

The Middle and Late Bronze Age in Central Oman: New Insights from Tawi Said, Al-Mudhairib and the Wilayat al-Mudhaybi

Stephanie Döpfer 

Johann Wolfgang Goethe University, Institute for Archaeological Sciences, Frankfurt am Main, Germany

Correspondence

Johann Wolfgang Goethe University, Institute for Archaeological Sciences, Frankfurt am Main, Germany
Email: doepfer@em.uni-frankfurt.de

Funding information

German Research Foundation (DFG) grant DO 211612-1.

Abstract

Significant changes in the material culture, subsistence and mode of life are associated with the Middle (c. 2000–1600 BCE) and Late Bronze Ages (c. 1600–1300 BCE) in Eastern Arabia. Since first excavations in the 1970s, research has focused on the United Arab Emirates, where all major sites of this period known to date are situated. This birthed the idea of two different lines of development in the second millennium BC. While a more gradual change is assumed for the United Arab Emirates, Central Oman was regarded as having completely abandoned settled agricultural life, returning to a less complex social organisation. This article presents new evidence from Tawi Said, Al-Mudhairib and the Wilayat al-Mudhaybi that shows that the developments in both regions were more akin to each other than previously assumed. This encourages us to reconsider our assumptions about Central Oman's social complexity during this pivotal period of Oman's history.

KEYWORDS

Wadi Suq period, Late Bronze Age, Central Oman, tombs, settlement sites

1 | INTRODUCTION

The Middle (c. 2000–1600 BCE) and Late Bronze Age (c. 1600–1300 BCE) are among the lesser researched periods in Eastern Arabia. This is especially true for Central Oman, defined here as the western foothills of the Al-Hajar Mountains in the Sultanate of Oman and the gravel terraces formed by the alluvial fans of the wadi systems adjacent to it, part of the “Oasis belt” (Fig. 1). The Al-Hajar mountain range separates the coastal plain (Batinah) from the gravel fans and sand dunes inland, reaching just over 3000 m at its highest peak, Jebel Shams. Some deep wadi systems provide communication from the coast to the inland. The most important of them in the Sultanate of Oman are Wadi Jizzi, which links the Buraimi/Al-Ain oasis with the Batinah coast, Wadi Hawasina and Wadi Ayn, which provide access from the area around Ibri to the Batinah coast, and Wadi

Sumail, which connects sites around Nizwa and Izki to the capital area of modern Muscat (Carter, 1997: 16).

Central Oman lies at the intersection of the hot desert climate of the Rub al-Khali and the Jebel al-Akhdar mountains (Parker & Goudie, 2008). Today, rainfall occurs in the winter months and is characteristically low, but there is considerable annual variation. The region of Ibri, near the ancient sites of Bat and Wadi Sunaysil in the western part of Central Oman, received annual average rainfall of 33 mm over the last 10 years, with a maximum of 155 mm in 2019 and a minimum of only 4 mm in 2014 (www.worldweatheronline.com/ibri-weather-averages/az-zahirah/om.aspx). Ibri, close to Tawi Said in the eastern part of Central Oman, received an average 52 mm of rainfall, with a maximum annual rainfall of 180 mm in 2010 and a minimum rainfall of 7 mm in 2018 (www.worldweatheronline.com/ibra-weather-averages/ash-sharqiyah/om.aspx). Most authors agree that the

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2021 The Authors. *Arabian Archaeology and Epigraphy* published by John Wiley & Sons Ltd.

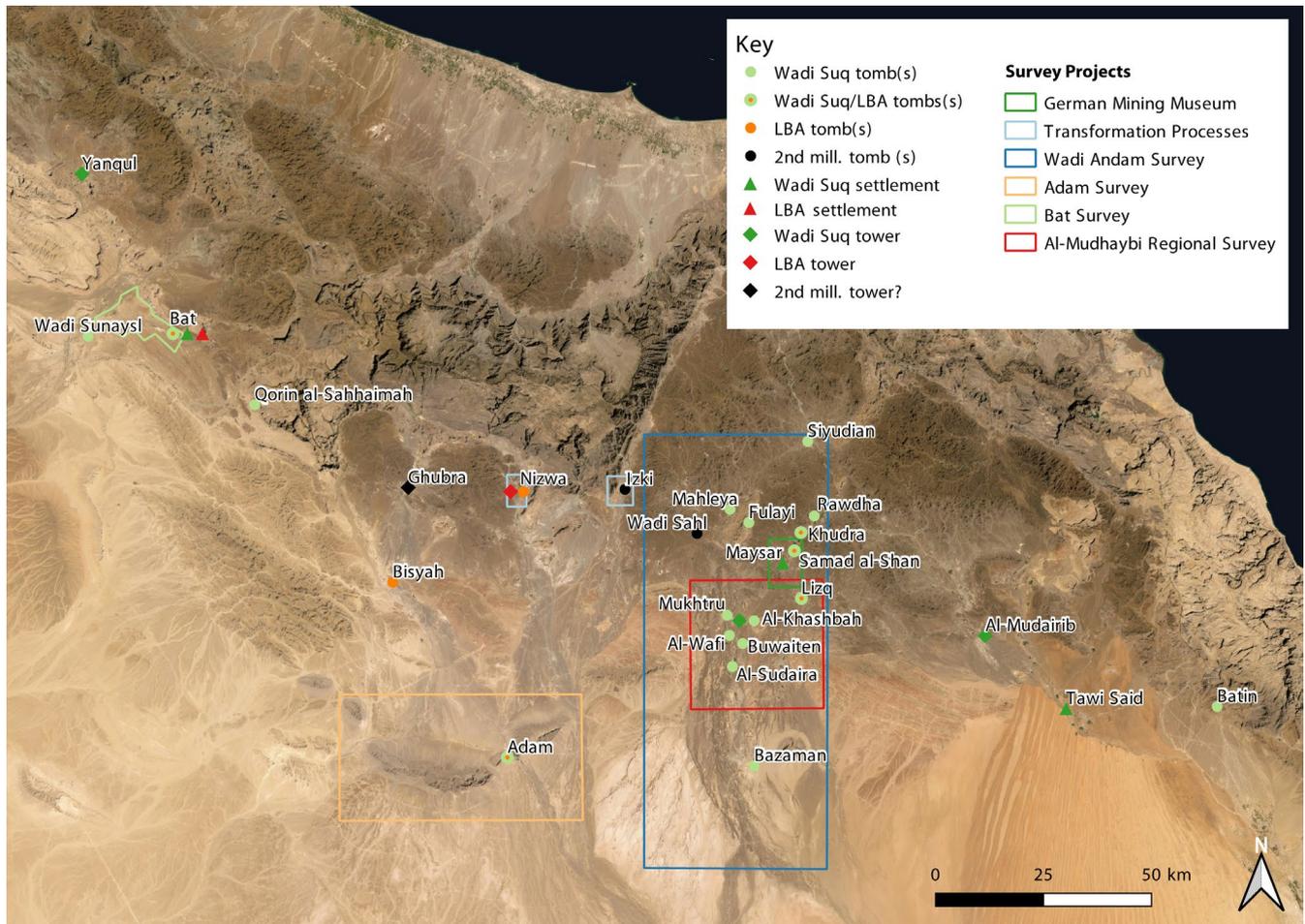


FIGURE 1 Map of Central Oman with sites mentioned in the text

climate successively became more arid around the end of the fifth millennium BC, as the Indian Ocean monsoon retreated south and rainfall occurred only from wintery western sources thereafter (Fleitmann et al., 2005, 2007; Goudie & Parker, 2011; Parker & Goudie, 2008; Parker et al., 2006; Sanlaville, 1992). Climatic fluctuations allowed for more moist periods intermittently (e.g., the Early Bronze Age/Umm an-Nar period) followed by increasingly more arid ones. An intense arid period is recorded around 2100 BC, coinciding with the transition from the Early to the Middle Bronze Age (Wadi Suq period) in Eastern Arabia. This resulted in climate conditions similar to those found in the region today, where surface water is only irregularly available after periods of rainfall. In terms of freshwater, the water table below the gravel fans in Central Oman are much more important (Carter, 1997: 18). Archaeological evidence for a falling groundwater in the second millennium BC table can be found at the Early Bronze Age tower Hili 8. Here, the first well of the early third millennium BC was dug 3.85 m below the surface of the plain at that time. The second nearby well was dug a few centuries later and remained in use until about 1800 BC. In the last stage, it reached 8.5 m below the surface of the plain, suggesting the water table dropped by 4.5 m in 1000 years (Cleuziou, 2009: 730).

2 | HISTORY OF RESEARCH

Remains from the Middle Bronze Age were first excavated and correctly dated by Karen Frifelt in the eponymous site Wadi Suq (Frifelt, 1975). After a similar style of pottery appeared in the upmost layers of Hili 8, Serge Cleuziou summarised in his 1981 article the level of knowledge for that time period, being dated from around 2000 to 1600 BCE. Not before 1986, remains of the second half of the second millennium were discovered during excavations of Shimal in the UAE (Velde, 1992). Stratified layers covering the whole of the second millennium BCE at Tell Abraç and Kalba allowed for more detailed chronological sequences. They led to a tripartite periodisation consisting of an early, middle and late phase (Carter, 1997: 232–239; Potts, 1993b: 194–199; Velde, 1992: 93–94; for a recent summary of the different chronological approaches, see Righetti, 2015: 28, fig. 23). This resulted in the term “Wadi Suq”, which was initially intended for only the first quarter of the second millennium BCE, but is now commonly used for the entire timespan from 2000 to 1300 BCE. Christian Velde (2003) challenges this view, demonstrating through reanalysis that there are two distinct material cultures: the Wadi Suq period (2000–1600 BCE; Middle Bronze Age) and the Late Bronze

Age (1600–1300 BCE), without any middle phase. This corresponds to Carter's (1997: 232–239) Classical Wadi Suq and Late Wadi Suq distinction and will be used in this article, despite some scholars' recent arguments for a less rigorous distinction between the two periods (de Vreeze, Düring & Olijdam, 2020).

Much of our knowledge on these periods derives from funerary data. This period is characterised by great variety in tomb architecture, ranging from simple underground pits for single inhumations to over 20 m long above-ground communal stone-lined tombs. For both periods, Carter (1997: 31–48, 55) classified 17 different types of tombs, while Righetti (2015: 127, fig. 114) classified 27, although the variety clearly shrinks during the Late Bronze Age. The distribution of the different types of tombs within the region reveals a distinct pattern separating the north, where large collective burials have been found, from the south and south-east, the latter including Central Oman, where only smaller, single, double or family burials are documented (Carter, 1997: 53). Another characteristic of the southern and south-eastern parts of the peninsula are large cemeteries either mainly or entirely comprised of small cist graves. Carter believes that this distribution is “a reflection of differences between the economy and organization of the population of in the north of the peninsula and the south and southeast” (Carter, 1997: 54). Carter believes that in the south and south-east, settled communities largely disappeared and the lifestyle became more mobile with the beginning of the second millennium BC, while in the north at least some of the large Early Bronze Age sites, such as Tell Abraç and Kalba, remained occupied during both the Wadi Suq and the Late Bronze Age. Besides having fewer resources to concentrate on monumental tomb architecture, being mobile would also complicate the return to a distant communal tomb when an individual dies (Carter, 1997: 54).

A significant reduction compared to the previous Umm an-Nar period is evident in the settlements. Settlements from both the Middle and the Late Bronze Age are rare in the archaeological record of Eastern Arabia. All of what Carter (1997: 55) classifies as major sites with massive structures and a considerable depth of deposit are located in the north, i.e. Tell Abraç, Kalba 4, Nud Ziba and possibly also Bida'a. In the south, only minor Wadi Suq period sites with remains consisting largely of pits, postholes, hearths, midden deposits and walls have been reported (Carter, 1997: 75), and none from the Late Bronze Age (Carter, 1997: 237). Although he admits more fieldwork conducted in the United Arab Emirates may introduce bias into the data, Carter nevertheless assumes that large structures as known from the second millennium BCE sites in the Emirates should also have been found in Oman if they were present (Carter, 1997: 72–73). Carter explains this concentration of second millennium settlement sites in the north by its high ecological diversity and reliable subsurface water, making it possible to feed a largely settled population, even if agricultural subsistence strategies were likely less important from 2000 BCE onwards (Carter, 1997: 77–78).

Overall, in the Middle and Late Bronze Age in Eastern Arabia, we see a progressive reduction of social complexity and—at least in the south and southeast—a growing predominance of mobile pastoralism, which culminated in the Late Bronze Age (Carter, 1997: 243, 247). Several possible underlying causes of the significant cultural changes at the beginning of the second millennium BC in Eastern Arabia have been suggested in addition to the deteriorating climate. These are an overexploitation of agricultural lands during the Umm an-Nar period (Carter, 1997: 243), cultural dynamics as a response to an increasing socio-economic hierarchisation (Azzarà & De Rorre, 2017: 14; Cleuziou, 2002: 228; 2007: 222; Cleuziou & Tosi, 2007: 275; Gregoricka, 2016: 214) and the collapse of the international trade along the Gulf (Crawford, 1996; 1998: 121–123; Potts, 2001: 44). According to Carter (1997: 247), the latter could have severely impacted the society's ability to mobilise labour for major projects such as the monumental towers of the Umm an-Nar period. The copper producing region, i.e. Central Oman, would have been most affected by this.

3 | THE SECOND MILLENNIUM BC IN CENTRAL OMAN: OLD AND NEW EVIDENCE

3.1 | Funerary sites

Wadi Suq period tombs in Central Oman are known from several sites (Figs 1 and 2 and Table 1). In 1972 Karen Frifelt recorded about 50 Wadi Suq period tombs at Wadi Sunaysil (Frifelt, 1975: 378–379). Due to stone robbery, only oval heaps were left visible on the surface, where some Wadi Suq period pottery and soft stone sherds were found. The largest corpus of excavated second millennium BC tombs in Central Oman comes from Samad ash-Shan. In the 1980s, the German Mining Museum excavated more than one hundred tombs in the cemeteries Samad-10 (Yule, 2001: 231–287), Samad-20 (Yule, 2001: 287–291), Samad-21 North (Yule, 2001: 291–299), Samad-21 South (Yule, 2001: 299–336) and Samad-22 (Yule, 2001: 336–338). Wadi Suq period tombs have also been found in two cemeteries at Adam, Adam South and Adam North, 60 km south of Nizwa (Gernez & Giraud, 2015). Both cemeteries feature Umm an-Nar, Iron Age and Samad period tombs in addition to the second millennium ones, whereby the majority of the graves in Adam North appear to date to the Wadi Suq. Further Wadi Suq period tombs were investigated at Qorin es-Sahhaimah (Yule & Weisgerber, 1996: 145–149), Batin (Cleuziou, 1981: 288), Khudra/Al-Akhdar (de Cardi, Collier & Doe, 1976: 156; Weisgerber, 1991: 324) and Bat (Frifelt, 1976: 59, 65, fig. 54; Williams & Gregoricka, 2016), whereby the tombs excavated on top of tower 1156 at Bat may also postdate the Wadi Suq period (Williams & Gregoricka, 2016: 308). So little has been published about the subterranean cists at Wadi Sahl that they can only generally be attributed to the second millennium BC (Vogt, 1985: 209).

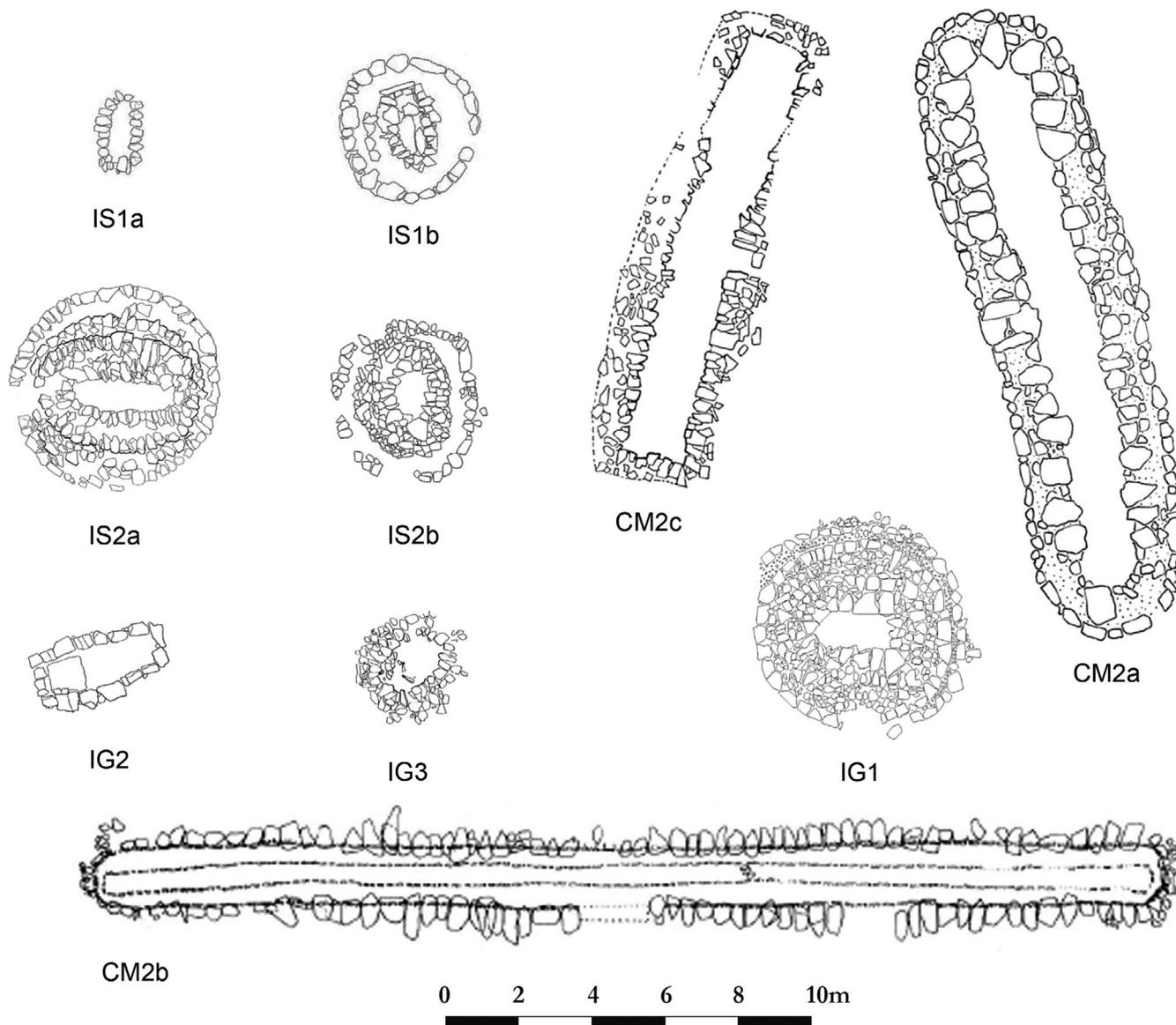


FIGURE 2 Different types of second millennium BC tombs mentioned in Table 1 (after Righetti, 2015: fig. 25)

The best known Late Bronze Age tomb in Central Oman is the “warrior burial” from Nizwa (Fig. 1). A local discovered the site in 1984 and it was investigated in the following years (Al-Shanfari & Weisgerber, 1989; Yule & Weisgerber, 2015: 11–14). The grave was nestled between two large boulders, which formed the chamber together with smaller rocks, fitting Carter’s Type 7 burials in rock shelters (Carter, 1997: 40–41). According to Yule and Weisgerber, the tomb’s inventory was found incomplete as only a few pottery sherds were present compared to the large quantities of soft-stone vessels and metal objects. Some Late Bronze Age arrowheads¹ were found in the excavated graves of the Khudra cemetery (Righetti, 2015: 468), Tomb 1006 at Adam (Righetti, 2015: 886), the tombs S2122, S2184, S2199 and S2202 at the cemeteries of Samad (Righetti, 2015: 554, 705,

740, 816), and a Late Bronze Age pottery vessel in Tomb S21114 (Righetti, 2015: 776), all alongside Wadi Suq period material. The same is true for the objects found in the uppermost layers of the Early Bronze Age tower 1145 at Bat, which Frifelt interprets as being part of a later, intrusive burial (Frifelt, 1976: 59, 65, fig. 54; Righetti, 2015: 458). Tomb S2135B at Samad yielded Late Bronze Age material (Righetti, 2015: 550) and further Late Bronze Age weapons were found in an unpublished tomb at Bisya (Weisgerber, 1991: 327–328).

More second millennium tombs are known from different surveys (Fig. 1), especially the Wadi Andam Survey conducted by Nasser Al-Jahwari from 2004 to 2006 (Al-Jahwari, 2008) and the survey conducted by Jürgen Schreiber from 2004 to 2005 as part of the project “Transformation processes in oasis settlements of Oman” (Schreiber, 2007). Al-Jahwari grouped the Wadi Suq period and the Late Bronze Age together in his survey. Possible second millennium

¹For a discussion of whether arrowheads are truly an indicator of the Late Bronze Age, see de Vreeze, Düring & Olijdam (2020).

TABLE 1 Second millennium BC funerary sites in Central Oman

Site	Period	Type	Investigation
Adam North	WS–LBA	Subterranean cist with and without superstructure (Righetti's types IS1a, IS1b, IS2a or IS2b); above-ground tombs with absidal funerary chamber (Righetti's type IG1); above-ground tombs with circular funerary chamber (Righetti's type IG3)	Excavation
Adam South	WS	Subterranean cist (Righetti's types IS1a or IS1b); above-ground tombs with absidal funerary chamber (IG1)	Excavation
Al-Feg	WS (?)	Collective tomb (?)	Survey
Al-Fulayj (CS.1.4)	WS	Subterranean cist with or without superstructure (Righetti's types IS1a, IS1b, IS2a or IS2b)	Survey
Al-Jardah	WS	Collective tomb (?)	Survey
Al-Khashbah	WS	Collective tomb (?; Righetti's type CM2b)	Survey
Al-Sudairah	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Survey
Al-Wafi	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Survey
Bat	WS–LBA	Above-ground tomb (Righetti's types IG1 and IG3); intrusive burial in tower T1145	Excavation
Batin	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Excavation
Barzaman (CS.7.2)	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Survey
Bisya	LBA	–	Excavation
Buweiten	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Survey
Izki	WS (?)	Collective monocellular tombs (?; Righetti's type CM2)	Survey
Khudra/Al-Akhdar	WS	Subterranean cist without superstructure (Righetti's type IS1a)	Excavation
Lizq	WS–LBA	Subterranean cist with or without superstructure (Righetti's types IS1a, IS1b, IS2a or IS2b)	Excavation
Mahleya (CS.2.50)	WS	Subterranean cist with or without superstructure (Righetti's types IS1a, IS1b, IS2a or IS2b)	Survey
Mahleya (CS.2.56)	WS	Reused cairn	Survey
Mukhtru	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Survey
Nizwa	LBA	Burial in rock shelters	Excavation
Qorin es-Sahhaimah	WS	Subterranean cist with circular surrounding wall (Righetti's type IS1b)	Excavation
Rawdhah (CS.9.8)	WS	Subterranean cist with or without superstructure (Righetti's types IS1a, IS1b, IS2a or IS2b)	Survey
Sa'a Sidri	WS	Collective tomb (?)	Survey
Samad-10	WS	Subterranean cist (Righetti's types IS1a or IS1b)	Excavation
Samad-20	WS	Subterranean cist (Righetti's types IS1a or IS1b)	Excavation
Samad-21 North	WS–LBA	Subterranean cist (Righetti's types IS1a or IS1b)	Excavation
Samad-21 South	WS–LBA	Subterranean cist (Righetti's types IS1a or IS1b); subterranean cist with circular surrounding wall (Righetti's type IS2b, tombs S2174, S2187, S21110); above-ground tomb with rectangular funerary chamber (Righetti's type IG2, tombs S21121, S21122 and S21119)	Excavation
Samad-22	WS	Subterranean cist (Righetti's types IS1a or IS1b)	Excavation
Siyudian	WS	Reused cairn	Survey
Wadi Sahl	WS/LBA	Subterranean cist with or without superstructure (Righetti's types IS1a, IS1b, IS2a or IS2b)	Excavation
Wadi Sunaysil	WS	Subterranean cists with superstructure (Righetti's types IS1b or IS2)	Excavation

subterranean tombs are reported from the sites CS.1.4 near Al-Fulayj (Al-Jahwari, 2008: 448–449, pl. 250), CS.9.8 near Rawdhah (Al-Jahwari, 2008: 485–486, pl. 480–481) as well as CS.7.2 near Barzaman (Al-Jahwari, 2008: 479–480, pl. 477–479). Further second millennium tombs might be hidden among the largely Samad period tombs of the Mahleya cemetery (site CS.2.50) as some second millennium surface

finds of pottery sherds indicate (Al-Jahwari, 2008: 510–513). An isolated cairn with four concentric walls at Siyudian (site CS.2.4) yielded twelve second millennium pottery sherds, a fragment of a soft-stone vessel, a spindle whorl, three beads, a copper sheet, a copper pin as well as three fragmented shells (Al-Jahwari, 2008: 490, pl. 482–486). Five second millennium sherds could be attributed to a third millennium

tomb at Mahleya site CS.2.56 (Al-Jahwari, 2008: 172–173, 519–520). Schreiber's survey in Central Oman focused on the areas around the modern cities of Izki and Nizwa. No second millennium tombs were indisputably identified, but some of the small subterranean cists with circular surrounding walls could be of a Wadi Suq or Late Bronze Age date (Schreiber, 2007: 132, 205–206). The same is true for some small, above-ground circular tombs (Schreiber, 2007: 133). Interestingly, Schreiber (2007: 132) also refers to some collective tombs at Izki, possibly dating to the second millennium BC. These elongated oval to rectangular tombs measure 7–10 m in length and 2.5–3.5 m in width. The only four Wadi Suq pottery sherds from Schreiber's survey originate from a reused Hafit period cairn (Schreiber, 2007: 133).

This overview demonstrates that several Wadi Suq period tombs are known in Central Oman, indicating the region was substantially inhabited during that period. The Late Bronze Age is clearly less represented. The architecture of the second millennium tombs in Central Oman consists primarily of cists without superstructure, corresponding to Righetti's types IS1a and IS1b and Carter's type 1, and cists with superstructure, corresponding to Righetti's types IS2a and IS2b and Carter's type 2, both for single inhumations (Carter, 1997: 31–35; Righetti, 2015: 127). That being said, the question of whether or not a tomb had a superstructure could also be one of preservation and interpretation. Occasionally, above-ground individual tombs are documented, albeit only for the Wadi Suq period so far. The Late Bronze Age burial from Nizwa can be classified as a burial in a rock shelter, belonging to Carter's type 7 (Carter, 1997: 55). There has been speculation that six tombs found during the University of Tübingen's survey at Al-Khashbah in 2015, might be of a Wadi Suq period date (Schmidt & Döpper, 2017: 216). From their architecture they seem comparable to the long, rectilinear semi-subterranean tombs from Sharm or Bidiyah, for example. The largest measures 13.1 m in length and 1.1 m in width (Fig. 3). The tombs from Al-Khashbah would be the first of their kind in Central Oman as their distribution is thus far limited to the northern portion of the Oman peninsula.

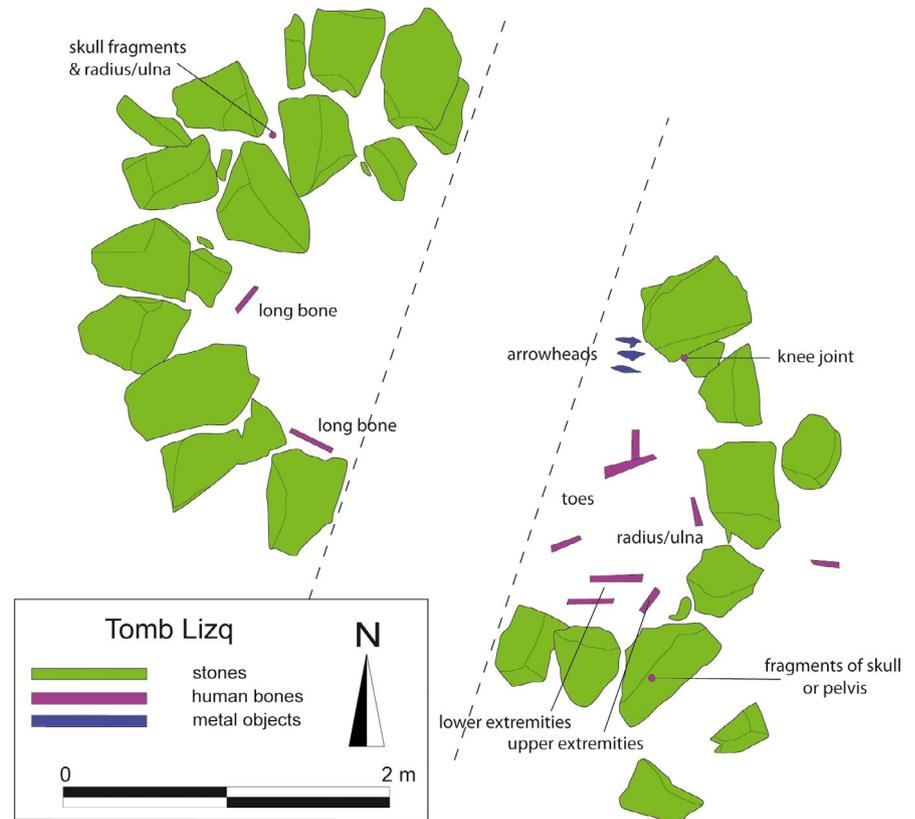
This would eliminate the traditional division in the distribution of tomb types in the Wadi Suq period between the UAE and Central Oman and by this challenge the idea that organised and sedentary populations were needed for constructing and maintaining and that such societies were only present in the UAE during the Wadi Suq (Al-Jahwari, 2008: 345; Carter, 1997: 54). In mobile societies, Carter considers it impractical to keep returning to a communal grave. However, without excavations, attributing the tombs in Al-Khashbah to the Wadi Suq period remains speculative as there were no surface finds. Nevertheless, second millennium collective tombs are also possibly present at Izki (Iz0075, Iz0096 und Iz0097) as discussed above (Schreiber, 2007: 133) and Al-Jardah (Schreiber, 2007: 133) as well as at the sites of Sa'a Sidri and Al-Feg in the Wadi Sarin, situated in the coastal plain of Oman, some 30 km south of Muscat (de Cardi, Collier & Doe, 1976: 151). Yule (1994: 559–560), however, dates the latter to the early Islamic period as they are oriented NW–SE.

New evidence for the second millennium funerary tradition in Central Oman was obtained from a rescue excavation as Lizq as well as from the ongoing survey in the region around the modern city of Al-Mudhaybi. In 2017, a second millennium subterranean tomb was the target of a rescue excavation at Lizq conducted by the University of Tübingen, in which the author participated, and in collaboration with the Ministry of Heritage and Culture of the Sultanate of Oman (Fig. 4). A local schoolteacher reported a Wadi Suq period soft-stone vessel (Fig. 5q) to the Ministry that was found in the course of power shovel excavations for the construction of a farmyard wall. Excavations identified an oval-shaped stone cist with the stone lining preserved at maximum three courses high. The tomb was cut in half by the JCB excavations. Skeletons of at least four individuals, three adults and one child, were present within the remaining accumulations of the tomb. Due to the disturbance, the position of the skeletons could not definitely be asserted, but the three adults were most likely placed in a flexed position. The remains of one of the skulls was surprisingly found on top of a stone of the tomb's wall, indicating a



FIGURE 3 Possible long collective tomb at Al-Khashbah from the second millennium BC

FIGURE 4 Wadi Suq and Late Bronze Age tomb at Lizq



later reuse. The soil heaps from the JCB work as well as the accumulations within the tomb were completely sieved, revealing three bronze arrowheads (Fig. 5m–o), one bronze pin (Fig. 5p), one large flint blade (Fig. 5e) as well as several flakes (Fig. 5f–l) and four beads made of different coloured stones (Fig. 5a–d). While the soft-stone vessel clearly dates to the Wadi Suq period, the arrowheads can be dated to the Late Bronze Age (Velde, 2003; but see de Vreeze, Düring & Olijdam, 2020) and are comparable to the Nizwa “warrior burial” (Al-Shanfari & Weisgerber, 1989: fig. 3). The tomb most likely belongs to Carter’s type 1 or 2, simple cist burials with or without superstructure. This would go along with Righetti’s type IS1 or IS2, although the tomb at Lizq is clearly not for an individual burial, but some of the skeletons could be from reuse during the Late Bronze Age. If a superstructure did exist, it was completely removed by the construction of the farmyard wall.

Additional information on the distribution and quantity of Wadi Suq period tombs in Central Oman come from the Al-Mudhaybi Regional Survey directed by the author and launched in 2019 (Fig. 6). Five large cemeteries from the second millennium BC were discovered during the first field season (Döpper & Schmidt, 2020a). These are the cemeteries near Mukhtru (two cemeteries, probably originally one, 85/195 tombs), near Al-Wafi (49 tombs), near Al-Sudairah (113 tombs) and near Buweiten (269 tombs). The majority of the tombs from these cemeteries are subterranean cist tombs with one or more above-ground stone walls, which encompass a heap of gravel and earth. Oftentimes, the large stones from the ring-walls at the top of the tomb have been removed, but their voids were still clearly visible. On the

surface, several Wadi Suq period finds were made, including pottery sherds and fragments from soft-stone vessels. So far, no material culture that clearly dates to the Late Bronze Age was found during the survey. The large size of these cemeteries demonstrates that, even if people during the Wadi Suq in Central Oman were mobile, they keep returning to the same site to bury their deceased.

3.2 | Settlements

Little is known about Wadi Suq period and Late Bronze Age settlements in Central Oman. That which is known would fit Carter’s definition of minor sites. At Bat, Wadi Suq and early Late Bronze Age remains were found at the settlement slope, which consists mainly of Umm an-Nar period structures. In the 1970s, Karen Frifelt and her team detected a hearth with a radiocarbon date of 1610 BC and a posthole with a date of 1920 BC in her “trench 1155” close to the tower 1156 associated with poorly built stone walls (Brunswig, 1989: 36; Frifelt, 1976: 60; 1979: 584). In 2013, the American–Japanese Bat Archaeological Project (AJBAP) renewed excavations at the settlement slope, in a flatter area to the west of Frifelt’s trench. Here a better-preserved domestic structure of the Umm an-Nar period was uncovered, that was remodelled during the Wadi Suq period (Fig. 7a). Samples from a large hearth and an ash lens within the structure provide radiocarbon dates from 1950 to 1770 BC and from 1795 to 1635 BC (Kerr, 2016: 254, fig. 146). At some point during the Wadi Suq period, the domestic structure fell out of use and was

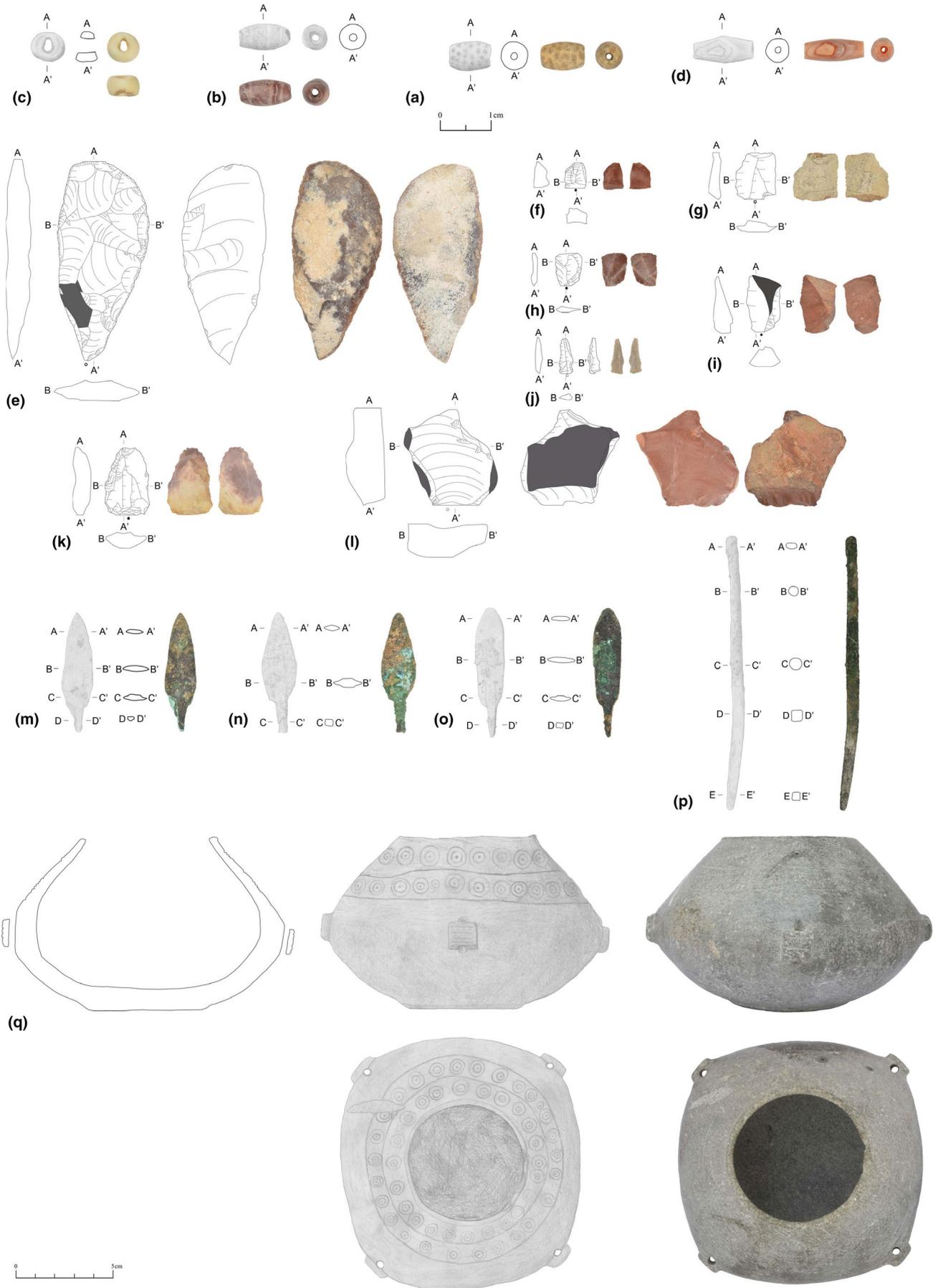


FIGURE 5 Small finds from Wadi Suq and Late Bronze Age tomb at Lizq: a–d. beads, e. flint blade, f–l. flakes, m–o. bronze arrowheads, bronze pin, q. soft-stone vessel

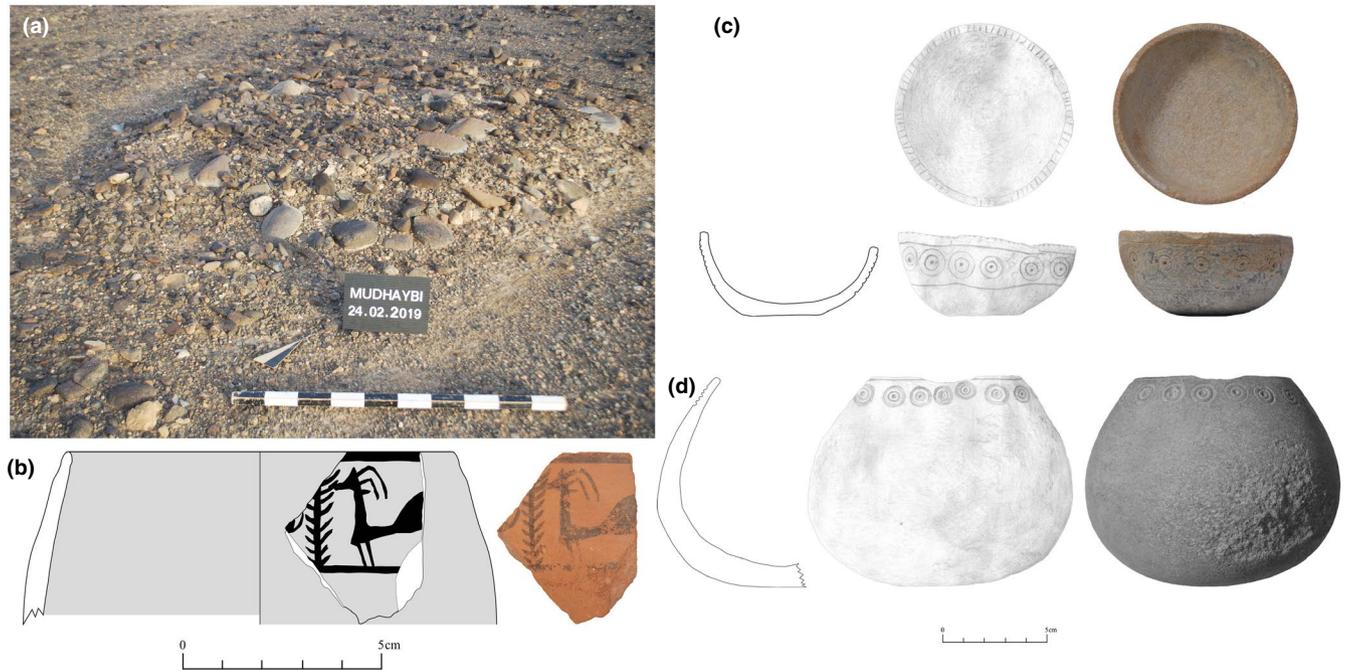


FIGURE 6 Al-Mudhaybi Regional Survey: a. Wadi Suq tomb in the Mukhtru cemetery, b. Wadi Suq period pottery sherd from Buweiten cemetery, and Wadi Suq period soft-stone vessels from the Mukhtru (c) and Buweiten (d) cemeteries

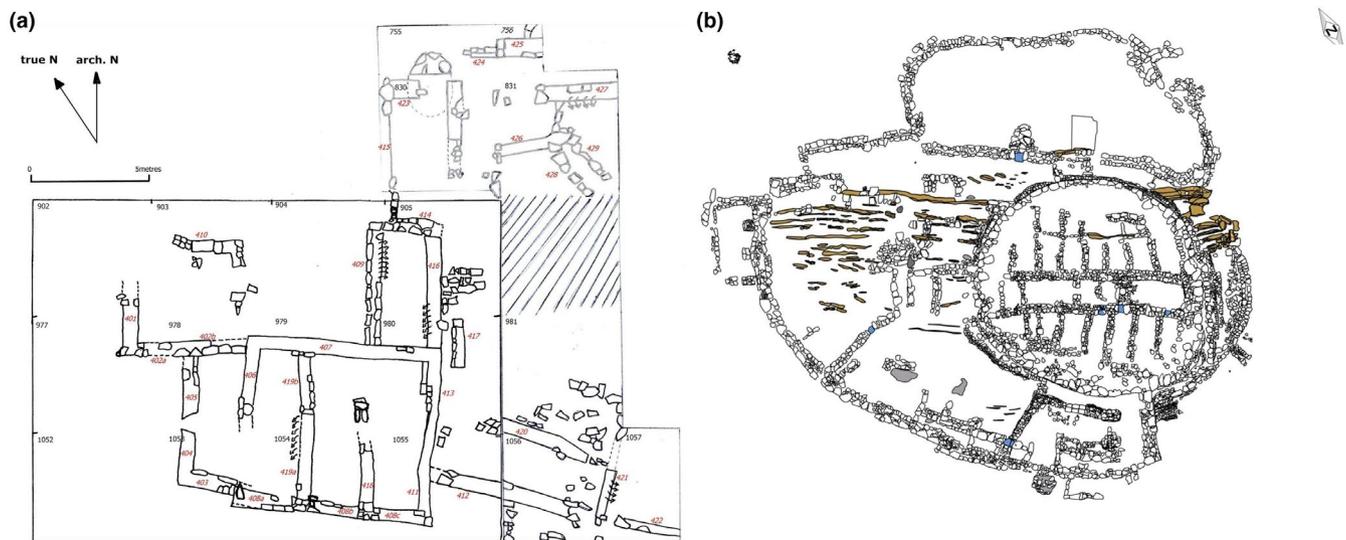


FIGURE 7 Second millennium BC settlement structures from Central Oman: a. settlement slope in Bat (after Kerr, 2016: 81 fig. 37), b. Al-Khutim tower (after Cocca et al., 2019: 88 fig. 4)

superimposed by the cist burials discussed above. Initially, this was believed to represent the end of second millennium occupation at the site, but a small collection of Late Bronze Age pottery sherds has been found, which might indicate continued habitation of the eastern part of the domestic structure after the tombs were constructed (Kerr, 2016: 275). Maysar-1, located in the western foothills of the Al-Hajar Mountains, might have a Wadi Suq period component at the end of its Umm an-Nar occupation (Carter, 1997: 72). Vogt dated a beaker with a pedestal from House 4 (Weisgerber, 1981: 194, Abb. 117.194) to the Wadi Suq period (Vogt, 1985:

225, table 104.221). Carter (1997: 72) sees parallels to a Late Bronze Age type, but points out that all of the other pottery found associated with it is clearly Umm an-Nar in both form and decoration. Thus, he sees the last phase of Maysar as very late Umm an-Nar or transitional, which is supported by two radiocarbon dates from House 1, ranging from 2132 to 1696 and 1901 to 1643 and 2 sigma cal. BCE (Weisgerber, 1981: 251 table 252; OM 013 and OM 016 recalibrated by the author with IntCal 213).

Other sites that have been suggested by some authors to possibly have a Wadi Suq period occupation, such as Amlah

3a–c, the monumental tower BB-22 (Vogt & Franke-Vogt, 1987: 67) and Andam 1 of the Harvard survey (Velde, 1992: 107), have been discounted by Carter (1997: 72) as the ceramics do not support this. A continuous use of an Umm an-Nar period tower into the Wadi Suq period is evident at Tower A in Yanqul/al-Safri (Schreiber, 1998: 29–30). Here, several Wadi Suq period pottery sherds were found. Of special interest in this regard are also the 2014–2018 excavations at Al-Khutim near Bat led by the Ministry of Heritage and Culture of Oman and carried out by an Italian team (Cattani et al., 2017; Cocca et al., 2019). Two major phases of occupation were discovered at this monumental Bronze Age structure: one dating to the Umm an-Nar and another to the Wadi Suq period (Cocca et al., 2019). During the Wadi Suq period, several major structural changes were made to the architecture (Fig. 7b). Aside from Wadi Suq period pottery sherds, a Dilmun type seal was found (Cocca et al., 2019: 92, fig. 10), providing evidence for the far-reaching contacts of Al-Khutim during the first centuries of the second millennium BCE.

This listing of Wadi Suq period settlements makes it clear that, contrary to previous assumptions (Carter 1997: 77), the monumental towers of the Umm an-Nar period not only continued to be used in regions with a high ecological diversity, such as the coasts of the United Arab Emirates, but also in the marginal landscape of Central Oman. Thus, we have either to conclude that such monumental buildings were not only constructed by sedentary farming communities, but also by mobile pastoralists, or that there was a sedentary population in the Central Oman during the Wadi Suq period.

A pottery bowl and base were found at Al-Ghubra BB-6 (Hastings, Humphries & Meadow, 1976: fig. 10A, N) that are consistent with Late Bronze Age forms according to Carter (1997: 71). He suggests they may originate from a Late Bronze Age burial added to the third millennium tower, but also points out that both sherds could just as likely date to the Umm an-Nar period. Another possible Late Bronze Age site is the so-called “Late Bronze Age” fortress at Nizwa (Carter, 1997: 237). Al-Shanfari and Weisgerber (1989: 17) report on a Late Bronze to Early Iron Age “impressive hillfort” at Sharjah al-Hadirah, close to Nizwa. They account for heavy pithoi sherds of a Late Bronze Age to Early Iron Age date found associated with an enormous semi-circular rampart and collapsed large walls and towers. As no illustrations or plans have been published, there is nothing to support these claims.

Recent investigations by the universities of Tübingen and Frankfurt, in which the author participated, brought to light new evidence for the Wadi Suq period in Central Oman from Tawi Said, Al-Mudhairib and Al-Khashbah. Tawi Said is situated approximately 5 km to the north-west of the modern town Bidiyah at Wadi Batha, directly north of the last extensions of the Sharqiyah (formerly Wahiba) sands. Beatrice de Cardi discovered the site in 1976 and further researched it in 1978 (de Cardi, 1977: 61; de Cardi, Bell & Starling, 1979). She reports on three concentrations of Wadi Suq period pottery mingled with fragments of soft-stone vessels and stone

tools. From the air, she discovered remains of a rectangular building made of mud-bricks, of which she could not draw a coherent plan, however. There are two walls 2.5 m apart and two unshaped mud-brick platforms. All structures were preserved to a height of only 2–3 cm. There was no pottery or otherwise datable material in the direct vicinity of these structures. In one of five test trenches, de Cardi discovered an early to middle Islamic fireplace. In a survey conducted by the University of Frankfurt at the site in November 2018, none of the mud-brick structures were rediscovered, but large quantities of pottery sherds from the Wadi Suq (Fig. 8a–g) and the late Islamic periods were, intermingled with some from the middle Islamic period (Döpper, 2020). Thus, it is possible that the structures discovered by de Cardi are of an Islamic date.

Special finds from the 2018 survey were two stamp seals (Döpper & Schmidt, 2020b). The first stamp seal is dome-shaped, made of a light green stone and its motif is difficult to interpret (Fig. 8h). There is a horizontal line in the centre with which three lines on the one side and two lines on the other side intersect perpendicularly. Further lines are present at its edge. This possibly depicts a highly stylised quadruped. Other interpretations of the motif might be anthropomorphic figures either holding hands or fighting. The second seal is made of dark grey soft-stone (Fig. 8i). A row of five circular drillings along the seal’s edge is clearly visible on the sealing surface. They surround an oval depression in the centre of the seal, which is associated with two incised lines and another circular drilling similar to those at the edge of the seal. The dome shape of the first seal is comparable to seals from the second millennium BC found in Shokur, Bidbid (David-Cuny, Frenez & Williams, 2016), Tell Abraq (Potts, 1993a: 433), Jebel Buhais (Jasim, 2008: 54–55) as well as Mazyad (Cleuziou, 1981: 285). Seals similar in shape and decoration to the second seal, but made of lead, were found on the surface of the Early Iron Age settlement of Qarn bint Saud (Stevens, 1992) and at Jebel al-Buhais (Jasim, 2008: 61). Additional similar finds include one made of chlorite and other stones in a surface find from Salut (Degli Esposti & Al-Muzini, 2015), a seal from Early Iron Age levels at Tell Abraq (Potts, 1991: 95) and from an Early Iron Age context in Rumeilah (Boucharlat & Lombard, 1983: 6, fig. 11; Lombard, 1998: 156, fig. 151). This seal and the Dilmun-type seal from Al-Khutim mentioned above are evidence that Central Oman was embedded into the intra-regional trading network of that time.

Wadi Suq period sherds are also associated with a monumental building that a resident of Al-Naba village, Mohammed Rashid Malik al-Rusiki, showed the author in 2019. On top of a hill approximately 7 km south-west of Al-Mudhairib, there are visible walls that seem to belong to a round structure approximately 25 m in diameter, built of wadi pebbles (Fig. 9a). The surface pottery is fine mineral tempered and at least one sherd features a typical Wadi Suq wavy-line decoration (Fig. 9b). No distinct Umm an-Nar period sherds or sherds from any other period were encountered during the visit.

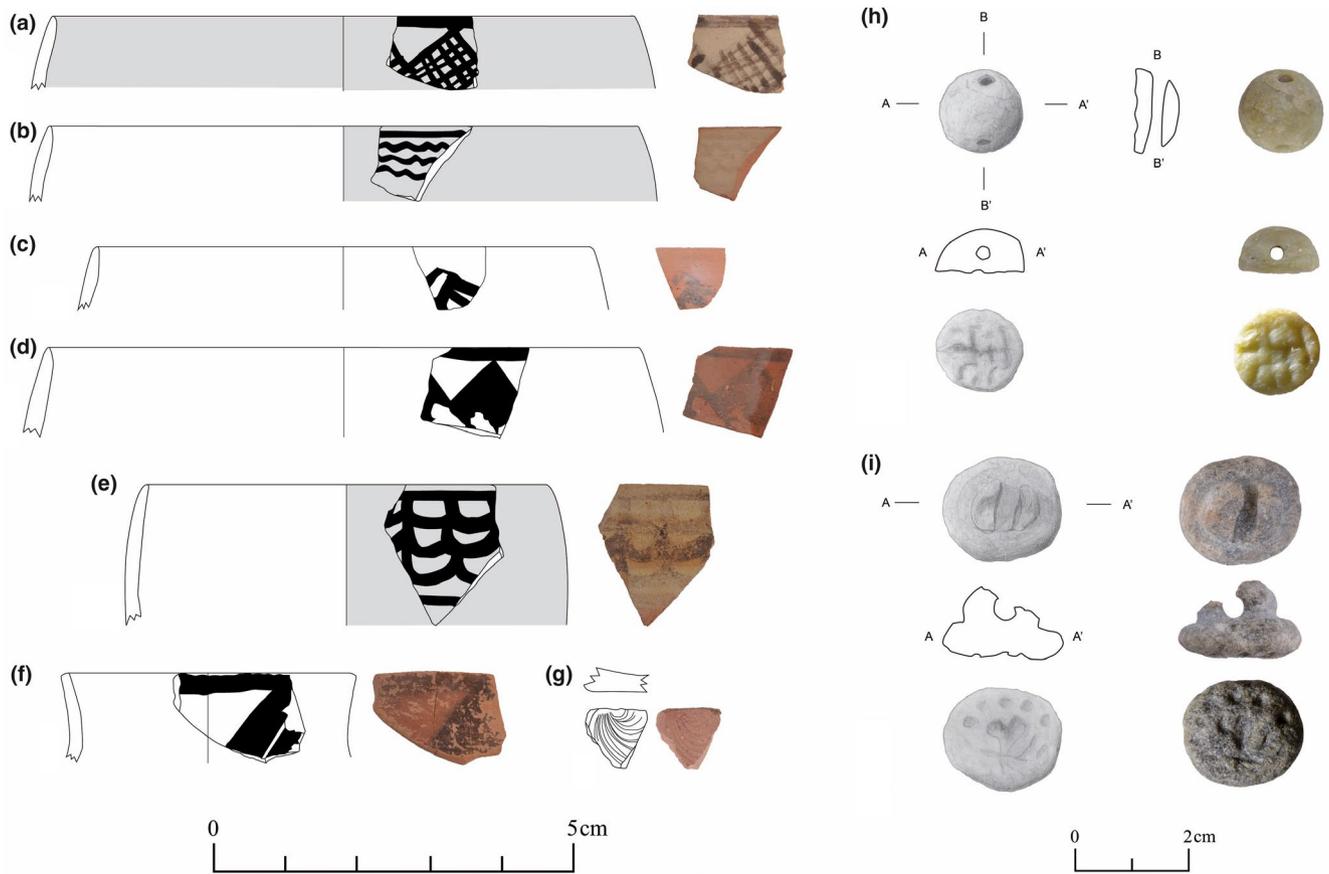


FIGURE 8 Tawi Said: a–g: Wadi Suq period pottery, h–i: stamp seals



FIGURE 9 Possible Wadi Suq period monumental structure near Al-Mudhairib (left) and pottery sherd found on its surface (right)

At the Umm an-Nar monumental tower Building IV at al-Khashbah, four possible Wadi Suq period pottery sherds were discovered during a survey by the University of Tübingen in 2015 (Schmidt & Döpper, 2017), of which two seem to belong to the same vessel (Fig. 10). Those two (KSB15H-q1847_2 and KSB15H-q1900_1) are decorated with short wavy lines. They might date to the very end of

the Umm an-Nar, but are more likely from the Wadi Suq period (for comparisons, see Cleuziou, 1989: 65, fig. 67.61–62; Frifelt, 1995: 176; Méry, 2000: fig. 162.169). Interestingly, these pieces display close parallels to the pottery sherd found at the monumental structure near Al-Mudhairib (Fig. 9b). The jar fragment KSB15H-q3013_1 exhibits black decoration on a light-coloured background and is made of a

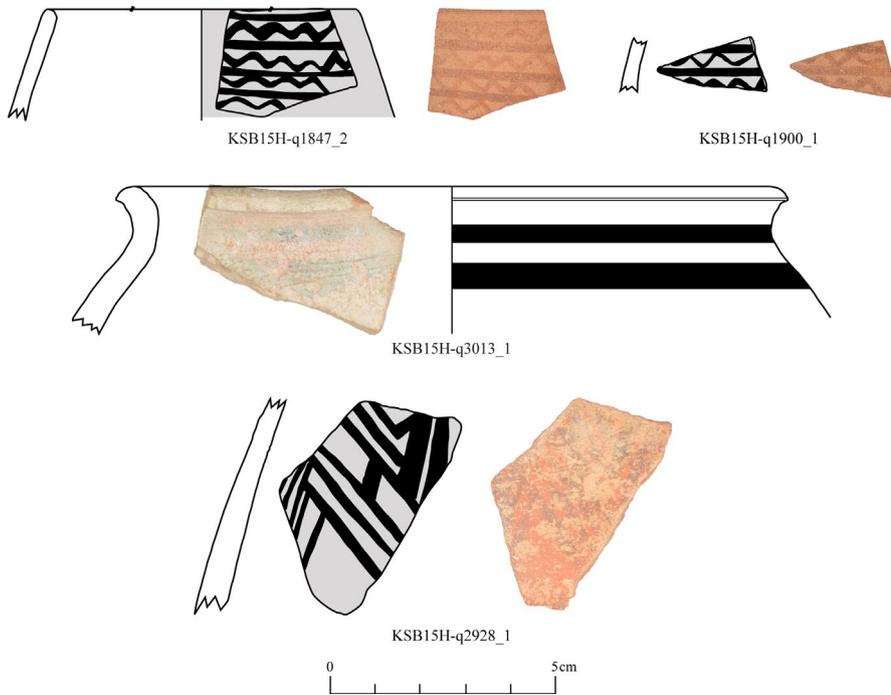


FIGURE 10 Wadi Suq period pottery sherds from Building IV at Al-Khashbah

semi-coarsely mineral tempered ware. KSB15H-q2928_1 is a fragment of a spouted jar (for comparisons, see Méry, 2000: fig. 161.169), painted with overlapping triangles. It is made of a chaff-tempered ware. This demonstrates that the tower remained in use during the Wadi Suq period.

4 | DISCUSSION

Even if most archaeologists today agree that the Early Bronze Age did not end with a complete collapse followed by a “dark age” millennium and that at least some sites with monumental architecture continued to be occupied, this mainly seems true for the coast of the United Arab Emirates with its more favourable environmental conditions. Central Oman, instead, is still widely regarded as having abandoned the achievements of the Umm an-Nar period, such as agriculture and monumental architecture, and returning to a mobile and less complex way of life at the beginning of the second millennium BC, even though people were clearly present in the region as the large number of tombs shows.

The evidence presented in this paper for the second millennium BC encourages this notion of Central Oman to be reconsidered, however. The truly ephemeral and often short-lived remains at Al-Maysar and Bat during the Wadi Suq period and, in the latter case, during the Late Bronze Age as well, argue in favour of small village communities with low levels of social organisation (Carter, 1997: 94) in a largely mobile society. However, the sites with monumental architecture in Central Oman speak a different language. The monumental Building IV at Al-Khashbah, Tower A at Yanqul and the Al-Khutm tower were continuously used until the Wadi Suq period. The monumental

building in Al-Mudhairib even seems to have been newly founded at that time. Further, there may possibly be a Late Bronze Age fort at Nizwa. The problem with most of this information is that it is based solely on surface collections. Intensive archaeological investigations at Al-Khutm prove that there was substantial occupation there during the Wadi Suq period. Thus, there is clear evidence that skills, resources and manpower to maintain and possibly even build monumental architecture were all still available in Central Oman during the Wadi Suq period, which is a strong indicator for a socially complex sedentary population present at these sites. Additionally, the settlement site of Tawi Said, even though it has not been excavated, presents evidence for a flourishing community in the Wadi Suq period that was involved in long-distance trade and possibly metal processing. The community also used stamp seals, although perhaps not for administrative purposes. The presence of different types of sites with and without monumental architecture during the Wadi Suq period in Oman indicates a settlement hierarchy, another clue to the social complexity of this time period. While individual cist graves indeed dominated in Central Oman, mounting evidence suggests that large collective tombs are not restricted to the north as generally assumed.

In terms of site distribution in the Al-Mudhaybi Regional Survey research area, including Al-Khashbah, a large number of tombs from the Wadi Suq period (719 in total) faces a comparably small number of tombs from the Umm an-Nar period (87 in total) (Döpper & Schmidt, 2020a). However, the Umm an-Nar period tombs are collective, while most of the Wadi Suq period tombs are individual inhumations, with the probable exception of those in Al-Khashbah. Thus, the total number of people in the region likely stayed relatively

constant. Nearly all of the Umm an-Nar period tombs are concentrated at three sites: Al-Khashbah, Al-Fath and Sinaw. The Wadi Suq period tombs are situated in the cemeteries of Al-Khashbah, Mukhtru, Al-Wafi, Al-Sudairah and Buweiten. Interestingly, few settlement sites with domestic architecture have been discovered for either period, i.e. only Al-Khashbah for the Wadi Suq period and Al-Khashbah, Al-Fath and Mukhtru for the Umm an-Nar. Thus, only Al-Khashbah was continuously used as a settlement and funerary site from the Umm an-Nar to the Wadi Suq periods, while Al-Fath and Sinaw were abandoned. Mukhtru, on the other hand, was a settlement site in the Umm an-Nar period that became a large cemetery in the Wadi Suq. New cemeteries emerged at Al-Wafi, Al-Sudairah and Buweiten, without known associated settlements.

In conclusion, changes from the Umm an-Nar to the Wadi Suq period in Central Oman seem to be more analogous to the developments in the United Arab Emirates than previously thought. In both areas, monumental sites remained occupied and were possibly even newly founded despite profound changes in the material culture and tomb architecture. The ratio of tombs to settlement sites argues for a large mobile component of the society, but as the Al-Mudhaybi Regional Survey demonstrates, this seems to have always been the case throughout the whole Bronze Age, not only during the second millennium BC. For the Late Bronze Age, evidence is much sparser concerning settlement sites and tombs alike. However, this is also true for the United Arab Emirates. As no studies have been conducted thus far on the people's subsistence in the Wadi Suq and Late Bronze Age periods in Central Oman, the notion of a (partial) abandonment of agriculture and shift towards a more diverse diet, as suggested for the United Arab Emirates, remains pure speculation.

5 | SUMMARY

In summary, the wealth of funerary data from Central Oman clearly indicates that the region was intensively used in the second millennium BC, especially during the Wadi Suq period. New evidence from the settlement of Tawi Said, and especially the monumental architecture of Al-Khashbah, Al-Khutm and Al-Mudhairib, suggests access to considerable manpower and other resources to build and maintain the monumental structures, contrary to previous assumptions. Thus, we can assume the existence of a socially complex, sedentary population in Central Oman at least during the Wadi Suq period. Furthermore, the existence of monumental sites demonstrates that a hierarchy of sites existed in both the United Arab Emirates (Carter, 1997: 95) and Central Oman in the Wadi Suq period. The differences between both regions thus seem smaller than previously thought. Nonetheless, much of the data presented here are preliminary results from surveys. Further fieldwork is required to provide more robust data for re-evaluating the second millennium in Central Oman.

ACKNOWLEDGEMENTS

Thanks are due to the Ministry of Heritage and Culture of the Sultanate of Oman, especially to His Highness Salim bin Mohammed Al-Mahruqi and Sultan Al-Bakri, General Director of Archaeology. I am grateful to Khamis Al-Asmi and to his staff.

ORCID

Stephanie Döpper  <https://orcid.org/0000-0003-4073-6621>

REFERENCES

- Al-Jahwari, N. (2008). *Settlement patterns, development and cultural change in Northern Oman Peninsula: A multi-tiered approach to the analysis of long-term settlement trends*. PhD thesis, Durham University. Retrieved on 14 January 2021 from <http://etheses.dur.ac.uk/1357/>
- Al-Shanfari, A. A. B., & Weisgerber, G. (1989). A Late Bronze Age warrior burial from Nizwa (Oman). In M. Costa & M. Tosi (Eds.), *Oman studies. Papers on the archaeology and history of Oman* (pp. 17–30). IsMEO.
- Azzarà, V. M., & De Rorre, A. (2017). Socio-cultural innovations of the final Umm an-Nar period in the Oman Peninsula: New insights from Ra's al-Jinz RJ-2. *Arabian Archaeology and Epigraphy*, 29, 10–26.
- Boucharlat, R., & Lombard, P. (1983). L'âge du fer dans l'oasis d'Al Ain: Deux saisons de fouilles à Roumeilah. *Proceedings of the Seminar for Arabian Studies*, 13, 3–17.
- Brunswig, R. H. (1989). Cultural history, environment and economy as seen from an Umm an-Nar settlement. Evidence from test excavations at Bat, Oman, 1977/78. *The Journal of Oman Studies*, 10, 9–50.
- Carter, R. A. (1997). *Defining the Late Bronze Age in Southeast Arabia: Ceramic evolution and settlement during the second millennium BC*. PhD thesis, University College London. Retrieved on 14 January 2021 from https://www.academia.edu/4450381/R_A_Carters_PhD_Thesis_Defining_the_Late_Bronze_Age_in_Southeast_Arabia
- Cattani, M., Al-Lawati, H., Al-Bakri, N. S. S., Tosi, M., Cocca, E., Armigliato, A., ... Vinci, G. (2017). The excavation at the Bronze Age tower of Al-Khutm (Bāt, Sultanate of Oman): A preliminary evaluation of the monument (poster). *Proceedings of the Seminar for Arabian Studies*, 47, 51–56.
- Cleuziou, S. (1981). Oman peninsula in the early second millennium B.C. In H. Härtel (Ed.), *South Asian archaeology 1979. Papers from the Fifth International Conference of the Association of South Asian Archaeologists in Western Europe held in the Museum für Indische Kunst der Staatlichen Museen Preussischer Kulturbesitz Berlin* (pp. 279–293). Dietrich Reimer Verlag.
- Cleuziou, S. (1989). The chronology of protohistoric Oman as seen from Hili. In M. Costa & M. Tosi (Eds.), *Oman studies. Papers on the archaeology and history of Oman* (pp. 47–78). IsMEO.
- Cleuziou, S. (2002). The Early Bronze Age of the Oman peninsula. From chronology to the dialectics of tribe and state formation. In S. Cleuziou, M. Tosi, & J. Zarins (Eds.), *Essays on the late prehistory of the Arabian Peninsula* (pp. 191–236). Institute italiano per l'Africa e l'Oriente.
- Cleuziou, S. (2007). Evolution toward complexity in a coastal desert environment. The Early Bronze Age in the Ja'alan, Sultanate of Oman. In T. A. Kohler & S. E. van der Leeuw (Eds.), *Model-based archaeology of socio-natural systems* (pp. 213–231). School of American Research Press.
- Cleuziou, S. (2009). Extracting wealth from a land of starvation by creating social complexity: A dialogue between archaeology and climate? *Comptes Rendus Geoscience*, 341, 726–738.
- Cleuziou, S., & Tosi, M. (2007). *In the shadow of the ancestors. The prehistoric foundations of the early Arabian civilization in Oman*. Ministry of Heritage and Culture.

- Cocca, E., Vinci, G., Cattani, M., Armigliato, A., Di Michele, A., Bianchi, M., & Gennuso, I. (2019). Al-Khutm Project 2017/2018: A Bronze Age monumental tower (Bat, Oman). *Proceedings of the Seminar for Arabian Studies*, 49, 85–96.
- Crawford, H. (1996). Dilmun, victim of world recession. *Proceedings of the Seminar for Arabian Studies*, 26, 13–22.
- Crawford, H. (1998). *Dilmun and its Gulf neighbours*. Cambridge University Press.
- David-Cuny, H., Frenez, D., & Williams, K. D. (2016). An unusual 2nd millennium BC stamp seal from Shokur (Dhank, al-Dhahirah Gov., Sultanate of Oman). Identifying a local series of Bronze Age seals? Paper presented at the Seminar for Arabian Studies, London. Retrieved on 14 January 2021 from https://www.academia.edu/27473872/David_Cuny_Frenez_and_Williams_2016_An_Unusual_2nd_Mill_BC_Stamp_Seal_from_Shokur_Oman_Identifying_a_Local_Series_of_Bronze_Age_Seals
- de Cardi, B. (1977). Surface collections from the Oman survey, 1976. *The Journal of Oman Studies*, 3, 59–70.
- de Cardi, B., Bell, R. D., & Starling, N. J. (1979). Excavations at Tāwī Silaim and Tāwī Sa'īd in the Sharqīyah, 1978. *The Journal of Oman Studies*, 5, 61–94.
- de Cardi, B., Collier, S., & Doe, D. B. (1976). Excavation and survey in Oman, 1974–5. *The Journal of Oman Studies*, 2, 101–187.
- de Vreeze, M., Düring, B., & Olijdam, E. (2020). New light on the late Wadi Suq period from the Suhār hinterlands. *Proceedings of the Seminar for Arabian Studies*, 50, 139–154.
- Degli Esposti, M., & Al-Muzini, W. (2015). A new seal from the ancient oasis of Salut (Central Oman). *Egitto e Vicino Oriente*, 38, 89–94.
- Döpper, S. (2020). Der Wadi Suq-zeitliche Siedlungsplatz von Tawi Said im Zentraloman: Bericht über den Survey 2018. *Mitteilungen der Deutschen Orient-Gesellschaft*, 152, 5–27.
- Döpper, S., & Schmidt, C. (2020a). Nothing but tombs and towers? Results of the Al-Mudhaybi regional survey 2019. *Proceedings of the Seminar for Arabian Studies*, 50, 157–169.
- Döpper, S., & Schmidt, C. (2020b). Two Wadi Suq and Early Iron Age stamp seals from Tawi Said, Sultanate of Oman. *The Journal of Oman Studies*, 21, 144–151.
- Fleitmann, D., Burns, S. J., Mangini, A., Mudelsee, M., Kramers, J., Villa, I., ... Matter, A. (2007). Holocene ITCZ and Indian monsoon dynamics recorded in stalagmites from Oman and Yemen (Socotra). *Quaternary Science Reviews*, 26, 170–188.
- Fleitmann, D., Burns, S. J., Neff, U., Mudelsee, M., Mangini, A., Kramers, J., & Matter, A. (2005). Holocene records of rainfall variation and associated ITCZ migration from stalagmites from Northern and Southern Oman. In H. F. Diaz & R. S. Bradley (Eds.), *The Hadley circulation: Present, past and future* (pp. 259–287). Kluwer Academic Publications.
- Frifelt, K. (1975). On prehistoric settlement and chronology of the Oman peninsula. *East and West*, 25, 359–424.
- Frifelt, K. (1976). Evidence of a third millennium BC town in Oman. *The Journal of Oman Studies*, 2, 57–67.
- Frifelt, K. (1979). Oman during the third millennium BC: Urban development of fishing/farming communities? In M. Taddei (Ed.), *South Asian archaeology 1977. Papers from the fourth international conference of the Association of South Asian Archaeologists in Western Europe held in the Istituto Universitario Orientale, Naples* (pp. 567–587). Istituto Universitario Orientale, Seminario di Studi Asiatici.
- Frifelt, K. (1995). *The island of Umm an-Nar 2: The third millennium settlement*. Aarhus University Press.
- Gernez, G., & Giraud, J. (2015). Protohistoric graveyards in Adam (Oman). Preliminary report on the 2013 and 2014 seasons of the French archaeological mission to Adam. *Proceedings of the Seminar for Arabian Studies*, 45, 107–122.
- Goudie, A. S., & Parker, A. G. (2011). Palaeoenvironments and prehistory in the Holocene of SE Arabia. In I. Martini & W. Chesworth (Eds.), *Landscapes and societies. Selected cases* (pp. 109–120). Springer.
- Gregoricka, L. A. (2016). Human response to climate change during the Umm an-Nar/Wadi Suq transition in the United Arab Emirates. *International Journal of Osteoarchaeology*, 26, 211–220.
- Hastings, A., Humphries, J. H., & Meadow, R. H. (1976). Oman in the third millennium BCE. *The Journal of Oman Studies*, 1, 9–55.
- Jasim, S. A. (2008). Stamp seals from Jebel al Buhais, Sharjah. In P. Hellyer & M. Ziolkowski (Eds.), *Emirates heritage. Proceedings of the 2nd annual symposium on recent archaeological discoveries in the Emirates, Al Ain, 2004* (pp. 54–63). Zayed Center for Heritage and History.
- Kerr, A. D. R. (2016). *A house complex in Bronze Age Arabia: A study of 'Umm an-Nar' and 'Wadi Suq' domestic architecture at the settlement slope, Bat (Oman)*. Masters thesis, Durham University. Retrieved on 14 January 2021 from <http://etheses.dur.ac.uk/11730/>
- Lombard, P. (1998). Quand la tradition tue l'innovation: Réflexions sur la glyptique de l'Âge du Fer à Rumeilah (E.A.U.). In C. S. Phillips, D. T. Potts, & S. Searight (Eds.), *Arabia and its neighbours: Essays on prehistorical and historical developments presented in honour of Beatrice de Cardi* (pp. 151–164). Brepols.
- Méry, S. (2000). *Les céramiques d'Oman et l'Asie moyenne. Une archéologie des échanges à l'Âge du Bronze*. CNRS.
- Parker, A., & Goudie, A. S. (2008). Geomorphological and palaeoenvironmental investigations in the southeastern Arabian Gulf region and the implication for the archaeology of the region. *Geomorphology*, 101, 458–470.
- Parker, A. G., Goudie, A. S., Stokes, S., White, K., Hodson, M. J., Manning, M., & Kennet, D. (2006). A record of Holocene climate change from lake geochemical analyses in southeastern Arabia. *Quaternary Research*, 66, 465–476.
- Potts, D. T. (1991). *Further excavations at Tell Abraq. The 1990 season*. Munksgaard.
- Potts, D. T. (1993a). Rethinking some aspects of trade in the Arabian Gulf. *World Archaeology*, 24, 423–440.
- Potts, D. T. (1993b). The late prehistoric, protohistoric, and early historic periods in Eastern Arabia (ca. 5000–1200 BC). *Journal of World Prehistory*, 7, 163–212.
- Potts, D. T. (2001). Before the Emirates: An archaeological and historical account of developments in the region c. 5000 BC to 676 AD. In I. Al Abed & P. Hellyer (Eds.), *United Arab Emirates: A new perspective* (pp. 28–69). Trident Press.
- Righetti, S. (2015). *Les cultures du Wadi Suq et de Shimal dans la péninsule omanaise aux deuxième millénaire avant notre ère. Évolution des sociétés du Bronze moyen et du Bronze récent*. PhD thesis, Université Paris 1, Panthéon Sorbonne.
- Sanlaville, P. (1992). Changements climatiques dans la péninsule arabique durant le Pléistocène supérieur et l'Holocène. *Paléorient*, 18, 5–26.
- Schmidt, C., & Döpper, S. (2017). The development of complexity at 3rd millennium BC Al-Khashbah, Sultanate of Oman: Results of the first two seasons 2015 and 2016. *Proceedings of the Seminar for Arabian Studies*, 47, 215–226.
- Schreiber, J. (1998). *Die Siedlungsarchitektur auf der Halbinsel Oman vom 3. bis zur Mitte des 1. Jahrtausends v. Chr.* Ugarit Verlag.
- Schreiber, J. (2007). *Transformationsprozesse in Oasensiedlungen Omans. Die vorislamische Zeit am Beispiel von Izki, Nizwa und dem Jebel Akhdar*. PhD thesis, Ludwig-Maximilians-Universität München.
- Stevens, K. G. (1992). Four "Iron Age" stamp seals from Qarn bint Sa'ud (Abu Dhabi Emirate – U.A.E.). *Arabian Archaeology and Epigraphy*, 3, 173–176.
- Velde, C. (1992). *Die spätbronzezeitliche und früheisenzeitliche Siedlung und ihre Keramik in Shimal/Ras al-Khaimah (Vereinigte Arabische Emirate)*. Magister thesis, Universität Göttingen.
- Velde, C. (2003). Wadi Suq and Late Bronze Age in the Oman peninsula. In D. T. Potts, H. Al-Naboodah, & P. Hellyer (Eds.), *Archaeology of the United Arab Emirates: Proceedings of the first international conference on the archaeology of the UAE* (pp. 102–113). Trident Press.
- Vogt, B. (1985). *Zur Chronologie und Entwicklung der Gräber des späten 4. – 2. Jahrtausends vor Christus auf der Halbinsel Oman: Zusammenfassung, Analyse und Würdigung publizierter wie auch*

- unveröffentlichter Grabungsergebnisse. PhD thesis, Georg-August-Universität zu Göttingen.
- Vogt, B., & Franke-Vogt, U. (1987). *Shimal 1985/1986. Excavations of the German archaeological mission in Ras Al-Khaimah, U.A.E. A preliminary report*. Dietrich Reimer.
- Weisgerber, G. (1981). Mehr als Kupfer in Oman – Ergebnisse der Expedition 1981. *Der Anschnitt. Mitteilungsblatt der Vereinigung der Freunde von Kunst und Kultur im Bergbau*, 33, 174–263.
- Weisgerber, G. (1991). Archäologisches Fundgut des 2. Jahrtausends v. Chr. in Oman. Möglichkeiten zur chronologischen Gliederung? In K. Schrippmann, A. Herling, & J.-F. Salles (Eds.), *Golf-Archäologie. Mesopotamien, Iran, Kuwait, Bahrain, Vereinigte Arabische Emirate und Oman* (pp. 321–330). Marie Leidorf.
- Williams, K. D., & Gregoricka, L. A. (2016). Excavation of the Wadi Suq tombs at tower 1156. In C. Thornton, C. Cable & G. L. Possehl (Eds.), *The Bronze Age towers at Bat, Sultanate of Oman: Research by the Bat archaeological project, 2007–12* (pp. 303–308). University of Pennsylvania Museum of Archaeology and Anthropology.
- Yule, P. (1994). Grabarchitektur der Eisenzeit im Sultanat Oman. *Baghdader Mitteilungen*, 25, 519–577.
- Yule, P. (2001). *Die Gräberfelder in Samad al Shān (Sultanat Oman). Materialien zu einer Kulturgeschichte*. Marie Leidorf.
- Yule, P., & Weisgerber, G. (1996). Die 14. Deutsche Archäologische Oman-Expedition 1995. *Mitteilungen der Deutschen Orient-Gesellschaft zu Berlin*, 128, 135–155.
- Yule, P., & Weisgerber, G. (2015). Al-Wāsiṭ tomb W1 and other sites: Redefining the second millennium BCE chronology in south-eastern Arabia. In P. Yule (Ed.), *Archaeological research in the Sultanate of Oman. Bronze and Iron Age graveyards* (pp. 9–108). Marie Leidorf.

How to cite this article: Döpper S. The Middle and Late Bronze Age in Central Oman: New Insights from Tawi Said, Al-Mudhairib and the Wilayat al-Mudhaybi. *Arab Arch Epig*. 2021;00:1–15. <https://doi.org/10.1111/aae.12181>