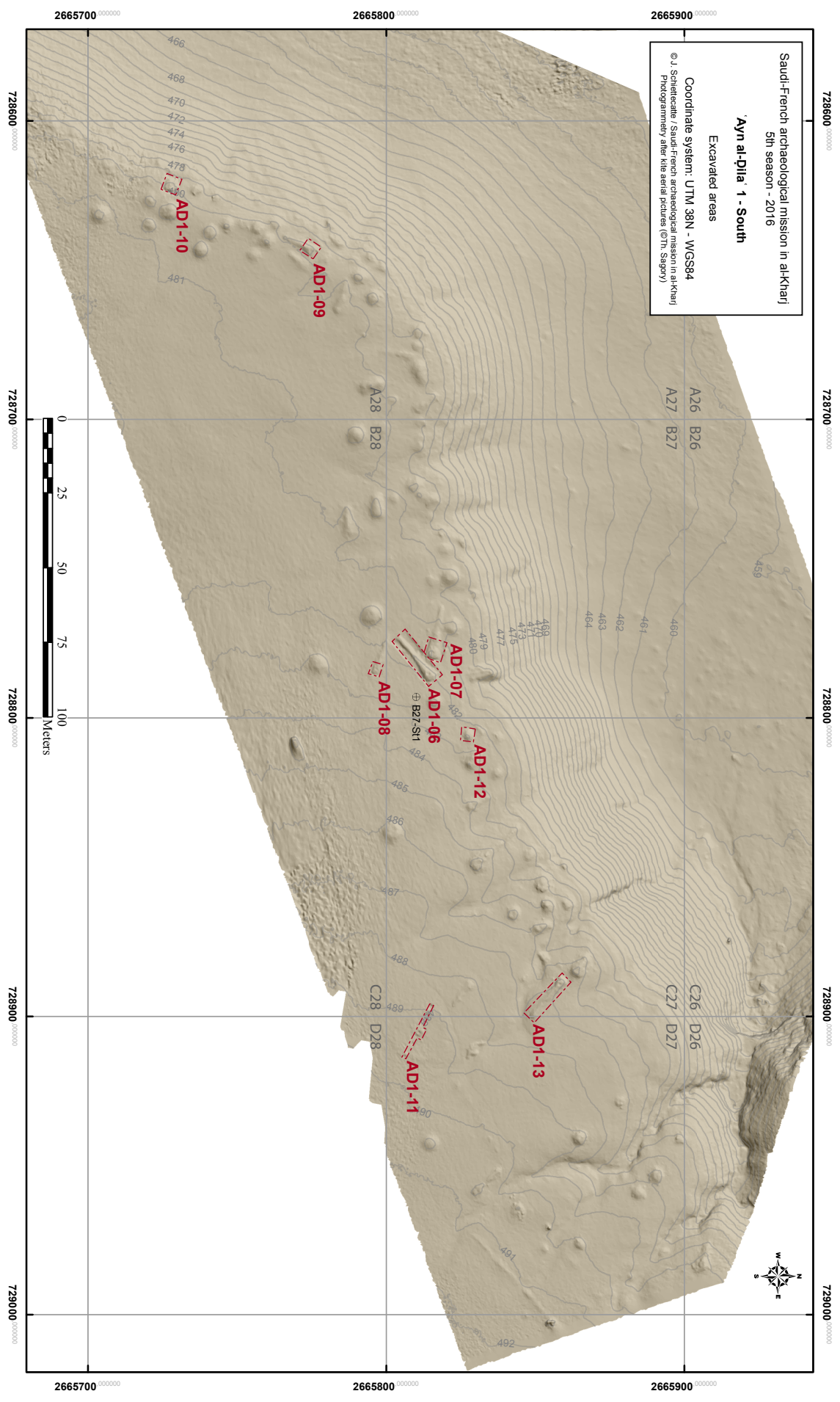


Figure 5: 'Ayn al-Dila' 1: plan of the excavated areas A28, B27, C27, D27 (J. Schiettecatte - Saudi-French Archaeological Mission in al-Kharj).



Figure 6: 'Ayn al-Dila': excavated tapered structures AD1-06, AD1-07, and AD-08 (Th. Sagory – Saudi-French Archaeological Mission in al-Kharj).

Methodology

The methodology applied on the field was as follow:

- 1 – A rectangular area was set up around the structure in order to include the whole structure and its collapse. In the case of the tapered structures, only one was completely excavated; the four other were only partly excavated: a sounding was set up around the triangular head of each tomb.
- 2 – The surface was then cleaned by removing surface loose sediment and small stones.
- 3 – For the tombs AD1-06 and AD1-07, the excavated area was then divided in two parts by drawing a longitudinal section of the structure. Each half was excavated one after the other. For the other structures, each stratigraphic unit was removed in one time over the whole surface without division in quarters/halves.
- 4 – The structure was then excavated in order to uncover the architectural features (surrounding walls; funerary chamber).
- 5 – Finally, the funerary chamber was carefully excavated and all the sediments were sieved. A bench was systematically left along one side of the chamber in order to show the stratigraphic sequence and possible disturbances. Once the bedrock uncovered in the funerary chamber, the bench was excavated in the same way.
- 6 – At the end of the excavation of a structure, a photo coverage was made with a kite and a fishing rod to implement the photogrammetrical software Agisoft Photoscan. 3D models of the tombs were built and orthorectified with the use of a D-GPS. This model was then used to draw plans and profiles of the different graves.

Information related to each structures, each stratigraphic unit, each archaeological and anthropological material are detailed at the end of this chapter in the tables.

Grave AD1-06

Excavated from January 9 to January 16, 2016.

24

Location

‘Ayn al-Dīla’ 1 – Tapered structure (c. 17.9 m long, 1.19 to 3.5 m wide) in Area B27, on the edge of the plateau, along the ridge overlooking the wādī.

The tomb is facing northeast.

A square of 19.5 m long (NE-SW) and 6 m wide (NO-SE) has been set up around the tomb in order to excavate the whole structure.

Architecture & Stratigraphy (figs. 7-8)

The structure

The excavated area has been divided into two parts on both halves of a northeast-southwest axis. The excavation started in the eastern half and was thereafter extended to the western one. Almost the same succession of stratigraphic units has been observed during the excavation of the both halves.

A surface cleaning was realized over the tumulus, removing aeolian sand accumulation and surface loose stones (UF 1100). Once this surface cleaning achieved, different elements appeared among a layer of collapsed stones: the top of the walls delineating the tomb and a little depression of aeolian sand (UF 1106) on the top of the tomb. The collapsed layer (UF 1103 in the eastern part, UF 1116 in the western part), including blocks of stone of various sizes, pebbles and hard sandy silt, was removed.

Under the collapsed layer, a layer of hard brown soil with inclusion of gravels (UF 1105 in the eastern part, UF 1117 in the western part) was uncovered. In the eastern part, a layer of dense sand accumulation (UF 1104) was noted between UF 1103 and UF 1105, against the eastern external wall. Its presence means that there has been a period of time with no activity between the construction and the destruction of the tomb. This layer was not found in the western side of AD1-06 probably because of the direction of the dominant wind, coming from the east.

After the removing of layers UF 1105 and UF 1117, the bedrock and the faces of the stone slabs of the external walls appeared: eastern wall W 1101, northern wall W 1102, western wall W 1115, and southern wall W 1122. The latter constitutes the southern end of the tail of AD1-06; not well-preserved, it is made of three small stones lined up. The other external walls were made of slabs of various sizes set on edge, generally directly on the bedrock (c. 85 × 35 × 20 cm for W 1101, 112 × 50 × 17 cm for W 1102, and 60 × 48 × 16 cm for W 1115). To the NW corner of the tomb and at some points of the western part of the tail, the slabs of the walls have fallen down and were covered with the collapse of the inner filling, composed by rubbles of stones and sandy brown silt. This is the consequence of the unevenness of the bedrock, above which the tomb has been erected. The bedrock is characterized by decreasing steps toward the valley. To compensate the slope, the slabs of the NW corner have been set on the brown hardened layer (UF 1117) and not directly on the bedrock (**fig. 9**). Moreover, the tail in the western part is built just on the ridge of one of the bedrock steps.

This irregular surface of the bedrock offered also possibilities to extract building material. A hole (P 1213) in the bedrock, has been discovered in the eastern part. A block of stone (c. 28 × 35 × 30 cm) was seemingly extracted, probably for building purpose.

The filling between the peripheral wall and the funerary chamber has not been excavated.

The funerary chamber

In the middle of the widened part of the grave, a funnel shaped depression was filled in with aeolian accumulation (UF 1106). It covered a collapsed layer with medium-size stones (c. 15 × 20 × 25 cm) (UF 1107) which closed the funerary chamber (R 1108) (**figs. 10-11**).



Figure 7: 'Ayn al-Dila' 1, Tomb AD1-06: orthophotograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).



Figure 8: 'Ayn al-Dila' 1, Tomb AD1-06: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).

In room R 1108, two stratigraphic units were identified:

- UF 1113: a sandy soil layer without any inclusion. Only two small stones, lying flat, were uncovered ($25 \times 10 \times 15$ cm and $16 \times 10 \times 4$ cm) (fig. 12).
- UF 1114: a sandy layer with inclusion of gravel and pebbles, lying directly above the bedrock. A fragmented bronze artefact (AD1.1114.1) was discovered during the excavation of the northern part (fig. 13).

Funerary chamber R 1108 is 1 m long (NE-SW), 0.7 m wide (SE-NW) and 0.64 to 0.73 m high.

It is bordered by walls W 1109 (to the west), W 1110 (to the north), W 1111 (to the east) and W 1112 (to the south). Wall W 1109 is in dry stone masonry, with seven courses of stones (c. 60×15 cm and 30×20 cm). Wall W 1110 is made of a single orthostat (c. 70×52 cm). Wall W 1111 is made of an orthostats ($70 \times 50 \times 15$ cm) and five courses of stone blocks in its southern half. Wall W 1112 is also made of mixed masonry: an orthostat (47×46 cm) and small stones to the west. These walls are built above the irregular surface of the bedrock. At the top of the room, capstones were laid flat on the corners of the walls, they constitute the first course of a rough corbelled vault (fig. 14).



Figure 9: 'Ayn al-Dila' 1, Tomb AD1-06: face of wall W 1102 with its collapsed NW corner. Looking south-west (A. Chevalier - Saudi French archaeological mission in al-Kharj).

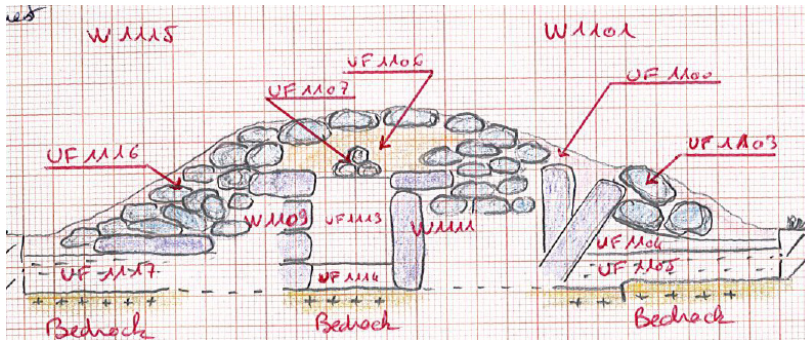


Figure 10: 'Ayn al-Dīla' 1, Tomb AD1-06: schematic section with the different stratigraphic units and structures (A. Chevalier - Saudi French archaeological mission in al-Kharj).

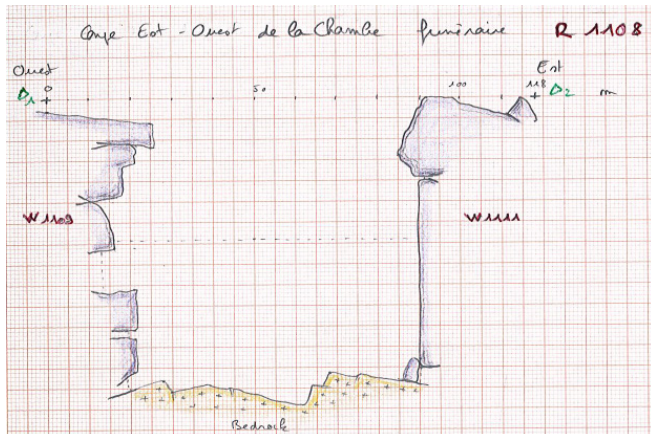


Figure 11: 'Ayn al-Dīla' 1, Tomb AD1-06: profile of the funerary chamber R 1108 (A. Chevalier - Saudi French archaeological mission in al-Kharj).



Figure 12: 'Ayn al-Dīla' 1, Tomb AD1-06: funerary chamber R 1108, base of UF 1113 (A. Chevalier - Saudi French archaeological mission in al-Kharj).



Figure 13: 'Ayn al-Dīla' 1, Tomb AD1-06: funerary chamber R 1108, base of UF 1114 (A. Chevalier - Saudi French archaeological mission in al-Kharj).



Figure 14: 'Ayn al-Dīla' 1, Tomb AD1-06: funerary chamber R 1108, wall W 1111 (left) and W 1112 (right) (C. Schmidt - Saudi French archaeological mission in al-Kharj).

Grave AD1-07

Excavated from January 14 to January 21, 2016.

28

Location

‘Ayn al-Ḍila‘ 1 – Tapered structure (17.7 m long and 4 m wide) in Area B-C27, on the edge of the plateau, along the ridge overlooking the wādī. The tomb is facing east.

A square of 7 m long (E-W) and 6.5 m wide (N-S) has been set up around the head of the tomb. The rest of the tail was left untouched, except cleaning for a photograph coverage.

Architecture & Stratigraphy (figs. 15-16)

The structure

A first layer of aeolian silt and surface loose stones (UF 1118) was removed over the whole excavated surface. The excavated area was then divided into two parts on both halves of an east-west bisection. Excavation started in the northern half and was thereafter extended to the southern one. The same succession of stratigraphic units has been observed during the excavation of the both halves.

The collapse layer (UF 1120 in the northern part, and UF 1129 in the southern part) is made of sandy brown soil and blocks of stone of medium size (c. 17 × 13 × 10 cm). This layer is located above and around the tomb.

The removing of the collapse layer around the structure leads to uncover a layer of indurated brown soil with gravels all around the tomb: UF 1121 (in the northern half) and UF 1149 (in the southern half). This layer is similar to the one distinguished in the AD1-06 excavated area (UF 1105 and UF 1117). This last layer was lying above the bedrock.

The outer walls of AD1-07 were then cleared: W 1130 to the south, W 1128 to the east and W 1115 to the north. They are built in stone slabs set on edge above the bedrock; slabs are 38 to 70 cm high and c. 10 cm wide.

The slabs of wall W 1119 partly collapsed to the east, covered with the collapse of the inner filling (rubbles and sandy silt). To the west, the orthostats are still set on edge; one of them is protruding from the alignment of the wall, thrust forward by the inner filling without having fallen down.

At the top of the structure, the removing of the collapse layer revealed huge slabs of stone laid flat and forming a circle. These are the capstones of funerary chamber R 1131.

Along the western bench of the excavated area, a sounding was carried out within the filling of the tail to determine its very nature. It run from wall W 1119 to W 1130 and the filling was fully removed down to the bedrock. This sounding was 1.2 m wide (EW) and 2.2/2.5 m long (NS). The inner filling in this part was made of three successive stratigraphic units (**fig. 17**):

- An upper layer of sandy brown soil with stone blocks of medium size (c. 15 × 20 × 15 cm to 35 × 35 × 8 cm) (UF 1210);
- An intermediate layer (UF 1211) almost identical to UF 1210 with huge stone blocks (up to 90 × 60 × 40 cm).
- At the base, a thin layer of sandy soil with gravels (UF 1212) (similar to UF 1221 and UF 1149) constitutes the interface with the bedrock.

A layer equivalent to UF 1212 is visible outside the grave, on the other side of both walls W 1119 W 1130 (UF 1221 to the south and UF 1149 to the north). This means that this layer was present previously to the grave and that it has been dug to set the stone slabs of the walls on edge directly above the bedrock. Besides, there is no attempt to wedge the slabs with small stones.

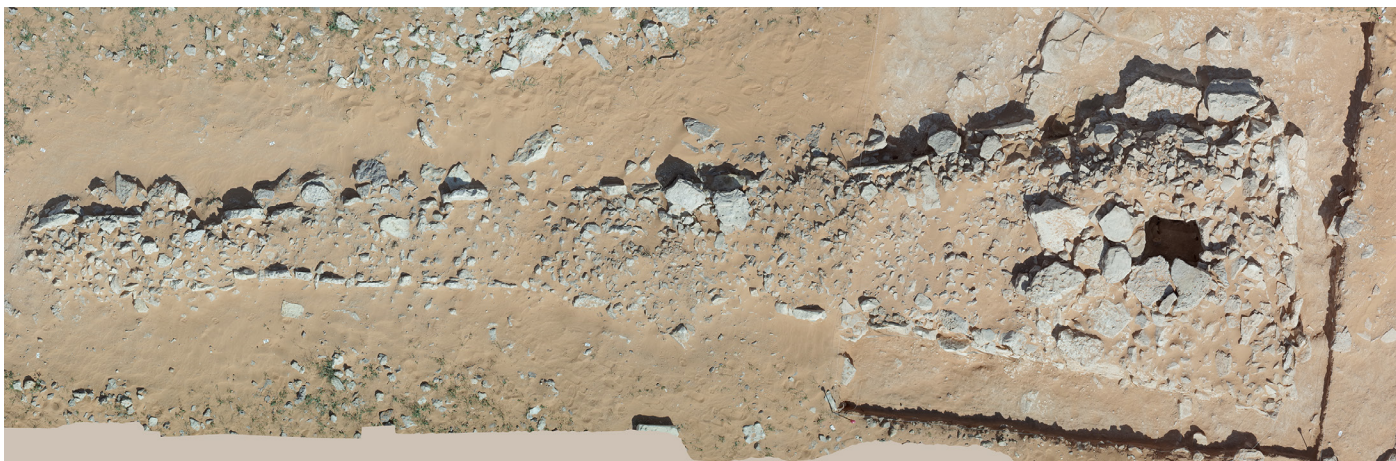


Figure 15: 'Ayn al-Dīla' 1, Tomb AD1-07: orthophotograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).

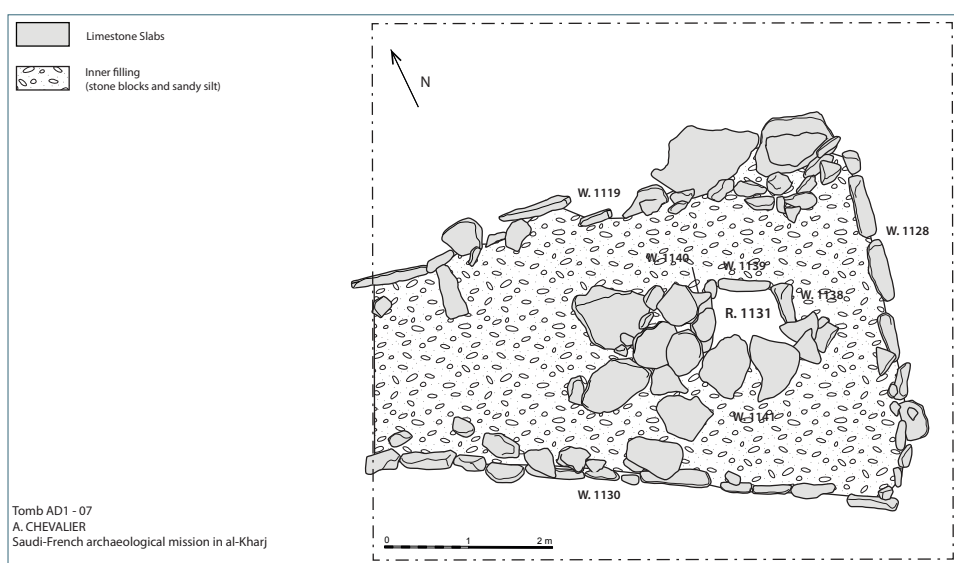


Figure 16: 'Ayn al-Dīla' 1, Tomb AD1-07: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).

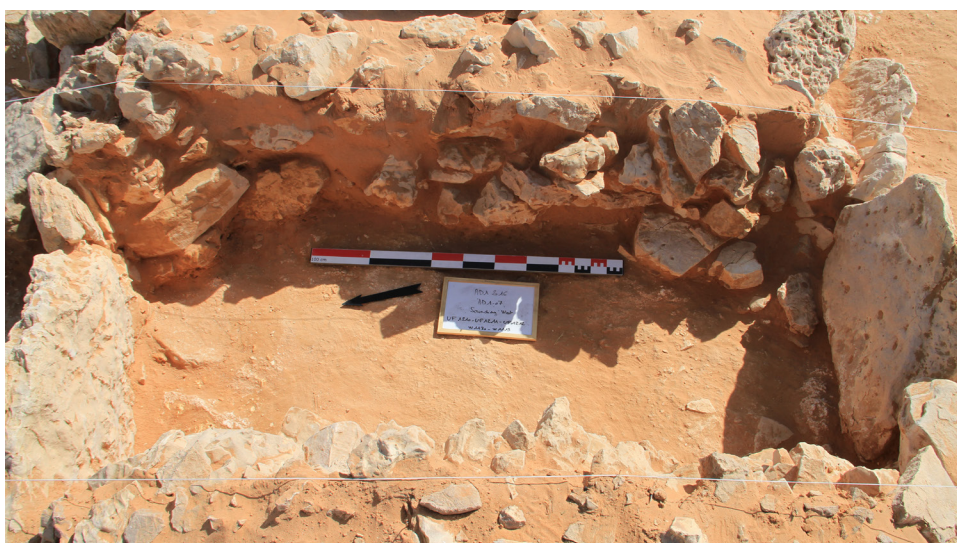


Figure 17: 'Ayn al-Dīla' 1, Tomb AD1-07: Sounding within the filling of the tail - base of UF 1212 between walls W 1119 (left) and W 1130 (right) (S. Tzortzis - Saudi French archaeological mission in al-Kharj).

The funerary chamber (R 1131)

The stratigraphic sequence is as follow (from top to bottom) (fig. 18):

- pocket of thin sandy soil with small gravels under the collapsed stones (UF 1132).
- layer of hardened sandy soil with gravels (UF 1136)
- denser sandy layer with small pebbles and stones of medium size as a buffer with the bedrock (UF 1137).

The room measures 1.15 × 1.1 × 1 m. It is bordered by walls W 1138 (east), W 1139 (north), W 1140 (west) and W 1141 (south). The lower parts of the walls are built with huge slabs of stone set on edge over the bedrock (c. 40 × 30 cm to the east, 60 × 55 cm to the north, and 48 × 12 cm to the south). The upper parts are made of smaller blocks of stone in irregular courses.

No bones nor artefacts were found in the funerary chamber.

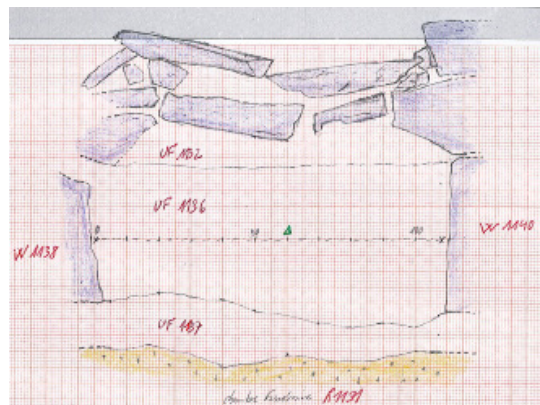


Figure 18: 'Ayn al-Dīla' 1, Tomb AD1-07: stratigraphic section of funerary chamber R 1108 (A. Chevalier - Saudi French archaeological mission in al-Kharj).

Grave AD1-08

Excavated from January 17 to January 20, 2016.

Location

'Ayn al-Dīla' 1 – Tapered structure (12.24 m × 1.8 m) in Area B27, on the edge of the plateau, along the ridge overlooking the wādī. The tomb is facing southeast.

A square of 4.5 m long (E-W) and 3.5 m wide (N-S) has been set up around the head of the tomb. The rest of the tail was left untouched, except cleaning for a photograph coverage.

Architecture & Stratigraphy (figs. 19-20)

The structure

A surface cleaning was realized over the tapered structure and surface loose stones, pebbles and silt of aeolian origin were removed (UF 1123). This layer was the upper part of a collapse layer (UF 1124) made of stones of various sizes and sandy silt.

It covered a layer of hard brown soil with pebbles (UF 1142) and the peripheral walls of the funerary structure. At the top of the grave, stone slabs lying flat in a circle appeared; they form the upper part of circular wall W 1135 which delineates funerary chamber R 1134.

AD1-08 is delineated by a northern wall (W 1125), an eastern wall (W 1126) and a southern wall (W 1127). This latter is built with stone slabs set on edge (c. 66 × 40 × 10 cm), whereas W 1126 is made of 2 to 4 courses of dry stone masonry. These walls are 20 to 50 cm high. The northern wall (W 1125) is preserved on a height of nine courses of stones (c. 1 m high). The external walls are built on the bedrock.

The filling between the peripheral wall and the funerary chamber has not been excavated.

The funerary chamber (R 1134)

The burial space was filled in with a single stratigraphic unit (UF 1133): sandy silt with inclusion of small pebbles and small stones (c. 15 × 10 × 5 cm). This layer lies directly above the irregular surface of the bedrock. No artefacts nor bones were discovered in this funerary chamber.

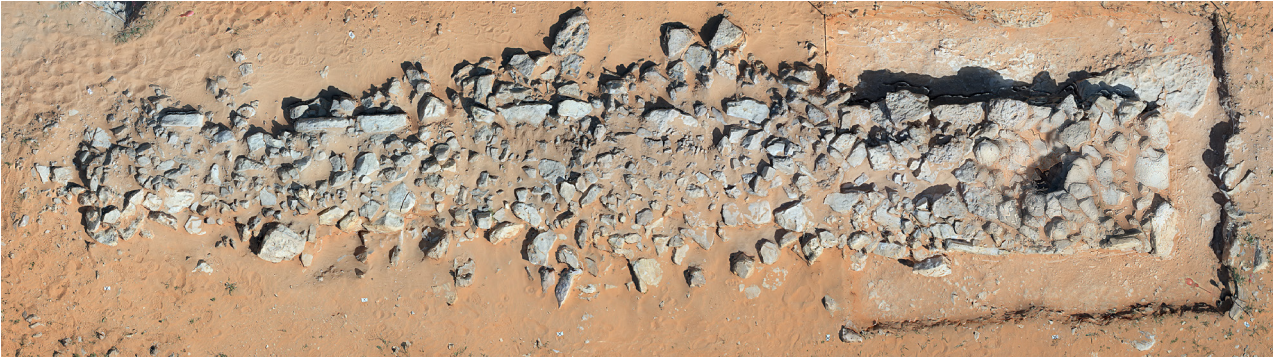


Figure 19: 'Ayn al-Dīla' 1, Tomb AD1-08: orthophotograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).

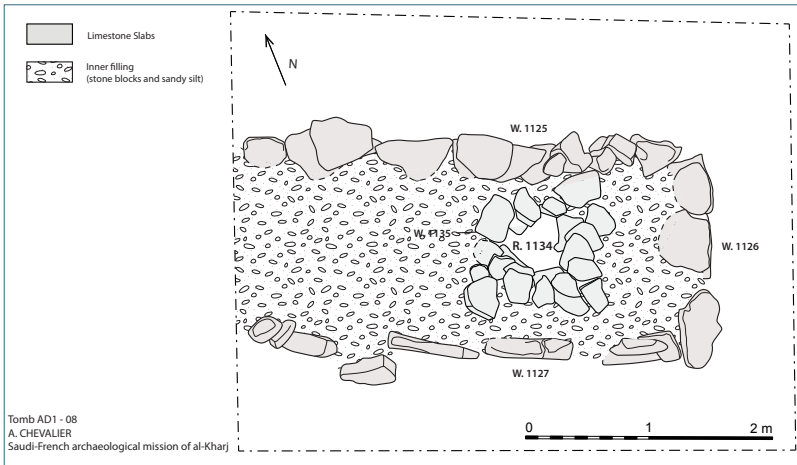


Figure 21: 'Ayn al-Dīla' 1, Tomb AD1-08: funerary chamber R 1134 (A. Chevalier - Saudi French archaeological mission in al-Kharj).

Figure 20: 'Ayn al-Dīla' 1, Tomb AD1-08: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).

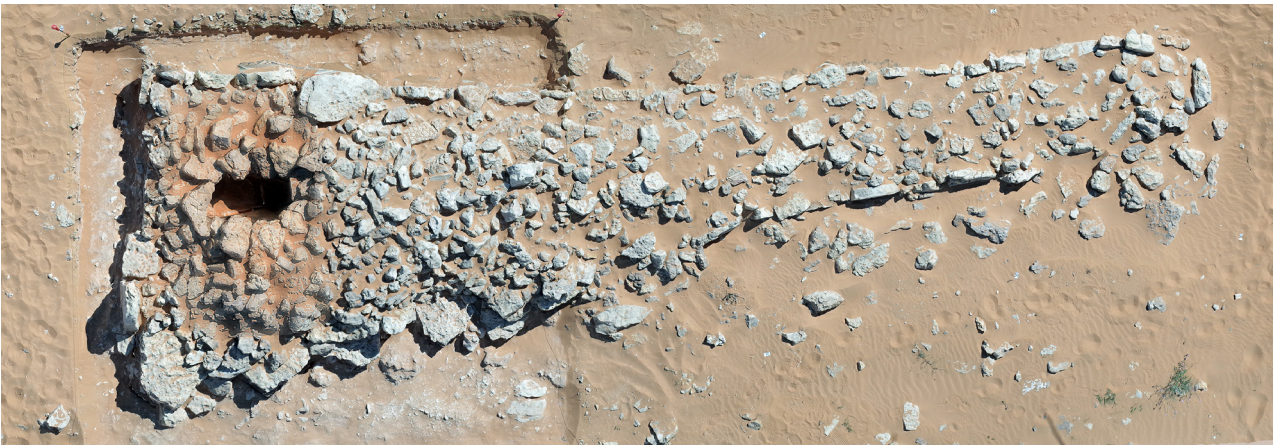


Figure 22: 'Ayn al-Dīla' 1, Tomb AD1-09: orthophotograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).

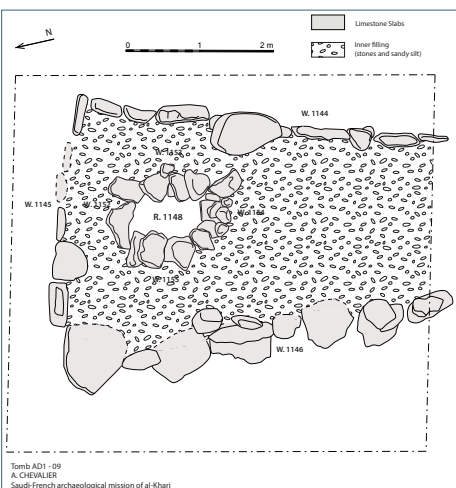


Figure 23: 'Ayn al-Dīla' 1, Tomb AD1-09: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).

The funerary chamber is small: 50-55 cm in diameter and 60 cm high. It is bordered by an irregular, more or less circular peripheral wall (W 1135) built in dry-stone masonry. Stones are c. 20 cm long and 10 cm high. The diameter of the room gets narrower to the base (fig. 21).

Grave AD1-09

Excavated from January 20 to January 23, 2016.

Location

‘Ayn al-Ḍilā‘ 1 – Tapered structure (12.15 × 3.90 m) in Area A28, on the edge of the plateau, along the ridge overlooking the wādī. The tomb is facing north-northeast.

A square of 5.5 m long and 5 m wide has been set up around the head of the tomb. The rest of the tail was left untouched, except cleaning for a photograph coverage.

Architecture & Stratigraphy (figs. 22-23)

The structure

The layer of aeolian accumulation silt and surface loose stones (UF 1143) was removed from the excavated area. It covered a collapse layer (UF 1147) composed of stone blocks of various sizes (mainly c. 30 × 30 × 8 cm). On the top of the tapered structure, stone slabs lying flat in a circular shape were indicating the location of funerary chamber R 1148. Outside the grave, the collapse covered a layer of compact sandy soil with small pebbles and gravels (UF 1150) lying on the bedrock.

The tomb is delineated by wall W 1144 to the east, by W 1145 to the north and W 1146 to the west. W 1144 is built with huge stone slabs (from c. 95 × 15 × 56 cm to 110 × 15 × 55 cm), completed in two places by stones stacked in two or three courses. W 1145 is built with slabs set on edge; slabs are 15 to 65 cm high. The average size of blocks is 40 × 35 × 10 cm. W 1146 is built with orthostats which have almost all collapsed to the west. These stone slabs are c. 40 × 20 × 70 cm.

The filling between the peripheral wall and the funerary chamber has not been excavated.

The funerary chamber

On the top of the tomb, between the capstones of the funerary chamber (R 1148), a layer of stone blocks (UF 1551) was uncovered under the collapse layer (UF 1147) which covered the whole structure.

In funerary chamber R 1148, the stratigraphic sequence is as follow (from top to bottom):

- UF 1151: collapse layer including stones (c. 30 × 20 × 5 cm) which dipped toward the centre of the burial space, almost vertically.
- UF 1156: compact 20-cm-high sand layer.
- UF 1158: layer including compact sand, pebbles, fragments of bedrock surface and calcareous nodules.

R 1148 is bordered with four walls which formed a quadrangular space: W 1152 to the north; W 1153 to the east; W 1154 to the south and W 1155 to the west. Walls are 3 to 5 courses high. They are in dry stone masonry, built with rough stones of medium size. The ground of the funerary chamber seems to have been slightly dug into the bedrock. The diameter of the chamber narrows toward the top because protruding stones are progressively forming a corbelled vault. The room is thus 135/90 × 97/55 × 60/87 cm.

Grave AD1-10

Excavated from January 23 to January 25, 2016.

Location

‘Ayn al-Ḍila‘ 1 – small tumulus (c. 3.10 m in diameter) in Area A28, on the edge of the plateau, along the ridge overlooking the wādī.

A square of 6 by 5.5 m has been set up around the tomb.

Architecture & Stratigraphy (figs. 24-25)

The structure

Before the beginning of the excavation, the peripheral outer wall (W 1160) was outcropping on the surface. It was made of huge orthostats (c. 110 cm long, 90 cm wide and 30 cm thick) set on edge or fallen down around the grave. The tomb is c. 3.1 m in diameter.

A surface layer (UF 1157) made of aeolian sand was covering the tumulus. Under it, a collapse layer (UF 1159) has been removed around the grave. This layer was either lying above the bedrock, or above a layer of compact sand with small pebbles and gravels (UF 1168). The bedrock is uneven: several steps going down toward the valley are visible to the west of the sounding (fig. 26).

In the collapse layer (UF 1159), 31 pottery sherds with a MNI of 4 vases have been collected. They all share the same characteristics: moulded large bowls in a coarse beige fabric with a black to grey core and abundant white mineral temper (1-2 mm thick) (figs. 27-28).

The filling between the peripheral wall and the funerary chamber has not been excavated.

The funerary chamber

Funerary chamber R 1163 was still closed by a large capstone (St 1167: 117 × 70 × 26 cm) (fig. 29). Two men were required to remove the capstone and roll it away. This is indicative of the workforce which was necessary to build such a grave: several people were assuredly mobilized.

The stratigraphic sequence in the room was as follow (from top to bottom) (fig. 30):

- An upper layer of dense aeolian sand (UF 1169);
- A same layer of compact sand covering four small slabs of stone lying flat (UF 1175);
- A layer of compact sand with small pebbles (UF 1176) covering the bedrock.

No bones nor artefact were discovered despite the sieving of the sand.

The funerary chamber is 1 m long, 70/80 cm wide, and 60 cm high. The walls are up to 3 courses high; the rough blocks of limestones are 35 to 70 cm long, 40 cm wide and 15 to 25 cm high. W 1174 to the west is 80 × 65 × 40 cm. W 1165 to the east is 65 × 42 × 60 cm. W 1166 to the south is 65 × 45 × 60 cm. W 1164 to the north is 70 × 40 × 60 cm.



Figure 24: 'Ayn al-Dīla' 1, Tomb AD1-10: orthophotograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).

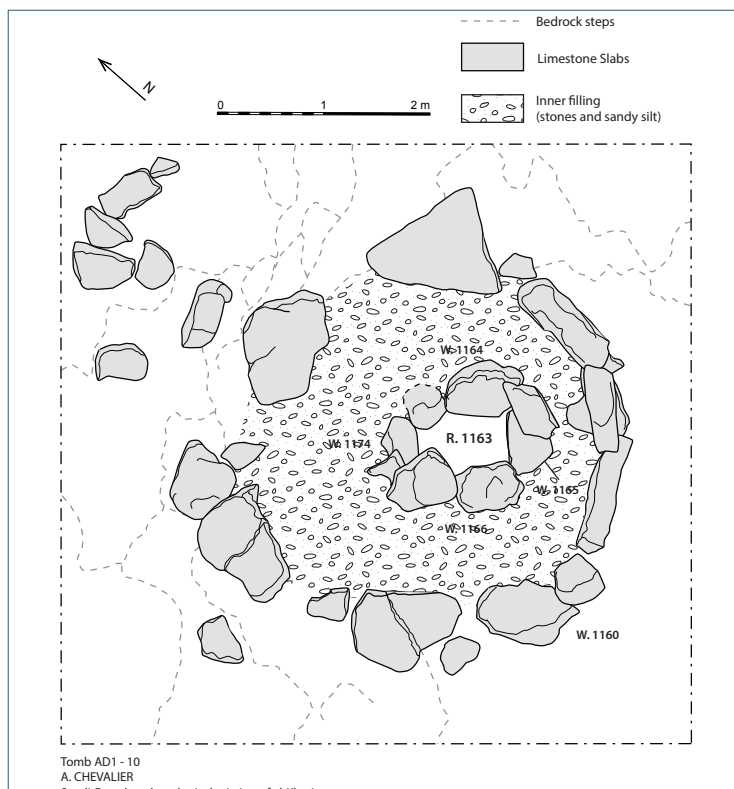


Figure 25: 'Ayn al-Dīla' 1, Tomb AD1-10: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).



Figure 26: 'Ayn al-Dīla' 1, Tomb AD1-10, looking south (S. Tzortzis - Saudi French archaeological mission in al-Kharj).

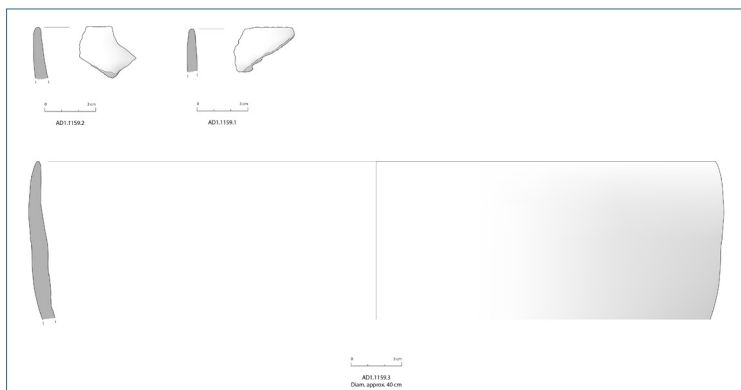


Figure 27: 'Ayn al-Dīla' 1, Tomb AD1-10: Bowls in a coarse beige fabric (L. Munduteguy - Saudi French archaeological mission in al-Kharj).



Figure 28: 'Ayn al-Dīla' 1, Tomb AD1-10: Coarse bowl (AD1.1159.3) (J. Schiettecatte - Saudi French archaeological mission in al-Kharj).



Figure 29: 'Ayn al-Dila' 1, Tomb AD1-10, upper section of funerary room R 1163 with the capstone at the top. Looking east (S. Tzortzis - Saudi French archaeological mission in al-Kharj).

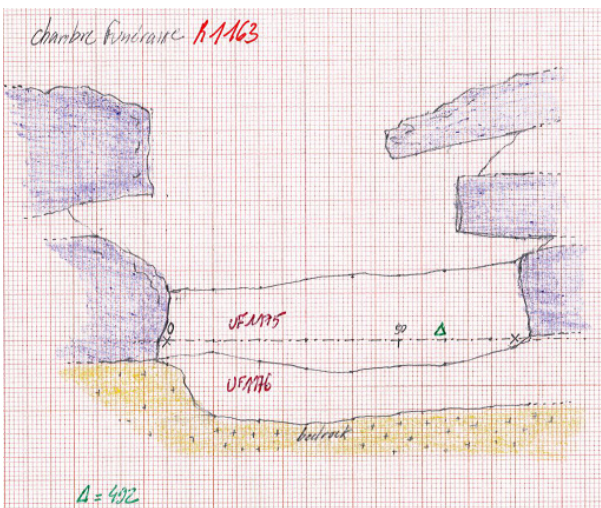


Figure 30: 'Ayn al-Dila' 1, Tomb AD1-10, funerary room R 1163. Stratigraphic section (S. Tzortzis - Saudi French archaeological mission in al-Kharj).



Figure 31: 'Ayn al-Dila' 1, Tomb AD1-10, funerary room R 1163. Looking east (S. Tzortzis - Saudi French archaeological mission in al-Kharj).

Grave AD1-11

Excavated from January 23 to January 26, 2016.

36

Location

‘Ayn al-Ḍila‘ 1 – circular tomb surrounded by a ring wall (c. 13 m in diameter for the ring wall and 2.9 m in diameter for the central tumulus) in Area D27, in the inner part of the plateau.

Architecture & Stratigraphy (fig. 32)

AD1-11 is a circular tomb surrounded by a ring wall. Due to its size and a lack of time, it was not excavated over its whole surface.

A transverse sounding along an east-west axis was realized along the wider diameter of the tomb. It was 20 m long and 1.5 to 3 m wide. It crossed the central tumulus (St 1171) and the ring wall (W 1181 = W 1162) in two opposite areas.

Stratigraphy

The stratigraphic sequence of the sounding was as follow (from top to bottom) (fig. 33):

- A surface layer (UF 1161) of aeolian sand and loose small stones covering
- a collapse layer (UF 1183) covers W 1181; it includes blocks of stone (20 × 30 × 8 cm), gravels, pebbles and dense earth.
- A layer of dense brown earth, pebbles and small stones above the bedrock: UF 1170 east of the ring wall (W 1162); UF 1173 between the central tumulus (St 1171) and W 1162; UF 1180 between St 1171 the ring wall (W 1181); UF 1182 west of wall W 1181. This layer had some natural cracks filled with aeolian orange sand (e.g. pit P 1172) (fig. 34).

The ring wall

The ring wall was excavated in two areas: W 1162 east of the sounding; and W 1181 west of the sounding. It is c. 13 m in diameter.

- W 1162 has been unearthed on a 1.5 m long section. It is c. 90 cm wide 14 to 20 cm high. A single course of stones is preserved and composed by medium-size rough blocks (c. 25 × 25 × 6 cm) (fig. 35).
- W 1181 has also been unearthed a 1.5 m long section. It is c. 1.3 m wide and 25 cm high.

It is built in dry stone masonry but its external limits are difficult to follow.

The funerary chamber

In the centre of the ring wall, a tumulus (St 1171) is c. 2.9 m in diameter and preserved on a height of 26 cm (fig. 36). It was covered by a thin collapse layer (UF 1178) including small stones (10 × 12 × 12 cm / 30 × 17 × 5 cm) and brown sediment. This tumulus is slightly off centre in the circle delineated by the ring wall and shows no clearly visible wall, only a small depression (R 1189) in the structure interpreted as a funerary room. In R 1189, a layer of hardened whitish earth (UF 1179) was lying on the bedrock.

No bones nor artefact were discovered.

The bad state of conservation of this monument might be linked to a deliberate destruction.

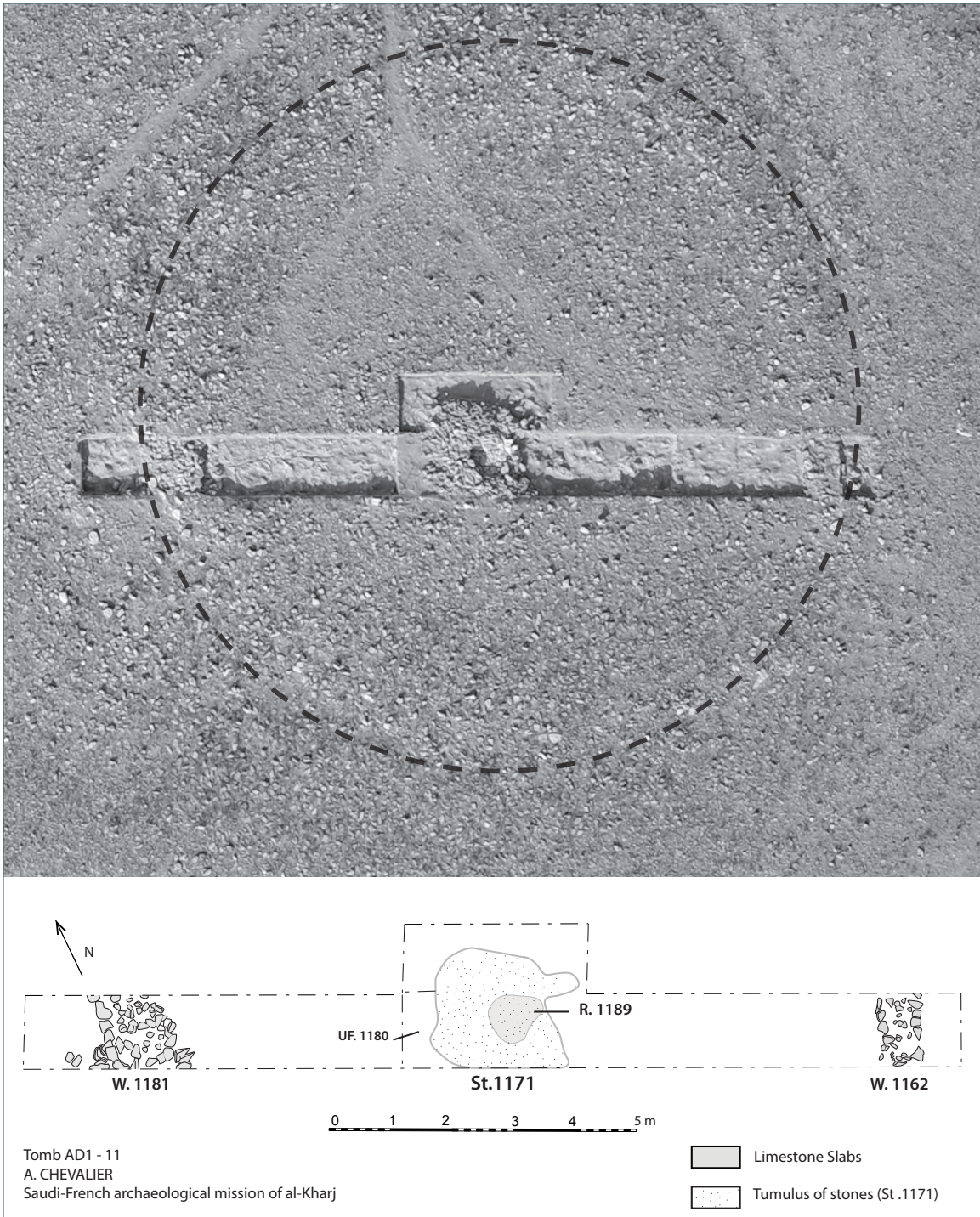


Figure 32: 'Ayn al-Dila' 1, Tomb AD1-11: orthophotograph and plan (A. Chevalier / Th. Sagory - Saudi French archaeological mission in al-Kharj).

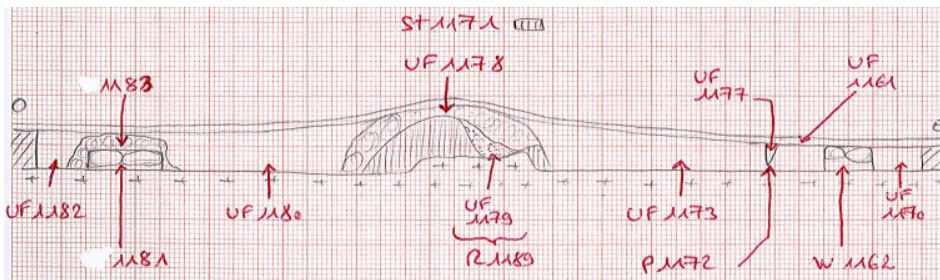


Figure 33: 'Ayn al-Dila' 1, Tomb AD1-11: schematic section of the cross sounding (A. Chevalier - Saudi French archaeological mission in al-Kharj).



Figure 34: ‘Ayn al-Ḍila’ 1, Tomb AD1-11: Natural crack in the ground (P 1172) filled with aeolian sand. Looking east (A. Chevalier - Saudi French archaeological mission in al-Kharj).

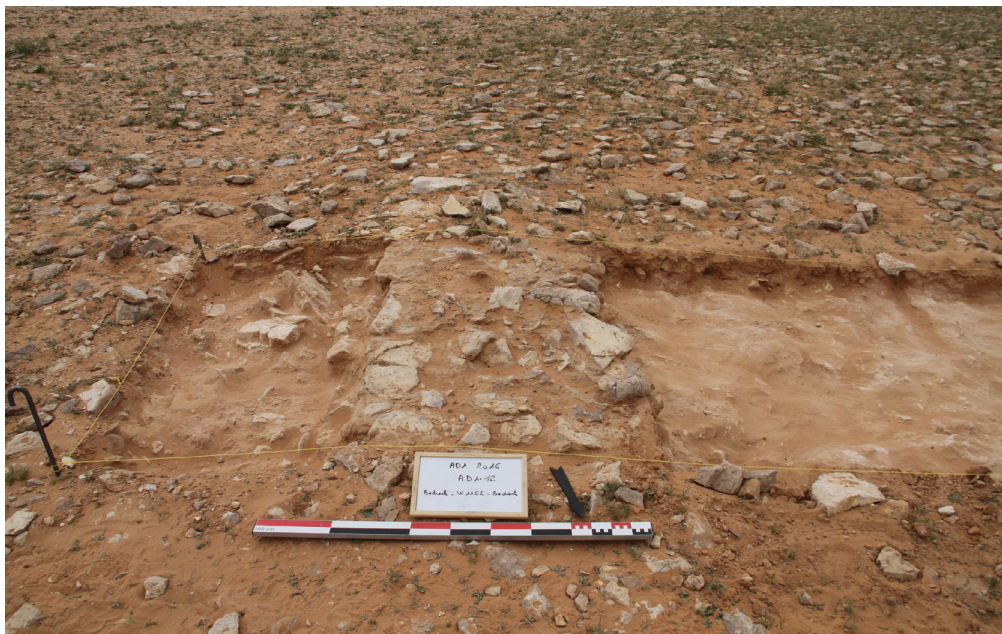


Figure 35: ‘Ayn al-Ḍila’ 1, Tomb AD1-11: Section of the ring wall (W 1162). Looking south (A. Chevalier - Saudi French archaeological mission in al-Kharj).



Figure 36: ‘Ayn al-Ḍila’ 1, Tomb AD1-11: Central tumulus St 1171. Looking west (A. Chevalier - Saudi French archaeological mission in al-Kharj).

Grave AD1-12

Excavated from January 26 to January 28, 2016.

Location

‘Ayn al-Ḍila‘ 1 – small tumulus (c. 3.10 m in diameter) in Area C27, on the edge of the plateau, along the ridge overlooking the wādī.

A square of 4 × 4.5 m has been set up around the tomb.

Architecture & Stratigraphy (figs. 37-38)

The structure

The surface of the tomb AD1-10 was covered by a layer of small stones and pebbles of limestones and aeolian silts (UF 1184). The removing of this layer yielded a few fragmented pieces of animal bones, whose nature remains undetermined.

Under it, a collapse layer made of aeolian sand and small and medium size stones has been removed of the whole structure (UF 1187). It covered a small circular grave of 3.10 m in diameter, bordered by a peripheral wall (W 1185). This wall is c. 60 cm high. It is made of limestone slabs set on edge, each being c. 70 × 15 × 55 cm (fig. 39). In the middle, the capstone of a small funerary chamber (R 1186) was preserved (fig. 40).

The filling between the peripheral wall and the funerary chamber has not been excavated.

The funerary chamber

The funerary chamber (R 1186) is 52 × 50 × 60 cm (fig. 41). It is bordered by 4 walls in dry stone masonry or in slabs set on edge:

- The western wall (W 1196) is 52 cm long and 60 cm high and is built with a single orthostat.
- The southern wall (W 1195) is a 60-cm-high wall made of 4 courses of rough stones.
- The eastern wall (W 1194) is made of a single orthostat (52 × 20 × 40 cm).
- The northern wall (W 1193) is made of 4 courses of slabs varying in size (from 26 × 10 cm to 50 × 40 cm). It is 50 cm long and 70 cm high.

The stratigraphic sequence in the room was as follow (from top to bottom) (fig. 42):

- A layer of sand with few gravels (UF 1188). In the centre of the burial space, a large stone was lying flat near the western wall (W 1196).
- A layer of orange sand and few pebbles (UF 1192). Fragments of bronze artefacts (AD1.1192.1 to 5) were found in the western half of the funerary chamber, except for AD1.1192.1, found in the eastern part of the bench.
- A layer of dense greyish sand and pebbles (UF 1197) lying above the bedrock. It yielded other bronze artefacts (AD1.1197.1 and AD1.1197.2) (fig. 43).



Figure 37: 'Ayn al-Dila' 1, Tomb AD1-12: ortho-photograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).

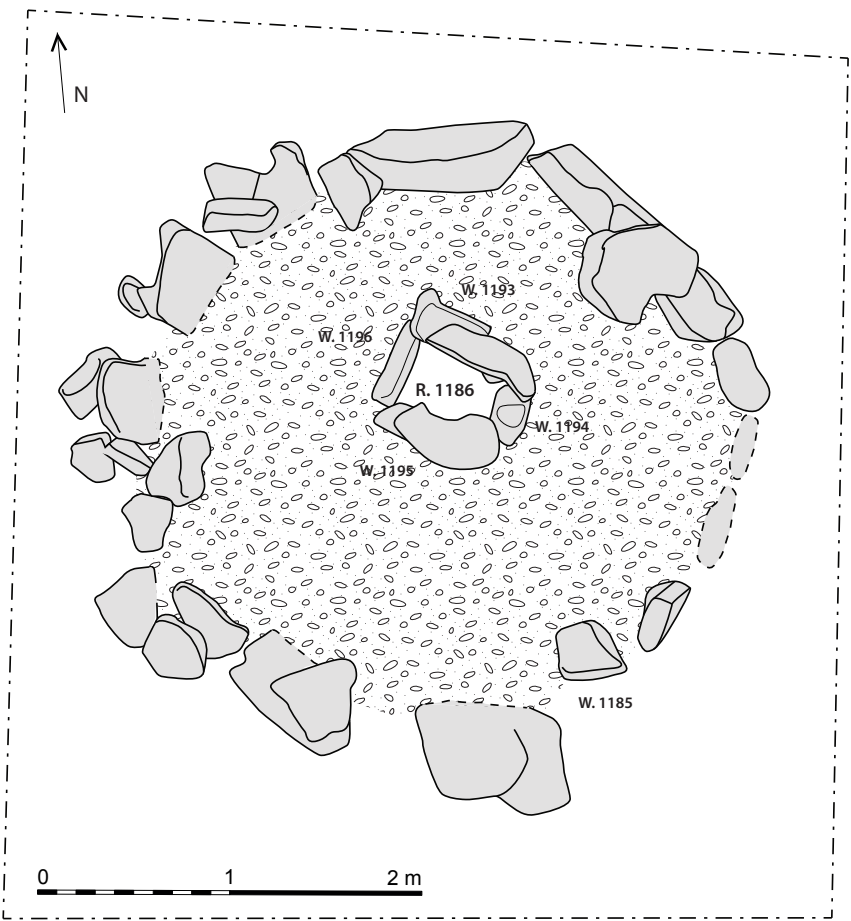


Figure 38: 'Ayn al-Dila' 1, Tomb AD1-12: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).

Tomb AD1 - 12
 A. CHEVALIER
 Saudi-French archaeological mission of al-Kharj

Limestone slabs
 Inner filling (stones and sandy silt)

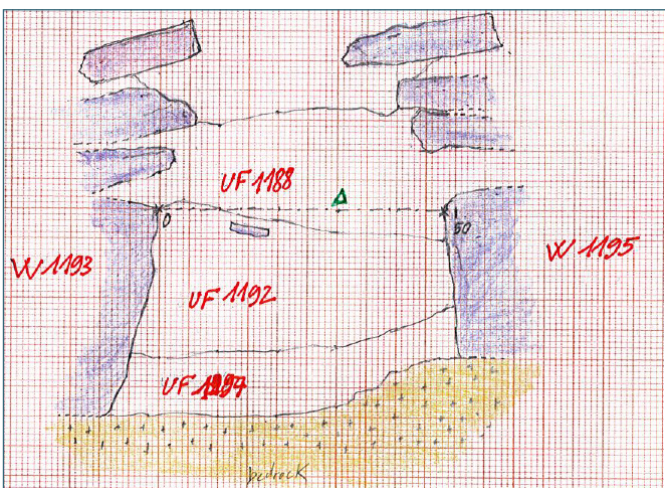


▲ Figure 39: 'Ayn al-Dila' 1, Tomb AD1-12: peripheral wall W 1185 (A. Chevalier - Saudi French archaeological mission in al-Kharj).



◀ Figure 40: 'Ayn al-Dila' 1, Tomb AD1-12: capstone (S. Tzortzis - Saudi French archaeological mission in al-Kharj).

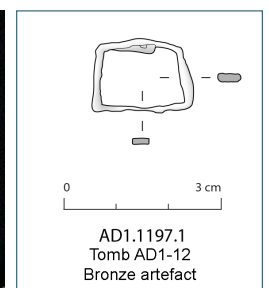
▼ Figure 41: 'Ayn al-Dila' 1, Tomb AD1-12: funerary chamber R 1186 (Ch. Schmidt - Saudi French archaeological mission in al-Kharj).



▲ Figure 42: 'Ayn al-Dila' 1, Tomb AD1-12: stratigraphic section of funerary room R 1186 (S. Tzortzis - Saudi French archaeological mission in al-Kharj).



► Figure 43: 'Ayn al-Dila' 1, Tomb AD1-12: bronze artefact AD1.1197.1 (Th. Sagory / L. Munduteguy - Saudi French archaeological mission in al-Kharj).



Grave AD1-13

Excavated from January 26 to January 31, 2016.

42

Location

‘Ayn al-Dīla‘ 1 – Tapered structure (c. 17 m long and 2.1m wide) in Area C27, on the edge of the plateau, along the ridge overlooking the wādī. The tomb is facing northwest.

Architecture & Stratigraphy (figs 44-45)

The structure

A surface layer cleaning was realized over the whole excavated area (4 × 4 m) set up around the head of the tapered structure. The rest of the tail was just cleaned for the needs of aerial photographs. Surface loose stones, pebbles and indurated silt of aeolian accumulation (UF 1190) were removed.

This surface layer was the upper part of a collapse layer (UF 1191), which consisted in rough limestone blocks of c. 40 × 30 × 5 cm or 20 × 20 × 12 cm with sandy brown silt.

After the removing of the collapse layer above and around the tomb, the top of the stone slabs which composed the outer walls were uncovered, and their outer faces were unearthed. Outside the grave, excavation stopped on the top of a hard brown sandy soil with inclusion of gravels lying over the bedrock. The filling between the peripheral wall and the funerary chamber has not been excavated.

The head of this tapered structure is surrounded by three peripheral walls:

- W 1198 to the south: built in large stone slabs c. 40 cm long, 17 cm thick, and 60 cm high. To the SW and in the western part of the southern wall, the slabs had fallen down and were covered with the collapse of the inner filling (stones of various size and sandy brown silt).
- W 1199 to the west: built in large stone slabs being up to 70 cm high.
- W 1200 to the north: c. 44 cm high, built in stone slabs set on edge of large size (up to 83 cm long and 34 cm high). In the eastern part of the excavated area, W 1200 had collapsed.

The funerary chamber

Funerary room R 1202 is 70/105 cm long, 75/90 cm wide, and 74 to 88 cm high.

The stratigraphic sequence (R 1202) was as follow (from top to bottom) (**fig. 45**):

- an orange sandy layer (UF 1201) with small stones (8 × 9 × 7 cm) concentrated on the top of R 1202, between large stones arranged in a circle which constitutes the first rows of a corbelled vault.
- a layer of sandy brown earth with pebbles (14 × 12 × 4 cm) and gravels (UF 1203).
- a collapse layer (UF 1208) including brown earth and pebbles (c. 10 × 10 × 5 cm / 15 × 10 × 8 cm) in the eastern side of the burial chamber. It seems to correspond to the collapse of wall W 1206 within the room. This layer yielded a bead in seashell (AD1-1208.1) (**fig. 46**).
- a compact sandy greyish layer (UF 1207). It also yielded a bead in seashell (AD1.1207.1) in the southern half (**fig. 46**) and a bone fragment badly preserved (S.1207.1) in the northern half of the funerary chamber. This bone is a fragment of the diaphysis of a long bone (tibia?), about a dozen of cm long.

The funerary chamber (R 1202) is bordered by dry-stone walls:

- W 1204 to the west: 71 cm long, 77 cm high, four courses.
- W 1205 to the north: 106 cm long, 54 cm high, three courses.
- W 1206 to the east: 73 cm long, 73 cm high, three courses.
- W 1209 to the south: 104 cm long, 75 cm high, five courses.

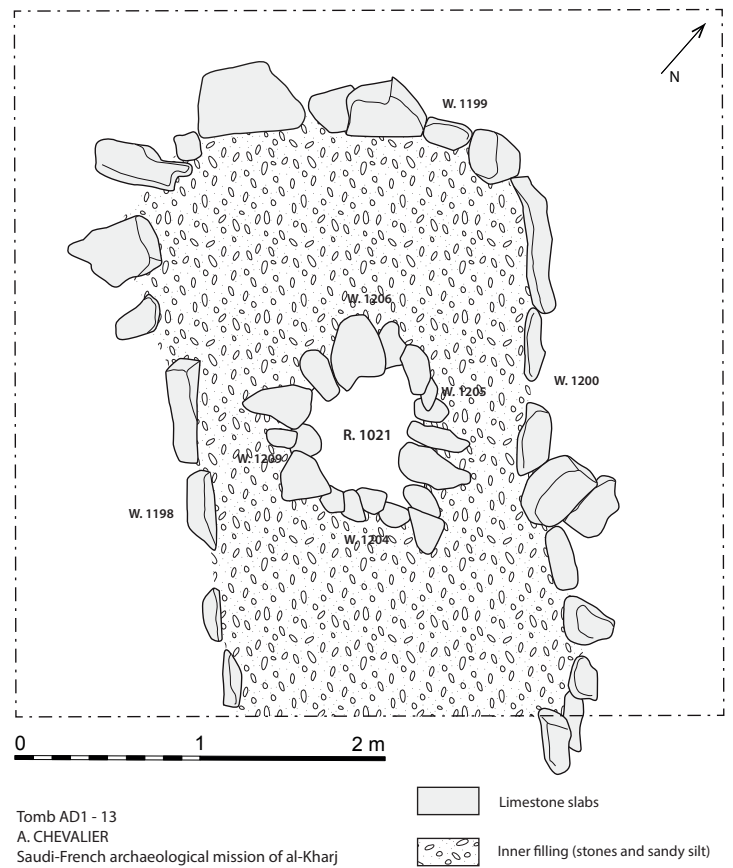
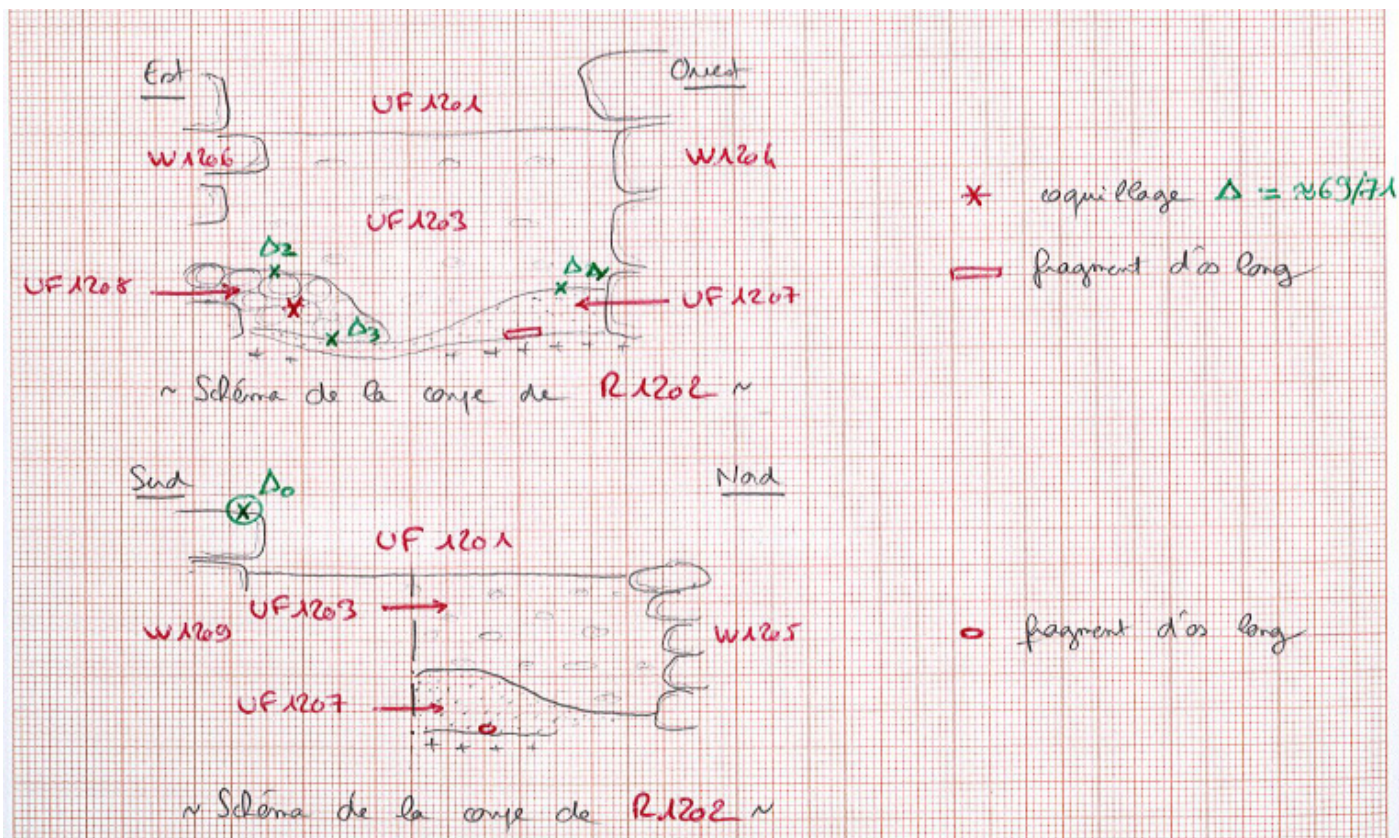
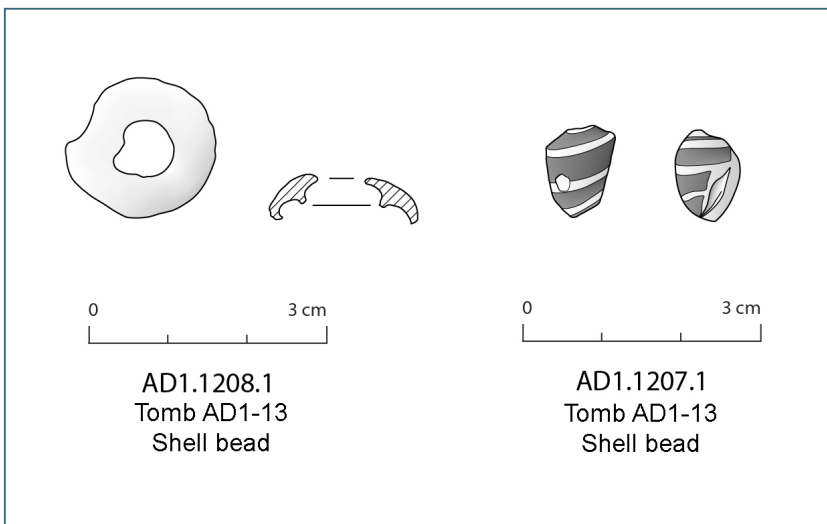


Figure 45: 'Ayn al-Dīla' 1, Tomb AD1-13: plan (A. Chevalier - Saudi French archaeological mission in al-Kharj).

Figure 44: 'Ayn al-Dīla' 1, Tomb AD1-13: orthophotograph (A. Chevalier, using aerial photographs by Th. Sagory - Saudi French archaeological mission in al-Kharj).



▲ Figure 45: 'Ayn al-Dīla' 1, Tomb AD1-13: stratigraphic section of funerary room R 1202 (A. Chevalier - Saudi French archaeological mission in al-Kharj).



► Figure 46: 'Ayn al-Dīla' 1, Tomb AD1-13: seashell beads AD1.1207.1 & AD1.1208.1 (L. Munduteguy - Saudi French archaeological mission in al-Kharj).

General considerations concerning the tapered structures

Five tapered structures were excavated during the field season in order to characterize this specific kind of grave. Common features can be put forward.

All these tombs are wedge-shaped, the widening of the head being more or less emphasized. They are bordered by four walls generally built with medium to large limestone slabs set on edge directly on the bedrock. In some cases, the external walls combined orthostats and courses of dry-stone masonry (AD1-08 and AD1-09). The length of the excavated tombs varies from 12.15 to 17.9 m and the width from 1.8 to 4 m.

No specific orientation of these graves has been favoured, some being oriented northeast–southwest (AD1-06 and AD1-09), others east–west (AD1-07 and AD1-08), or else northwest–southeast (AD1-13). The only common characteristic with regard to the location was the close proximity to the ridge of the plateau.

According to a small sounding done in tomb AD1-07, the filling between the outer walls includes stone blocks of various sizes, rubble, and sandy sediment.

A small funerary chamber is located in the head of the tomb, directly on the bedrock. It was covered with a corbelled roof made of limestone slabs. Some were still preserved. In two of the tombs (AD1-06 and AD1-07), the walls of the funerary chamber were made of huge stone slabs set on edge, sometimes completed with blocks of stone. The funerary chamber in the other graves was lined with walls in dry-stone masonry. The size of the funerary chambers varied from 0.5 to 1.15 m in length, 0.5 to 1.1 m in width, and 0.6 to 1 m in height.

A common stratigraphic sequence was observed. In general, the tombs were built above a thin sandy indurated brown soil with inclusion of gravel and small pebbles covering the bedrock. In some cases, this thin natural superficial layer had been dug to hold the vertical slabs in place.

After their abandonment the structures collapsed resulting, in the southern area, in a layer of hard sandy silt, rubble, and stones of various sizes above and around the structure. A surface layer of sandy silt had settled all over the structures.

In the funerary chambers, original deposits were rare. Taphonomic conditions and looting have led to the disappearance of most of the human remains and few of the artefacts have been left untouched.

The discovery of a human bone fragment in grave AD1-13 testifies to the presence of at least one burial (S.R1207.1) in the tapered structures and underlines how the harsh taphonomy of the southern part of the necropolis impacted on human remains. Its presence precludes identifying these particular structures as cenotaphs.

AL-YAMĀMA
A LATE PRE-ISLAMIC &
ISLAMIC SITE

AL-YAMĀMA - AN INTRODUCTION

Jérémie SCHIETTECATTE (CNRS, UMR 8167, Paris)

Description of the site of al-Yamāma

Al-Yamāma is the largest ancient settlement reported in the region of al-Kharj. It is located in the centre of al-Kharj oasis, one kilometre to the north-west of the Industrial City, and west of the confluence of the Wādīs Ḥanīfa and Nisāḥ.

The existence of this site was first reported by H. St. J. Philby in 1920. During the Comprehensive Survey of Saudi Arabia in 1978, the site received the registration number 207-30 (ZARINS *et al.* 1979: 27, 30). Finally, soundings were carried out in the late 1980s by Abdalaziz al-Ghazzi, north and west of the site, for his PhD thesis at the University College London. They revealed well-preserved mudbrick structures. A pottery typology was subsequently put together (AL-GHAZZI 2010).

The archaeological area stretches over 75 ha, north-west of a village named al-Yamāma, on the edge of palm groves. Two other names are locally used to designate the site: al-Bannā' and al-Mahraqa. Al-Bannā' is a recent name meaning the source of mud that could be reused for recent building activity by inhabitants of the neighbourhood.

The site has been identified with the mediaeval city of Jaww al-Khiḍrīma (AL-JUHANY 2002: 45; AL-GHAZZI 2010: 45–47, ROBIN & ARBACH *in press*) mentioned by Ibn Khordādhbeh as 'Jaww al-Khiḍrīma' (KHORDĀDHBEH 1889: 113) and by al-Balādhurī as 'al-Khiḍrīma' in the 9th cent. AD (BALĀDHURĪ 1916: 141–142), by al-Mas'ūdī as 'Jaww' in the 10th century AD (AL-MAS'ŪDĪ 1861–1877 iii: 106, 276, 287–288), and by Yāqūt as 'Jaww al-Khaḍārim in Yamāma' (*Jaww al-Khaḍārim bī-l-Yamāma*) in the 12th cent. AD (YĀQŪT 1866–1873 ii: 120, 161). Finally, two South Arabian pre-Islamic inscriptions mention the toponym Jawwān (*Gwn*) in association with Kharjān (*Hrgn*) and Yamamatān (*Ymmtn*), respectively inscription 'Abadān 1, dated to AD 360 (ROBIN & GAJDA 1994) and 'Irāfa 1 from the 5th cent. AD (GAJDA 2004). The toponym Jawwān is likely to be identified with the mediaeval Jaww [al-Khiḍrīma] also associated with the valley of al-Kharj and the region of al-Yamāma (regarding the toponyms Jaww, al-Kharj and al-Yamāma: ROBIN & ARBACH *in press*).

Today, al-Yamāma is only used to name a village in the vicinity of al-Kharj, near the archaeological site. We are inclined to see it as a legacy of the time when this site, the ancient Jaww al-Khaḍārim, was nicknamed al-Yamāma.

Most of the archaeological area was fenced off in the 1980s. It enclosed a 75-ha-wide area, 1,000 m from north to south and 750 m from east to west. Many mudbrick structures are visible on the ground, together with a large quantity of pottery sherds. Archaeological structures are also to be seen outside the fenced area, principally to the north-west of the site. Another concentration of outcropping mudbrick walls has been located 700 m north-east of the site (figs. 9-10).

According to South-Arabian inscriptions, Arab-Islamic sources, pottery sampled on the ground, surface coins dated to the early Christian era (AL-GHAZZI 2010: 89–90, pl. 23/1–2), the four soundings and the excavation of Buildings 1 and 2, the occupation of the site dates from at least the 4th cent. BC to the 18th cent. AD (SCHIETTECATTE & AL-GHAZZI (ed.) 2011, 2012, 2013, 2015, *in press*; SCHIETTECATTE *et al.* 2012, 2013, 2016).

Previous works (2011-2015)

The detail concerning these previous operations can be found in the reports available on line:

1st season: Schiettecatte & Al-Ghazzi (ed.), 2011: <https://halshs.archives-ouvertes.fr/halshs-00670367>

2nd season: Schiettecatte & Al-Ghazzi (ed.), 2012: <https://halshs.archives-ouvertes.fr/halshs-00797003>

3rd season: Schiettecatte & Al-Ghazzi (ed.), 2013: <https://halshs.archives-ouvertes.fr/halshs-01062149>

4th season: Schiettecatte & Al-Ghazzi (ed.), 2015: <https://halshs.archives-ouvertes.fr/halshs-01186755>

The main steps have been the realization of:

- a topographic map (2011-2012): A map of the site and its remains visible on the ground has been drawn during the 1st and 2nd seasons with the use of a total station Leica TS-06 and a D-GPS Trimble R4 (**fig. 1**).
- a geomagnetic survey of the site (2011-2013).
- a pottery typology (2011-2016): macroscopic characterization of 57 pottery types sampled on the surface or in the soundings
- Sounding 1 (area N6) - 2011-2012: deep sounding which provided a stratigraphic sequence from the 4th cent. BC to the 18th cent. AD.
- Sounding 2 (area O7) - 2011: small sounding in Building 2 (modern house), 17th-18th cent. AD.
- Sounding 3 (area G17) - 2012, 2016: trench outside of the fenced area, SW of the site, pottery workshop from the Abbasid period.
- Sounding 4 (area K17) - 2015: deep sounding south of the site in a dwelling area, stratigraphic sequence from the 4th cent. BC to the 18th cent. AD.
- the excavation of the Great Mosque (Building 1 & 3) and its surroundings (area N6) - 2012-2016.
- an archaeobotanical and archaeozoological study of the fauna and flora.

Four seasons of excavation of the Great Mosque

During the first excavation season (2011), the north-west corner of a large columned hall that was partly visible on surface was exposed in the southern part of Sounding 1. This construction was labelled Building 1. During the second season (2012), we concentrated our efforts on the excavation of the western and central naves of the columned hall. Several things proved it to be the Great Mosque of the site (**fig. 2**): the presence of a large columned hall with three rows of ten columns preceded by a large courtyard to the east and a square recess (*miḥrāb*) built in the middle of the western wall (*qibla* wall). The third season (2013) was devoted to pursuing and extending the excavation of the prayer room and part of the courtyard (area N6, Building 1). During the fourth season (2015), both the prayer room (R. 013) and the courtyard were entirely cleared. Three pits dug through the plaster floor F. 015 were emptied.

Several soundings were done within and outside the building to define the earliest occupation of the mosque (Building 1) and to characterize previous stratigraphical and architectural phases before the construction of Building 1 (**fig. 2**):

- Trenches A & B were dug under floor F. 015.
- Trench C was done in the north-western corner of the courtyard (Trench C).
- Trenches D & E were dug west of the mosque
- Trench F was dug north of the mosque.

The foundations were reached in trenches A, B and E. Older structures (Buildings 3, 4 and 5) were identified in Trenches B and D.

Purpose of the 5th season

The purpose of this 5th season (2016) was:

- 1) to enlarge Trench D and excavate the pre-Islamic houses seen at the end of the previous field season;
- 2) to study the levelled structures belonging to Building 3 and visible on floor F. 015 of Building 1 in order to determine the nature of this Building 3 and its connection with the Great Mosque (Building 1);
- 3) to resume and complete the excavation of the pottery workshop only partially recognized in a small trench during the second season (2012).

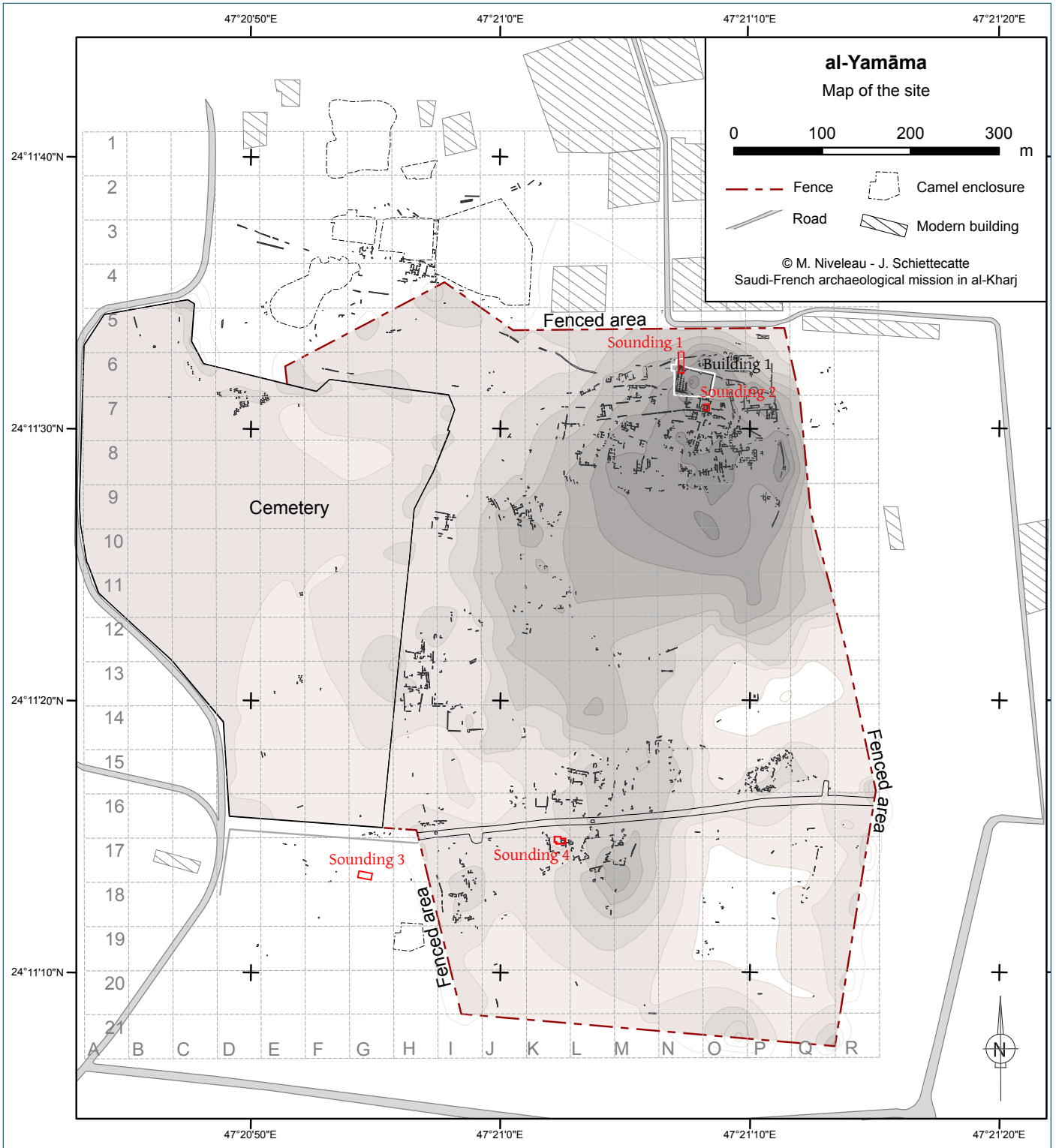


Figure 1: al-Yamāma: topographic map of the site (M. Niveleau, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

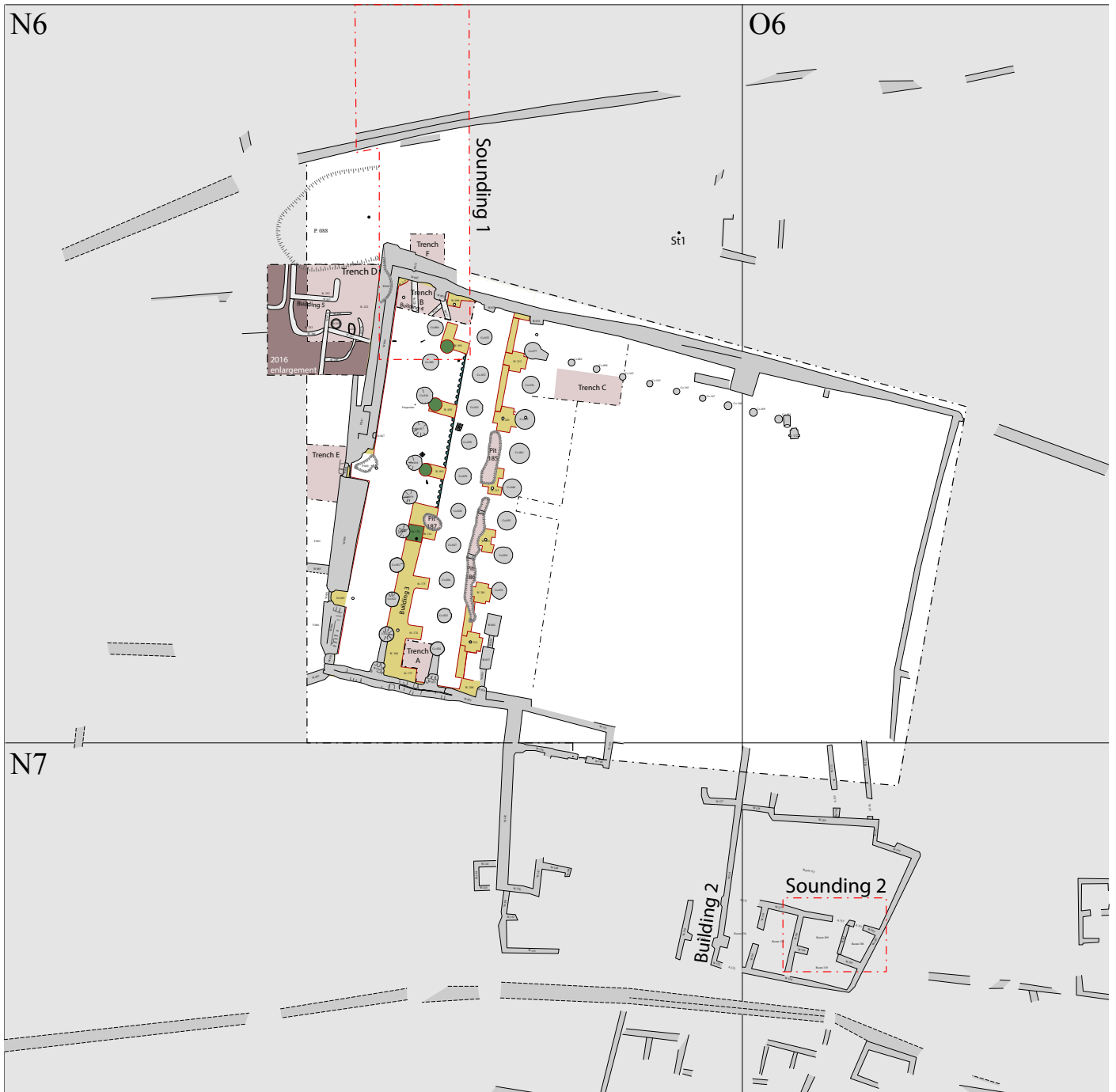


Figure 2: Al-Yamāma: detailed map of the mosque area (areas N6 & O6) - Location of Trenches A & B, Pits P. 185, 186 & 187 as well as the soundings carried out in 2015 (pink colour) (M. Niveleau, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

AL-YAMĀMA - TRENCH D (AREA N6): PRE-ISLAMIC AND ISLAMIC SETTLEMENTS

J r mie SCHIETTECATTE (CNRS, UMR 8167, Paris)

With the participation of Alexia ROSAK, Sa' d al-'UTAYB  & Abdalaziz BIN NAF SSA

Location and aim of the sounding

During the fourth season (2015), a trench had been opened to the north-west of Building 1 with the label Trench D. It was located in area N6, outside Building 1, at the foot of the western wall (W. 006) (fig. 3). Trench D was originally 5 × 4 m. A house was partly excavated there and its occupation was dated to the pre-Islamic period according to a ¹⁴C analysis (SacA42321: 2295±30 BP, 405-231 cal-BC) and artefacts (SIM ON & SCHIETTECATTE 2015: 62-63, figs 84, 87).

The opportunity to excavated pre-Islamic structures for the first time on the site led us to enlarge (7 × 7 m) and resume the excavation of Trench D.

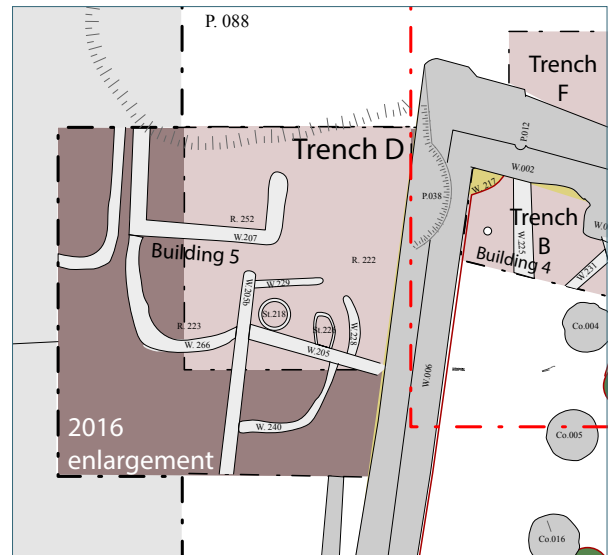
Stratigraphy and chronological phases

Trench D was excavated during two successive seasons (4th and 5th) and upper layers in this area were removed previously to the digging of Trench D (1st-3rd season), this report offers then the opportunity not only to display the results of the last field season but also to collate all the data together in order to provide a complete stratigraphic sequence, from the Pre-Islamic occupation to modern period.

The excavated layers in Trench D are partly abutting the qibla wall of the Great Mosque (Building 1) to the east, and partly going deeper than this wall. There, two domestic buildings have been successively discovered: Building 6, characterized by two architectural phases, both Islamic, and Building 5, characterized by two occupation phases, both pre-Islamic. Under Building 5, a small sounding showed the presence of the most ancient building activities in this site. The sediment extracted in Trench D during the 2015 and 2016 seasons have been sieved.

The stratigraphic sequence (figs. 5-7) permitted to recognize seven successive phases:

- Phase 0: A surface accumulation of aeolian deposit after the abandonment of the site
- Phase 1: Latest stages of occupation of the modern mosque (Building 1) on the eastern limit of Trench D
- Phase 2: Second architectural phase of Building 6 (Building 6b – modern period), contemporary to the Great Mosque (Building 1)
- Phase 3: First architectural phase of Building 6 (Building 6a – modern period), contemporary to the construction of the Great Mosque (Building 1)



- Phase 4: Two phases of occupation of Building 5 (pre-Islamic dwelling)
- Phase 5: isolated mudbrick wall 1m below Building 5 – base of Trench D.

54 Phase 0

This phase consisted in a thick accumulation of aeolian sand over the collapsed structures of the late occupation of the site. In this area, the collapse is mainly that of the outer mudbrick walls of the Great Mosque W. 002 and W. 006 (fig. 6). The stratigraphic units corresponding to this event (UF 029, 031, 032, 033, 039, 041) yielded a large quantity of faunal remains (5.4 kg) and pottery sherds belonging to different stages of occupation of the site, all mixed together. Two significant artefacts are (fig. 13):

- A fragment of a dark-red glass bangle (Y.041.2) decorated with inlays of different coloured glass applied on the dorsal surface. Similar artefacts from Julfār (U.A.E.) have been considered as Iranian manufacture imported in the first half of the 18th century (HANSMAN 1985: 81).
- A sherd of Abbasid turquoise glazed pottery with a yellow fabric and applique décor (Y.041.1) similar to the Iraqi Sasanian / Abbasid productions (6th-10th cent.).

Phase 1

Under the collapse and aeolian accumulation of Phase 0, an open-air circulation level was uncovered in 2012 along the qibla wall of the mosque (Building 1): floor F. 065. It appeared to be contemporaneous with floor F. 014 within Building 1 –i.e. stage 4 of Building 1 (SCHIETTECATTE & SIMÉON, 2016: 171, figs. 122, 144). According to ¹⁴C analysis realized on samples connected to F. 014, this phase is dated to the 16th-18th cent. AD.

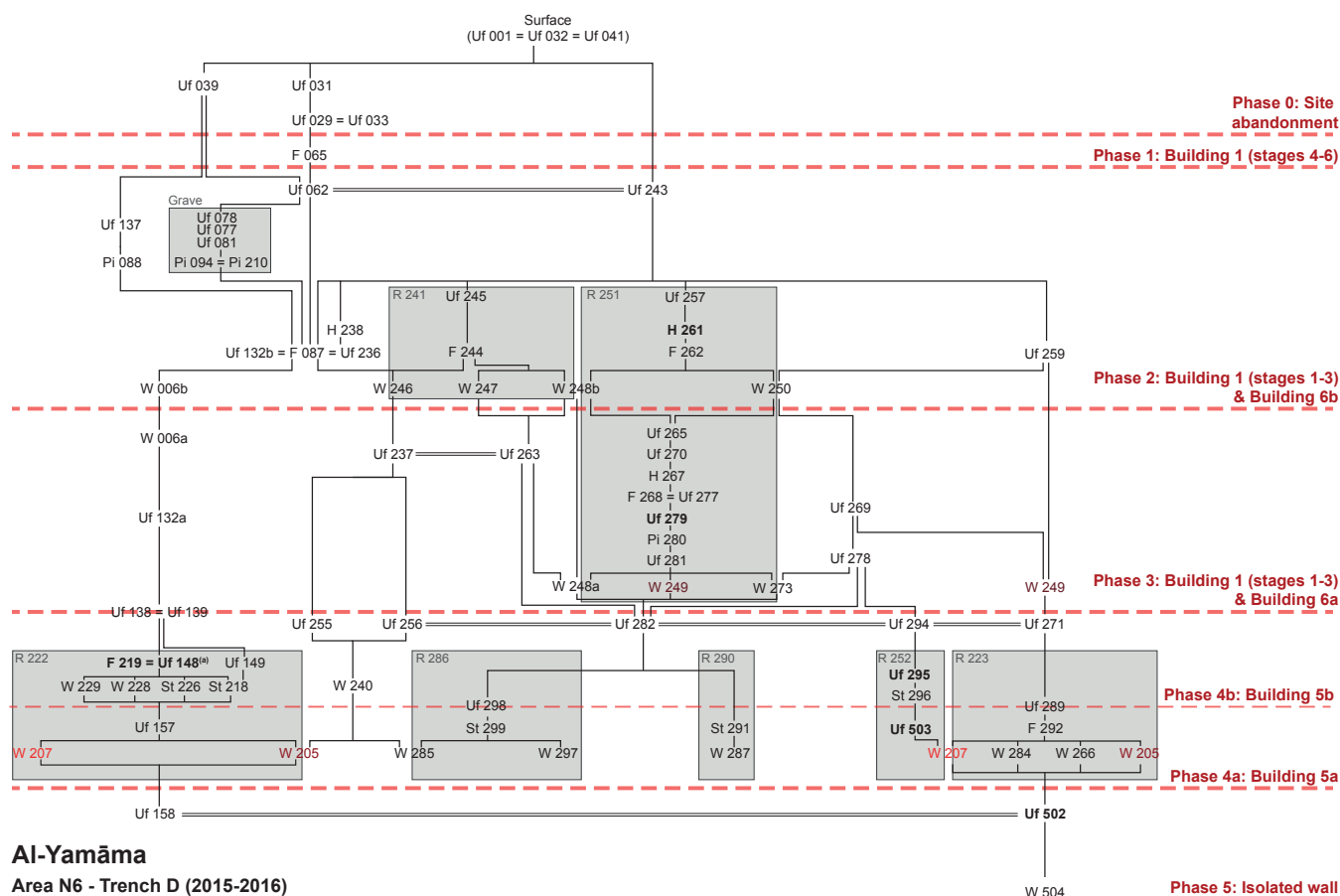


Figure 5: Al-Yamāma: Trench D (area N6): Stratigraphic sequence (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

Phase 2

Plan & architecture (fig. 8)

This phase corresponds to the presence of a house (Building 6b) separated from the mosque by a street (F. 087). This phase was unearthed in 2013 in its eastern half (details in the report of the third season) and 2016 in its western half.

Street F. 087 is a 3-m-wide corridor bordered by the qibla wall (W. 006) of the mosque (Building 1) and the eastern wall (W. 246) of the house (Building 6). It is a c. 10-cm-high level made of compact earth abutting W. 006 and W. 246.

Building 6b is a dwelling structure only partly excavated. It continues toward south and west, beyond the limits of Trench D. Three rooms were identified:

- R. 251, to the west (fig. 10), bordered by packed earth walls W. 250 (north), W. 249 (east) and W. 248b (south). It is 1.8 × 3 m. The walls are leaning one against the others, they are not chained: W. 250 is abutting W. 249 which is abutting W. 248b. Their limits are irregular and they are thicker to the bottom. The floor of the room (F. 262) is also made of packed earth. In its centre, small hearth H. 261 (fig. 11) is regularly dug (diam.: 24 cm). It was filled with ashes, sand and charcoal.
- R. 241, to the south-west (fig. 10), is 3.2 × 1.9 m. It is bordered by W. 248b (north) and mudbrick wall W. 246 (east). Only two courses of mudbricks were preserved in W. 246, the wall is built directly above sand. A low wall (W. 247) in packed earth was leaning against W. 246 and dividing space in the eastern half of R. 241. The eastern part of the room had a 1-cm-thick regular white plaster floor (F. 244). This plaster coating continued against walls W. 246 and W. 247. Floor F. 244 was not preserved in the western half of the room.
- R. 223, to the east, is a 1-m-wide corridor bordered by W. 249 to the west and W. 246 to the east. It has the same plaster floor (F. 244) as R. 241 further south. This room was only preserved in its southern end, the rest having disappeared with the later digging of a wide pit (P. 088) in this area.

Grave P. 094 is a small pit dug through Street F. 087 and covered with two fired mudbricks. This grave contained a single immature individual (6-12 months old). Details of its excavation are reported in the report of the 2013 field season (SCHIETTECATTE & GHAZZI (eds.) 2013: 99; 102-105).

Pit P. 088 is a 3 × 4 m wide pit (fig. 12) dug through the layers and structures of Phase 2, possibly for building material recycling. It cuts W. 246 and F. 244 to the north, as well as Street F. 087 to the north-west. Most of R. 223 was wiped out because of it.

Stratigraphy & artefacts (figs. 6-7)

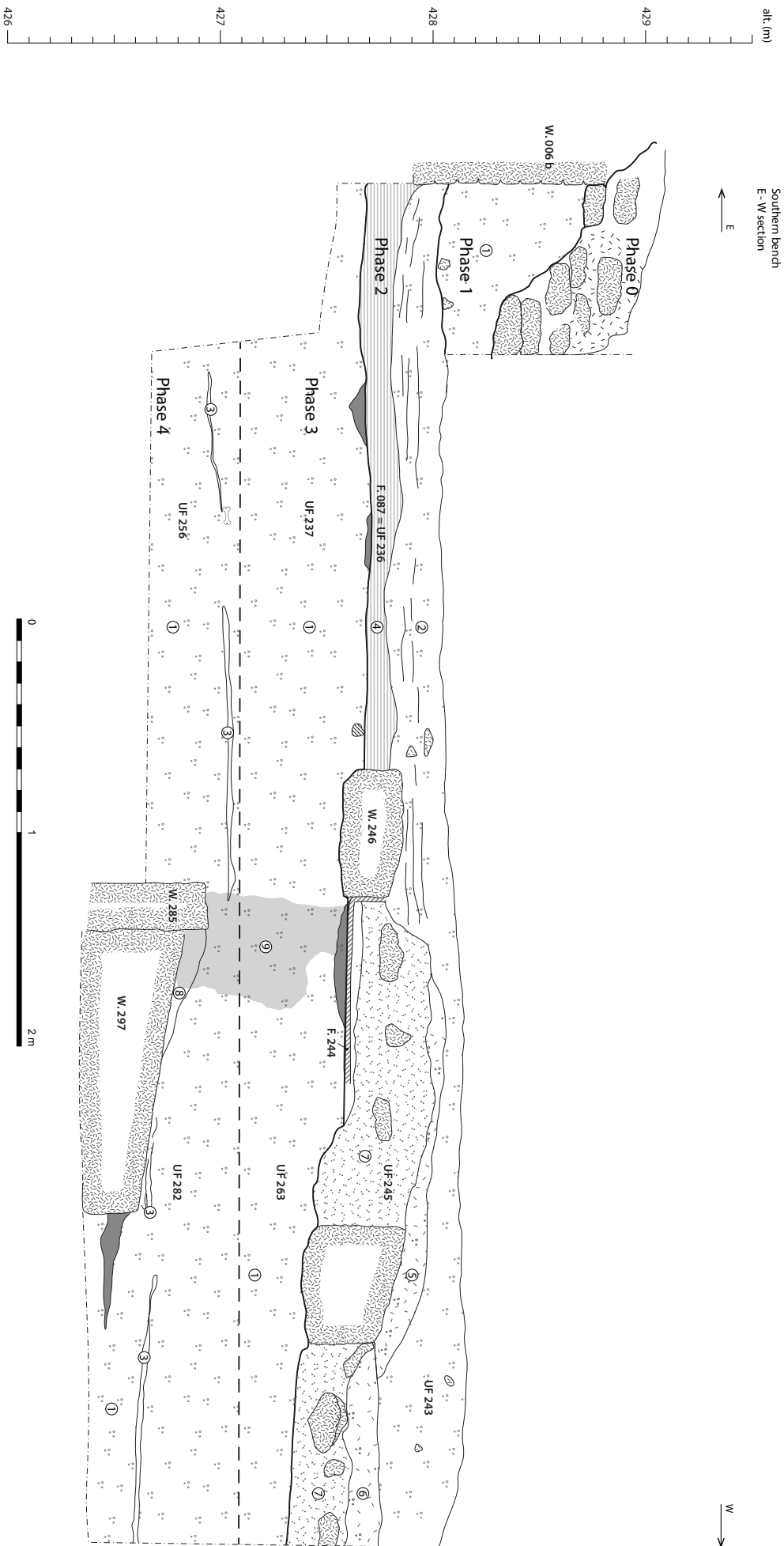
The sequence is as follow:

- Construction Building 6b (W. 246, W. 247, W. 248b, W. 249, W. 250)
- Occupation of Building 1 (F. 015: stages 1-3 – see Schiettecatte & Siméon 2016), Building 6b (F. 244, F. 262, H. 261, UF 245, UF 257) and outer space (UF 132b, UF 236, UF 259, F. 087, H. 238)
- Digging of a grave in the street F. 087 (Pi. 094, UF 081, UF 077, UF 078).
- Collapse of Building 6b (UF 245).
- Digging of a large pit, possibly for mud reemployment (Pi. 088, UF 137)
- Accumulation of sand after abandonment of Building 6b (UF 062, UF 243).

The sequence in the different locations and the artefacts are as follow:

R 251: floor F. 262 was abutting walls W. 248b, W. 249 and W. 250. It was covered by a 50-cm-thick layer (UF 257) made of a succession of clayish sand with few mudbrick nodules, brownish sand with lime nodules and clayish sand with no inclusions. It included very few materials: bones (281 g.), a few charcoals and 12 pottery sherds including a single rim (Y.257.1, cat. 35) and a sherd of porcelain imitation (Y.257.2, cat. 34).

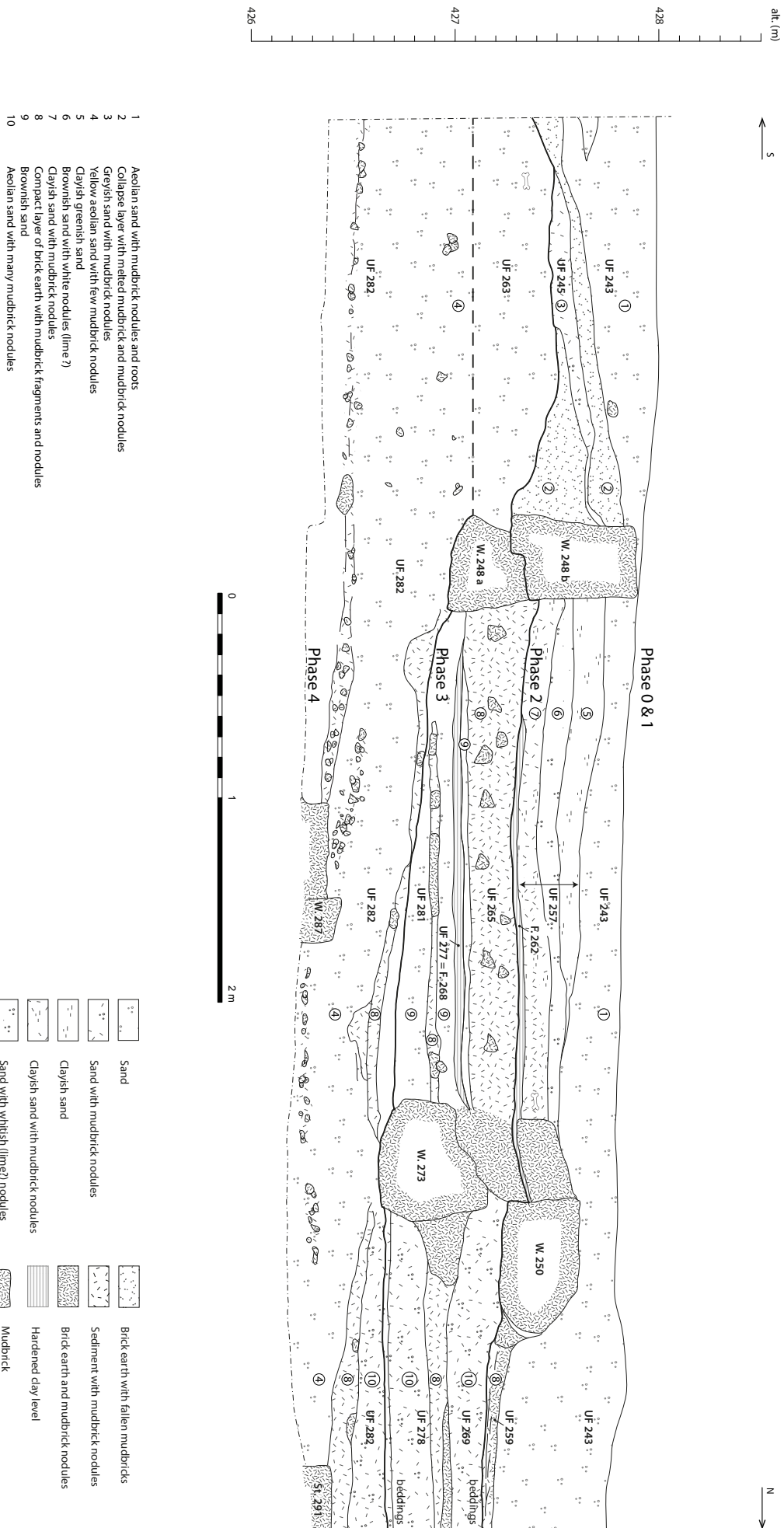
Yamama 2016 - N6
Trench D
Southern bench
E - W section



- 1 Aeolian sand
- 2 Aeolian sand with hard horizontal beddings
- 3 Thin hard layer with clay fragments
- 4 Hardened clay level (floor F.087)
- 5 Greyish sand with bones, roots, and mudbrick nodules
- 6 Greyish sand with bones, roots, and many mudbrick nodules
- 7 Collapse layer with melted mudbrick and mudbrick nodules
- 8 Sand with mudbrick nodules
- 9 Perculating greasy or resinous material hardening and darkening the sand

- | | | | |
|--|---------------------------------|--|---------------------|
| | Sand | | Plaster |
| | Sand with mudbrick nodules | | Hardened clay level |
| | Sediment with mudbrick nodules | | Stone |
| | Brick earth and fallen mudbrick | | Mudbrick |
| | Ashes and charcoal | | Bone |

Figure 6: Al-Yamāma: Trench D (area N6): Stratigraphic section of the southern bench (A. Rosak & J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



- 1 Aeolian sand with mudbrick nodules and roots
- 2 Collapse layer with melted mudbrick and mudbrick nodules
- 3 Greyish sand with mudbrick nodules
- 4 Yellow aeolian sand with few mudbrick nodules
- 5 Clayish greensand
- 6 Clayish sand with white nodules (lime?)
- 7 Clayish sand with mudbrick nodules
- 8 Compact layer of brick earth with mudbrick fragments and nodules
- 9 Brownish sand
- 10 Aeolian sand with many mudbrick nodules

- | | | | |
|--|------------------------------------|--|-----------------------------------|
| | Sand | | Brick earth with fallen mudbricks |
| | Sand with mudbrick nodules | | Sediment with mudbrick nodules |
| | Clayish sand | | Brick earth and mudbrick nodules |
| | Clayish sand with mudbrick nodules | | Hardened clay level |
| | Sand with whitish (lime?) nodules | | Mudbrick |
| | | | Bone |

Figure 7: Al-Yamāma: Trench D (area N6): Stratigraphic section of the western bench (A. Rosak & J. Schiettecatte - Saudi French archaeological Mission in al-Khary).

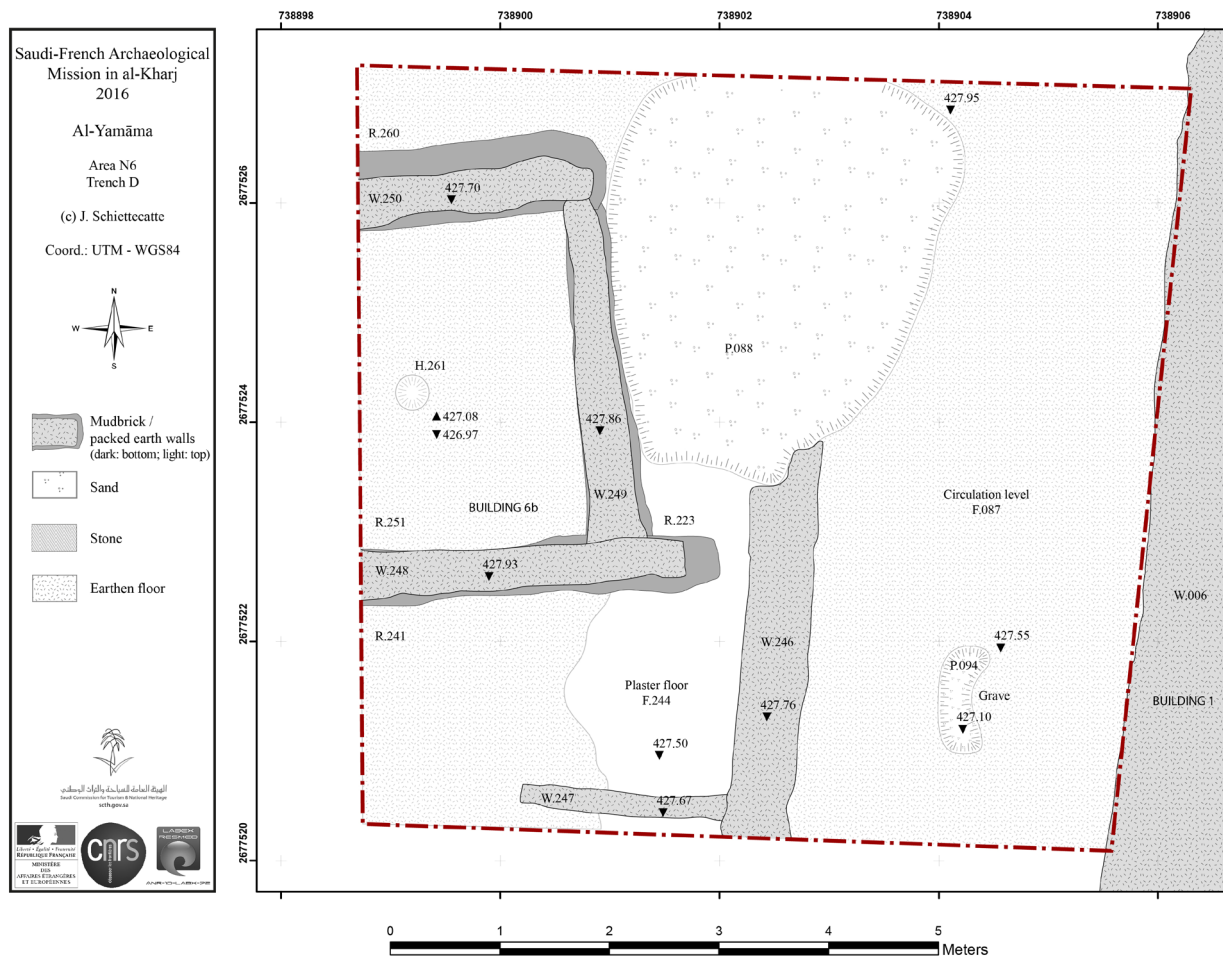


Figure 8: Al-Yamāma: Trench D (area N6): Plan of the Phase 2 (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

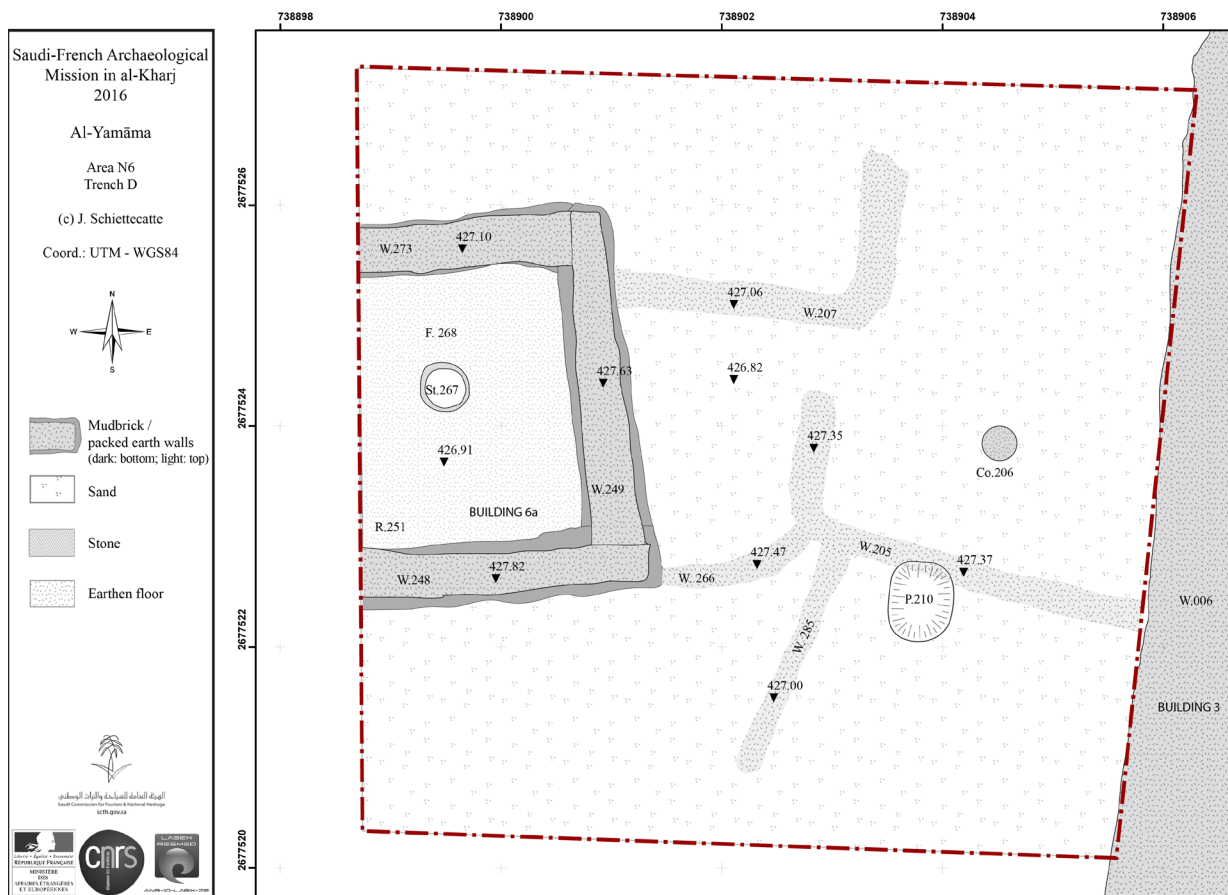


Figure 9: Al-Yamāma: Trench D (area N6): Plan of the Phase 3 (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



▲ Figure 11: Al-Yamāma: Trench D (area N6) - Phase 2 - Building 6b, R. 251, detail of hearth H. 261. Looking west (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

◀ Figure 10: Al-Yamāma: Trench D (area N6) - Phase 2 - Building 6b, R. 251. Looking south (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

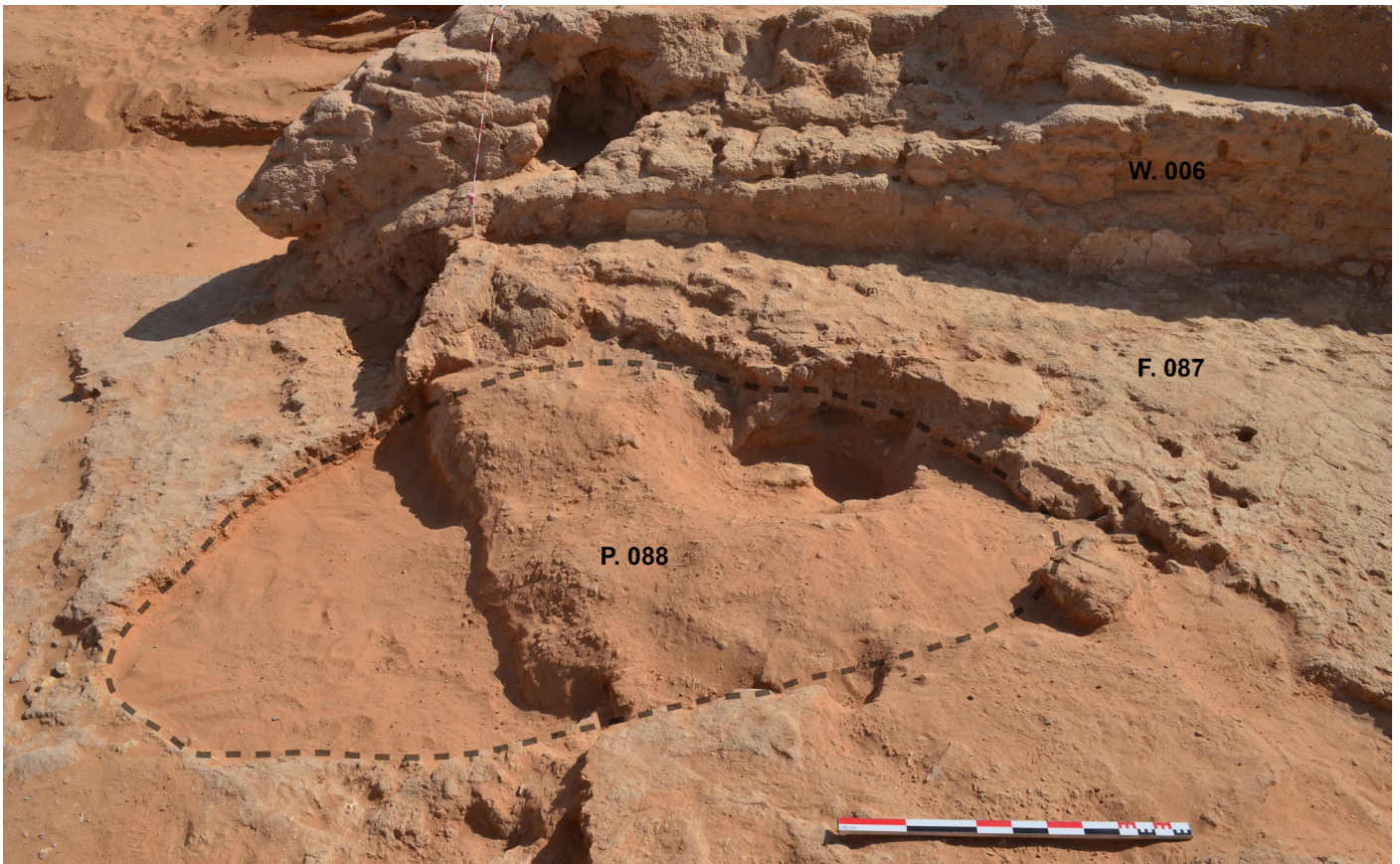


Figure 12: Al-Yamāma: Trench D (area N6): Pit P. 088. Looking east (P. Siméon - Saudi French archaeological Mission in al-Kharj).

Outside R. 251, to the north, an open air area had a floor made of a compact layer of melted brick with mudbrick fragments (UF 259). It was covered with a thick aeolian deposit. This layer yielded a lot of faunal remains (954 g) and 29 pottery sherds including 5 rims (1 bowl, 1 hole-mouth jar, 3 indeterminate) [for a discussion about the distribution of pottery categories by phase, see below].

R 241: floor F. 244 was covered with a 10 to 40-cm-thick layer collapse layer of melted mudbrick, mudbrick nodules, silt and sand mixed together (UF 245). Under the collapse, a thin layer of ashy sand and clayish sand was covering the plaster floor (F. 244) to the east and the packed earth floor to the west.

A large quantity of artefacts were discovered, most of them directly above floor F. 244: bones (752 g.), a piece of iron (16 g.), charcoal (10 g.), sherds of glass (16 g.), stone tools (grinder, pestle), two copper spindles, a carnelian bead and a fragment of the rim of a steatite vessel (**fig. 14**). 92 pottery sherds including 3 bases, 1 handle, 14 rims of basins (2), bowls (4), jars (3) and hole-mouth jar (1). A heavily weathered sherd of glazed ware or fritware was also discovered (Y.245.17).

Street F. 087: this circulation level was made of a 10-cm-thick floor (F. 087) made of compact earth and melted mudbrick (UF 132b = UF 236). A hearth with fired walls (H. 238) was dug through this floor. While dismantling this floor, 63 pottery sherds were retrieved including 27 characterized forms: 5 bases, 2 decors on body fragments, and 18 rims of basin (3), bowls (8), goblets (2), jars (4) or indeterminate (2). A body sherd of a plain opaque white glazed on a yellow fabric was also found (Y.132.27) (**fig. 15**), it can be compared to the Iraqi productions from the 9th-10th cent.

Grave P. 094: see SCHIETTECATTE & GHAZZI (eds.) 2013: 99; 102-105.

Pit P. 088: The pit was filled over more than 50 cm with mud coming from the weathered collapsed walls of Building 1 and sand (UF 137).

Abandonment of Building 6: All these areas were covered with a 30 to 50 cm thick layer of loose sand with patches of hardened sand mixed with earth and ashes (UF 062 in the eastern half = UF 243 in the western half). It included a lot of animal bones (1950 g.), fragments of eggshells (6 g.), a pestle, a carnelian bead. In this upper layer, corresponding to the surface of Trench D in its western half, only diagnostic pottery sherds were sampled. It included a sherd of fritware (Y.243.1) (**fig. 15**) and an imitation of blue-white porcelain (Y.062.1) (**fig. 15**).

Date

The postulated contemporaneousness with stages 1-3 of Building 1, the presence of sherds of fritware and porcelain imitations within R. 241 and R. 251, points to a modern occupation of the area (c. 16th-18th centuries AD).

Phase 3

Plan & architecture (**fig. 9**)

This phase corresponds to the presence of a dwelling (Building 6a) surrounded by a sandy area. In this phase, Trench D is bordered to the east by the western wall (qibla wall W. 006) of the Great Mosque (Building 1). Thin walls made of rammed earth are outcropping in the sandy area surrounding Building 6a. They correspond to a previous occupation (see Phase 4).

Layers of phase 3 were unearthed in 2015 in the north-eastern half of Trench D (see the report of the fourth season) and 2016 in the rest of the trench.

Building 6a is a dwelling structure only partly excavated. It continues toward west, beyond the limit of Trench D. It was buried directly under R. 251 of Building 6b. A single room was identified. At the same place as R. 251 of Building 6b, the same label was kept here.

R. 251, to the west (**figs. 16-17**), is bordered by mudbrick walls W. 273 (north), W. 249 (east) and W. 248a (south). It is 2 × 2.6 m. The walls are leaning one against the others, they are not chained: W. 273 is abut-



Figure 13: Al-Yamāma: Trench D (area N6): Artefacts from Phase 0 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

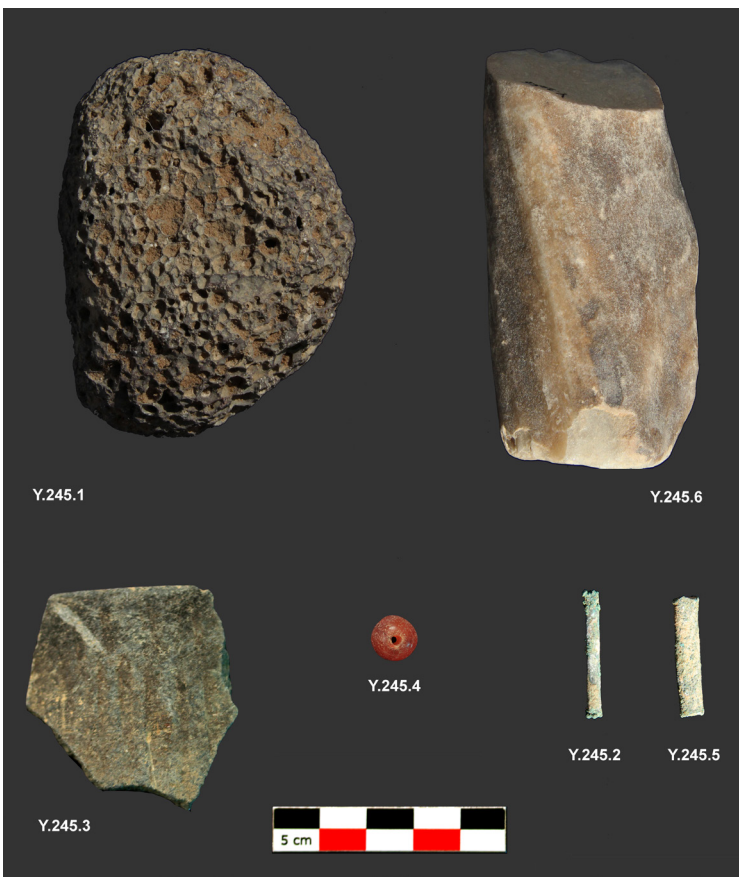


Figure 14: Al-Yamāma: Trench D (area N6): Artefacts from Phase 2 (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

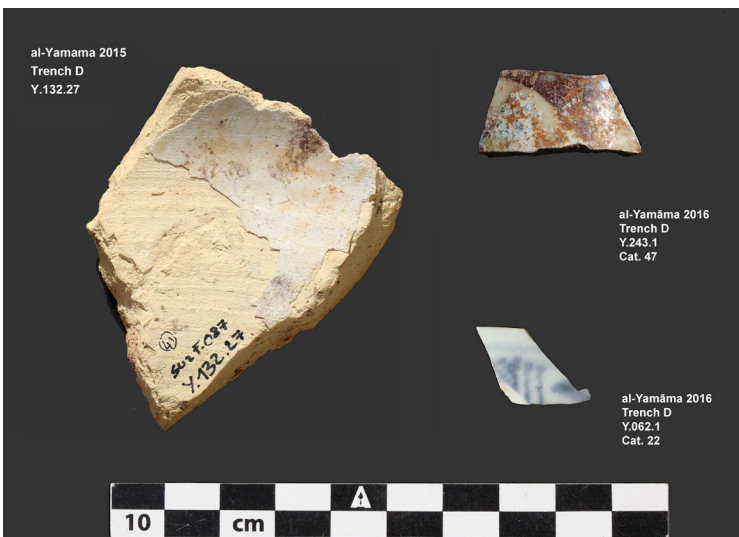


Figure 15: Al-Yamāma: Trench D (area N6): Diagnostic sherds from Phase 2 (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

ting W. 249 which is abutting W. 248a. Their limits are irregular and they are thicker to the bottom. These walls are built in mudbricks. W. 248a is right under W. 248b; it was used as a basis for the construction of the latter. On the contrary, the northern wall of the room (W. 273) is not under W. 250, which bordered R. 251 in the later phase 2; it was built further south, with a same direction (fig. 7). The three walls are 3 courses high, mudbricks are 37 × 25 × 13 cm and convex. The floor of the room (F. 277) is made of packed earth. In its centre, a 40-cm-wide circular hearth (H. 267) is dug through the floor and bordered by an annular ridge in earth hardened by the firing process of the hearth (figs. 16, 18). It opened onto a hole directly dug through the sand layer below the floor.

Stratigraphy & artefacts (figs. 5-7)

The sequence is as follow:

- Construction of Building 1 (W. 006) and Building 6a (W. 248a, W. 249, W. 273)
- Occupation of Building 6a (F. 268, H. 267, Pi. 280, UF 270, UF 277, UF 279, UF 281).
- Accumulation of sand around Building 6a (UF 132, UF 237, UF 263, UF 278).
- Collapse of Building 6a (UF 265, UF 269).

The sequence in the different locations and the artefacts are as follow:

Building 6a / R 251: Building 6a is built directly on the slope of a sand mound (fig. 7). Walls W. 248a, W. 249 and W.273 were built above this ground with no foundation. Within room R. 251, brownish sand was spread to level out the ground and a floor made of rammed earth and mudbrick nodules was set (UF 281). It corresponds to the first occupation of the room and the building (figs. 17-18). It yielded 164 g. of faunal remains and 16 sherds including a single rim of a basin (cat. 35). North of the room, a 40-cm-wide shallow pit served as a hearth (Pi. 280) (figs. 18-19). The pit was filled in with a dense and grey layer of ashes and charcoals (UF 279). Nothing but a small piece of copper/bronze (2 g.) was found in this filling.

Above UF 281, a thin layer of sand was covered with a 7-cm-thick level made of packed earth (UF 277). It constituted a second floor (F. 268) corresponding to the second occupation of room R. 251 (figs. 16, 18). The dismantling of this floor yielded faunal remains (130 g.) and charcoals. As previously mentioned, a 40-cm-wide circular hearth (H. 267) was dug through floor F. 268; it was bordered by an annular rammed earth ridge hardened by the firing process of the hearth (figs. 16, 18). Down the hearth, a hole dug directly into the sand down floor F. 268 contained a 18-cm-thick layer of sandy ashes (UF 270). Only 3 pottery sherds (with no specific shape) and a single fragment of stone vase (Y.277.1) were retrieved in this second occupation layer. These layers were covered with a 25-cm-thick layer of sediment with mudbrick nodules (UF 265) corresponding to the collapse of the walls bordering R. 251, at a time when Building 6a was probably abandoned. A similar collapse layer made of mudbrick nodules (UF 269) was found north of Building 6a. These collapse layers yielded more artefacts than the occupation layers:

- Samples: faunal remains (1538 g.), eggshell (4 g.), glass fragments (3 g.), a piece of iron (10 g.), charcoals;
- Artefact: a small fragment of a black glass bangle with a triangular section (Y.265.1);
- Pottery: 65 sherds including 8 characterized shapes (cat. 2, 4 and 28): 3 rims of bowls, 2 rims of basins, 1 indeterminate rim and 2 flat bases.

This collapse layer was levelled to permit the construction of Building 6b (see Phase 2).

Outer space: Contemporaneously to the occupation of Building 6a, aeolian sand accumulated around the building:

- UF 132 (NE quarter): layer of aeolian sand including fragments of mudbrick, bones, and 92 pottery sherds;
- UF 237 (SE quarter): layer of loose aeolian sand with large bones, ashes, and 34 pottery sherds;
- UF 263 (SW quarter, south of R. 251): layer of aeolian sand with mudbrick nodules, bones, egg-



Figure 16: Al-Yamāma: Trench D (area N6): Phase 3, Building 6a, R. 251, second level of occupation with floor F. 268, hearth H. 267. Looking east (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 17: Al-Yamāma: Trench D (area N6): Phase 3, Building 6a, R. 251, first level of occupation (base of UF 281). Looking east (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 18: Al-Yamāma: Trench D (area N6): Phase 3, Building 6a, second level of occupation on the right (F. 268, H. 267) and first level of occupation to the left. Looking east (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 19: Al-Yamāma: Trench D (area N6): Pit Pi. 280 and its filling (UF 279). Looking east (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

shell fragments, stone tools and 181 pottery sherds;

- UF 278 (NW quarter, north of R. 251): layer of aeolian sand with mudbrick nodules, bones, glass fragments, and 63 pottery sherds.

All these layers correspond to a same event, we can synthetize the material assemblage as follow:

- Samples: faunal remains (3082 g.); eggshells (7 g.); flint; glass fragments (14 g.); charcoals.
- Artefacts: a fragment of a black glass bangle (Y.132.2); a fragment of steatite vessel (Y.132.3); 2 stone tools (or jar stoppers) (Y.263.1) and a turquoise (?) bead (Y.278.1) (**fig. 20**).
- 370 pottery sherds including 83 characterized shapes: cat. 1 (14), cat. 2 (1), cat. 4 (14), cat. 5 (1), cat. 7 (2), cat. 12 (1), cat. 14 (1), cat. 20 (1), cat. 21 (1), cat. 26 (2), cat. 28 (16), cat. 3 (32), cat. 33 (3), cat. 35 (14), cat. 36 (3), cat. 37 (1), cat. 41 (3), cat. Others (4).
- Shapes include: 9 flat bases, 1 ring base, 3 handles, 1 lid, rims of 14 basins, 22 bowls, 2 cups, 1 goblet, 8 jars, 3 hole-mouth jars, 1 plate, 18 indeterminate rims.

The diagnostic pottery sherds are:

- 3 bases belonging to 3 plain opaque white glazed vessels (Y.263.26; Y.263.30; Y.263.41) – 9th-10th cent. (?) (fig. 22);
- 1 rim of a blue-green glazed plate (Y.263.42) with parallels in the PIR A levels at Mleiha (Mouton 2008: fig. 10.7) – 3rd-2nd cent. BC (fig. 21);
- a fragment of the base of a black varnish attic ware (Y.132.18) (fig. 21).

Date

Assessing the period of occupation of Phase 3 layers is hard since very few pottery sherds or artefacts can be ascribed to a period of time. Moreover, all of them have been found in thick aeolian sand layers outside Building 6a. This material was “floating” at the interface of pre-Islamic layers from Phase 4 and late Islamic layers from Phase 2. Some material is clearly intrusive as indicated by the mix of pre-Islamic Attic varnished ware and a blue-green glazed plate, with Abbasid plain opaque white glazed vessels, and a modern black glass bangle. The presence of lead musket bullet (Y.282.1, fig. 36) in a sand layer below Building 6a was rather indicative of a recent occupation of this building.

It was confirmed by a ¹⁴C dating realized on sample S.279.1 (charcoal of a small branch of *Acacia* sp.), taken in the filling of Pi. 280, and dated to cal-AD 1677-1940 (SacA47095: 125 ± 30 BP).



Figure 20: Al-Yamāma: Trench D (area N6): Artefacts from Phase 3 (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 21: Al-Yamāma: Trench D (area N6): Pre-Islamic glazed ware and black Attic varnished ware found in Phase 3 layers (intrusive material?) (L. Munduteguy, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 22: Al-Yamāma: Trench D (area N6): plain opaque white glazed ware from Phase 3 layers (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

Phase 4

Plan & architecture

This phase corresponds to the presence of an architectural complex labelled Building 5. This complex continues beyond the limits of Trench D toward north, west, south, and under Building 3 (mosque) to the east (figs. 23-24). Layers of phase 4 were unearthed in 2015 in the north-eastern quarter of Trench D (see the report of the fourth season) and 2016 in the rest of the trench.

Building 5 is an architectural complex only partly excavated and stretching over Trench D and beyond. Three rooms and three open-air areas were identified. All the walls were built in rammed earth. No mudbricks were visible in these structures except for W. 240 (R. 239) and St. 296 (R. 252) – see details in the respective rooms below.

R. 252, to the north (figs. 25-26), is bordered by a bended wall (W. 207); it opened onto R. 222 to the east. The room is 2.25 × 1.77 m. It was preserved on a height of 1.15 m. The right-angle-bended wall W. 207 circumscribes the room on three sides; it is c. 38 cm thick. Between R. 252 and R. 222, two mudbricks lying flat on the ground constituted a threshold. South of R. 252, a mudbrick structure (St. 296) was abutting W. 207 (fig. 27). It is 1 × 0.4 × 0.26 cm; it comprised two small compartments bordered by mudbricks set on edge. One to the west was filled with sand from bottom to top and could have been used as chest; one to the east was partly filled with mudbrick fragments and coated with mud. It could have been used as a sink.

R. 223, in the middle of Trench D (fig. 28), was a room built by the addition of a wall bent at right angles (W. 266 = W. 284) against two pre-existing walls (W. 207 to the north and W. 205 to the east). The room is 2.2 × 2.1 m. Wall W. 266 (= W. 284) is 25-cm-thick; it circumscribes the room to the west and south. An opening between W. 207 and W. 205 gives access to R. 222 to the east. A step in packed earth constitutes a threshold and a door socket was laid down north-east of the access (fig. 29).

R. 222, to the north-east of Trench D (fig. 30), was an open air area with cooking facilities. It is closed by wall W. 205 to the south and south-west, it is bordered by rooms R. 223 and R. 252 to the west and it continues beyond the limits of Trench D to the north and east (under Buildings 1 and 3 = mosques). To the south of this area, a rammed earth platform bordered by two low walls (W. 228, W. 229) comprises a low rammed earth basin (St. 226) and an oven (St. 218). This area was excavated during the previous season and is described with much details in the report of the 4th season.

R. 239, to the south-east of Trench D (fig. 31), was an open air area with a large basin. It is closed by wall W. 205 to the north, W. 285 to the west, and it continues toward the south and east, beyond the limits of Trench D. The large basin is set in the corner formed by W. 285 and W. 205, and closed by a curved mudbrick wall W. 240. This wall is the only one in this phase to be built in mudbricks, it is 40 cm high. In the basin, a thick rammed earth glacis is applied against W. 285. At the bottom of the basin, a 70-cm-long stone with 5 shallow holes was probably a work surface (for crushing). The purpose of this basin is unknown; it might have been a trough.

R. 286, to the south-west of Trench D (fig. 32), was a wide open air area partitioned by two low rammed earth walls. One of these (W. 297) is curved and 30 cm high. It is abutting W. 285 and constitutes a small enclosure. In its south-eastern corner, a small structure (St. 299) is made of wedging stones surrounding a posthole (fig. 33).

R. 290, to the north-west of Trench D, is a small room closed by a curved wall (W. 287) to the south and east. It continues beyond the limits of Trench D. No opening was found to enter the room. It might belong to a different building. Its wall W. 287 is 54 cm high and is also built in rammed earth. It is parallel and tangential to the western portion of W. 207. Considering that the floor in R. 290 is at the same altitude as the floor in R. 252, and the relation between their bordering walls, both rooms might have been built at approximately the same time. A small rammed earth platform (St. 299) is abutting W. 287 to the south (in R. 286). It is 52 × 50 × 20 cm. Another one (St. 291) was discovered inside R. 290, down the bench of Trench D. It is 60 × 26 × 24 cm.



Figure 25: Al-Yamāma: Trench D (area N6): Building 5, R.252, upper occupation layer (UF295). Looking South (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 26: Al-Yamāma: Trench D (area N6): Building 5, R.252, lower occupation layer (UF503). Looking South (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 27: Al-Yamāma: Trench D (area N6): Building 5, R.252, St. 296. Looking South (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 29: Al-Yamāma: Trench D (area N6): Building 5, access to R. 223 from R. 222. A door socket is laid down the access (lower right). Looking West (P. Siméon - Saudi French archaeological Mission in al-Kharj).



Figure 28: Al-Yamāma: Trench D (area N6): Building 5, R.223, floor F. 292. Looking East (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

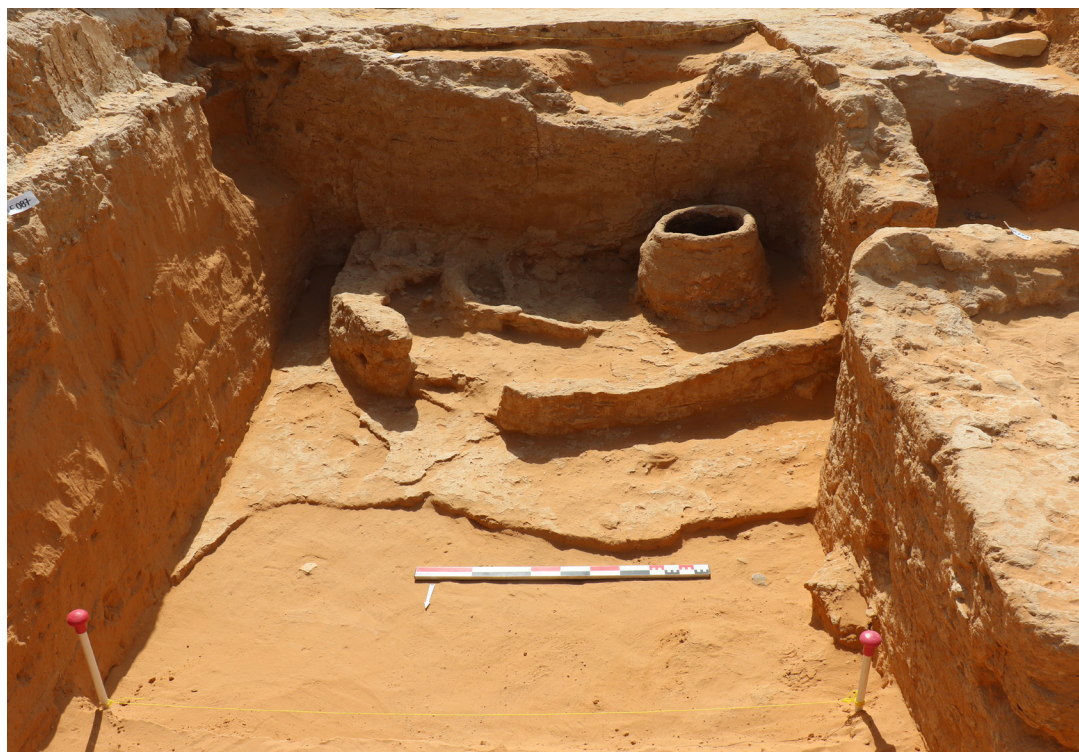


Figure 30: Al-Yamāma: Trench D (area N6): Building 5, R. 222. Looking south (P. Siméon - Saudi French archaeological Mission in al-Kharj).



Figure 31: Al-Yamāma: Trench D (area N6): Building 5, R. 239 (foreground). Looking north-west (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).



Figure 32: Al-Yamāma: Trench D (area N6): Building 5, R. 286. Looking north (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

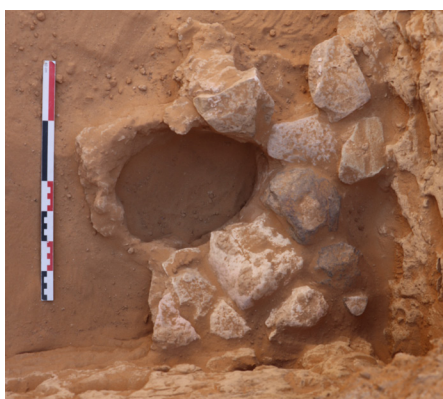


Figure 33: Al-Yamāma: Trench D (area N6): Building 5, R. 286. Structure St. 299. Looking east (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

Stratigraphy & artefacts

The sequence is as follow:

- Construction of Building 5 in at least 3 times:
 - W. 287, W. 205 and 207, St. 291, St. 299;
 - W. 284 = W. 266
 - W. 285 and enclosure W. 297
- First phase of occupation of Building 5 (F. 292, UF 289, UF 298, UF 503, UF 157).
- New structures added to Building 5: the cooking area (W. 228, W. 229, St. 218, St. 226), the basin (W. 240), a sink/chest (St. 296).
- Second phase of occupation of Building 5 only clearly recognized in the areas with new facilities: R. 222 (F. 219, UF 148, UF 149) and R. 252 (UF 295).
- Accumulation of sand around Building 5 (UF 138 = 139, UF 255, UF 256 = UF 271 = UF 282 = UF 294).

The sequence in the different locations and the artefacts are as follow:

R. 222: Despite R. 222 was excavated in 2015 and already presented in the previous field report (SIMÉON & SCHIETTECATTE 2015: 62-63), it has now to be considered again once the excavation of Building 5 completed. Moreover, the discovery of new pottery categories within Building 5 has led us to come over the sherds found in the layers already excavated in Trench D during the previous season and to reassign some of them to these new categories. A short presentation of the stratigraphy of R. 222 within this new perspective is necessary.

Within R. 222, a 15-cm-high layer of aeolian sand (UF 157) with no specific structures but sherds and artefacts, corresponds to the first occupation of this open-air area. It yielded:

- Bones (338 g.);
- 20 sherds including 6 characterized shapes: 3 jugs (cat. 26 and 52) and 3 bowls (cat. 32, 35 and 55);
- 2 grinders (Y.157.1, Y.157.2), a millstone (Y.157.3) and an incense burner (Y.154.4) (**fig. 34**).

In a second phase of occupation, the cooking facilities were built south of the area: the platform bordered by low walls W. 228 and W. 229, the small basin (St. 226) and the oven (St. 218). The circulation level in R. 222 was then a hard crust of sand (F. 219). The filling of the oven (UF 149) only yielded two beads: one is in carnelian (Y.149.1), the second is an indeterminate stone (Y.149.2) (**fig. 35**). Over F. 219, aeolian sand accumulated during the second occupation (UF 148). This layer included a lot of charcoals and ashes around oven St. 218 and against wall W 205. It yielded:

- Bones (662 g.);
- 78 sherds including 7 characterized shapes: 4 bowls (cat. 33, 35), 1 jar (cat. 51), 1 plate (cat. 56), 1 indeterminate base;
- 2 door sockets (access to R. 223).

A 50-cm-thick layer of aeolian sand progressively accumulated above this occupation (UF 138) and included fragments of mudbricks in its upper part (UF 139). These layers corresponds to a progressive abandonment of the area; they yielded the following artefacts:

- animal bones (604 g.)
- a carnelian bead (Y.138.1) (**fig. 36**)
- 82 sherds from at least 10 characterized shapes: 1 basin (cat. 51), 6 bowls (cat. 33, 35, 36, 56), 1 jar (cat. 26), 2 indeterminate bases (cat. 26, 51) (**figs. 37-38**: Y.138.9, Y.139.2).

R. 252: The sequence in this room included two successive phases of occupation. The first occupation is characterized by a floor made of a hard sand crust preserved in almost all the room (**fig. 26**). A patch of ashes and charcoals in the south-east corner testifies to the presence of a small hearth. Then, sand progressively accumulated over 10 cm before the second occupation. This first occupation yielded animal bones and pottery sherds:

- animal bones (662 g.);
- 33 sherds including a heavily weathered glazed sherd and 14 characterized shapes: 1 basin (cat. 51), 1 cup (cat. 26), 6 hole-mouth jars (cat. 33 and 55), 3 indeterminate rims (cat. 4, 33 and 52), 3 indeterminate bases (cat. 51 and Others).

Ten centimetres above the first floor, a second occupation of room R. 252 is characterized the construction of structure St. 296 (sink/chest against W. 207) and by the presence of another hard sand crust on the ground (UF 295) (fig. 25). East of the room, three mudbricks set on edge constitutes a U-shaped hearth. Inside, ashes and charcoals were concentrated. This layer yielded more artefacts and ceramics, including a complete bowl found upside-down in the south-east corner as well as a large part of a broken basin lying flat on the ground. A concentration of faunal remains has been found in the south-west corner. UF 295 yielded:

- animal bones (1272 g.);
- a grinder (Y. 295.1), an iron blade (Y.295.2) and a millstone (Y.295.3) (fig. 35);
- 41 sherds from at least 12 characterized shapes: 1 basin (cat. 51), 1 goblet (cat. Other), 1 plate in green glazed ware (cat. 20), 3 bowls (cat. 33 and 52), 4 indeterminate rims (cat. 33, 36 and 56), 3 indeterminate bases (cat. 52 and Others) (figs. 37-38: Y.295.2, Y.295.12, Y.295.13).

As for R. 222, the room was progressively filled up with aeolian sand and then covered by the collapse of the upper parts of the walls (UF 294). This abandonment layer yielded:

- animal bones (518 g.);
- a spindle whorl (Y.294.1) (fig. 36);
- 28 sherds from at least 3 characterized shapes: 1 bowl (cat. 52), 1 indeterminate rim (cat. 6), 1 indeterminate base (cat. Other).

R. 223: in this room a single continuous occupation has been noticed: a 10-cm-thick rammed earth floor (F. 292) was found in the entire room, it was directly covered by a 28-cm-thick layer of aeolian sand (UF 289). This room yielded a large quantity of pottery sherds, and among these several fragmentary jars. This could be indicative of a small storage place. In this room were found:

- animal bones (1190 g.);
- a small limestone pebble (slingstone? – Y.289.1) (fig. 35);
- 57 sherds including a heavily weathered glazed sherd and 17 characterized shapes: 1 basin (cat. 35), 2 bowls (cat. 20, 35), 1 cup (cat. 1), 6 jars (cat. 1, 15, 28, 35, 51), 2 indeterminate rims (cat. 4 and Other), 5 indeterminate bases (cat. 7, 35, 52, Other).

The room was then filled up with a 36-cm-thick layer of aeolian sand (UF 271) which corresponds to the abandonment of the area. Few material was found here:

- Samples: animal bones (82 g.), 1 date stone, 1 fragment of glass vessel;
- 6 sherds of the same type (cat. 7) with only one fragment of a flat base which was indicative of the shape.

R. 239: in this open-air area, no clear occupation level was discovered, except the basin structure surrounded by W. 240. An homogeneous filling of aeolian sand was removed within the structure (UF 255) and outside of it on a depth of c. 50 cm (UF 256). This filling yielded very few artefacts:

- animal bones (44 g.);
- 24 sherds but only 5 characterized shapes: 2 jars (cat. 1, 35), 1 bowl (cat. 32), 1 plate (cat. Other) and 1 indeterminate rim (cat. 37).

R. 286: in this open-air area, the enclosure bordered by W. 297 only contained a 20-cm-thick layer of aeolian sand. No specific built floor was discovered. This occupation layer contained very few material:

- Samples: animal bones (104 g.); 1 glass fragment.
- 48 sherds but only 3 characterized shapes: 2 jugs (cat. 4) and 1 indeterminate body sherd with an incised decor (cat. 56).

A 50-cm-thick abandonment layer of aeolian sand with fragments of rammed earth (UF 282) was covering the area of R. 286 and R. 290. This corresponds to the progressive decay and silting up of Building 5, equivalent to :

- UF 138 = UF 139 in R. 222;
- UF 255 = UF 256 in R. 239;

- UF 294 in R. 252;
- UF 271 in R. 223.

Artefacts found in UF 282 were:

- Samples: animal bones (1670 g.); 1 glass fragment; 1 eggshell fragment;
- Artefacts: 1 grinder (Y.282.2); 1 musket bullet (Y.282.1) (**fig. 36**);
- 63 sherds including 13 characterized shapes: 2 basins (cat. 51, 55); 3 bowls (cat. 35, 56, Other), 1 cup (cat. Other), 2 jars (cat. 35, 56), 2 indeterminate rims (cat. 33 and Other), 4 indeterminate bases (cat. 7, 51).

Date

After the 4th field season, ¹⁴C analysis was realized on a burned date stone coming from the second level of occupation in room R. 222, near the oven (St. 218). Another sample of charcoal (*Acacia* sp.) from the 1st occupation level in R. 252 (UF 503) was dated after the 5th season. The results are:

AMS Lab #	Location	Nature	%C	δ13CAMS	Radiocarbon activity (pMC)	Radiocarbon age (14C yrs BP)	Calibrated date [intcal09.14c (Reimer et al., 2009)] - Two Sigma Ranges [start:end] relative area
SacA42321	Al-Yamāma Area N6 Trench D UF 148	Charcoal of date stone	53.4	-24.0	75.16 ± 0.22	2,295 ± 30	[cal BC 405: cal BC 354] 0.741 [cal BC 291: cal BC 231] 0.259
SacA47094	Al-Yamāma Area N6 Trench D UF 503	Charcoal of <i>Acacia</i> sp.				2,265 ± 30	[cal BC 398: cal BC 350] 0,464 [cal BC 306: cal BC 210] 0,536

It indicates a 4th-3rd century BC occupation. This is rather consistent with the presence of the rim of a blue-green glazed plate (Y.295.2 - **figs. 37-38**) which is resembling that mentioned earlier (Y.263.42 - **fig. 21**) and shows parallels with similar vessels from the PIR A levels at Mleiha (MOUTON 2008: fig. 10.7).

Moreover, a fragment of a jar in red ware with grey-black core and very abundant chaff temper (cat. 15) was found in the occupation level of the storage place R. 223 (UF 289). This category is also considered as characteristic from this pre-Islamic period. Most of the sherds belonging to this type were previously discovered in the lowest layers of the deep Sounding 1 (UF 059-060) where several ¹⁴C analysis were realized on charcoals. All provided the same chronological range:

AMS Lab #	Radiocarbon age (14C yrs BP)	Calibrated date
SacA36379	2,235 ± 30 BP	389-204 BC
SacA36380	2,230 ± 30 BP	384-204 BC
SacA36381	2,295 ± 35 BP	409-211 BC

One last thing is puzzling: the presence of a lead musket bullet (modern time) in the aeolian sand accumulation over Building 5, in a layer considered as more ancient than the Phase 3 (Modern period). The only explanation would be an intrusive artefact.

Phase 5

Architecture, stratigraphy and artefacts

Phase 5 was located in only two small areas (**fig. 5**):

- UF 158: in a trench in the middle of R. 222 (**fig. 23**), under the first occupation of Building 5, a 30-cm-thick layer of aeolian sand including small fragments of rammed earth was excavated (425.69 to 426.07 m a.s.l.). Due to lack of time and the limitation of space, the excavation stopped arbitrarily without having encountered previous structure. The layer comprised
 - Animal bones (122 g.);
 - 8 sherds including the rim of a basin (Y.158.1 - cat. 52) (**fig. 42**).

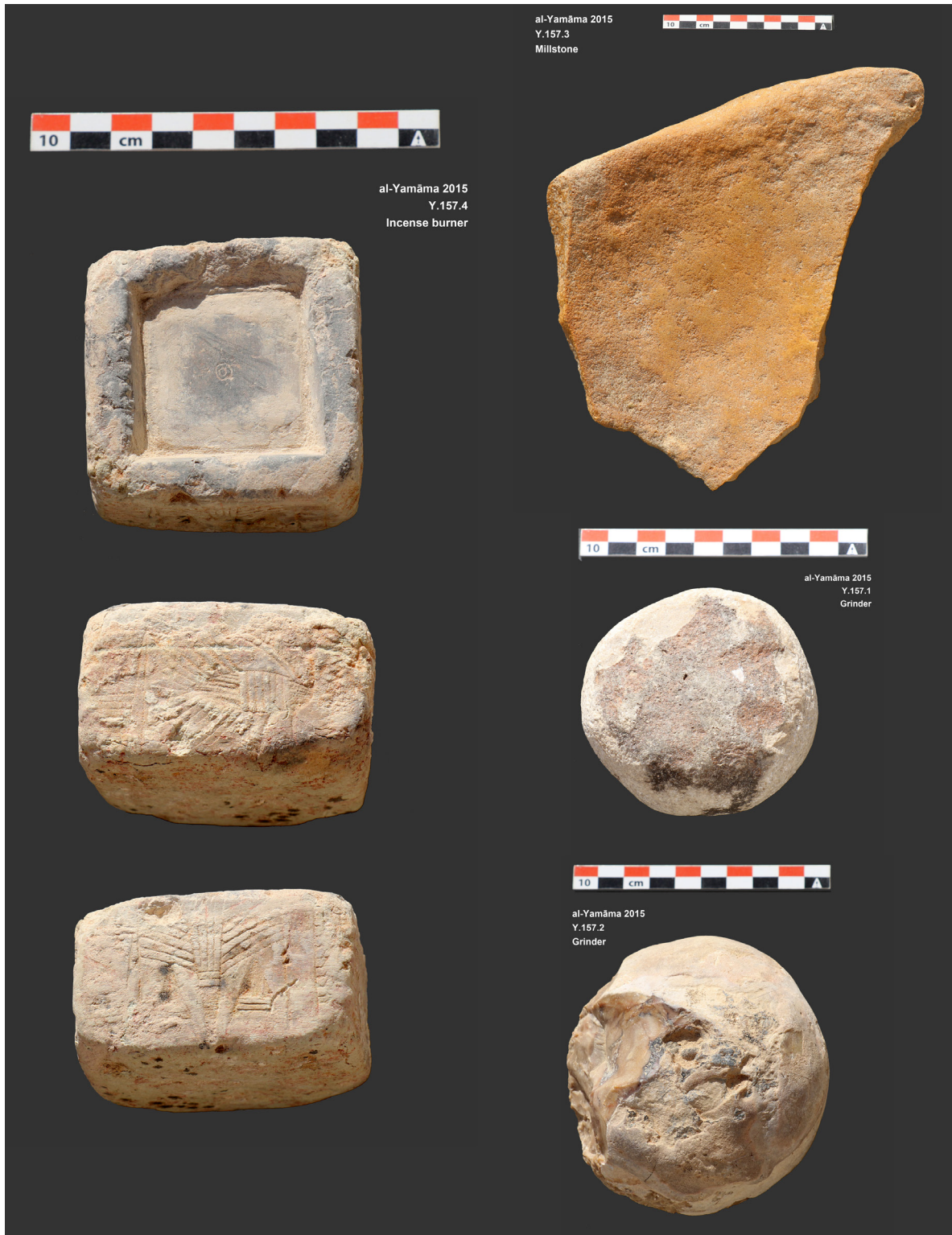


Figure 34: Al-Yamāma: Trench D (area N6): Building 5, artefacts from the first occupation (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

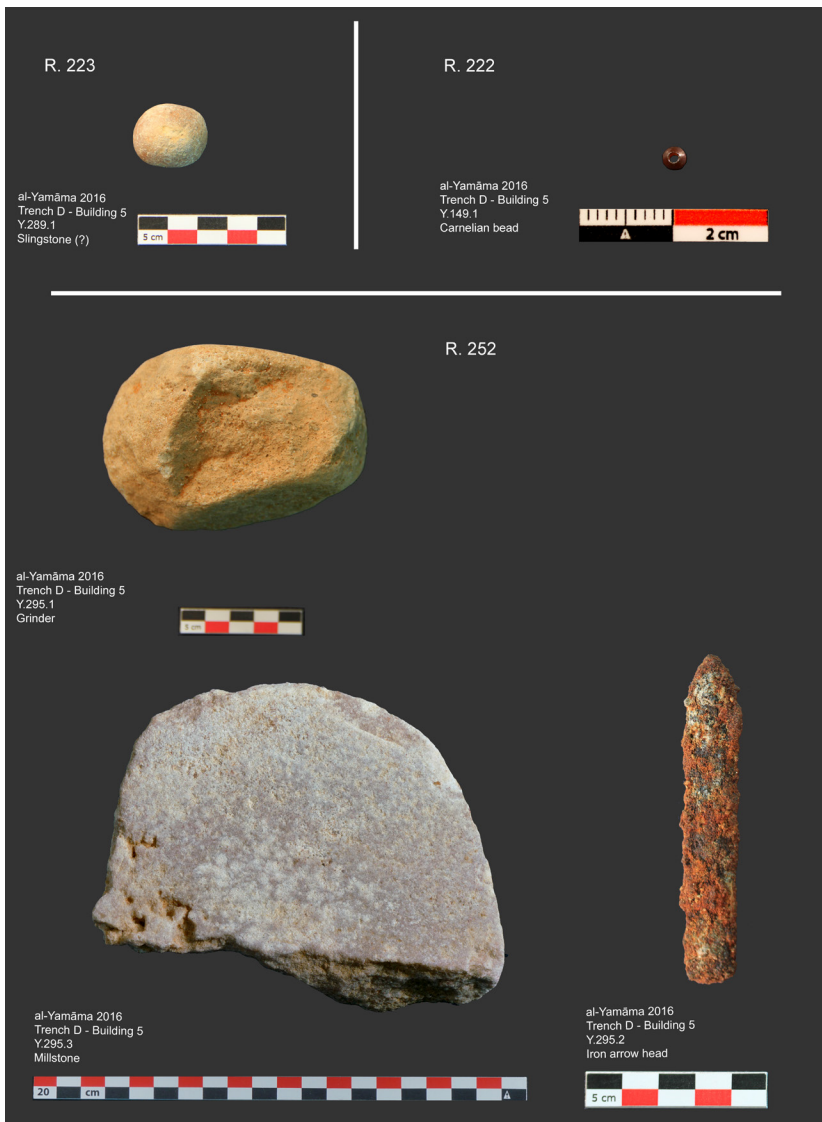


Figure 35: Al-Yamāma: Trench D (area N6): Building 5, artefacts from the second occupation (Th. Sagory, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

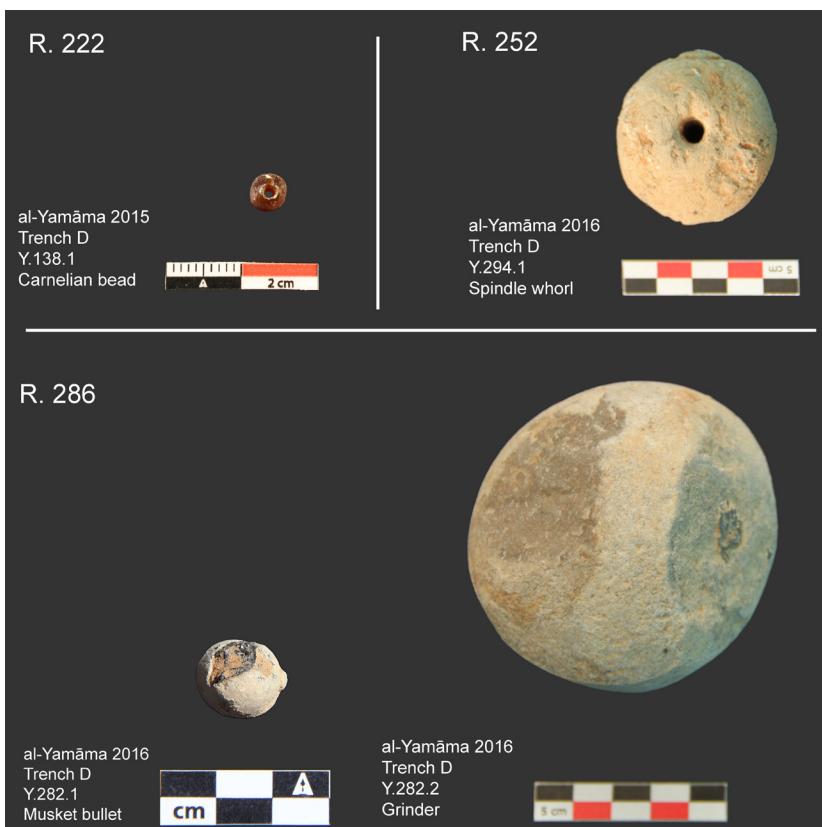


Figure 36: Al-Yamāma: Trench D (area N6): Building 5, artefacts from the abandonment layers and the aeolian sand deposit over the building (Th. Sagory, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

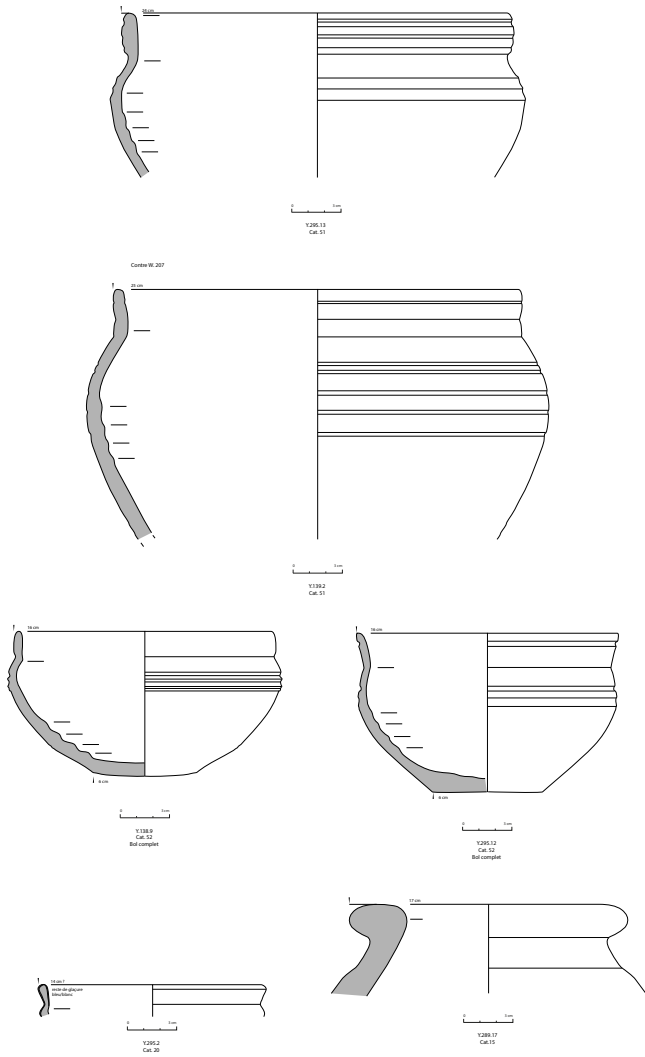


Figure 37: Al-Yamāma: Trench D (area N6): Building 5, pottery from Phase 4 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

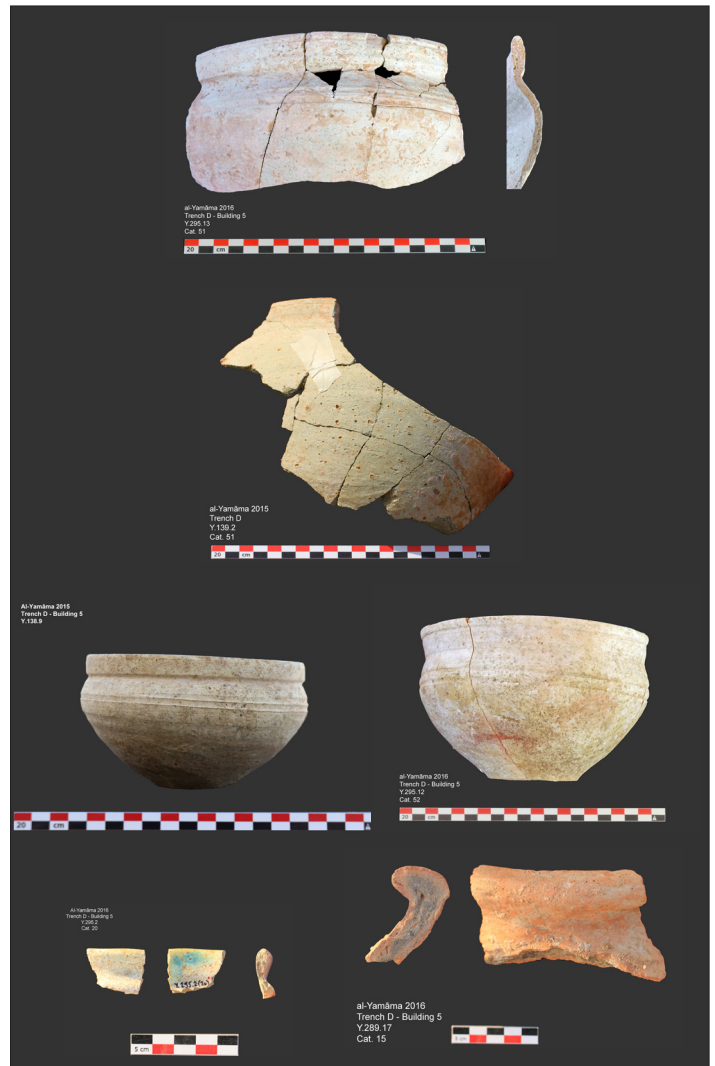


Figure 38: Al-Yamāma: Trench D (area N6): Building 5, pottery from Phase 4 (Th. Sagory, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

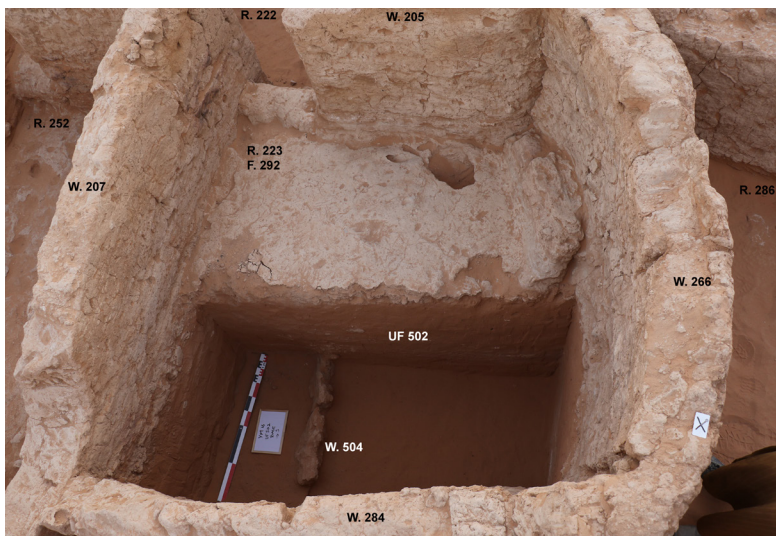


Figure 39: Al-Yamāma: Trench D (area N6): Phase 5 layer (UF 502) and structure (W. 504) under R. 223 (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

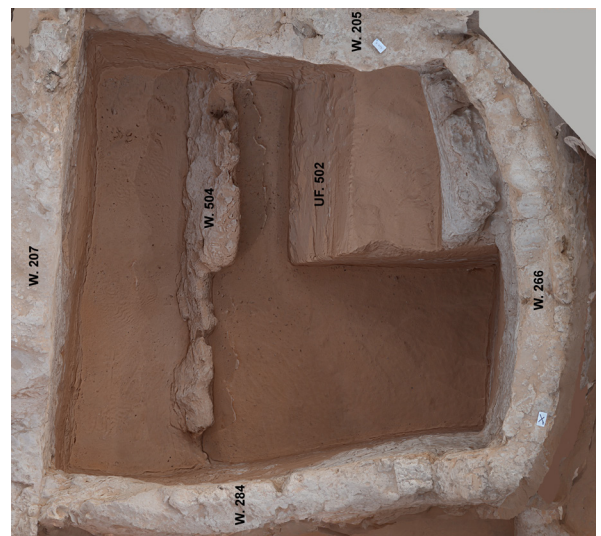


Figure 40: Al-Yamāma: Trench D (area N6): Orthophotography of the fully excavated Phase 5 layer (UF 502) and structure (W. 504) under R. 223. Bottom of Trench D (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

- UF 502: in R. 223, the western half of the room was excavated below F. 292 (**fig. 39**). The altitude of this floor (426.21 to 426.27 m a.s.l.) roughly corresponds to the basis of the walls surrounding the room (W. 205, W. 207, W. 266 and W. 284). A 1-m-deep level of aeolian sand with fragments of rammed earth was excavated (down to 425.25 m a.s.l.). At the bottom, a thin wall (W. 504) made of rough blocks of rammed earth set on edge above the sand was found. To get a better picture of it, the sounding was extended in the entire area below R. 223 (**fig. 40**). The wall continues toward east. No connection with another structure was found. The lack of space and time did not permit to extend this level of occupation nor to go deeper. This layer yielded many artefacts, most of them concentrated in the upper third of the layer (30 cm below F. 292). These are:
 - Samples: animal bones (852 g.); iron fragment (16 g.);
 - Artefacts: 2 spindle whorls (Y.502.1) and a stone tool (Y. 202.2) (**fig. 41**).
- 66 sherds including 22 characterized shapes (cat. 33, 51, 52, 55, 56, Others). Uncharacterized sherds include 15 sherds of category 15 (dated to the 4th-2nd cent. BC, cf above) and a single sherd of green glazed ware (cat. 20). Identified shapes are: 2 basins; 6 bowls; 1 jar; 1 jug; 1 hole-mouth jar; 9 indeterminate rims and 2 indeterminate flat bases (**fig. 42**).

Date

The pottery material found in the aeolian accumulation between W. 504, at the bottom of Trench D, and Building 5 is quite similar to the assemblage found in Building 5: a majority belong to the same types (categories 33, 51, 52, 55, 56). Many sherds of the category 15 were found in this layer and we already mentioned their chronological assignment (4th-2nd cent. BC). To finish a single sherd of green glazed ware (Y.502.13) was found within the assemblage. All these elements point to a chronological range from the 4th to the 2nd cent. BC, i.e. the same period as Phase 4.

It was confirmed by a 14C dating:

AMS Lab #	Location	Nature	Radiocarbon age (14C yrs BP)	Calibrated date [intcal09.14c (Reimer et al., 2009)] - Two Sigma Ranges [start:end] relative area
SacA47093	Al-Yamāma - Area N6 Trench D - UF 502	Charcoal of wood (cf <i>Fabaceae</i>)	2,255 ± 30	[cal BC 395: cal BC 349] 0,368962 [cal BC 314: cal BC 208] 0,631038

This would mean that the 1-m-thick accumulation of sand happened quite rapidly in this area. This is not unlikely if we consider that in Sounding 1, the aeolian sand accumulated on a thickness of 3 metres from the 16th to the 20th century AD.



Figure 41: Al-Yamāma: Trench D (area N6): Artefacts from the Phase 5 layer (UF 502) (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

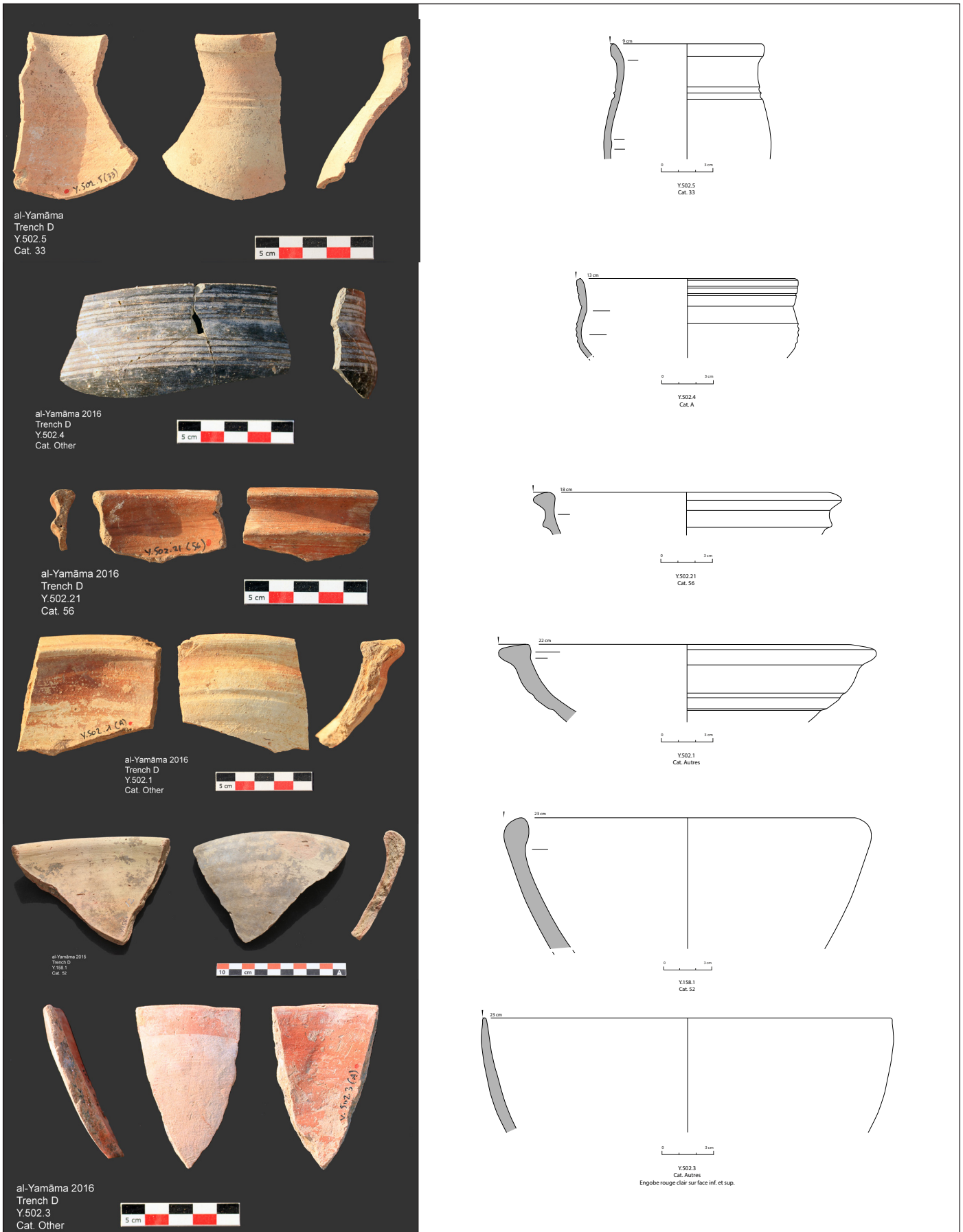


Figure 42: Al-Yamāma: Trench D (area N6): Selection of pottery from the Phase 5 layer (UF 502) (Photographs: J. Schiettecatte; drawings: L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

Pottery assemblage and chronological assignment to local productions

Distribution

78

1099 sherds including 248 characterized shapes have been collected in Trench D. Forty-one out of the fifty-six pottery categories from the site of al-Yamāma are present in the layers of this trench (Table 1). A Minimum Number of Individuals (MNI) of 346 vessels has been estimated on the basis of the presence of indeterminate sherds and the number of registered characterized shapes (foot, handle, decor, rim, etc.).¹

Among the 41 pottery categories from Trench D, at least 6 are clearly imports (cat. 20-22, 34, 41, 47). One is possibly a regional import (cat. 10: Layla ware), coming from the region of Layla-Aflaj, c. 200 km south of al-Kharj. Other categories are considered as either local productions, or unidentified regional imports. One of the issues of this excavation is to characterize and date these pottery categories.

The distribution of pottery categories in the layers from the different phases of Trench D matters in two different ways:

- It permits to date the phases by the presence of well-known imports;
- In turn, it permits to ascribe local productions and unidentified regional imports within periods of time.

This distribution of the MNI of vessels for each category, phase by phase, is presented in Table 2. Phases 2 and 3 respectively correspond to Late Islamic 2 and 1 periods (16th-19th centuries). Phases 4 and 5 correspond to the Late Pre-Islamic 2 and 1 periods (5th-2nd cent. BC).

Table 2 shows that some of the pottery categories –grey colour in the table– cannot be considered as statistically representative; they include less than 10 individuals, often distributed in two or three different phases. The presence of 1 or 2 individuals of a category in a specific phase cannot be a deciding argument for a dating (e.g. cat. 8, 10, 11, 13, 14, 17, 18, 29, 30, 40, 42, 53, 54). Moreover, these categories can also be either a variant of another one (e.g. cat. 49 and 29 being a variant of cat. 4) or an ill-defined category in which several pottery productions from different periods can be included (e.g. cat. 7, 32, 36). No conclusion can be drawn regarding the chronological belonging of these categories.

Thirteen local or regional pottery categories can be analysed (table 3, **figs. 43-44**).

To do so, it is important to distinguish pottery coming from close context (inside buildings) and those coming from the outside, because of the nature of the sediment in ancient open-air areas (eolian sand), the difficulty to clearly identify the interface between two successive layers in such context, and the capacity of artefacts to move downward or upward because of burrowing animals or barkhan shifts under the action of wind. Pottery from open-air areas are less reliable and shall be considered with much caution.

¹ The number of shape fragments determine the MNI in each UF. If no shape is attested, the presence in a UF of one or several uncharacterized sherds of a distinct category indicates a MNI = 1.

Cat.	Description	Imports	Conservation	MNI
1	Common buff ware with medium to thick grits		Indet. sherds + shapes	30
2	Common reddish ware with medium to thick grits		Indet. sherds + shapes	14
4	Medium reddish ware with medium to thick grits		Indet. sherds + shapes	29
5	Medium fine buff ware with white and red matt slip		Indet. sherds + shapes	4
6	Pinkish cooking ware with white exploded grits		Indet. sherds + shapes	11
7	Medium red-orange sandy ware		Indet. sherds + shapes	9
8	Coarse red-orange sandy ware with whitish surface		Indet. sherds	3
10	Layla ware with glossy surfaces	Import?	Indet. sherds	1
11	Thick buff ware with medium temper and reddish wash		Indet. sherds	1
12	Medium fine buff ware		Indet. sherds	4
13	Medium buff ware with black striped red slip		Indet. sherds + shapes	1
14	Medium buff ware with grey inclusions		Indet. sherds + shapes	2
15	Red ware with grey-black core and very abundant chaff temper		Indet. sherds + shapes	10
16	Handmade grey gritty ware		Indet. sherds + shapes	4
17	Handmade cooking wares		Indet. sherds + shapes	4
18	Slow wheel-turned reddish cooking ware		Indet. sherds	2
19	Thick buff chaff tempered ware		Indet. sherds	7
20	Blue / green glazed ware	Import	Indet. sherds + shapes	6
21	Glazed Islamic ware	Import	Indet. sherds + shapes	3
22	Porcelain	Import	Indet. sherds + shapes	1
26	Medium yellow sandy ware		Indet. sherds + shapes	15
28	Thin greenish ware		Indet. sherds + shapes	27
29	Well fired reddish to buff orange ware		Indet. sherds	1
30	Plane grey scratchy wares		Indet. sherds	2
32	Fine grey ware with grey slip, some burnished		Indet. sherds + shapes	6
33	Fine reddish buff ware with cream slip		Indet. sherds + shapes	21
34	Earthenware with blue and white decoration (porcelain imitation)	Import	Indet. sherds + shapes	1
35	Medium reddish buff ware with cream slip		Indet. sherds + shapes	43
36	Fine red-orange sandy ware with reddish slip		Indet. sherds + shapes	6
37	Medium reddish buff ware with black / reddish slip		Indet. sherds + shapes	5
40	Coarse grey ware with whitish surface		Indet. sherds	1
41	Abbasid ware with an opaque white glaze	Import	Indet. sherds + shapes	3
42	Clinky handmade ware with whitish surface		Indet. sherds	2
47	Fritware	Import	Indet. sherds + shapes	1
49	Common reddish ware with thin red grits (chamotte)		Indet. sherds + shapes	5
51	Crumbly greenish ware with medium to thick grits, hand-made or slow wheel turned.		Indet. sherds + shapes	17
52	Hand-made/moulded red buff ware with cream slip (variant of 35)		Indet. sherds + shapes	13
53	Hand-made thick red ware with cream slip		Indet. sherds	2
54	Thick coarse red and brown ware with medium grits		Indet. sherds	3
55	Greenish scratchy wares with grey slip		Indet. sherds + shapes	13
56	Fine brown scratchy ware with cream slip		Indet. sherds + shapes	12

Table 1: pottery categories attested in Trench D with the MNI for each category.

Category	Description	Phase 2	Phase 3	Phase 4	Phase 5	Total
1	Common buff ware with medium to thick grits	10	16	4		30
2	Common reddish ware with medium to thick grits	7	7			14
4	Medium reddish ware with medium to thick grits	3	17	9		29
5	Medium fine buff ware with white and red matt slip	1	2	1		4
6	Pinkish cooking ware with white exploded grits	3	5	3		11
7	Medium red-orange sandy ware	3	2	4		9
8	Coarse red-orange sandy ware with whitish surface		3			3
10	Layla ware with glossy surfaces			1		1
11	Thick buff ware with medium temper and reddish wash			1		1
12	Medium fine buff ware		2	2		4
13	Medium buff ware with black striped red slip	1				1
14	Medium buff ware with grey inclusions		1	1		2
15	Red ware with grey-black core and abundant chaff temper		2	7	1	10
16	Handmade grey gritty ware	1		3		4
17	Handmade cooking wares	2	2			4
18	Slow wheel-turned reddish cooking ware	1	1			2
19	Thick buff chaff tempered ware	2	3	2		7
20	Blue / green glazed ware		1	4	1	6
21	Glazed Islamic ware	2	1			3
22	Porcelain	1				1
26	Medium yellow sandy ware	3	5	7		15
28	Thin greenish ware	5	20	2		27
29	Well fired reddish to buff orange ware			1		1
30	Plane grey scratchy wares			2		2
32	Fine grey ware with grey slip, some burnished	4	1	1		6
33	Fine reddish buff ware with cream slip		1	12	8	21
34	Blue and white porcelain imitation	1				1
35	Medium reddish buff ware with cream slip	12	13	18		43
36	Fine red-orange sandy ware with reddish slip		4	2		6
37	Medium reddish buff ware with black / reddish slip	1	1	3		5
40	Coarse grey ware with whitish surface			1		1
41	Abbasid ware with an opaque white glaze		3			3
42	Clinky handmade ware with whitish surface			2		2
47	Fritware	1				1
49	Common reddish ware with thin red grits (chamotte)	2	1	2		5
51	Crumbly greenish ware with medium to thick grits			15	2	17
52	Hand-made/moulded reddish buff ware with cream slip			11	2	13
53	Hand-made thick red ware with cream slip			2		2
54	Thick coarse red and brown ware with medium grits			3		3
55	Greenish scratchy wares with grey slip			9	4	13
56	Fine brown scratchy ware with cream slip			9	3	12

Table 2: distribution of the pottery categories attested in Trench D by phase (in grey: local categories or unidentified regional imports with MNI < 10; in red: imports).

Category	Trench D Phase 2 Islamic 2		Trench D Phase 3 Islamic 1		Trench D Phase 4 LPI 2		Trench D Phase 5 LPI 1	Chronological assignment to the pottery type (LPI = Late Pre-Islamic)
	Inside	Outside	Inside	Outside	Inside	Outside	Outside	
22		1						Islamic 2
34		1						Islamic 2
47		1						Islamic 2
21	2			1				Islamic 1 – Islamic 2
41				3				Islamic 1
2	1	6	4	3				Islamic 1 – Islamic 2
28	3	2	2	18	1	1		Islamic 1 – Islamic 2
1	3	7	2	14	2	2		Islamic 1 – Islamic 2
35	10	2	1	12	10	8		LPI 2 – Islamic 1 – Islamic 2
4	1	2	1	16	5	4		LPI 2 – Islamic 1
26	2	1	2	3	4	3		LPI 2 – Islamic 1 – Islamic 2
6	2	1	1	4		3		LPI 2 – Islamic 1 – Islamic 2
20				1	4		1	LPI 2
15				2	3	4	1	LPI 2
33				1	8	4	8	LPI 1 – LPI 2
51					6	9	2	LPI 1 – LPI 2
52					8	3	2	LPI 1 – LPI 2
55					7	2	4	LPI 1 – LPI 2
56					5	4	3	LPI 1 – LPI 2

Table. 3 : Seriation and periodization of 13 local pottery categories or unidentified regional imports and 6 imported categories (in red)

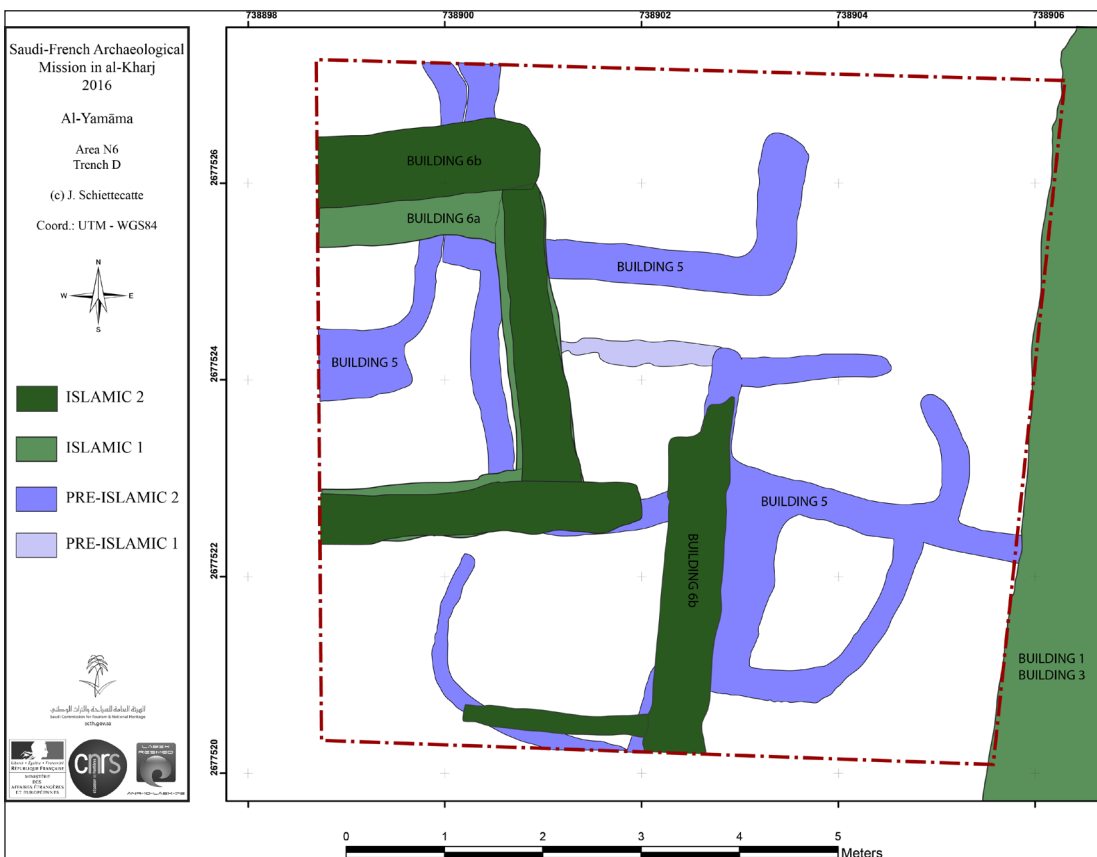


Figure 43: Al-Yamāma: Trench D (area N6): Plan of the four successive chronological phases (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

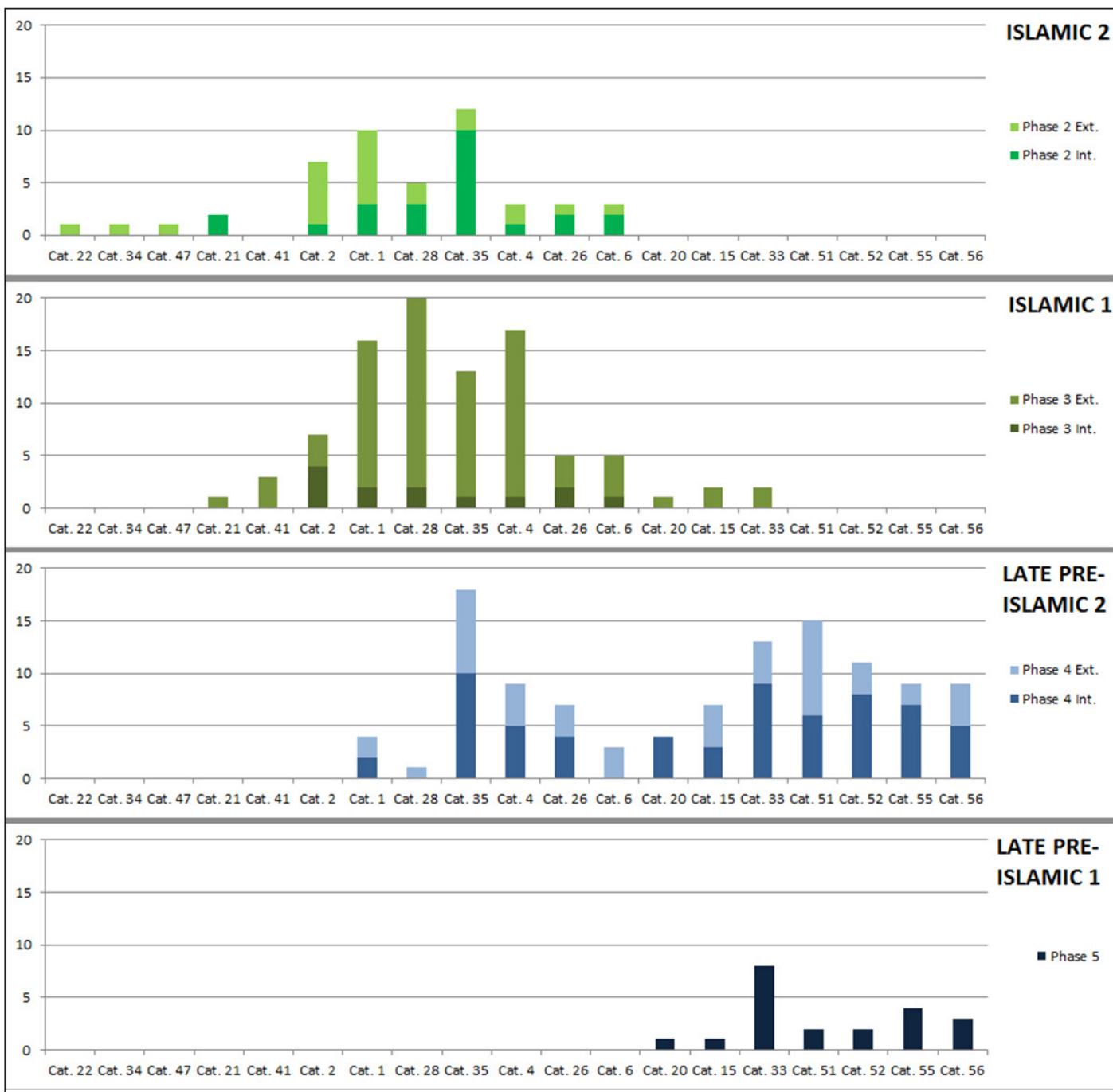


Figure 44: Al-Yamāma: Trench D (area N6): Distribution of the MNI of 13 local pottery categories or unidentified regional imports and 6 imported categories by chronological phases (J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

Pre-Islamic local or regional productions

Six categories are specific to the pre-Islamic levels of Trench D:

- Cat. 15 - Red ware with grey-black core and abundant chaff temper;
- Cat. 33 - Fine reddish buff ware with cream slip [thinner variant of cat. 35];
- Cat. 51 - Crumbly greenish ware with medium to thick grits [coarser variant of cat. 52];
- Cat. 52 - Hand-made / moulded / slow-wheel turned reddish buff ware with cream slip [non wheel turned variant of cat. 35];
- Cat. 55 - Greenish scratchy wares with grey slip [greenish variant of cat. 30; thinner variant of cat. 51];
- Cat. 56 - Fine brown scratchy ware with cream slip.

Cat. 15: A MNI of 10 vessels was estimated in Late Pre-Islamic [LPI] 1 and 2 layers but only one shape was found: a jar with thick wall and a thick triangular rim (**fig. 51.17**). This coarse fabric was also well attested at the bottom of Sounding 1 (UF 059-060, 5th-2nd cent. BC – MOUTON *ET AL.* in press: 202-203, fig. 182), it was also used there for the production of small jars with thick walls. Only 3 sherds of cat. 15 belonging to at least 2 vessels were found in Islamic 1 eolian sand layers (UF 237 and 278), at the interface with the-Pre-Islamic layers. They might be considered as intrusive.

Cat. 33 is the thin version of cat. 35. In Trench D, it was almost restricted to LPI 1 and 2 (MNI respectively = 13 and 8 vessels).

In LPI 1, the shapes are: small widely open jars with a single groove under the neck (**fig. 53.16**), small jars with a triangular rim (**fig. 53.13-15**) or small carinated bowls with a triangular rim (**fig. 53.2**).

In LPI 2, this fabric was mainly used to produce bowls and small basins with a flat base, a round body and a vertical or slightly everted neck. Both body and neck have horizontal grooves (**fig. 50.8-14**). Two sherds showing this kind of shape were found in Islamic 1 eolian sand level at the interface with LPI 2 layers (**fig. 49.13-14**). They may be intrusive.

Cat. 51: This fabric is coarse, probably fired at low temperature hence its crumbly texture, the temper includes medium to thick grits and it was either moulded or slow-wheel turned. A cream slip sometimes covers the outer side, a brown slip is sometimes applied inside. It is a coarse variant of cat. 52, used for large vessels: large basins with thickened round rim (**fig. 52.9-10**), large basins with a round body and a vertical grooved neck (**fig. 50.6-7**), open jars (**fig. 53.17**) or close jars with a vertical neck and everted triangular/rectangular rim (**fig. 51.14-15**). This category is mainly attested in LPI 2 levels (MNI = 15 vessels), and rarer in LPI 1 levels (MNI = 2 vessels).

Cat. 52 has the same fabric as cat. 35, a reddish buff ware with cream slip, but was either moulded, or slow wheel-turned. LPI 2 shapes are: bowls with a thick horizontal groove under an everted triangular rim (**fig. 52.7-8**), bowls with a flat base, a round body, a vertical or slightly everted neck and a décor of horizontal grooves (**fig. 50.17-18**), and jars with a vertical neck and horizontal everted rim (**fig. 51.13**). In LPI 1 levels, shapes are a thick bowl with thick inverted rim (**fig. 53.11**) and small carinated bowl with a round everted rim (**fig. 53.1**).

Cat. 55 is a wheel-turned greenish scratchy fabric with a fine to medium mineral temper and a grey slip. This category is a greenish variant of the grey cat. 30 and a thinner variant of cat. 51. At least 13 vessels were found in LPI 1 & 2 levels (respectively 4 and 9). These are basins and bowls with a round body, a slightly everted neck and a décor of horizontal grooves (**fig. 50.1-2**; **fig. 53.4-5**).

Cat. 56 is a fine brown scratchy ware with mineral temper and cream slip. Twelve vessels were numbered in LPI 1 & 2 levels (respectively 3 and 9). In LPI 1 levels, it included bowls with a thick horizontal groove under a thick triangular rim (**fig. 53.8**); in LPI 2 levels, these were bowls with a round body, a slightly everted neck and a décor of horizontal grooves (**fig. 50.15-16**), and carinated bowls with an everted body and an inverted rounded rim (**fig. 52.18-19**).

Cat. 35 stands apart as it was attested in all the chronological phases of the sounding, both Pre-Islamic (LPI 2) and Islamic (1 & 2) with respectively a MNI of 18, 13 and 12 vessels. It consists in a medium reddish buff ware with cream slip (cat. 33 and cat. 52 are respectively a thinner and a non-wheel-turned variants of cat. 35).

In LPI 2 levels, this fabric was used for bowls with a round body, a vertical neck and a décor of horizontal grooves (**fig. 50.3-4**), simple bowls with curved body (**fig. 52.6, 11**), carinated basins with an everted body and an inverted rounded rim (**fig. 52.21**), and jars with a vertical neck and a thick triangular rim (**fig. 51.16**).

Discussion

A look at the corpus of pottery shapes from the Late Pre-Islamic levels 1 & 2 shows a quite homogeneous catalogue which can be divided in 4 main type of vessels with no major differences between LPI 1 and 2:

- Jars with a vertical neck and an everted triangular/round rim [cat. 35, 51, 52] (**fig. 51.13-16, fig. 53.13**);
- bowls and basins with a flat base, a round body, a vertical or slightly everted neck and a décor of horizontal grooves [cat. 26, 32, 33, 35, 51, 52, 55, 56] (**fig. 50.1-18, fig. 53.3-5**);
- carinated bowls and basins with an everted body and an inverted rounded rim [cat. 5, 33, 35, 36, 52, 56] (**fig. 52.12-21, fig. 53.10-11**);
- bowls with a thin to thick horizontal groove under a thick protruding triangular rim [cat. 51, 52, 56] (**fig. 52.7-10, fig. 53.8-9**).

Therefore, the corpus is much more homogeneous when considering shapes rather than fabrics. Shapes are not characterized by a same fabric. Moreover, the different fabrics are often variants of another one:

- cat. 33 = fine variant of cat. 35;
- cat. 51 = coarse variant of cat. 52;
- cat. 52 = non-wheel-turned variant of cat. 35;
- cat. 55 = green variant of cat. 30 and fine variant of cat. 51.

As a consequence, this corpus likely reflects the presence of several local or regional pottery workshops sharing common habits (general use of a mineral temper, frequent use of slip, production of a limited variety of shapes) but possibly using different clays with non-generalized use of the wheel, and different firing techniques.

The only clear distinct local or regional production are jars in red ware with grey-black core and abundant chaff temper (cat. 15). Concerning this category, both the shapes and fabric have nothing in common with the rest of the corpus.

Late Islamic regional productions (16th-19th cent.)

Cat. 1-2 – Common buff (cat. 1) or reddish (cat. 2) ware with medium to thick grits

These two categories are predominant. They seem to constitute the major local production over a long period of time. They were found in Late Islamic levels in Trench D, however a workshop dedicated to this production has been identified and excavated in area G17 and dated to the Abbasid period (see in this report “Al-Yamāma - Sounding 3 (Area G17): A pottery workshop” by F. Lesguer). Cat. 2 appears as a variant of cat. 1, its different colour being most likely the result of variations during the firing process.

In trench D, these categories are ascribed to the Late Islamic periods 1 & 2 (Islamic 1 & 2). Only 4 MNI comes from Late Pre-Islamic 2 (LPI 2) levels against 40 in Islamic 1 & 2, and three of them were indeterminate sherds which were found in post-abandonment sand accumulation (UF 256, 282, 294).

In Islamic 1 levels, these are bowls and basins with a thin everted triangular rim (**fig. 48.12**) or a thick

rounded triangular rim (fig. 48.9-11), and most often close jars with a vertical neck and a squared or rounded everted rim (fig. 47.18-22), or a vertical neck, a thickened rim and vertical handles with a bean-shaped section (fig. 47.11, fig. 47.17). Bases are flat (fig. 47.6-8).

In Islamic 2 levels, profiles are different, these are: bowls with triangular rim and horizontal incisions (fig. 46.5), bowls with thickened rim (fig. 46.3), open jars with triangular everted rim (fig. 46.10), large jars or basins with a flat base (fig. 45.3-4), and thin close jars with flat base (fig. 45.10-11). Handles have oval section (fig. 45.9).

Cat. 28 - Thin greenish ware

Beside cat. 1 & 2, thin greenish ware (cat. 28) is one of the most frequent category in Islamic 1 & 2 (respectively a MNI of 20 and 5 vessels). The fabric closely resembles cat. 1 but it was specifically dedicated to thinner and smaller vessels. A single sherd has been found in a LPI 2 eolian sand layer (UF 256), which is most probably intrusive.

In Islamic 1, shapes are homogeneous: grooved vertical rims of bowls or small open jars (fig. 49.1-8), small jars with vertical neck (fig. 47.14-15) and small rounded bowls with inverted rim (fig. 48.1, fig. 48.3-4). The only base is flat (fig. 47.5).

In Islamic 2, these are large and shallow rounded bowls with inverted rim (fig. 46.1).

Cat. 35 - Medium reddish buff ware with cream slip

This category is still widely used in both Islamic 1 (MNI = 13) and Islamic 2 (MNI = 12) levels.

In Islamic 1 levels, the shapes are: grooved vertical necks of bowls or small open jars (fig. 49.9-10), small close jars with vertical neck (fig. 47.13), close jars with triangular protruding rim (fig. 47.23), basins with a folded down triangular rim (fig. 48.13).

In Islamic 2 levels, the shapes are the same small close jars with vertical neck (fig. 45.1), close jars with triangular rim (fig. 45.7), rounded bowls (fig. 46.7) and large open jars with a triangular inverted rim and a décor of wavy lines (fig. 46.12).

Discussion

The same observation as those expressed about LPI 1 & 2 periods can be done concerning the pottery assemblage of the Late Islamic 1 levels: the corpus of shapes is homogeneous with 6 main types of vessels, each shape being produced in different fabrics:

- Small close jars with a vertical neck [cat. 4, 28, 35] (fig. 47.12-14);
- Large close jars with a vertical neck and rounded everted rim [cat. 1, 2, 35] (fig. 47.18-22);
- Large bowls / small open jars with a rounded body, a vertical neck and a décor of horizontal grooves [cat. 26, 28, 35] (fig. 49.1-11);
- Carinated/rounded bowls with an everted body and an inverted rounded rim [cat. 4, 5, 28, 32, 36, 37] (fig. 48.2-8);
- Basins with a thick triangular rim [cat. 1] (fig. 48.9-11);
- Bowls / basins with a folded down triangular rim [cat. 1, 35] (fig. 48.12-13).

As for the pre-Islamic corpus, this Late Islamic 1 corpus likely reflects the presence of several local or regional pottery workshops sharing common habits (general use of a mineral temper, production of a limited variety of shapes) but possibly using different clays, different firing techniques, sometimes using slips (cat. 5, 32, 35, 36, 37), sometimes not (cat. 1, 4, 26, 28).

Some of the shapes show similarities with those of the LPI 2 levels, indicating a continuity in local pottery traditions. The most obvious are:

- Jars with a vertical neck and an everted rounded rim: cat. 51 largely used in LPI 2 levels is replaced by cat. 1;
- Bowls and small open jars with a flat base, a round body, a vertical or slightly everted neck and a décor of horizontal grooves: cat. 33, frequent in LPI 2 levels is apparently replaced by cat. 28;
- Carinated bowls and basins with an everted body and an inverted rounded rim, produced in a wide range of fabrics in both LPI 2 and Islamic 1 levels.

In general, large shapes produced in cat. 51 during the LPI 2 levels are replaced by cat. 1 in Islamic 1 levels, be that the large jars mentioned above, or the large basins (compare [fig. 48.9-11](#) and [fig. 52.9-10](#)). In this case, wheel techniques and firing process had improved.

Smaller shapes which were produced in cat. 33 during the LPI 2 period were produced in cat. 28 during the Islamic 1 period.

The novelty in Islamic 1 period is principally the appearance of triangular rims realized by folding down the clay, up the neck ([fig. 48.12-13](#)), a profile which becomes frequent in Islamic 2 assemblage ([fig. 45.7](#), [fig. 46.6](#), [fig. 46.10-12](#)).

Shapes from the Islamic 2 levels are less numerous and the corpus cannot be easily characterized. We can only observed the large number of widely open bowls and basins ([fig. 46.1-6](#)) and open jars ([fig. 46.7-13](#)) produced in a wide range of fabrics and showing a variety of décor and profiles.

The issue of the long-lasting Pre-Islamic – Late Islamic pottery categories

Four categories are problematic since they appear in most of the chronological phases and cannot be ascribed to one or another phase:

- Cat. 4 - Medium reddish ware with medium to thick grits;
- Cat. 6 - Pinkish cooking ware with white exploded grits;
- Cat. 26 - Medium yellow sandy ware;
- Cat. 35 - Medium reddish buff ware with cream slip.

In two cases (cat. 4 and 26), this is most probably the consequence of a lack of detail in the definition of the category which resulted in the inclusion of too many variants, each being peculiar to a specific period. This is particularly true with the yellow sandy ware (cat. 26), whose MNI per phase is particularly low and do not permit to isolate a specific assemblage within it.

In the case of cat. 4, the distribution shows a peak in the Islamic 1 period (MNI = 17) but the presence of a MNI = 9 in the LPI 2 levels does not validate the consistency of this category.

The case of cat. 6 is peculiar : this type is highly characteristic and recognizable (pinkish colour, exploded grits). However, its distribution does not show any consistency either and the weak statistical representativeness of the sampling does not permit to ascribe it within a definite chronological span.

Thus these three categories are too poorly represented and/or too generally described to be confidently considered.

To finish, the medium reddish buff ware with cream slip (cat. 35) does not have these two limitations, its characteristics are detailed and recognizable, and it is abundantly distributed in the archaeological levels. It is quite puzzling to see it towering over other categories in LPI 2, Late Islamic 1 and Late Islamic 2 periods, all the more that a 1500-yrs-long gap separate the Late Pre-Islamic Period from the Late Islamic Period. We can only make the assumption that it corresponds to a long-lasting local tradition of clay preparation and firing.

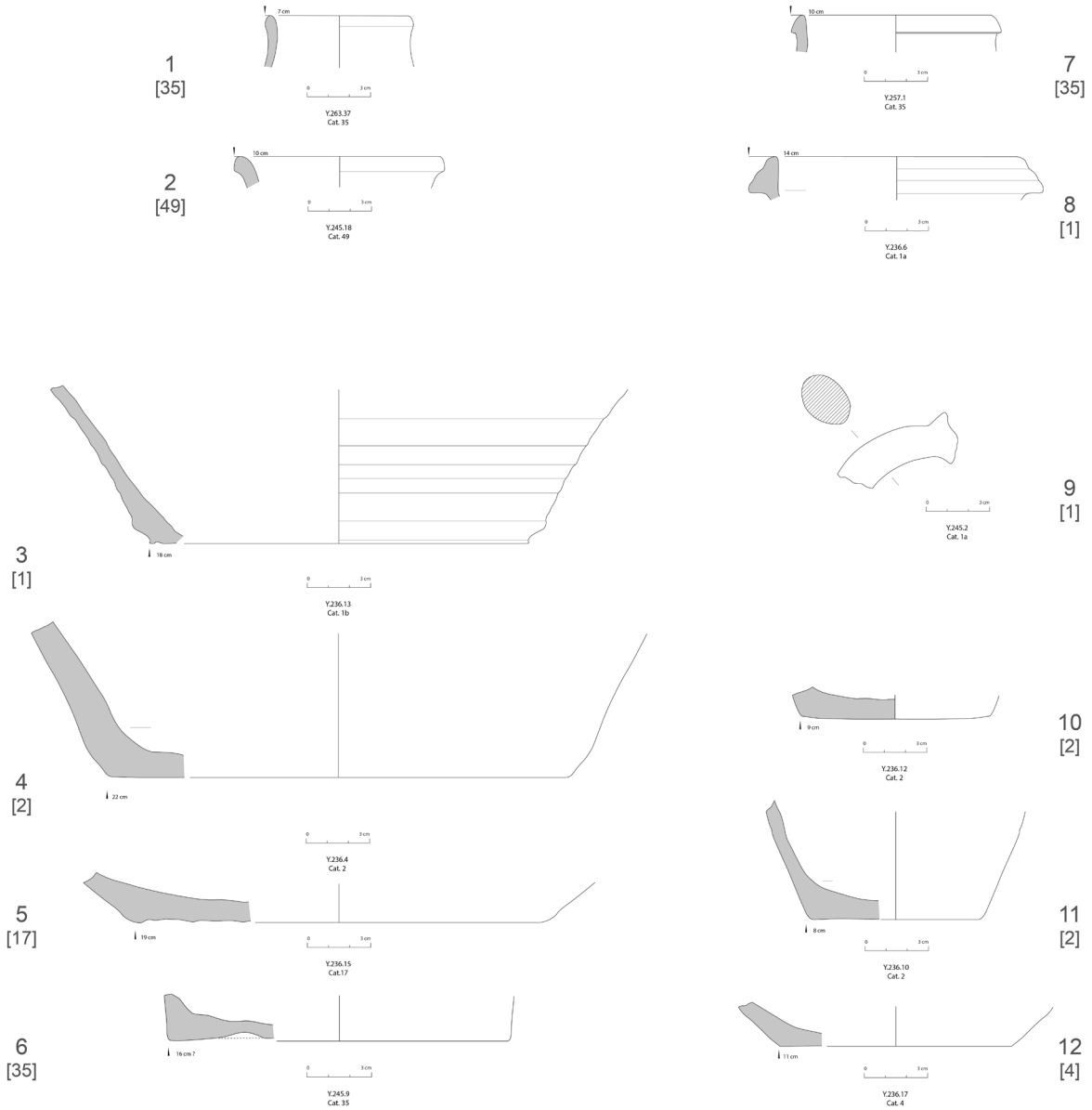


Figure 45: Al-Yamāma: Trench D (area N6): Phase 2 / Islamic 2 - bases, handles, close jars.
 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

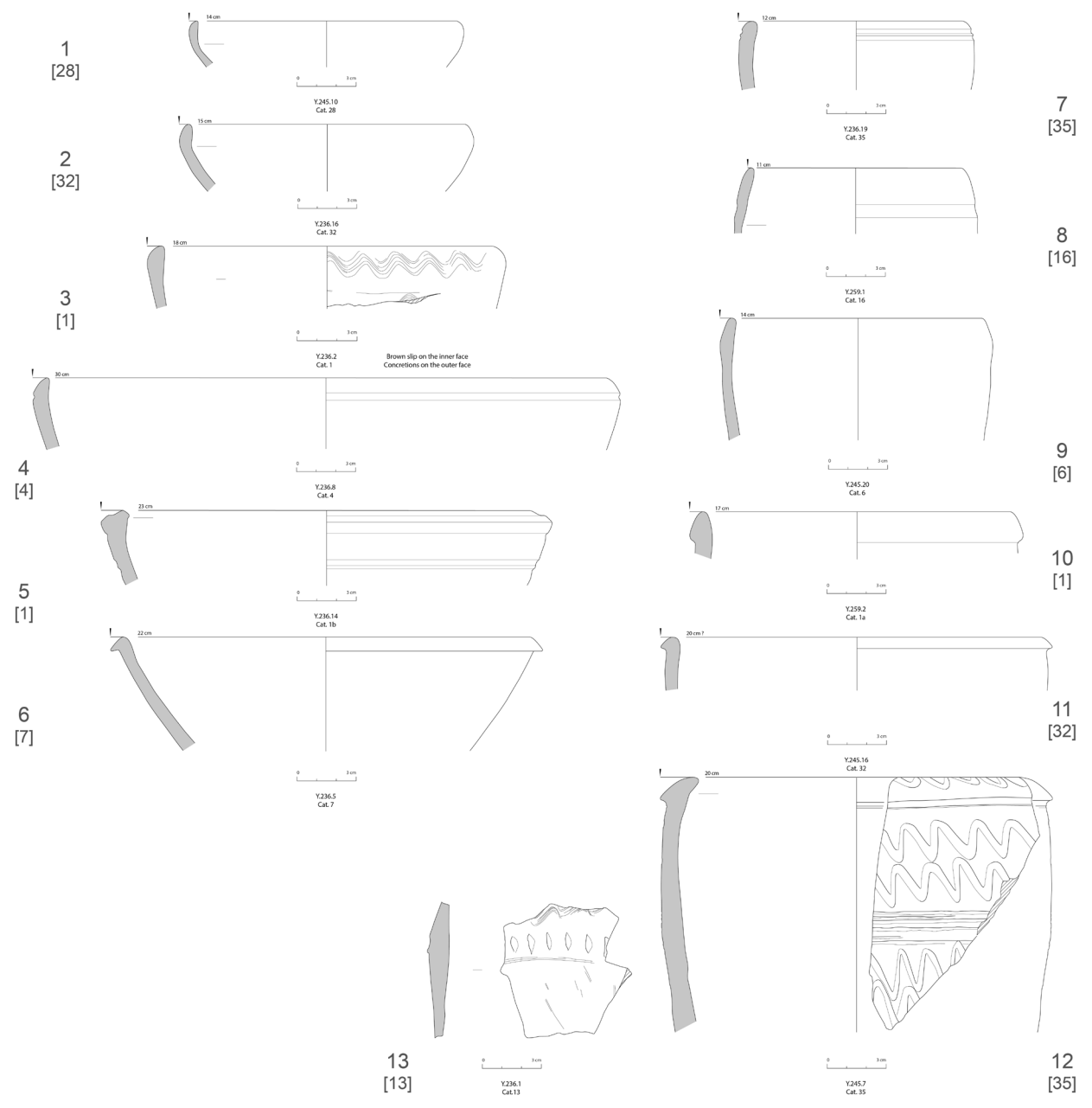


Figure 46: Al-Yamāma: Trench D (area N6): Phase 2 / Islamic 2 - bowls, basins, open jars.
 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

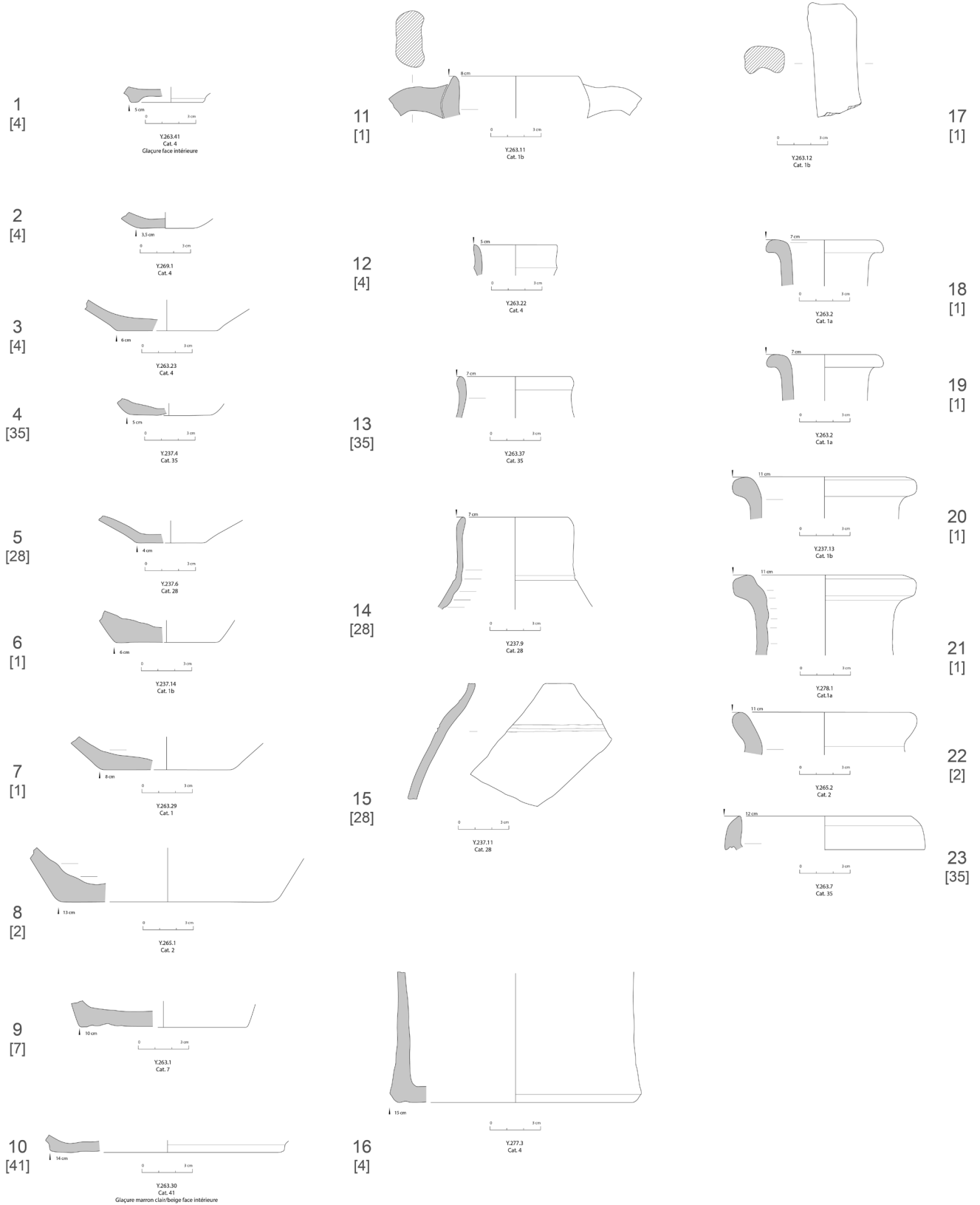


Figure 47: Al-Yamāma: Trench D (area N6): Phase 3 / Islamic 1 - bases, handles, close jars.
(L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

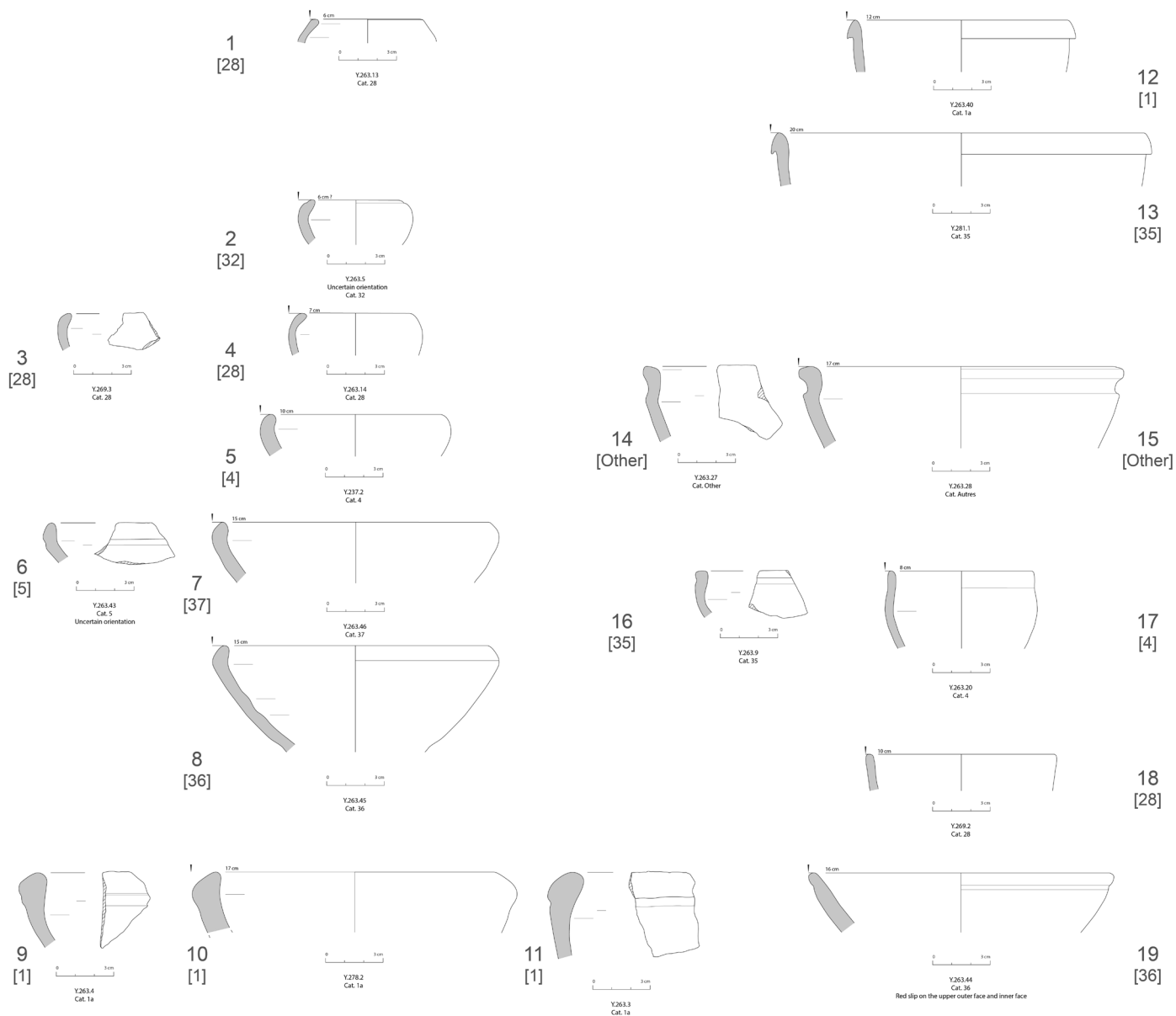


Figure 48: Al-Yamāma: Trench D (area N6): Phase 3 / Islamic 1 - bowls and basins.
 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

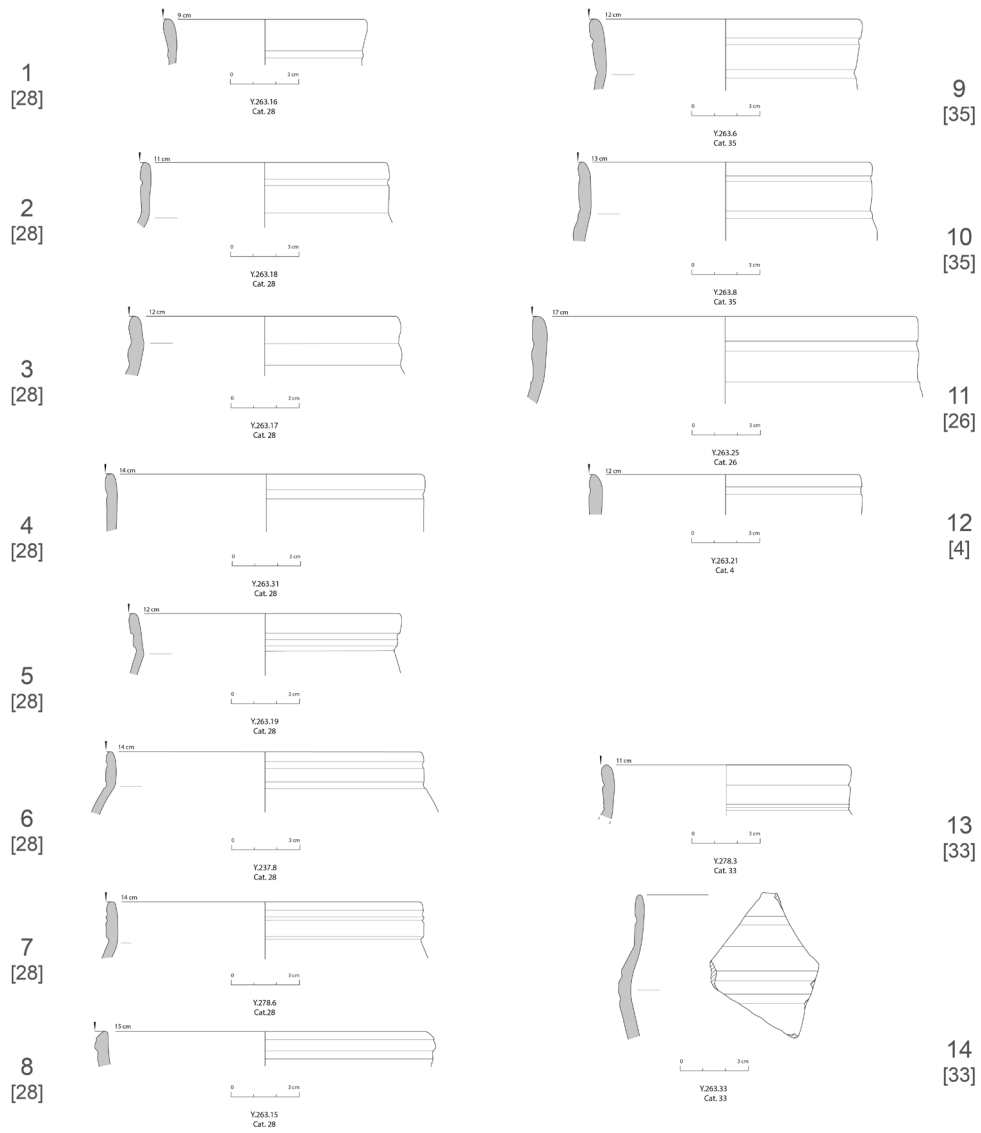


Figure 49: Al-Yamāma: Trench D (area N6): Phase 3 / Islamic 1 - close jars and bowls.
 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

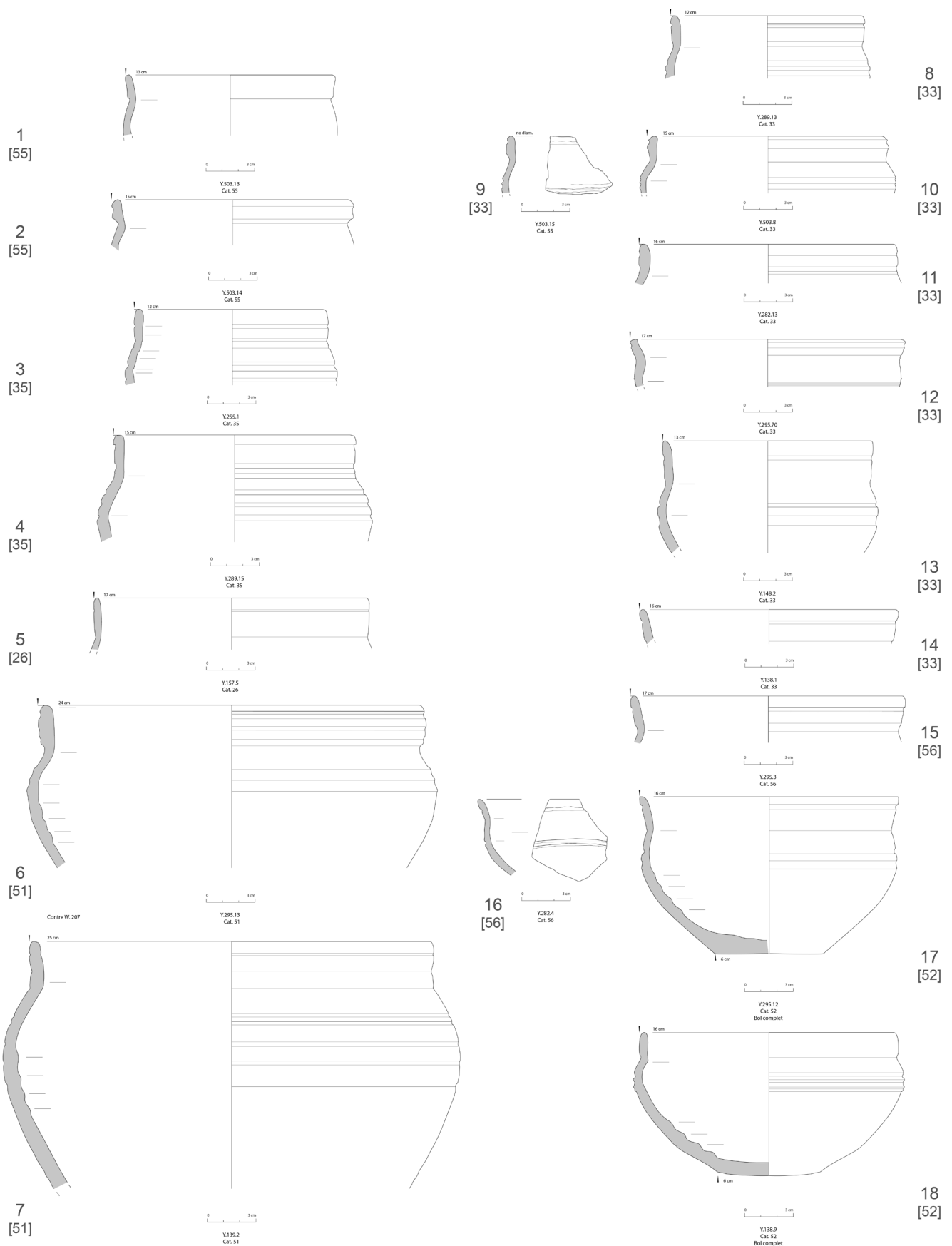


Figure 50: Al-Yamāma: Trench D (area N6): Phase 4 / Late Pre-Islamic 2 - open jars, bowls and basins.
(L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

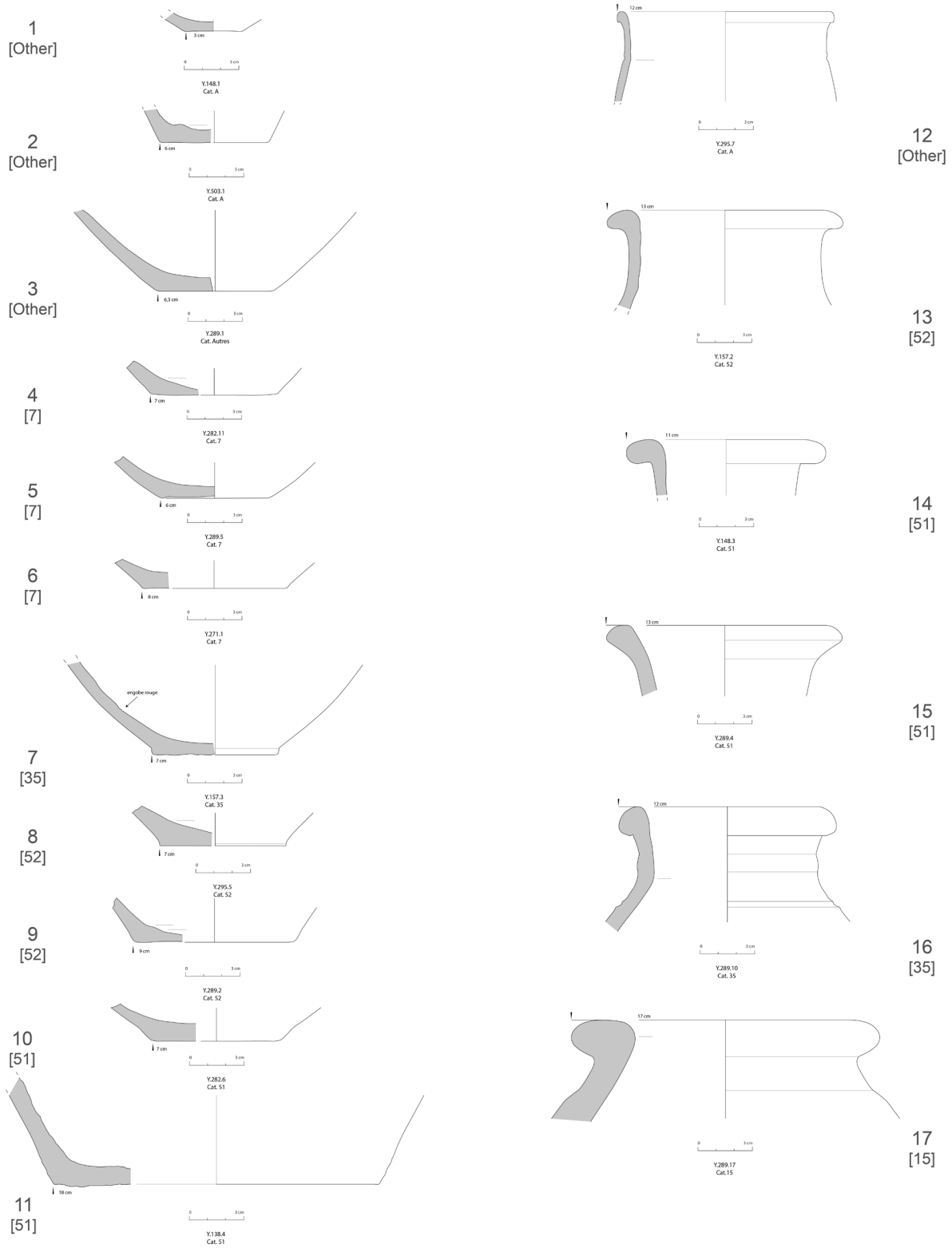


Figure 51: Al-Yamāma: Trench D (area N6): Phase 4 / Late Pre-Islamic 2 - bases, close jars.
(L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

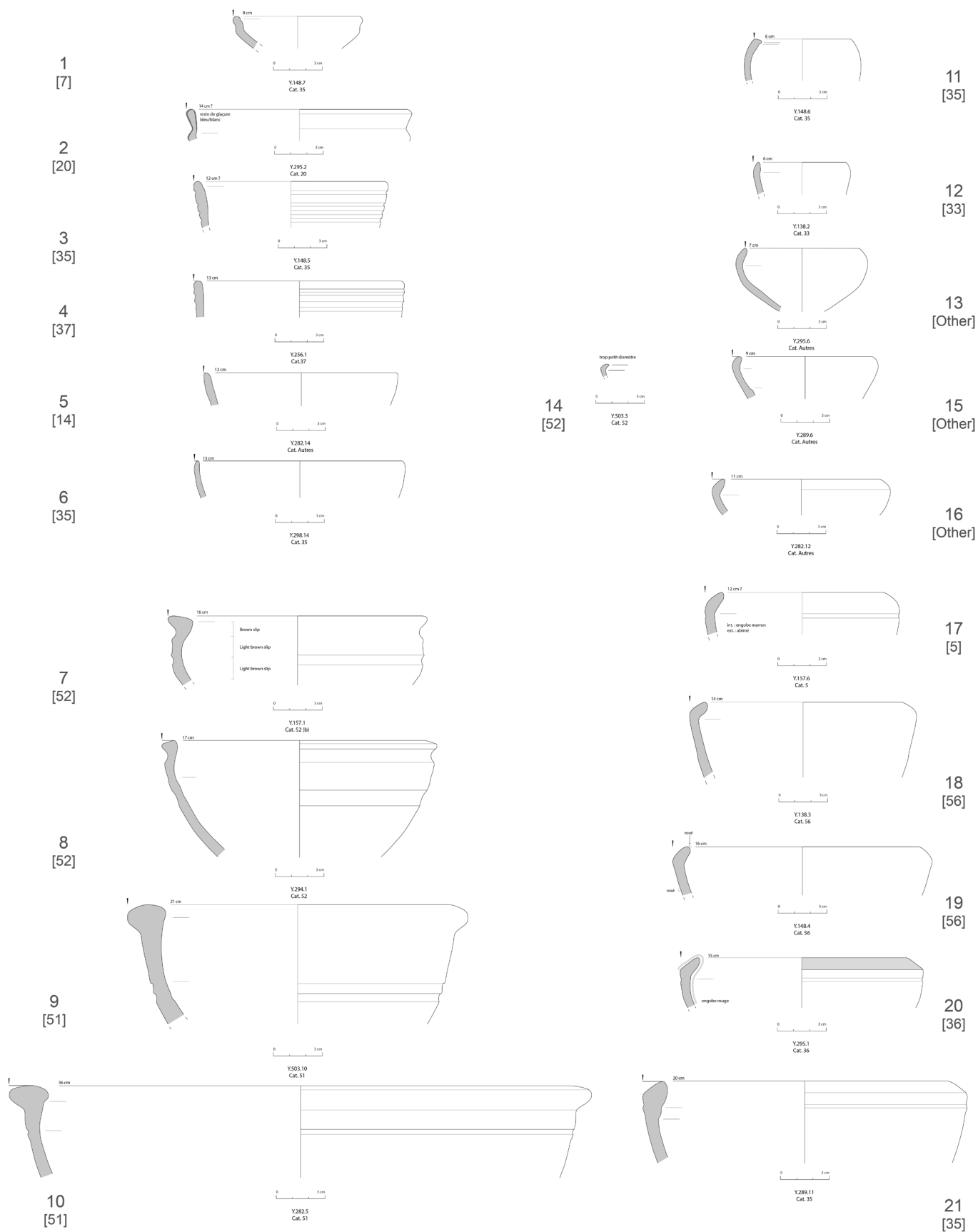


Figure 52: Al-Yamāma: Trench D (area N6): Phase 4 / Late Pre-Islamic 2 - bowls and basins.
(L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

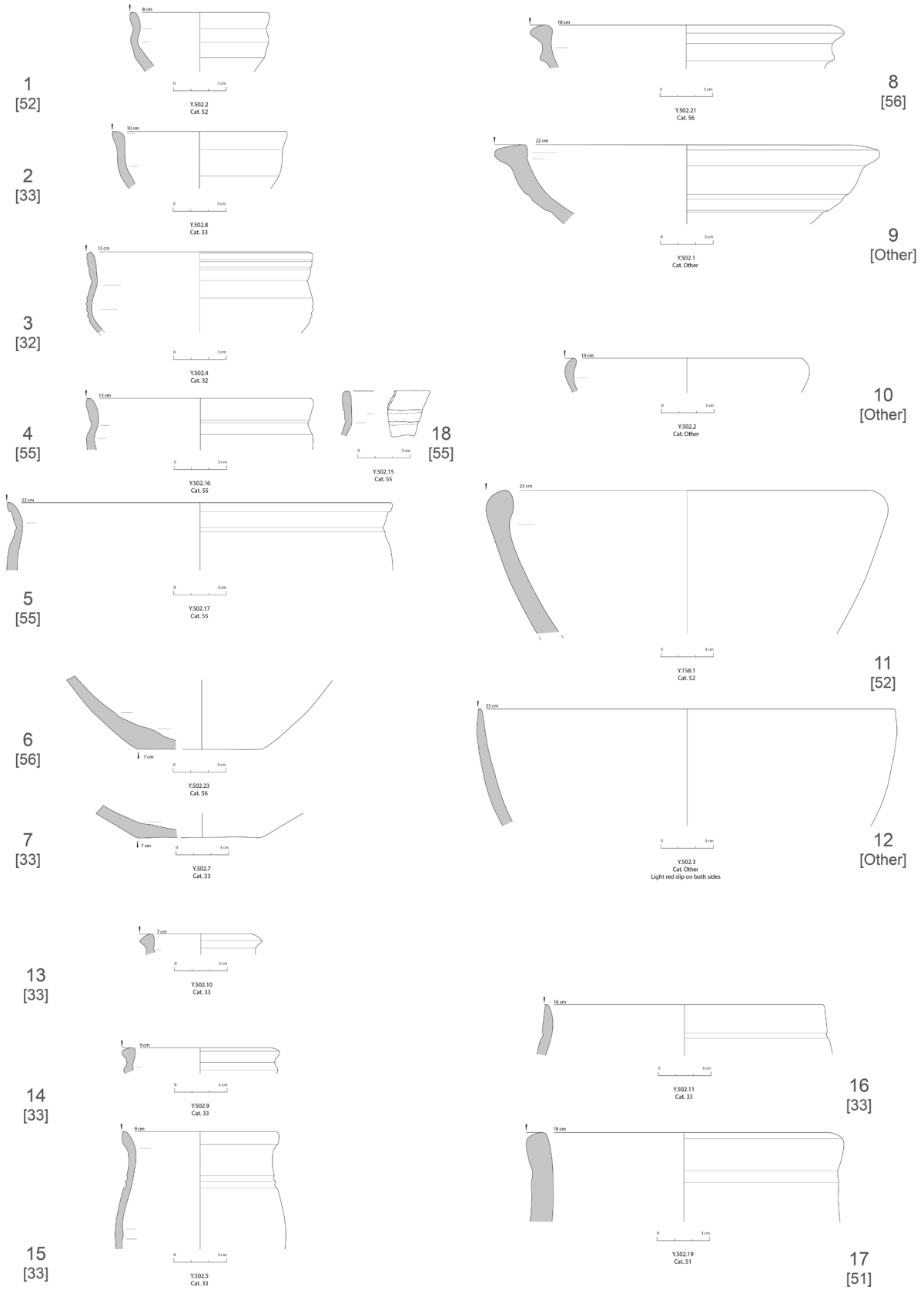


Figure 53: Al-Yamāma: Trench D (area N6): Phase 5 / Late Pre-Islamic 1.
 (L. Munduteguy - Saudi French archaeological Mission in al-Kharj).

Christian DARLES (Ecole Nationale Supérieure d'Architecture, Toulouse)

L'étude architecturale de la mosquée (Building 1) d'al-Yamāma effectuée en janvier 2016 venait après quatre années de fouilles archéologiques organisées sur la partie sommitale du tell, au sein de la zone archéologique protégée.

Ces fouilles, menées à la suite de prospections terrestres et de relevés photographiques aériens, ont occasionné le dégagement d'un bâtiment important (un enclos de 40.3 m par 29.2 m, orienté approximativement est-ouest avec une salle prière occidentale de 12 m de profondeur et une cour de 29 m par 28 m) (figs. 1-2). Plusieurs niveaux d'occupation bien datés ont ainsi été étudiés (le plus ancien actuellement visible est daté par ¹⁴C de l'époque abbasside et les derniers de l'époque moderne (XV^e-XVIII^e siècles). Des sondages, à l'intérieur de l'édifice, ont accompagné ces dégagements et ont permis la récolte de données stratigraphiques importantes. L'un d'entre eux (au nord-ouest) a atteint des niveaux préislamiques. De plus, des fosses associées au niveau mis en valeur, dont certaines de récupération, ont été vidées de leur contenu et nettoyées. Elles ont fourni, outre du matériel, une stratigraphie précise où plusieurs sols ont pu être clairement identifiés (F. 192, F. 182, F. 015) (SIMÉON & SCHIETTECATTE 2015).

Dès le commencement des recherches archéologiques il fut évident que le tell d'al-Yamāma abritait les vestiges d'une grande mosquée. La fouille avait été arrêtée en 2015 sur un sol de chaux bien conservé daté de l'époque abbasside au-dessus duquel des piliers de section circulaire ont été édifiés et, de nombreuses fois à l'occasion de la surélévation des sols successifs, chemisés par adjonction d'un enduit de terre.

Déroulement de l'étude

Le sol F. 015, sur lequel s'est arrêtée la fouille en 2015, est très bien conservé et possède un certain nombre de traces arasées visibles qui indiquent la présence de structures bâties antérieures contre lesquelles il vient s'appuyer. Le mortier de chaux recouvre à peine ces structures qui affleurent par endroit. Une approche architecturale plus fine indique qu'un bâtiment –« Building 3 »–, associé aux sols immédiatement inférieurs (F. 182 et F. 192), est lui-même précédé par une structure porteuse intégrée ultérieurement dans le système porteur de l'édifice. Ces deux derniers sols ont été identifiés dans les coupes résiduelles des fosses de pillage ainsi que dans le sondage nord-ouest ; ils ont également été repérés dans le mirhāb. La remontée de ces sols en plinthe ou en enduit est visible à de nombreux emplacements, ce qui permet d'affirmer que les états concernés du Building 3 sont conservés en plan durant plusieurs états et sans nul doute durant un certain nombre d'années.

Les techniques constructives des édifices précoces montrent que ces deux sols ont été particulièrement soignés. Ils remontent systématiquement en enduit autant sur les parois que sur les éléments porteurs verticaux. Le sol F. 015, plus tardif, vient buter contre F. 182 et F. 192. On a donc pu, après un nettoyage soigneux, comprendre les différentes couches d'enduit à la chaux qui recouvraient les piliers et colonnes d'origine. Nous avons pu identifier la stratification de ces sols et définir les différents choix constructifs opérés par les bâtisseurs.

Plans et numérotation des structures et des espaces architecturaux

Pour la clarté de nos explications nous proposons une numérotation complémentaire accompagnée par une table de concordance avec les données fournies par les archéologues. La numérotation proposée concerne le repérage des nefs et des travées ainsi que les files des parois et points porteurs.

Nous nommons nefs les espaces perpendiculaires au mur de la *qibla*.



Figure 1: Aerial view of Building 1 (Mosque) (Thomas Sagory - Saudi-French archaeological mission in al-Kharj).



Figure 2: Al-Yamāma. Plan of Building 1: white: working area; pink= pits and trenches; yellow= levelled mudbrick structures (Building 3) (M. Niveleau & J. Schiettecatte - Saudi-French archaeological mission in al-Kharj).

Nous nommons travées les espaces parallèles à ce même mur.

Nous nommons files les alignements de piliers et les murs extérieurs.

Bâtiments associés aux sols F. 182 et F. 192 (figs. 3-4) :

- Orientés dans le sens ouest-est :
 - Sept nefs numérotées de « a » à « g », du sud vers le nord ;
 - Deux murs sud et nord numérotés respectivement « 1a » et « 8a » ;
 - Deux files de contreforts, « 1 » et « 8 » ;
 - Six files de points porteurs verticaux, numérotés de « 2 » à « 7 ».
- Orientés dans le sens nord-sud :
 - Deux travées numérotées « A » et « B » de l'ouest vers l'est ;
 - Le mur de la Qibla, à l'ouest, numéroté « Ia » ;
 - Une file de piliers circulaires (côté nord) alignés avec un mur sud, numérotée « IIa » ;
 - Une file de contreforts, numérotée « IIb » ;
 - Une file correspondant à des parois de type murs bahuts, numérotée « IIIb » ;
 - Une file de piliers cruciformes numérotée « IIIa ».

Bâtiment bâti sur le sol F. 015 (figs. 5-6)

- Orientés dans le sens ouest-est :
 - Onze nefs numérotées de « a' » à « k' », du sud vers le nord ;
 - Deux murs sud et nord numérotés respectivement « 1a » et « 8a » ;
 - Deux files de contreforts, « 1 » et « 8 » ;
 - Dix files de points porteurs verticaux, numérotés de « 2a » à « 11a ».
- Orientés dans le sens nord-sud :
 - Trois travées numérotées « A' », « B' » et « C' » de l'ouest vers l'est ;
 - Le mur de la Qibla, à l'ouest, numéroté « Ia » ;
 - Trois files de piliers circulaires, numérotée « IV », « V » et « VI ».

Description sommaire de la mosquée bâtie sur le sol F. 015 (Building 1)

Plan barlong (figs. 5-6)

Cette salle a été dégagée après les études archéologiques de niveaux plus récents s'étageant entre le XV^e et le XVIII^e siècle. Sans modification majeure du plan et de la structure des bâtiments précédents, ils correspondent à des occupations tardives (se référer aux rapports précédents : SIMÉON & SCHIETTECATTE 2015 ; SCHIETTECATTE & SIMÉON in press). La structure porteuse a été fréquemment réemployée lors des transformations successives du *haram* et le mur de la *qibla*, souvent renforcé par des adossements de parois complémentaires bâties du côté extérieur, à l'ouest, a été conservé de même que la niche du *mirhāb*.

La salle hypostyle possède onze nefs délimitées par trois files de dix grands piliers circulaires et deux contreforts latéraux. Elle comprend trois travées (fig. 6). Le sol est de qualité et possède de nombreux jeux gravés et incisés. Si cette salle de prière est, par rapport aux édifices antérieurs, légèrement agrandie côté oriental, vers la cour, force est de constater qu'elle comprend beaucoup plus de points porteurs (30 piliers et 6 contreforts) que la mosquée associée aux sols F. 182 et F. 192 –i.e. Building 3– (12 piliers parfois reliés et 4 contreforts). Cette ossature est complétée structurellement par le mur de la *qibla* et par les parois latérales qui rejoignent les contreforts, face sud et face nord. Si les trois faces extérieures ne subissent que des renforcements significatifs, force est de constater que ces murs périphériques ne sont pas ou très peu déplacés au fil des réfections et des transformations.

Les contreforts montrent que des poutres principales reposaient sur les piliers et étaient disposées paral-

lèlement au mur de *qibla*. Néanmoins on ne peut pas éliminer l'hypothèse de la présence d'arcades munies de tirants en bois comme plusieurs exemples de mosquées de l'époque abbasside en témoignent.

Le *mirhāb* est orienté vers l'occident. Il semble avoir été complété ou remplacé, tardivement, par un autre (peut-être une niche du premier état) dans la nef « 2 » à une époque plus récente.

Un escalier en maçonnerie de briques crues est disposé dans l'angle sud-ouest (nef 1, travée A), il peut avoir donné accès à la toiture en terrasse ou, éventuellement, à un minaret. Ce dispositif est attesté dans de nombreuses mosquées anciennes du royaume, il est soit disposé dans un angle de la cour contre le *haram* soit dans son espace intérieur, ce qui est le cas ici. Le mur de *qibla* est épais et composite avec des adjonctions en pelure d'oignons à partir de l'extérieur.

Deux possibilités de déroulement des phases sont possibles. L'état des lieux montre que ce sol F. 015 supporte les piliers (nommés « Co. ... » dans les rapports précédents). Il s'appuie contre des structures porteuses préexistantes et parfois un très fin lait de chaux les recouvre partiellement. De ce fait, soit on peut attribuer ce sol à une phase antérieure à l'édifice défini par ces piliers circulaires, soit le sol F. 015 est réalisé immédiatement avant les piliers de manière à simplifier le travail des bâtisseurs qui n'auraient pas à remonter en plinthe contre eux. L'avantage de cette méthode de construction est de maintenir une couche homogène, lisse et imperméable sous les colonnes bâties en briques crues et enduites de terre.

La mosquée Tārīk Khāne de Dāmghān, avec une salle hypostyle de plan arabe mais de structure sassanide (fig. 8), pourrait avoir été bâtie au-dessus d'un édifice préexistant ; elle présente de grandes similitudes avec la mosquée d'al-Yamāma. Cependant l'écartement entre les piliers est plus important, et surtout les colonnes sont recouvertes d'un enduit de chaux et non de terre. L'illustration photographique (fig. 7) montre bien par la précision du joint entre le sol de chaux et l'enduit des colonnes circulaires, que ces dernières ont été édifiées sur un sol proprement aplani dans un premier temps (HOAG 1982 : 42-43). Contrairement à la mosquée d'al-Yamāma, la nef centrale est légèrement plus large et possède une façade de type *īwān* (fig. 8).

Cour

Les passages entre la salle et la cour se font par la mise en œuvre d'un dispositif de seuils en pierre bâtis sur un support de briques crues intercalé entre les piliers de la file « VI ».

Dans la cour, la galerie nord comprend neuf piliers dont les vestiges sont encore visibles, distants de 2.2 m du mur nord. Ils sont écartés de 1.8 m et l'un deux, effondré, possède encore un chapiteau (figs. 6, 9). Cette galerie peut être restituée. Selon les archéologues elle daterait de l'époque moderne, XV^e-XVIII^e siècles.

La présence de ce type de chapiteau démontre la présence d'arcades et est caractéristique et représentative du style adopté dans les mosquées de l'Arabie centrale aux alentours des XIV^e et XV^e siècles (KING 1986 ; al-Rashid *et al.* 2013 : pl. 6.15C). Il peut aussi être comparé à la mosquée de Bawr en Ḥaḍramawt (Yémen) (fig. 10). Cette galerie est associée au sol F. 014, qui vient après le sol F. 015. On ne peut pas déduire l'existence systématique d'arcades dans le système porteur massif de la mosquée associée au sol F. 015.

L'accès à la cour est envisageable dans l'angle sud-est, alors que de nombreuses pièces de vie (habitat temporaire avec fours, échoppes ou ateliers) sont adossées à l'extérieur de la paroi sud de celle-ci (fig. 1). La question peut se poser d'un habitat saisonnier lié à des pèlerinages.

Description de la mosquée associée aux sols F. 182 et F. 192 (Building 3)

Plan barlong

Cette salle comprend 7 nefs et 2 travées. Elle se caractérise par une architecture puissante de piles et de murs réalisés en briques crues (figs. 3-4, 11).

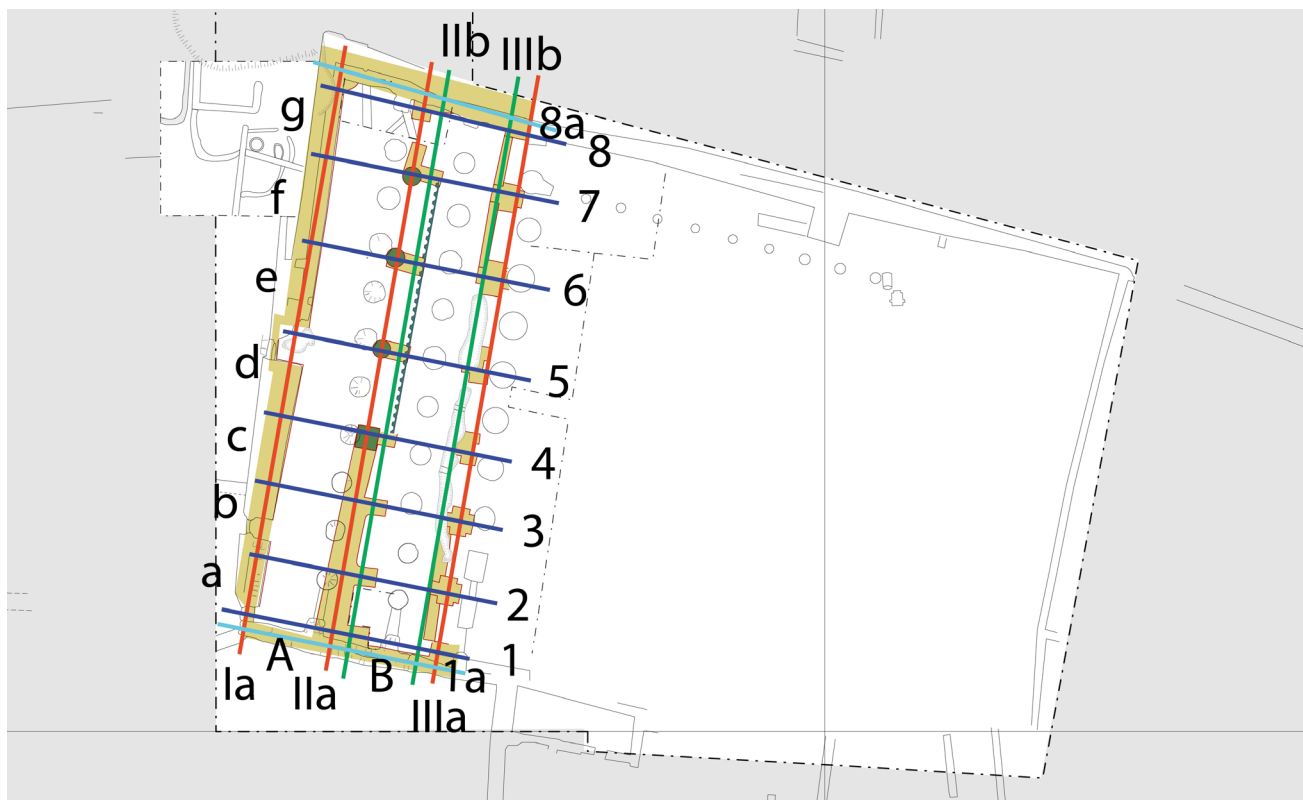


Figure 3: Al-Yamāma. Plan of Building 3: Numbering of pillar lines, naves and rows linked to floors F. 182 and F. 192 (Ch. Darles, M. Niveleau, J. Schiettecatte - Saudi-French archaeological mission in al-Kharj).

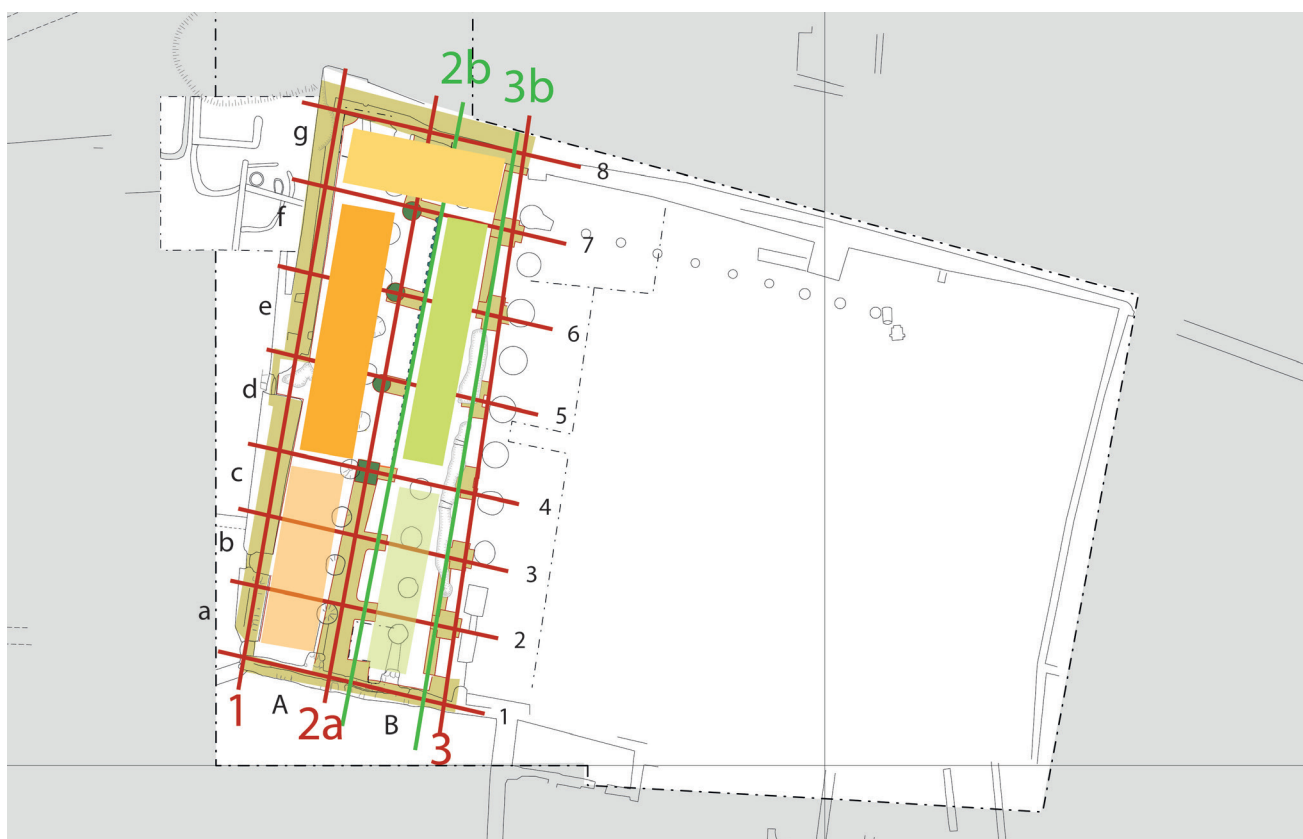


Figure 4: Al-Yamāma. Plan of Building 3: Tentative definition of spaces within Building 3 (connected to floors F. 182 and F. 192 (Ch. Darles, M. Niveleau, J. Schiettecatte - Saudi-French archaeological mission in al-Kharj).

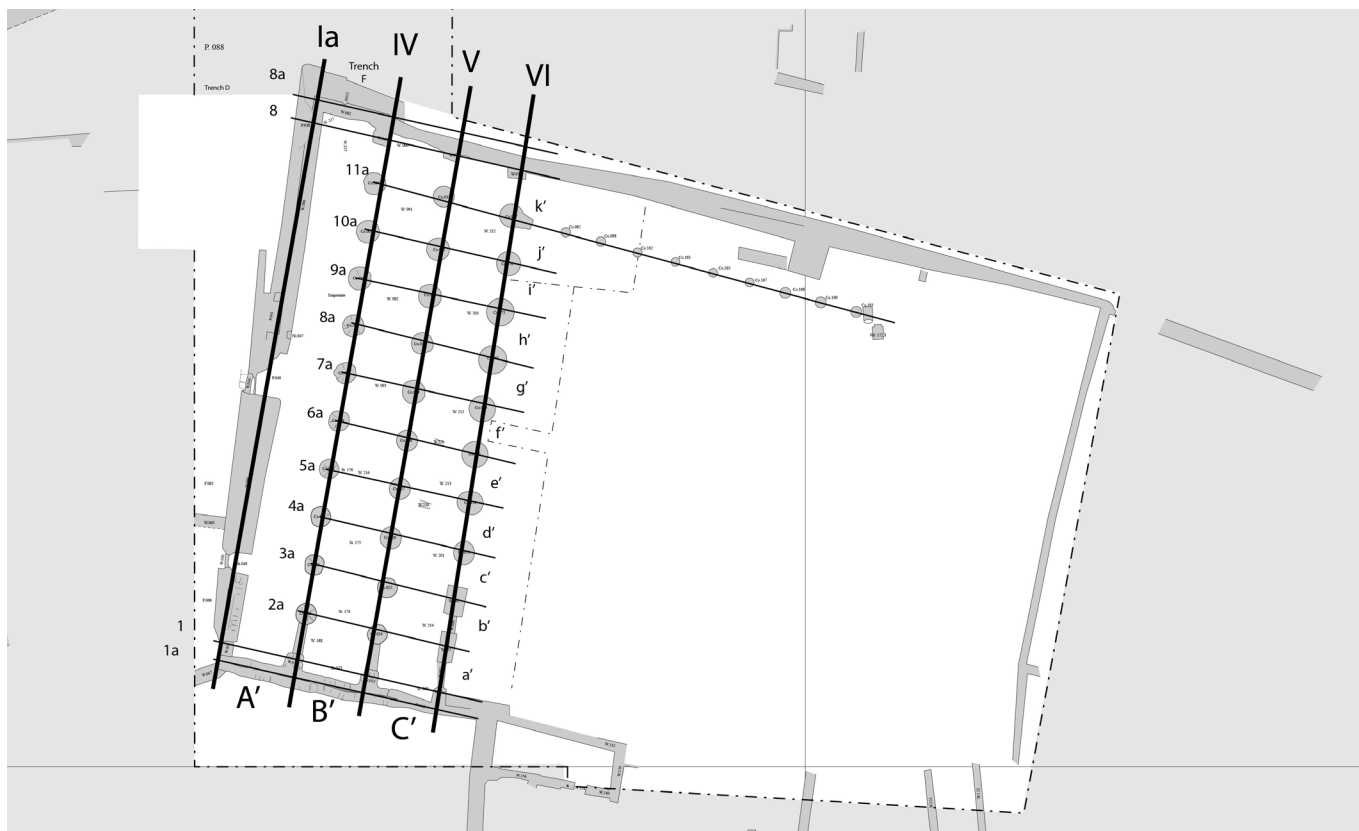


Figure 5: Al-Yamāma. Plan of Building 1: Numbering of pillar lines, naves and rows of Building 1, built above floor F. 015 (Ch. Darles, M. Niveleau, J. Schiettecatte - Saudi-French archaeological mission in al-Kharj).

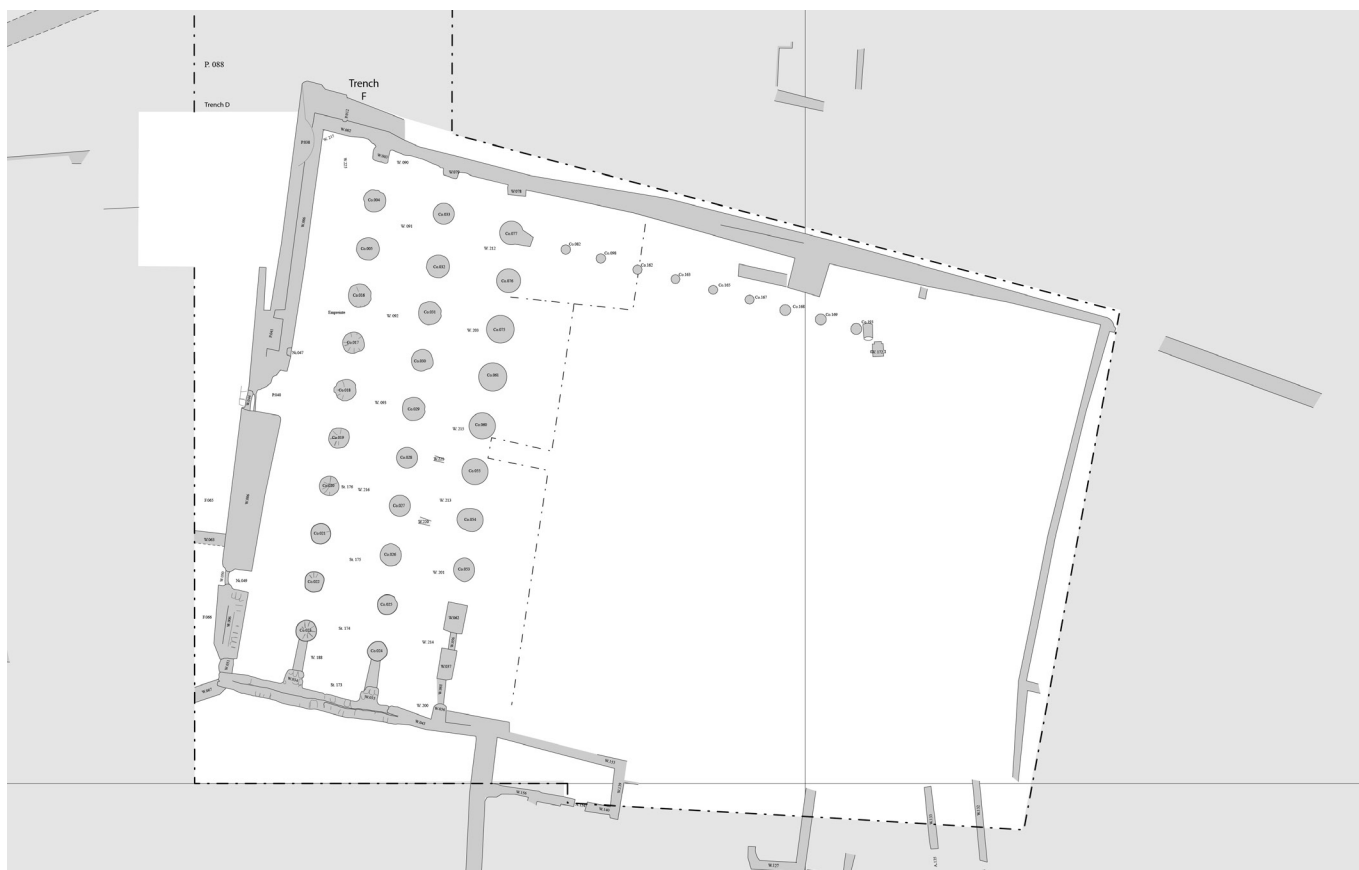


Figure 6: Al-Yamāma. Plan of Building 1 (Ch. Darles, M. Niveleau, J. Schiettecatte - Saudi-French archaeological mission in al-Kharj).

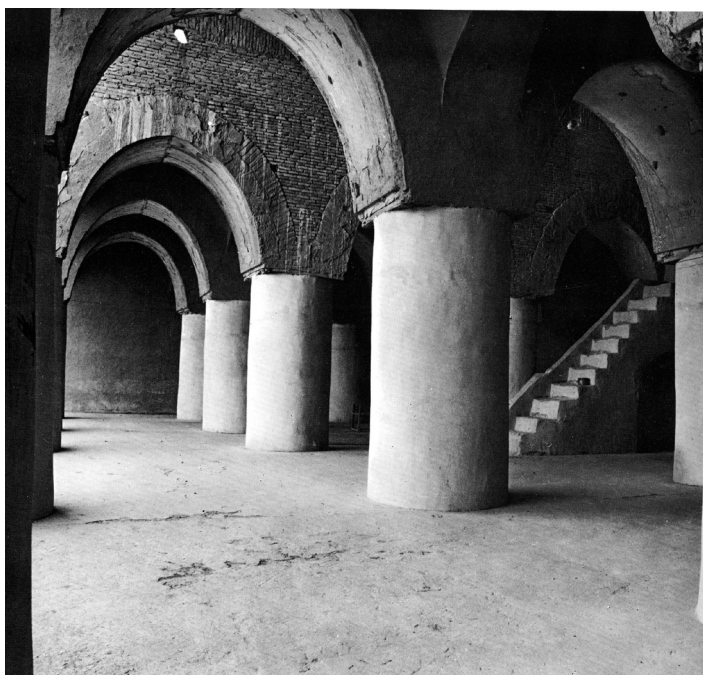


Figure 7: Dāmghān (Iran): Tārīk Khāne mosque: prayer hall (Hoag 1982: 42).

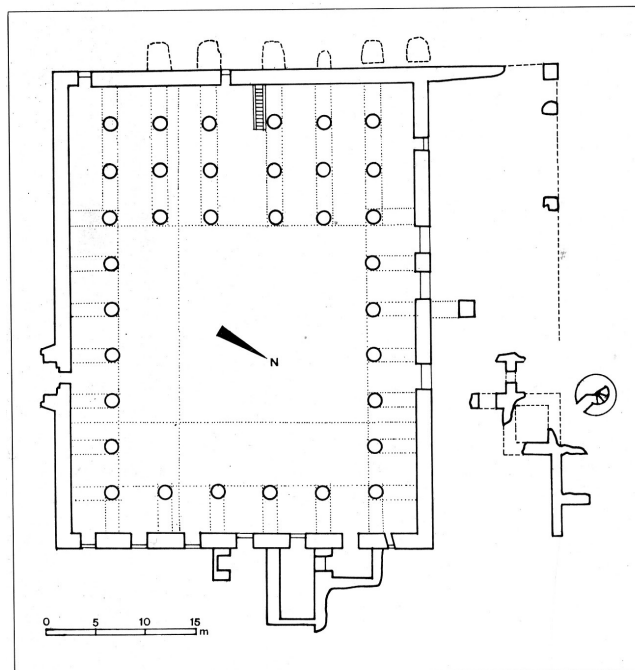


Figure 8: Dāmghān (Iran): Tārīk Khāne mosque: plan and view of the courtyard (Hoag 1982: 43)

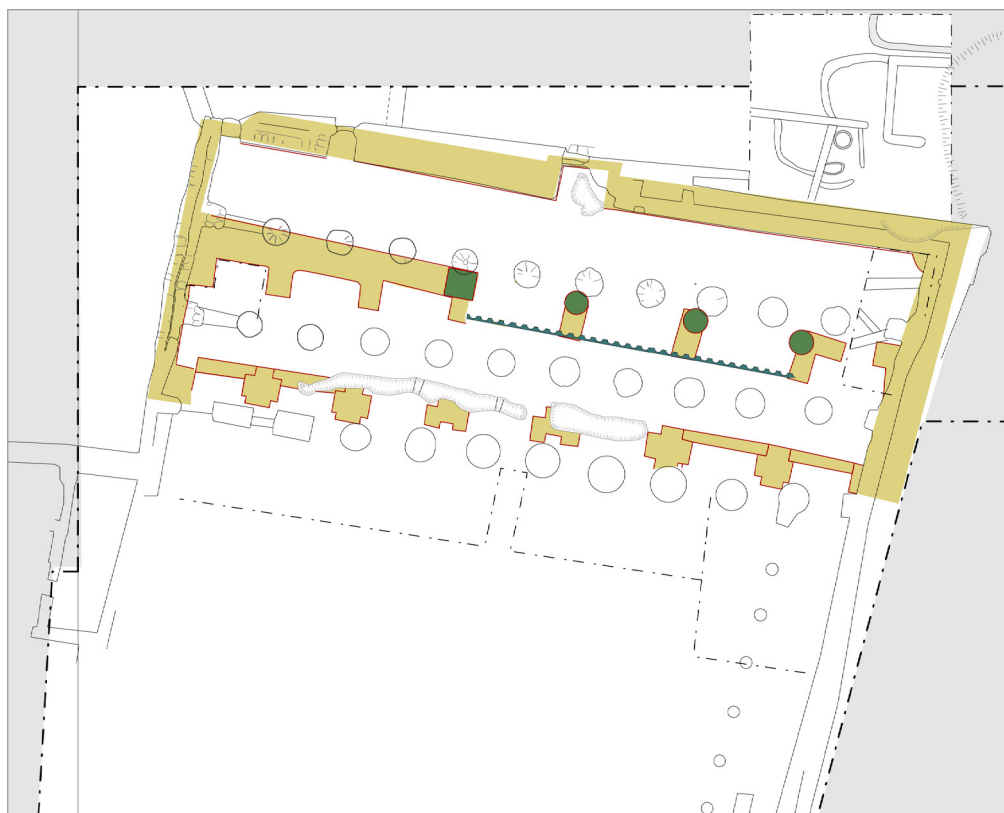


Figure 9: Al-Yamāma. Building 1: column Co. 193 and capital W. 172 belonging to the peristyle, north of the courtyard (P. Siméon - Saudi-French archaeological mission in al-Kharj).



◀ Figure 10: Bawr mosque, Ḥaḍramawt (Yemen) (Ch. Robin).

▼ Figure 11: Al-Yamāma. Plan of Building 3 (yellow), location of the wooden screen (blue) and pillars from a previous building (green) (Ch. Darles, M. Niveleau, J. Schiettecatte - Saudi-French archaeological mission in al-Kharj).



Deux salles de prière peuvent être distinguées elles sont séparées par des dispositifs architecturaux complexes. Elles correspondent aux travées « A » et « B ». On peut également admettre que la travée côté cour, « B », correspond à une salle ouverte, véritable auvent donnant sur l'espace extérieur et séparée de la cour par une petite murette. Une autre partition est définie par les dimensions de la structure porteuse, ainsi les nefs « a », « b » et « c » sont plus étroites que les nefs « d », « e », « f » et « g ». Les nefs plus étroites correspondent à une zone où les travées « A » et « B » sont séparées par un puissant mur construit en briques crues. On peut penser que l'écartement primitif des maçonneries antérieures a été conservée et qu'une extension vers le sud a lors été réalisée avec un rétrécissement des nefs « a », « b » et « c ». Ce mur (« Ila » –a, b et c) a une épaisseur telle qu'il peut être considéré comme un mur porteur. Il est aligné avec le massif carré de brique en « Ila4 », contre lequel il vient s'appuyer, et avec les piliers circulaires d'un état antérieur en « Ila5 », « Ila6 » et « Ila7 » et avec le contrefort du mur nord en « Ila8 ». Cependant il possède dans la travée « B » des contreforts importants (files « 1 », « 2 », « 3 » et « 4 ») alignés avec les poteaux rectangulaires des files « 5 », « 6 » et « 7 » et constituent la file « I Ib » parallèle au mur de *qibla* (« Ia »).

La disposition de la structure porteuse indique, également par la forme des piliers, que les poutres principales étaient disposées perpendiculairement au mur de *qibla*. Il y a donc eu entre cet état et l'état plus tardif

(rattaché à F. 015 – voir ci-dessus), un changement de direction du système porteur de la salle de prière de la mosquée.

Murs bahuts entre cour et salles de prière (*haram*)

Une murette se calait entre les piliers de la file « IIIa », côté intérieur (file « IIIb »). Des fosses de récupération de la maçonnerie de ces parois et de leurs fondations (Pi. 185, Pi. 186) occupent les emplacements des nefs « b », « c », « d » et « e ». Le mortier de revêtement de ces murettes basses, en « IIIb-f » et « IIIb-g », est arrondi et lissé. Le poli du mortier de ces deux seuils dénote l'existence d'une usure liée à des passages fréquents (fig. 12). Ce dispositif est confirmé par l'existence d'un passage rétréci, au niveau des files « IIa » et « IIb », entre « IIb-7 » et « IIb-8 », en alignement au seuil disposé au nord. L'absence, pour raison de pillage et de récupération de matériaux, de ces parois dans les nefs « c », « d » et « e » ainsi que la détérioration et l'arasement du sommet en « a » et « d », ne permet pas d'affirmer que chaque nef possédait un seuil comme en « f » et « g ». Seule la composition de l'ordonnancement symétrique des piliers de façade peut éventuellement donner une information sur l'existence éventuelle d'un seuil axial correspondant à la nef « d » (voir infra).

La barrière de séparation ajourée en bois.

Peut-on en déduire que ces deux seuils permettaient l'accès à deux zones distinctes. Celui du nord (IIIb-g) vers la travée occidentale, le long du mur de qibla, le seuil le plus au sud, donnant accès à une autre pièce délimitée d'une part par le mur méridional et ses contreforts (file IIa et IIb), d'autre part par les trois piles réunies par une cloison de bois ajourée dont les empreintes sont encore visibles (fig. 13). Elles correspondent aux parties basses des pétioles de palmier, rattachées au stipe (ou tronc), convexes d'un côté, avec une arête de l'autre. Ces tiges peuvent mesurer près de deux mètres de long. Cette cloison s'appuie sur le sol F. 182, à peine ancrée de quelques millimètres (ce qui indique que cette cloison est disposée alors que le sol F. 182 est encore humide et malléable), et est calée en pied par une banquette basse (St. 288), environ 0,3 × 0,3 m en section, dans laquelle les bases des pièces de bois de palmier verticales sont noyées. Ce type de moucharabiehs, à notre connaissance, ne semble pas attesté dans les mosquées primitives d'Arabie centrale et du sud, nous pensons donc qu'une étude documentaire complémentaire permettra de mieux cerner l'originalité de ce dispositif architectural.

Massifs de briques crues

Une importante maçonnerie en briques de terre crue a été mise en œuvre en relation avec les sols F. 182 et F. 192. Ses vestiges, arasés lors de la construction du Building 1, témoignent d'une parfaite maîtrise de la construction en terre (fig. 14). La mise en œuvre de la brique de terre crue a-t-elle été imposée pour des raisons d'efforts structurels ou bien, a contrario, les dimensions des murs et des piliers quadrangulaires, en croix ou en « H », correspondent-elles aux modules des briques ? Les maçonneries semblent surdimensionnées. Elles étaient prévues pour être enduites avec de la chaux.

Les piliers de la façade sur cour (file « IIIa ») sont soit cruciformes, avec un pilastre axial vers la cour (files « 2 », « 3 », « 6 » et « 7 ») soit possèdent une saignée également axiale pour les deux piliers du centre de la composition (files « 4 » et « 5 »). Ils sont destinés à recevoir, dans leurs décrochements latéraux, des cloisons basses ou des murs bahuts peu épais. On a donc une ordonnance composée comme telle : un contrefort en retour du mur sud, deux piles cruciformes puis une pile avec une encoche, l'ensemble se répétant de manière symétrique vers le nord.

Description d'un bâtiment antérieur au Building 3

N'ont pu être repérés de ce bâtiment « primitif » que quatre éléments porteurs, trois colonnes circulaires (« IIa-5 », « IIa-6 » et « IIa-7 ») et un pilier quadrangulaire (« IIa-4 ») (fig. 11 : éléments en vert). Ces ma-



Figure 12: Al-Yamāma. Building 3: plastered threshold in IIIb-g and successive floors F. 182 and F. 015 against it. Looking west (Th. Sagory - Saudi-French archaeological mission in al-Kharj).



Figure 13: Al-Yamāma. Building 3: plastered structure St. 288 corresponding to the anchorage of a wooden screen in floor F. 182 (A. Rosak - Saudi-French archaeological mission in al-Kharj).



Figure 14: Al-Yamāma. Building 3: levelled mudbrick wall W. 188 (left) and floor W. 182 abutting it (right). Looking north (P. Siméon - Saudi-French archaeological mission in al-Kharj).

çonneries en pierres calcaires sont enduites de plusieurs couches de chaux témoignant d'une certaine durée d'usage (fig. 15). Il n'a pas été possible de savoir à quel sol se rattachaient ces quatre piliers. Ils ont été consciencieusement intégrés dans les maçonneries en briques crues du Building 3, postérieur. Leur écartement primitif a donc été conservé. La présence d'une fosse de pillage ou de récupération (Pi. 187) a permis de comprendre le lien de ces supports composites avec le sol F. 192 qui remonte en plinthe et en enduit. Ce sol a également été découvert dans la fosse au pied du *mirhāb*, dans la Trench B (SIMÉON & SCHIETTECATTE 2015) dans l'angle nord-ouest de la salle et en remontée en plinthes contre des piliers de la file « IIIa ». Seule une datation par analyse ¹⁴C permettra de proposer une chronologie et ainsi de situer ces vestiges primitifs situés entre les maçonneries préislamiques repérées en profondeur et les niveaux islamiques.



Figure 15: Al-Yamāma. Building 3 and previously: Levelled column Co 276 built in limestone and lime mortar. Looking west (A. Rosak - Saudi-French archaeological mission in al-Kharj).

Dispositions des éléments architectoniques

Les trois états identifiés (F. 015, F. 182, F. 192 et antérieur) correspondent à des transformations majeures de la mosquée. Le système porteur est transformé tant dans sa nature (piliers circulaire en maçonnerie de pierre, piliers carrés en briques crues, puis piliers circulaires en briques) que dans son plan (extension vers l'est, plus grand nombre de points porteurs). À une complexité préexistante se met en place un processus de simplification du plan de la mosquée.

Dispositifs architecturaux

Deux *mirhābs* sont aujourd'hui visibles. Le premier est situé dans la nef « b », c'est-à-dire complètement décalé par rapport à l'axe de l'édifice. Le second offre la particularité d'être conservé durant les trois phases liées aux sols F. 192, F. 182 et F. 015. Son encadrement soigné en plâtre est resté visible durant ces trois phases et a été recouvert d'un enduit de terre lors des réaménagements successifs de l'époque moderne.

Un escalier élaboré et réalisé en terre crue occupe l'angle sud-ouest du *haram*. Il ne débouche aujourd'hui que sur le vide. Il ne possède pas de volée supérieure qui permettrait d'accéder au toit. On peut cependant envisager l'existence d'une échelle en bois. On peut penser, vue sa morphologie, qu'il aboutissait à un édifice aujourd'hui disparu et accolé au mur de *qibla*. Peut-être un minaret.

Hypothèses de restitutions

Les écrits concernant l'architecture des mosquées primitives sont peu nombreux et le plus souvent l'œuvre d'historiens de l'art qui ne s'attachent que peu à l'architecture en valorisant plus particulièrement les données des décors (MARÇAIS 1946 ; VOGT-GÖKLIN 1975 ; KING 1986 ; CLÉVENOT 1994 ; PAPADOPOULOU 2002 et bien d'autres). La mosquée hypostyle correspond à un des trois grands types traditionnellement répertoriés de

l'architecture religieuse musulmane : mosquées à salle hypostyle, mosquée à iwans et mosquées à coupoles. Elle est souvent considérée comme représentative du type le plus ancien. Il est important de noter que, dans le cas des mosquées « ordinaires », c'est surtout les plus faciles à concevoir, à réaliser et à transformer.

108

Nous nous fonderons avant tout sur les données recueillies sur le terrain en proposant quelques comparaisons et en osant situer le problème en relation avec les mondes préislamiques byzantins, perses et sassanides. En effet cette mosquée semble représentative d'un ensemble d'édifices bâtis de manière précoce peu après l'apparition de l'islam en Arabie centrale (KING 1986).

Le plan et sa transformation

L'apparition du plan barlong caractérise les mosquées à salle hypostyle des débuts de l'Islam. Sans qu'il n'y ait ici de nef centrale accentuée comme dans certaines mosquées des premiers siècles de l'Hégire – mosquée al-Aqsa de Jérusalem, al-Hakim au Caire (VOGT-GÖKLIN 1975 : 32) –, la mosquée d'al-Yamāma se rattache à ce type. La question se pose de l'invention du plan barlong, attribuée par certains à l'architecture islamique en raison de l'alignement des fidèles face à la Mecque. On connaît cependant de nombreuses basiliques romaines ou chrétiennes qui offrent un plan barlong à double abside comme la basilique Ulpia à Rome vers 110 ap. J.-C. (MACDONALD 1962 : 46, fig. 2), la basilique de Mididi (GRABAR 1966 : 348, fig. 407) ou la basilique de Feriana (GRABAR 1966 : 347, fig. 404) toutes les deux en Afrique du Nord. On retrouve cette morphologie pour l'église de Saint-Jean-Baptiste à Jérusalem (GRABAR 1966 : 356, fig. 432).

Il existe aussi des mosquées primitives carrées ou du moins sans plan barlong comme la mosquée al-Aqsa à Jérusalem (CRESWELL 1958 : 206, fig. 39).

L'orientation de la structure vers l'ouest, donc vers La Mecque, a été conservée tout au long de l'histoire des édifices successifs de même pour la présence d'une cour orientale en continuité du *haram*. L'accès se fait par la cour, dans un des angles et non pas directement dans la salle de prière, de même l'escalier d'accès au minaret (?) est situé dans le *haram* et non pas à l'extérieur.

Les dimensions des portées

La présence de couvertures et de plafonds plats en bois semble être générale en Arabie. Quant aux parois en clayonnages elles sont attestées à Koufa et à Bassora (Vogt-Göcklin 1975 : 30) La nature même de l'ossature de la mosquée liée au sol F. 015 (Building 1) pourrait nous faire envisager que la terrasse a pu être un espace de prière comme souvent en Arabie ou en Afrique du Nord.

Le changement d'orientation des files porteuses ne semble pas être une caractéristique importante pour le classement typologique des mosquées à salle hypostyle. Pour ne prendre des comparaisons qu'avec les plus célèbres mosquées construites avant le X^e siècle, les mosquées al-Aqsa de Jérusalem, de Cordoue ou de Tunis au VIII^e siècle, celles de Sousse et de Samara au IX^e siècle ou celle de Kairouan au X^e siècle ont une structure perpendiculaire au mur de la *qibla*. Celles de Damas, de Qaṣr al-Khayr, de Baalbek ou de Harran, au VIII^e siècle, ont une ossature parallèle au mur de la *qibla*.

On ne peut constater que l'orientation de la structure est en relation avec la nature même des supports : piliers circulaires en pierre, massifs quadrangulaires de briques crues, piliers circulaires en briques crues. On note l'absence de colonnes en bois ou en pierre due au manque de réemplois antiques, les bois de hautes tiges étant réservés à l'ossature linéaire horizontale.

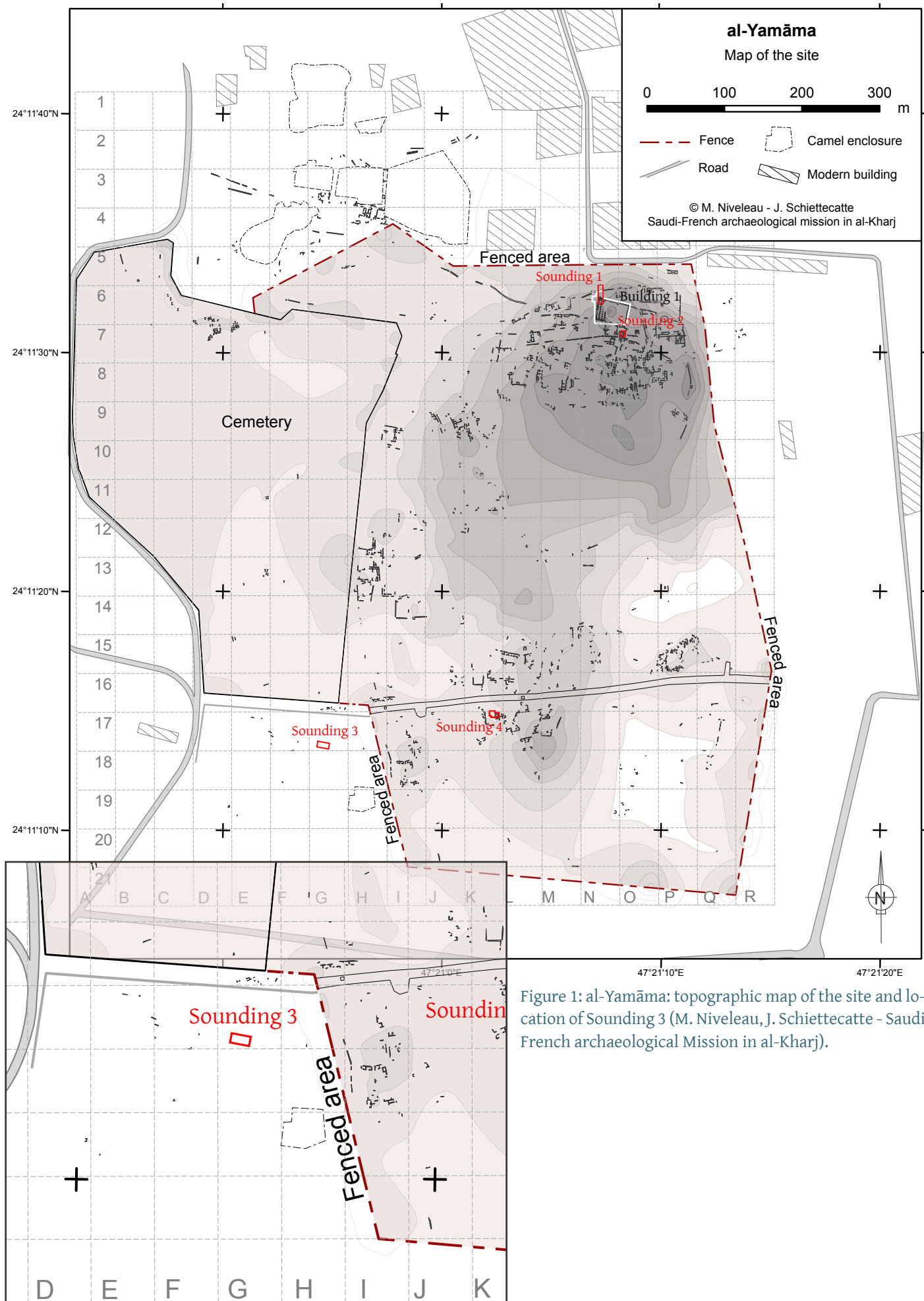


Figure 1: al-Yamāma: topographic map of the site and location of Sounding 3 (M. Niveleau, J. Schiettecatte - Saudi French archaeological Mission in al-Kharj).

AL-YAMĀMA - SOUNDING 3 (AREA G17): A POTTERY WORKSHOP

Fabien LESGUER (*Evéha, Paris*)

111

Location and aim of the sounding

During the first season of the Saudi-French mission in al-Kharj (2011), ceramics were discovered outside the fenced archaeological area at al-Yamāma, to the south-west of the site (area G17). A sounding (Sounding 3) was opened in this area in 2012 (MOUTON 2012). A 10 × 1 m large trench was excavated. This sounding confirmed the presence of handcraft combustion structures. This season, it has been decided to resume and complete the excavation of this area by an extensive excavation; it was conducted from January 16 to February 3, 2016 (**fig. 1**).

Given the type of evidence previously founded (part of kilns, misfired sherds), the most probable working hypothesis was the presence of a pottery workshop. Thus, the study focused on two issues:

- to characterize the spatial organisation and the evolution of the workshop.
- to identify and characterize the ceramic production: the spatial distribution of wasters, the production techniques and the evolution of the local ceramics have been examined.

The excavation protocol was based on the implementation of a sounding of 77 m² (14 m × 5.5 m). A complete photographic record by photogrammetry was realized at the different stages of the excavation in order to have a complete sounding monitoring.

- Sounding 3 18/01/16 (<https://skfb.ly/QxrR>) (**fig. 2**)
- Sounding 3 22/01/16 (<https://skfb.ly/QxrW>) (**fig. 3**)
- Sounding 3 03/02/16 (<https://skfb.ly/Nv6N>) (**fig. 4**)

The ceramics from each UF was counted, inventoried and the characterized shapes and décor were individually registered, drawn and photographed. The local production was sorted into three categories (wasters, over-fired sherds and normal).

General description

The sounding was located in an abandoned palm grove which had been levelled by the past. Before the excavation started, the ground altitude was 422.65 m a.s.l. At the end of the excavation, the lowest point was at 420.22 m a.s.l. (bottom of structure H. 068).

The final plan of Sounding 3 (**fig. 5**) comprises four rooms and a courtyard. Rooms R. 368, R. 367, R. 070 and R. 071 form an architectural unit (UA) with a circulation system between each space. The courtyard (R. 316) is located to the west of this UA. Rooms R. 070 and R. 071 are 3 × 2 m. R. 367 is 2.7 × 1.4 m. R. 368 is 3.6 × 1.7 m. The courtyard R. 316 is at least 6 m long and 7 m large. It continues beyond the north and west benches.

The first twenty centimetres of sediments were removed with a mechanical digger. This surface layer (UF 300) was densely compacted and cemented consequently to salt infiltration due to the recent irrigation of the crops.

Phasing and architectural description (figs. 6-7)

This workshop had three phases of occupation with an evolution of its spatial organisation. All walls are made with the same construction technique, the cob. The cob is a natural building material made from sub-soil, water, some kind of fibrous organic material (typically straw).



Figure 2: al-Yamāma: Area G17 – Sounding 3: orthophotography on the 3rd day of excavation (January, 18); the trench excavated in 2012 is still visible (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 3: al-Yamāma: Area G17 – Sounding 3: orthophotography on the 7th day of excavation (January, 22); (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 4: al-Yamāma: Area G17 – Sounding 3: orthophotography on the 19th day of excavation (February, 3); (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

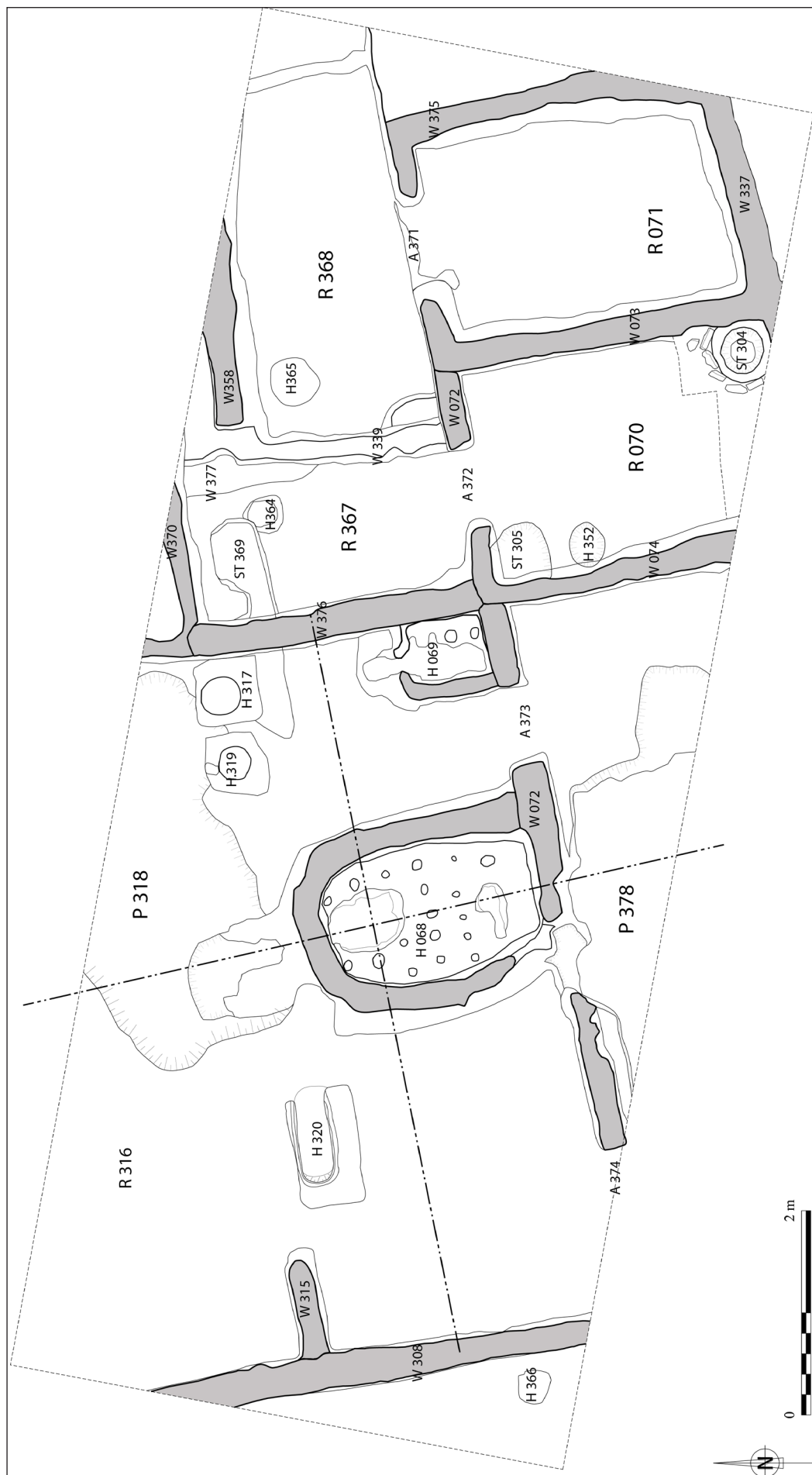


Figure 5: al-Yamāma: Area G17 – Sounding 3: plan and axis of the stratigraphic sections (figs. 6-7) (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

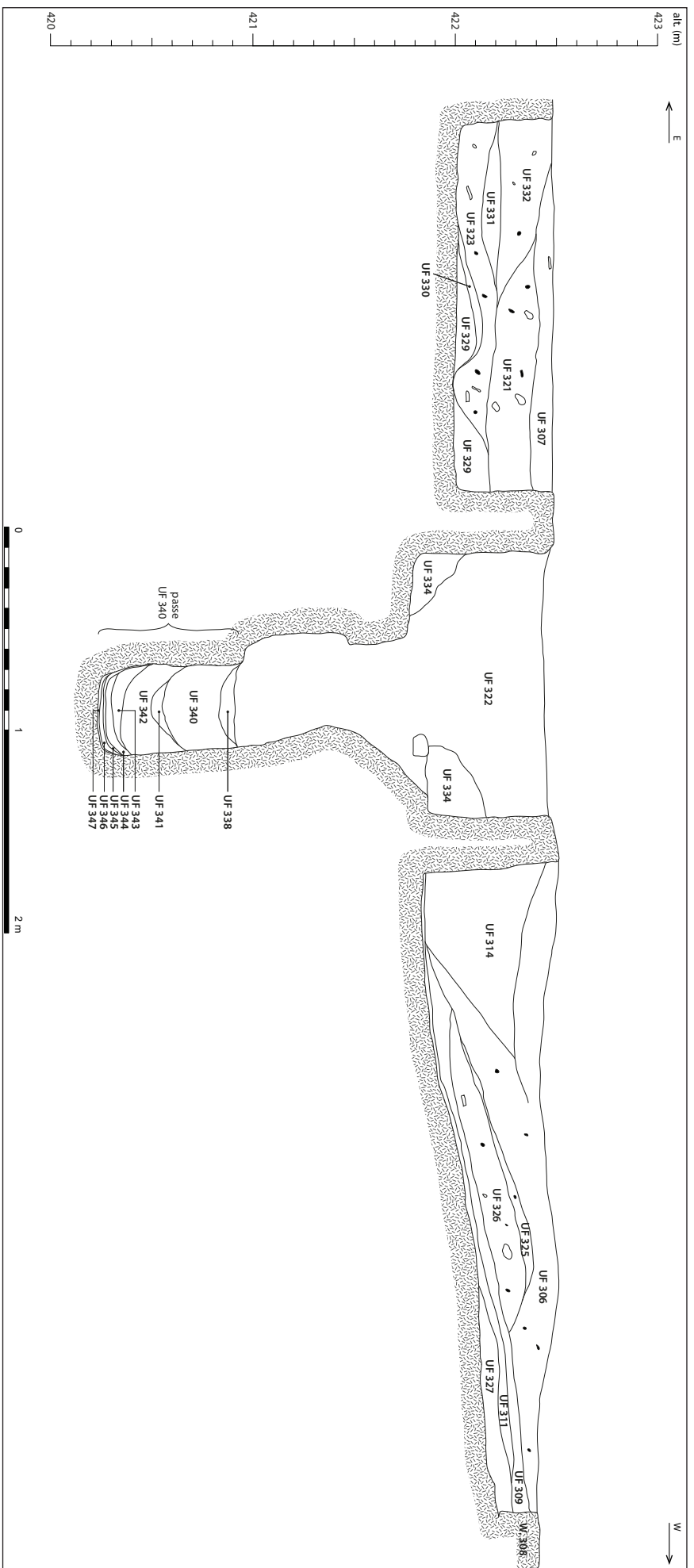


Figure 6: al-Yamāma: Area G17 – Sounding 3: east-west stratigraphic section (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

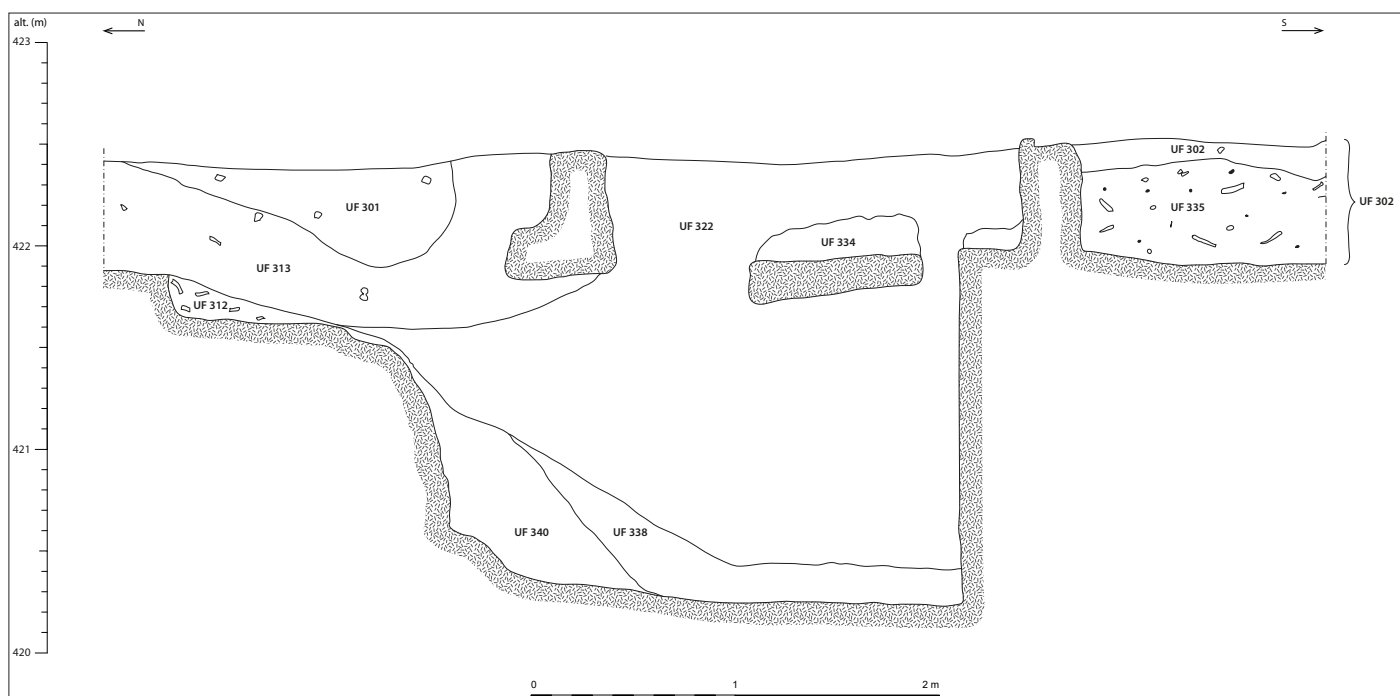


Figure 7: al-Yamāma: Area G17 – Sounding 3: north-south stratigraphic section (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

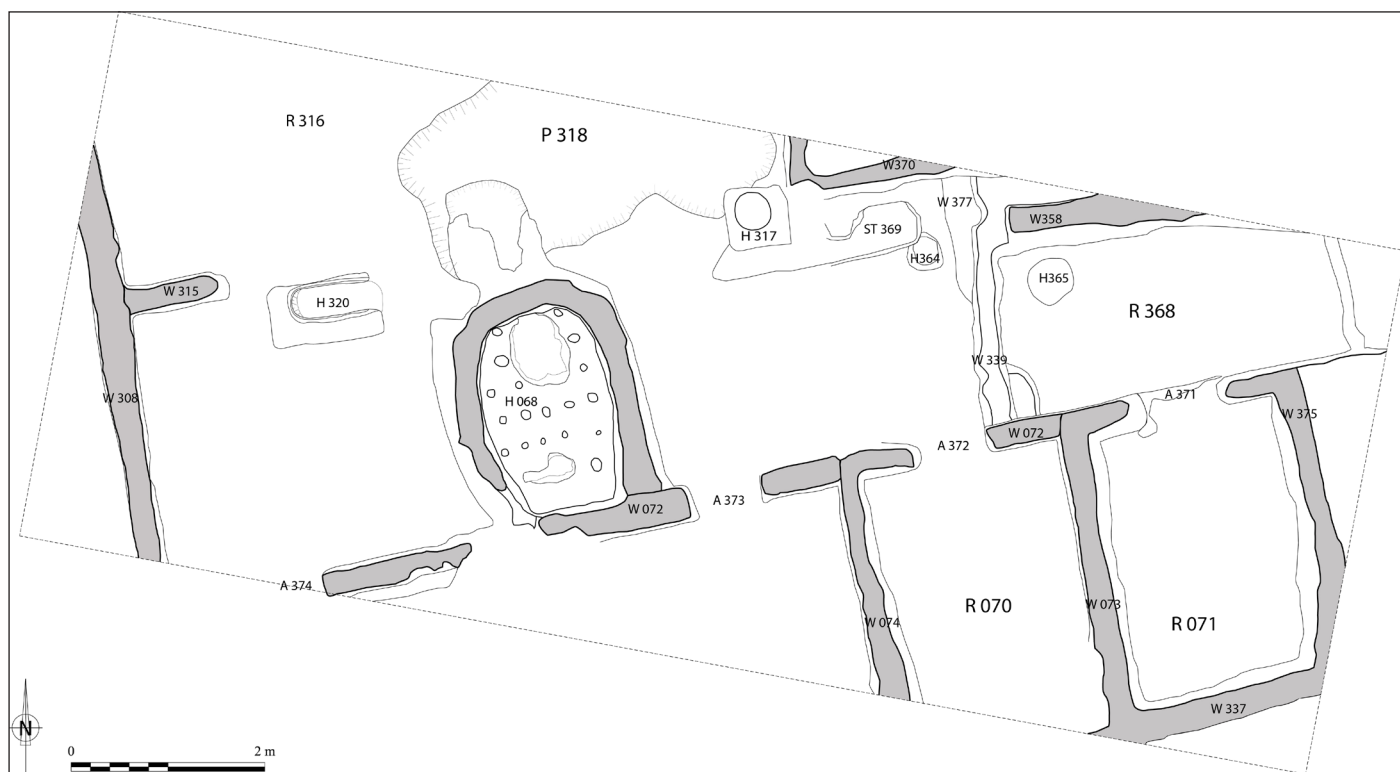


Figure 8: al-Yamāma: Area G17 – Sounding 3: plan of Phase 1 (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

Phase 1 (fig. 8)

Courtyard R. 316 (fig. 9)

116

During Phase 1, room R. 367 had not been built yet. The courtyard (R. 316) had a direct access to room R. 070 and R. 368. The courtyard was bordered by a set of three walls: north-south walls W. 308 and W. 339, and east-west wall W. 072. West wall W. 308 was excavated on a length of 4.65 m and continues to the north beyond the limit of Sounding 3. Its maximal width is 0.24 m; its current height 0.33 m. A low wall (W. 315) was abutting wall W. 308 and dividing the south west area of room R. 316 in two parts. It was 1.43 m long. South wall W. 072 was excavated on a length of 12.77 m. Its maximal width was 0.25 m; its current height 0.65 m. It is cut by 4 openings (from east to west: A. 371, A. 372, A. 373, and A. 374). R. 316 was bordered to the east by two superimposed walls (W. 377 and W. 339). Wall W. 377 was below W. 339, the latter being probably a late reconstruction of W. 377. W. 377 was at least 1.24 m long. W. 339 was excavated on a length of 2.16 m. Its maximal width was 0.20 m; its current height 0.32 m.

Two levelled structures were present in the courtyard R. 316 during phase 1:

- Kiln H. 320 (fig. 10-11) was built during this phase on the western part of the courtyard. It is seriously damaged. Only the rectangular heating room remained. Its external dimensions are 1.18 m long and 0.68 m wide. It is preserved over a height of 0.32 m. The heating room was 0.8 × 0.3 m. The inner part of the wall of heating chamber is vitrified on its upper part. The bottom of the heating room was still filled in with a layer of compact ashes (UF 361). Its upper altitude was 422.12 m.
- A levelled structure (St. 369) was covered with plaster at the bottom. It was 2.2 × 0.65 m and leaning against W. 370. This structure could have been a work platform or a bench. Against this structure and the western side of W. 339, a hearth (H. 364) had a diameter of 0.4 m (upper altitude: 421.96 m).

It is highly likely that kiln H. 068 and *tanūr* (oven) H. 317 were already present during phase 1.

Kiln H. 068 (figs. 12-14) was built against wall W. 072. This kiln had two chambers, a firing room and a heating room. A floor which is perforated by 18 flues minimum separates both chambers. It is supported by five arches of mudbricks fired during the heating process (fig. 15). Its external plan is pseudo-rectangular; its external dimensions are 3.1 m long and 1.84 m wide. It is preserved over a height of 2.2 m. The heating room is built in mudbricks hardened during the heating process. The walls of the room are vitrified. The heating room was 2.5 × 0.93 m and 1.5 m high. Its plan is pear-shaped. The firing room was 2.11 × 1.36 m and at least 0.5 m high. Its plan is pear-shaped. The fire tunnel was 0.4 m long and 1 m wide. In front of the fire tunnel, a working pit (Pi. 318) in the shape of a large funnel area gave access to the tunnel (fig. 16). At the bottom of the kiln, there was a succession of layers of indurated ashes and charcoals (UF 338, UF 340, UF 341, UF 342, UF 343, UF 344, UF 345, UF 346, and UF 347). The walls of the heating chamber showed traces of repairs.

A *tanūr* (H. 317) was located on the border of the funnel shaped working pit and against structure St. 369 (figs. 17-19). It was 0.76 × 0.6 × 0.38 m (external dimensions). It was constituted by a rectangular pit filled with compact ashes; its wall was made of a cylindrical earthenware open at the top and at the bottom. At the bottom of the *tanūr*, there was a layer of loose ashes (UF 357).

Room R. 070

Room R. 070 was bordered by four walls: W. 074 and W. 073 (north-south), W. 072 and W. 377 (east-west). The door A. 372 gave access to the room (alt. 421.96 m). It was 0.56 m wide. The west wall (W. 074) was 2.55 m long and 0.30 m wide; its current height was 0.62 m. The east wall W. 073 was 2.99 m long, 0.27 m wide; its current height was 0.83 m.

Room R. 368

Room R. 368 was bordered by four walls: W. 339 and W. 377 (north-south), W. 072 and W. 358 (east-west). North wall W. 358 was 1.77 m long, 0.39 m wide; its current height was 0.39 m. A hearth (H. 365), in the corner of walls W. 339 and W. 358, has a diameter of 0.41 m (upper alt. 421.88 m).



Figure 9: al-Yamāma: Area G17 – Sounding 3: Courtyard R. 316 and kiln H. 068. Looking south-east (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

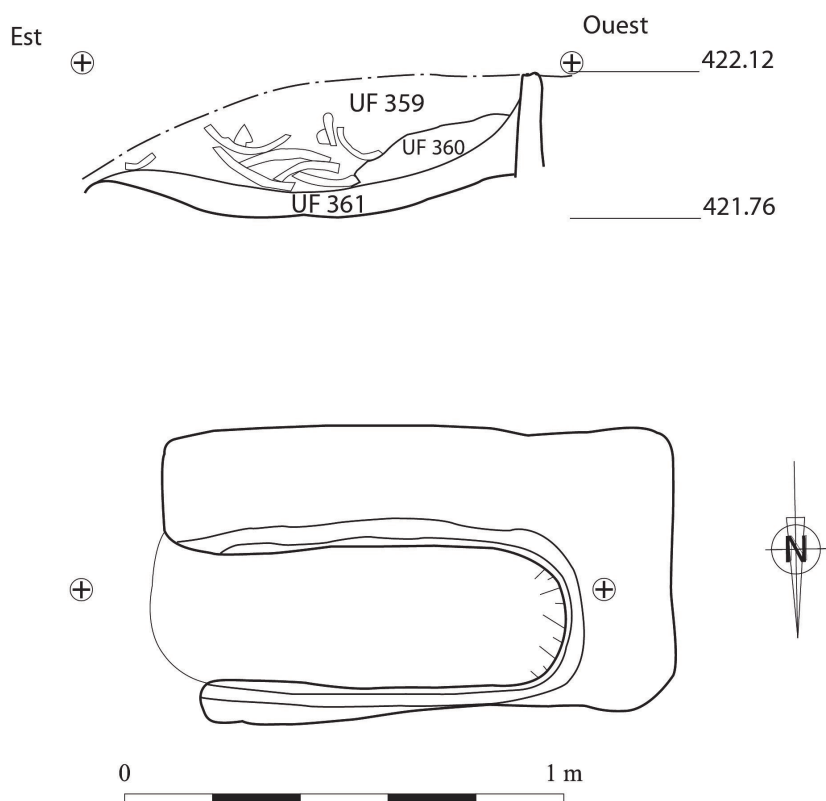


Figure 10: al-Yamāma: Area G17 – Sounding 3: Plan and section of kiln H. 320 (J. Schiettecatte & F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 11: al-Yamāma: Area G17 – Sounding 3: Kiln H. 320 (F. Lesguer – Saudi French archaeological Mission in al-Kharj).[DJ2016a0628]

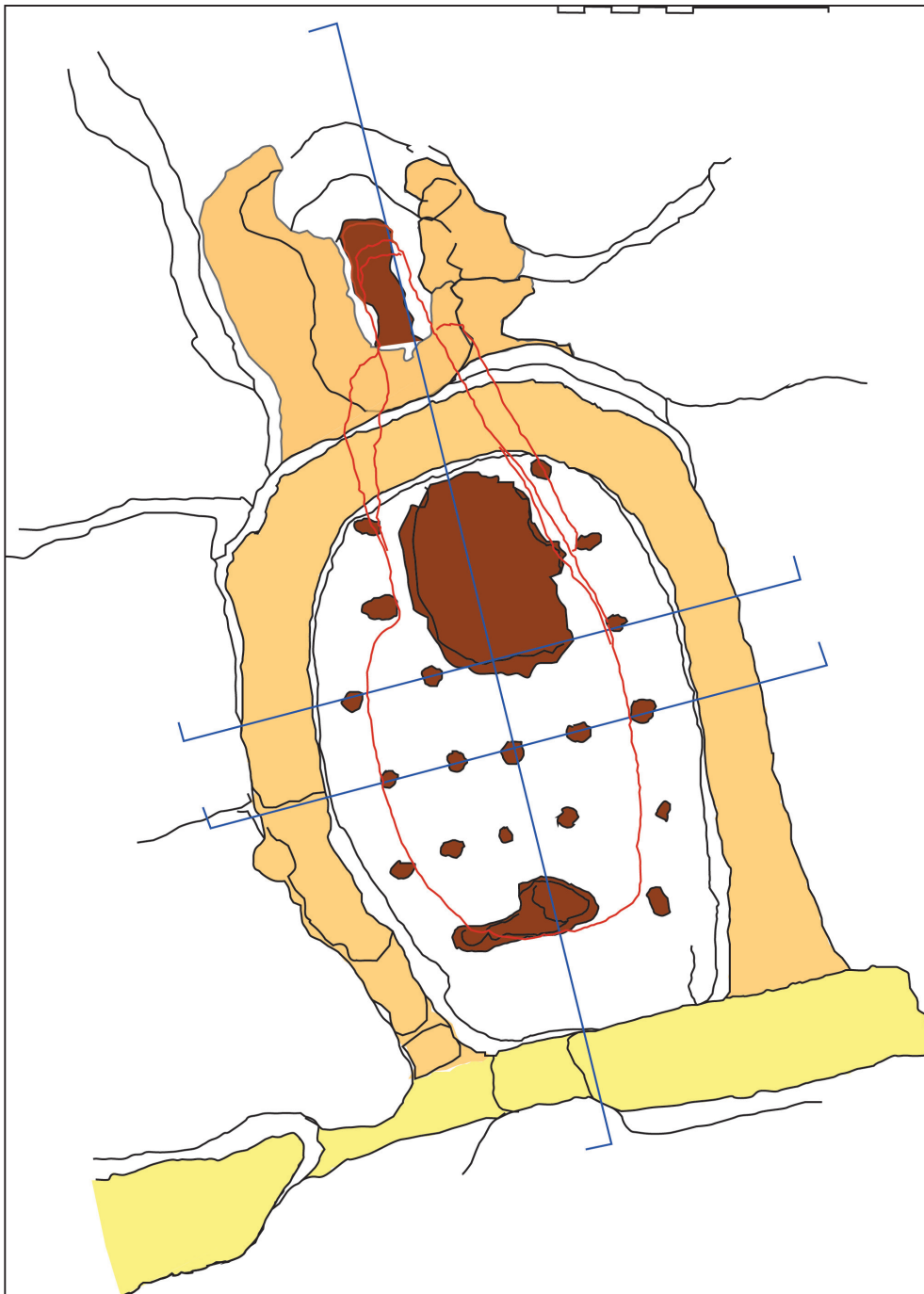


Figure 12: al-Yamāma: Area G17 – Sounding 3: Kiln H. 068, plan (Ch. Darles, F. Lesguer – Saudi French archaeological Mission in al-Kharj).

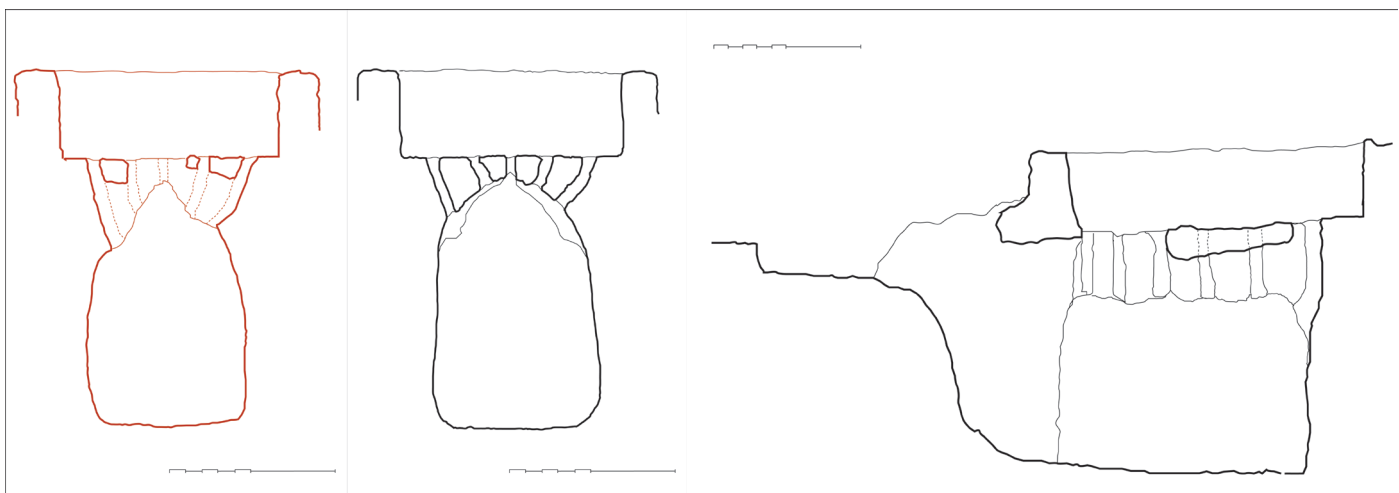


Figure 13: al-Yamāma: Area G17 – Sounding 3: Kiln H. 068, transverse sections (a, b) and longitudinal section (c) (Ch. Darles, F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 14: al-Yamāma: Area G17 – Sounding 3: Kiln H. 068. Looking south-west (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 15: al-Yamāma: Area G17 – Sounding 3: Kiln H. 068, firing room and section of the charcoal and ashes filling. Looking north (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

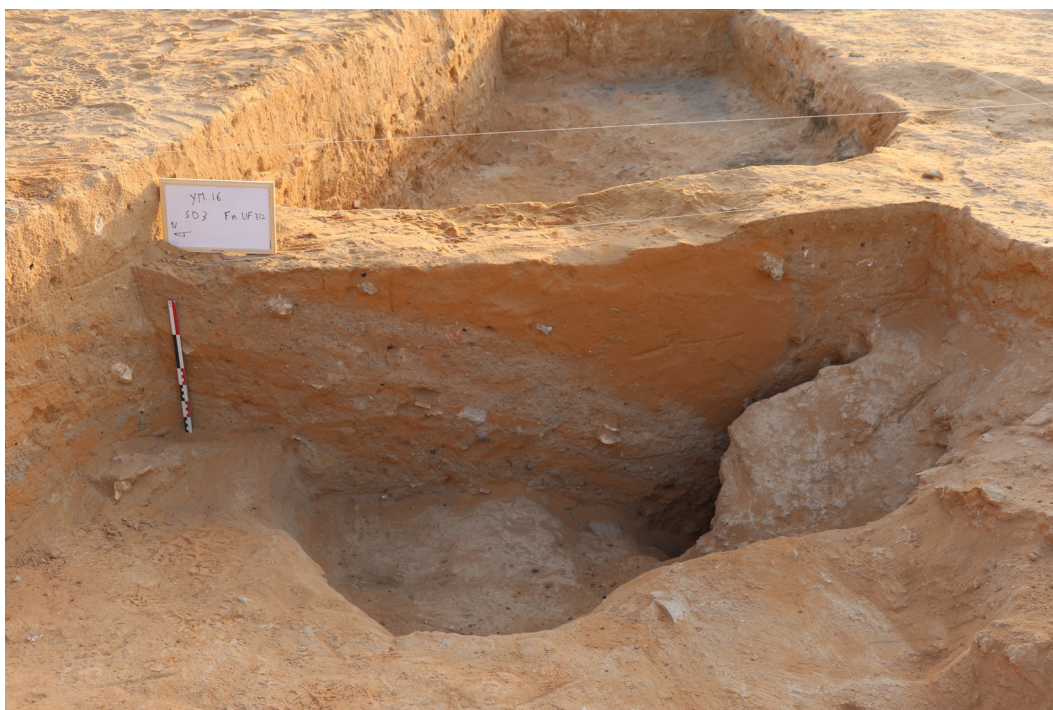
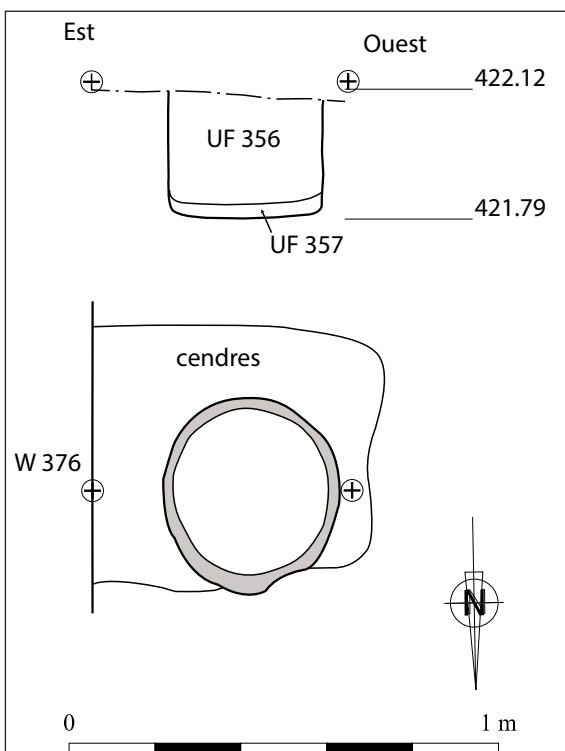


Figure 16: al-Yamāma: Area G17 – Sounding 3: Kiln H. 068, funnel shaped area (Pi. 318) in front of the tunnel leading to the firing room. Looking west (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



◀ Figure 17: al-Yamāma: Area G17 – Sounding 3: tanūr (oven) H. 317, plan and section (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

▼ Figure 18: al-Yamāma: Area G17 – Sounding 3: tanūr (oven) H. 317 (left) and H. 319 (right) . Looking south (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 19: al-Yamāma: Area G17 – Sounding 3: tanūr (oven) H. 317. Looking south (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

Room R. 071

Room R. 071 was bordered by four walls: W. 073 and W. 375 (north-south), W. 072 and W. 377 (east-west). The door (A. 371) gave access to room R. 368; it was 0.82 m wide. The threshold had a plaster coating (alt. 421.72 m). East wall W. 375 was excavated on a length of 2.81 m. Its maximal width was 0.27 m; its current height 0.81 m. South wall W. 375 was excavated on a length of 2.04 m. Its maximal width was 0.30 m; its current height 0.82 m.

Phase 2 (fig. 20)

Room R. 367

The eastern part of the former courtyard (R. 316) was partly closed by the construction of W. 376. It delineates a new room (R. 367) east of the courtyard. Wall W. 367 is built on a previous occupation layer made of compact levels of grey silt alternating with layers of grey ashes (UF 349 - upper alt.: 422.2 m). This layer covered structures St. 369 and H. 364.

Room R. 368

Wall W. 339 was lowered to an altitude of 422.23 m in order to permit the circulation between rooms R. 367 and R. 368. The transition was made easier by the construction of a 0.15-m-high step against W. 339.

Room R. 070

The circulation level was raised from 421.97 m to 422.35 m. This layer of backfill (UF 348) was composed of heterogeneous green indurated clayey silt. It contained many pottery sherds. Structures St. 304, St. 305, and H. 352 are built on this level.

- St. 304 (figs. 21-22) is a water tank located in the corner of walls W. 073 and W. 367. It consists of a complete jar buried in the ground, wedged with stones and sealed in plaster. It was 0.74 m in diameter and 0.5 meter deep.
- Structure St. 305 (figs. 23-24) is located in room R. 070, in the corner of W. 074 and W. 072. This indeterminate structure is plastered and is 0.54 × 0.5 × 0.08 m. Near this structure, hearth H. 352 is 0.44 × 0.34 × 0.08 m.

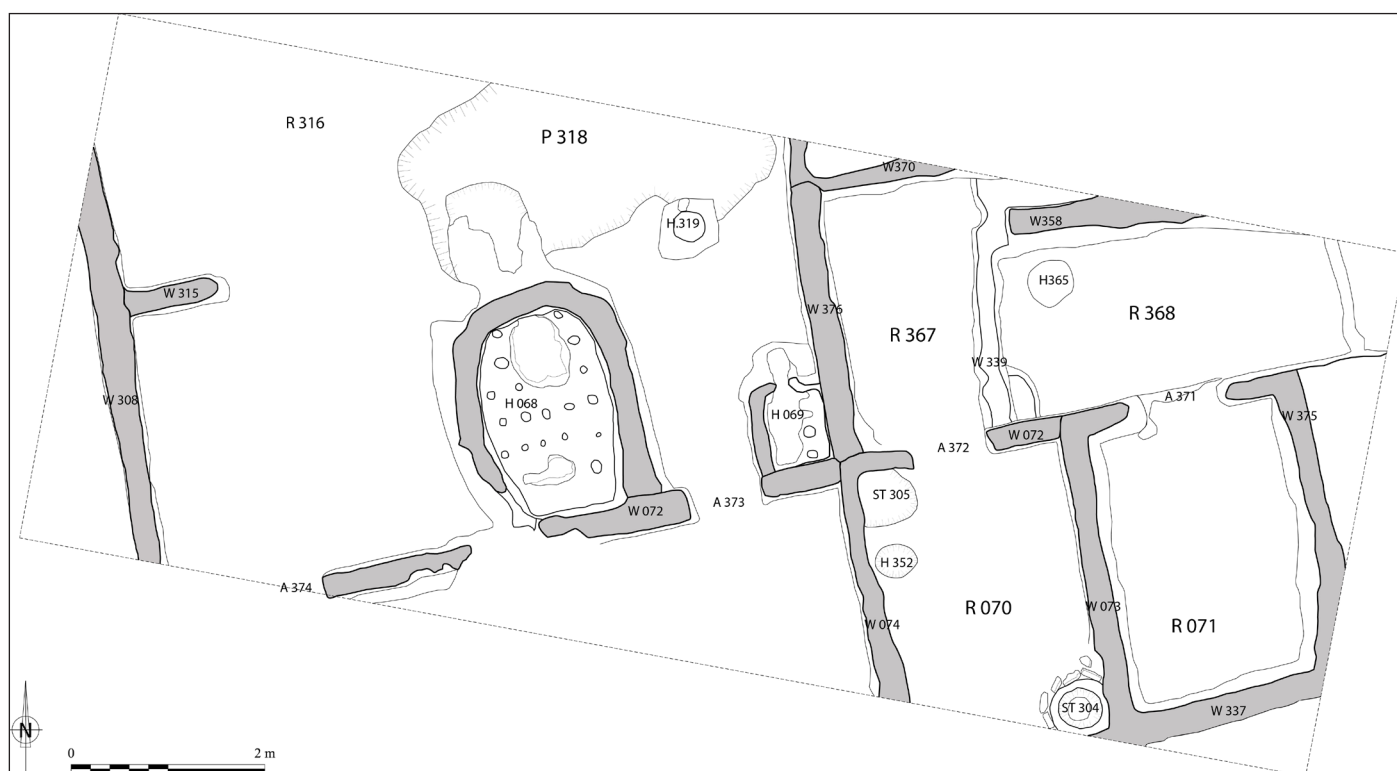


Figure 20: al-Yamāma: Area G17 – Sounding 3: plan of Phase 2 (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

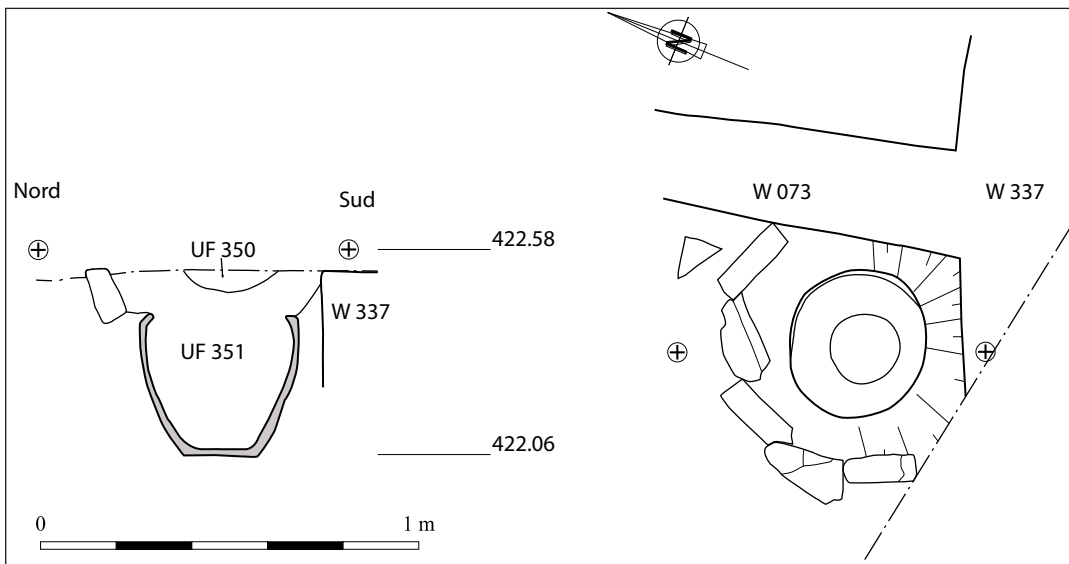


Figure 21: al-Yamāma: Area G17 – Sounding 3: St. 304, plan and section (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

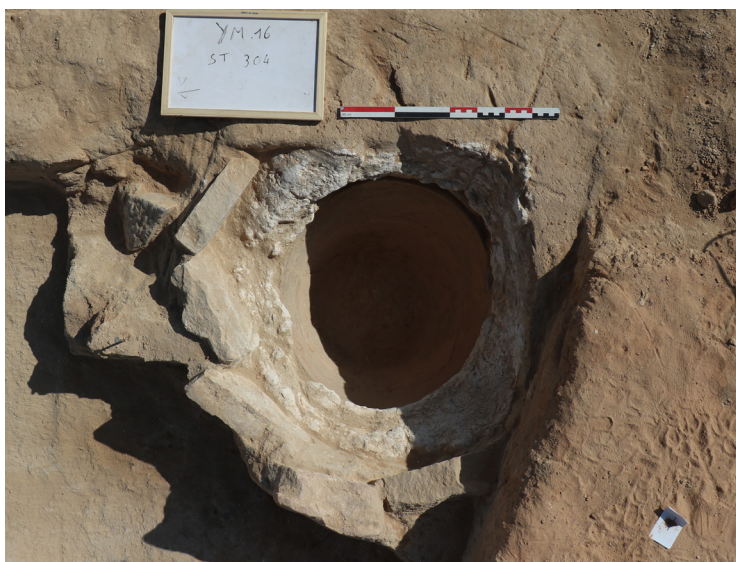


Figure 22: al-Yamāma: Area G17 – Sounding 3: St. 304 (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

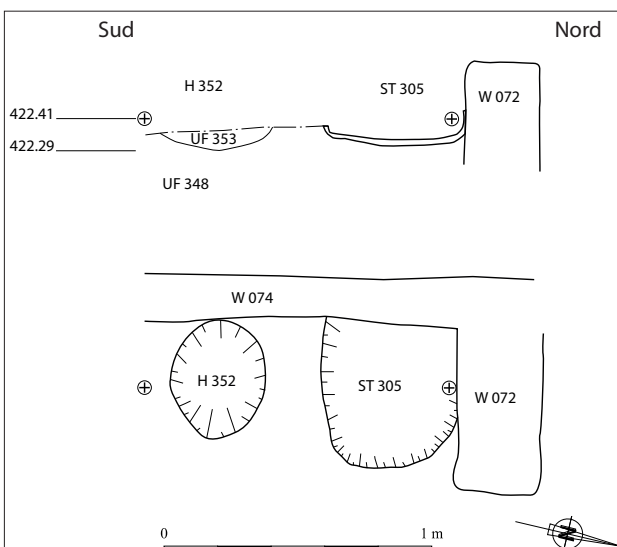


Figure 23: al-Yamāma: Area G17 – Sounding 3: St. 305, plan and section (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 24: al-Yamāma: Area G17 – Sounding 3: St. 305 (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

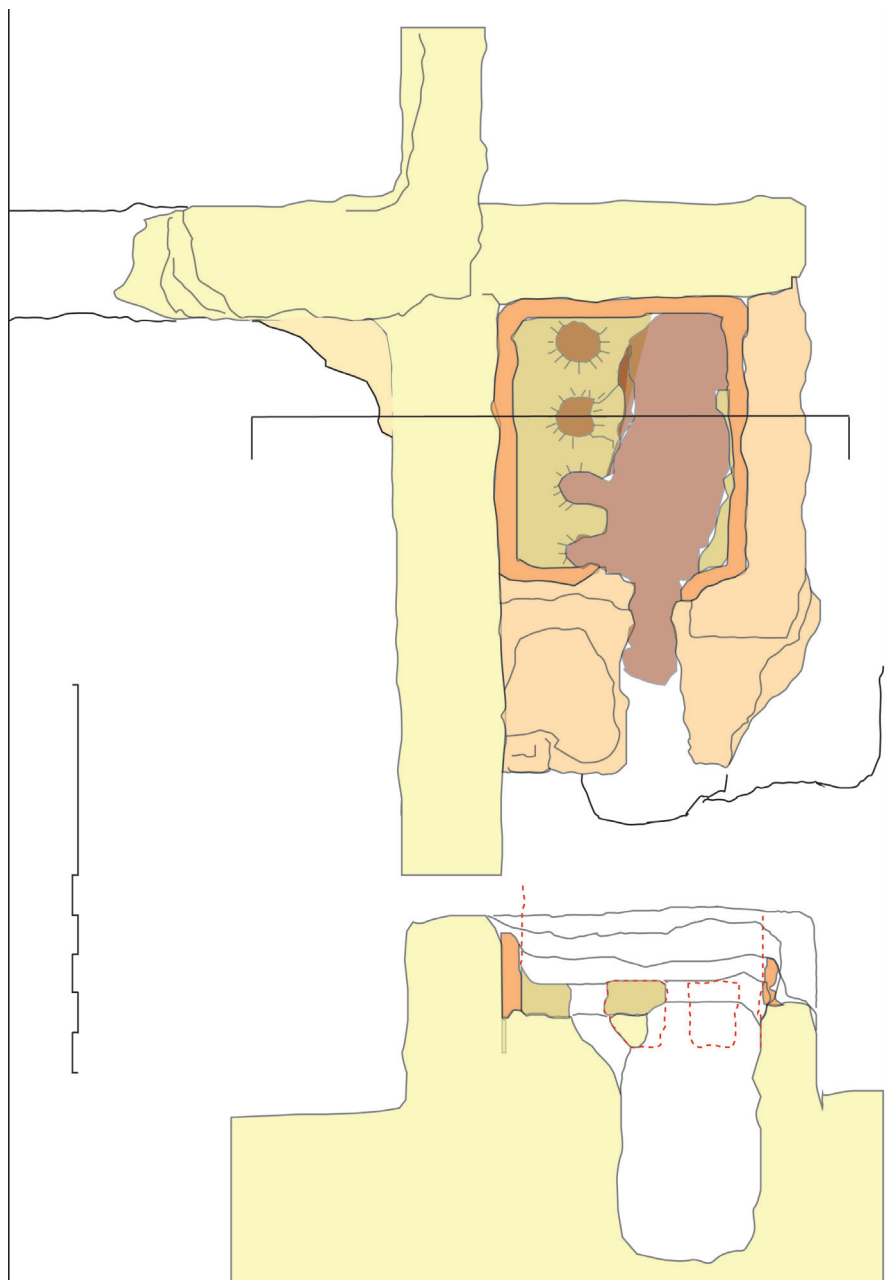


Figure 25: al-Yamāma: Area G17 – Sounding 3: kiln H. 069, plan (Ch. Darles, F. Lesguer – Saudi French archaeological Mission in al-Kharj).

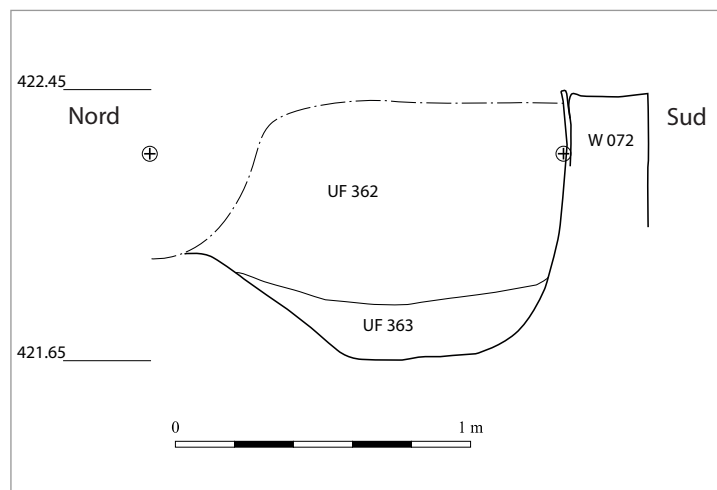


Figure 26: al-Yamāma: Area G17 – Sounding 3: kiln H. 069, section north-south (F. Lesguer – Saudi French archaeological Mission in al-Kharj).



Figure 27: al-Yamāma: Area G17 – Sounding 3: kiln H. 069. Looking east (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

Courtyard R. 316

124

A new kiln (H. 069) was built in the corner of W. 376 and W. 072 to replace kiln H. 320. This kiln has two chambers, a firing room and a heating room (figs. 25-27). A floor perforated by at least 4 flues separates both chambers. It is supported by three arches. Its external plan is pseudo-rectangular; its external dimensions are 1.26×0.83 m. It is preserved over a height of 0.9 m. The heating room is constructed in adobe. The walls of the room are vitrified. The heating room was 0.9×0.37 m and 0.59 m high. It had a pear-shaped plan. The firing room was 0.7×0.6 m and preserved over 0.17 m high. It had a rectangular plan. The fire tunnel was 0.24×0.64 m. At the bottom of the kiln, there was a layer of indurate ashes (UF 363)

A new *tanūr* (H. 319) was installed on the borders of the funnel shaped working pit (Pi. 318) (figs. 19, 28). Its external dimensions were $0.58 \times 0.5 \times 0.32$ m. It was a rectangular pit filled with compact ashes (UF 354); its wall was made of a cylindrical earthenware open at the top and at the bottom. At the bottom, there was a layer of loose ashes (UF 355).

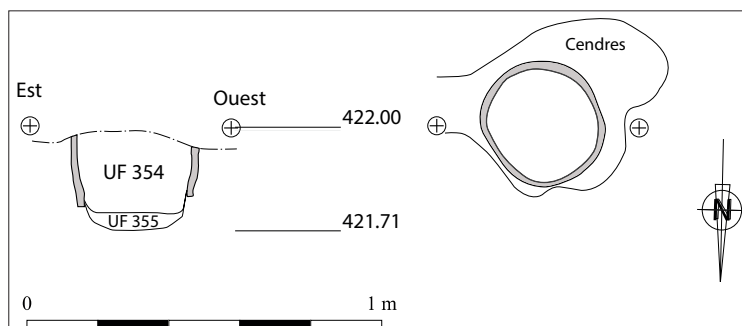


Figure 28: al-Yamāma: Area G17 – Sounding 3: *tanūr* (oven) H. 319, plan and section (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

Phase 3 (fig. 29)

The last phase of occupation corresponds to a period of abandonment of the workshop. South of room R. 316, a pit (Pi. 378) was dug, in part in wall W. 072 and in kiln H. 068. This pit was filled with indurated homogeneous sandy silt (UF 302 and UF 335). It contains faunal remains, many pottery sherds and glass fragments. This layer contained a lot of misfired or broken sherds (during the baking process) coming from another pottery workshop nearby. To the west of wall W. 308, a squatter hearth (H. 366) was 0.31 m in diameter (upper alt. 422.49 m).

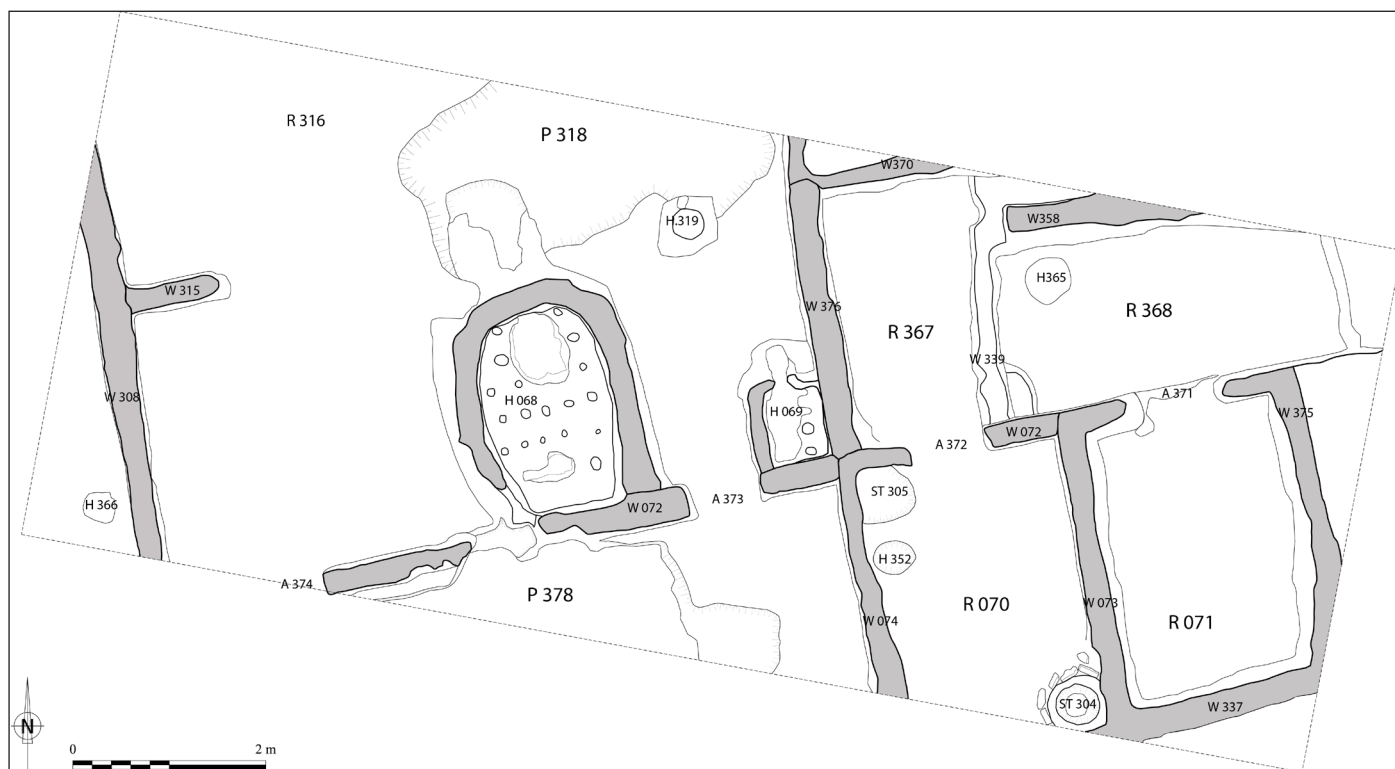


Figure 29: al-Yamāma: Area G17 – Sounding 3: plan of Phase 3 (F. Lesguer – Saudi French archaeological Mission in al-Kharj).

Courtyard R. 316

During the abandonment phase, a backfill of wasters and fragmentary kiln walls (UF 332, UF 321, UF 331 and UF 323) accumulated between kilns H. 069 and H. 068. To the west of kiln H. 068, a succession of level of destruction and abandonment accumulated (UF 309, UF 326, UF 325, UF 314 and UF 306).

Preliminary interpretations

The evolution of the workshop enables to distinguish the functions of some spaces.

Because of the presence of the kilns, the courtyard R. 316 was obviously the firing area. The preparation of the vessels could also have taken place here if we consider the presence of stone tools (Y.321.30, Y.321.45) found between kilns H. 068 and H. 069, within oven H. 320 (Y.359.1), and the presence of a seemingly potter's wheel found in broken pieces in an abandonment layer within the heating room of kiln H. 068 (Y.322.1) (**fig. 30**).

Room R. 071 could have been a clay storage place: it was almost empty of artefacts and filled in with an 85-cm-thick layer of green clayey marl. The function of the other rooms requires a comparative study with other pottery workshops to determine their functions.

In terms of production techniques, the presence of two types of kiln is interesting. The different size of the two kilns might be linked to a management of firing depending on demand, or on the kinds of products (small shapes vs. large shapes). To produce little items in small quantities, potters used the kilns H. 069 or the H. 320, whereas for a large order or larger items, they used the kiln H. 068.

The local production of pottery is still under study.



Figure 30: al-Yamāma: Area G17 – Sounding 3: wheel (?) found in the heating room of kiln H. 068 (Y.322.1) (F. Lesguer, J. Schiettecatte – Saudi French archaeological Mission in al-Kharj).

Date

For the time being, a chronological range within the Abbasid period (9th-10th cent.) can be proposed for the entire workshop on the basis of the following elements:

- Two ¹⁴C analyses realized on charcoals coming from or near kiln H. 068:

AMS Lab #	Location	Nature	Radiocarbon age (14C yrs BP)	Calibrated date (2 sigma)
SacA39060	Outside kiln H. 068, waste - UF 205	Charcoal	1,160 ± 30 BP	773-968 AD
SacA47096	Pottery kiln H. 068 (hearth) - UF 340	Charcoal (<i>Phoenix dactylifera</i>)	1,060 ± 30 BP	898-1023 AD

- Presence of 5 sherds of turquoise glazed ware, sometime with appliqué decoration (**fig. 31**).
- Presence of 6 sherds of plain opaque white glazed ware and possible eroded lustre ware (**fig. 32**).

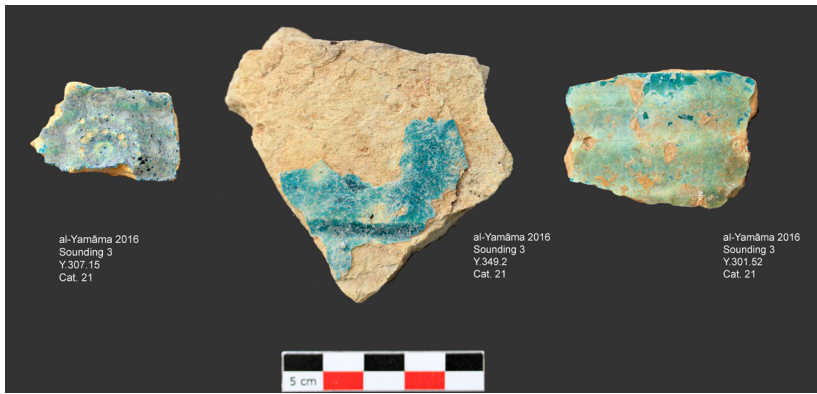


Figure 31: al-Yamāma: Area G17 – Sounding 3: turquoise glazed ware (F. Lesguer, J. Schiettecatte – Saudi French archaeological Mission in al-Kharj).

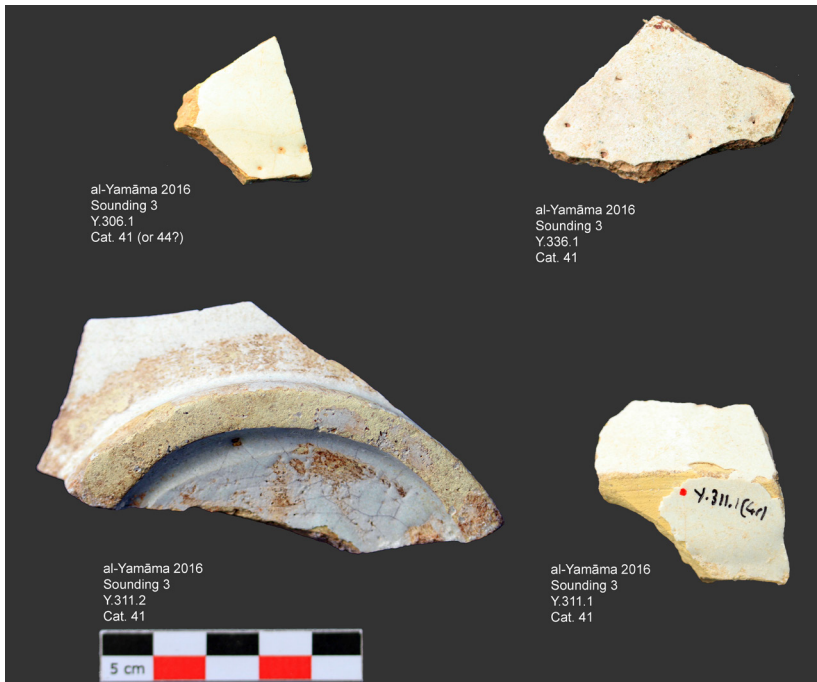


Figure 32: al-Yamāma: Area G17 – Sounding 3: plain opaque white glazed ware (F. Lesguer, J. Schiettecatte – Saudi French archaeological Mission in al-Kharj).

REFERENCES

- AL-ASKAR A. 2002. *Al-Yamama in the Early Islamic Era* (Salsala dirāsāt Athariyya Muḥakma, 10). Dryden – Riyadh: Ithaca Press – King Abdul Aziz Foundation for Research and Archives.
- BALĀDHURĪ, ABŪ 'L-ḤASAN / ED. E. PH. KH. HITTI 1916. *The Origins of the Islamic State being a Translation from the Arabic, accompanied with Annotations, Geographic and Historic Notes, of the "Kitāb futūḥ al-buldān" of al-Imām abu-l 'Abbās Aḥmad ibn Jābir al-Balādhurī*. Vol. 1 = Studies in History, Economics and Public Law, vol. LXVIII, no. 163 (New York 1916 [reedited in 2002: Georgias Press]).
- BIN KHAMĪS A.M. 1978. *Mu'jam al-Yamāma* (2 volumes). Riyadh.
- CLÉVENOT D., 1994. *Une esthétique du voile, essai sur l'art arabo-islamique*, Paris : L'Harmattan.
- CRESWELL K.A.C., 1958. *Early Muslim Architecture*. Beirut: Librairie du Liban.
- DE GAURY G. 1945. A Burial Ground in Al-Kharj. *The Geographical Journal* 106/3: 152–153.
- GAJDA I. 2004. Ḥimyar en Arabie centrale – un nouveau document. *Arabia* 2: 87–98.
- AL-GHAZZI A. 1996. A preliminary report of an excavation at Hazem Agila in al-Kharj oasis/central region of Saudi Arabia. *Atlat* 14: 43–51.
- AL-GHAZZI A. 2009. *Awān fukḥāriyya min mawqa' Ḥazm 'Aqīla (muḥāfaḍat al-Ḥarj/Maṭṭaqat al-Riyādh)*. Riyadh: Dārat al-malik 'Abd al-'Azīz.
- AL-GHAZZI A. 2010. *A Comparative Study of Pottery from a site in the al-Kharj Valley, Central Arabia*. (Series of archaeological refereed studies, 1). Riyadh: Saudi Commission for Tourism and Antiquities.
- AL-GHAZZI A. 2011a. *Mashrū' masaḥ w-tawthīq al-Manshāt al-ḥajariyya fī maḥiṭ 'Aynī Farzān. Al-mujāllad al-awal. Dirāsat maydāniyya muqārna li-l-muqābarā al-rakāmiyyat al-ḥajariyya*. Riyadh: Dārat al-malik 'Abd al-'Azīz.
- AL-GHAZZI A. 2011b. *Mashrū' masaḥ w-tawthīq al-Manshāt al-ḥajariyya fī maḥiṭ 'Aynī Farzān. Al-mujāllad al-thānī. Qanāt al-rī fī Farzān 'Aynī Farzān wa-fukḥār-ha (Dirāsat maydāniyya tawthīqiyya athāriyya muqārna)*. Riyadh: Dārat al-malik 'Abd al-'Azīz.
- GRABAR, A. 1966. *L'âge d'or de Justinien: de la mort de Théodose à l'Islam*. Paris: Gallimard.
- HANSMAN J. 1985. *Julfār, an Arabian port: its settlement and Far Eastern ceramic trade from the 14th to the 18th centuries*, London: Royal Asiatic Society of Great Britain and Ireland.
- HOAG J.D., 1982. *Architecture Islamique* (Coll. Nervi, P. L., Histoire Mondiale de l'Architecture), Paris: Berger-Levrault.
- AL-JUHANY U. M. 2002. *Najd before the Salafi reform movement. Social, political, and religious conditions during the three centuries preceding the rise of the Saudi state*. Reading – Riyadh: Ithaca Press – King Abdul Aziz Foundation for Research and Archives.
- KHORDĀDHBEH, ABŪ 'L-KĀSIM 'UBAIDALLAH IBN 'ABDALLAH IBN / ED. M. J. DE GOEJE, 1889. *Kitāb al-masālik wa-l-mamālik. Auctore Abu 'l-Kāsim Obaidallah ibn Abdallah Ibn Khordādhbeh et excerpta e Kitāb al-Kharāj auctore Kodāma ibn Dja'afar quae cum versione Gallica edidit, indicibus et glossario instruxit M.J. de Goeje*. Leiden: Brill.
- KING G.R.D., 1986. *The Historical Mosques of Saudi Arabia*, London - New York: Longman.
- MACDONALD W.L. 1962. *L'architecture paléo-chrétienne et byzantine*. Paris: Editions des Deux-mondes.
- MARÇAIS G. 1946. *L'art de l'Islam*. Paris: Larousse.
- AL-MAS'ŪDĪ, 'ALĪ IBN AL-HUSAYN / ED. C. BARBIER DE MEYNARD C. & A. PAVET DE COURTEILLE. 1861–1877. *Les prairies d'or [Murūj al-dhahab wa ma'ādin al-Jawhar], traduction française de [Charles-Adrien-Casimir] Barbier de Meynard et [Abel] Pavet de Courteille*. 9 vol.. Paris: Imprimerie impériale.

- MOUTON M. 2008. *La Péninsule d'Oman de la fin de l'Âge du Fer au début de la période sassanide, 250 av.-350 ap. JC*. British Archaeological Reports 1776, Oxford: Archaeopress.
- MOUTON, M. 2012. Sounding 3 (Area G17). In: J. Schiettecatte & A. al-Ghazzi (ed.), *Preliminary report. Second season of the Saudi French Mission in al-Yamāma. Al-Kharj area*: 44-46 [https://halshs.archives-ouvertes.fr/halshs-00797003].
- MOUTON M., SIMÉON P. & SCHIETTECATTE J., 2016 (in press). Al-Yamāma (area N6): The Pottery Assemblage. In J. Schiettecatte & A. al-Ghazzi (eds), 2016: 193-240.
- PAPADOPOULO, A. 2002. *L'Islam et l'art musulman (L'art et les grandes civilisations 6)*. Paris: Citadelles & Mazenod.
- PHILBY H. ST J. 1919. *Southern Nejd. Journey to Kharj, Aflaj, Sulaiyyil and Wadi Dawasir in 1918*. Cairo: The Arab Bureau.
- PHILBY H. ST J. 1920. Southern Najd. *The Geographical Journal* 55/3-4: 161-185.
- PHILBY H. ST J. 1949. Two notes from Central Arabia. *The Geographical Journal* 113: 86-93.
- AL-RASHID A., ABA HUSSAIN A., AL-HAMMAD A., AL-HADLAQ A., ET AL., 2013, Archaeological Survey of Shaqra Area. First Season 1428 H, *Atlat* 23: 129-152.
- ROBIN CH. & ARBACH M. in press. Nouveaux jalons pour une géographie historique de la Yamāma. In J. Schiettecatte & A. al-Ghazzi (eds.) 2011: 51-68.
- ROBIN CH.J. & GAJDA I. 1994. L'inscription du wādī 'Abadān. *Raydān* 6: 113-137.
- SANLAVILLE P. 2000. *Le Moyen-Orient arabe, le milieu et l'homme*. Paris: Armand Colin.
- SCHIETTECATTE J., AL-GHAZZI A. (ED.), 2011. *Preliminary report of the first season of the Saudi French Mission in al-Yamāma. Al-Kharj area*, on-line: https://halshs.archives-ouvertes.fr/halshs-00670367.
- SCHIETTECATTE J., AL-GHAZZI A. (ED.), 2012. *Preliminary report. Second season of the Saudi French Mission in al-Yamāma. Al-Kharj area*, on-line: https://halshs.archives-ouvertes.fr/halshs-00797003.
- SCHIETTECATTE J., AL-GHAZZI A. (ED.), 2013. *Preliminary report. Third season of the Saudi French Mission in al-Kharj*, on-line: https://halshs.archives-ouvertes.fr/halshs-01062149.
- SCHIETTECATTE J., AL-GHAZZI A. (ED.), 2015. *Preliminary report. Fourth season of the Saudi French Mission in al-Kharj*, on-line: https://halshs.archives-ouvertes.fr/halshs-01186755.
- SCHIETTECATTE J. & AL-GHAZZI A. (ED.), in press. *Al-Kharj I. Report of two excavation seasons in the oasis of al-Kharj (2011-2012)*. Saudi Arabia. Riyadh.
- SCHIETTECATTE J., AL-GHAZZI A., CHABROL A., FORTIN G. & FOUACHE E. 2012. Le peuplement protohistorique et historique de l'oasis d'al-Kharj (province de Riyād, Arabie Saoudite). *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*, 2012, III (juillet-octobre): 1365-1399.
- SCHIETTECATTE, J., AL-GHAZZI, A., CHARLOUX, G., CRASSARD ET AL., 2013. Al-Kharj oasis through time: first results of archaeological fieldwork in the province of Riyadh (Saudi Arabia). *Proc. Sem. Arabian Stud.* 43, 285-308.
- SCHIETTECATTE J., CHABROL A. & FOUACHE E., 2016. « Landscape and settlement process in al-Kharj oasis (province of Riyadh) », in M. Luciani (ed.) *Archaeology of North Arabia: Oases and Landscapes. Proceedings of the colloquium held in Vienna, December 6-7, 2013* (Oriental and European Archaeology, Band: 3), Vienne: Verlag der Österreichischen Akademie der Wissenschaften.
- SCHIETTECATTE J. & SIMÉON P., 2016 (in press). Al-Yamāma (area N6): Building 1 – The Great Mosque. In J. Schiettecatte & A. al-Ghazzi (eds), 2016: 167-192.
- SIMÉON P. & SCHIETTECATTE, J., 2015. Al-Yamāma - The Great Mosque (Area N6 - Building 1). In J. Schiettecatte & A. al-Ghazzi (eds), 2015: 27-73.

- STIERLIN H., 1996. *Islam. Vol. 1. Les origines, de Bagdad à Cordoue*, Köln - Paris: Taschen.
- THILO U., 1958. *Die Ortsnamen in der altarabischen Poesie: Ein Beitrag zur vor- und frühislamischen Dichtung und zur historischen Topographie Nordarabiens*. (Schriften der Max Freiherr von Oppenheim-Stiftung, 3). Wiesbaden: Harrassowitz.
- VASLET D., AL-MUALLEM M.S., MADDAH S.S., BROUSSE J.-M. ET AL. 1991. *Geologic Map of the Ar-Riyādh Quadrangle, Sheet 24 I, Kingdom of Saudi Arabia [1:250,000] & Explanatory Notes to the Geologic Map of the Ar-Riyādh Quadrangle, Sheet 24 I, Kingdom of Saudi Arabia*. Riyadh: Ministry of Petroleum and Mineral Resources.
- VOGT-GÖKLIN U., 1975. *Mosquées*, Paris: Chêne.
- WÜSTENFELD F. 1874. *Bahrein und Jemâma. Nach arabischen Geographen beschrieben*. Göttingen: Dieterichschen Buchhandlung.
- YĀQŪT SHIHĀB AL-DĪN ABĪ ‘ABD ALLĀH B. ‘ABDALLĀH AL-ḤAMAWĪ AL-RŪMĪ AL-BAGHDĀDĪ / ED. F. WÜSTENFELD. 1866–1873. *Kitāb mu‘jam al-buldān. Jacut’s geographisches Wörterbuch, aus den Handschriften zu Berlin, St. Petersburg, Paris, London und Oxford, herausgegeben von Ferdinand Wüstenfeld*. 6. vol. (Deutsche Morgenländische Gesellschaft, in Commission bei F. A. Brockhaus). Leipzig: F.A. Brockhaus. [Reed. 1924].
- ZARINS J., IBRAHIM M., POTTS D. T. & EDENS CH. 1979. Saudi Arabian Archaeological Reconnaissance 1978. The preliminary report on the third phase of the Comprehensive Archaeological Survey Program — The Central Province. *Atlat* 3: 9–42.