

The Al-Mudhaybi Regional Survey: field seasons 2021 and 2022

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Summary

During the final two field seasons of the Al-Mudhaybi Regional Survey in central Oman conducted in 2021 and 2022, systematic field-walking of the north-south transects continued. This resulted in the discovery of a possible Neolithic to Early Bronze Age flint scatter north-east of Al-Khashbah and an Iron Age settlement at Shariq. The area of the Iron Age settlement also incorporates a possible Umm an-Nar period tower. Additionally, excavations were carried out at the Umm an-Nar period site of Al-Qabrayn. Here, stone walls and mud-brick structures radiocarbon-dated to 2800–2400 BC were uncovered, which might be the remains of another third-millennium BC tower. These findings, together with those from the 2019 and 2020 field season, allow initial reconstructions of the archaeological landscape of the region. Different phases of site concentration and dispersal as well as shifting site locations are presented in a diachronic perspective. While the Neolithic and Hafit periods are scattered over most of the survey area, Umm an-Nar, Wadi Suq, and Iron Age remains are concentrated in just a few places. Interestingly, there is little continuation regarding site location between the different periods.

Keywords: survey, transects, central Oman, find scatters, landscape archaeology

Introduction

The aim of the Al-Mudhaybi Regional Survey was to reconstruct the archaeological landscape of the Al-Mudhaybi region in central Oman from the Stone Age to the present day, with a special focus on Bronze Age developments. While the early days of archaeological surveys in Oman were mainly concerned with putting places on a hitherto blank map, more systematic approaches have been employed since 2000 (e.g. Al-Jahwari 2008; Giraud & Cleuziou 2009; Giraud et al. 2010; Cable 2012; Williams & Gregoricka 2013; Harrower et al. 2014; Kondo et al. 2014; 2016; Düring & Olijdam 2015; Kennet, Deadman & Al-Jahwari 2016; Deadman 2017; Nathan Staudt 2017; Cable & Al-Jabri 2019; Dollarhide 2019). The Al-Mudhaybi Regional Survey falls within this tradition. After conducting remote sensing on freely available satellite images and subsequent ground-truthing in 2019 (Döpper & Schmidt 2020), as well as the first field-walking of transects and small-scale excavations at the sites of Al-Batha, Al-Fath, and Mukhtru in 2020 (Döpper 2022a) in the last and final two field seasons of the project in 2021 and 2022, field-walking continued and excavations were carried out at Al-Qabrayn (Fig. 1). The results of these two field seasons are presented in this paper.

The survey area of the Al-Mudhaybi Regional Survey

incorporates different kinds of landscapes. In the west, the survey area is bordered by the Sufrat al-Dawh mountain range and in the south-east by the Al-Hammah mountains. Smaller are the Jebel al-Shuway'ī mountains in the north, the Qarn al-Aqban, north of the modern town of Lizq, and the Jebel al-Khashbah, east of the modern village of the same name. The area is also characterized by the two large wadi systems of Wādī Andam and Wādī Samad, crossing the area from north to south. Between the mountains and the wadis, the area is made up of ancient and sub-recent alluvial terraces. The different types of landscape impact the distribution of structures and finds in the survey area. For example, most of the finds from the transects come from sub-recent alluvial fans and terraces, which only account for c.40% of the geological background of the transects. The opposite is true for ancient alluvial fans and terraces. Here, fewer finds were made compared to the presence of this geological type in the transects (Döpper 2022b).

Results of the 2021 and 2022 field seasons

Field-walking the transects

Systematic field-walking covered eight evenly spaced (4 km apart), 30 km-long north-south transects.

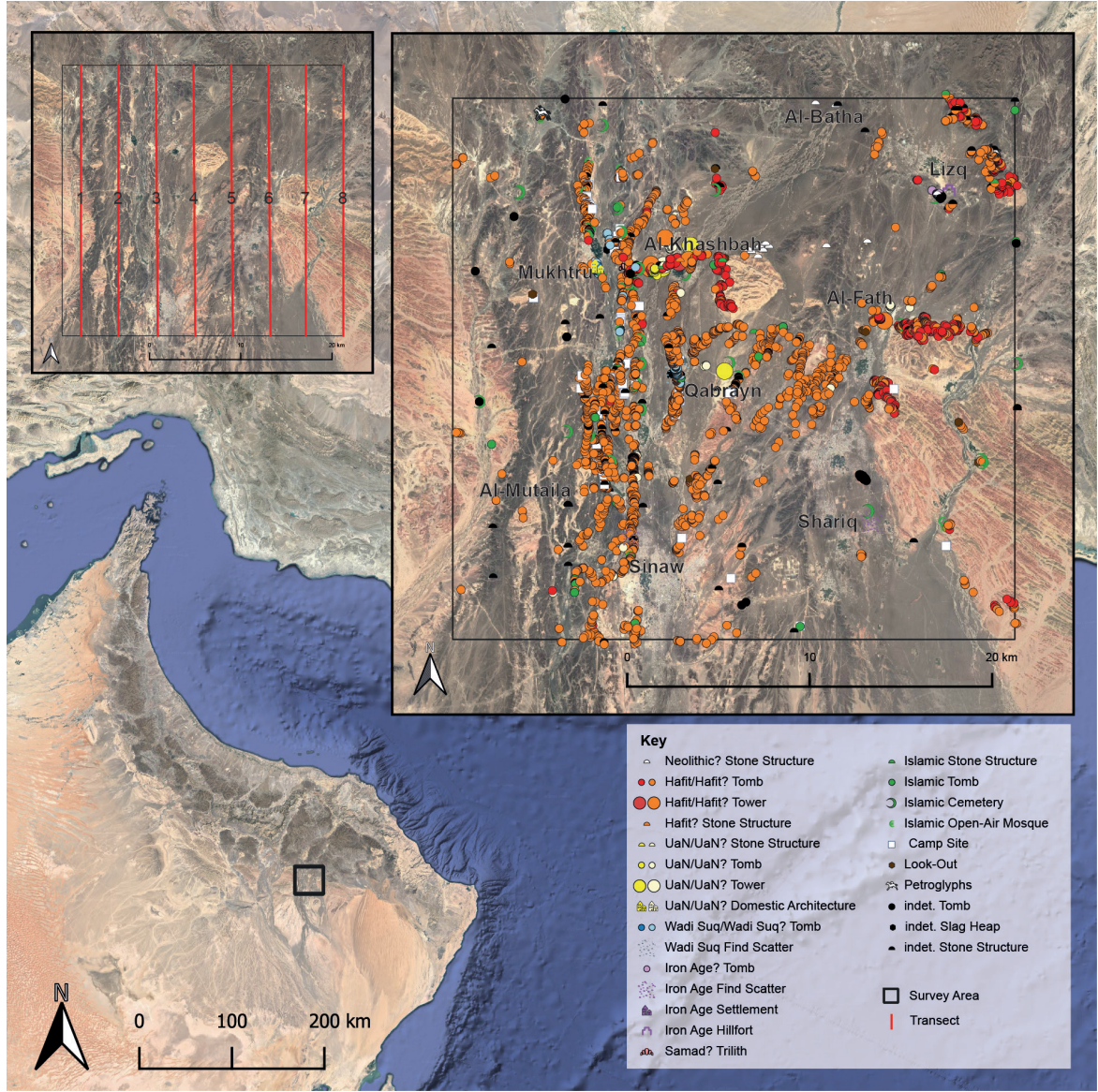


FIGURE 1. A map of the Al-Mudhaybi survey area with field-walked transects and structures identified during remote sensing and ground-truthing.

Field-walking was undertaken in teams of four, with individuals spaced 2 m apart to ensure complete visual coverage of the area. All surface finds were collected and their positions recorded with a hand-held GPS (Garmin eTrex10). One of the transects (transect 3) was completed during the 2020 field season, transects 4 to 6 in the 2021 field season, and transects 1, 2, 7, and 8 in the 2022 field season (see Fig. 1). In total, c.240 km have been field-walked. During this process, nearly 20,000 pieces

of pottery were found, as well as flint tools, seashells, personal adornments, soft-stone fragments, and other small finds.

The systematic field-walking survey identified three substantial find scatters indicating the presence of sites. The first site, discovered in 2020 at the southern end of transect 3 in the outskirts of the modern city of Sinaw, was previously known to the Ministry of Heritage and Tourism of the Sultanate of Oman but not hitherto

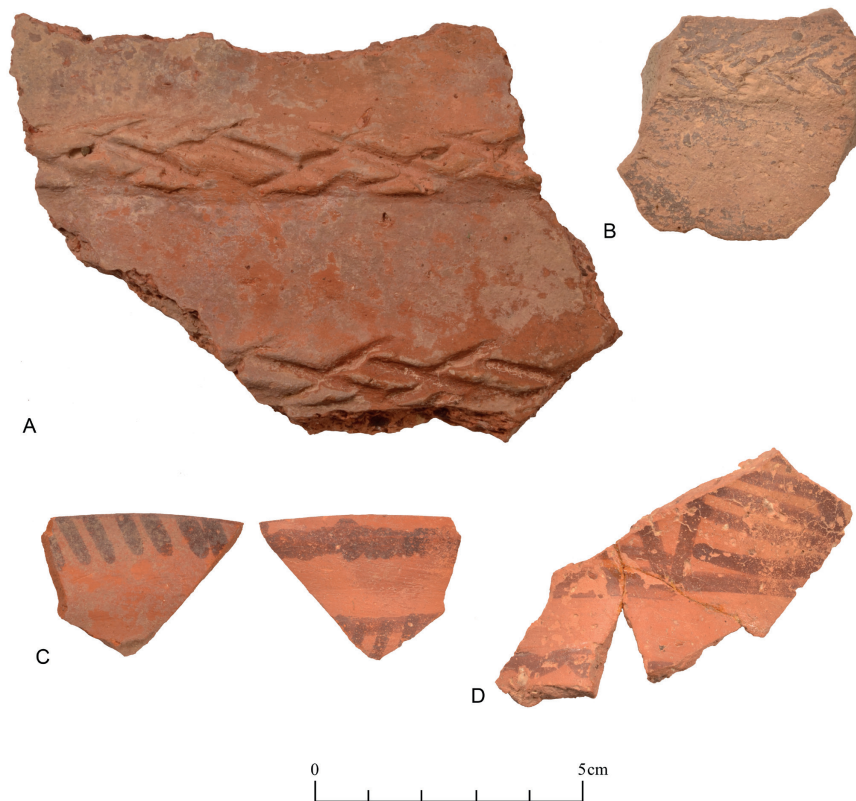


FIGURE 2. Iron Age II pottery sherds from the transect at the Iron Age site of Sinaw. **A and B.** fragments of storage vessels with criss-cross incisions (MDH20Z-05970 and MDH20Z-02655); **C.** fragment (front and back) of a bowl in fine red painted ware (MDH20Z-04461); **D.** fragment of a small jug in fine red painted ware (MDH20Z-03078).

investigated (Döpper 2022a: 158–159). Surface pottery clearly dates it to the Iron Age II (Fig. 2). In 2021 a second Iron Age settlement was identified at the southern end of transect 6 in the vicinity of the modern village of Shariq (Fig. 3). Here, Iron Age pottery is spread over a vast area, incorporating several small hillocks on both sides of a wadi branch. In transect 6, 2250 pottery sherds were found along a 5.3 km stretch (Fig. 3). Most of the sherds date to the Iron Age but early Islamic Turquoise Glazed Ware (TURQ) was also present among them. Generally, the pottery spread is not as dense as that observed on transect 3 in Sinaw but it covers a much wider area. Approximately 200 m east of the transect line and discovered by chance on the way to the transect is a circular hill with walls made of massive stone blocks (Fig. 3). Today these walls are mainly visible on the lower flanks of the hill (Fig. 3/B–C). Most of the pottery sherds on the surface in this area are Iron Age, but the large stones used in construction and a few Umm an-Nar sherds also found on the surface (Fig. 3/D) indicate the possible presence, below the Iron Age layers, of an Early

Bronze Age monumental tower. This would place it in a fairly similar situation to the Umm an-Nar and Iron Age settlements of Izki (Schreiber 2007: 130–131). Here, the settlement area (Iz0118) south of the Umm an-Nar period tower (Iz0005) was covered with Iron Age sherds, although some Umm an-Nar sherds were present as well.

The third find scatter was discovered in the northern part of transect 4. It presented a high volume of collected lithic artefacts, corresponding to two-thirds of the total amount of lithic material collected during the systematic surveys (1887 pieces out of 2916). The debitage is flake-oriented with multi-directional flake cores (91) and a high rate of simple flakes (1287) and production waste (305). Most flakes are unidirectional and present a plain butt with prominent bulbs. Several knapping accidents, as with the reflected and hinged flakes, further support the idea that direct percussion with a hard hammer was the technique most frequently used. Even the retouched pieces (198) show inaccurate blanks preparation and retouch, often abrupt or semi-abrupt.

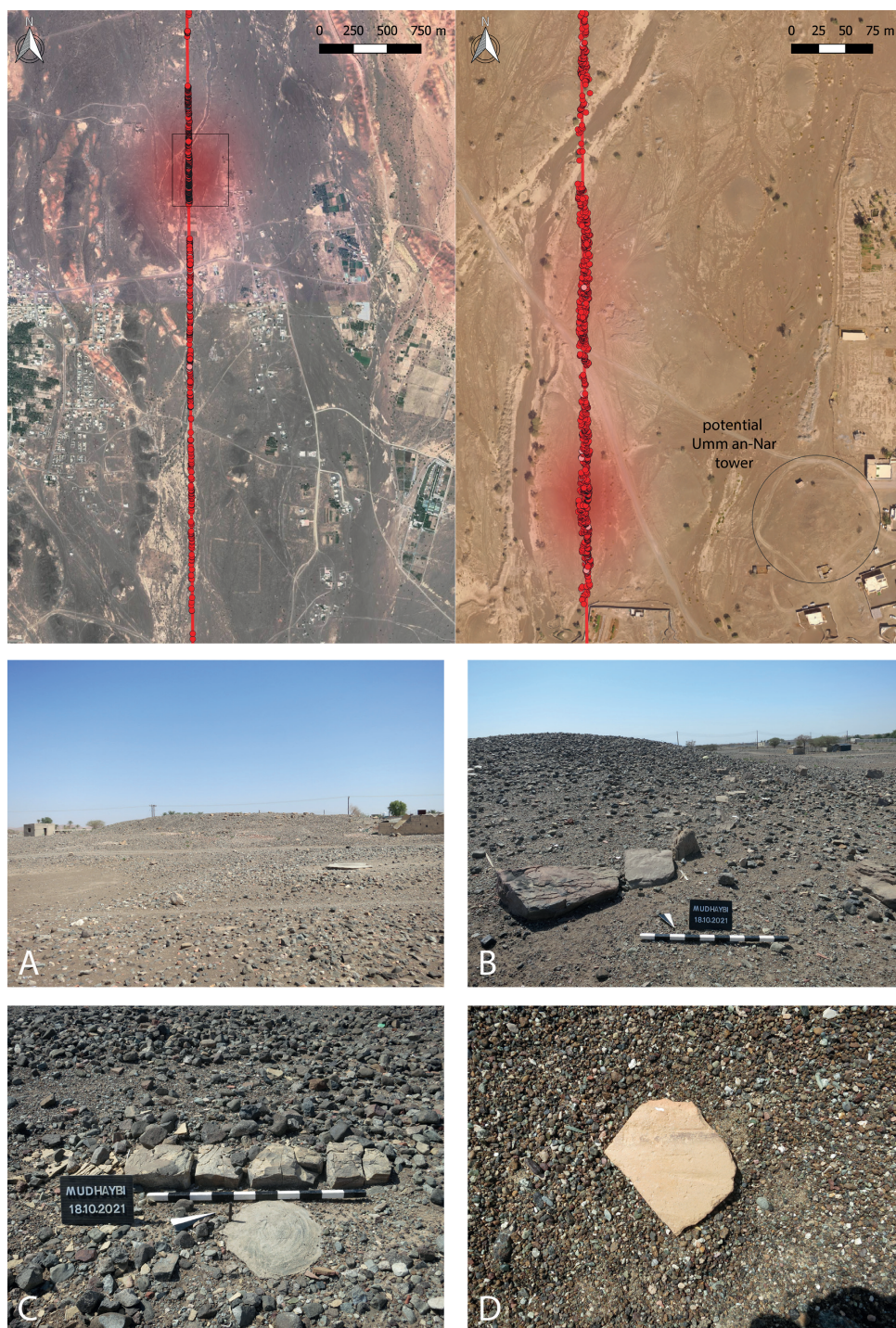


FIGURE 3. The Iron Age settlement of Shariq with a possible Umm an-Nar period tower; red dots indicate pottery finds from the transect; the heat map shows the distribution of finds on the transect in the background. **A.** View of a possible Umm an-Nar tower at Shariq; **B and C.** the remains of stone walls made from large stone slabs; **D.** an Umm an-Nar pottery sherd from the surface of the potential tower.

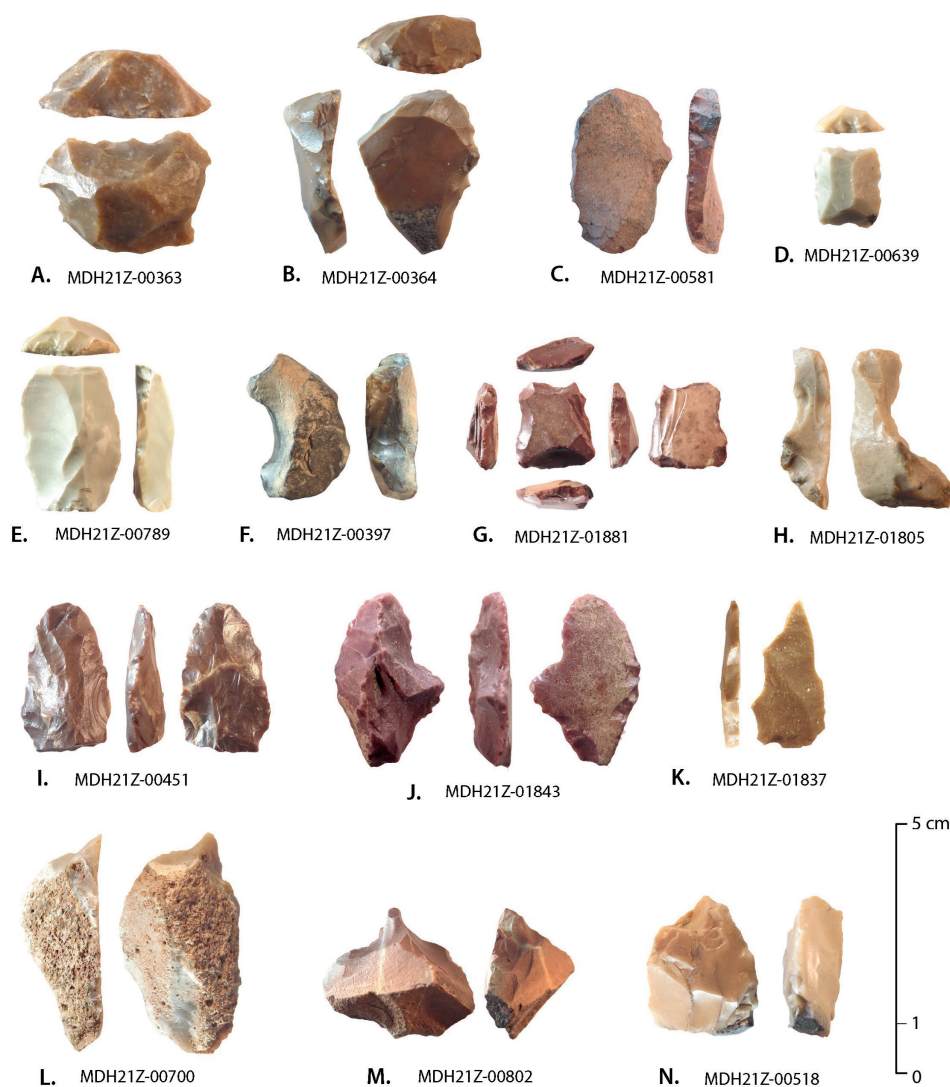


FIGURE 4. Some of the retouched lithic artefacts: **A.** denticulate; **B–E.** scraping tools; **F–H.** notches; **I.** biface; **J, K and M.** composite tools; **L.** simple borer; **N.** burin.

Exposure to the surface means the presence of pseudo-retouch is very common (more than 90% of the implements). The more recognizable tools are the notches (24; Fig. 4/F–H), scrapers (32; Fig. 4/B–E), denticulate (22; Fig. 4/A), borers (14; Fig. 4/K, L) and composite tools (20; Fig. 4/J, K, M), with a small presence of bifaces (7; Fig. 4/I), burins (9; Fig. 4/N), and scaled pieces (4). Composite tools are particularly interesting, as we see the recurrent presence of side-notched scraping tools (one-third of the total number), notched or burinated drills (Fig. 4/K, M). Chronologically, the assemblage fits with that characterizing the first

Neolithic site excavated in the area (KHS-A, Maiorano et al., in preparation) dating to the fifth millennium BC. In this phase of Omani prehistory, borers, scraping tools, and notches were the most common tools in lithic assemblages. However, implements with heavier patination or blade-oriented blanks were identified and might be related to older industries, but the specimens are too few to proceed with an in-depth analysis. Moreover, studies on the function of the collected tools, and on the lithic assemblages from the area generally, are still underway and any wider interpretation at this stage of research would be premature.

Excavations at Al-Qabrayn

In 2021 a small mound was observed in the extensive field systems of the late Islamic site of Al-Qabrayn. In addition to late Islamic pottery, a few Umm an-Nar period sherds were discovered on its surface. On the south-western side of the mound, one-fifth of a circular stone wall (or c.10 m of a full 51 m-diameter wall) was recorded. Both the Umm an-Nar pottery and the wall were the deciding factors for starting small-scale excavations here during the 2022 field season. Excavations were carried out on the eastern side of the hill in a 4 x 9 m large trench with a 4 x 3 m extension to the north (Fig. 5). Here, remains of two parallel stone walls, not aligned to the circular stone wall on the south-western part of the hill, were visible on the surface. The topmost layer of the excavations consists of fist-sized stones. Several of these stone heaps were visible on the top of the hill (Fig. 5, grey circles). The function of these stone heaps is unclear and the initial idea that they represent tombs was disproved. In between the stones, several copper, crucible, and ground stone tool fragments were found, along with seashells and Umm an-Nar pottery sherds (see Fig. 8). The accumulation of stones overlays a mud-brick structure and a stone wall (A-Inst. 0019 and A-Inst. 0015 respectively; Figs 5 & 6). The stone wall consists of medium-sized (15 x 15 x 7 cm to 50 x 30 x 15 cm) reddish or grey limestone slabs, occasionally interspaced with pebbles. In the northern part of the excavation area, the stone wall comes to an end. Here, and between this stone wall and the smaller stone wall (A-Inst. 0020), the mud-brick structure continues. As far as can be ascertained, mud bricks generally measure 30–40 x 20–35 x 7–8 cm. Half-sized mud bricks were used to line the stone wall A-Inst. 0015 and the space between the two stone walls. Interestingly, several of the mud bricks from the structure featured the finger impressions of their makers. Two radiocarbon dates (MAMS-56350 and MAMS-56351) from charcoal found between the mud bricks of this structure date to 2850 to 2475 2σ cal. BC, well into the Umm an-Nar period (Fig. 7). Additionally, similar radiocarbon dates come from the layer of decayed mud bricks above the structure as well as the deposits from this and a second stone wall (A-Inst. 0020; Fig. 5). East of, and most likely also below, the stone structure, there is a layer of compacted earth (A-Inst. 0017; Fig. 6). To the east, the mud-brick structure was

increasingly eroded and cut by the agricultural soil of the late Islamic field system (A-Fs0050/A-Fs0073; Fig. 6). Here, a hole, measuring 20 cm in diameter and 14 cm in depth and filled with gravel, was recorded (A-Inst. 0025; Fig. 6). In these deposits, late Islamic as well as Umm an-Nar pottery sherds were found (Fig. 8/D). The natural soil was reached in the lowest layers, which were only excavated in the south-eastern corner of the excavation area (A-Fs0075; Figs 5 & 6).

While an Umm an-Nar date for the structure is beyond doubt, no general plan could be reconstructed from the excavations. The straight stone wall and adjacent mud-brick structure do not correspond either with the circular layout of an Early Bronze Age tower or with the circular wall visible on the surface in the south-western part of the hill, but neither do they correspond with the common rectilinear domestic structure of that period. It is possible that the outer features of the mud-brick structure vanished into the late Islamic field system and that we are dealing with the interior features of a third-millennium BC monumental tower. This, however, cannot be verified at present.

Discussion and outlook

The results of four years of archaeological research have enabled us to start reconstructing the archaeological landscape in the Al-Mudhaybi regions. So far, no material has been found that has been unequivocally identified as Palaeolithic, which is representative of the general scarcity of remains from this period in the region. The Neolithic is mainly evident from single arrowheads found in the landscape without any other context, potentially from the flint scatter in the northern part of transect 4 — although a Neolithic date cannot be confirmed at present — and from the Neolithic structures east of Al-Khashbah (Maiorano et al., in preparation). Additionally, more than 300 small stone structures were identified while ground-truthing and field-walking the transects (Fig. 9) whose date is mainly unclear, although a Neolithic date is possible as surface finds comprise only flint tools and their general shape is reminiscent of those from more thoroughly investigated Neolithic sites of the interior such as Lizq-2 (Weisgerber 1981: 252–258) and Jebel al-'Aluya near Ādam (Lemée et al. 2013), as well as the site of Al-Batha, excavated by the project in 2020 (Döpfer 2022a). No finds were made and, aside from

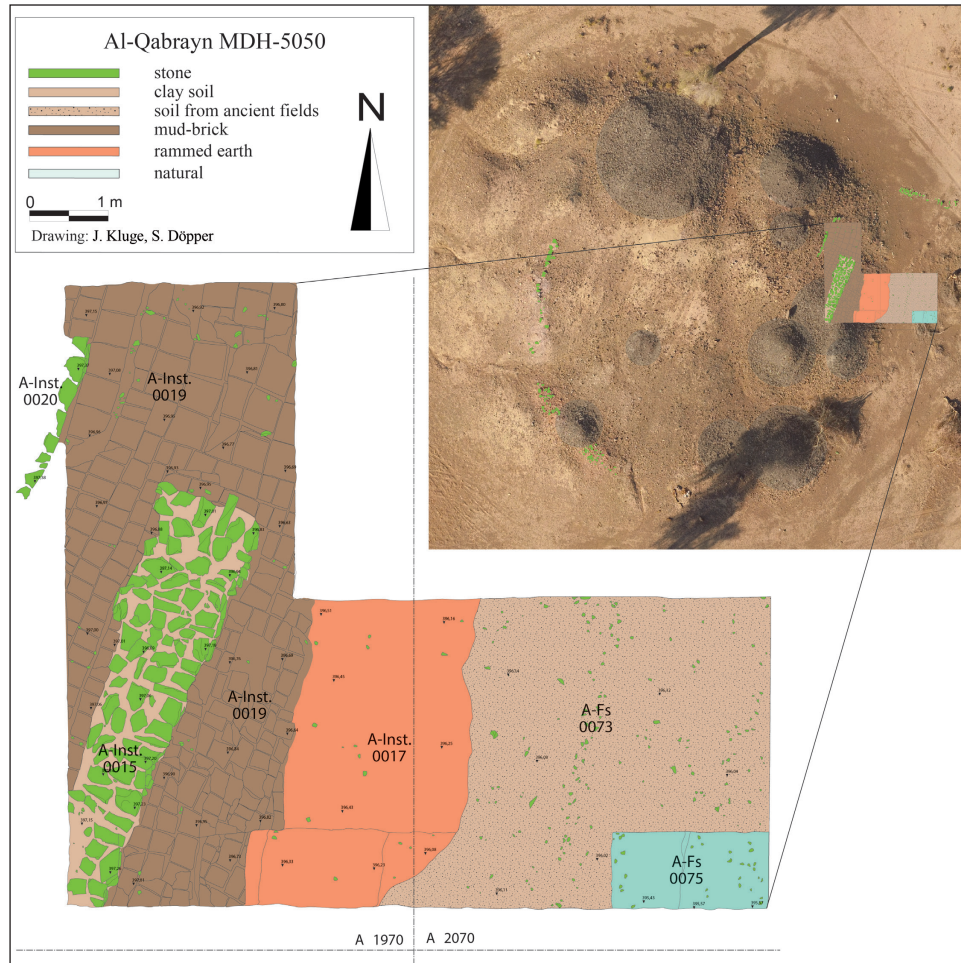


FIGURE 5. A map of Al-Qabrayn MDH-5050. Features: A-Inst. 0015 = stone wall of reddish and grey stone slabs; A-Inst. 0017 = compacted earth; A-Inst. 0019 = mud-brick structure, eroded to the east; A-Inst. 0020 = stone wall of reddish stone slabs. Grey circles indicate stone accumulations.

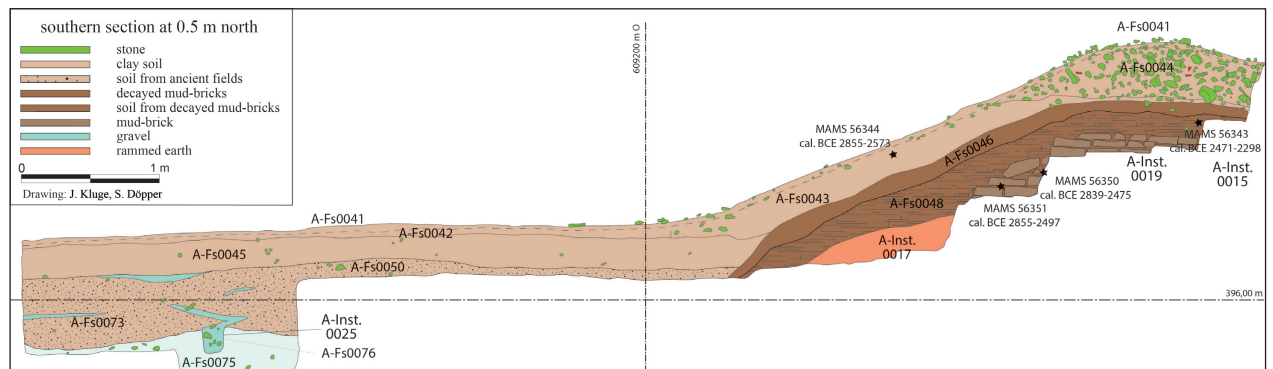


FIGURE 6. Southern section at 0.5 m north. Layers: A-Fs0041 = surface; A-Fs0042/A-Fs0043 = fine, soft, light-brown to beige earth with a few small stones and some gravel; A-Fs0044 = numerous small stones (limestone, gabbro) in soft, fine light-brown earth; A-Fs0045 = medium-coarse to coarse, medium-hard earth with some stone and a little gravel, many small roots; A-Fs0046 = soft, light-brown to beige soil of decayed mud bricks; many charcoal inclusions; A-Fs0048 = mud-brick debris with a few gravel inclusions; becomes less compact down the slope; A-Fs0050/A-Fs0073 = soil from the late Islamic field system; medium coarse, medium hard, some stone and gravel inclusions; harder and more gravel bands in the lower part (A-Fs0073) and a high number of Umm an-Nar period pottery sherds; A-Fs0075 = very hard, light-coloured natural virgin soil, no artefacts; A-Fs0076 = gravel.

Lab code	Sample name	Locus	¹⁴ C age [yr BP]	±	δ ¹³ C AMS [‰]	2σ cal. BC	Material
MAMS-56343	QBR22A-00102	QBR-A-Fs0048	3916	26	-26.4	2471–2298	charcoal
MAMS-56344	QBR22A-00124	QBR-A-Fs0046	4099	21	-28.3	2855–2573	charcoal
MAMS-56345	QBR22A-00129	QBR-A-Fs0050	4077	21	-29.5	2846–2496	charcoal
MAMS-56349	QBR22A-00210	QBR-A-Fs0048	4082	21	-25.1	2847–2498	charcoal
MAMS-56350	QBR22A-00211	QBR-A-Fs0048	4058	28	-32.6	2839–2475	charcoal
MAMS-56351	QBR22A-00233	QBR-A-Fs0048	4086	27	-26.7	2855–2497	charcoal
MAMS-56352	BTH20A-00001	BTH-A-Fs0005	9996	30	-7.3	9740–9328	shell limnic
MAMS-56353	BTH20A-00002	BTH-A-Fs0006	12530	40	-10.0	13135–12596	shell limnic

FIGURE 7. Radiocarbon samples from Al-Qabrayn. Processed with OxCal 4.4.2 (Bronk Ramsey 2009) and IntCal20 (Reimer et al. 2020).

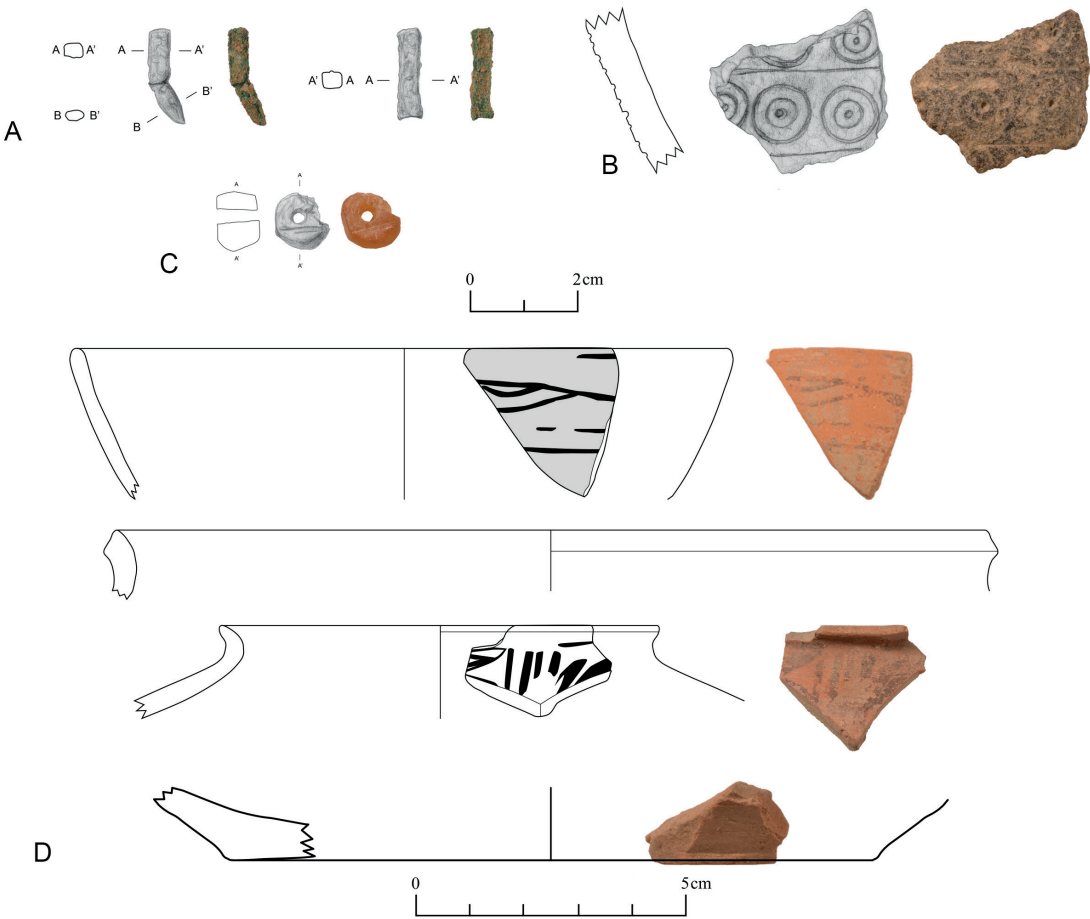


FIGURE 8. Finds from Al-Qabrayn. A. Copper fragments (QBR22A-00228 and QBR22A-00227); B. soft-stone vessel fragment with dot-in-circle decoration (QBR22A-00116); C. carnelian bead (QBR22A-00270); D. Umm an-Nar pottery sherds (QBR22A-00250_1; QBR22A-00141_1, QBR22A-00045_1 and QBR22A-00149_3).

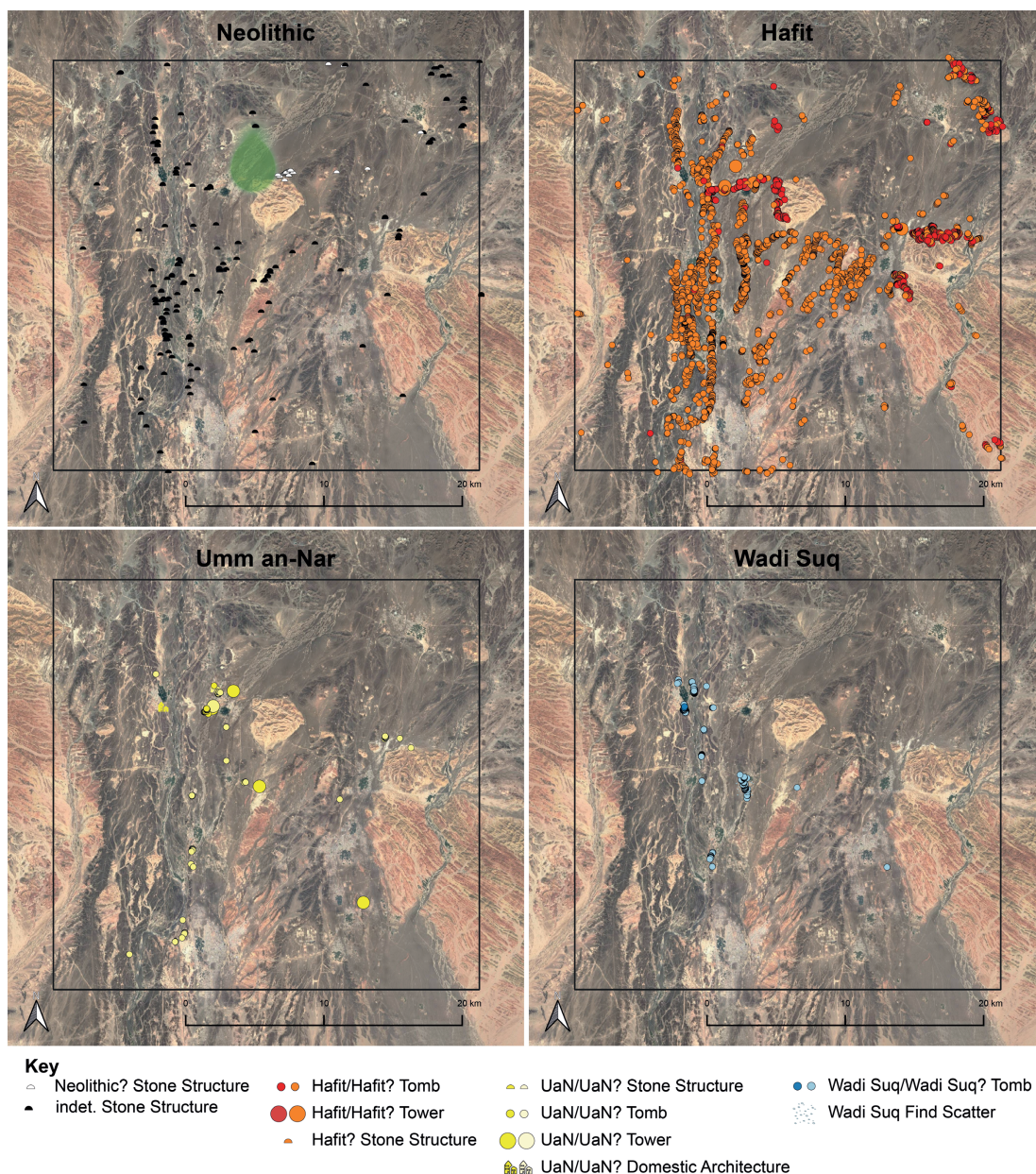


FIGURE 9. Distribution of archaeological features in the Al-Mudhaybi Regional Survey from the Neolithic to the Wadi Suq periods. Areas marked in green indicate high concentrations of finds from the respective period.

Melanoides tuberculata shells, no organic material was found for dating. Radiocarbon dating on these shells provided very old dates (Fig. 7, MAMS-56352 and MAMS-56353) due to the freshwater reservoir/hard water effect, they do not help in establishing the chronology for Al-Batha. Despite challenges in dating, the results add to the growing

evidence of Neolithic structures in inland Oman, making it less empty than it previously seemed. Nevertheless, they also demonstrate that chronology and our current inability to identify characteristic types of flint tools for the late Neolithic still present a substantial obstacle for correctly reconstructing this period in the landscape.

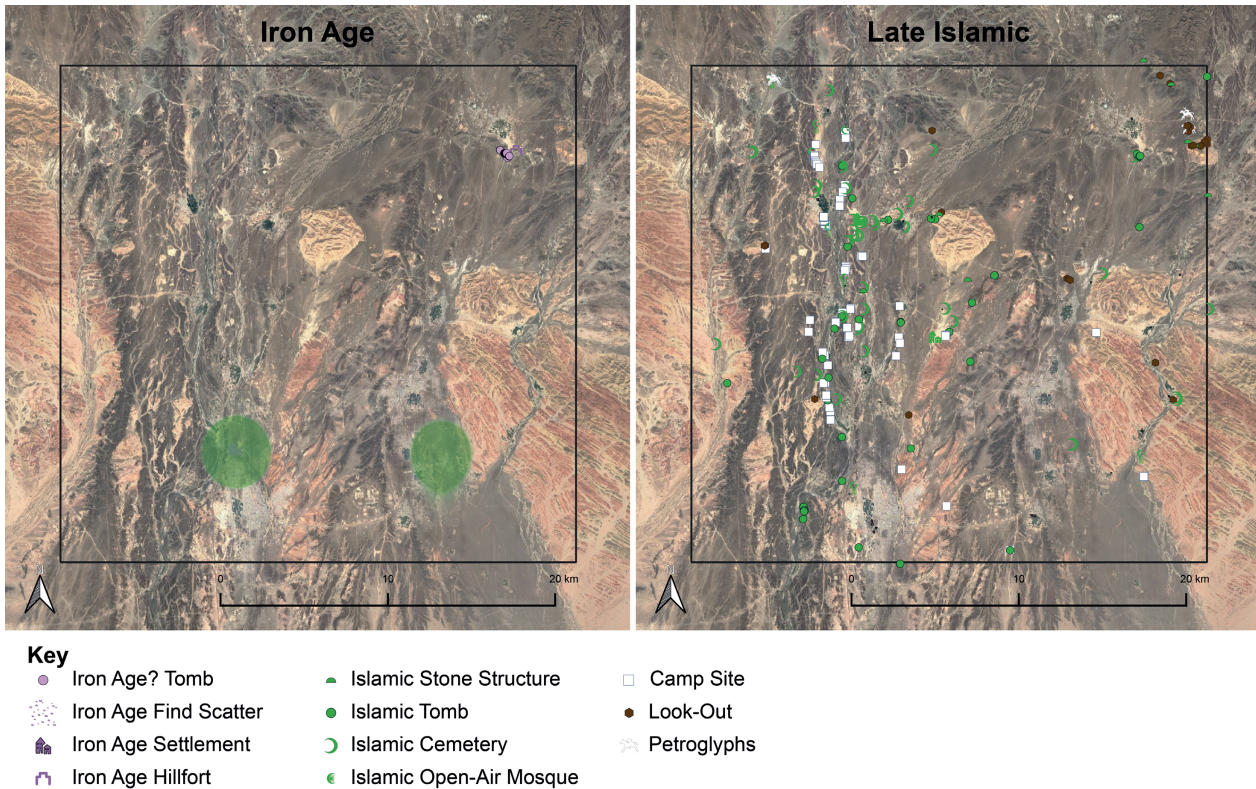


FIGURE 10. Distribution of archaeological features in the Al-Mudhaybi Regional Survey area in the Iron Age and late Islamic periods. Areas marked in green indicate high concentrations of finds from the respective period.

The Hafit period (3100–2700 BC) is clearly the most visible in the survey area. Totals of 612 Hafit and 2499 potentially Hafit period tombs (Fig. 9) speak to the high level of human activity in the region during that time. As elsewhere, despite several Hafit period towers at Al-Khashbah (Schmidt et al. 2021) and the possible Hafit period tower at Al-Fath (Döpper & Schmidt 2020), no clear domestic structures were identified, giving credence to the widespread opinion that people in the Hafit period were mainly mobile pastoralists, possibly in combination with opportunistic agriculture or intensive harvesting of wild plants (e.g. Magee 2014: 97; Deadman 2017; but see Giraud & Cleuziou 2009). However, no find scatters or any other artefacts dating to the Hafit period were identified during the survey. Mobile communities leave fewer material traces than sedentary ones, but they still produce a material record. The lack of Hafit period objects is therefore more likely due to our inability to recognize them. In this region, the Hafit period is

aceraemic and so far, no flints or other diagnostic objects for the Hafit period are known.

While the Umm an-Nar period (2700–2000 BC) is often highlighted as the period of consolidation of sedentism and oasis agriculture in the region as well as a general economic and cultural upswing (Al-Jahwari 2009; Magee 2014: 98–107; Cleuziou & Tosi 2018), it is surprisingly enigmatic in the Al-Mudhaybi Regional Survey. Including those from Al-Khashbah, only seventy-seven Umm an-Nar tombs were identified in the survey area. Rectilinear domestic architecture is limited to Al-Khashbah (Schmidt et al. 2021) and the newly discovered site of Mukhtru (Döpper 2022a), c.3 km west of Al-Khashbah. Umm an-Nar monumental towers are restricted to Al-Khashbah (Schmidt et al. 2021) and possibly Al-Qabrayn and Shariq. Other than Hafit period remains, Umm an-Nar remains are concentrated in a few select places, indicating a corresponding concentration of human activities (Fig. 9). The paucity of domestic

structures suggests that mobile pastoralism still played a prominent role in the subsistence strategy of the people here. This does not match Al-Jahwari's results from the Wadi Andam survey, where Umm an-Nar remains were among the most prominent (Al-Jahwari 2008). This discrepancy might be due to differences in survey methods as the Wadi Andam survey explicitly focused on areas that had the highest potential for Umm an-Nar remains, while the Al-Mudhaybi Regional Survey tried to encompass all parts of the survey area equally, regardless of their ascribed potential for featuring archaeological sites. In terms of site location choices, there is clear evidence of continuity between the Hafit and Umm an-Nar periods at Al-Khashbah. In Mukhtru and Al-Qabrayn, however, there are only a few Hafit period tombs at several hundred metres' distance from the Umm an-Nar structures, and the closest known Hafit tomb at Shariq is more than 1.8 km away from the potential Umm an-Nar tower. These sites therefore appear to have been newly founded during the Umm an-Nar period.

With the beginning of the Wadi Suq period (2000–1600 BC), material culture changed profoundly following the collapse of the Umm an-Nar culture. In the survey area, site locations shift away from the Umm an-Nar centres that were mostly abandoned at the end of the third millennium BC. Continuation, although with a changing function, is only observed at Mukhtru where the Umm an-Nar period settlement is overlaid by a Wadi Suq period cemetery (Döpfer 2022a), possible Wadi Suq period tombs, and a handful of pottery sherds at Al-Khashbah (Schmidt et al. 2021: 113–115; 279–280, Taf. 65.875, 877). Other large Wadi Suq period cemeteries with single burials are found in places with occasional Hafit period tombs but none from the Umm an-Nar period (Fig. 9). No settlements of this period were identified. According to Kennet, Deadman and Al-Jahwari (2016: 161), a large number of tombs in the same location would be difficult to achieve for an entirely nomadic population and would thus be indicative of a sedentary community, but the lack of contemporaneous settlements argues against this (Döpfer 2021). Thus, during the Wadi Suq people in the Al-Mudhaybi survey area seem to have followed a mobile lifestyle. Late Bronze Age (1600–1300 BC) material was not recorded, probably due to an inability accurately to differentiate it from that of the Wadi Suq.

The Iron Age (1300–300 BC) represents another

significant shift in settlement activities in the region. Substantial Iron Age settlements in the Al-Mudhaybi survey area are present at Sinaw (Döpfer 2022a), Shariq, and of course, the well-known Iron Age hill fort on Jebel Radhanah at Lizq (Kroll & Yule 2013). In addition, there are some tombs with Iron Age material on their surfaces (Döpfer & Schmidt 2020). These are most likely reused Hafit period cairns. Other potential Iron Age tombs are situated in the foothills of Jebel Radhanah and the surrounding area (Fig. 10). In eastern Arabia the Iron Age, especially Iron Age II (1000–600 BC), is seen as a period of previously unparalleled settlement intensification associated with the invention of the *falaj* (pl. *aflāj*) irrigation system (Benoist 2001; Al-Tikriti 2010; Magee 2014: 215; Yule 2014: 43–45; Charbonnier 2015). Both Sinaw and the hillfort at Lizq were founded at sites with no (known) previous Bronze Age occupation, aside from Hafit period cairns. Whether *falaj* irrigation played a role in the founding of any of these settlements is currently unresolved. A similar shifting of settlements along the wadi systems from the Bronze to the Iron Age was observed in the Nizwa region (Schreiber 2007). In Shariq, on the other hand, there might be an Early Bronze Age tower below some of the Iron Age remains, indicating a revival of an older site. Iron Age sherds, in addition to late Islamic sherds, make up the bulk of the pottery found while field-walking the transects, an observation that seems to be common for other regions in Oman as well (e.g. Schreiber 2007: Abb. 28 and 51; Kennet, Deadman & Al-Jahwari 2016: fig. 3; but see Al-Jahwari 2009: fig. 5). Kennet, Deadman and Al-Jahwari (2016: 162) suggest that the development of new pottery manufacturing and distribution processes may have resulted in more consumption of pottery, thereby increasing the period's visibility in the archaeological record.

Samad (300 BC–AD 300), Sasanian (AD 300–630), and early Islamic (AD 630–1055) periods are as good as absent from the survey area of the Al-Mudhaybi Regional Survey. Only a few Samad period objects were encountered on older cairns (Döpfer & Schmidt 2020), and several Turquoise Alkaline Glazed Ware (TURQ) sherds were also found. The only remains from the area dating to the middle Islamic period (AD 1055–1500) come from the excavations of the Early Bronze Age tower at Al-Fath, indicating a reuse in that period (Döpfer & Schmidt 2020). This can be explained by the

state of our current knowledge of diagnostic types, in terms of both architecture and artefacts, especially where non-glazed pottery wares are concerned, rather than by a genuine lack of artefacts from these periods in the area. Interestingly, almost all the Umm an-Nar period sites from Al-Jahwari's Wadi Andam survey were reoccupied during the Samad period, something not visible in the data from the Al-Mudhaybi Regional Survey (Al-Jahwari 2009: 128).

From the late Islamic period up to the modern era (AD 1500–1970) records multiply, with numerous mud-brick villages, open-air mosques, camp sites, cemeteries, and lookouts, as well as large quantities of late Islamic and modern pottery sherds collected from field-walking the transects (Fig. 10). The nature of the structures reveals an interesting interplay between the mobile and sedentary parts of the community (Döpper, in press).

Mobile and sedentary lifestyles are a reoccurring theme in the archaeology of the Al-Mudhaybi Region. The ebb and flow of these different, but often supplemental and co-occurring, ways of life characterizes the archaeological landscape of the region, as does the concentration and dispersal of sites from different periods throughout time. At present, the reasons behind the changes in lifestyles and site locations are still not well understood, but it is hoped that a comprehensive evaluation of the results of the four field seasons, especially the study of the pottery, will provide us with a better understanding of the underlying causes for these developments in the future.

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