

THE 2017 EXCAVATION OF THE EARLY AHMARIAN SITE OF AL-ANŞĀB 1 IN THE LOWER WĀDĪ ŞABRAH, GREATER PETRA AREA, JORDAN

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Introduction

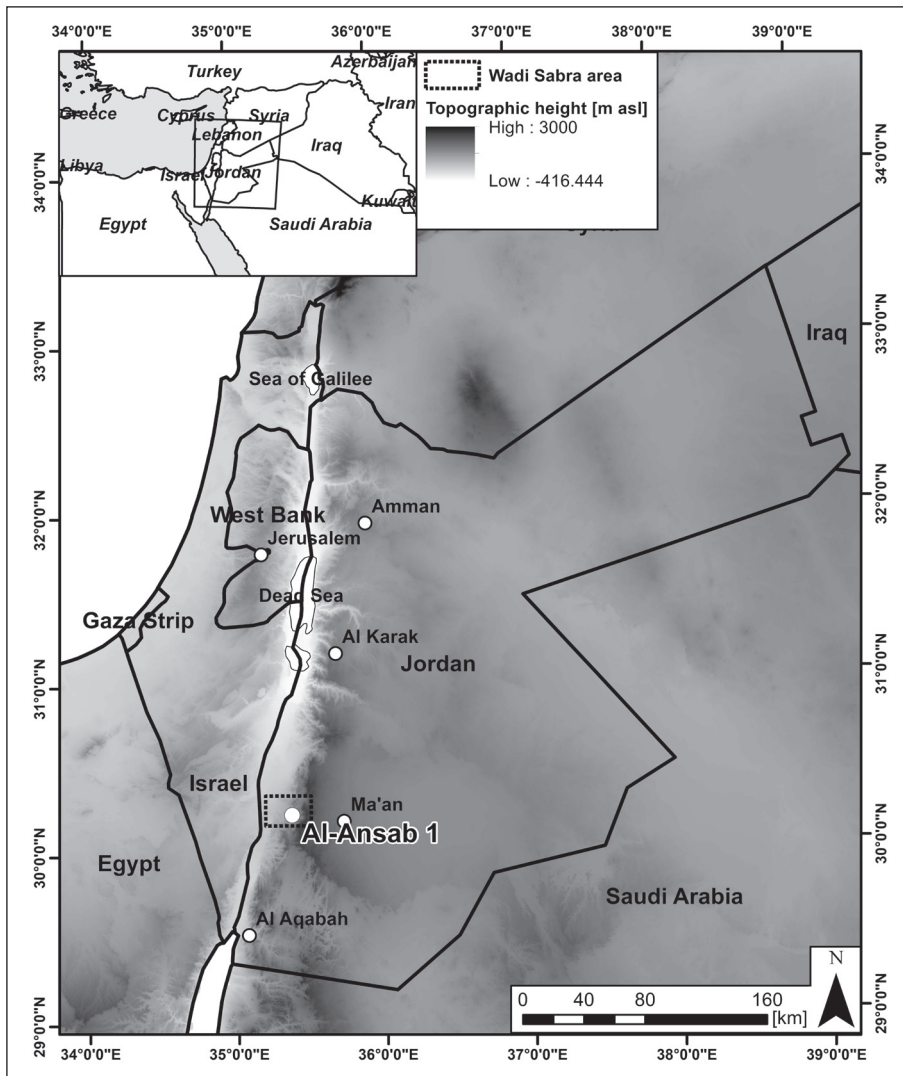
Geo-archaeological research in the Wādī Şabrah has been conducted jointly by the University of Cologne, RWTH Aachen and University of Jordan since 2008. The fieldwork carried out in Jordan constitutes an essential part of the collaborative research project CRC 806 -‘Our Way to Europe’ (<http://www.sfb806.uni-koeln.de/>) which is funded by the German Research Foundation (DFG). CRC 806 is designed to investigate the pathway of *Homo sapiens* from Africa to Europe by focusing on past human-environment interactions. Jordan, as part of the Levant, plays a key role in the Out-of-Africa 2 model making it a focal point of the CRC research framework. Field research in the Wādī Şabrah focuses on the Upper Palaeolithic, in the wake of which nearly 50 (pre-)historic sites ranging from Middle Palaeolithic to Nabataean age have been discovered and recorded (Richter *et al.* 2015).

During the course of geo-archaeological research in the Wādī Şabrah conducted by CRC 806, (1) sedimentological and geochemical compositions of Pleistocene sediments have been investigated (Bertrams *et al.* 2012a, 2014), (2) newly developed remote sensing methods aimed at the identification of Pleistocene sediments using satellite imagery have been applied and advanced (Löhner *et al.* 2013), (3) major Upper Palaeolithic sites have been excavated, techno-typological studies on lithics have been conducted and their historic context was established (Schyle and Richter 2015), (4) geological and archaeological contexts have been OSL-dated while some preliminary carbon-14 results have also been produced (Klasen *et al.* 2013). Furthermore, (5) a model of Late Pleistocene

to Holocene landscape evolution has been proposed (Bertrams *et al.* 2012b), while recently (6) advanced lithobiont studies attempt to further investigate taphonomic and palaeoenvironmental aspects of the Wādī Şabrah sites (Kiers 2017).

Wādī Şabrah is located in the Jordan Rift Valley, a tectonically active zone with the Dead Sea at its lowest geographical position (**Fig. 1**). The adjacent Wādī ‘Arabah connects the Dead Sea in the north with the Red Sea to the south, while the Wādī Şabrah is located east of this rupture and west of the Jordanian Highlands some 15km southwest of the Nabataean capital of Petra. The rugged landscape of the Wādī Şabrah is mainly characterised by red sandstone of the Palaeozoic Umm ‘Ishrīn formation, some white sandstone of the Palaeozoic Disi formation, some limestone of the Mesozoic Na‘ur formation and the Palaeocene/Eocene Umm ar-Rijām Chert limestone that contains flint nodules in many places, plus a few basaltic outcrops of the Ahaymir volcanic rock formation (Bertrams *et al.* 2012a; Parow-Souchon 2017).

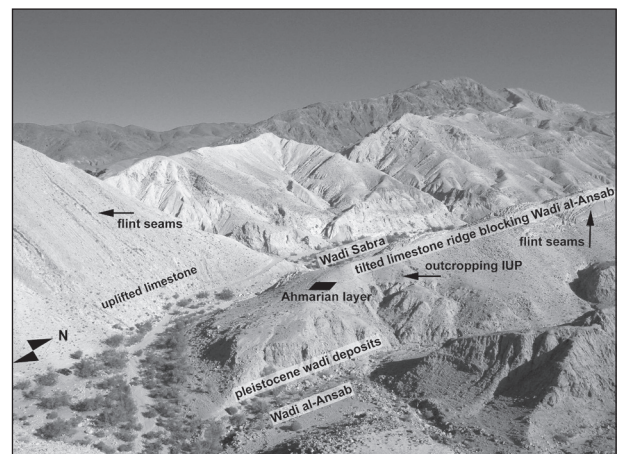
al-Anşāb 1 is located in the lower Wādī Şabrah on a Pleistocene sediment promontory at 610m asl some 25m above the narrow wadi bed (**Figs. 1 and 2** [UTM Grid 36R: 0729360 E / 3347130 N]). Pleistocene sediments at al-Anşāb have been preserved due to the adjacent limestone crest of the Umm Rijam Chert limestone that protects the site from erosion. The surrounding ridges contain abundant flint blocks that were frequently used for tool making at al-Anşāb 1 (Parow-Souchon, 2017). Besides flint raw material, a spring is located just a few hundred metres from the site, which must have made al-Anşāb particularly attractive for prehistoric hunter-gatherers.



1. Location map of al-Anṣāb 1 in the southern Levant.

al-Anṣāb 1 was discovered during survey activity in 1983 and was rediscovered in 2009 (Schyle 2015a; Schyle and Uerpmann 1988). This was followed by a series of field campaigns in 2009, 2011 and 2013, which had goals such as establishing a chronological framework for geological and cultural layers, revealing patterns of past climate change and placing al-Anṣāb 1 in its culture-historical context (Bertrams *et al.* 2012a; Hussain 2015; Klasen *et al.* 2013; Schyle 2015a). These objectives were approached by means of sediment studies, radiometric dating and techno-typological studies of the lithic material, which was recovered in abundance from a relatively small portion of the site. Based on techno-typological studies and corroborated by radiometric dates, al-Anṣāb 1 can be described as a typical Southern Early Ahmarian site that is characterised by narrow blade/lets struck from unidirectional

volumetric cores that were then retouched into *el-Wad* points, edge-retouched pieces and typical Upper Palaeolithic tools including a few carinated pieces (Gilead 1991; Goring-Morris



2. al-Anṣāb 1 in its local context. The Pleistocene sediments containing al-Anṣāb 1 and 2 are protected from erosion by a ridge of Umm ar-Rijām Chert limestone.

and Belfer-Cohen 2018; Kadowaki *et al.* 2015; Schyle 2015b). The Early Ahmarian is associated with the permanent establishment of Homo sapiens in the Middle East just after Neanderthals became extinct (Higham *et al.* 2014; Hublin 2015; Shea 2003).

In contrast to earlier fieldwork at al-Anṣāb 1, excavations in 2015 and 2017 aimed to shed light on prehistoric on-site activities that would have resulted in functional structuring of the site. This research question is approached by excavating extensive occupation surfaces and stringently mapping finds and features with the aim of identifying discrete on-site activity areas and events. Further archaeoscientific studies such as residue and use-wear studies, and faunal and charcoal analyses are planned. Consequently, the goal of the 2017 campaign was to expand the excavation area at al-Anṣāb 1 aiming to further investigate activities carried out by early Homo sapiens in the Middle East.

Excavations in 2017 were carried out between April 9th and May 13th. Team members were Prof. Dr. Jürgen Richter (University of Cologne; Project Director), Prof. Dr. Maysoun al-Nahar (University of Jordan; Project Director), Dr. Dirk Leder (Deputy Site Director), Dipl. Ing. Joel Orrin (Site Technician), Kira Dähling (MSc Geology; Site Assistant), Laurenz Rathke (BA Archaeology, Site Assistant), Jonathan Schoenenberg (BA Archaeology, Site Assistant) and Jelena Marinkovic (Geoarchaeology Undergraduate Student; Site Assistant).

Method of Excavation

One-metre squares form the base unit of the excavation grid. Each m² was further subdivided into four squares measuring 50×50cm each (¼m²) which were then excavated in 5cm-deep units (spits). All finds >1cm that were recovered while excavating (lithics, bones, charcoal *etc.*) have been single plotted using an EDM total station (Leica TS06 ultra 2'') to provide three-dimensional data. Such finds were continuously drawn and photographed in plan while their levels were taken using the EDM. In addition, finds >2cm were georeferenced using at least two measuring points (blade/lets) or more (*e.g.* cores, flakes, rocks, *etc.*) depending on the object's contours. Finds <1cm were collected and georeferenced based on the ¼m²

and spit numbers they had been retrieved from. All sediments were sieved through 2mm mesh to facilitate complete recovery of all artefacts and palaeo-environmental samples. All finds retrieved in this way were georeferenced on the basis of ¼m²-spit units.

Owing to the high density of finds at al-Anṣāb 1 (ca 300 finds per ¼m² spit), it was felt appropriate to document 'intermediate plans' to ensure that all finds were photographed and drawn *in situ* before reaching the base of the spit. Once a spit base was reached, a plan was drawn, photographs were taken, surface levels recorded by EDM, and sediments, features, disturbances, *etc.* described in writing.

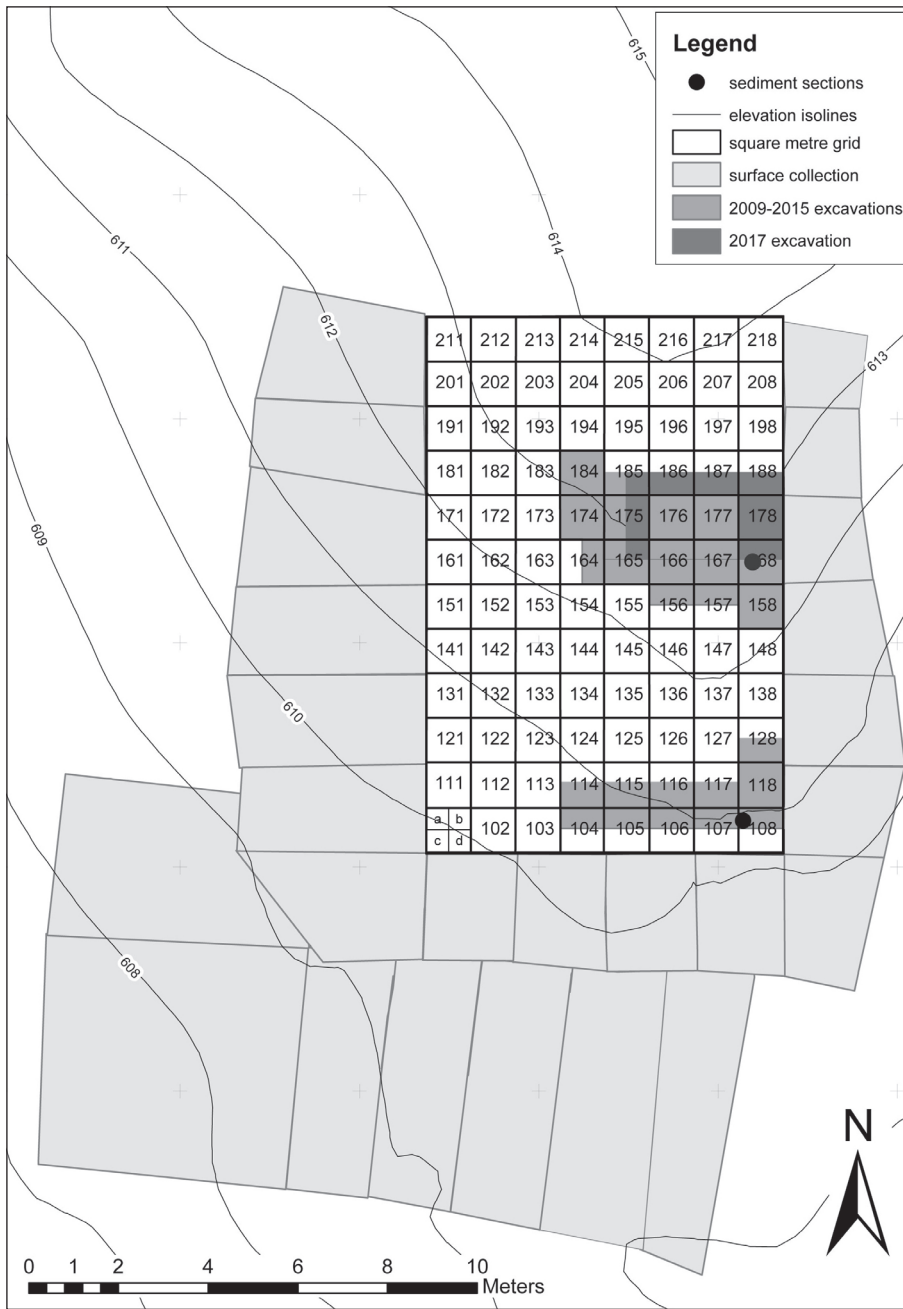
Whenever features were discovered, they were documented in plan and section (written description, photographs and drawings, plus SFM/photogrammetry). Finds retrieved from inside features were kept separate from those outside features. Sediment samples were taken from all features and their surroundings for further geo-archaeological studies. In addition, OSL samples and samples from surrounding sediments were taken from the north section after sunset. Finally, micromorphology samples were taken from the north and east sections.

Site Plan and Stratigraphy

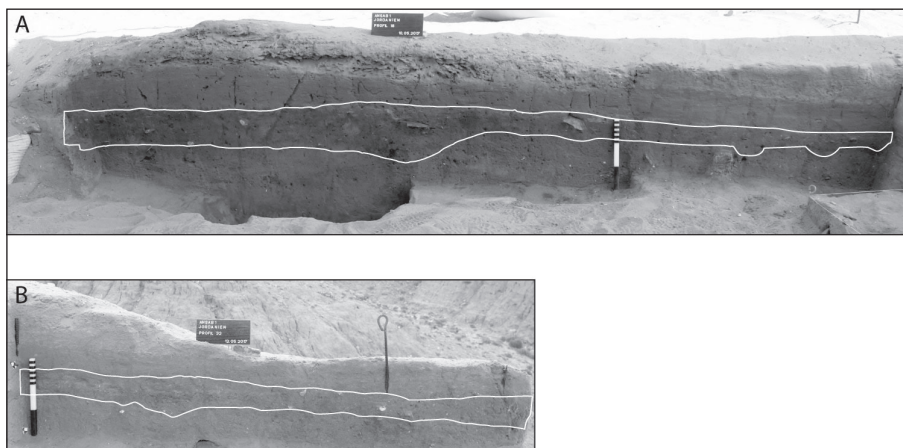
The 2017 excavation area was located in the so-called 'upper section' area, continuing work carried out during the 2009-2015 survey and excavation campaigns (Fig. 3 [Schyle 2015a]). The square metres excavated in 2017 surround square metres excavated in the previous 2015 campaign (166, 167, 176 and 177), which were themselves surrounded by square metres excavated during the 2009, 2011 and 2013 campaigns. The 2017 trench enclosed the central fireplace excavated in 2015. Despite the aforementioned high finds density and small team size we were able to complete 4.5 square metres between square metres 165 and 188 in a stringent manner.

A generalised stratigraphy is described here based on the representative north and east sections (Figs. 4 and 5):

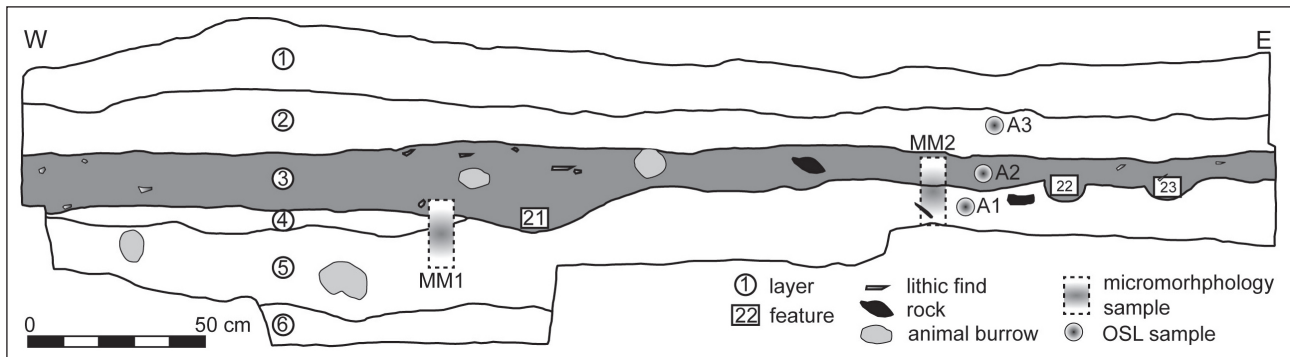
Layer 1 is up to 20cm thick and covers the whole sediment sequence in the northern half of the excavation area, whereas in the southern half, layer 2 was found on top of the sequence.



3. Excavation plan of al-Anṣāb 1 showing the location of the 2017 excavation and previous excavation activities, as well as the relief of the Pleistocene sediment spur.



4. Photographs of the north (A) and east sections (B) of the 2017 excavation indicating the archaeological horizon framed in white.



5. Drawing of the north section. The archaeological horizon is highlighted in grey; the locations of micromorphology and OSL samples, as well as the finds, are indicated on the drawing.

Layer 1 consists of loose to semi-compact reddish-beige medium sand with horizontally layered calcareous deposits and some small pebbles.

Layer 2 covers the entire excavated sequence and has a maximum thickness of 20cm. Layer 2 was described as compact, reddish fine to medium sand with a few patchy calcareous deposits.

Layer 3, the archaeological horizon, was exposed throughout the entire excavation area and was up to 20cm thick in the western part, thinning to less than 10cm in the east. It is a compact grey-brown medium to fine sand that constitutes the cultural layer. It contains abundant lithics, some bone, ochre and charcoal fragments. A few animal burrows and desiccation cracks are restricted to the western half.

Layer 3 could be subdivided into sub-layers 3a and 3b in a south-eastern portion of the east section. While layer 3b is identical to layer 3, the superimposed layer 3a can be described as a thin sediment band of 110cm length and 2-6cm thickness; it is a mottled greyish-red medium to fine sand with abundant flint artefacts and some bone fragments, ochre *etc.*

Layer 4 is a sediment pocket measuring 120×10cm that was found beneath layer 3 in the western part of the excavation. It consists of light greyish-red fine sand, which differentiates it from the underlying layer 5. Layer 4 is less compact than layer 3 and contains a few flint artefacts, possibly in secondary position, that are similar to those embedded in layer 3.

Layer 5 extends across the entire excavation area with a thickness of up to 30cm. It consists of beige medium to fine sand containing small pebbles in parts and a few lithic finds similar to those embedded in layer 3. Hollow animal burrows are abundant in the upper part of layer 5, which sometimes caused layer 3 material to collapse into these burrows during excavation. As a result, finds from the last millimetres of the final spit could only be collected instead of single plotted. Layer 3 was not directly affected by these recent burrowing activities as: (a) no artefacts were found in the cavities; (b) the much looser sediments of layer 5 were much easier for rodents to penetrate in contrast to the consolidated layer 3 sediments.

Layer 6 was exposed only in a western portion of the north section. It is a homogenous reddish-brown fine sand that retains moisture much better than the layers above.

The described stratigraphy of the 2017 campaign is in good agreement with previous descriptions of directly adjacent sections at al-Anṣāb 1 (Bertrams *et al.* 2012a; Schyle 2015a).

Archaeological Finds

The majority of finds consists of lithic artefacts (n=18,070), followed by faunal remains (n=882) and ochre pieces (n=82) (**Table 1; Fig. 6**). Unfortunately, bone preservation is poor owing to fragmentation and weathering. As well as artefacts and fauna, we were able to

Table 1: Archaeological material recovered during the 2017 excavation.

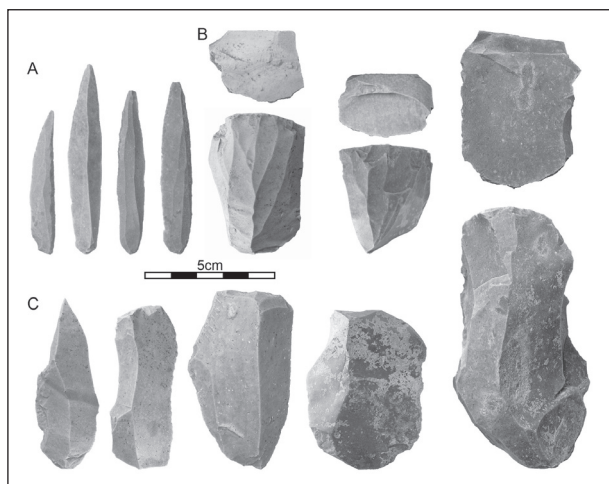
Material	Lithics	Fauna	Ochre	Charcoal	Soil Samples*	Rocks/Other**	Total
n	18,070	882	82	92	50	149	19,325
%	93.51	4.56	0.42	0.48	0.26	0.77	100.00

* Includes three micromorphology and six OSL samples.

** Includes one carved stone collected from the surface.

retrieve 92 charcoal and 50 sediment samples, the latter including samples for OSL dating and micromorphology.

The lithic material recovered from al-Anṣāb 1 represents the entire chaîne opératoire from core initialisation to re-tooling as evidenced through the presence of cortical pieces (>50% cortex cover), core trimming elements (CTEs), flakes, blades, chips (flakes <1cm), cores and tools (Table 2). Common CTEs are crested blades (n=32 [often with one-sided crests or only partial crest]) and some core tablets (n=9) indicating the core initialisation and preparation



6. Typical lithic finds from al-Anṣāb 1: a: El-Wad points; b: blade/let cores; c: burins and endscrapers (photos: H. Schluse).

methods applied at al-Anṣāb 1. Cores belong to the sub-pyramidal type and were exploited in a frontal, unidirectional manner (Hussain 2015; Schyle 2015a). Their extraction surfaces largely show blade/let scars.

The tool kit of the 2017 campaign consists of only 86 retouched pieces, mainly burins, edge-retouched pieces and El-Wad points in that order (Table 3). The tool-kit composition is in good agreement with those of previous campaigns, only burins were more abundant in 2017 at the expense of edge-retouched pieces.

Blanks employed in tool production were mostly blades (46.5%) and bladelets (25.6%), followed by flakes (<14% [Table 4]). Chunks, CTEs and cortical pieces were frequently used in tool production too (<14%). The 19 El-Wad points from the 2017 campaign are often fragmented (n=11) and mostly belong to the sub-type of backed blade/lets, although specimens with either fine or semi-abrupt retouch are common as well. Twelve El-Wad points were made on blades and seven on bladelets. Burins were regularly made on blades (n=12) and to a lesser extent flakes (n=5), while edge-retouched pieces were predominantly made on bladelets (n=11) and blades (n=7). Endscrapers on the other hand were made on various products that were likely selected for their sturdy properties (broad, thick specimens).

Table 2: Lithic finds from the 2017 excavation and their state of preservation.

Lithics	Total n	Total %	Single plotted	% of total	Fragments (single plotted)	Fragmentation rate (%)	Burnt (single plotted)	Burning rate (%)
Core	53	0.29	52	98.11	4	7.69	2	3.85
CTE	119	0.66	112	94.12	24	21.43	6	5.36
Cortical piece	86	0.48	68	79.07	25	36.76	4	5.88
Flake	1,360	7.53	580	42.65	274	47.24	50	8.62
Blade	745	4.12	514	68.99	329	64.01	37	7.20
Bladelet	1,410	7.80	353	25.04	229	64.87	10	2.83
Chips and chunks	14,234	78.77	309	2.17	21	6.80	103	33.33
Other	63	0.35	23	36.51	1	4.35	0	0.00
Total	18,070	100.00	2,011	11.13	907	45.10	212	10.54

Table 3: Tools retrieved in 2017 and previous campaigns.

Tools	El-Wad point	End-scraper	Truncation	Burin	Notch/dent.	Edge retouch	Multi-tool	Total
2017	19	11	1	23	8	22	2	86
%	22.09	12.79	1.16	26.74	9.30	25.58	2.33	100.00
2009-2015	65	40	17	29	0	91	8	250
%	26.00	16.00	6.80	11.60	0.00	36.40	3.20	100.00
Total	84	51	18	52	8	113	10	336
%	25.00	15.18	5.36	15.48	2.38	33.63	2.98	100.00

Table 4: Tool blank selection at al-Anşāb 1.

Tools by blank	El-Wad point	End-scraper	Truncation	Burin	Notch/dent.	Edge retouch	ES-burin*	TR-burin	Total n	Total %
CTEs		1		2		1			4	4.65
Cortical piece				2		1			3	3.49
Flake		4		5	1	2			12	13.95
Blade	12	3		12	4	7	1	1	40	46.51
Bladelet	7	1	1	1	1	11			22	25.58
Chunks		2			2				4	4.65
Other				1					1	1.16
n	19	11	1	23	8	22	1	1	86	100.00
%	22.19	12.79	1.16	26.74	9.30	25.58	1.16	1.16	100	
Burnt	2	0	0	2	0	0	0	0	4	4.65
Frag.	11	6		6	4	15	1	0	43	50.00

*Collected from surface.

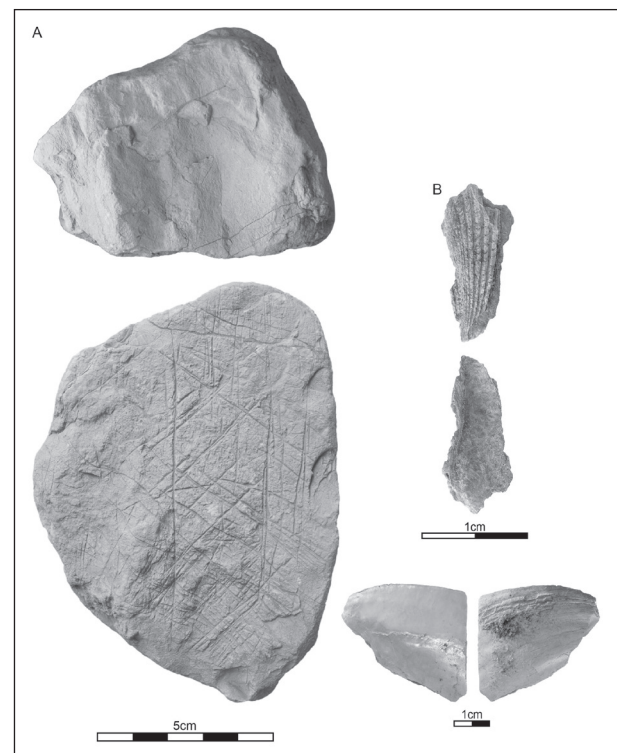
When assessing the proportions of the various artefact classes, it becomes apparent that cores (0.3%) and tools (0.5%) are under-represented while blanks (19.5%) and debris in particular (chips and chunks [78.8%]) are abundant. This is in line with the interpretation of al-Anşāb 1 as a primary workshop site, which culminates in a high blank:core ratio (66.3:1), a high blank:tool ratio (40.9:1) and a high debris:core ratio (268.6:1), while the tool:core ratio is low (1.6:1). The figures seem suggestive of some core export from the site, or at least from the excavated portion of it.

Fragmentation of lithic artefacts has so far been computed for single plotted finds (n=2,011 [Table 2]). What is striking is the high degree of fragmentation affecting nearly half of all lithic artefacts (45.1%). The abundance of broken artefacts might be due to trampling during extensive and/or repeated periods of site occupation. Fragmentation values are particularly high in blades and bladelets, whereof approximately two-thirds are incomplete compared to less than half of all flakes, and even less in cortical pieces and CTEs. More frequent blade/let fragmentation should be a result of their thin and elongated proportions that render them more fragile than sturdy flakes, CTEs or chunks. Consequently, this would result in considerably lower numbers of complete blade/lets in comparison to flakes and would thus alter the current flake:blade:bladelet ratio of 1.9:1:2 (see inter alia Schyle 2015c for a recent discussion of this topic).

Traces of burning occur among approximately one-tenth of all single plotted lithics

(Table 2). While chunks frequently show traces of burning or are in fact shattered (one-third), other artefact classes - bladelets in particular - rarely show heat impact resulting in low values of around 5% for these categories.

In addition to the aforementioned finds, three special objects are worth mentioning. Firstly, two marine shells were retrieved from the cultural layer (Fig. 7). Both specimens are fragmented and show no signs of perforation on



7. Special finds from al-Anşāb 1: a: carved yellow sandstone block from the surface; b: marine shell fragments (photos: H. Schluse).

the preserved portions that could indicate usage as, for example, body ornaments (Bar-Yosef Mayer *et al.* 2009; Kuhn *et al.* 2001). While both fragments can be classified as marine bivalve molluscs, they have not yet been identified to species level. However, considering the ochre-stained shell, an attribution to the Cardiidae family (*e.g.* *Glycimeris* sp.; *Acanthocardia* sp.) is possible, while the other specimen might belong to *Panopea* sp. instead. The same range of bivalve molluscs has been reported from broadly contemporaneous sites along the Mediterranean coast (Bosch *et al.* 2015; Douka *et al.* 2013; Kuhn *et al.* 2001). The al-Anṣāb 1 molluscs must have been transported to the site by humans from either the Red Sea or Mediterranean, which would mean a minimum transport distance of 90km from the former and even 170km from the latter.

The other peculiar object is a weathered yellow sandstone block measuring 12×8.9×6.8cm, with X-shaped carvings arranged in a row and framed by long parallel lines (Fig. 7). The object was found on the surface just south of the excavation area, which leaves its cultural affiliation open. Comparable objects have thus far not been reported from any Ahmarian site in the Levant.

Features

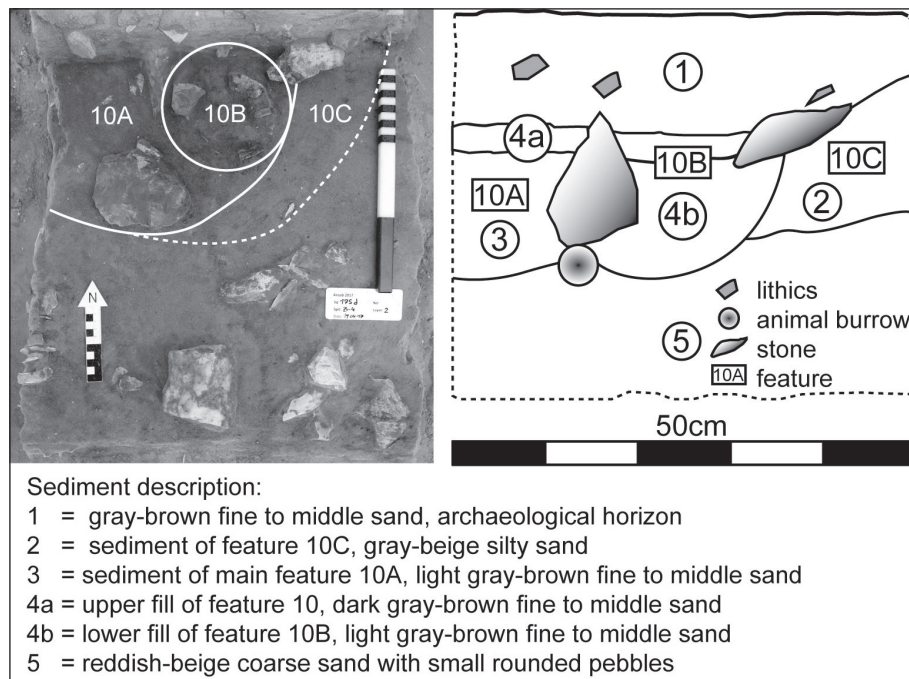
The majority of excavated features in al-Anṣāb 1 can be described as charcoal concen-

trations containing the usual lithic artefacts and faunal remains (features 11-23). They are oval, circular or rounded-amorphous in plan, with a shallow depth of up to 3cm. Three were documented as shallow depressions in the northern section (features 21-23). All these features might be associated with the central fireplace excavated in 2015; analyses of on-site activities are currently underway.

Feature 10 is the only exception to that general picture (Fig. 8). In plan, feature 10 was recognized by its darker colouring that was likely the result of higher charcoal content. What at first seemed like just another charcoal concentration turned out to contain a pit of some 20cm depth and diameter (feature 10B). In plan, feature 10B had a circular shape and was lined with rocks and lithic finds. It contained two sediment fills. The top fill was darker grey in colour than the archaeological horizon and was also found outside the pit to the west (layer 4a). It was found superimposed on a light grey sediment that was lined with lithics of different sizes dipping downwards (layer 4b). The function of the pit is currently unclear, but is subject of further analyses.

Conclusion

al-Anṣāb 1 is a typical Southern Early Ahmarian site with diagnostic lithic artefacts such as *el-Wad* points, abundant narrow blade/lets



8. Plan and profile view of feature 10.

and unidirectional blade/let cores. The excavation carried out in 2017 continued survey and excavation work conducted within the framework of CRC 806 between 2009 and 2015. As well as abundant lithic finds, organic remains such as charcoal, bone, and sea and egg shell were retrieved, providing much potential for future studies.

Preliminary findings show that various activities had been carried out by prehistoric hunter-gatherers at al-Anšāb 1, including stone knapping, food processing and the use - and possibly cleaning and re-use - of a hearth. The discovery of a pit next to that hearth adds further data to the question of on-site activities that we intend to explore further in the near future by continued excavations and scientific analyses.

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