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[For RESEARCH section]

Marking the sacral landscape of a north Arabian oasis: a sixth-millennium BC monumental stone platform and surrounding burials

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<LOCATION MAP, 6.5cm colour, place to left of abstract and wrap around>

ABSTRACT

Prehistoric stone structures are prominent and well-studied in the Levantine desert margins. In northern Arabia, however, such structures have received less attention. This article presents the results of investigations of a 35m-long stone platform, first constructed in the mid sixth millennium BC, overlooking the oasis of Dûmat al-Jandal in northern Saudi Arabia. Excavation of the platform has yielded bioarchaeological and cultural remains, along with evidence for several phases of construction and intermittent use down to the first millennium BC. Analysis of the platform and nearby tombs highlights the persistent funerary and ritual use of this area over millennia, illuminating nomadic pastoralist lifeways in prehistoric Arabia.

Keywords: Arabian Peninsula, Neolithic, Mid-Holocene, monumentality, funerary landscape, nomadic pastoralism

Introduction

Generally considered as territorial markers, clusters of stone structures—in particular cairns and enclosures or aligned stones visible on satellite imagery, such as the so-called desert kites—reveal dense and interrelated occupation across the Levant and the Arabian Peninsula during the Mid-Holocene (*c.* 6.5k–2.8k BC) (Steimer-Herbet 2004). This phenomenon also suggests that a pastoralist way of life spread along the desert margins for a distance of over 2000km during this Mid-Holocene period of transition from the Late Neolithic to the Chalcolithic (Guagnin *et al.* 2017). As elsewhere in the world (e.g. Göbekli Tepe and Stonehenge; see Parker Pearson 2013; Schmidt 2015), the most exceptional of these megaliths can be considered as places for social gatherings and associated ceremonies.

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Unlike in the southern Levant, prehistoric stone monuments in northern Saudi Arabia remain largely unexplored (Nayeem 1990; Fujii 2013; Crassard *et al.* 2015; Kennedy 2017). Although the mid-Holocene in northern Arabia has been much discussed (e.g. Groucutt & Petraglia 2012; Crassard & Drechsler 2013; Magee 2014), research has focused predominantly on lithic technology, rock art, palaeoclimatic and palaeoenvironmental conditions and infrequently encountered stratified seasonal campsites (e.g. Crassard *et al*. 2013; Gebel 2013, 2016; Jennings *et al.* 2013; Guagnin *et al.* 2017, 2018, 2020; Scerri *et al.* 2018; Zielhofer *et al.* 2018). The lack of focus on stone monuments is due mostly to the relatively late exploration of the region, the first surveys dating to the 1970s (Adams *et al.* 1977; Parr *et al.* 1978; Zarins *et al.* 1979). Furthermore, it is still difficult to date these structures since so few have been excavated.

To gain an overview of such a large-scale phenomenon across the Near East, we must understand how these stone structures, particularly the largest examples, developed in the arid margins. In this regard, the recent excavation of a late Mid-Holocene stone platform in the oasis of Dûmat al-Jandal in Jawf Province, Saudi Arabia, constitutes a major contribution to our understanding of the origin, nature and evolution of human occupation in the region. Detailed analysis of the site, combined with dating of nearby tombs, confirms that ceremonial activity took place at this northern Arabian oasis from the second half of the sixth millennium BC onwards.

Architectural and stratigraphic sequence of the platform

Best known for its role as a crossroads on the caravan routes of antiquity, the oasis of Dûmat al-Jandal, is located in a desert region that today receives no more than 50mm of annual precipitation (Charloux 2018) (Figure 1). The oasis is situated in the lower part of a vast graben (steep-sided valley) at 580–680m asl, supplied with water by several small wadis and, especially, by a now overexploited source of fossil groundwater (Charloux *et al.* 2018).

<FIGURE 1, 13.5cm colour>

The study area, in the western part of the oasis, is located on the southern side of the mouth of two small wadis filled with Quaternary alluvial and aeolian deposits. A vast limestone plateau (of the geological formation known as the Qasr Member of the Jauf formation; Wallace *et al.* 1997), stands some 50m above the valley (average altitude 665m), extending over 2.7km at this location. Most of the archaeological remains are concentrated on a 700m-long natural tongue-shaped promontory on the plateau's northern flank, which belongs to the geological formation known as the Hammamiyat Member of the Jauf formation. Archaeological investigations between 2010 and 2017 have concentrated on a 40ha fortified sector in this area, but also on the systematic recording of archaeological remains within the oasis and in an area approximately 30km around it (Charloux 2018) (Figures 1–2).

<FIGURE 2, 20cm colour, place landscape>

In 2014–2016, we excavated a monumental stone structure (L2200 on Figures 1–2) on the southern edge of the promontory. It is trapezoidal in shape, taking the form of a platform oriented on an east–west axis (Figures 3–4). The structure survives to a maximum height of 0.7m and is 34.6m long. It is 14.6m wide on its eastern side and 3.4m wide on its western side. The eastern part of the monument has two rectangular niches, each approximately 1m wide and 2m long, symmetrically arranged on either side of the structure's longitudinal axis. The platform is bounded by dry-stone walls and entirely filled with rubble.

<FIGURE 3, 13.5cm colour>

<FIGURE 4, 20cm colour, place landscape>

The platform was built in three phases, followed by an abandonment phase and a later, monumental third- to second-century BC rampart. Four deposits were assigned to the Late Neolithic architectural sequence.

The initial platform (phase I) was built on a west/north-west to east/south-east axis, corresponding to the winter sunrise and sunset. It is trapezoidal in shape, and measures 20.6m in length; its width is 2.7m at its western end and 8.8m at its eastern end. All the phase 1 walls are connected, indicating a single phase of construction. Built either directly on the bedrock or on an indurated marl-limestone layer, the walls comprise rough dry-stone courses of irregular flat stones, on average about 0.20 × 0.30m, and 50–100mm thick. The pressure exerted by the stone infilling created an overhang on the south-eastern side of the platform; to prevent the wall from collapsing outwards, large irregular blocks were added to support it. The eastern facade of the platform has a central niche (niche 1) measuring 1 × 2.15m (Figures 4–5). On the base of this niche, four stones were set vertically in the white substrate, suggesting the presence of a wooden post.

<FIGURE 5, 13.5cm colour>

In Phase II, the structure was extended 8.4m towards the north-west, and a second niche installed (niche 2) abutting the northern wall of phase I (Figures 3–4). Niche 2, measuring 2.30 × 1.10m, resembles niche 1 in size, and its layout suggests an attempt at symmetry on either side of the longitudinal axis of the platform. Phase III is an additional extension of 5.30m to the west. The same building techniques were used in this phase, including a coarsely faced wall with rubble infill.

Phase IV corresponds to the abandonment of the structure, attested by the collapse of several walls, such as the western wall and the north-eastern corner of the platform. Phase Va represents the construction of the Hellenistic period (third to second centuries BC) rampart. Surviving to a height of up to 2.65m, this rampart rests partly on the collapsed north-eastern corner of the platform. A layer of green marl between the platform's demolition layer and the first foundation of the rampart indicates that the ground was levelled before its construction. Phase Vb is characterised by the installation of two first-millennium BC hearths on the abandoned platform (see Figure 6 and the online supplementary material (OSM) 1).

<FIGURE 6, 20cm greyscale, place landscape>

Archaeological deposits on the platform

Deposit 1 was discovered within the stone infill of the phase 1 platform. It is characterised by two concentrations of human bones in a secondary position, representing at least one individual aged over 15 years (see OSM 2). Radiocarbon dating of bioapatite indicates that this individual, and probably the associated deposit, dates to the end of the sixth millennium BC (Figure 6 & OSM 1). Two artefacts were associated with this deposit: a white limestone bead and a perforated marine gastropod (*Pterygia crenulata*) shell (Figure 7A & B).

<FIGURE 7, 13.5cm colour>

Sealed beneath aeolian sandy layers in niche 1, deposit 2 (phases I–IV) contains evidence of human occupation. An ashy layer located at the base of the niche 1 was sampled (50 litres) for archaeobotanical analysis. It yielded a moderate quantity of small charcoal fragments, 56 of which have been analysed. Three taxa have been identified (Figure 8A–B & OSM 3): white acacia (*Fadherbia albida*, 32 fragments), tamarisk (*Tamarix* sp., 17 fragments) and the Amaranthaceae family (three fragments). Growing to 30m in height, white acacia (Figure 8A1) is native to the Sudano-Zambezian floristic region (Neumann *et al.* 2001: 318) and is rarely recorded in Arabia today in its wild form (Jagiella & Kürschner 1987: 20–34). The

Amaranthaceae family includes several shrub species with similar anatomical traits (Figure 8A2). *Haloxylon salicornicum* is the most widespread, found today in the sandy and rocky plains of north-western Arabia (Kürschner & Neef 2011). *Tamarix* sp. typically grows along watercourses in desert areas (Figure 8A3), *Tamarix aphylla* being the most common species in north-western Arabia (Miller & Cope 1996). A fragment of tamarisk (*Tamarix* sp.) from this charcoal layer was radiocarbon-dated to the middle of the sixth millennium BC (Figure 6 & OSM 1).

<FIGURE 8, 13.5cm greyscale>

Deposit 2 in niche 1 also yielded a faunal assemblage (n = 68), comprising 45 fragments of bovid (*Bos* sp.) maxillary teeth (probably the teeth of a single adult individual), the burnt distal extremity of an ovicaprine metapodial, and 22 unidentified fragments (Figure 8C & OSM 3). Probable exposure to water and sand has resulted in heavy weathering and abrasion of all tooth fragments—as also observed in faunal assemblages from Jabal Oraf 2 and Alshabah in northern Saudi Arabia (Guagnin *et al.* 2017; Scerri *et al.* 2018).

The lithics (Figure 7G) found in deposit 2 mostly consist of small unretouched flakes from two or three different cores. Dating broadly to the Neolithic, these lithics are made of carefully selected raw material, mainly coloured flints and jaspoid cherts, as attested on numerous Mid-Holocene sites across the Arabian Peninsula (e.g. Crassard *et al*. 2013).

Deposit 2 in niche 1 also yielded two bone artefacts: a 110mm-long pin and a 55mm-long naviform object of unknown function (Figure 7D–E). Finally, a small cut and polished conical stone mearing approximately 200 × 200mm (Figure 7F) was found in deposit 2. Possibly a small grinding pestle, it resembles an artefact recently discovered in Rajajil in north-western Arabia (Gebel 2016: 91, fig. 8).

Evidence of human activity in deposit 3 (phases II–IV) in niche 2 is limited to a few flint flakes and cores, along with a fragment of good-quality chalcedony unknown from the vicinity.

Deposit 4 (phases II–IV) consists of artefacts found disturbed in a recent looting pit dug against the eastern wall of the platform (D4 on Figure 4). Excavation of the pit yielded fragmented and disarticulated human bones (n = 2647) representing at least five individuals (OSM 2), as well as 13 stone and shell beads (Figure 7C & OSM 4). These comprise two cylindrical shell beads, three cylindrical stone beads, three flat beads of whitish stone, and five carnelian beads of either local or Egyptian origin (OSM 4–5).This material was mixed with a loose, orange-brown sand, including many large, irregular stones, similar to those of the platform. A radiocarbon assay of a human bone fragment (bioapatite) indicates that the deposit from which the artefacts derive dates to the second half of the fourth millennium BC (Figure 6 & OSM 1). Deposit 4 also yielded a faunal assemblage (n = 75) comprising 48 bovid (*Bos* sp.) tooth fragments, one burnt distal epiphysis of a caprine metapodial, seven fragments from a large herbivore and 19 unidentified bones (Figure 8).

Discussion

Structurally, the original platform (phase I) appears to have been modified in two successive phases (phases II and III) before it was abandoned, although it is not possible to determine how long the platform was in use. The date obtained on the tamarisk charcoal sample at the base of niche 1 indicates activity as early as the mid sixth millennium BC, followed by a late sixth-millennium BC date for human bone in deposit 1 (Figure 6 & Table S1 in OSM 1). Deposit 4 dates to the second half of the fourth millennium BC, but, as it is disturbed, it cannot be attributed more precisely than to a period between phases II and IV. The monument was certainly in use during the second half of the sixth millennium BC, but a longer period, until the fourth millennium BC, cannot be discounted. The date of the platform's abandonment

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remains uncertain, with only a *terminus ante quem* provided by the first-millennium BC construction of the rampart and installation of surface hearths of phase V.

Two categories of archaeological deposit illuminate the function of this platform:

- Funerary deposits (deposits 1 and 4) attest to the repeated use of the area for mortuary activity over two millennia.
- Primary deposits (deposits 2 and 3) in the niches, including artefacts and bioarchaeological remains, potentially related to the symbolic use of the space or structure.

The platform's dimensions and evidence of longevity and maintenance all indicate that it should be considered as a monument (following Osborne 2014). In addition to the disposal and commemoration of the dead, the platform's east–west alignment with the winter solstice reveals a knowledge of astronomical phenomena that is common to other structures in Arabia and elsewhere (Steimer-Herbet 2004). The platform constituted a ceremonial space for social and ritual activities, providing a material anchor for social memory and identity construction (Scarre 2011, 2018), as well as a territorial marker, for the mobile pastoralists of the area.

Although the Dûmat platform is unique in its proportions, similar stone structures from the southern Levant and the central and southern Arabian Peninsula connect it to a broader cultural tradition. Probably built during the Mid-Holocene (Neolithic to Early Bronze Age) and spanning an area of over 2000km from north to south, these structures vary in length from 6–30m, and have many different shapes, including circular, rectangular and trapezoidal (Figure 9). Most platforms are interpreted as ceremonial structures, collective spaces linked to pastoralism, or cenotaphs (e.g. Zarins *et al.* 1979; Haiman 1996; al-Khalifa *et al.* 2001; McCorriston *et al.* 2012, 2014; Abu-Azizeh *et al.* 2014: 167–68; Gebel 2016: 87–91; Schiettecatte *et al.* 2017). In addition, these platforms appear to be systematically linked to a religious or a funerary function.

<FIGURE 9, 13.5cm greyscale>

The presence of a platform at Dûmat al-Jandal and the high density of burials in its vicinity (comprising 66 structures; Figure 1) are also strongly suggestive of prehistoric occupation in or close to the oasis. Predominantly located at the highest points of the landscape and overlooking the wadis, as is frequent in Arabia (e.g. Steimer-Herbet 2004; Steimer-Herbet *et al.* 2006; Cleuziou & Munoz 2007; Giraud 2010), most of the hundreds of (systematically looted and often reused) funerary structures in the Southern Jawf have similar circular shapes (cairns). The assemblages recovered from these tombs are relatively standard, comprising simple elements of adornment (e.g. limestone and carnelian beads, and pierced shells), and, less frequently, metal artefacts (e.g. weapons and tools) or scarab-shaped seals in the most recent tombs (see OSM 4).

Radiocarbon dating was undertaken on human bone from these cairns, revealing at least four periods of use (Figure 6 & OSM 1):

1) Fifth millennium BC, between 4685 and 4075 BC.

2) Second half of the fourth millennium BC to the second half of the third millennium BC (3485–2345 BC).

3) Mid-second millennium BC (between 1610 and 1435 BC).

4) First millennium BC to the beginning of the first millennium AD (between 768 BC and AD 55).

One radiocarbon date obtained on a charcoal sample from a cairn burial excavated on the promontory (Tomb L2204, SD31) suggests that it was used at the very end of the first millennium BC to the beginning of the first millennium AD, although the material found in the tomb could suggest an earlier date from the first half of the first millennium BC (Figure 10; see also OSM 1, 4 & 5). Continuity in the use of the local funerary landscape is also noted for later periods, with evidence of a Nabataean–Roman necropolis inside the oasis (Figure 6; OSM 1; also see Charloux *et al.* 2014).

<FIGURE 10, 13.5cm colour>

The sequence recorded at Dûmat al-Jandal provides four major lines of evidence. First, the region was repeatedly occupied, from at least the sixth millennium BC, but with hiatuses during the first half of the fourth millennium BC and in the second millennium BC, represented only by tomb TB1088, 15km north-west of Dûmat al-Jandal (Figure 1). Second, the sequence of stone cairns seems to confirm continuity in funerary customs from the fifth millennium BC onwards, potentially suggesting a continuous nomadic pastoralist way of life. Third, the platform is, in the current state of research, the oldest structure in the oasis. Fourth, several tombs may have been contemporaneous with the use of the platform if we envisage a long-term use, although it is possible that the tombs are more recent and not related to the platform but forming part of the landscape of the fifth to fourth millennia BC.

Mid-Holocene occupation in the region

After a relatively humid phase lasting from the Early Holocene (8000–6500 BC) to the Mid-Holocene (*c*. 5000 BC) (Engel *et al.* 2017; Zielhofer *et al.* 2018), it seems that climatic variations in northern Arabia led to aridity in the lowlands around 3000 BC. Palynological research in Taymā' in north-western Saudi Arabia, for example, shows a progressive decline from semi-arid steppe to the arid/hyper-arid desert-like landscape that we know today (Dinies *et al.* 2016). Several palaeolakes dried up during this period of aridification, for example in the southern Jawf and the Nefud Desert (Crassard *et al.* 2013; Loreto 2013; Guagnin *et al.* 2018). A perennial lake at Taymā' contracted gradually from 6000 BC onwards, disappearing by 2000 BC (Wellbrock *et al.* 2018). Other sites, such as Rasif (also in north-western Saudi Arabia), however, continued to be fed by aquifers (Gebel & Wellbrock 2019). The transition to more arid conditions during the sixth–fourth millennia BC caused the human population to contract as nomadic pastoralism developed. The lack of reliable data on northern Arabian Early and Mid-Holocene annual precipitation, and the scarcity of stratified archaeological contexts, however, preclude a fuller understanding of this long-term process. Following the Late Neolithic settlements known to have existed in north-eastern Jordan and northern Saudi Arabia (e.g. Fujii 2010; Rollefson *et al.* 2014; Gebel 2016), traces of permanent occupation disappeared in the late sixth to fifth millennia BC in these regions, possibly to be replaced by seasonal camps (Guagnin *et al.* 2018; Scerri *et al.* 2018). Thousands of stone cairns found across northern Arabia attest to the presence of post-sixth-millennium BC mobile pastoralist populations, who gathered in collective spaces, shrines or funerary areas with standing stones. These sites fulfilled important collective functions, for example at Rajajil (Zarins *et al.* 1979; Gebel 2013, 2016) and further afield, for example, at Rizqeh (e.g. Kirkbride 1969).

In this regard, the site of Rasif is of primary importance, as it provides evidence for the evolution of water management and lifeways in a 'proto-oasis' during the Late Neolithic–Chalcolithic transition (Gebel 2016; Zielhofer *et al.* 2018; Gebel & Wellbrock 2019). At Taymā', fig (*Ficus carica* type) pollen and seeds dating to *c.* 4800-4300 BC suggest a Late Chalcolithic–Early Bronze Age permanent occupation and an oasian way of life, a chronology also supported by the archaeological data (Dinies *et al.* 2016; Hausleiter *et al*. 2018).

Considering this overall sequence, it is necessary to question the role and position of the Dûmat al-Jandal oasis during the Chalcolithic–Early Bronze Age periods, in particular the problematic fifth to third millennia BC. The platform (L2200) was built in the Late Neolithic, possibly by mobile pastoralists, while stone structures, including tombs as well as the platform, attest to a recurrent human presence from the second half of the sixth millennium BC. There is little doubt that Dûmat al-Jandal was a well-watered place, and therefore a refuge for human populations, throughout its history; a large 5 × 8km basin ranging in depth from 50 to 100m, the oasis was naturally supplied with water from small wadis and abundant springs (Charloux *et al.* 2018). Although the prehistoric landscape cannot be reconstructed without detailed hydrological and palaeoclimatic analyses, the Dûmat basin certainly contained a palaeolake during the early Mid-Holocene. It may therefore be that this place was only partly affected by the increasing aridity of the later Mid-Holocene.

The long-term human presence at Dûmat al-Jandal—as highlighted by the monumental platform and surrounding funerary landscape—can be explained by the presence of perennial water resources. By overtly marking the landscape with their tombs, the groups frequenting the area may have materialised their presence and asserted their rights and inheritance over these resources (see Parker Pearson 1999). It remains to be ascertained, however, whether the Chalcolithic–Early Bronze Age pastoral nomadic groups, characterised by their burial cairns, occupied a semi-permanent site in the early oasis, as seen at nearby Rasif, or whether they lived alongside populations already permanently settled in the oasis. The second hypothesis would correspond to the indigenous way of life known from the first millennium BC to the nineteenth century AD in the hyper-arid context at Dûmat al-Jandal (Veccia Vaglieri 2012). Both hypotheses would be compatible with an early oasis in the fifth millennium BC, as at Taymâ' (Hausleiter *et al*. 2018) or at Rasif (Gebel & Wellbrock 2019). At the latter site, local environmental conditions precluded the development of a full oasis economy, such as at Dûmat al-Jandal. Further research should provide greater insights into the subsistence economy of protohistoric Dûmat al-Jandal. Our results suggest that monumental structures and burials in northern Arabia marked the landscape over millennia, anchoring nomadic pastoralists to a significant place, not only for its environmental advantages but also for its significance to the community, a recurrent theme in much pre-and protohistoric archaeology.

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Supplementary material

To view supplementary material for this article, please visit XXXX

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https://doi.org/10.15184/aqy.2020.81

Figures

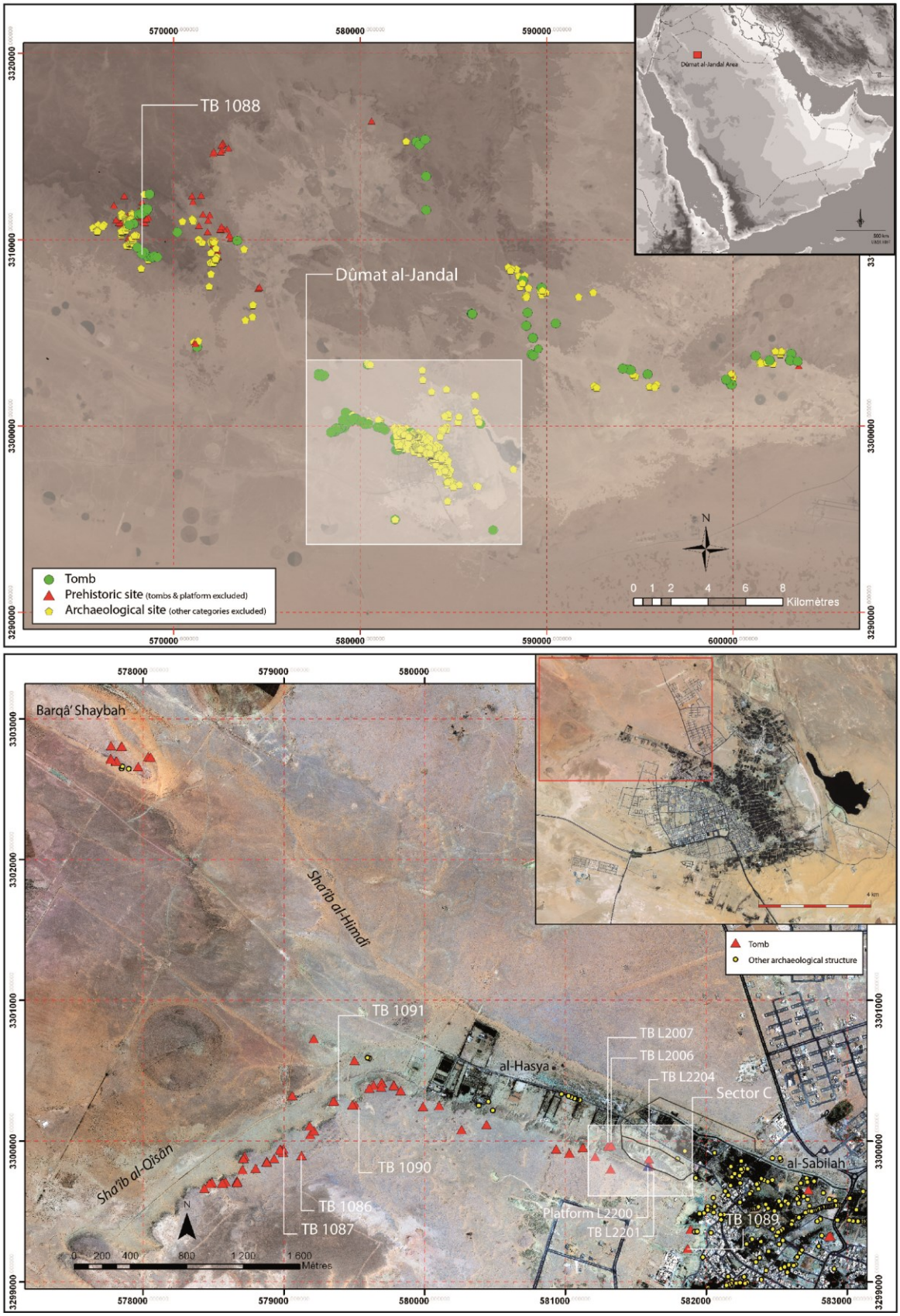

Figure 1. Map of surveys in the Dûmat al-Jandal oasis area in the northern Arabian Peninsula (top), and location of stone tombs around the platform in the western part of the oasis (bottom) (© Mission archéologique de Dûmat al-Jandal; figure by G. Charloux).

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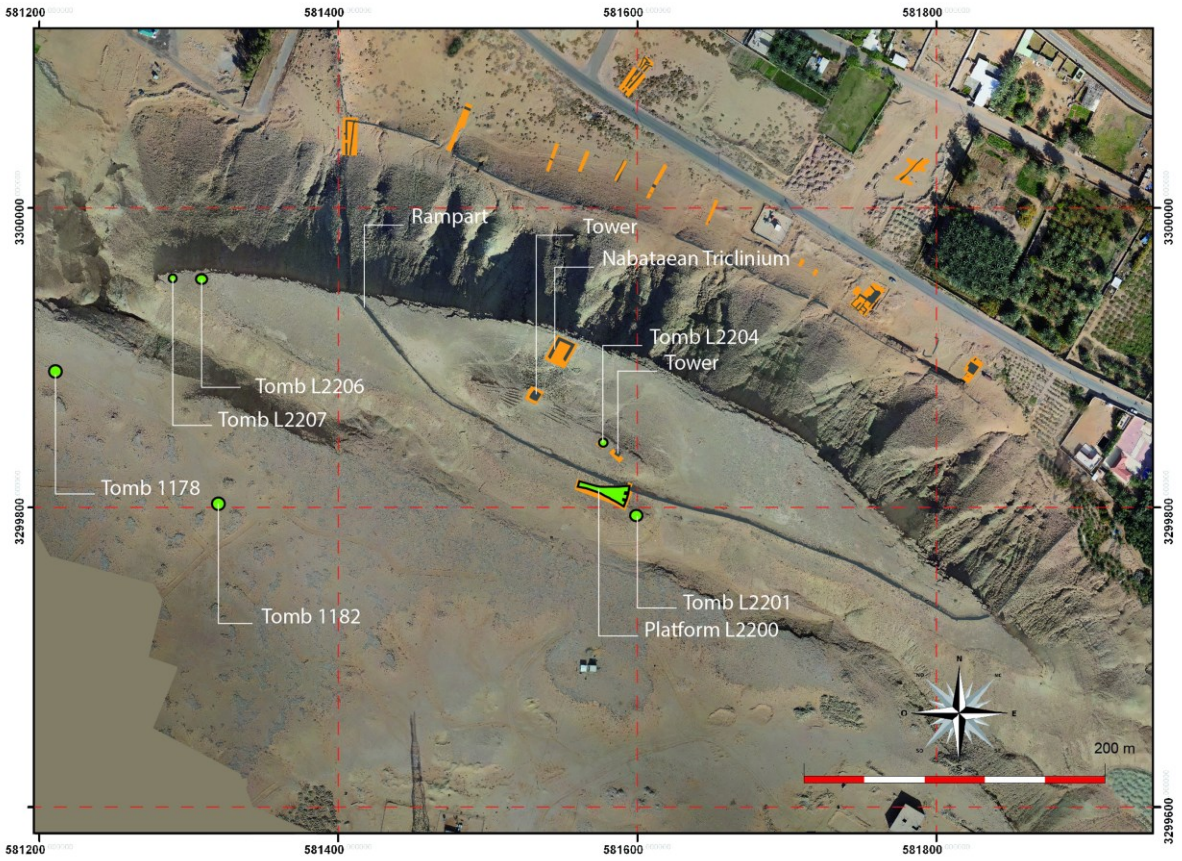

Figure 2. Satellite image of the al-Burj promontory showing the locations of archaeological structures (© Mission archéologique de Dûmat al-Jandal; figure by G. Charloux).

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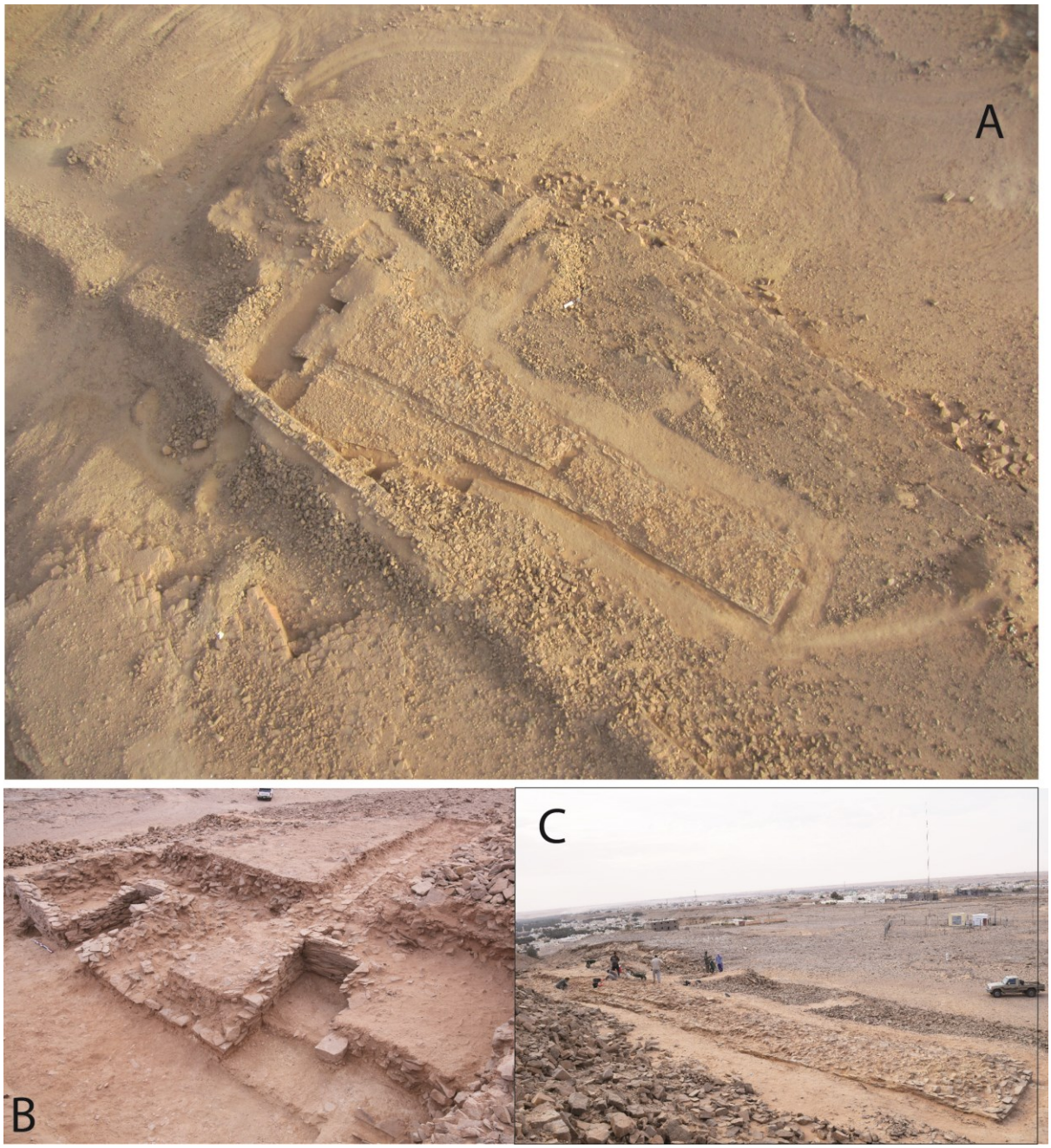

Figure 3. A) Aerial view of the platform and niches; B) eastern face of the platform with Niches 1 and 2; C) view of the platform from north (© Mission archéologique de Dûmat al-Jandal; photographs by M. Cotty, O. Munoz and R. Schwerdtner).

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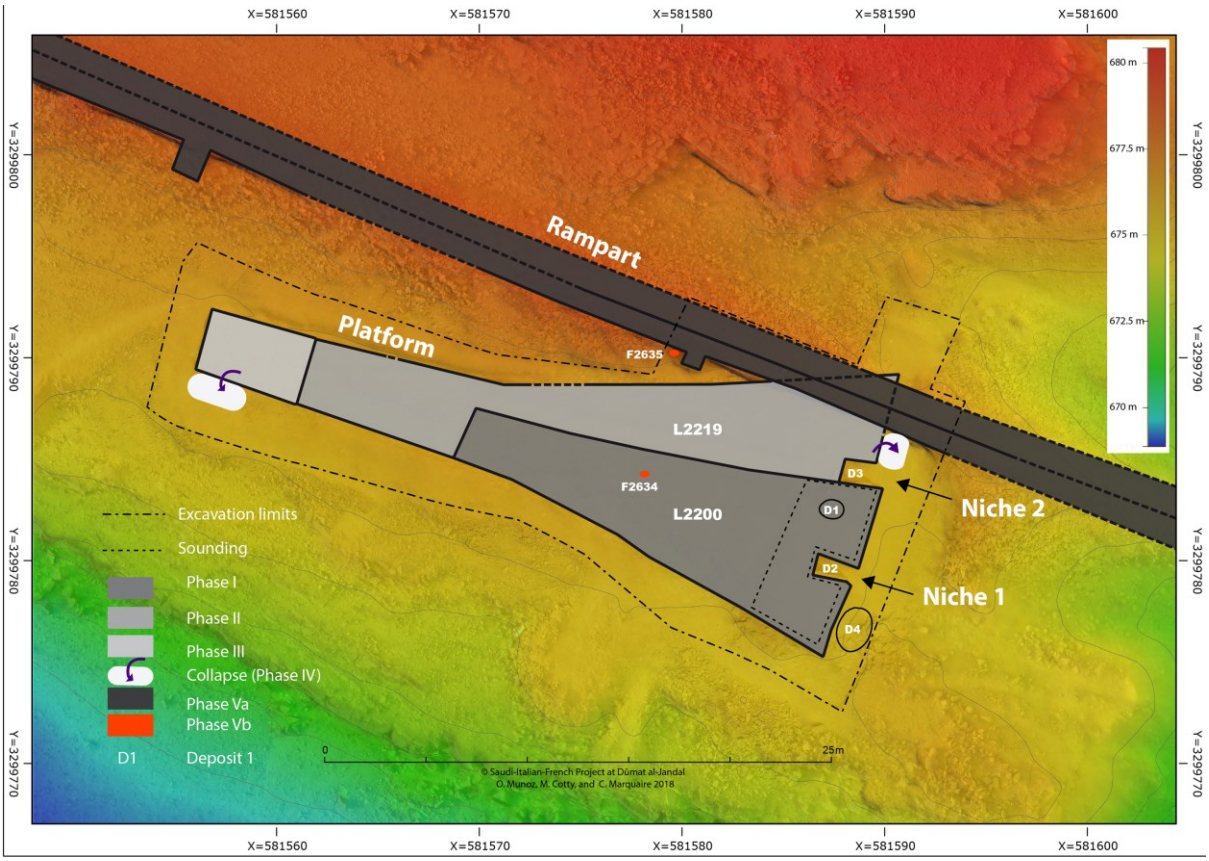

Figure 4. Plan of the platform with digital terrain model and aerial image and its construction phases, with features mentioned in the text (© Mission archéologique de Dûmat al-Jandal; figure by O. Munoz, M. Cotty, G. Charloux, C. Marquaire and R. Schwerdtner).

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Figure 5. Views of deposit 2 (niche 1) during excavation (© Mission archéologique de Dûmat al-Jandal; photographs by M. Cotty, O. Munoz and G. Charloux).

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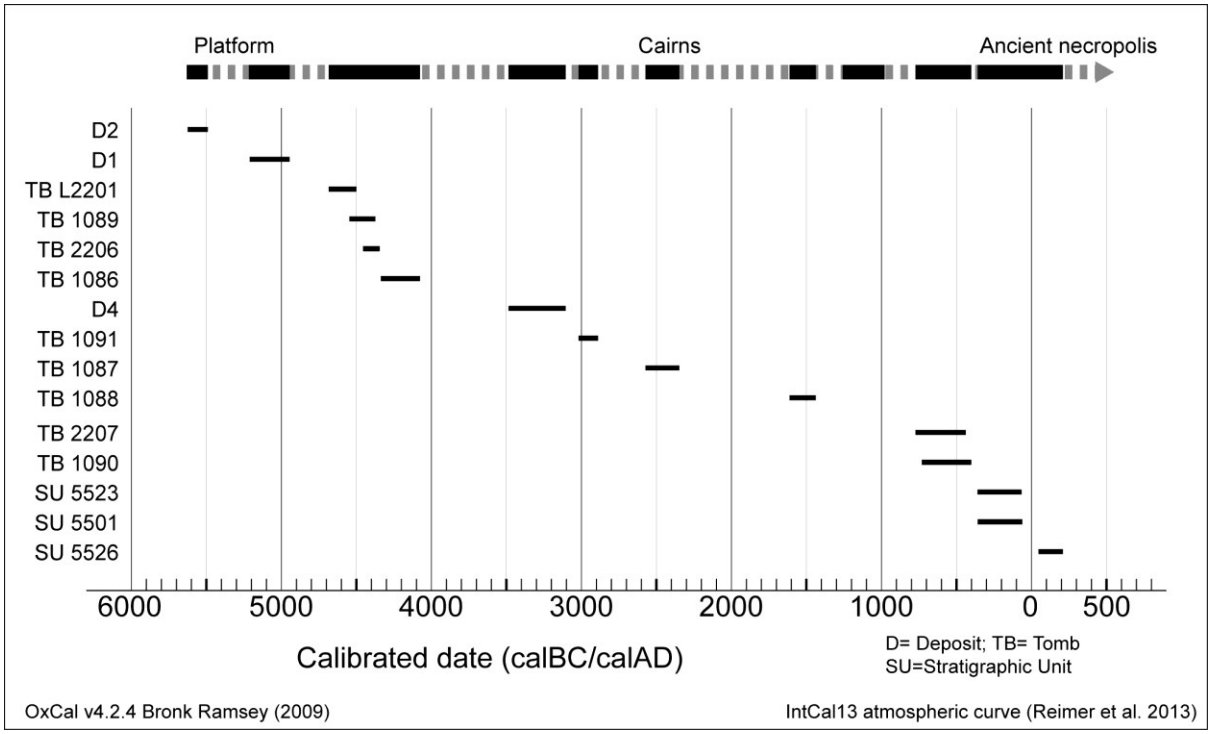

Figure 6. Radiocarbon dates and summary of the chronological sequence (© Mission archéologique de Dûmat al-Jandal; figure by O. Munoz).

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Figure 7. Artefacts from deposits 1, 2 and 4: limestone bead (A) and perforated gastropod (*Pterygia crenulata*) (B) from deposit 1; stone and shell beads from deposit 4 (C); bone tools (D–E), truncated conical stone (F), lithics (G), terrestrial gastropods of the* Melanopsidae *family (H) and gravel (I) from deposit 2 (© Mission archéologique de Dûmat al-Jandal; photographs by G. Charloux, M. Cotty and A. Chevalier).

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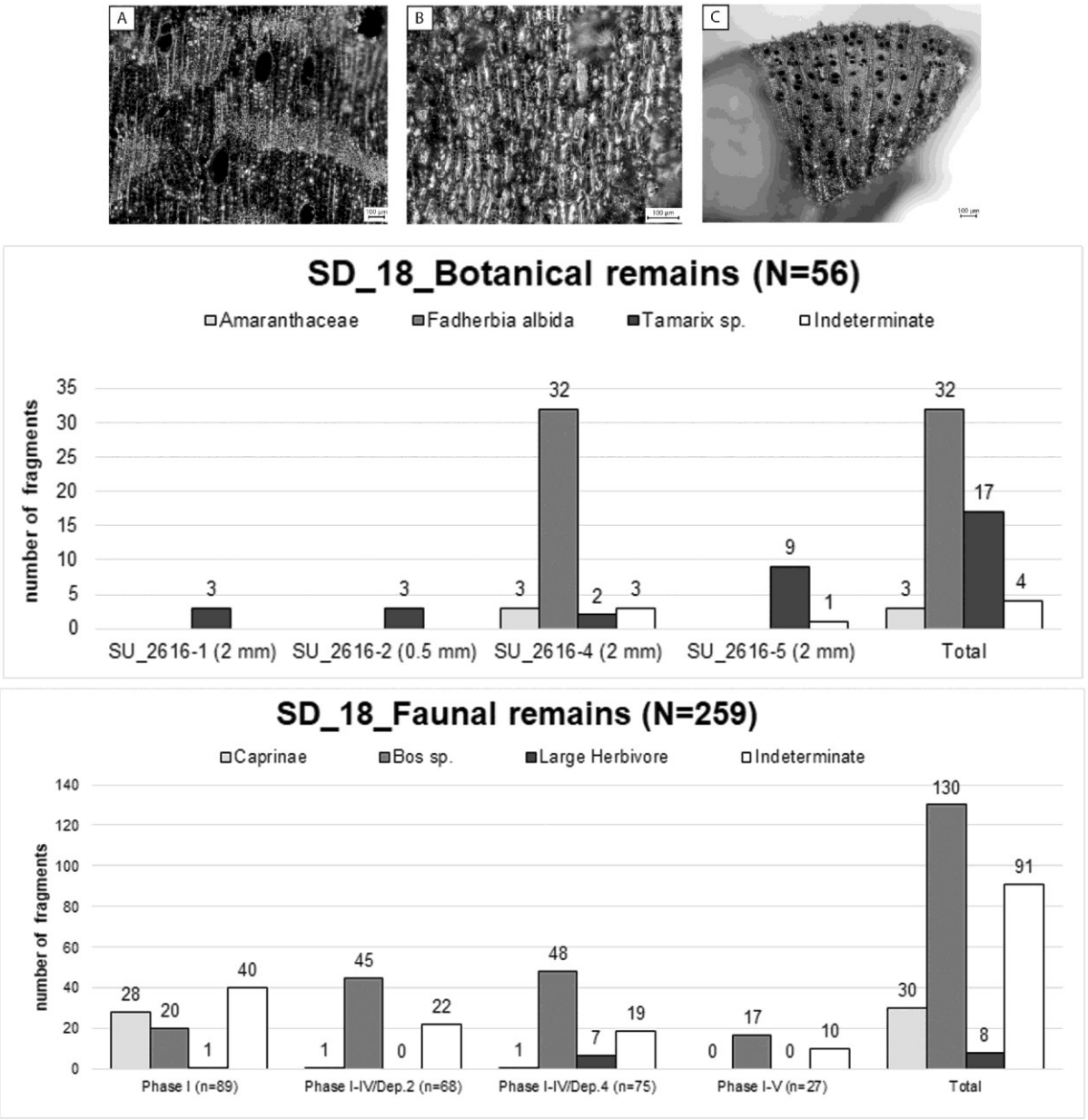

Figure 8. Top: charcoal from deposit 2, microscopic photographs A.* Fadherbia albida, *transversal section; B.* Fadherbia albida, *tangential section; C.* Tamarix *sp., transversal section (© MADAJ; photograph by C. Bouchaud). Middle: results of the charcoal study of deposit 2. Bottom: faunal remains from sounding 18 (© Mission archéologique de Dûmat al-Jandal; photograph by H. Monchot).

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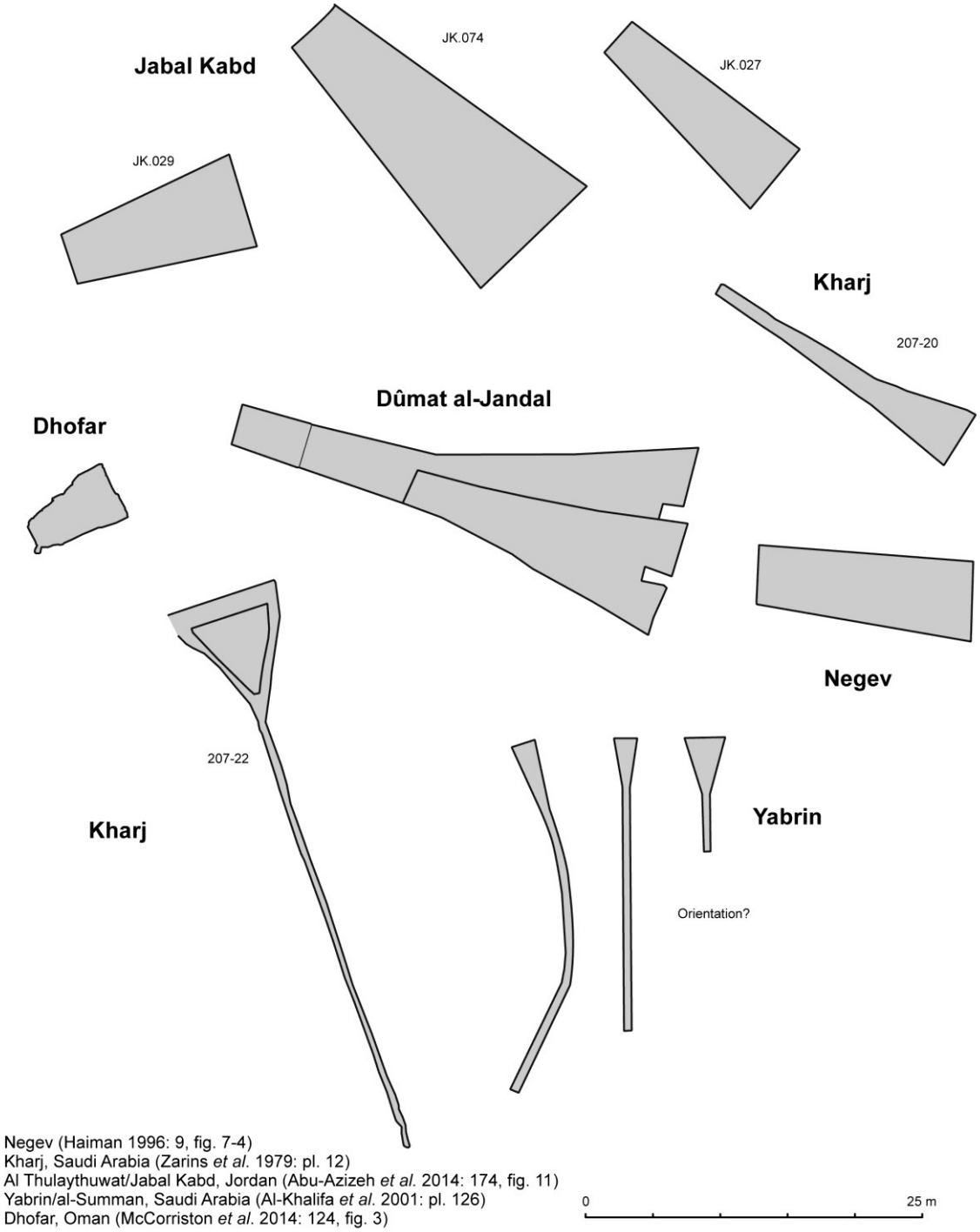

Figure 9. Schematic comparisons of known prehistoric stone platforms (© Mission archéologique de Dûmat al-Jandal; figure by G. Charloux).

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Figure 10. Artefacts from tomb L2204, SD31: A)* Dentalium *sp. beads; B) carnelian beads; C) perforated* Pterygia crenulata *shells; D) Egyptianising scarab; E) faience bead; F–G) stone beads; H) perforated* Engina mendicaria *shell (©Mission archéologique de Dûmat al-Jandal; photographs by G. Charloux and A. Chevalier).

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[Supplementary material]

Marking the sacral landscape of a north Arabian oasis: a sixth-millennium BC monumental stone platform and surrounding burials

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OSM 1. Radiocarbon dates from Dûmat al-Jandal (by O. Munoz, G. Charloux, M. Cotty & A. Zazzo).

The radiocarbon dates discussed in this text are listed in Table S1 by area of investigation (platform, survey in the surroundings, and ancient necropolis). While the dates from the platform area and the ancient necropolis were obtained from samples collected in the excavation trenches by the archaeologists, most of the dates from the nearby cairns originate from human bone bioapatite samples (Zazzo & Saliège 2011). They were collected during the 2015 survey in the surroundings of Dûmat by Anaïs Chevalier (PhD candidate at University of Paris 1) within the framework of the Saudi-Italian-French archaeological project in Dûmat al-Jandal.

All the radiocarbon dates have been calibrated with Oxcal v4.2.4 (Bronk Ramsey 2009), with IntCal13 atmospheric curve (Reimer *et al*. 2013). The calibrated dates are given with a 95.4% range probability (2σ).

Table S1. Radiocarbon dates from Dûmat al-Jandal protohistoric structures (Table by O. Munoz).

LAB #	Context	Nature	Species	Radiocarbon age BP		Date, cal BC/AD (2σ)	
Platform area							
UBA-32224	Deposit 2 [SD18_L2200_SU2616]	Charcoal	*Tamaris*	6619	±37	5625 BC	5490 BC
SacA44356	Deposit 1 [SD18_L2200_SU2608]	Bone (apatite)	*H. Sapiens*	6110	±30	5210 BC	4940 BC
SacA44357	Tomb L2201	Bone (apatite)	*H. Sapiens*	5735	±30	4685 BC	4500 BC
SacA44355	Deposit 4 [SD18_L2200_SU2605]	Bone (apatite)	*H. Sapiens*	4555	±30	3485 BC	3100 BC
UBA33305	Fireplace [SD18_L2200_F2635]	Charcoal	-	2386	±32	730 BC	395 BC
UBA33306	Tomb L2204 [SD31_SU2910]	Charcoal	-	2026	±32	155 BC	AD 55
Cairns (survey)							
SacA44370	Tomb 1089	Bone (apatite)	*H. Sapiens*	5645	±30	4545 BC	4370 BC
SacA44358	Tomb L2206	Bone (apatite)	*H. Sapiens*	5545	±30	4450 BC	4340 BC
SacA44367	Tomb 1086	Bone (apatite)	*H. Sapiens*	5385	±30	4335 BC	4075 BC

SacA44378	Tomb 1091	Bone (apatite)	*H. Sapiens*	4310	±35	3020 BC	2880 BC
SacA44368	Tomb 1087	Bone (apatite)	*H. Sapiens*	3960	±30	2575 BC	2345 BC
SacA44369	Tomb 1088	Bone (apatite)	*H. Sapiens*	3235	±30	1610 BC	1435 BC
SacA44359	Tomb L2207	Bone (apatite)	*H. Sapiens*	2470	±30	770 BC	430 BC
SacA44371	Tomb 1090	Bone (apatite)	*H. Sapiens*	2390	±30	730 BC	395 BC
Ancient necropolis							
SacA44361	SectD_Trench10_SU5523	Burned bone (apatite)	*H. Sapiens*	2150	±30	360 BC	60 BC
SacA44360	SectD_Trench2_SU5501	Bone (apatite)	*H. Sapiens*	2145	±30	355 BC	55 BC
SacA44366	SectD_Trench10_SU5526	Bone (apatite)	*H. Sapiens*	1895	±30	AD 50	AD 215

OSM 2. Notes on the human bones from the Deposits 1 and 4 (by O. Munoz).

Deposit 1 consists of two concentrations of human bones lying horizontally in the stone filling of the platform, about 0.80m from the bedrock. The first concentration is mainly represented by a secondary deposition of five long bones diaphysis (femur, radius and three portions of indeterminate long bones), as well as a skull cap fragment about 100mm in diameter, a femur head fragment, a vertebral arch fragment, and a cuneiform fragment.

A few dozen centimeters further north, at the same altitude, few fragments of indeterminate long bones were grouped with altered remains of a coxal bone.

Unfortunately, the poor state of conservation of the human remains limits their proper identification. At least one individual is represented, and the format of the bones found corresponds to an adult skeleton. However, the absence of the extremities of the long bones does not make it possible to ascertain the state of synostosis. It can therefore only be stated that at least one individual over 15 years of age is represented.

Some long bones had axial deformations due to the weight of the stones and sediments covering them. This suggests that they were still "fresh" (containing collagen) when they were buried, because in the opposite case (totally dry bones), they would have been fractured.

In Deposit 4, 2647 bone fragments have been collected, from which 450 have been identified. The remaining 2197 were too fragmentary to be precisely determined (e.g. small fragments or splinters from a skull(s), long bone diaphysis, or spongious bone). At least five individuals are represented in this assemblage including one subadult (1–4 years old), and four adults.

The position of the bones and artefacts, which rested at varying depths in the sediment, indicate a secondary deposit and probable disturbances. Although the provenience of the primary deposit is unknown, we can assume that it comes from a funerary structure in the vicinity, as suggested by the presence of small bones and pearls, and the presence of disrupted stone tombs in the area (e.g. Tomb L2201; Figure 2). Finally, the state of preservation of the bones, rather good despite their fragmentation, suggests that they have not been exposed to climatic agents for long periods (limited weathering). Therefore, it is unlikely that these funerary remains would have been disposed of in front of the eastern wall of the platform.

OSM 3. Tables of the archaeobotanical and faunal studies (by C. Bouchaud & H. Monchot).

Table S2. Identification of the archaeobotanical remains found in the Niche 1 (SU 2616) of the platform (table by C. Bouchaud).

Fraction	Amaranthaceae	*Fadherbia albida*	*Tamarix* sp.	Indeterminate	Total
SU_2616-1 (2mm)			3		3
SU_2616-2 (0.5mm)			3		3
SU_2616-4 (2mm)	3	32	2	3	40
SU_2616-5 (2mm)			9	1	10

Total	3	32	17	4	56

Table S3. Identification of the faunal remains found in the platform (table by H. Monchot).

Phase	*Caprinae*	*Bos*	Large herbivore	Indeterminate	Total
Phase I (n=89)	28	20	1	40	89
Phase I-IV/Dep.2 (n=32)	1	9	0	22	32
Phase I-IV/Dep.4 (n=72)	1	46	6	19	72
Phase I-V (n=27)	0	17	0	10	27
Total	30	92	7	91	

OSM 4. Notes on the beads found in Deposit 4 and SD31 (L. 2204) (by O. Brunet).

Thirteen beads mixed with the human remains were recovered from Deposit 4: two cylindrical shell beads, three cylindrical stone beads, three flat beads of whitish stone, and five carnelian beads.

Although the materials and typologies of the beads do not refer to a precise chronological period, the presence of chalcedony (worked and unworked) is particularly interesting, as it hints at mid- to long-distance contacts from the Chalcolithic to the first millennium BC.

Chalcedony deposits, which carnelian belongs to, seem to be present in western Saudi Arabia in small quantity, as stated by M. Tosi (Tosi 1980). Flint drills discovered in Rajajil, 32km from Dûmat, suggest local working of hard stones in the area (Adams *et al.* 1977: Pl. 15, n° 17, 28, 29; Eichmann *et al*. 2006: 101). Some 270 km south-west, at Taymā', a carnelian bead workshop was found (Bawden *et al.* 1980; Miller 1984; Hausleiter 2013; Al-Ghabban *et al.* 2010: 250–51). Beads found there show similar sizes and the same technological know-how. This could suggest a local origin for carnelian products. For later contexts, however, an Egyptian origin of carnelian beads can be assumed (Aston *et al.* 2000: 26–27; Bloxam 2006), and is supported by the artefacts discovered during the excavation of a looted tomb located at 20m of the platform (SD31, TB L2204, excavated by Anaïs Chevalier (PhD candidate at University Paris 1; Figure 2). There, several carnelian beads were found in association with *Dentalium* and *Pterygia crenulata* shells, whose species may be found in the Red sea (Bar Yosef 2005), as well as an Egyptianized scarab (see OSM 5), and a faience bead with a light green superficial glaze (Figure 9). It is well known that Egypt was one of the main areas of development of this glazing technique (Caubet & Pierrat-Bonnefois 2005). Radiocarbon dating from this tomb indicates a much more recent date than the platform and the Deposit 4 (155 cal. BC–AD 55; Table S1). In Taymā', several objects with Egyptian influence were also discovered (see al-Ghabban *et al.* 2010: 231; Hausleiter 2013).

Therefore, if contacts between North-Western Arabia and Egypt are well attested for the first millennium BC, more investigation will be needed to prove such contacts during the protohistoric period.

OSM 5. Notes on scarab O.2910-1 from a looted tomb (SD31, TBL2204) (by V. Boschloos).

This scarab-shaped seal-amulet is made of steatite and traces of blue glaze remain inside the engravings. The object is pierced longitudinally and measures 12 × 8 × 7mm. Its base is engraved with a stylized representation of a human figure (most probably male) facing right. While its right arm hangs down next to the body, its left arm is raised in front of the figure. He wears a long skirt, decorated with crossing lines, either indicating decorative patterns or folds in the fabric. A vertical incision is discernible in the lower right part, connected to the front of the skirt. On the edges, sections of a line surrounding the entire design are still visible.

The figure most likely represents an Egyptian Pharaoh, as the contours of the headdress indicate that he is wearing the *Pschent* or the Egyptian Double Crown. He is shown in a standing pose,

with one foot visible below. Depictions of a single royal figure as a main motif appear on scarabs as early as the seventeenth–sixteenth century BC (e.g. Ben-Tor 2007: pl. 63, n° 6-7 & 20, pl. 102, n°14 & 25), but they are particularly popular during the Egyptian New Kingdom (eighteenth–twentieth dynasties, *c.* 1550–1075 BCE), especially during the early to mid-eighteenth dynasty, and between the mid-nineteenth and mid-twentieth dynasty (Wiese 1990: 11). The image of the standing pharaoh is also occasionally engraved on Egyptian scarabs at the beginning of the Late Period (twenty-sixth dynasty, *c*. 664–525 BCE) as a result of an 'archaising' trend in that period, for example, on a scarab attributed to the twenty-sixth dynasty found at Tel Dan: Keel (2010: 390–91, n°21) and parallels cited there.

However, the great majority of these scarabs show the king holding the *ḥqa* sceptre, the *was* sceptre, and/or the flagellum, wearing the Khepresh or Egyptian Blue Crown, in his ceremonial function as divine leader. One variation of the theme is the standing royal figure with a cobra or uraeus, which highlights the protective and apotropaic power of the royal figure, and consequently of the seal-amulet. Either single or in pairs, the cobra is placed in association with the king (next to or below his feet), or is in direct contact with the king, attached to his skirt (Wiese 1990: 18–24, see p. 23 for the interpretation of the cobra attachments as belts in the royal dress).

The latter seems to be the case on the scarab from Dûmat al-Jandal. Such cobras are protruding outwards from one or both sides of the king's skirt, hanging down from it and looking outwards, in this case from the front. However, the best parallels for the present scarab depict a kneeling pharaoh with a uraeus attached to his skirt (kept in the Egyptian Museum in Cairo, see Wiese 1990: 20 n°231-233, abb. 32). Most interestingly, the standing or kneeling pharaoh with uraei is most frequently attested on scarabs dated to the Ramesside Period (e.g. Teeter 2003: n°11). Even though only a few bear royal names that would allow linking them to particular kings or dynasties, the style of their engravings and the morphology of the scarabs suggest that this iconographic sujet does not appear before the nineteenth dynasty (Wiese 1990: 20).

Furthermore, the morphology of this particular scarab does not exclude a date as early as the New Kingdom (for typological characteristics see Keel 1995: 50–51). When seen from above, the legs surround the beetle like a frame, and small v-shaped notches are engraved on the humeral callosities (the 'shoulders' of the beetle). The legs are carved out and may have been decorated with parallel hatching. Unfortunately, the state of preservation of the scarab's surface does not allow discerning details on the scarab's head and legs.

In conclusion, I should emphasize that this is one of the few scarabs from controlled excavations in Saudi Arabia (see also concluding remarks in Boschloos & Akkermans forthcoming). Less than a dozen scarabs have surfaced in the Arabian Peninsula, and all were found along the coast of the Arabian Gulf and in Southern Arabia. The presence of this scarab at Dûmat al-Jandal, in the Northwest of Saudi Arabia, is currently an isolated find. Contrary to other finds on the peninsula, it probably arrived by land. The presence of Egyptian-style objects at the site is explained by its proximity to the Sinai and to the Southern Levant, where large numbers of Egyptian and Egyptianising scarabs circulated from the early second millennium BC to at least the mid-first millennium BC.

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