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A Hafit-period stone tool assemblage from Al-Khashbah, Sultanate of Oman

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Summary
In 2015, an intensive surface survey was conducted at several selected locations of the site of Al-Khashbah, Sultanate of Oman, under the direction of Dr Conrad Schmidt (University of Tübingen). Al Khasbah is a well-known site for its Hafit and Umm an-Nar buildings. It is one of the first Early Bronze Age settlements with clearly associated stone tools in the interior of Oman. A unique stone tool assemblage was discovered in and around Building I, clearly dating to the Hafit period. It includes a variety of tools, which have little in common with Hafit-period stone tool assemblages from the coast. The discovered micro-debitage, which was found during the subsequent excavations, shows that this place was also a knapping area. The paper will give a short overview of the different types of stone tools represented and their spatial distribution within Building I.

Keywords: stone tool assemblage, Al-Khashbah, Early Bronze Age, Hafit period, Sultanate of Oman

Introduction

This paper presents a stone artefact assemblage from site Al-Khashbah (Schmidt & Döpper 2019: 265) in the southern Hajar Mountains near the town of Sināw (Fig. 1). The site is surrounded by Wādī Samad, which is characterized by grey, coarse sand. Due to its inland location, Al-Kasbah is an important site for Oman for the end of the fourth and beginning of the third millennium BC, given that this period is particularly well-known on the coast from sites such as Ras al-Hadd and Ras al-Jinz (Charpentier 2001: 34–35, fig. 6; Hilbert & Azzarà 2012: 7–25). Al-Khashbah adds important evidence to the small record of inland sites including Hili 8, Jebel Hafit, and Bat (Choimet 2016: 217–228). The site provides evidence of Early Bronze Age settlement through several buildings and graves from the Hafit and Umm an-Nar periods.

This paper focuses on stone artefacts from the survey of Building I. In contrast to the Neolithic period, stone tool assemblages from the Early Bronze Age are less well-studied and understood. A total of 20 ha was surveyed and 18,000 artefacts were collected during the survey. Among them were about 1300 stone tools. Stone artefacts collected from Building I feature a notable increase in density, which led me to conclude that they must be related to this building. The distribution clearly corresponds to the outline of the building (Fig. 2), which was not the case in other buildings, for example Building V. Almost no flint artefacts were found here (Schmidt & Döpper 2017: 2–4). Radiocarbon analyses of charcoal samples (Schmidt & Döpper 2019: 269, fig. 5) clearly date Building I and the related stone artefacts to *c.*2800 cal. BC and hence to the Hafit period of the Early Bronze Age (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; Schmidt & Döpper 2017: 2–4). Besides indications of the production of stone tools, there is also evidence from Building I indicating the production of beads and adornments made of seashells and stones. Moreover, large grinding stones were found, which probably indicates copper processing. As usual for the Hafit culture, no ceramic fragments were found in Building I, which also means that the subsequent ceramic-bearing Umm an-Nar culture had no influence on these buildings (Schmidt & Döpper 2019: 267–269).

Methods

The stone inventory was examined for a short overview within the Al Khashbah project and the following artefact groups were identified: flakes with and without

Figure 1.
The location of Al-Khashbah in the south of the Hadjar Mountains.

retouch (dimensions not recorded), blades with and without retouch (dimensions recorded), and cores. The latter were classified according to scar dimensions into flake and blade cores, as well as according to the location and number of striking platforms. Retouch was described according to the location on the blank and direction of striking. Retouched artefacts were classified using established stone tool typologies.

Results

Raw material

The raw material of the artefacts examined here is dominated by radiolarites of the Hawasina nappe, which is thought to date to the transition between the late Jurassic and Cretaceous periods (Hoffmann et al. 2016: 116–118). Given that raw material featuring the typical deformed bands alternating with limestone can be found in the immediate vicinity of the survey area in Al-Khashbah (Fig. 3), a local origin for the raw material used for the production of the stone artefacts is likely. The banding is responsible for the great variance in colour and texture of the raw material.

The inventory

A total of 765 stone artefacts were recorded from the area within Building I. This represents more than half of the flint tools collected in the entire survey area (Fig. 4).

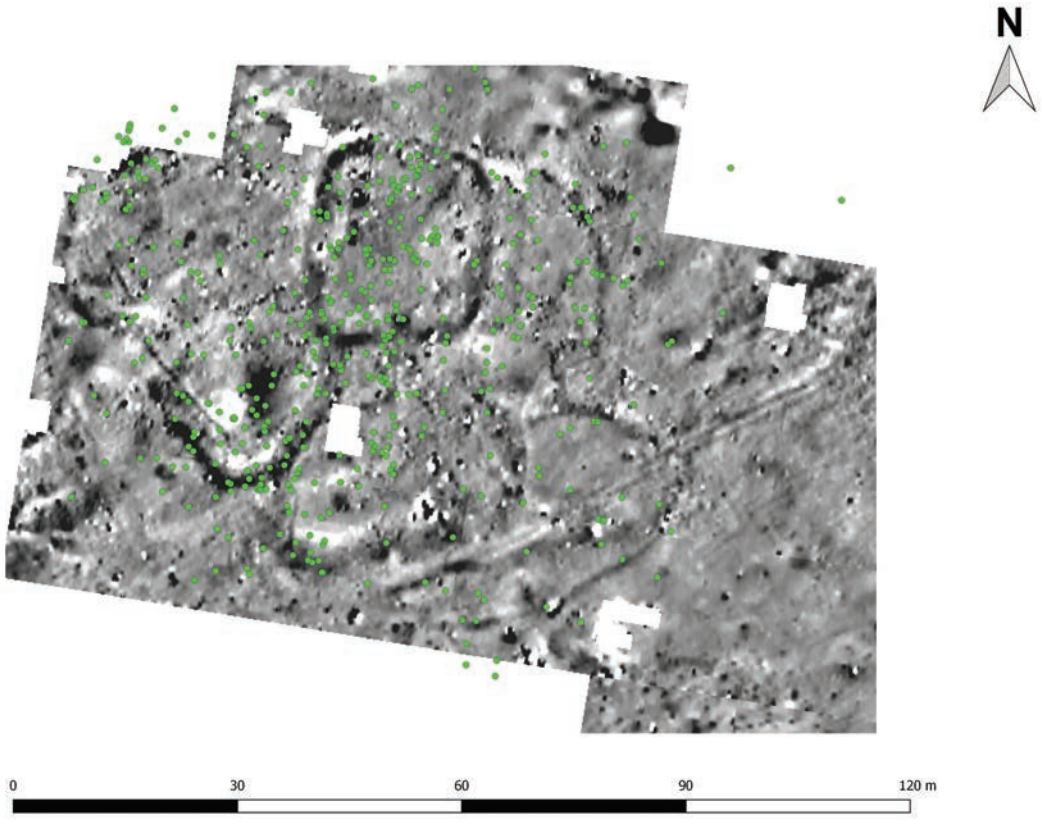

Figure 2. *Magnetometer survey of Building I with clearly corresponding stone artefacts (in green).*

Figure 3. *Source of lithic raw material.*

More than 87% (n = 666) of these are flakes. Of these, 651 are complete while the remaining fifteen specimens are broken. Only twenty-five of the complete flakes and two of the broken artefacts show a light use retouch (Fig. 5).

Artefact type	n	%
Total	765	100
Flakes	666	87.1
Blades	68	8.8
Cores	13	1.7
Core preparation	5	0.7
Bladelets	3	0.4
Tools	9	1.2

Figure 4. *Total stone artefact assemblage of Building I.*

Artefact	n	%
Total=Complete+fragmented	666	100
Complete	651	97.7
Complete+unretouched	626	93.9
Complete+retouched	25	3.8
Complete+retouched+polished	2	0.3
Fragmented	15	2.2
Fragmented+unretouched	13	1.95
Fragmented+retouched	2	0.3

Figure 5. *Complete and fragmented flakes of Building I.*

Blades

At 8.8% (n = 68) blades form the second largest group after flakes. More than half (n = 35) are complete and most (n = 21) are unretouched. Dimensions range between 21 x 13 x 4 mm and 50 x 24 x 12 mm. Corresponding blade cores are missing. Similar observations have been made at other Bronze Age excavations, including Ras al-Hadd and Ras al-Jinz. Researchers argue that blades might be imported and not locally produced (Hilbert & Azzarà 2012: 17). On the other hand, it is also possible that blades were produced and discarded locally while the blade cores were exported. The analysed blades have a very large size range with blades measuring up to 30 mm in width and small bladelets measuring less than 12 mm.

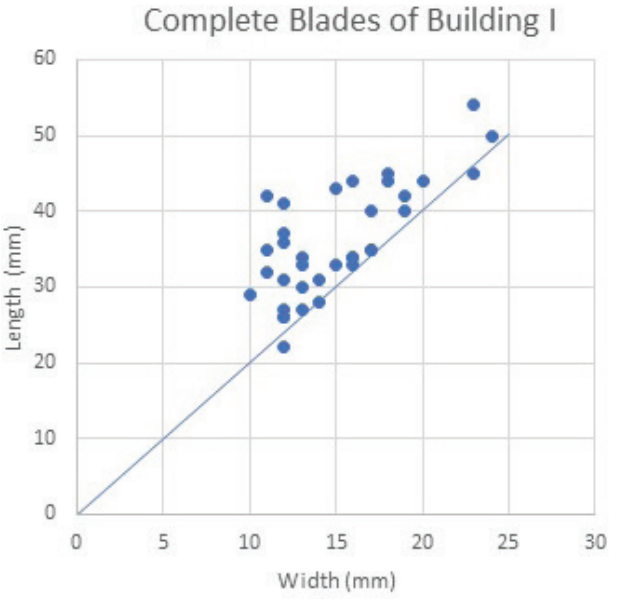

Figure 6. *Diagram showing length/width measurements of blades.*

Cores

In total thirteen cores were found and all, except one bladelet core, are flake cores (Fig. 7). The bladelet core has only one reduction surface featuring three bladelet negatives and a cortex covered back. The remaining twelve flake cores show different patterns of reduction including six double-platform cores and five cores that can be classified as single-platform cores. One core is a multi-platform core with three striking platforms. They all have a similar appearance and are usually fairly small. The largest core measures just 65 x 30 x 15 mm. Given the number of cores and flakes recovered, it can be concluded that there are too few cores. Clear hammerstones could not be identified. It is possible, however, that the grinding artefacts for copper processing mentioned above may be hammerstones for stone knapping, but this remains to be confirmed with another investigation.

Tools

Among the blades there are fourteen retouched samples. Retouch mostly occurs partially. Considering the raw material of the blades, it is clear that the blade cores

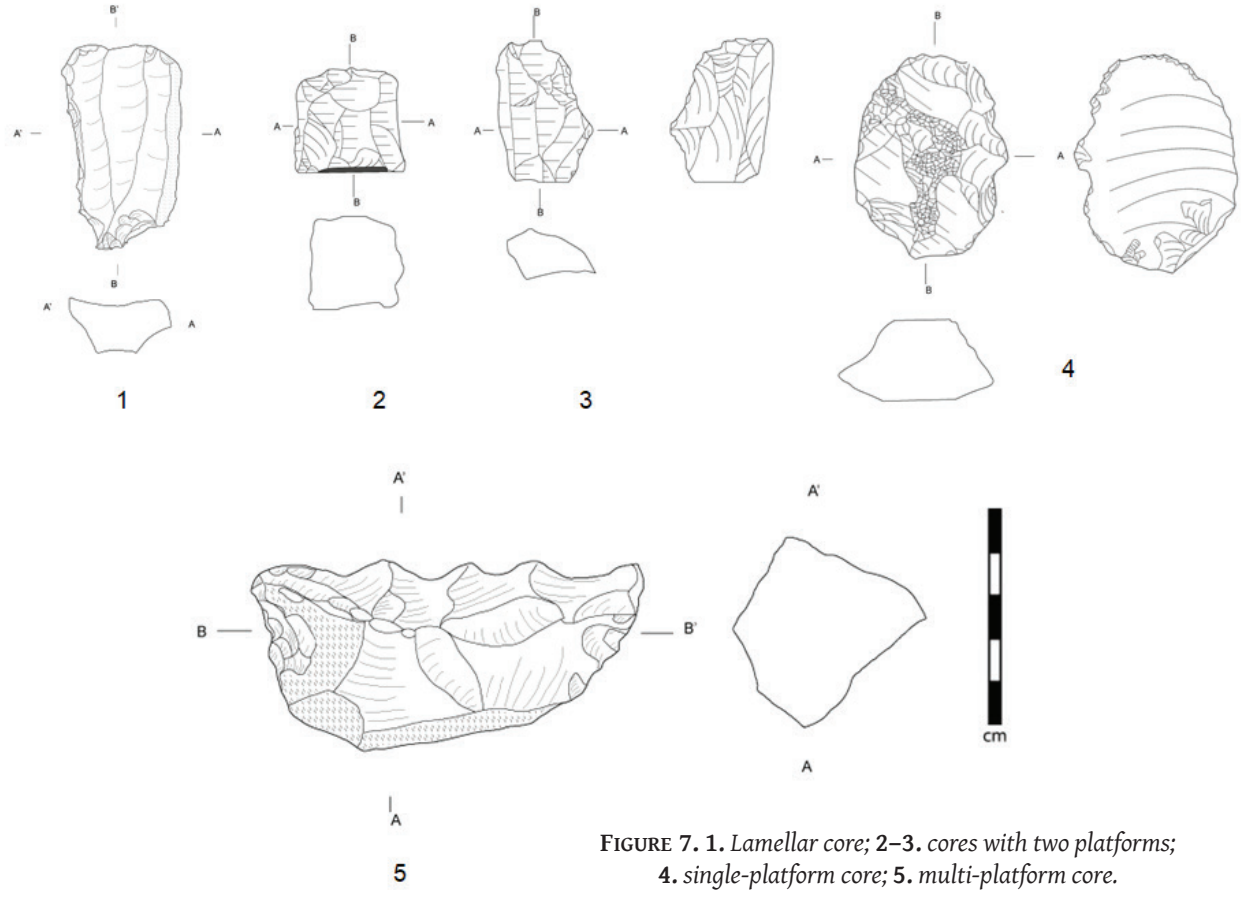

Figure 7. 1. *Lamellar core;* **2–3.** *cores with two platforms;* **4.** *single-platform core;* **5.** *multi-platform core.*

were not reworked into flake cores. In general, it was possible to identify more than fifty different types of radiolarite and chert. They vary mainly in their colour and texture. Ten of the retouched blades show a backed retouch. On four of these, a polish on the unretouched edge was identifiable (Fig. 8). I do not intend to open a discussion about possible sickle blades and associated agriculture at this point as we have not found any other evidence, such as cereal grains or watering systems — for example, the modern falaj — at the site. I agree in this regard with Patricia C. Anderson who has already suggested that such polish may have other causes and needs to be analysed using a high-powered microscopic approach. Many non-cereal plants like reeds, grasses, sedges, or rushes can leave polish behind. Silicon crystals are significant as they are present in both grain and clay and fine polish the edges (Anderson 1999: 120). This is interesting for our interpretation, because the floor as well as parts of low walls of Building I consist of clay bricks. To give these bricks better stability a binding material such as straw was essential. This indicates that the polished blades were possibly used for cutting wild grasses for the binder and not for the harvesting of grain (Schmidt & Döpper 2019: 267–268, figs 2, 3/b–d). Comparable blades were found in Yemen. In Wadi Dhar, only a few kilometres west of the capital Sanaa, several find complexes were discovered. On the basis of comparative finds, the site Shaabat Sulaiman SaS-1 dates to the Neolithic, between the fifth and fourth millennia BC. Numerous back retouched blades with traces of polish on the unretouched edge were found there (Kallweit 2001: 81, 99, figs 7 & 8).

Back retouched blades are also known from other sites on the Oman peninsula, including the sites of Sharbitat on the east coast of Oman (Maiorano et al. 2018). Here pieces were found at the Late Neolithic and Early Bronze Age site SHA-2, as well as the Late Neolithic site SHA-10b. The blades there are somewhat concavely curved, which is why they are called lunates (2018: 228–229, fig. 9.). They are also found in the Neolithic

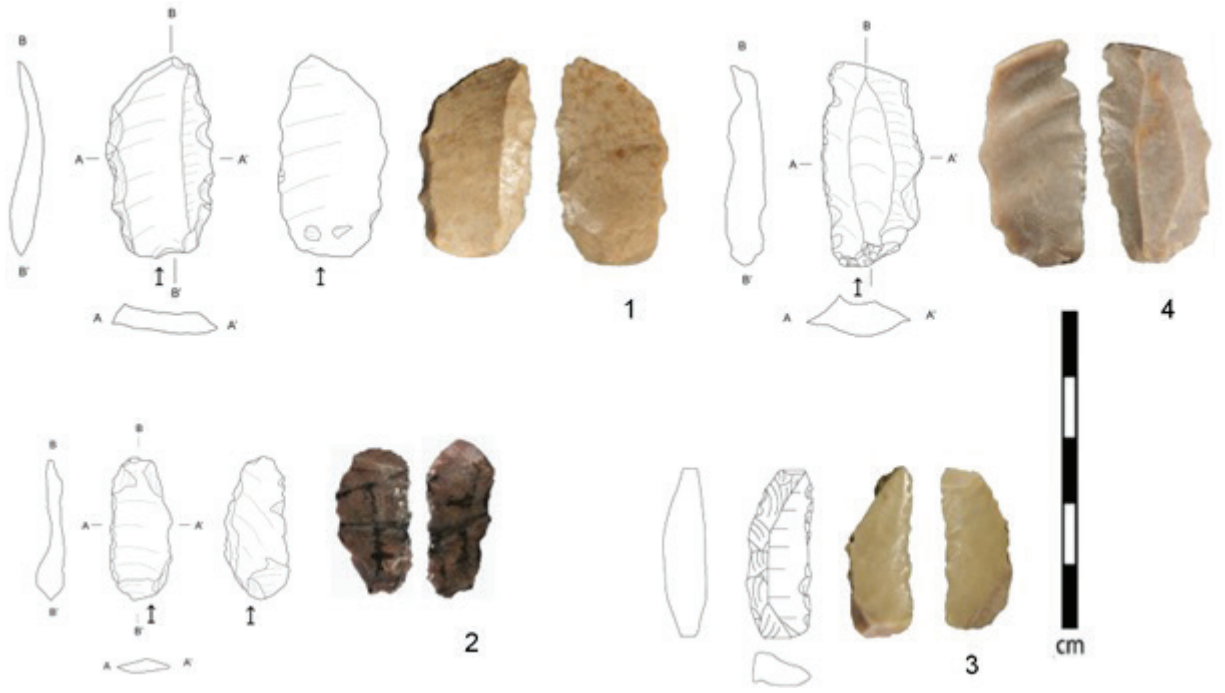

Figure 8. 1–3. *Backed and polished blades;* **4.** *polished blade without back retouch.*

stone artefact inventory of Marawah MR-1, a coastal site in the United Arab Emirates, where they are also discussed as sickle-shaped inserts or arrowheads, but no traces of polish on the unretouched edge are mentioned (Charpentier 2004: 53–54, fig. 1/1,2).

Scrapers are another category of tools present in the assemblage of Building I. Three pieces were found, which all have the typical end-scraper cap but vary in shape and size (Fig. 9). Their dimensions range from 29 to 42 mm in length and from 16 to 29 mm in width. One of them has a kind of drill retouch at its distal end. It should be noted that they are made of both coarse and very fine raw material. In comparison with scrapers from coastal sites such as Ra's al-Hadd, HD-6, there are some similarities. They have a similar retouch but are on the whole bulkier. One piece has a straight end-scraper cap (Hilbert & Azzarà 2012: 15–16, fig. 10/5,6). Two burins were also recovered, one of which has a stop notch. The corresponding burin spall was not identified.

Arrowheads are another important group present at the site. Three artefacts fall into this category. The first point is 29 mm long and 15 mm wide, bifacially retouched and fusiform in shape (Fig. 10). A similar arrowhead was found in Jebel Abiyad, Ruwayz 1B4. It dates to *c.*5750 BC. Charpentier (2008) describes this type of point as Wide Fusiform Point Type 1.C of the fusiform foliated pieces, which are already known from the early levels of Suwayh 1 (2008: 68–67, fig. 6/3). The example found at Al-Khashbah is 2 cm longer and somewhat narrower. The bifacial retouch is also more pronounced, which could indicate use and resharpening over a longer period of time. The second arrowhead is a bifacially retouched point with recognizable shoulders. It is 25 mm long and 7 mm wide. The tang is relatively long and broken. One similar piece was found at site Suwayh SWY-1 in Period I dated to *c.*5500–4500 BC. This one is also foliated and bifacially retouched with biconvex section, and its barbs are worked. The tang is shorter and pointed (Charpentier 2008: 65, fig. 4/11). For the last point, it was not possible to find a close equivalent, but it is also bifacially retouched and shows slightly retouched barbs. The example is 31 mm long and 13 mm wide. Given several kilogrammes of micro-debitage were found during the excavation, it can be assumed that the tools had been retouched and probably resharpened on site.

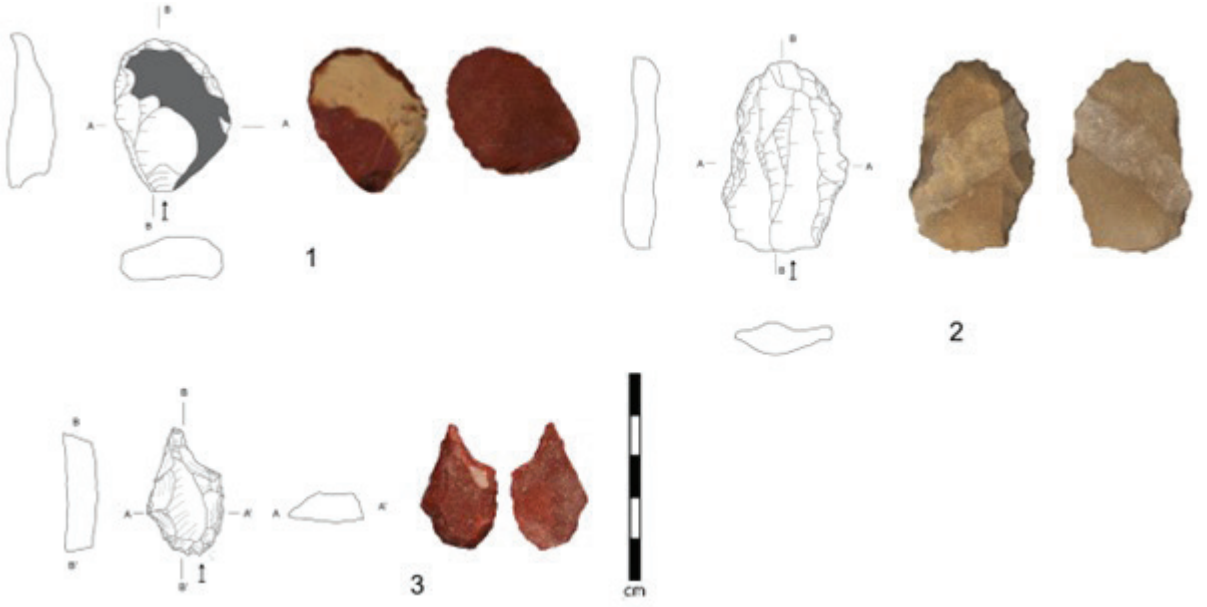

Figure 9. 1–2. *Scrapers;* **3.** *perforator-scraper.*

Highlights of the 2016–2017 excavation season

Finally, some of the highlights of the 2016 and 2017 campaigns will be presented. Even though this may seem a bit unusual and the overall reappraisal of the three excavation campaigns will take some time, it is imperative that these artefacts be presented to a wider public, as they are artefacts that have a different appearance in direct comparison to other Bronze Age sites. They are stone artefacts that raise some questions about their design and function. These are discussed here.

The first — very interesting — group comprises the elongated points shown in Figure 11. They are up to 40 mm long and 5 mm wide. They have a square cross section and a circumferential retouch. Because of their small size they are probably retouched by pressure techniques. Morphologically, they could be tangs of trihedral points but no clear break edges can be identified (Fig. 11/1–3). On the question of how these points were produced, the core shown on Figure 11/4 raises some questions. Like the points, this core also has a square cross section. Whether this morphology is related to the production of the elongated points with square cross section remains speculative since the core's shape may be related instead to the knapping approach. It is also questionable whether these points were used as arrow tips. Compared to Neolithic arrowheads, they have no wings or shoulders while Neolithic points were, similarly, only slightly leaf-shaped without shoulders. In the latter case they are up to 6 cm long and 1 cm wide (Charpentier 2008: 31–34). The only points with a similar design are the trihedral points mentioned above. Even though they have a triangular cross section, they were also pressure retouched and efforts to produce them may have been equally strong. The morphology of the arrowheads is usually optimized to cause large bleeding wounds in the prey. This would not be the case with the long, narrow tips with square cross section. Given the lack of data on the use of poisoned arrowheads, the latter conclusion remains speculative. Considering tips from the previous Neolithic, however, they are much larger. Furthermore, some of them are only roughly trimmed and only retouched at the base. Another possible interpretation is their use not as hunting tips but to defend against possible invaders. Precious copper was, after all, being processed at the time, which could have caused resentment. In this case, even a small non-lethal wound would prevent the attacker from further attacking his target. The thin tips could be explained as

Figure 10. *Arrowheads from Building I.*

a method to shoot through a potential leather armour.

Another interesting find from the excavations is the arrowhead shown in Figure 12/1. It is 43 mm long and 13 mm wide at its widest point while only 5 mm thick. Overall, it has a fusiform shape. The tang is denticulated with four teeth on each side. This piece is similar to an arrowhead found on the well-known Neolithic site of Jebel Buhais 18 in the Emirate of Sharjah (Fig. 12/2), which dates to the fifth millennium BC (Uerpmann et al. 2013: 107, fig. 5). The main differences between these two examples are the tang shape and the fact that the point from Al-Khashbah is more elongated than the one from Jebel Buhais 18. On the other hand, both have the same number of teeth on their tangs. The question is, of course, how can these points look so similar when they have been found hundreds of kilometres apart and come from different periods?

Figure 11. 1–3. *Tetrahedral elongated points;* **4.** *core or preform of the elongated points?*

Conclusions

In sum, Building I is a very complex structure of the Hafit period which holds one of the first stone tool assemblages from an inland site of this period. Building I was a production area of flakes and blades. Despite the fact that no clear spatial patterns for knapping and maintenance of stone tools could be identified, it is clear that activities in Building I were related to the production of lithic artefacts. Clearly, this investigation also raises questions that must remain unanswered for the time being. For example, an explanation for the polish on the blades is still pending. Their back retouching clearly points in the direction of a shaft. The question as to whether they were used for harvesting wild grains for consumption or

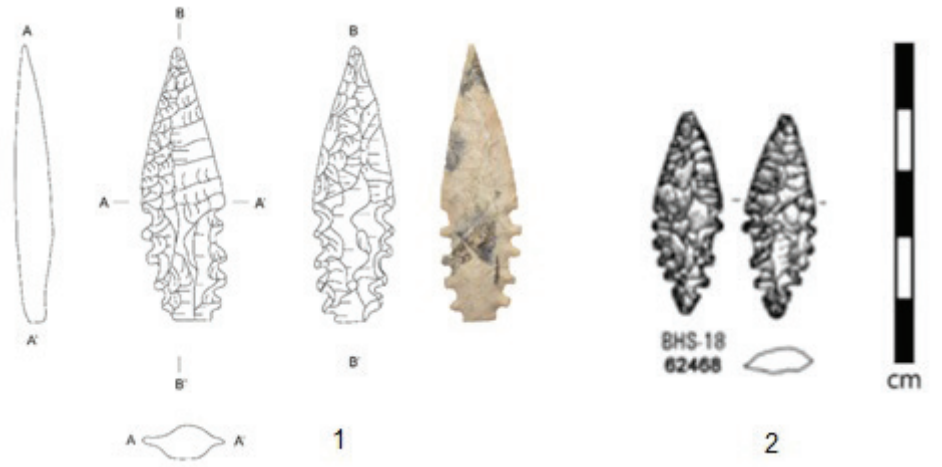

Figure 12. *Fusiform-shaped denticulated arrowhead with biconvex section.*

grass to produce binding material for clay bricks remains open until cereal grains have been found. In addition, the function of the long points with square cross sections is unclear. They do not correspond to a certain type of arrowhead. It is therefore questionable whether these points were arrowheads at all. Even the fusiform arrowhead is a mystery because it looks very similar to a point made in Jebel Buhais. Its preservation is astonishing and there are absolutely no traces of use on it. Perhaps the yet to be examined 40 kg of stone artefacts from the excavation of Building I can provide an answer.

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