

QAṢR MUSHĀSH SURVEY: FIRST RESULTS OF ARCHAEOLOGICAL FIELDWORK IN 2011 AND 2012

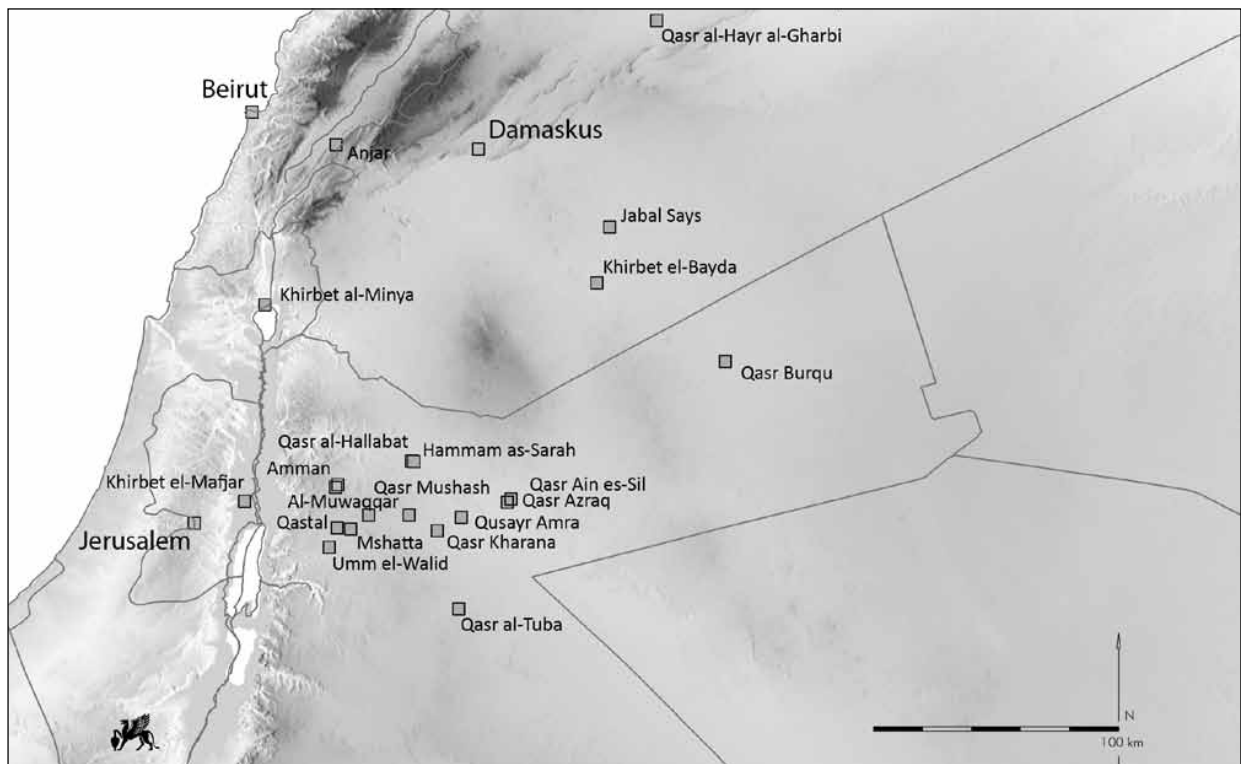
Karin Bartl, Ghazi Bisheh, Franziska Bloch and Tobias Richter

Introduction

Qaṣr Mushāsh lies *ca.* 40km east of Ammān in an arid zone without a permanent supply of water (**Fig. 1**). The site is actually comprised of two parts that are separated by *ca.* 1.5km from one another, Qaṣr Mushāsh West and Qaṣr Mushāsh East. The two settlement sections Qaṣr Mushāsh West and Qaṣr Mushāsh East differ in size and structure. Qaṣr Mushāsh West, where the small square building of the *Qaṣr* (arab.: castle, fortress) is located, forms the core of the complex and embraces an area of some nine hectares. Noteworthy in both settlement parts is

the large number of hydraulic complexes in the form of reservoirs, cisterns and dams.

Qaṣr Mushash has often been assigned to the group of Early Islamic “desert castles”. This designation signifies palace-like complexes located in remote regions of the desert, which served mostly as temporary seats of rulers of the Umayyad times (661–750 A.D.). The structure addressed as ‘*qaṣr*’ in Mushāsh, a square building with a side-length of 26m, lies on the north bank of Wādī Mushāsh and is still partly preserved. Alois Musil was the first to visit this complex in 1901 and to make a short de-



1. Desert castles in Bilād ash-Shām, location of Qaṣr Mushāsh (map: DAI, Orient-Department, Th. Urban, using USGS/ NASA 3-arc second SRTM data).

scription of it (Musil 1907:115; Abb.104-105). Aurel Stein documented it in detail during his *Limes* project in 1938 (Gregory and Kennedy 1985:286f., pl.64c). The site was visited a new and described only later, at the beginning of the 1980s, by Geoffrey King, during a large-scale survey on the documentation of early Byzantine and Early Islamic ruins in northern Jordan. The surveys carried out in the 1980s in the area of Qaṣr Muṣḥāsh were primarily in places, where at that time recognisable remains of buildings still marked the terrain. These remains were entered in a schematic plan so as to note their approximate location (King 1982:86-88, 1983:386-392). The excavations that followed in 1982 and 1983 under the direction of Ghazi Bisheh were focussed on the Qaṣr, the bath and a reservoir. The documentation of these ruins all together constitutes the most important data of the site (Bisheh 1989, 1992).

In 2011 a cooperation project between Jordan Department of Antiquities (DoA) and the Orient Department of the German Archaeological Institute began and has several and different aims: the documentation of all archaeological sites within a radius of 10 km from the settlement, the creation of a new plan of the entire settlement site that should serve as the basis for a 3D-model, and investigations on the water supply for the site, whose structure and function were hitherto hardly known.

In the current plan all further, newly discovered wall- and buildings remains should be recorded; it also documents all illicit excavations and looter pits, which have increased drastically during the past two decades and destroyed major parts of the ruins as far down as the foundations. Surveys of the terrain around Qaṣr Muṣḥāsh and vicinity are carried out basing on the assessment of high-resolution satellite images. The exact determination of the site coordinates was subsequently achieved through GPS and recordings of buildings with a total station. Surface finds were collected selectively. A topographic isohypse plan in 10cm intervals was created for the site Qaṣr Muṣḥāsh -West on the basis of satellite images and available plans in a scale of 1:25 000. Building remains visible on the surface were recorded photogrammetrically, drawn digitally and integrated in the topographic plan. These terrain and building recordings should

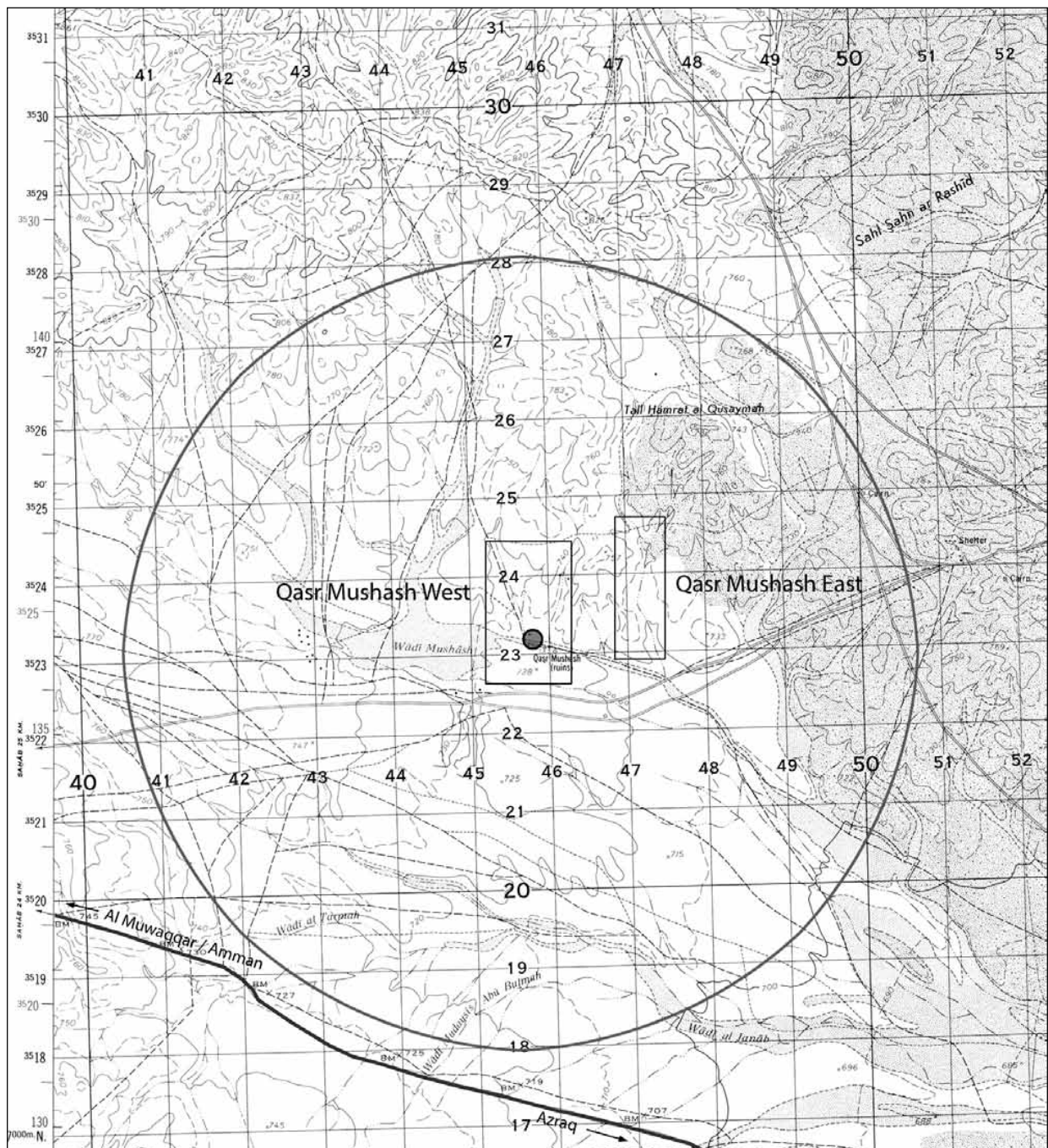
serve in creating a 3D-model of the terrain of the entire site. Geophysical investigations with the aid of geomagnetic and georadar are an aid in the search for further structural remains. The data achieved are integrated into the entire plan and, thus, augment the setting of the settlement, without necessitating any greater interventions in the remaining ruins. Specified soundings should aid in clarifying stratigraphic questions and the association of individual building elements. Geomorphological investigations at a local level should supply more exact information about regional water resources.

Results

Previous work at Qaṣr Muṣḥāsh concentrated, firstly, on conducting an archaeological survey and creating a topographical plan of the area under study. Consequently, with the expedition seasons of autumn 2011 as well as spring and autumn 2012 almost the entire area within 10 kilometres of the site was surveyed. Thereby, 164 findspots were plotted (**Fig. 2**). The data recorded at the site of Qaṣr Muṣḥāsh itself were focused on the settlement part in the west, the actual core of the complex. There numerous hitherto undocumented wall and building remains were plotted.

Of the 164 aforementioned findspots, 35 were located in the immediate vicinity of the settlement Qaṣr Muṣḥāsh West and Qaṣr Muṣḥāsh East. The dating of the surface material confirms that the sole historical settlement periods represented there are those of the early Byzantine and Early Islamic or Umayyad times, that is, the time span between the 4th and 7th and the 7th and 8th centuries A.D. (**Fig. 3**) (see contribution of F. Bloch). Almost no older or younger archaeological material has been attested until now.

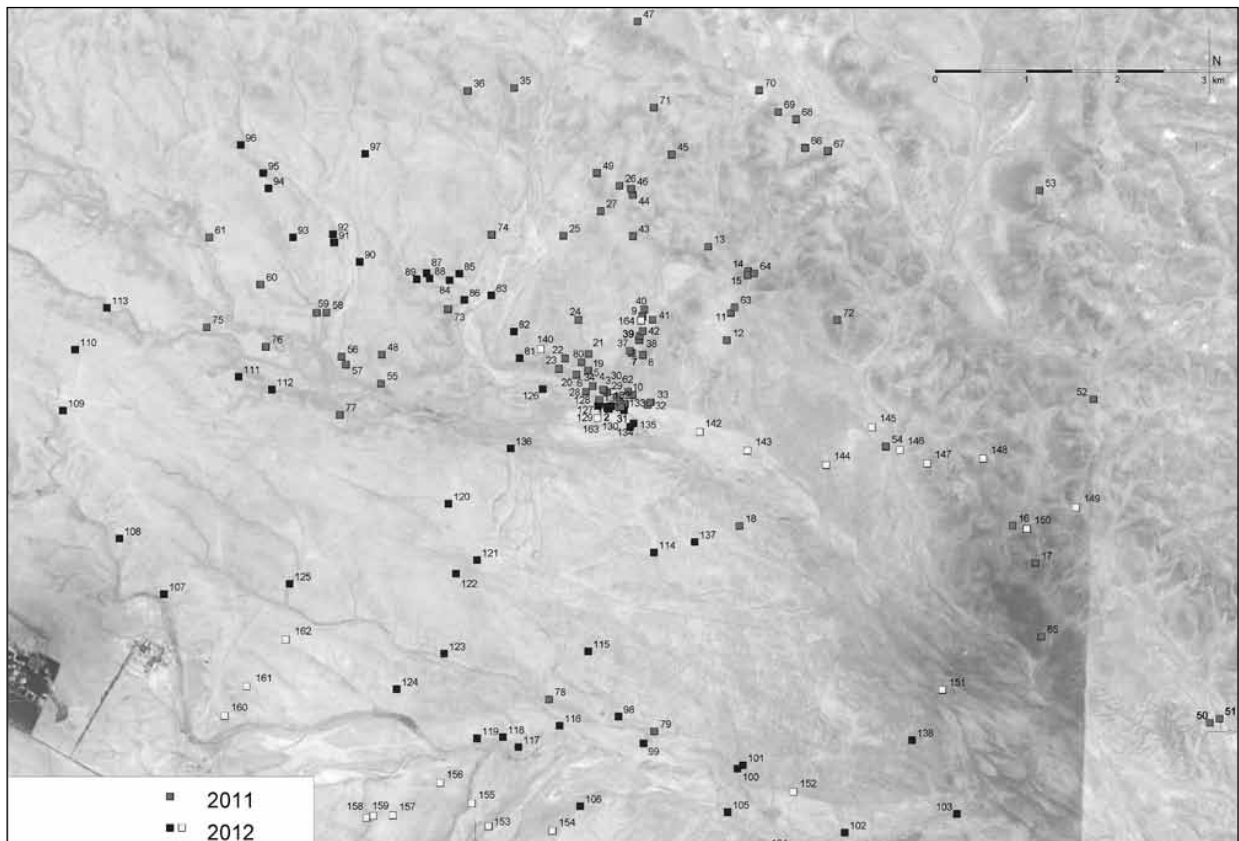
A total of 129 findspots yielded exclusively surface material from prehistoric periods. The majority of these finds stem from the time of the Old Palaeolithic to Epipalaeolithic periods (*ca.* 500,000 to 12,000 BP) (**Fig. 4**). However, in general, a clearly defined region cannot be assigned to these periods. Even though the finds were found in the region, their exact localisation is not possible, because they could have been widely dispersed by erosive processes (see contribution of T. Richter).



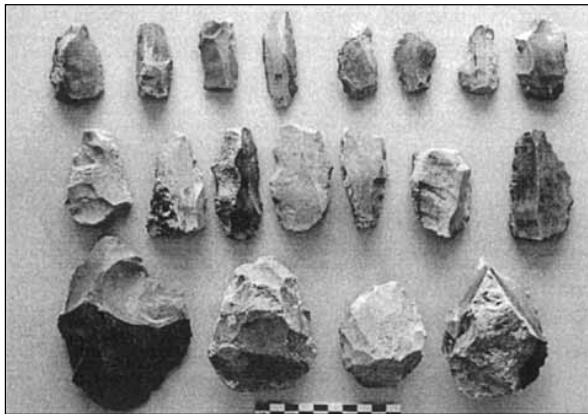
2. *Location of Qaṣr Mushāsh with areas of research (map: Jordan 1:50,000, sheet 32531, Defense Mapping Agency, Washington DC, 1974).*

In this regard, pottery finds collected during the field surveys have confirmed that the Qaṣr itself is unmistakably of an earlier origin than the rest of the buildings (**Fig. 5**). Several ceramic types point to an occupation since the 3rd century A.D. at least; perhaps even earlier. Observations of the settlement surface in the immediate surroundings as well as the results of geophysical

prospection attest a much larger size at the site than revealed by previous investigations. Several settlement parts could be differentiated in Qaṣr Muṣḥāsh West: the Qaṣr itself with nearby smaller buildings and adjoining cisterns in the East, and to the west the central area with the bath, rectangular reservoir and a large square building. The last complex, discovered through



3. *Qaşr Mushāsh Survey 2011-2012, archaeological find spots (map: DAI, Orient-Department, Th. Urban).*



4. *Qaşr Mushāsh Survey, lithic tools, FP 94 fragment (photo: DAI, Orient-Department, K. Bartl).*



5. *Qaşr Mushash, view from the northwest (photo: DAI, Orient-Department, Th. Urban).*

geomagnetical prospecting, is constituted by a building (side-length of 40m) with a large courtyard enclosed by rows of rooms. Located to the west of the central area is another part of the settlement, composed of numerous small houses (**Fig. 6**). In addition, several large-sized buildings in similar direction stand to the northeast of the central area. A large, square water pool with a side-length of 21m is located to the west, outside of the settlement area. Further groups of buildings lie some 500m east and north of these complexes (**Fig. 7**). A very large reservoir with an original capacity of almost 2000m³ is situated *ca.* 900m north of the Qaşr (**Fig. 8**). Even more remains of walls, possibly once part of, stand on the southern bank of the Wādī. However, the rediscovery of a tower documented by A. Musil in 1901 was not yet possible.

Investigations on the water supply have revealed preliminarily that apparently only the winter rains that drained in small water courses from the north into Wādī Mushāsh were used. There was sufficient slope for these streamlets to flow into the settlement's cisterns and res-



6. *Qaṣr Mushāsh, house remains west of the Qaṣr (photo: DAI, Orient-Department, K. Bartl).*



7. *Qaṣr Mushāsh, large reservoir west of the central area (photo: DAI, Orient-Department, K. Bartl).*



8. *Qaṣr Mushāsh, large reservoir north of the Qaṣr (photo: DAI, Orient-Department, K. Bartl).*

ervoirs; in addition, they could be controlled more easily than the considerably larger Wādī Mushāsh. The latter lies distinctly lower than the facilities for storing water, so that the use of this water necessitated a means of raising water, such as a water wheel or lift, of which however no traces are present today. However, several remains of strong walls formerly crossing the Wādī Mushāsh in North-South direction might be indications for a barrier damming the water thus forming a kind of reservoir. Further investigations are necessary in order to determine the conduits to the water storage facilities of the site.

Investigations until now have shown that Qaṣr Mushāsh is a settlement site with several, spatially separate units of various function. The oldest part of the site is the Qaṣr itself in the East, which was already present in Late Roman or Roman times and perhaps used as a guard post in the desert steppe. This complex was obviously in further use in Umayyad times, perhaps for

the same purpose. At that time further buildings were erected in the immediate surroundings of the Qaṣr. These include in the central settlement area with the large square building, the bath, the adjoining reservoir and different structures. The square building with the large courtyard is the largest of the total of four square complexes. In later times this type of structure often represented the core of caravan stations, for example, on the Hajj route.¹ Together with the bath and reservoir it forms a likely uniformly planned complex. By comparison the neighbouring Quṣayr 'Amra is of rather modest design (Vibert-Guigne and Bisheh 2007). The settlement section to the west of the central area with smaller, multi-roomed houses can be interpreted as a simple residential area, while the buildings northeast of the central area, differing distinctly from the western houses in size and internal division, might have served as representational structures. The large reservoir in the west is located at rather a dis-

1. Another example of this type, probably originating from Late Roman times but mainly used in the Umayyad period is a square structure of similar size at Umm al-Walid (Kennedy 2004:230; Bujard 1997: 359ff.). A

very similar structure at Jabal Says is defined as service building for the Qaṣr (Schmidt 2012). At Resafa-Sergiopolis/Rusafat Hisham similar building types are named caliphal residences (Sack *et al.* 2010:112ff.).

tance from the residential and functional buildings, on the very edge of the settlement, and was possibly used for watering animals.

The present results render the assumptions already made by A. Stein and Gh. Bisheh, that Qaṣr Mushāsh was a caravan station on the route between 'Ammān/Philadelphia and Wādī as-Sarhān, quite plausible. Future research will be concerned foremost with questions about the time of the site's occupation, its resources and the economy, in addition to further documentation of the remaining buildings. (KB/GB)

Islamic Pottery Finds

The historical Balqā'-region, in which Qaṣr Mushāsh is located halfway between the Umayyad sites of al-Muwaqqar and Kharrāna, is well known for having been densely settled in the Early Islamic I Period (600-800 AD) and for having served as preferential place of residence for some members of the ruling Umayyad elite (significant archaeological data being available i.a. from 'Ammān Citadel, Quṣayr 'Amra, Qaṣr Kharrāna, Qaṣr al-Hallābāt, Ḥisbān, Tall Jāwa, Umm al-Walīd). Not surprisingly, an Umayyad settlement phase was established for Mushāsh during previous research. This assignment was i.a. based on ceramic evidence. With the new survey conducted in 2011/2012, the rather general picture of a settlement in the Umayyad period was sought to be specified and stated more precisely by identifying specific pottery-types, both familiar and lesser-known.

Because the material presented in this contribution is surface collected, no stratigraphy can be established and the analysis has to rely on typological comparison. Diagnostic criteria are techniques of decoration and the macroscopic appearance of the fabric. On the basis of approx. 1000 collected sherds, a solid spectrum of wares or functional groups could be defined, allowing a closer chronological assignment. Furthermore, from a more general view, the corpus also provides interesting indications of pottery – notably architectural ceramics – from the context of an early Islamic bath.

Corresponding to observations made at other qaṣr-sites, the complex at Mushāsh is characterized by a general scarcity of finds. The corpus presented here consists mainly of common ware production. Except for one single (somewhat enigmatic and

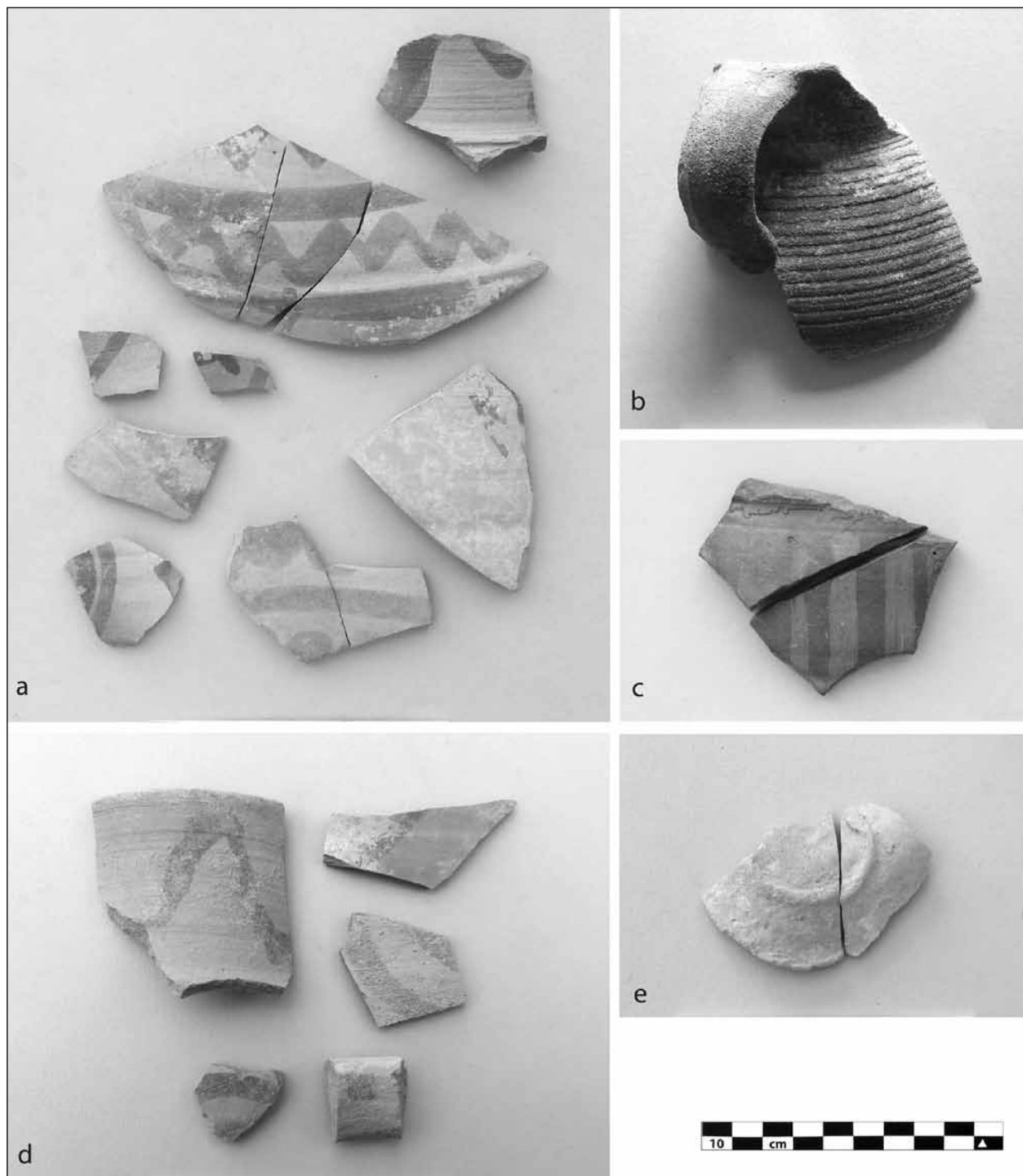
seemingly out of context) fragment of stonepaste, the recovered material is all domestic, non-glazed, with two wares showing painted decoration.

Red-Painted Ware: The examples are distinguished by a smooth, buff coloured fabric decorated with a cream coloured slip and dark red to brown paint. Patterns include linear, circular or waved motifs and alternating bands of geometric designs. As form, a medium size jar predominates, judging from the fragments with relatively sharp bend between shoulder and body and distinct ridge at the lower neck of the vessel (**Fig. 9a**). The ware dates from the late-seventh to mid-eighth centuries AD and has been called “a hallmark of the Umayyad period” (Smith 1989 113; recently Walker 2012: 529). The later (Abbasid) variant of painted cups, characterized by smaller and more intricate geometric designs, are not recorded in the Mushash material.

Bag-Shaped Jars: Several rim and body sherds are evidence of large, bi-ansulate, bag-shaped storejars. The buff fabric is covered by a cream to pale brown slip and reddish brown paint (**Fig. 9d**). The dark variant of this vessel type with white paint is also attested (**Fig. 9c**). Similar painted decoration of broad geometric bands and curls is applied on both wares. In sherd section, grey cores are frequently revealed. The dark type is usually dated slightly earlier than the buff ware and points to a mid-7th / early 8th c. context (cf. e.g. Daviau 2010: 263f.).

Cooking Pots: Ribbed cooking pots (**Fig. 9b**) and casseroles with lids and horizontal loop handles are the most frequent pottery in the assemblage. As the ware is known since Roman times and appears well up to the medieval period, a refined chronology is difficult to establish on the basis of the collected isolated and small-sized sherds. Fragments with ribbed exterior surface belonging to both forms appear in different fabrics: a red ware, a thin-walled and frequently grey slipped brown ware, and a relatively hard and crisp grey ware.

Gray Ware Basins: Handmade large and smaller basins with everted (triangular) rims and combed lines of straight or wavy bands already appear in the Byzantine age but occur com-



9. Pottery finds from Qaşr Mushāsh Survey: a. red-painted ware; b. cooking pot ware; c. white-on-dark Bag Jar; d red-on-buff Bag Jar; e. lamp fragment (photos: DAI, Orient-Department, K. Bartl).

monly in Umayyad occupational levels and are considered as another key form of early Islamic utility wares. Several other basin sherds of a buff ware could belong to both the Late Roman and Umayyad period.

Common Plain Ware: Plain orange-buff pottery with and without slip is well attested in the assemblage and represents the transition from the Byzantine phase to the Islamic period. There are fragments of Late Roman Red Ware (found ex-

clusively at FP 1) pointing to pre-Islamic settlement activity at Muṣḥaṣh. A fragment of terra sigillata will be considered separately.

One fragment of a mould-made *ceramic lamp* was recovered (**Fig. 9e**). The preserved sherd belongs to a bottom half with a circular ring base. It can be reconstructed as lower part of an almond-shaped lamp-body, which has to be complemented to an upper part with shoulder decoration in low relief of the “channel nozzle” type and a nub handle (for the classification cf. Day 1942). The ring-base suggests a late antique/early Umayyad date, as later types are characterized by an almond shaped foot.

Architectural Ceramics: Another interesting subgroup of plain pottery could be documented in substantial quantity from the bath-context (**Fig. 10**). Two distinct forms were observed: The first is a rim of an object with a (round ?) opening of 6 cm in average, which widens rapidly to about 9,5 cm in diameter, bending sharply at the end of the short “shoulder” so that the continuing wall points vertically in relation to the opening (**Fig.10 a-b**). These fragments most certainly belong to tubular elements of a pipe system, where one tube section could be con-

nected to another by overlapping ends.

The other group of sherds is made up of body-fragments belonging to the same system. Notably, they show short sections of flattened edges running vertically opposed (!) to the turning grooves (**Fig. 10** arrow markings), in cases forming rounded corners. This feature might possibly be interpreted as *tubuli*, well known from Roman baths. In antiquity, these hollow earthenware tiles were connected to the hypocaust in order to channel hot gases through the wall for heating purposes. Laterally matching holes on the sides of the rectangular (“box-shaped”) tiles ensured the circulation of the heat (Yegül 1992 363-365). The fact that several fragments were soot-blackened on the inner surface further supports the assumption that the fragments belong to steam pipes of a wall heating system rather than to water pipes, and that they might have been installed close to the furnace of the bath. However, evidence for *tubuli*-heating has not been provided from other sites in the Islamic period so far.

Although itself not representing a veritable “desert castle”, Muṣḥaṣh certainly has to be seen in connection with the group of palatial estates of the eastern steppelands (*bādiya*). Historical reference points were pointed out by Gh.



10. Architectural ceramics from Qaṣr Muṣḥaṣh FP 3 (bath): a/b. constricted end of pipe element; arrows marking flattened edges, at times running opposed to the turning grooves (photos: DAI, Orient-Department, K. Bartl).

Bisheh in order to analyze the archaeological evidence of the site (Bisheh 1989: 88ff.). Given the difficulty in distinguishing certain Umayyad vessel types from Late Roman ones, the ceramic evidence indicates a strong continuity between the Byzantine and Early Islamic occupations of Mushāsh, and suggests that a pre-Islamic settlement has existed prior to the extensive development of the site under Umayyad rule. Contrariwise, the absence of clear later types (such as ICW or glazed pottery) suggests that the settlement did not continue beyond the eighth century. This seems especially true when compared to the Abbasid pottery from neighboring al-Muwaqqar (cf. Najjar 1989). (FB)

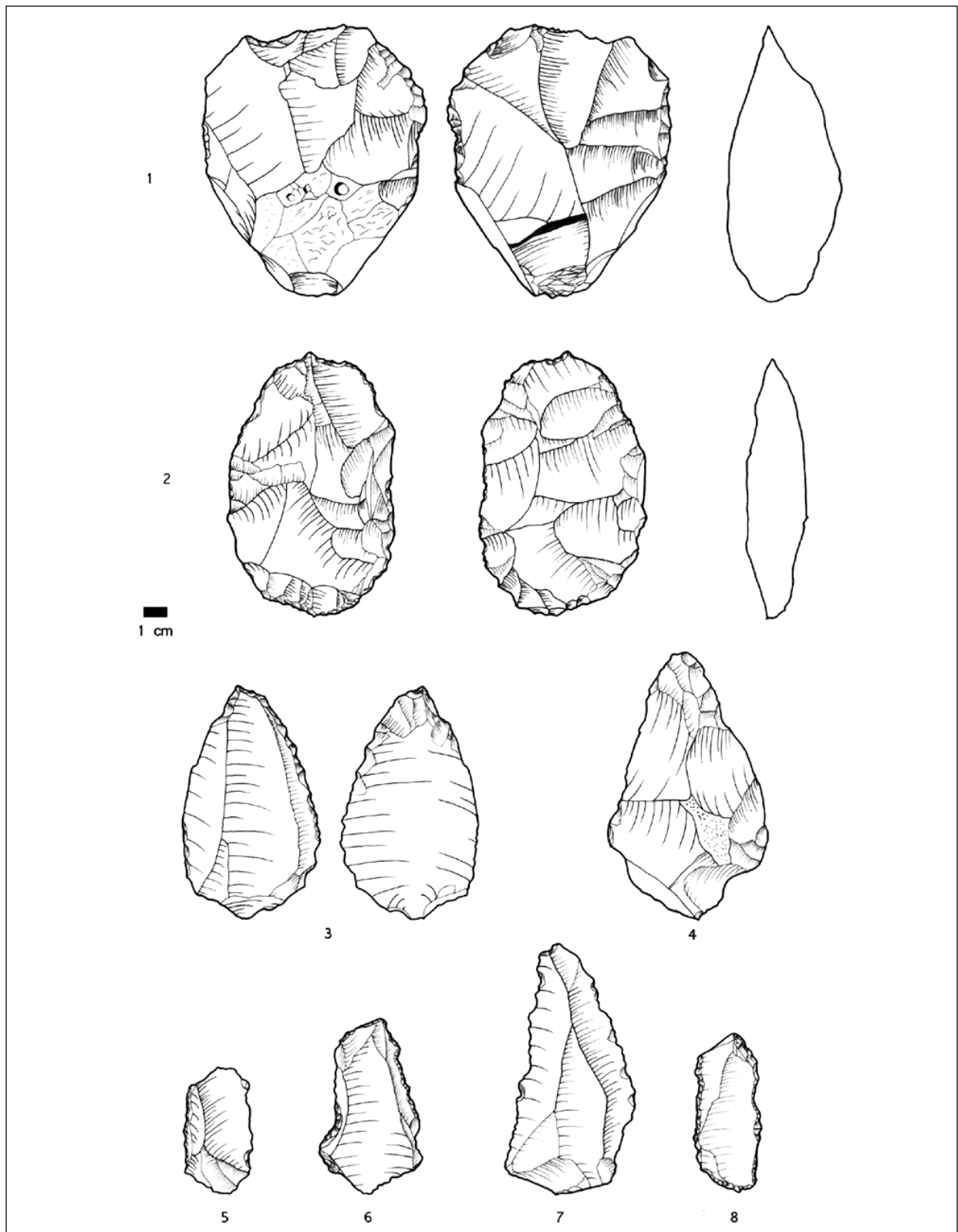
Lithic Artefacts

The material was collected from 131 find points located in a 5km radius around Qaṣr Mushāsh, stretching chronologically from the Lower Palaeolithic to the Chalcolithic/ Bronze Age. In all, 1235 artifacts were examined. The majority of the collection is comprised of wind abraded, rolled and/or re-patinated artefacts. Most artefacts were found in isolation on the surface and out of geomorphological context. While few of these artefacts therefore come from definable 'sites', they nevertheless provide some insights into the use of the Wādī Mushāsh landscape by past hominins and human groups. It should be noted that the natural flint pavements that cover most of the limestone bedrock surfaces in the study area make it very difficult at times to spot lithic artefacts or delineate the edges of dense scatters. Due to this strong background noise the results are very likely skewed towards larger and easily recognizable lithic artefacts, with cores and debitage being under-represented in the collection. Many find points produced mixed assemblages of material that date to more than one time period. This reflects the dispersed and indiscreet nature of the surface distributions of artefacts.

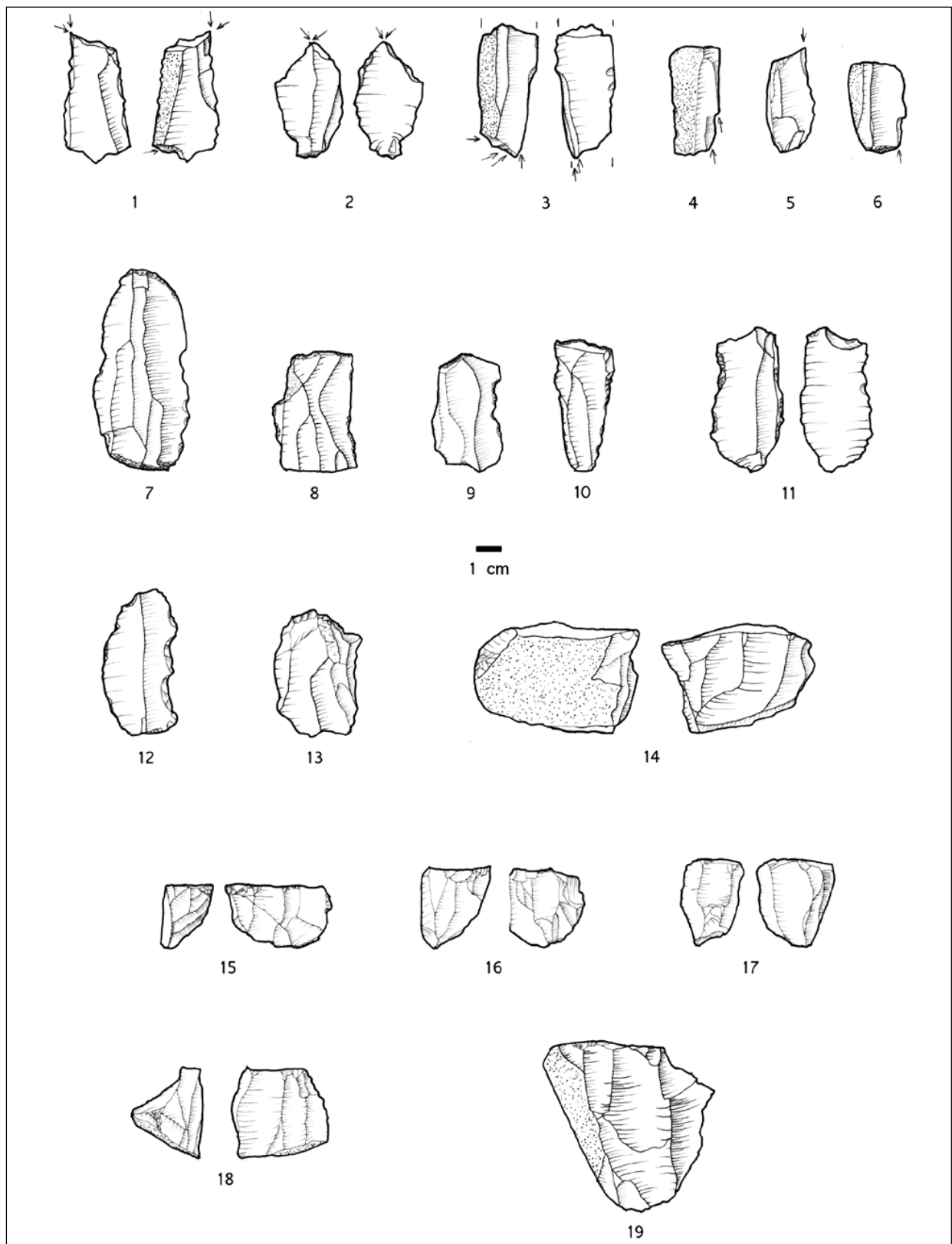
Localities with diagnostic Lower and Middle Palaeolithic artefacts are discussed together here, since in many cases a clear-cut separation of the two phases is very difficult and was often only possible on the basis of diagnostic retouched artefacts. None of the material derived from dense artifact concentrations or *in situ* contexts, but was found as dispersed surface material. This is

clearly reflected in the condition of a large part of the assemblage. Repatination, abraded edges and ridges, sandblasting and 'desert sheen' were common on most of the artefacts, suggesting suggests long-term exposure to the desert environment. 33 bifaces were collected which fall into the Palaeolithic bracket and are assumed to relate to the activities of Lower Palaeolithic hominins in the Qaṣr Mushash area. These included the odd Acheulean handaxe, ovates, several cleavers and some biface roughouts (**Fig. 11**). Apart from the roughouts the majority of tools appeared very worn and reduced by use. The interpretative value of the Lower Palaeolithic material is limited, due to its dispersed distribution and unprovenanced origin. The frequent occurrence of ovoids in conjunction with handaxes and cleavers would suggest Middle to Late Lower Palaeolithic dates for many of these occurrences, although the majority are likely to be Late Acheulean, corresponding with the dates of other sites in the Azraq Basin (Copeland and Hours 1989; Rollefson *et al.* 1997; Rollefson *et al.* 2006). The earliest settlement in the study area therefore probably occurred as early as 500,000 years ago. Cores consist predominantly of Levallois cores, which include uni-directional parallel and bi-directional opposed cores, radial/centripetal cores and unipolar convergent cores. 'Classic' tortoise radial/centripetal cores were rare, while unipolar convergent cores and bi-directional opposed cores were represented in equal numbers. All cores fall into the broad category of the Levantine Mousterian. Since the material represents collections from quite dispersed finds loci it is difficult to identify a more fine-grained chronology. However, the relative lack of radial/centripetal cores may hint at a lack of occupation during Oxygen Isotope Stage 5 (OIS). Conditions during OIS 5 are thought to have been hyper arid and warm initially, which would have made the interior parts of southwest Asia rather hostile and difficult environments. Conversely, the presence of early MP and late MP Phase 1 and Phase 3 uni-directional parallel/ bi-directional opposed and unipolar convergent cores may reflect the more suitable cooler and wetter conditions of OIS7-6 and OIS4 respectively.

Sixteen find spots produced lithic artefacts that could be clearly identified as Upper or Epi-palaeolithic. The differentiation of Upper and/



11. Lower and Middle Palaeolithic lithic artefacts from the Qaşr Mushash Survey. 1: Cleaver, 2: ovate, 3: Levallois point, 4: bifacial foliate, 5-6: Levallois flakes, 7: Levallois point, 8: Levallois blade (drawings: DAI, Orient-Department, T. Richter).



12. Lithics from Findspot 163. 1-6: burins, 7: endscraper, 8-9: flakes, 10-13: retouched flakes and blades, 14-18: multi-platform flake cores, 19: single platform flake/blade core (drawings: DAI, Orient-Department, T. Richter).

or Epipalaeolithic often depends on the degree of microlithization in an assemblage. This indicator was impossible to use in the present case since, as noted earlier, find spots often did either not produce sufficiently large collections or because the material from individual findspots was spatially widely dispersed. Eight of the sixteen find spots produced mixed collections, which included Lower and Middle Palaeolithic or later prehistoric finds. Three findspots were classed as Upper Palaeolithic and/or Epipalaeolithic (#'s 47, 79 and 166). All produced retouched blades and endscrapers on blades that would not be out of place in either the Upper or the Epipalaeolithic. Seven localities produced clearly distinguishable Upper Palaeolithic material, consisting predominantly of retouched artefacts. Cores and debitage were exceedingly rare. Findspot 71 is noteworthy, since this locality produced a highly uniform collection of seventeen pieces, including many retouched blades, an endscraper and a retouched bladelet. Although far less numerous than the Lower/Middle Palaeolithic findspots there are several instances of Upper and Epipalaeolithic occupations in the survey area. Since these reflect a much shorter period of occupation from c. 50,000 – 11,500 years ago, as compared to the much longer period of time represented by the Lower and Middle Palaeolithic findspots, they show that the area was probably inhabited throughout the latter part of the Pleistocene. No clear evidence for late Epipalaeolithic settlement was found, but given the existence of a large Early and Middle Epipalaeolithic site at Kharaneh IV (Maher *et al.* 2012; Muheisen 1988a, b), it is not surprising to see a reasonable representation of Upper and Epipalaeolithic findspots. This shows that occupation appears to have been thin, but constant in the study area throughout the Late Palaeolithic.

24 find spots produced material that is grouped here as 'late prehistoric' flint. In the majority of cases (15 find spots) this material could not be dated in any more detail since it lacked more diagnostic elements. The remaining sites could be more precisely dated. Findspots 22, 112 and 163 are the only two clearly identifiable aceramic Neolithic localities. Findspot 163 is a Late PPNB 'burin site', which will be discussed in more detail below. Findspot 112 produced several bipolar retouched blades and

a blade core. A burin, denticulate and retouched blade, as well as several retouched flakes from Findspot 22 suggest that this is also a PPNB locality. Five further findspots produced material that is diagnostic of the Late Neolithic/ Chalcolithic. These are 36, 50, 51, 84, 105. Findspot 50, in particular, produced a nice bifacial knife, as well as a thumbnail scraper. Findspot 51 also produced a nice collection of 4 bifaces, including three bifacial knives and two fragmented bifacial knives, as well as 32 retouched pieces. The latter included several denticulates, notches and burins. Although Late Prehistoric material is comparatively rare across the study area, the collection nevertheless shows that there was some sporadic settlement in the Mushāsh area from at least the LPPNB onwards (c. 9250 cal BP). The dispersed and low density character of this occupation clearly reflects patterns of transhumance and mobility in what was then an increasingly arid and steppe environment.

Findspot 163 is located c. 250 meters southwest of Qaşr Mushāsh between two tributaries of the Wadi Mushash. This is the only clearly identifiable prehistoric 'site' located during the survey with a concentrated spread of chipped stone and a sharp boundary. The site measures c. 3000 square meters. No architecture or other features were observed. A surface collection was carried out in a 2x2 meter area in the approximate centre of the site. This produced a collection of 151 chipped stone artefacts, including 16 (10,6%) cores, 38 pieces of debitage (25,17%) and 97 retouched pieces (64,24%, see **Table 1**). A reasonable number of burins in the retouched artifact assemblage suggests that this may be a LPPNB burin site, which have been documented at numerous other locations in the Azraq Basin (Rollefson and Muheisen 1985; Rollefson and Frohlich 1982; Betts 1998; Finlayson and Betts 1990). The presence of multiple blade/ bladelet cores and ad hoc flake cores, as well as many ad hoc retouched flakes, and one pressure-flaked fragment of a tanged blade support this idea (**Fig. 12**). This site represents one of many temporary specialized LPPNB campsites in the eastern desert of Jordan. Although the burin aspect is not as characteristic or well represented at this site as at some others the lithic technology and retouched artefacts fall within the same spectrum of material. Findspot

Table 1: Qasr Mushāsh – Detailed analysis of findspot 163.

Cores	Count	%
Single platform bladelet core	2	1.32
Opposed platform bladelet core	1	0.66
Double platform bladelet core	1	0.66
90 degree opposed platform bladelet/ flake core	2	1.32
Pyramidal single platform flake core	1	0.66
Multi platform flake core (ad hoc)	1	0.66
Single platform flake core	3	1.99
Single platform blade core	2	1.32
Core fragment	1	0.66
Bifacial discoidal cores	2	1.32
Sub-Total	16	10.60
Debitage		
Burin Spalls	4	2.65
Cortical Flakes	2	1.32
Blades	6	3.97
Bladelets	4	2.65
Plunging blade (angle correction)	1	0.66
Plunging flake	1	0.66
Hinge step removal blade	2	1.32
Lateral Core Trimming Flake	1	0.66
Unprepared Initial Blade	1	0.66
Flakes	16	10.60
Sub-Total	38	25.17
Tools		
Endscraper	5	3.31
Sidescraper	1	0.66
Scraper/Burin	1	0.66
Burin on truncation	1	0.66
Dihedral Burin	2	1.32
Burin on break	6	3.97
Double burin on truncation	2	1.32
Truncation	3	1.99
Notched	7	4.64
Multiple notches	6	3.97
Denticulate	1	0.66
Retouched Blade	6	3.97
Retouched Bladelet	7	4.64
Retouched Flakes	48	31.79
Tanged blade (unfinished projectile point?)	1	0.66
Sub Total	97	64.24
Total	151	100.00

163 suggests that there was relatively intense, seasonal occupation of the Qasr Mushāsh area during the LPPNB. (TR)

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Bibliography

Bartl, K. and Bisheh, G.

Forthc. Water Management in Desert Regions. Qasr Mushash as an Example in Early Islamic times. In S. McPhillips and P. Wordsworth (eds.), *The Materiality of the Rural Islamic World: Archaeological and Historical Approaches*. Proceedings of a conference held in Copenhagen 2012.

Betts, A.V.G.

1998 *The Harra and the Hamad. Excavations and Surveys in Eastern Jordan Volume 1*. Sheffield: Sheffield Academic Press.

Bisheh, G.

1992 The Umayyad Monuments between Muwaqqar and Azraq: Palatial residences or caravanse-rais?. In S. Kerner (ed.), *The Near East in Antiquity* Vol. III: 35-41.

1989 Qasr Mshash und Qasr 'Ayn al-Sil: Two Umayyad Sites in Jordan. Pp. 81–103 in A. Bakhit and R. Schick (eds.), *The History of Bilad al-Sham during the Umayyad period* (Fourth International Conference: 24–29 October 1987, Amman), Proceedings of the Third Symposium.

Bloch, F.

2011 Jabal Says. Keramik und Kleinfunde, *Damaszener Forschungen* 14. Philipp von Zabern, Mainz am Rhein.

Bujard, J. avec collaboration de Trillen, W.

1997 Umm el-Walid et Khan ez-Zabib, cinq qusur omeayydes et leur mosques revisites. *ADAJ* 41: 359-382.

Copeland, L. and Hours, F.

1989 *The hammer on the rock. Studies in the early Palaeolithic of Azraq, Jordan*. Oxford: British Archaeological Reports International Series.

Daviau, M.

2010 *Excavations at Tall Jawa, Jordan, Vol. 4, The Islamic House*.

Day, F.

1942 Early Islamic and Christian Lamps. *Berytus* VII: 65-79.

Finlayson, B. and Betts, A.,

1990 A functional Analysis of Chipped stone Artifacts from the late Neolithic Site of Gabal Na'ja, eastern Jordan. *Paléorient* 16(2):.13–30.

Gregory, S. and Kennedy, D.

1985 *Sir Aurel Stein's Limes Report*. BAR International Series 272 (i)

King, G., Lenzen, C.J. and Rollefson, G.O.

1983 Survey of Byzantine and Islamic Sites in Jordan, Second Season Report, 1981. *ADAJ* 27: 387-436, plates 85-98.

King, G.

1982 Preliminary Report on a Survey of Byzantine and Islamic Sites in Jordan. *ADAJ* 26: 85-95, plates: 433-444.

Maher, L.A. et al.

2012 Twenty Thousand-Year-Old Huts at a Hunter-Gatherer Settlement in Eastern Jordan. *PLoS One*, 7(2), p.e31447.

Muheisen, M.

1988a. Le gisement de Kharaneh IV, note sommaire sur la phase D. *Paléorient* 14(2):.265–282.

- Muheisen, M.
 1988b The Epipalaeolithic Phases of Kharaneh IV. Pp. 353–367 in A. N. a. H. G. G. Garrard, (ed.) *The Prehistory of Jordan. The state of Research in 1986*. Oxford: British Archaeological Reports International Series 396.
- Musil A.
 1907 *Kusejr 'Amra*, I. Text, Kaiserliche Akademie der Wissenschaften, Wien.
- Najjar, M.
 1989 Abbasid Pottery from al-Muwaqqar. *ADAJ* XXXIII: 305-322.
- Rollefson, G.O. et al.
 1997 Ain Soda and 'Ayn Qasiya: New late pleistocene and early Holocene sites in the Azraq Shishan area, eastern Jordan. Pp. 45–58 in H.G.K. Gebel and G.O. Rollefson (eds.), *The Prehistory of Jordan II. Perspectives from 1997*. Studies in early Near Eastern production, subsistence, and environment. Berlin: ex oriente.
- Rollefson, G.O. and Frohlich, B.
 1982 A PPNB Burin Site on Jabal Uweinid, Eastern Jordan. *ADAJ* 26: 189–198.
- Rollefson, G.O. and Muheisen, M.
 1985 Chipped Stone Artifacts from a Specialized Camp near Kharaneh Castle, Eastern Jordan. *ADAJ* 29: 141–150.
- Rollefson, G.O., Quintero, L.A. and Wilke, P.J.
 2006 Late Acheulian variability in the southern Levant: a Contrast of the Western and Eastern Margins of the Levantine Corridor. *Near Eastern Archaeology* 69(2): 61–72.
- Sack, D., Sarhan, M. and Gussone, M.
 2010 Resafa-Sergiupolis/Rusafat Hisam, Syrien. Pilgerstadt und Kalifenresidenz. Neue Ansätze, Ergebnisse und Perspektiven. *Zeitschrift für Orient-Archäologie* 3: 102-129.
- Schmidt, K.
 2012 Jabal Says. Die Architektur, *Damaszener Forschungen* 13, Philipp von Zabern, Mainz am Rhein.
- Smith, R.H. and Day, L.P.
 1989 *Pella of the Decapolis II. Final Report on the College of Wooster Excavation in Area IX*.
- Walker, B.
 2012 The Islamic Period. Pp. 507-593 in J.A. Sauer and L.G. Herr (eds.), *Ceramic Finds: Typological and technological studies of the pottery remains from Tell Hesban and vicinity, Hesban 11*.
- Yegül, Fikret
 1992 *Baths and Bathing in Classical Antiquity*. New York.