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The Hafit period at Al-Khashbah, Sultanate of Oman: results of four years of excavations and material studies

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Summary
Al-Khashbah, located approximately 17 km north of the modern city of Sināw, is one of the largest Early Bronze Age sites in the Sultanate of Oman. The University of Tübingen has carried out excavations at the site during the last four years (2015–2018), revealing a significant amount of Hafit-period architecture and finds, including a mud-brick complex (Building I) and a stone tower (Building V). Building I dates to around 2800 cal. BC and has provided evidence of bead and chipped stone workshops. Its layout is comparable to the contemporaneous tower at Hili 8, Phase I. Building V yielded the oldest substantial evidence of copper processing in Oman, dating to the end of the fourth millennium, around 3200 cal. BC. Thus, the archaeological record in Oman can now corroborate archaic texts from Uruk in southern Mesopotamia that mention copper objects from the Gulf. This paper presents the preliminary results of the study of the architecture, metallurgy, lithics, ground-stone tools, and anthracological material from Al-Khashbah. These diverse strands of evidence offer valuable insights into the Hafit-period economy, environment, and lifestyle at Al-Khashbah.

Keywords: Hafit, Al-Khashbah, towers, copper processing, Oman

Introduction

The archaeological research project of the University of Tübingen at Al-Khashbah, Sultanate of Oman, began in 2015. It seeks to investigate changes in the settlement pattern in the region, focusing on the development of complex societies at the end of the fourth and the beginning of the third millennium BC. Al-Khashbah lies about 17 km north of the city of Sināw, in the Wilayat of al-Mudhaiby of the governorate of al-Sharqīyah North in Central Oman. The geography of Al-Khashbah is characterized by a row of shallow limestone outcrops, which cross Wādī Samad from east to west, branching into several arms. Most of the archaeological remains can be found on top or close to these rocky outcrops. Today, sporadic shrubs and acacia tree vegetation dominate the landscape of Al-Khashbah. Not far to the west of the site is another wadi, Wādī ʿIndām, which is one of the biggest wadis in the Sultanate.

An extensive survey of the site in 2015 identified 325 buildings and other structures (Schmidt & Döpper 2017a; 2017b; Döpper & Schmidt 2018). The majority of these date to the Hafit and Umm an-Nar period, followed by a big gap in the occupation of the site. In the seventeenth to nineteenth century Al-Khashbah became an important place for local agriculture, which is attested in particular by wells and *aflāj* in and around the oasis, as well as by small farms with extensive field systems in the vicinity. Most of the archaeological remains of Al-Khashbah date to the Hafit period (3200–2700 BC). These comprise 205 cairn tombs and seven monumental towers made of stone and mud brick. The Hafit tombs are situated almost exclusively on the rocky outcrops, while the contemporary towers were built either in the plain or slightly elevated on the outcrops — the latter always lie directly next to one of the main wadi arms. Excavation during the last four years has resulted in the partial clearance of two monumental buildings, Building I and Building V, which are the focus of this paper.

The late Hafit-period Building I

Building I is situated in Area B, where at least three other Hafit-period towers exist (Fig. 1). As none of these was excavated, it cannot be determined whether all the structures in Area B are contemporaneous and if they belong to the same settlement. Directly to the north of Building I lies Building XI, one of the other Hafit-

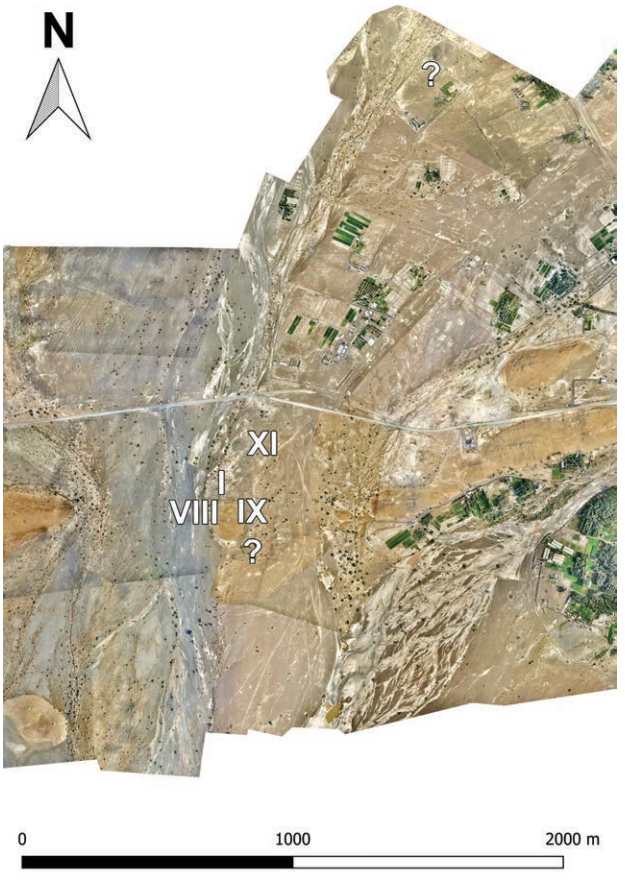

Figure 1. *Area B and Area F at Al-Khashbah with Hafit-period buildings (I, VIII, IX, XI) and other possible Hafit-period remains.*

period buildings in Area B. It comprises a small mound that is surrounded by two concentric ditches of 65 to 80 m in diameter, clearly visible in the magnetogram (Herrmann et al. 2018). The other two buildings, VIII and IX, are located south of Building I on a small rocky outcrop. Preservation of the monumental buildings VIII and IX is quite poor, with only minor parts remaining of their walls (Schmidt & Döpper 2017b: 221, fig. 10). In a foot survey, this area yielded the highest density of slag in the entire survey area of Al-Khashbah (Schmidt & Döpper 2017a: 129, Abb. 5). High concentrations of slag are typical for all Hafit-period buildings in Al-Khashbah, and were also encountered south of Buildings VIII and IX but so far, no architecture has been identified here (Fig. 1). There is another possible tower in Area F, which lies to the north of Area B (Fig. 1). Consisting of a small mound, it is very similar to Building XI in Area B both in its form and location, namely to the east of the same wadi arm.

The area upon which Building I sits is only about 1 m higher in elevation than the surrounding plain. This is the natural topography of the area and is not the result of earlier building activities at this place. The magnetogram of the site revealed the existence of at least three roughly rectangular structures with rounded corners each measuring *c.*20 x 20 m (Schmidt & Döpper 2017b: 222, fig. 12; Herrmann et al. 2018). In addition, there are smaller anomalies, especially a long structure running north–south in the eastern part of the site, composed of two semi-circles. Prior to the excavations at Building I, a foot survey was also conducted. Lithics made up the majority of finds from this survey, although there was also a number of slag and furnace fragments (Döpper & Schmidt 2018: 171, fig. 1). All these surface finds are clearly associated with the architectural structures visible in the magnetometry.

Excavations at Building I between 2015 and 2018 revealed a spacious late Hafit complex composed of several mud-brick structures. It remains unclear whether they superimpose each other or were a contemporary cluster of structures. Due to erosion and proximity to the surface, only one structure could be completely exposed while the others were only partially preserved. The mud-brick structures are surrounded by ditches that are 3 m deep and 4 m wide (Schmidt & Döpper 2017a: 148, Abb. 27). The authors previously proposed that they might represent drainage ditches (Schmidt & Döpper 2017b: 219). In the 2018 season, a small, square, and very well-constructed stone well came to light in the middle of one of these ditches (Fig. 3/a). As the well was built after sediments had already filled the ditch, the previous interpretation must be modified. The well demonstrates the availability of water at this location. The bottom of the ditch exposed a gravel layer, facilitating the collection of upward-seeping groundwater. Even after the ditch had silted up, the builders of the well must have known that groundwater was present here. Thus, access to groundwater was probably the main reason for establishing Building I at this location.

The area surrounded by the ditches of Building I contains mainly mud-brick architecture (Fig. 2). Characteristic of these structures are small

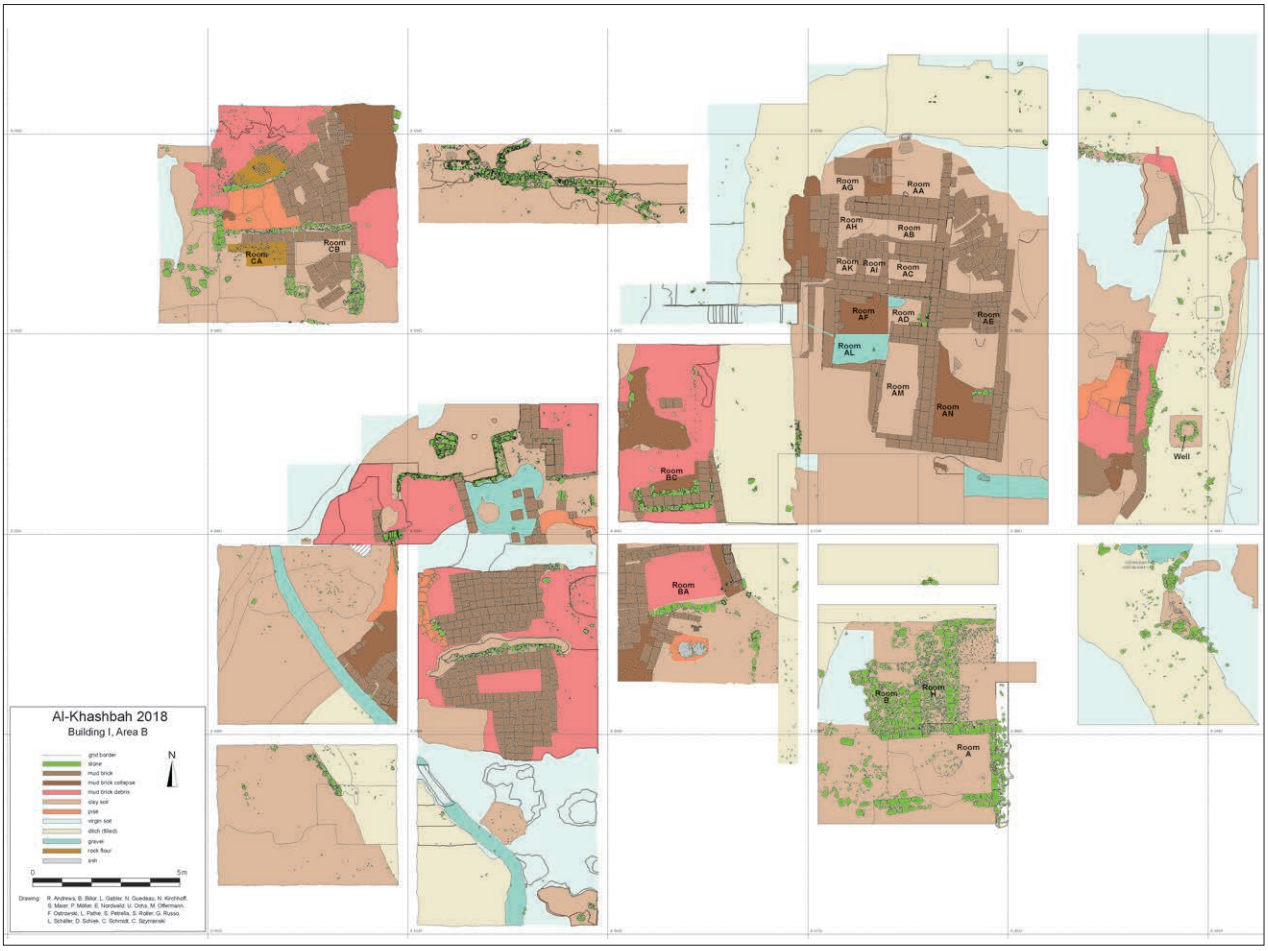

Figure 2. *Excavated area of Building I.*

compartments similar to other towers in Oman (Fig. 3/b), for instance at Bat. Usually, the mud-brick walls consist of a row of rectangular mud bricks (0.4 x 0.6 m) edged by two half-sized rows of mud bricks. A variation of this kind of construction is the combination of mud brick and stone. In this case, the two smaller mud-brick rows are replaced by stones (Fig. 3/c). Although completely stone-built walls are not common in Building I, they do exist, especially in the western part of the building (Fig. 3/d). This part of the building also contains the only evidence of more than one building phase. The rest of the complex consists of a single building phase. Additionally, the southern part of Building I consists solely of stone architecture (Fig. 4). The eastern part of this stone architecture is completely preserved. There is a stone-paved corridor, which separates the outer wall from a square platform in the middle of the structure. The western part is destroyed. The stone architecture follows exactly the edge of its surrounding ditches (see Fig. 2).

Building I dates to the late Hafit period. Analysis of charcoal from several fire pits and stratified accumulations within the building provide highly consistent dates of around 2800 cal. BC. Yet the material has also provided some older dates, which are considered to be older than the building itself (Fig. 5). Architectural comparisons for Building I can be found in the contemporary mud-brick tower of Hili 8, Phase I, in the UAE (Cleuziou 1989). Although Hili 8 is better preserved, the sub-rectangular ground plan and the

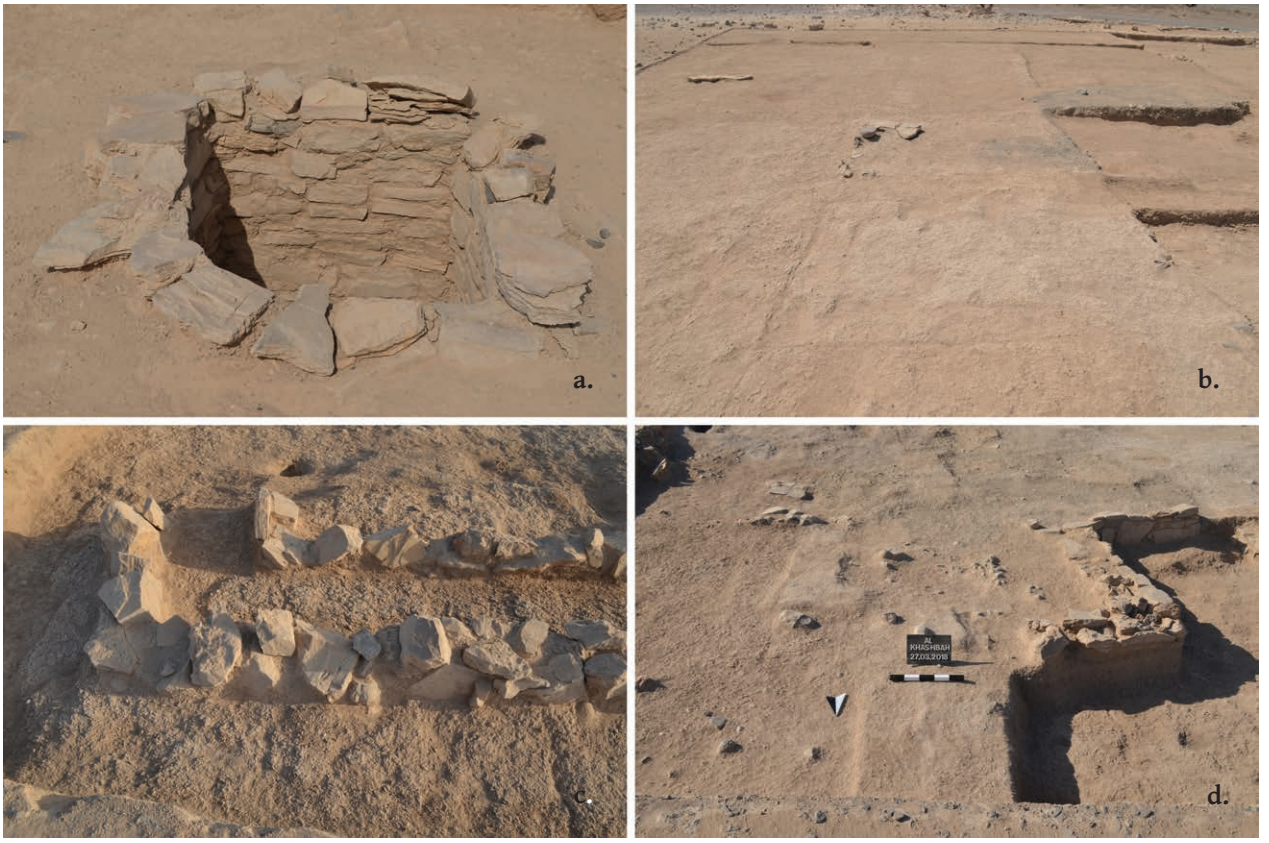

Figure 3. a. *A well cutting the filling of a ditch;* **b.** *mud-brick compartments;* **c.** *a wall built with a combination of mud brick and stone;* **d.** *an area with two building phases in the west.*

Figure 4. *Stone architecture in the south with surrounding ditches.*

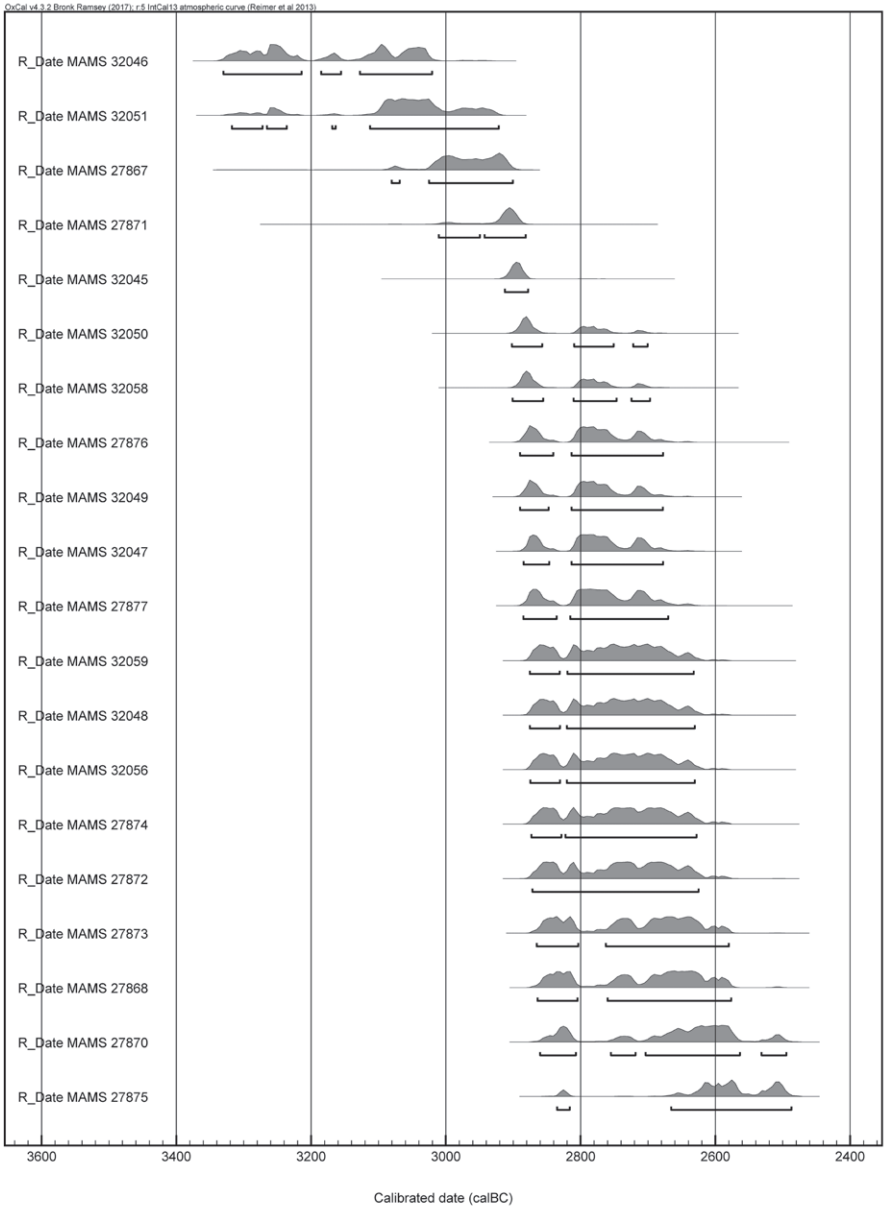

Figure 5. *Calibrated ^{14}C dates for Building I in Al-Khashbah (lab: R. Friedrich, Curt-Engelhorn-Zentrum Archäometrie, Mannheim, Germany; INTCAL13 [Reimer et al. 2013], and SwissCal 1.0 [L. Wacker, ETH-Zürich]) processed with OxCal v4.3.2 (Bronk Ramsey 2017).*

internal layout of small compartments are very similar to Building I at Al-Khashbah.

The various groups of finds from Building I provide valuable information on the activities conducted here. One hundred pieces of ground-stone tools have been found (Döpper, in press), including large upper and lower grinding stones and hammer stones.[1] Both types were most likely used in the course of the copper processing that is attested at the site. Copper processing was not the only activity undertaken in Building I. There are clear indications of a bead workshop, as attested by numerous beads and especially semi-finished products (Fig. 6/a–b). Other objects of personal adornment include pendants and perforated shell rectangles belonging to bracelets (Schmidt & Döpper, in press). Together with the many shell beads, these objects demonstrate the far-reaching contacts of Al-Khashbah with the coast. A

[1] All ground-stone tools from al-Khashbah are published online as 3D models: www.archaeoman.de/en/al-khashbah-3d-modelle-funde/

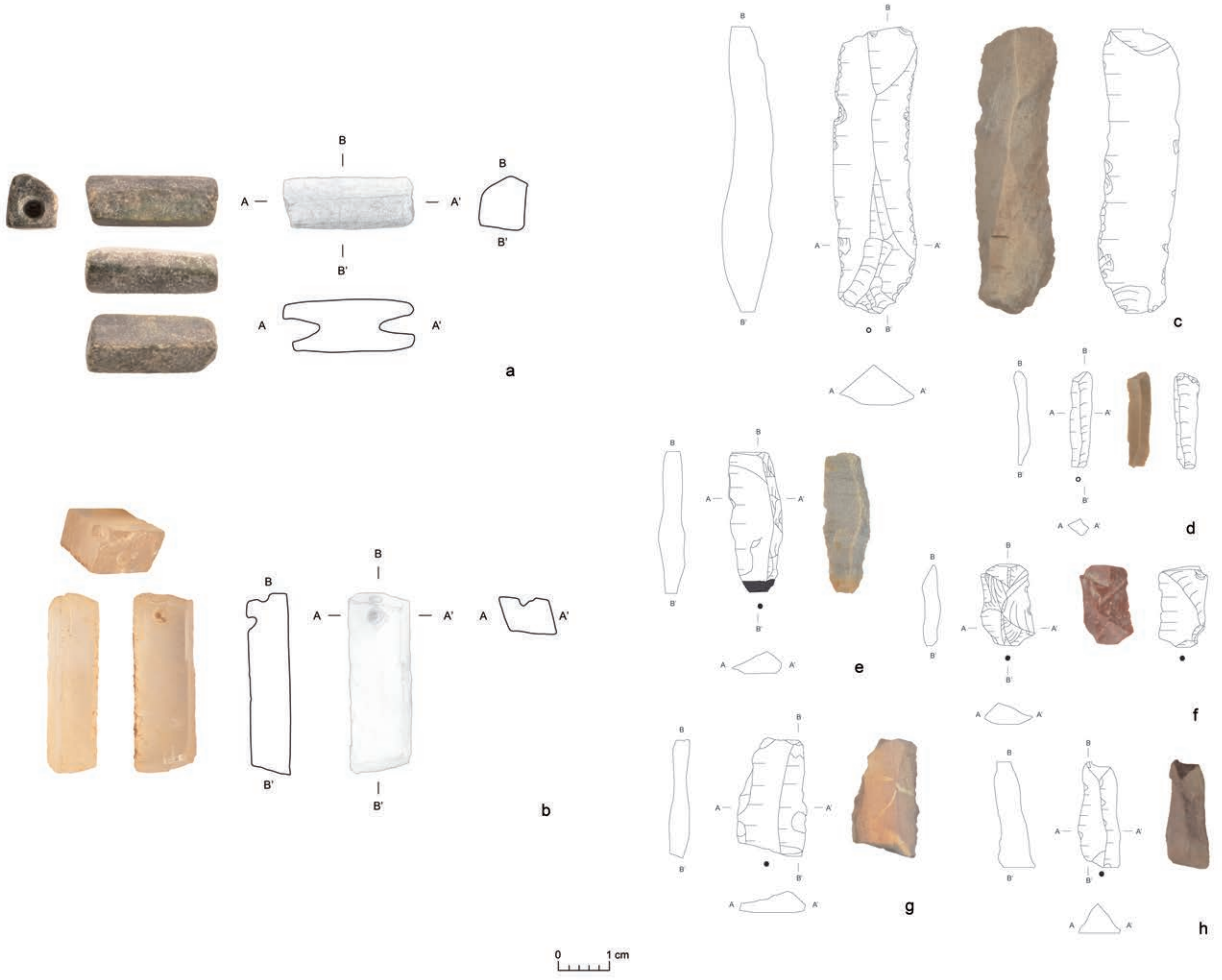

Figure 6. a–b. *Semi-finished beads;* **c–h.** *lithic blades.*

very important group of objects are the chipped stone artefacts. The presence of both tools and debris from their production clearly shows that the lithic objects were produced on-site. The analysed material from the foot survey consisted of 87.1% flakes; and sixty-eight blades (Fig. 6/c–h) and eighteen cores, as well as four scrapers, three lamina flakes, three arrowheads, one point, and two piercers. This assemblage is very interesting for the reconstruction of the socio-economic conditions of the Hafit period in Central Oman.

Anthracological analyses, conducted by Katleen Deckers from the University of Tübingen, were initiated in 2017 (Deckers, Döpper & Schmidt, in press). Preliminary results for Building I and Building V show that the wood burned at Al-Khashbah at the end of the fourth and the beginning of the third millennium BC mainly consisted of *Ziziphus*, *Acacia*, and *Tamarix*. Additionally, *Avicennia marina*, a species of mangrove, indicates contacts with the coast. Date palm was attested as well, but no differentiation between wild and cultivated date palm is possible.

The early Hafit-period Building V

The second area of intensive excavations is a monumental tower, Building V (Fig. 7). The tower is located on the eastern edge of a long rocky outcrop. Outside the tower, excavations revealed a series of three smaller stone walls to the south. These three walls do not run parallel to each other or to the outer ring-wall of the

main tower (Schmidt & Döpper 2017b: 220, fig. 8). Thick accumulations of stone debris and waste from copper processing, such as slags, prills, as well as furnace and crucible fragments were present between the tower and these smaller stone walls. The outer ring-wall is built of large limestone blocks. It has a diameter of 25 m and a preserved height of up to 1.10 m. The most surprising result in this context is that this stone ring-wall does not represent the oldest phase of Building V but replaces a former mud-brick wall at the same location, of which only fragmentary sections have survived. The foundation pit for the stone wall was so broad that a massive packing of large stones was necessary to fill the gap (Fig. 8).

Apart from the outer mud-brick wall, the layout of the original tower is very well preserved in the form of compartments made of mud brick and stone walls (Fig. 7) (Schmidt & Döpper, in press: Beilage 2). While the eastern part of the excavated area is dominated by stone walls (Fig. 9), the western part is solely made up of mud-brick architecture. Occasionally, stone and mud-brick walls were used together, similar to the construction method used in some late Hafit walls in Building I. At a later stage some stone walls were added to the compartments. Unlike most of the other walls, they do not rest on the bedrock but on the accumulation of debris that fills the rooms.

One of the most important discoveries at Building V is its date. Charcoal samples from the accumulations outside the ring-wall, from fire pits on the bedrock on which the tower is founded and from the rooms inside the building, all associated with substantial copper

Figure 7. *An aerial view of Building V.*

Figure 8. *The remains of an older mud-brick wall cut by the foundation pit for the outer stone wall.*

processing debris, give consistent dates in the early Hafit period, around 3200 cal. BC (Fig. 10). This makes Building V the oldest known monumental building in Oman. The construction of the outer stone wall and all the modifications of the interior walls of the building also fall within this date. A second group of charcoal samples dates to the very end of the Hafit period, around 2800 to 2700 cal. BC. These samples come from a yellowish material close to the surface sealing the fourth-millennium remains.

Some of the finds from Building V are similar to those from Building I, such as large ground-stone tools, most likely used to grind copper during the processing, as well as hammer stones for crushing the ore or slag. Additionally, large seashells have been found at both Hafit-period buildings. In contrast to the wider variety of activities attested at Building I, other objects from Building V indicate that it had a rather specialized function as a copper workshop. Directly above the bedrock on which the tower is founded, is a thick layer of copper-rich slag. Together with the prills, the thousands of furnace and crucible fragments show that the smelting was conducted close to the tower. It is interesting to note that no pottery was found either at Building V or Building I.

Figure 9. *The interior of Building V with stone wall compartments.*

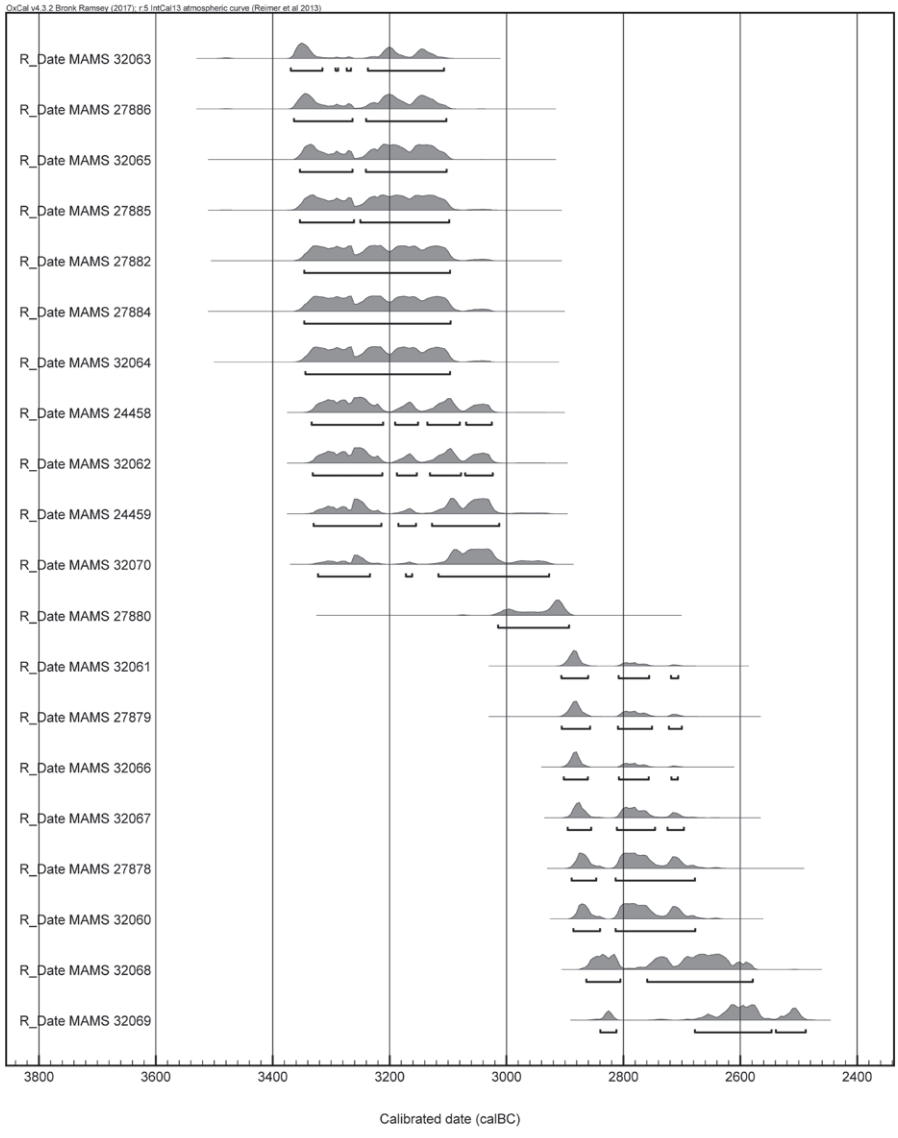

Figure 10. *Calibrated ^{14}C dates for Building V in Al-Khashbah (lab: R. Friedrich, Curt-Engelhorn-Zentrum Archäometrie, Mannheim, Germany; INTCAL13 [Reimer et al. 2013], and SwissCal 1.0 [L. Wacker, ETH-Zürich]) processed with OxCal v4.3.2 (Bronk Ramsey 2017).*

Conclusions

Both of the excavated monumental buildings at Al-Khashbah provide valuable insights into the socio-economic conditions of the otherwise sparsely attested Hafit period in Central Oman. Building I is a large and diverse late Hafit-period complex with parallels to Hili 8, Phase I in the UAE. It offers manifold evidence for a range of activities, including bead and chipped stone workshops, as well as small-scale copper processing. The early Hafit-period Building V yields the oldest substantial evidence of copper processing in Oman to date,[2] preceding the site of al-Maysar by 1000 years. It is roughly contemporary with the archaic texts from Uruk in southern Mesopotamia that mention copper objects from the Arab-Persian Gulf (Englund 1983). Thus, for the first time, archaeological and written records fit together.

[2] Further evidence for the use and working of copper in the Hafit period comes from the coastal sites of Ra's al-Hamra RH-10 and Ra's al-Hadd HD-6 (Giardino 2015).

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