Sonderdruck aus

Zeitschrift für Orient-Archäologie

2019 **BAND 12**

Deutsches Archäologisches Institut • Orient-Abteilung

Deutsches Archäologisches Institut
Orient-Abteilung

Zeitschrift für Orient-Archäologie

Band 12 • 2019

Gebr. Mann Verlag • Berlin

Redaktion: Lisa Klisch, Anja Fügert, Alexander Ahrens (DAI, Orient-Abteilung)
Arabische Übersetzung: Hala Attoura, Tübingen
Standard-Layout und Umschlaggestaltung: Beyer foto.grafik, Berlin
Titelvignette: The high mound and lower town of Kemune seen from northwest (eScience Center, University of Tübingen / B. Glissmann)
Aufmachergestaltung: Lisa Klisch (DAI, Orient-Abteilung), Autor/-innen
Satz: Punkt.Satz, Zimmer und Partner, Berlin
Druck und buchbinderische Verarbeitung: Beltz Grafische Betriebe GmbH, Bad Langensalza

ISSN 1868-9078
ISBN 978-3-7861-2852-6

Bibliografische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.d-nb.de abrufbar.

Die Zeitschrift für Orient-Archäologie ist beim European Reference Index for the Humanities and the Social Sciences (ERIH Plus) verzeichnet.

♾ Gedruckt auf säurefreiem Papier, das die US-ANSI-Norm über Haltbarkeit erfüllt.
Printed in Germany
www.gebrmannverlag.de

The landscape of Qatar (© DAI Orient Department/photo: Ph. Drechsler).

الطبيعة في قطر (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصورة: ف. دْرِكسلَر).

Neolithic Settlement and Land Use Strategies in the Asaila Area

Philipp Drechsler – Mathias Probst

Abstract / Kurzfassung / الخلاصة

Archaeological investigations at Asaila uncovered distinct strategies of Neolithic land use and flint technologies. During the late 6th millennium BC, land-use patterns changed with an increased focus on habitation in the centre of the Asaila basin. Flint knapping during that time was concentrated on the production of bifacial tools and embedded within a broader range of domestic activities.

Archäologische Untersuchungen in Asaila offenbarten unterschiedliche Strategien neolithischer Landnutzung und Feuersteintechnologien. Während des späten 6. Jahrtausends v. Chr. veränderten sich die Landnutzungsmuster, wobei der Fokus vermehrt in der Besiedlung des zentralen Asaila-Beckens lag. Die Feuersteinbearbeitung konzentrierte sich auf die Herstellung bifazialer Werkzeuge und war eingebettet in ein breiteres Spektrum häuslicher Aktivitäten.

أظهرت أبحاث علم الآثار في منطقة العسيلة استراتيجيات مختلفة لاستغلال الأراضي وتقنيات حجر الصوان خلال العصر الحجري الحديث. وقد تغيرت إبان أواخر الألف السادس قبل الميلاد النماذج التي تم على أساسها استغلال الأراضي، مع العلم بازدياد التركيز على استيطان المنطقة المركزية لحوض العسيلة. وقد ركزت معالجة حجر الصوان على صناعة الأدوات الثنائية الوجه وكانت جزءًا من الطيف الواسع لنشاطات العمل المنزلي.

Neolithic Land Use · Flint Technologies · Asaila Basin · Bifacial Tools
Neolithische Landnutzung · Feuersteintechnologien · Asaila-Becken · Bifaziale Werkzeuge

Introduction

Asaila (also spelled Acila) is an almost electrifying name in Arabian archaeology: During pioneering archaeological investigations in Qatar by the 'Danish Archaeological Mission in the Gulf'[1], the 'British Archaeological Expedition in Qatar'[2] and the 'Mission Archéologique Francaise à Qatar'[3] during the 1960s and 1970s, numerous archaeological remains including burial cairns as well as localities comprising of dense scatters of apparently Neolithic flint artefacts were thoroughly described. This high density of archaeological remains clearly suggests favorable conditions for human occupation in the Asaila region, probably as the result of an advantageous hydrogeological situation during prehistoric and historic times.

The Asaila Survey, initiated as part of a joint 'South Qatar Survey Project'1980 (SQSP) between Qatar Museums (QM) and the German Archaeological Institute (DAI) in 2012, aimed to identify specific patterns of prehistoric and historic land use against the background of local environmental conditions with a special focus on the Neolithic occupation of this area. Between 1976 and 1982, the French Archaeological Mission to Qatar investigated several places at the northern edge of the Asaila basin where blade-related Qatar-B flint industries were found.[4] These sites

1 Kapel 1967.
2 De Cardi 1978.
3 Inizan 1978; Inizan 1988; Tixier 1980.
4 Inizan 1980; Inizan 1988.

presumably represent the earliest evidence for mobile pastoralists at the eastern part of the Arabian Peninsula that tentatively date back into the 6th millennium BCE. After this initial work, field investigations suspended although vivid scientific discussions about the implications of Qatar-B industries continue until today.[5] Nevertheless, all these arguments remained rather hypothetically as information of the original locations of archaeological sites with Qatar-B industries from both the Danish and French Archaeological Missions was widely lost. The re-discovery of site 36[6] in 2012 as well as the identification of additional Qatar-B sites in the Asaila region during surveys between 2012 and 2014 indicated the potential of this region for more systematic investigations into the Early Neolithic period in Qatar.

A dense Middle Neolithic occupation of the Asaila area, identifiable in the field on the basis of flint tool types reminiscent to the "Arabian Bifacial Lithic Tradition" *sensu* Edens[7] was also previously noted[8], but not thoroughly studied. Field investigations during the course of the Asaila survey provided the opportunity to record the Middle Neolithic occupation of the area in detail, allowing for the study of changing settlement and land use patterns during the course of the Neolithic period in West Qatar. The unexpected identification of dense scatters of artefacts in the center of the Asaila depression that show technological and typological conformities to the Middle Neolithic, but date into the late 7th and early 6th millennium BCE raise questions about the transition from the blade-based Early Neolithic to the Middle Neolithic in Eastern Arabia, characterised by bifacially chipped implements.

Survey strategies

Main objective of the Asaila survey was the comprehensive documentation of material remains resulting from past human activities in the landscape. Therefore, systematic intensive pedestrian surveys with an intended 100 % coverage were carried out. This survey methodology allowed for the documentation of material remains that otherwise would be easily overlooked and enabled robust estimations of the amount and range of archaeological finds.

In preparation of systematic surveys in the Asaila region (Fig. 1), a survey area was designated that comprises the western part of the Asaila basin as well as adjacent landscapes. Measuring 7.5 km by 7.0 km, it covers a total of 50 km^2 as some areas have been excluded *a priori*. These excluded areas are either covered by *sebkhas* or modern settlements. The survey area is subdivided into 200 individual survey units, each measuring 500 m by 500 m that represent the basic units for pedestrian surveys and landscape mapping.[9] Although the size of these survey units was arbitrarily chosen, it proved a suitable size for systematic transect field walking: It is small enough to overlook the whole survey unit during walking, but big enough to cover diverse landscape configurations even within rather uniform landscapes.

During two field campaigns in spring 2014 and spring 2015, a total of 16 survey units, spanning an area of 4,000,000 m^2, or 8 % of the whole survey area, were investigated (Fig. 2). Survey units were selected purposefully either on the basis of known archaeological sites, or according to landscape configurations that offered a range of natural resources such as water, flint, shelter from winds, or grazing ground.

Individual survey units were studied by a survey team consisting of four persons, each equipped with handheld GPS-devices to track the walked area. Limits of survey units as well as the present position of the individual surveyor were displayed and recorded in each GPS-device, enabling for permanent control over the area under investigation. During the surveys all four members of the survey team systematically walked over the survey unit in parallel transects[10] with an intended spacing of 10 m (Fig. 3). All places of archaeological interest were documented in field journals according to standards established by Qatar Museums, while finds mostly remained in the field.

It was initially intended to map all remains visible on the surface in this way, from single lithic flakes and potsherds to settlements. Nevertheless, high densities of single lithic finds (predominantly single undiagnostic flakes and cores) as well as the fact that single artefacts are overlooked even during systematic intensive surveys required adaptations of the original survey design: Only technologically or typologically diagnostic pieces and/or scatter of lithic artefacts, defined as more than three knapped flint pieces within a radius of 5 m, were recorded. To contextualise all archaeological remains in their local environment, features of the landscape that characterised the individual survey units were extensively mapped in the field using pre-prepared satellite images as a basis.

5 Crassard – Drechsler 2013, Drechsler 2009, Pelegrin – Inizan 2013, Uerpmann – Uerpmann 1996.
6 Acila 36: Inizan 1988.
7 Edens 1982; Edens 1988; *cf*. Uerpmann 1992.
8 Kapel 1967.
9 *Cf*. Banning 2002, 81.
10 *Cf*. Banning 2002, 89.

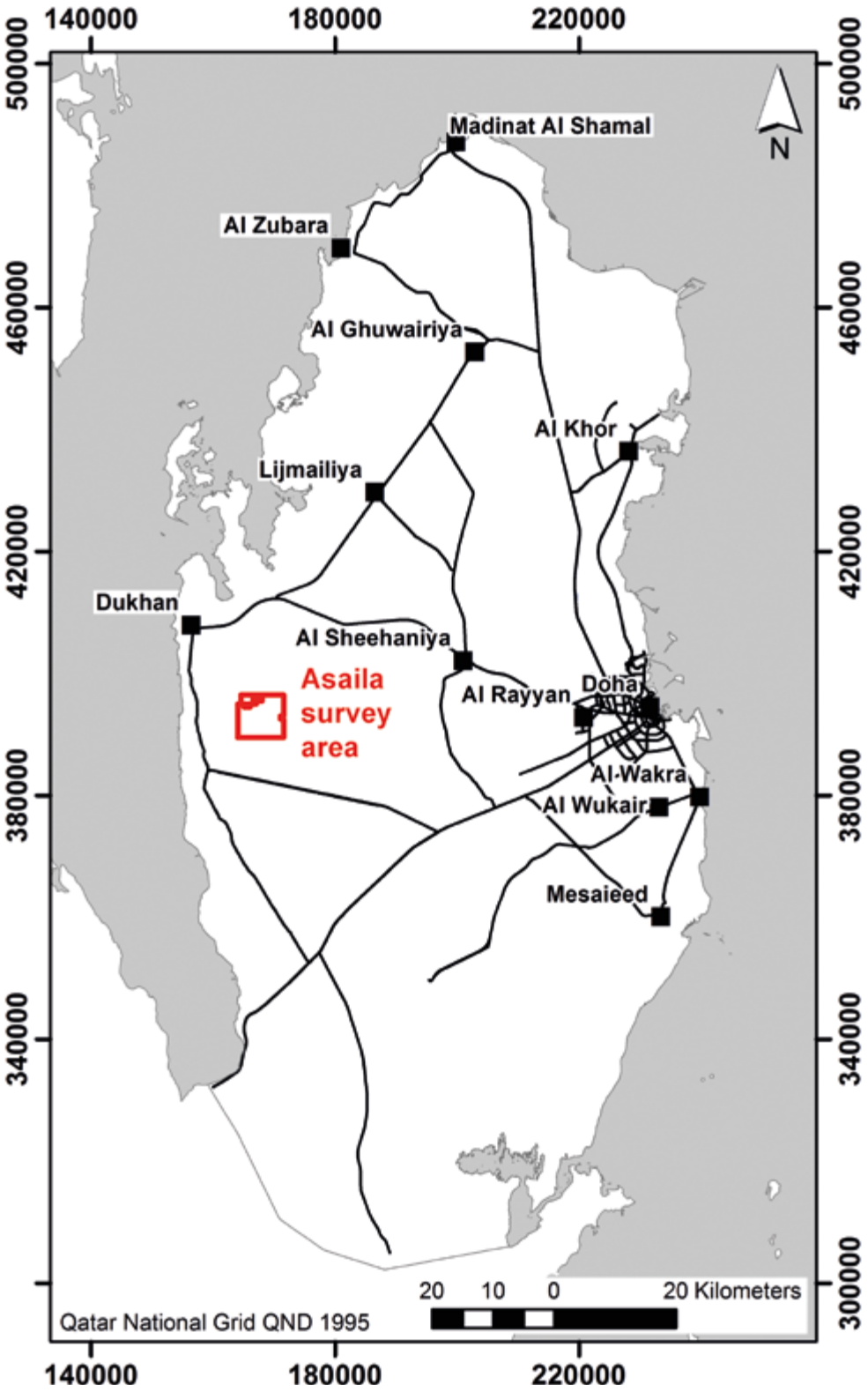


Fig. 1 Location of the Asaila survey area (© DAI Orient Department / photo: Ph. Drechsler).

الشكل ١: تحديد منطقة المسح الآثاري في العسيلة (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصورة: ف. دْرِكسلَر).

The benefits of this time-consuming survey strategy can be demonstrated when comparing the results from systematic surveys with the record of localities during a previous reconnaissance survey in survey unit 103 (Fig. 4 a–b): While the systematic survey was able to document a total of nine localities including two cairns, one stone structure, one pottery and flint scatter as well as five flint scatter and diagnostic flint artefacts, only one cairn was recognised during the reconnaissance survey.

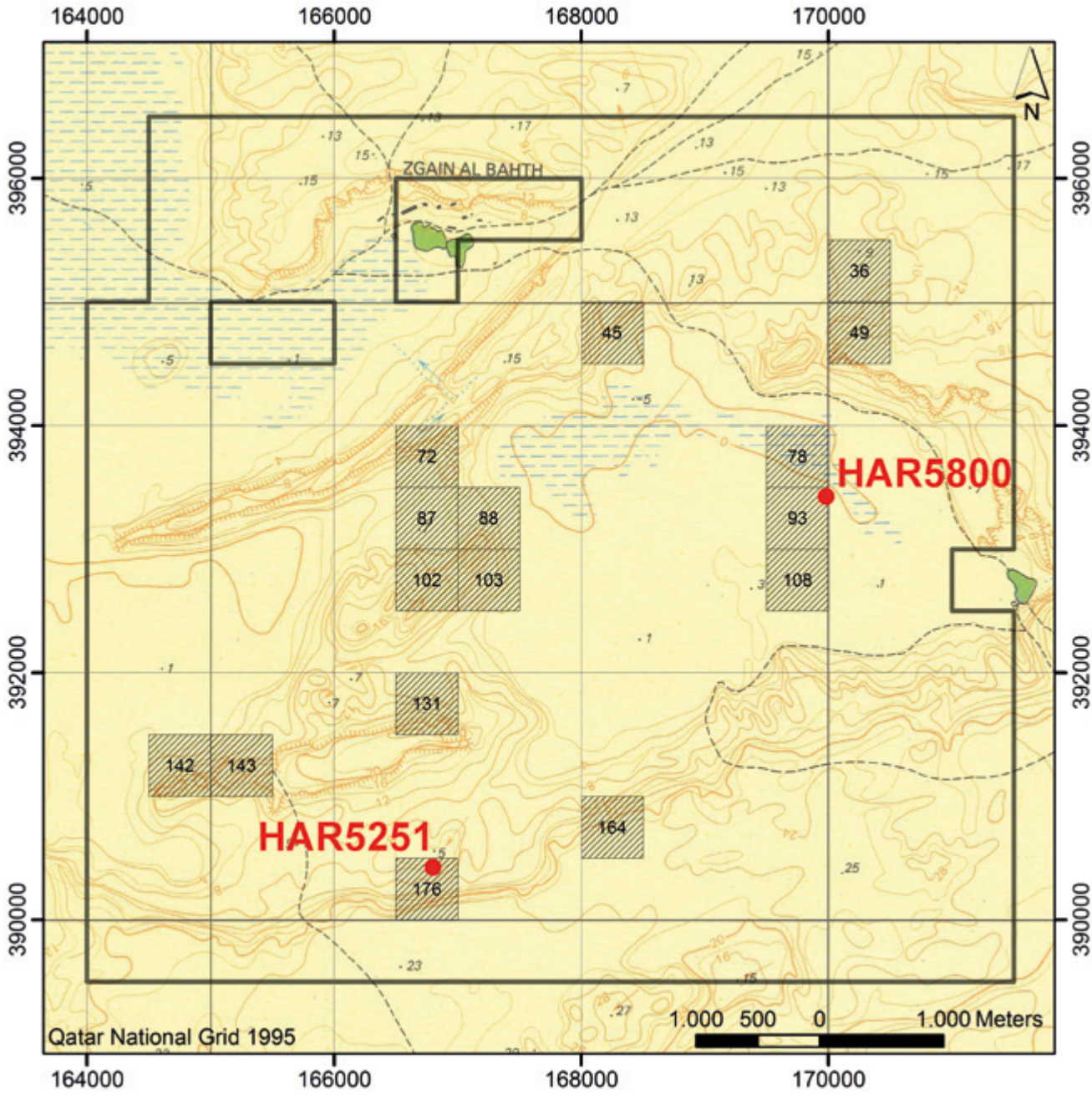
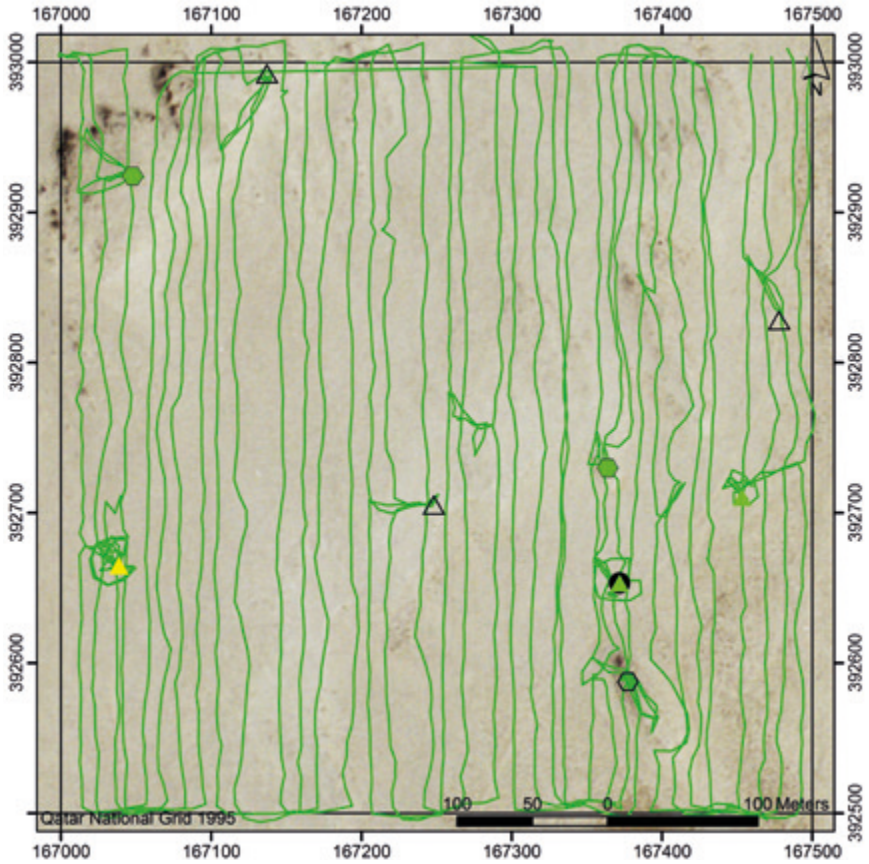


Fig. 2 Area of the Asaila survey with survey units investigated by intensive pedestrian surveys. HAR5251 and HAR5800 refer to localities that were studied in detail (Background map: Qatar HSL 1971, 1 : 50,000/© DAI Orient Department/Ph. Drechsler).

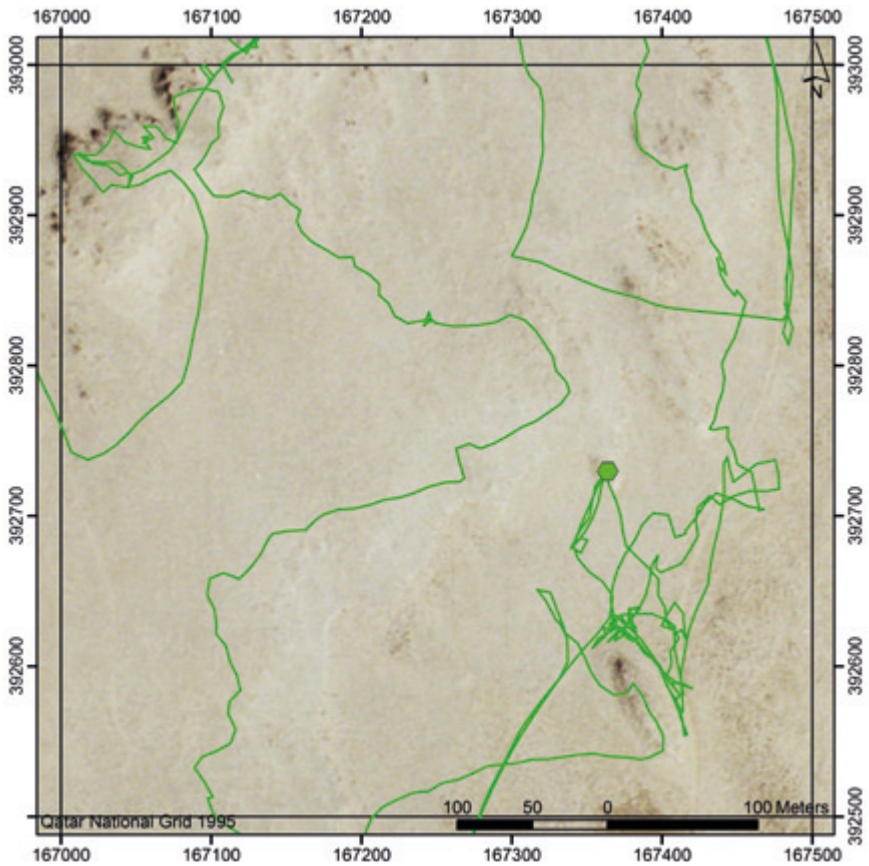
الشكل ٢: منطقة مسح الآثاري في العسيلة مع وحدات المسح التي أُجري البحث فيها خلال المسوحات المكثفة سيرًا على الأقدام. تشير كل من HAR5251 و HAR5800 إلى موضعين دُرسا بالتفصيل (خريطة الخلفية: Qatar HSL 1971, 1 / المقياس ١:٥٠٠٠٠ / حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

Fig. 3 Pedestrian surveys with an intended spacing of 10 m. Survey unit 45, spring 2014 (© DAI Orient Department/photo: C. Gerber).

الشكل ٣: المسوحات سيرًا على الأقدام بمسافات متعمدة قدرها ١٠ م، وحدة المسح 45، ربيع ٢٠١٤ (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصورة: ك. غِرْبَر).



a



b

Fig. 4 Comparison of survey results from the systematic pedestrian survey with an intended spacing of 10 m (a) and reconnaissance survey in survey unit 103 (b). Filled hexagon: cairn, open hexagon: stone structure, filled circle: pottery scatter, filled triangles: medium (yellow) and low (green) density flint scatter, open triangle: single diagnostic flint artefact (© DAI Orient Department / Ph. Drechsler).

الشكل ٤: مقارنة للنتائج من المسح النظامي سيرًا على الأقدام بمسافات متعمدة قدرها ١٠ م (a) والمسح الاستطلاعي في وحدة المسح 103 (b). مسدس مملوء: ركام من الحجارة، مسدس مُفرَّغ: بنى حجرية، دائرة مملوءة: فخار متناثر، مثلثات مملوءة: كثافة متوسطة (أصفر) ومنخفضة (أخضر) من حجر الصوان المتناثر، مثلث مُفرَّغ: مصنوعة صوانية تشخيصية منفردة (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

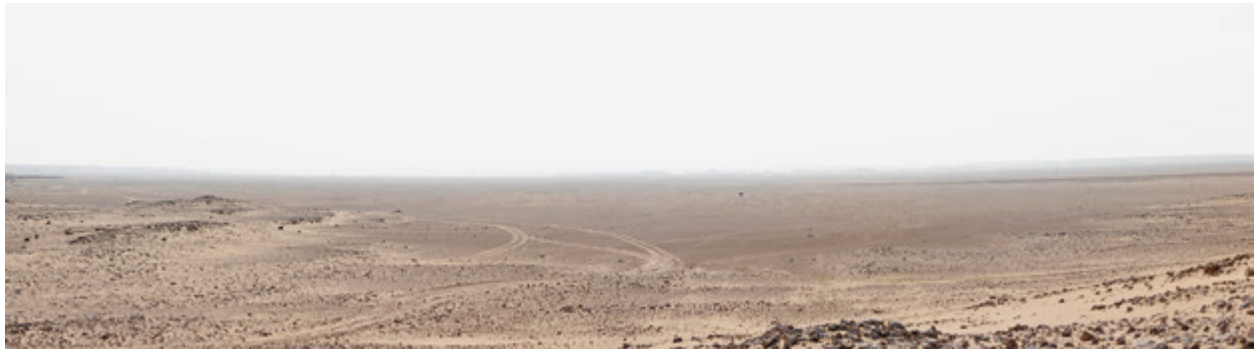


Fig. 5 Panoramic view across the Asaila basin towards east. The lowest part of the depression that forms a sebkha is visible in the middle distance (© DAI Orient Department/photo: Ph. Drechsler).

الشكل ٥: منظر شامل عبر حوض العسيلة باتجاه الشرق، ويبدو في منتصف الصورة الجزء الأكثر انخفاضًا من المنخفض والذي يشكل سبخة (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصورة: ف. دْرِكسلَر).

Environmental context

The Asaila depression is located in the southwestern part of Qatar between Dukhan in the north and Umm Bab in the south. It is separated from the Arabian Gulf by the Dukhan ridge, the main oil-bearing anticline of Qatar mainly resulting from Miocene to Pliocene folding, and the Dukhan Sebkha, representing the syncline between the Dukhan anticline and the much smoother central arch – literally the geological backbone – of Qatar.[11] Dominating element of the landscape in the Asaila region is the Asaila basin, a low-lying solution collapse feature measuring approximately 4.0 km by 3.0 km surrounded by limestone plateaus (Fig. 5). Covered with wind-blown sand, the flat topography of this depression relates to the high groundwater level. Ascending groundwater leads to slight stabilisation of the sand surface through evaporite precipitation creating an equilibrium surface associated with groundwater fluctuations in this area.[12] Meso- to oligohaline, not-potable ground water can be found in a depth between 1.5 m and 8.0 m below present surface within the basin.[13] Relict landforms further indicate the presence of flowing water during the past and suggest the presence of a collapsed (sub-) surface drainage system at the easternmost part of the Asaila depression. Gypsum crusts on top of slightly raised terraces that occur both in the center and along the edges of the depression indicate higher ground levels, and therefore higher groundwater levels, during the past. At present, deflation seems to dominate over accumulation of sediments.[14]

In addition to the Asaila depression, flat plains occur between dissected limestone ridges in the western part of the survey area. With a width of approximately 1 km they form a series of ridges and basins, connecting the Asaila depression with the southwestern extension of the Dukhan Sebkha. In contrast to the Asaila depression, the surfaces of these smaller basins are covered by *hamada* overlying solid limestone rock.

The wide plateaus surrounding the Asaila depression are built up by Eocene limestone of the Dammam formation. Flint nodules in primary position that predominantly occur in the upper part of the sequence crop out along prominent cliff lines framing the plateaus. They also form substantial scatters of natural flint on top of the plateaus. The cliff lines surmount the surrounding basins by approximately 20 m.

Flint artefacts in the landscape – indicators of changing human activities during the Neolithic

General aim of the Asaila survey was the identification of occupation patterns and settlement dynamics in a distinct and well-defined landscape to gain insights into social and economic developments during prehistoric and historic times. To reach this goal, systematic surveys were carried out in a total of 16 survey units, covering a total area of 4,000,000 m^2, during two field campaigns in 2014 and 2015.

One focus of the field work was the northern and western edge of the Asaila depression, where eight survey units were investigated (SU36, SU45, SU49, SU72, SU87, SU88, SU102, SU103). A great diversity of landforms, the occurrence of flint raw material and the proximity to known archaeological sites[15] characterise this particular area. Three survey units

11 Al-Yousef 2003.
12 Drechsler *et al*. 2016.
13 Personal observation in 2012 and 2013.
14 Drechsler *et al.* 2016.
15 Inizan 1980; Inizan 1988.

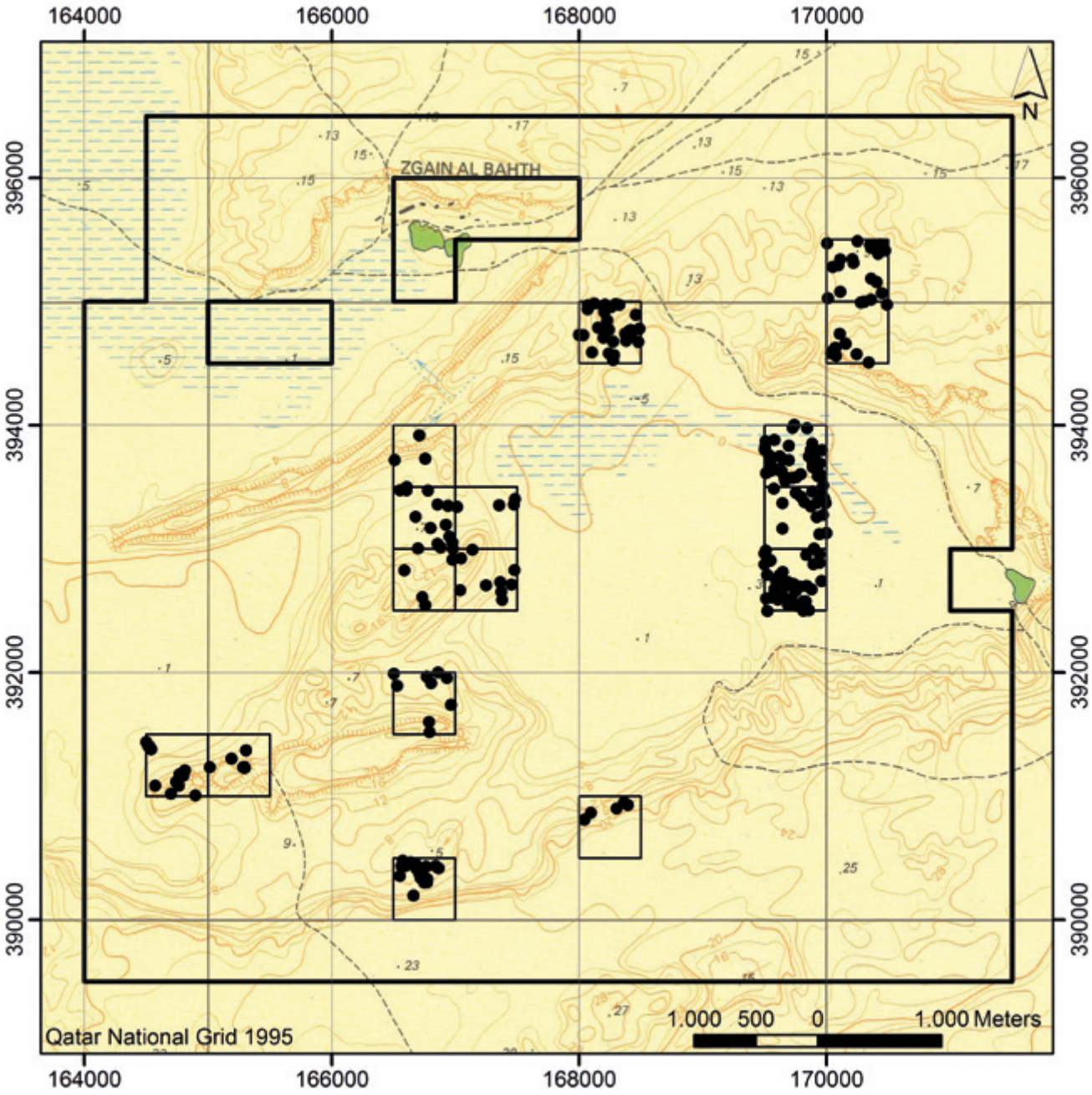


Fig. 6 Spatial distribution of localities recorded during intensive systematic surveys in the Asaila area (Background map: Qatar HSL 1971, 1 : 50,000/© DAI Orient Department/Ph. Drechsler).

الشكل ٦: التوزع المكاني للمواضع المسجلة خلال المسوحات النظامية المكثفة التي أجريت في منطقة للعسيلة (خريطة الخلفية: Qatar HSL 1971, 1 / المقياس ١:٥٠٠٠٠ / المقياس حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

were studied in the eastern central part of the Asaila depression due to the high density of lithic finds that were previously unknown (SU78, SU93, SU108). The remaining five survey units cover specific parts of the landscape in the western part of the survey area: A prominent spur that extends into the Dukhan Sebkha (SU142, SU143), small basins between limestone ridges (SU131, SU176) and a terrace that borders the southwestern edge of the Asaila depression (SU164).

During these surveys, 237 localities with remains of past human activities were documented (Fig. 6), spanning from prehistoric to modern times, with a clear focus on the Neolithic period.[16] While the majority of localities consist of flint scatters (N=96; 41 %) and single diagnostic flint artefacts (N=67; 28 %), pottery scatter (N=17; 7 %), cairns (N=18; 8 %) and

16 Drechsler *et al*. 2016.

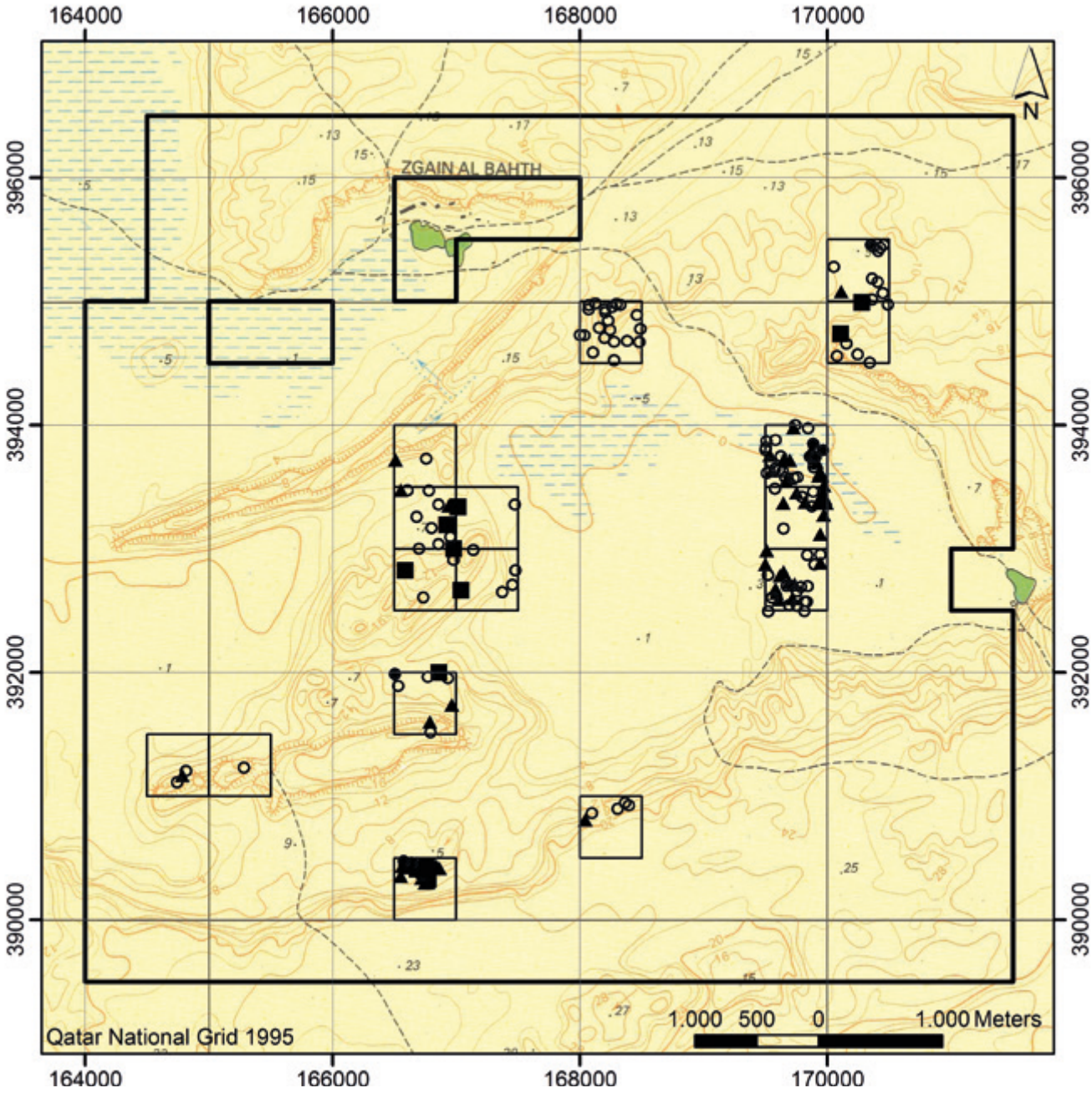


Fig. 7 Spatial distribution of flint sites (N=173): Early Neolithic (squares, N=12), Middle Neolithic (triangles, N=51), Prehistoric (open circles, N=110) (Background map: Qatar HSL 1971, 1 : 50,000/© DAI Orient Department/Ph. Drechsler).

الشكل ٧: التوزع المكاني لمواقع اللقى الصوانية (N=173): العصر الحجري الحديث المبكر (المربعات، N=12) العصر الحجري الحديث الوسيط (المثلثات، N=51) ما قبل التاريخ (الدوائر المفرغة، N=110) (خريطة الخلفية: Qatar HSL 1971, 1 / المقياس ١:٥٠٠٠٠ / حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

ephemeral settlements (N=3; 1 %) were also documented. Other material remains of human activities observed during surveys (N=36; 15 %) include finds of ammunition and rubbish piles. Although densities vary between 3 and 37 localities per survey unit, it can be concluded that the whole Asaila region was occupied during the past, clearly designating Asaila as one preferred area for human inhabitation in Qatar.

Remains of a dense Neolithic occupation: Flint artefact scatters and single pieces of diagnostic flint artefacts

Flint artefact scatters (N=106) and single pieces of flint artefacts (N=67) represent the most frequently observed expressions of material culture in the Asaila region. They occur in all 16 survey units, clearly emphasising the intensive human occupation of the area during prehistoric times (Fig. 7).

At the present state of archaeological research in Qatar, only two flint artefact industries can be securely identified and differentiated: a blade-oriented, presumably Early Neolithic Qatar-B industry[17] and the Middle Neolithic reminiscent to the Arabian Bifacial Tradition.[18] Although chronologically poorly defined due to a lack of stratified sites or radiocarbon datings, the Qatar-B industries have been technologically related to the Pre-Pottery Neolithic B (PPNB) of the Levant, suggesting a dating to the 7th millennium BCE.[19] The chronological homogeneity of the Qatar-B industries was questioned recently for selected sites formerly described as reminiscent of Qatar-B.[20] Nevertheless, all blade-dominated assemblages documented during our surveys in the Asaila area (N=12) are technologically conform to the artefacts from site Acila 36, a "type site" for the Qatar-B industries.[21]

The Middle Neolithic industries (N=51) are characterised by a predominance of (bi-)facial shaping for the production of flint tools, while a standardised primary production is widely absent. Tools were either made on broad flakes, suitable pieces of natural shatter or tabular flint nodules. Radiocarbon dates that are available from a limited number of archaeological sites with related artefacts both in Qatar[22] and Eastern Arabia[23] place the Middle Neolithic into the time frame between the late 6th and early 4th millennium BCE.

A high proportion of flint artefacts identified during the surveys can be assigned to one of the two aforementioned industries. Nevertheless, the unspecific character of flint artefacts from a total of 114 localities does not allow for a precise assignment of these places. Such localities were recorded as "prehistoric" in the field although it cannot be excluded that some artefacts have been produced during historic times, as flint artefacts were in use by local people until recently.[24]

Early Neolithic/Qatar-B

The Early Neolithic Qatar-B flint industry in Qatar is characterised by the production of regular blades from bidirectional, 'naviform' cores[25] using soft hammer percussion[26]. With these technological characteristics unique for the eastern part of the Arabian Peninsula, corresponding flint artefacts, even single pieces, can be identified in the field beyond a doubt. However, Qatar-B assemblages still lack an exact dating: Although typological and technological similarities to Levantine PPNB assemblages suggest a dating into the 7th millennium BCE, independent radiometric datings do not exist until today.

For the first time, Qatar-B flint artefact scatter along the northern edge of the Asaila depression were described by the French Archaeological Mission in 1980.[27] Reconnaissance surveys by SQSP in the Asaila area in 2012 led to the re-discovery of the French site Acila 36 as well as to the documentation of additional Qatar-B sites in direct vicinity.

Systematic surveys in the Asaila region identified a total of 14 Qatar-B sites, among them eleven artefact scatter and three finds of single diagnostic artefacts. Localities were exclusively found along the northern and western fringes of the Asaila depression, in most cases close to high-quality flint raw material outcrops from primary contexts. One additional locality with Qatar-B artefacts was recorded on top of a terrace overlooking a small basin few kilometers southwest of the Asaila depression in survey unit 176, likewise in close spatial proximity to raw material outcrops (HAR5251). The fact that at all localities with Qatar-B artefacts cores and core preparation flakes clearly predominate over blades suggests that flint knapping occurred at the sites while the blades were taken away as the intended preforms. The interpretation of the Qatar-B sites as flint knapping workshops is further verified by three refits (Fig. 8) indicating that flint knapping took place on spot.

The only flint tool that was found during the surveys and which can be associated with the Qatar-B industry is an end-scraper made on a blade from locality HAR5408. While the working edge does not show any traces of use-wear, this particular piece could be joined to an adjacent second blade (Fig. 9). Therefore, this tool was most likely found at the place of its production rather than on the place of its (envisioned) use, clearly supporting the hypothesis that Qatar-B sites in the Asaila region represent flint knapping workshops rather than camp sites.

Middle Neolithic

Middle Neolithic flint artefacts and flint artefact assemblages were identified in the field on the basis

17 Inizan 1988; Kapel 1967; Pelegrin – Inizan 2013.
18 *Sensu* Edens 1982; Edens 1988.
19 Kapel 1967, 18 (P. Mortensen); Pelegrin – Inizan 2013.
20 Scott-Jackson *et al*. 2015, 333.
21 Inizan 1980; Inizan 1988; Pelegrin – Inizan 2013.
22 Inizan 1988, 57. 103.
23 Beech *et al*. 2005; Carter 2010; Drechsler 2011; Glover – Beech 2005.
24 Pers. comm. Faisal al-Naimi, Qatar Museums.
25 Inizan 1980; Inizan 1988.
26 Pelegrin – Inizan 2013.
27 Inizan 1980.

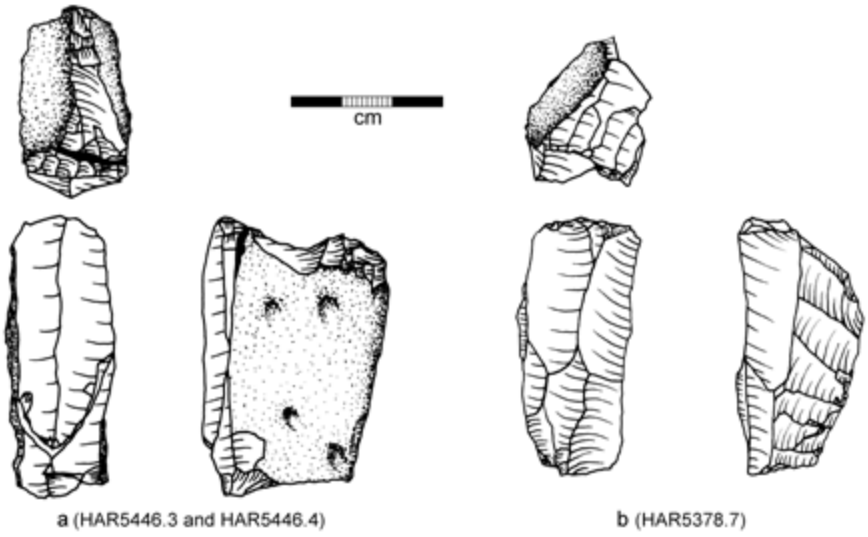


Fig. 8 Bidirectional 'naviform' blade cores and refits recorded during systematic surveys (© DAI Orient Department / drawings: F. Brodbeck / S. Kunze).

الشكل ٨: نوى نصال ‹زورقية› ثنائية الاتجاه وقطع مجددة وُثّقت خلال المسوحات الآثارية النظامية (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ف. بْرُدبِك / س. كُنْتْسِه).

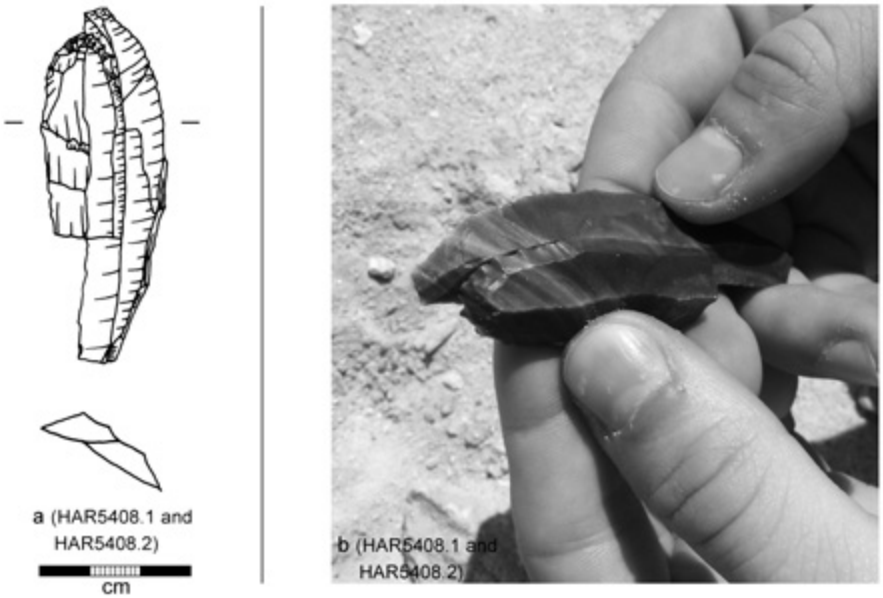


Fig. 9 Drawing (a) and photograph (b) of an end-scarper that could be refitted to a blade (© DAI Orient Department / drawing: F. Brodbeck / S. Kunze / photo: N. Atas).

الشكل ٩: رسم (a) وصورة (b) لمِحكّ يمكن أن يكون قد جُهز ثانية ليصير نصلة (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسمان: ف. بْرُدبِك / س. كُنْتْسِه / الصورة: ن. أَتَس).

of easily identifiable tool types: unifacial and bifacial points, scrapers, and bifacially chipped winged and tanged arrowheads were seen as characteristic elements of the wider "Arabian bifacial lithic tradition"[28]. Although comparable Middle Neolithic flint artefact assemblages from other localities in Qatar are poorly dated, they most plausibly fall within the time range between the second half of the 6th and first half of the 4th millennium BCE.[29] One characteristic of these assemblages is a poorly developed primary production. Most flint tools are made on suitable pieces of natural shatter or tabular flint nodules instead of flakes or blades.

Middle Neolithic artefacts and artefact scatter were documented in all survey units under investigation. This dense distribution of Middle Neolithic artefacts suggests an intensive occupation of the area during the Mid-Holocene. Nevertheless, localities with artefacts that were assigned to the Middle Neolithic show two contradicting characteristics. In the center of the Asaila depression, dense scatters of flint artefacts predominate that include cores, flakes and flint tools (Fig. 10). They occur together with shatters of unworked flint that have to be considered as manuport. This spectrum of artefacts together with pieces of burned limestone and ashy sediment indicates both flint-knapping on spot as well as domestic activities. The raw material diversity at these sites is conspicuously high. Not only local whitish flint was used, but a wide range of colorful non-local flint that was brought to the Asaila depression from abroad.

28 Edens 1982; Edens 1988.
29 Inizan 1988, 57. 103.

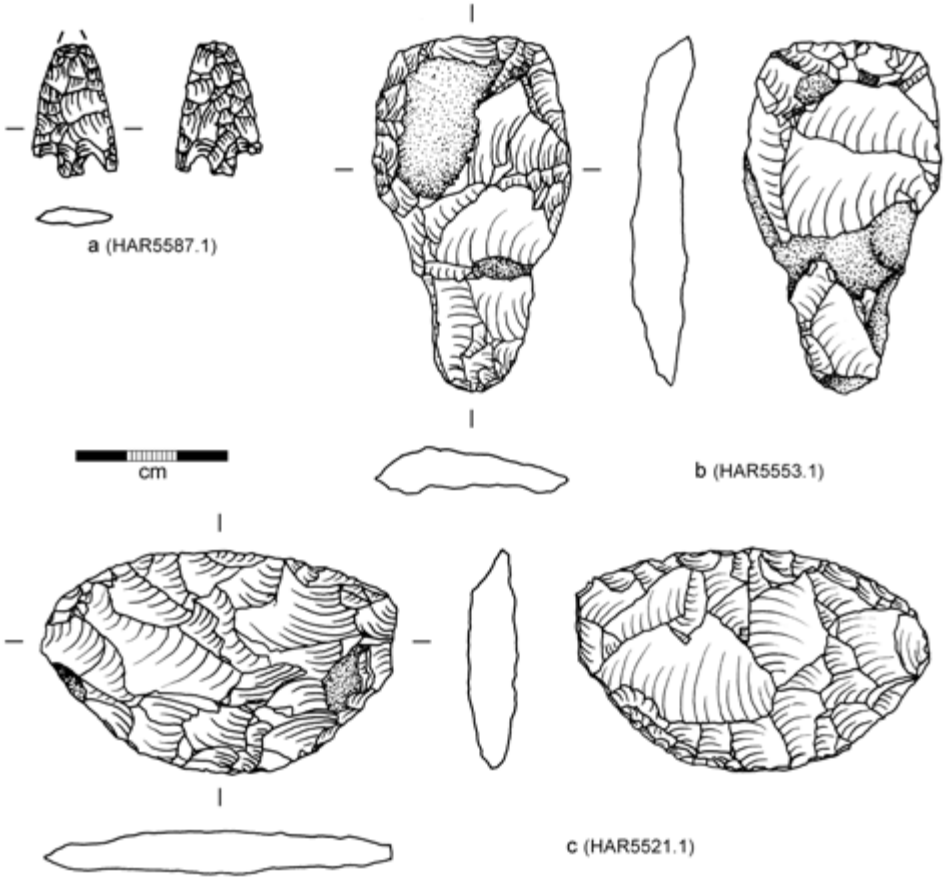


Fig. 10 Spectrum of Middle Neolithic flint tools from the center of the Asaila depression. Bifacial winged and tanged arrowhead, flint adze or "hoe" and bifacial scraper (© DAI Orient Department/drawings: F. Brodbeck/ A. Keßeler/S. Kunze).

الشكل ١٠: سلسلة من الأدوات الصوانية العائدة إلى العصر الحجري الحديث الوسيط والتي اكتُشفت في مركز منخفض العسيلة. رأس سهم ثنائي الوجه مجنح وذو سيلان وقدوم صواني أو «مجرفة» ومكشط ثنائي الوجه (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ف. بْرُدبِك / أ. كِسلَر / س. كُنْتْسِه).

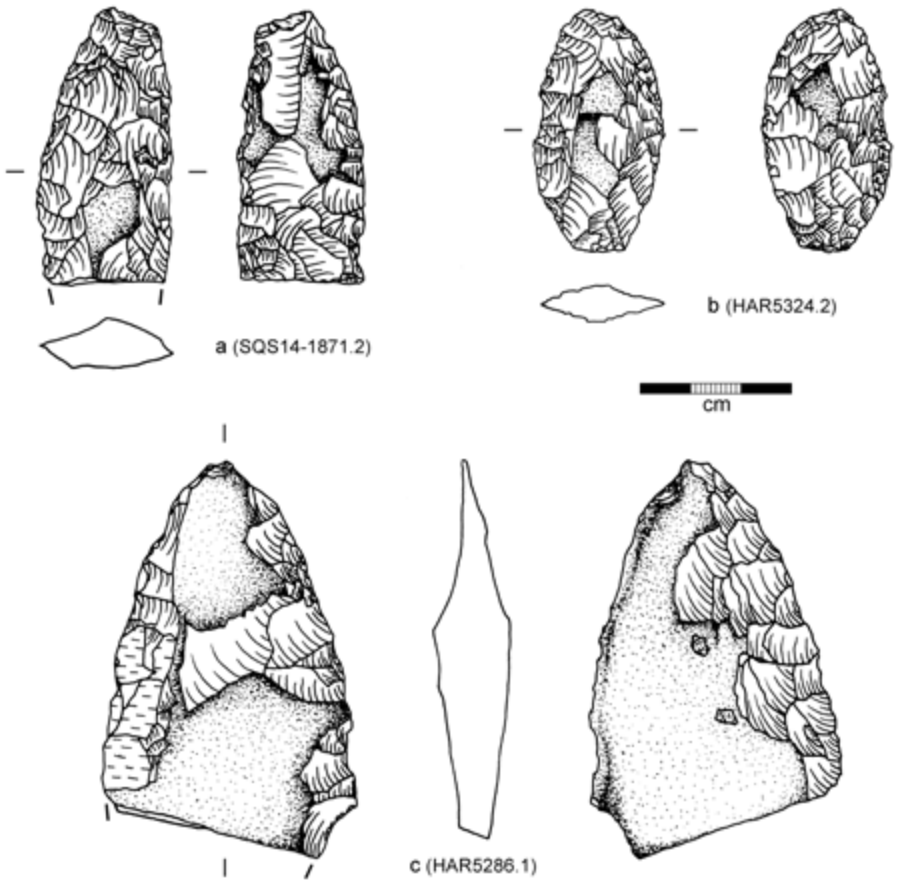


Fig. 11 Pointed bifacial tools from the plains and terraces surrounding the Asaila depression. Remaining cortex suggests a manufacture of bifacial implements from suitable pieces of raw material (© DAI Orient Department/drawings: N. Atas/F. Brodbeck/ J. Daitche/S. Kunze).

الشكل ١١: أدوات ثنائية الوجه مستدقة الرؤوس من السهول والمصاطب المحيطة بمنخفض العسيلة. ويدعو المتبقي من القشر إلى اقتراح صناعة أدوات ثنائية الوجه من القطع المناسبة من المادة الخام (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ذ. أَتَس / ف. بْرُدبِك / ي. دايتْشِه / س. كُنْتْسِه).

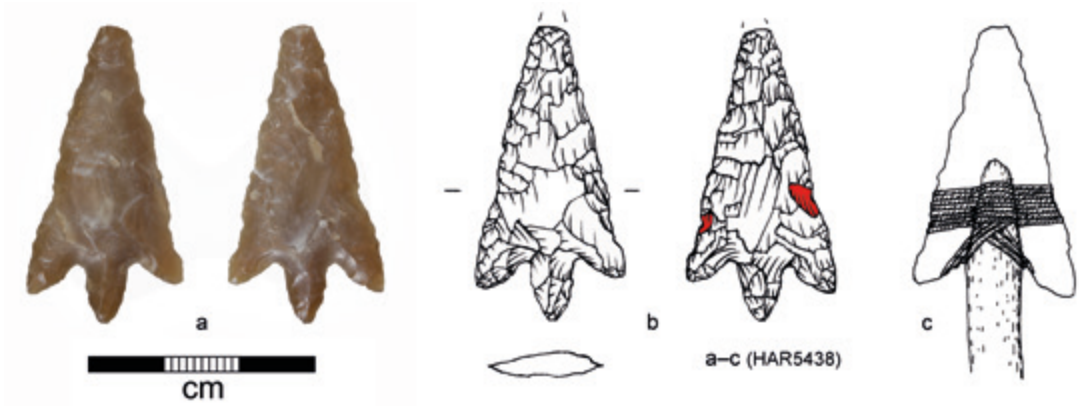


Fig. 12 Image scan (a) and sketch (b) of a bifacially chipped winged and tanged arrowhead found at locality HAR5438 close to a small hill dissected from the limestone plateau at the western part of the Asaila depression. Hafting wear visible on the lateral edges of the arrowhead marked on the drawing in red allows for a reconstruction of the hafting pattern (c) (© DAI Orient Department / drawings: F. Brodbeck).

الشكل ١٢: مسح ضوئي لصورة (a) ورسم سريع (b) لرأس سهم متشظ على الوجهين ومجنح وذي سيلان اكتُشف في الموضع HAR5438 قريبًا من هضبة صغيرة مقتطعة من الرابية البازلتية في الجزء الغربي من منخفض العسيلة. ويظهر موضع تثبيت المقبض على الحافتين الجانبيتين لرأس السهم وقد حُدِّدتا على الرسم باللون الأحمر مما يسمح بإعادة تصميم نسق المقبض (c) (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: م. بْرُدْبِك).

In contrast, on the plains towards the west of the survey area, a high amount of single tools that were found without any association of other flint artefacts are characteristic, suggesting tool use and discard on spot. Although most of these tools were made from angular debris of the local raw material (Fig. 11), distinct flint workshops were documented only sporadically in this area. In few cases, single diagnostic artefacts throw individual episodes of past human activities into light: One bifacially chipped winged and tanged arrowhead with impact marks from locality HAR5438 suggests the repairing of an arrow (Fig. 12) in the windscreen of a small hill within survey unit SU87.

Occupation pattern and settlement dynamics

The exact chronological determination of most surface finds is often difficult and sometimes questionable. Convincing and unequivocal evidence for Palaeolithic artefacts remains absent in the survey area. However, it cannot be excluded that among the undiagnostic lithic finds designated as "Prehistoric" during our surveys Palaeolithic artefacts exist. What can be said with a sufficient degree of certainty is that the Asaila region was a focus of Neolithic occupation. A total of 12 localities with Early Neolithic Qatar-B flint artefacts were recorded, often in close spatial association with high flint raw material outcrops. The spectrum of flint artefacts from these localities suggests that the production of tool blanks was the main motivation for visits to the Asaila area, the according sites therefore have to be considered as flint workshops. In contrast, evidence for Early Neolithic settlement sites remains elusive.

A dense Middle Neolithic occupation focused on the center of the Asaila depression. Fireplaces and flint artefact scatter that include both production waste and flint tools classify these localities as camp sites. As in most parts of the Arabian Peninsula, preservation conditions for animal bones in archaeological contexts are very poor in Asaila. Therefore reconstructions of prevailing subsistence strategies are reliant on indications only. Finds of winged and tanged arrowheads suggest that hunting played a major role in those people's economy. Nevertheless, herding cannot be excluded as the fine-grained sediment of the Asaila depression provides potential grazing ground for domestic animals as well in light of a potentially more humid climate. The predominance of foreign flint raw material suggests an extended raw material procurement area, indicating a high degree of mobility of the according populations.

Conclusion

Systematic surveys in the Asaila region documented more than 200 localities with evidence for past human activities within an area of 4,000,000 m^2, suggesting that Asaila was a preferred area for human inhabitation at least since Early Neolithic times. The overwhelming numbers of recorded localities of archaeological interest are flint scatter and single finds of diagnostic flint artefacts. Although poorly dated due to the lack of well-stratified sites – which

is mainly the result of currently prevailing deflation inside the depression – most flint artefacts can be dated into the Neolithic period based on typological and technological characteristics.

Blade-based flint artefact assemblages reminiscent of Early Neolithic Qatar-B flint industries represent the material evidence for the earliest Neolithic populations in the area. High densities of flint knapping sites ("workshops") along the edges of the Asaila depression suggest an intensive exploitation of locally available flint raw material. In contrast to Early Neolithic sites, flint artefacts that can be placed into the Arabian Middle Neolithic show a different spatial distribution: They occur almost ubiquitous, indicating a dense and intensive occupation of the whole area. One particular focus of the Middle Neolithic occupation was the Asaila depression itself where dense scatter of artefacts were found. At that time, this area may have been more suitable for grazing of both domesticated and wild animals due to potentially higher groundwater levels and increased moisture availability as documented for parts of southeast Arabia[30] and indicated by the geomorphological investigations in the Asaila area.[31]

After the Mid-Holocene, evidence for human occupation of the Asaila depression becomes sparse. Several cairns that represent either burials or landmarks tentatively date into the period between the 3rd millennium BCE and 1st millennium CE. They can be associated with nomadic societies roaming the area together with their herds. More substantial evidence for the presence of human groups comes from the Islamic Period and modern times. The Asaila fort[32] built on top of a prominent hill overlooking a well-watered area suggests the presence of an oasis predating the establishment of the Asaila farm during the 1970s. Remains of abandoned small farmsteads and corrals along the northern fringe of the depression indicate an intensive use of the area for animal husbandry during the last decades.

Archaeological surveys in the Asaila region proved an intense occupation both during the Neolithic and the Islamic period until modern times, while evidence for human activities in the area during the Palaeolithic and Chalcolithic to Classical Periods remains elusive. This general pattern is hardly the result of the survey method: Intensive pedestrian surveys in selected survey units should be able to identify even inconspicuous artefacts. Therefore we assume an actual pattern of human occupation in the area, plausibly influenced by fluctuating climatic conditions. Evidence for human occupation starts with the advent of moister conditions in most parts of Arabia during the Early Holocene and ends with the onset of aridisation during the Mid-Holocene. However, other culturally driven mechanisms that result in the population and depopulation of specific areas must not be neglected as well.

Investigations at locality HAR5251 – an Early Neolithic flint workshop (Qatar-B)

Systematic surveys by the South Qatar Survey Project (SQSP) documented a total of 12 localities with an Early Neolithic Qatar-B component in the Asaila area. This extended set of detailed archaeological data was related to various environmental parameters, allowing for a contextualisation of the sites to gain insights into specific land use and settlement strategies. However, the exact character of the localities documented during the surveys often remained vague as only remains of human activities visible on the surface could be considered. It was therefore decided to investigate one locality in greater detail as a model for Qatar-B sites in the Asaila area.

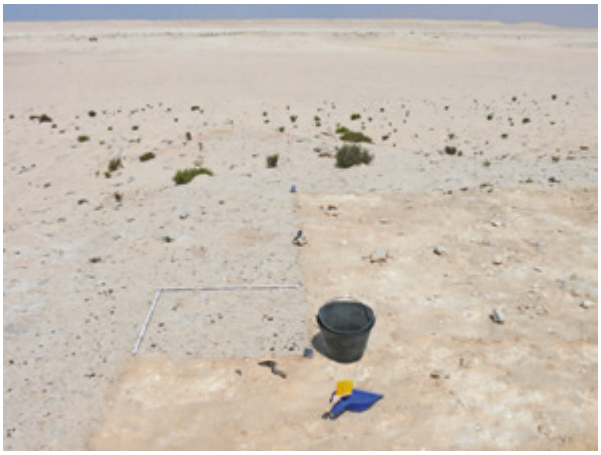
Due to the relative richness of artefacts visible on the surface and the imminent destruction by car tracks running nearby, locality HAR5251, originally recorded as SQS13-233, was chosen for further investigation in spring 2015. It is located on top of a terrace that encompasses a small depression 1.5 km southwest of the edge of the Asaila basin. Within a comparatively small area of approximately 100 m^2, several bidirectional 'naviform' blade cores, crested pieces and core preparation flakes were found in spring 2013 that suggested on-spot flint knapping activities. Accordingly, the site was initially considered as a flint workshop. Subsequent intensive pedestrian surveys in 2014 within this area covered by survey unit 176 revealed a high density of Middle Neolithic and prehistoric flint scatters in the direct vicinity, while the spatial concentration of Qatar-B artefacts at locality HAR5251 remained a singular case.

Methodology

Car tracks in the direct vicinity of locality HAR5251 suggested some degree of disturbance and dislocation of individual artefacts in the area. In addition,

30 E.g. Neff *et al*. 2001; Preston *et al*. 2015.
31 Drechsler *et al*. 2016.
32 Hardy-Guilbert 1980.

a



b

Fig. 13 Brushing and scraping the surface of locality HAR5251 (© DAI Orient Department/photos: Ph. Drechsler).

الشكل ١٣: كشط سطح الموضع HAR5251 وتنظيفه بالفرشاة (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصور: ف. دْرِكسلَر).

the collection of diagnostic artefacts during the initial recording of the locality in 2013 already affected the spatial distribution of artefacts. Due to these uncertainties in their spatial location it was decided to abstain from a measurement of individual artefacts. Instead, an area of 11 m by 7 m that covered the densest occurrence of flint artefacts on the surface was subdivided into a regular square grid, with each square measuring 1 m × 1 m. During subsequent surface cleaning by brushing and surface scraping down to a depth of approximately 3 cm (Fig. 13 a–b), each individual one meter square was further subdivided into four sampling squares measuring 50 cm × 50 cm. All sediment retrieved from these quarter square meters was screened with a mesh size of 1 cm and 2 mm and all artefacts were collected individually for further studies.

Results of field investigations

The cleaning of the surface by brushing and scraping did not indicate the presence of any anthropogenic sediment at the locality. The surface itself is formed by an accumulation of limestone debris and both worked and unworked flint, the latter deriving from local natural flint outcrops along the edge of a prominent 20 m high cliff line about 250 m south of HAR5251. Below this deflation horizon, whitish and yellowish gypsum crusts formed a hard but porous layer that continues into the underlying limestone bedrock. No artefacts were found embedded into the gypsum crusts, only in very rare occasions fine silty sediments filled larger cracks.

Flint artefact assemblage

Within the studied area of 11 m × 7 m, a total of 569 flint artefacts were collected from 308 quarter square meters, suggesting an average density of 7.5 flint artefacts per square meter. In addition, 39 flint artefacts were unsystematically collected from this locality during the initial visit in 2013. As they definitively derive from the gridded area they are included in the technological study, but not in the distribution maps (*cf.* Figs. 25–28).

The entire flint artefact assemblage consists of 59 cores, 540 pieces of debitage and 9 tools. The raw material for the majority of all artefacts (74.6 %) is a whitish to yellowish, slightly translucent dense flint that shows a characteristic “chocolate”-beige-brown patination. Corresponding raw material can be found as nodules weathering out of the cliff line south of the locality. Whitish and greyish striped flint with a likewise beige-brown patination also occurs frequently, deriving from the same flint outcrops along the cliff line. The absence of any traces of burning among the flint artefacts supplements the field observation that no traces of combustion features were observed.

Characteristic elements of the flint artefact assemblage are bidirectional ‘naviform’ blade cores (Fig. 14) that account for 78.0 % of all cores (N=46). If completely preserved (N=38), they are qualified by two opposing striking platforms used for the removal of blades from a common removal surface. The striking platforms are carefully prepared, while the back of the cores are either flat and formed by the outer surface of the original nodule, angular, or chipped to form a distinct keel (Fig. 15). Preforms of ‘naviform’ cores are most often angular pieces of shatter

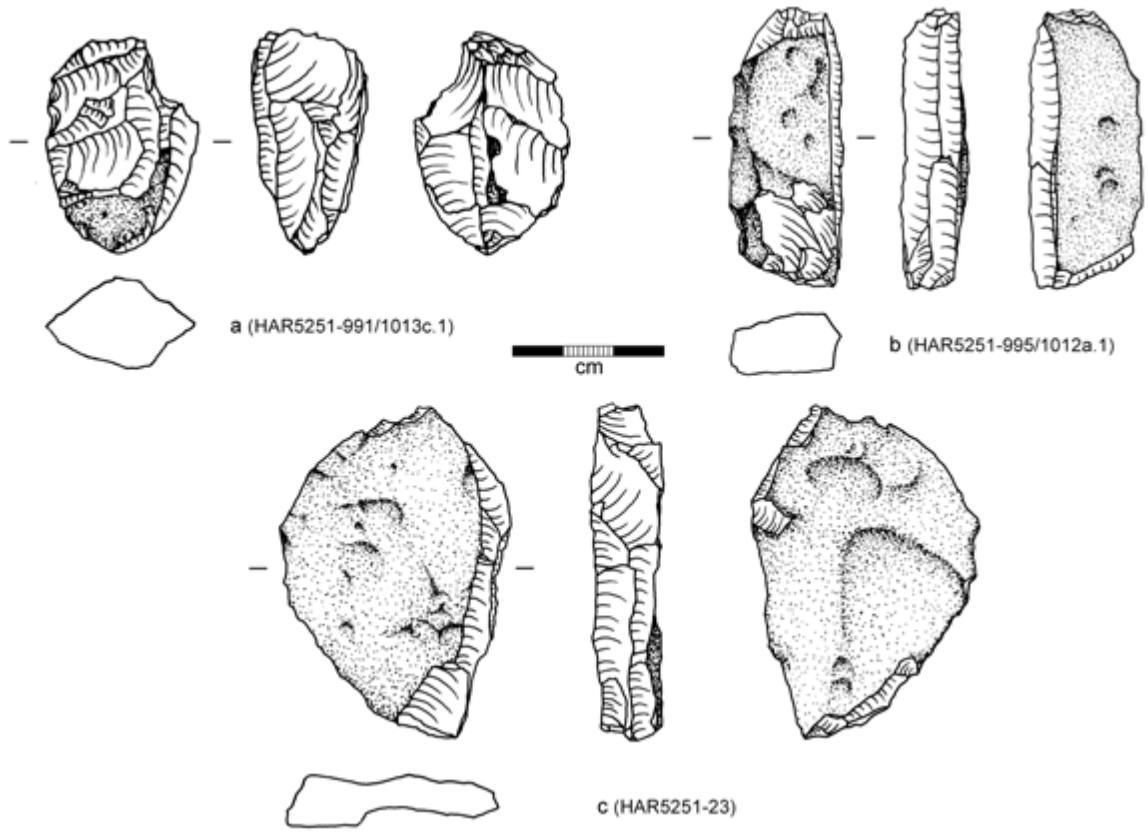


Fig. 14 Bidirectional 'naviform' blade cores from locality HAR5251. Raw materials were either flint nodules or tabular pieces of flint (© DAI Orient Department/drawings: A. Keßeler/S. Kunze).

الشكل ١٤: نوى نصال ‹زورقية› ثنائية الاتجاه من الموضع HAR5251. وكانت المواد الخام إما عُقيْدات صوانية أو قطع مسطحة من الصوان (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: أ. كِسِلَر، ش. كُنْتْسِه).

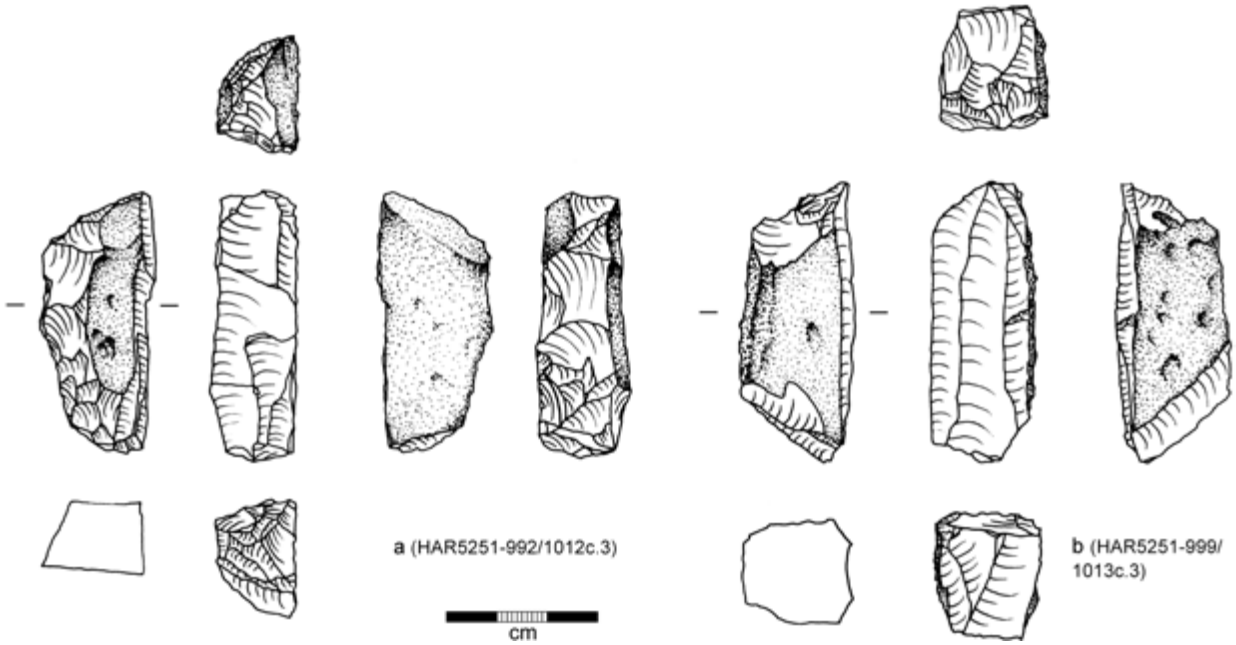


Fig. 15 Bidirectional 'naviform' blade cores showing the careful preparation of striking platforms (© DAI Orient Department/drawings: A. Keßeler/S. Kunze).

الشكل ١٥: نوى نصال ‹زورقية› ثنائية الاتجاه تظهر الإعداد المتقن لسطح الطرق (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: أ. كِسِلَر، ش. كُنْتْسِه).

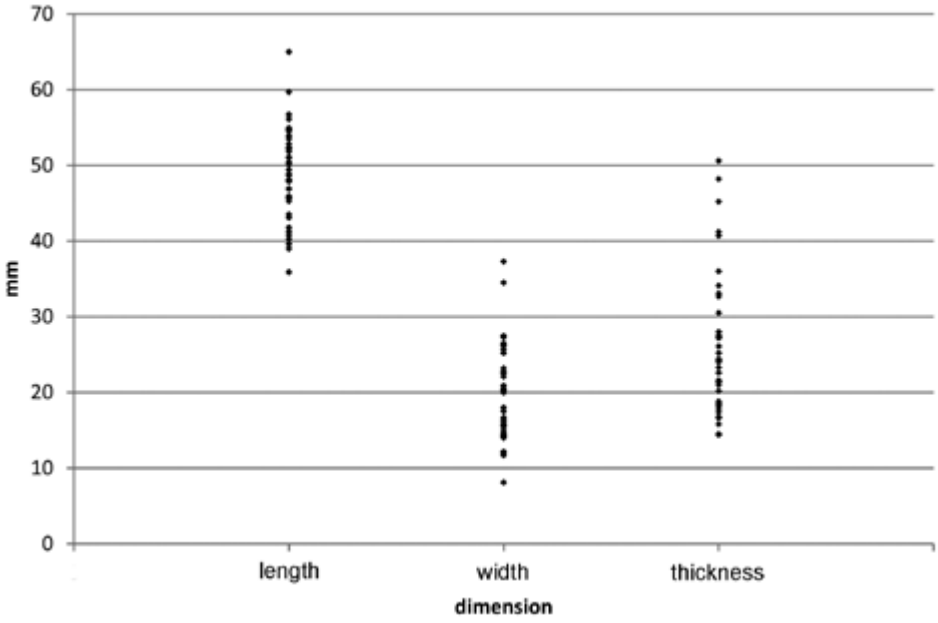


Fig. 16 Dimensions of 'naviform' blade cores (N=38).

الشكل ١٦: أبعاد نوى النصال ‹الزورقية› (N=38).

(65.2 %; N=30), nodules (28.3 %; N=13) or tabular flint pieces (6.5 %; N=3). The majority of the remaining 13 cores are untypical single platform cores with a single removal surface (5.1 %; N=3), initial cores/tested raw material slabs (3.4 %; N=2) or unspecific core fragments (13.6 %; N=8) whose technological characteristics cannot be determined in detail.

While both tested raw material slabs and core fragments possibly supplement the finds of 'naviform' blade cores, technological differences of the blade and flake cores leave the question open whether the single platform cores belong to the Qatar-B assemblage or are the result of a palimpsest. At least three pieces of debitage that plausibly derive from bifacial flaking clearly indicate a chronological heterogeneity of the flint artefact assemblage collected from locality HAR5251. Therefore the three flake cores can be likewise considered as a foreign element.

In comparison to 'naviform' blade cores from the Levant, completely preserved 'naviform' cores from locality HAR5251 (N=38) are conspicuously small (Fig. 16): The length of the removal surfaces center around 48.8 mm, the width of the cores (measured perpendicular to the length of the removal surface) ranges between 8.1 mm and 37.3 mm, while the core thickness ranges between 14.4 mm and 50.6 mm. Although this small size mirrors the dimensions and quality of available raw material slabs and reflects the cores at the state of their final discard, the smaller size of cores cannot be explained by these constraints alone.

The debitage from locality HAR5251 appears technologically homogenous. Among 540 collected pieces, only 13 pieces were omitted as potentially foreign elements: Three pieces of debitage derive from bifacial shaping, while 10 pieces show a diverging raw material or patination. Seven additional pieces were excluded from subsequent analyses as their artefact character could not be clearly attested. The remaining debitage assemblage (N=520) is dominated by unspecific preparation flakes (42.7 %; N=222), although primary crested pieces (5.4 %; N=28), secondary crested pieces (2.5 %; N=13) and core-edge pieces (11.3 %; N=59) are the most conspicuous elements.

The careful preparation of the cores is clearly expressed in the presence of primary and secondary crested pieces: before the removal of the first blade from the anticipated removal surface, a ridge was formed by flake removals perpendicular to the foreseen knapping direction. After the removal of the primary crested piece, subsequent removals still show according perpendicular removal scars on part of the dorsal surface, qualifying these artefacts as secondary crested pieces (*cf.* Fig. 24 a). A special case of primary crested pieces represent a total of 11 long and narrow blades with a triangular cross-section that show a cortex coverage of 100 %: plausibly a distinct natural ridge replaced a preparation of the crest.

A common core preparation strategy to maintain the convexity of the removal surface is the removal of core edge pieces. These blanks are characterised by considerable cortex coverage along one lateral edge of the piece. The narrow removal surfaces of 'naviform' cores allow the removal of only few blades before corrections of the convexity of the striking platform become necessary. Therefore the high numbers of core-edge pieces are conform to the predominance of 'naviform' blade cores.

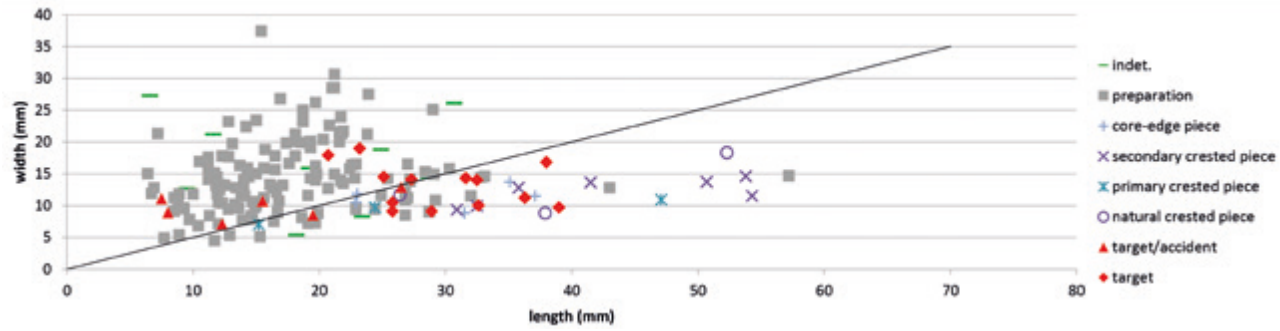


Fig. 17 Scatterplot of length and width of completely preserved blanks (N=197). Target products (blades) separated from the majority of preparation flakes.

الشكل ١٧: رسم بياني مشتت لطول وعرض الأسندة الخام المحافظ عليها كاملة (N=197). وقد فُصلت المنتجات المستهدفة (النصال) عن أكثرية شظايا أعمال التحضير.

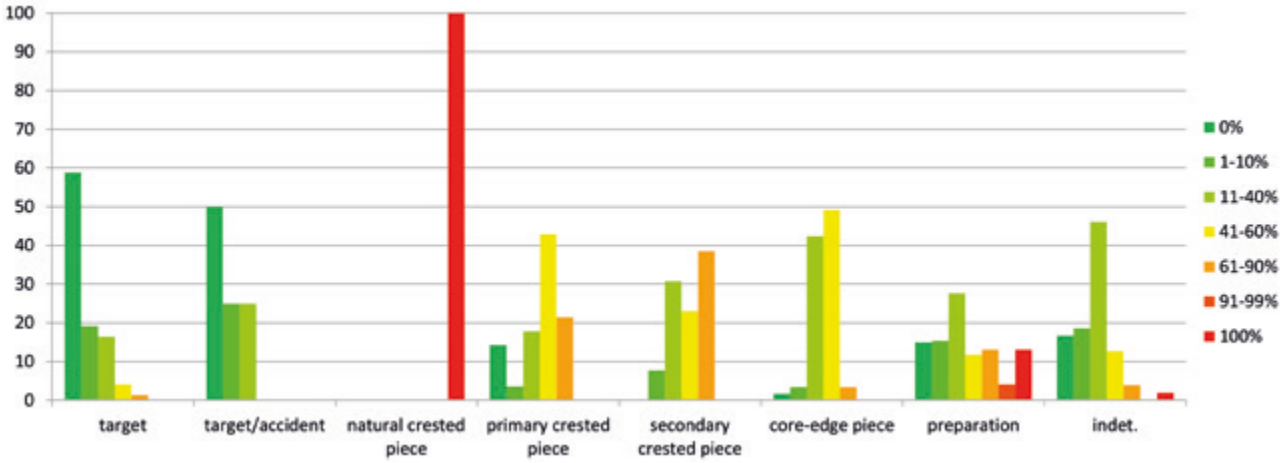


Fig. 18 Cortex coverage of debitage types (Percentages, N=519).

الشكل ١٨: مدى انتشار القِشر في نماذج عمليات الطرق (النسب المئوية، N=519).

The remaining pieces of debitage were either classified as potential tool blanks/target products (14.0 %; N=73) or indeterminate pieces (19.6 %; N=102) that show the characteristics of preparation flakes, but could likewise represent target products.

A metrical debitage analysis of completely preserved pieces (N=197) closely mirrors this subdivision of the assemblage: Metrical blades (i.e. pieces of debitage with a length > 20 mm and a length/width-index > 2) occur most frequently among target products, core-edge pieces and primary/secondary/natural crested pieces, but are clearly underrepresented if considering the entire debitage assemblage (Fig. 17). Conspicuous are two flakes classified as target products during the analysis. They correspond well to the occurrences of single platform cores, either suggesting different flint knapping strategies or a palimpsest of artefacts at the locality. The majority of preparation flakes and indeterminate pieces fall into the metrical range of flakes.

In connection with a sequential core reduction, the proportion of cortex coverage represents an excellent indicator for the classification as preparation flakes and target products, following the rationale that higher degrees of cortex coverage are associated with the initial steps of core preparation and core rejuvenation. Generally high proportions of cortex coverage characterise core preparation flakes and the majority of indeterminate pieces, while target products show a lower degree of cortex coverage on the dorsal surface (Fig. 18).

Despite this clear differentiation into preparation flakes and target products, the knapping technique remained constant during the production sequence. Only minor differences can be observed in the exterior shape of striking platforms (general predominance of the impact point behind a central ridge, formed by two previous removals, Fig. 19) and characteristics (preparation flakes show a higher proportion of cortical striking platforms, Fig. 20).

Likewise, evidence for dorsal reduction is weak during all stages of core preparation and blade removal (Fig. 21). The lack of impact points, absent or weakly developed cones, diffuse bulbs of percussion

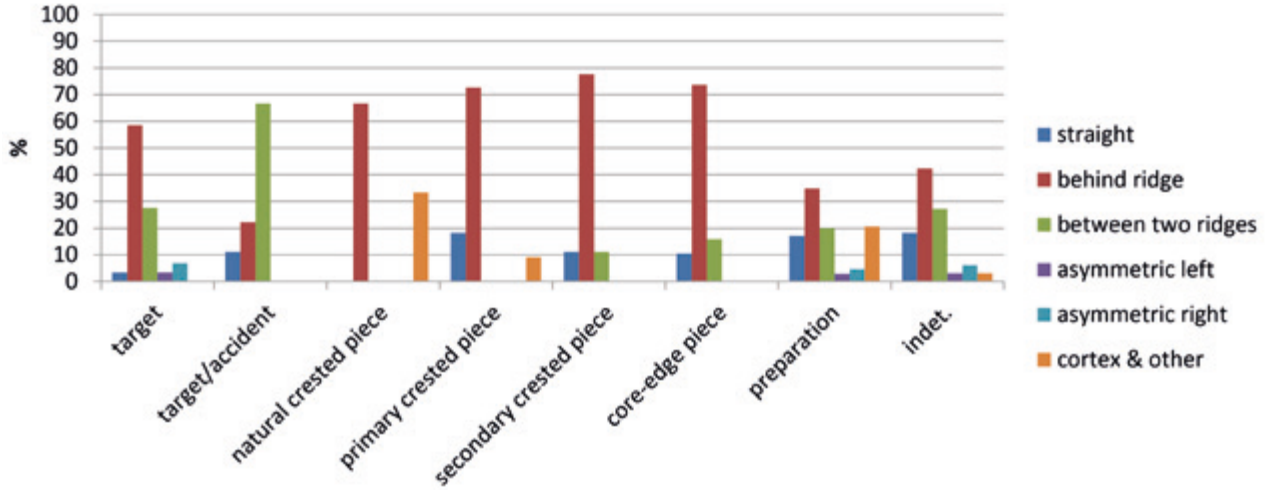


Fig. 19 Exterior shape of striking platforms (Percentages, N=291).

الشكل ١٩: الهيئة الخارجية لسطوح الطرق (النسب المئوية، N=291).

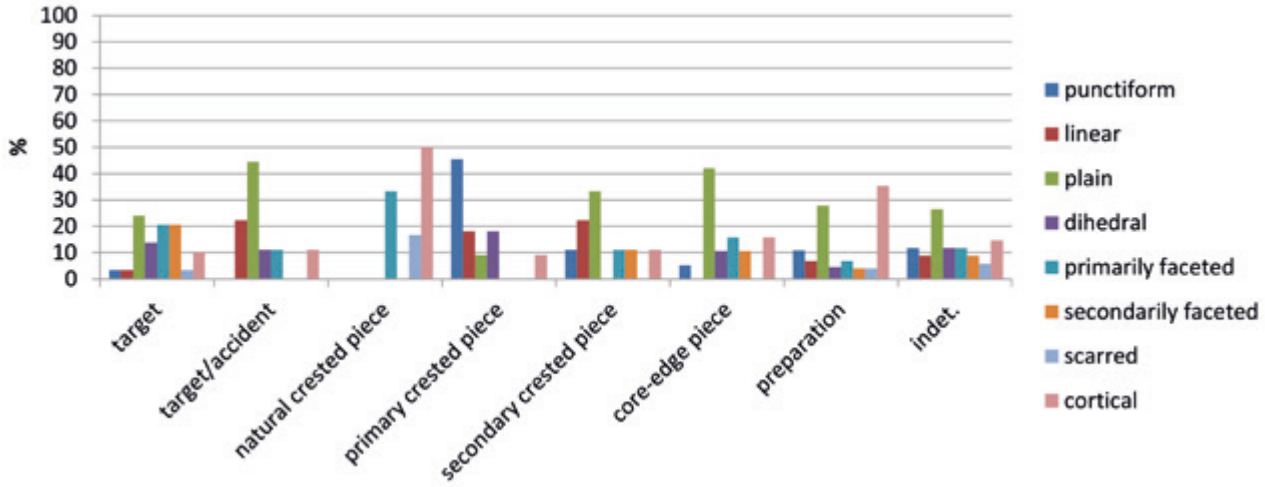


Fig. 20 Striking platform characteristics of debitage types (Percentages, N=293).

الشكل ٢٠: خصائص سطح الطرق لنماذج عمليات تصنيع الأدوات الحجرية (النسب المئوية، N=293).

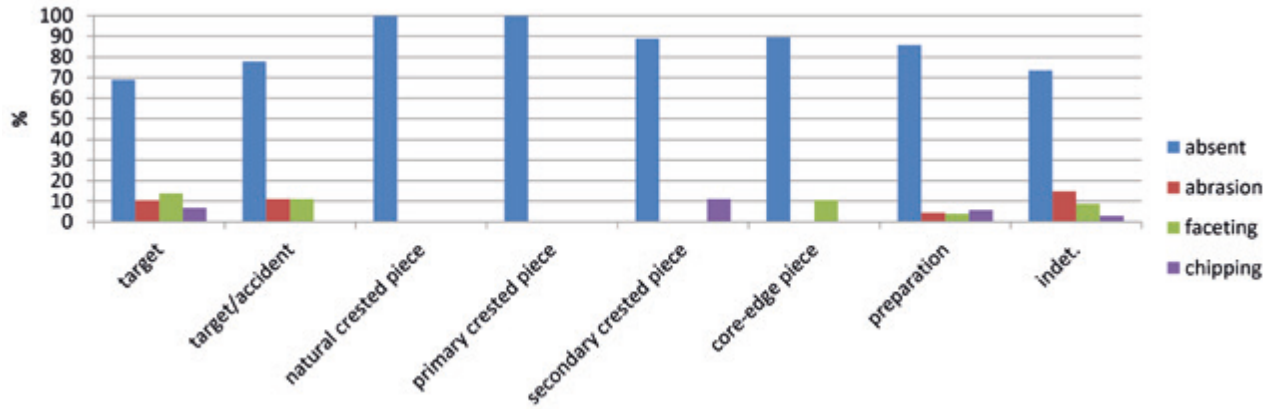


Fig. 21 Dorsal reduction (Percentages, N=293).

الشكل ٢١: إنقاص ظهري (النسب المئوية، N=293).

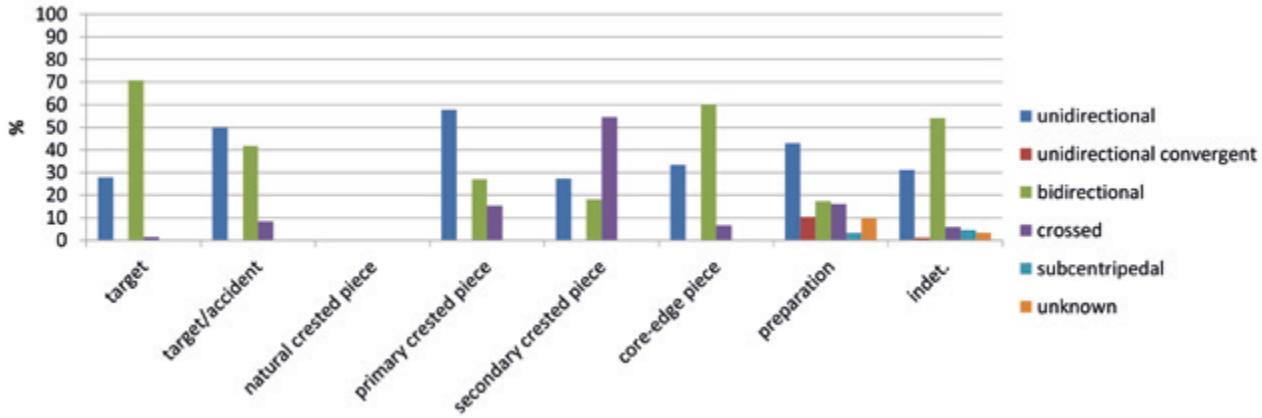


Fig. 22 Dorsal scar pattern (Percentages, N=397). الشكل ٢٢: أنماط الندب الظهري (النسب المئوية، N=397).

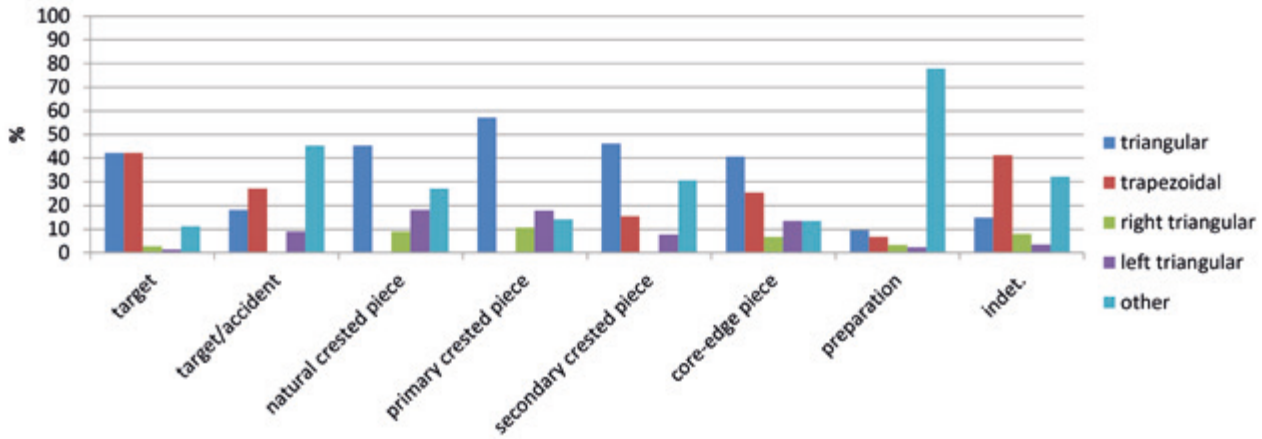


Fig. 23 Cross sections of debitage (Percentages, N=489). الشكل ٢٣: مقاطع تستعرض عمليات الطرق (النسب المئوية، N=489).

and the regular appearance of bulb scars are indicative for direct percussion with a soft hammer stone.[33] This observation is further confirmed by the absence of flint hammer stones at the site. Clear differences between target products and preparation flakes are likewise expressed in the scar pattern and cross sections of individual artefacts. While bidirectional scar pattern and trapezoidal cross-sections predominate the target products, preparation flakes are characterised by unidirectional scar patterns and diverse – predominantly triangular – cross sections (Figs. 22– 23).

A total of nine flint artefacts from locality HAR5251 show traces of secondary modifications and were therefore classified as tools. Clearly associated with the Qatar-B assemblage from locality HAR5251 are eight tools: three fragments of projectile points (Fig. 24 b–d) as well as two borers, two retouched blades and one endscraper. All three projectile points are preserved as shafts only, while the tips are broken off elsewhere and were not found during field investigations. In all three cases, tool blanks were regular blades. Broad tangs are clearly formed by a lateral retouch, in one case the body of the point shows a unilateral retouch on the dorsal surface as well. With these characteristics, the projectile point fragments morphologically resemble fragments of Levantine Neolithic Jericho points, although their size is comparatively small.

All other tools are completely preserved. The majority is made of preparation flakes (retouched blades: core-edge piece, secondary crested piece), of a blade obtained during early stages of core reduction (borer) or of an unspecific blank (borer). Only the tool blank of the endscraper is a small, regular blade.

A foreign element in the artefact assemblage is a fragment of a bifacial knife, plausibly not belonging to the Qatar-B assemblage and considered as the result of repeated human activities in the area as

33 *Cf.* Pelegrin – Inizan 2013 for comparable observations on the assemblage from Acila 36; Inizan 1988.

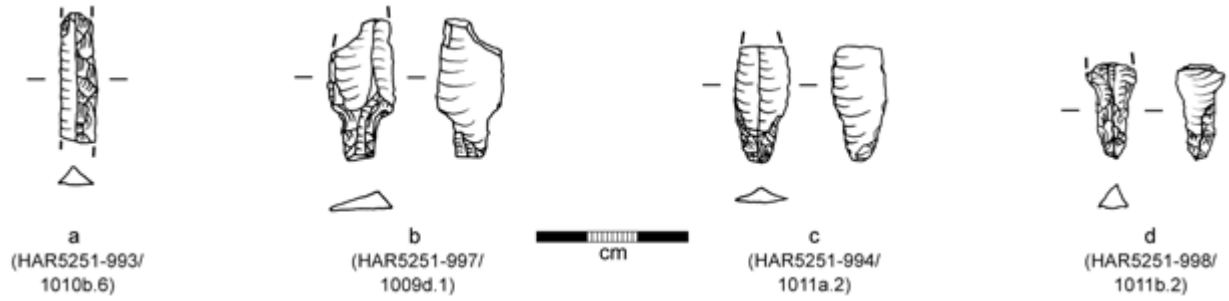


Fig. 24 Secondary crested piece and basal parts of blade arrowheads from locality HAR5251 (© DAI Orient Department/drawings: A. Keßeler/S. Kunze).

الشكل ٢٤: قطعة جُعِل لها عرف ثانويًا وأجزاء قاعدية لنصال أسنة أسهم من الموضع HAR5251 (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: أ. كِسِلَر / ش. كُنْتْسِه).

indicted by the documentation of numerous artefact scatters in the vicinity of locality HAR5251. Found in square 996/1009c, it is made from a piece of tabular flint with an oscillating, bifacial retouch along the working edge.

Spatial distribution

The spatial distribution of artefacts within the area under investigation is not uniform (Fig. 25). A denser concentration of artefacts is apparent in the southwestern part, while the density of artefacts fades out towards the northeast, indicating that the eastern limit of the site has been successfully identified. The same holds true for the northwestern part where artefact densities are also reduced. Here the investigated area almost borders the edge of the terrace where the artefact concentration is located, forming a natural border. In contrast, the southern border of the flint artefact scatter was not documented: although a lower density of flint in the southernmost rows of quarter squares suggests some kind of fading-out, flint artefacts still can be found on the surface further south.

Conclusions

Archaeological field investigations at locality HAR5251 were carried out to collect an exemplary Qatar-B flint artefact assemblage for a comprehensive technological study. Such detailed investigations were not possible during field surveys when artefacts generally remained in the field. The results from the study characterise the locality as flint workshop, but also gain insights into technological aspects of flint knapping, clearly confirming the results obtained by Inizan and Pelegrin[34] during their analysis of the artefact assemblage of locality Acila 36, located about 5 km NE of HAR5251. They therefore approve the technological homogeneity of the Qatar-B assemblages in the Asaila area that belong to a singular technological and chronological entity.

The study of flint artefacts from locality HAR5251 provides only limited evidence for foreign elements: A total of 13 pieces of debitage show technological characteristics and/or raw material qualities that do not fit the pattern of the general assemblage. In addition, one bifacial knife collected within the area under investigation was identified as intrusive. Despite these few finds, the assemblage is considered as technologically and chronologically homogenous, i.e. not influenced by palimpsest.

Although field work was limited to an area of 11 m × 7 m, the larger part of the artefact concentration at locality HAR5251 was documented. Clear spatial distribution patterns of flint artefacts were not found, suggesting severe taphonomic processes leading to a spatial rearrangement of artefacts within a meter scale. During surface cleaning, no evidence for any structural remains such as installations or combustion features was found in the area. The absence of both structures associated with an extended occupation and evidence for domestic activities disqualifies the locality as camp site. Rather, task specific activities were paramount.

The material remains from human activities are exclusively represented by flint artefacts. Although taphonomic processes that led to the complete disappearance of other (organic) material are plausible against the background of climatic and geomorphological conditions, a predominance of activities related to the manufacture of flint artefacts can be stated. The spectrum of flint artefacts is dominated by unspecific core preparation flakes but cores and primary crested pieces represent the most characteristic elements of the assemblage. In contrast to the

34 Pelegrin – Inizan 2013.

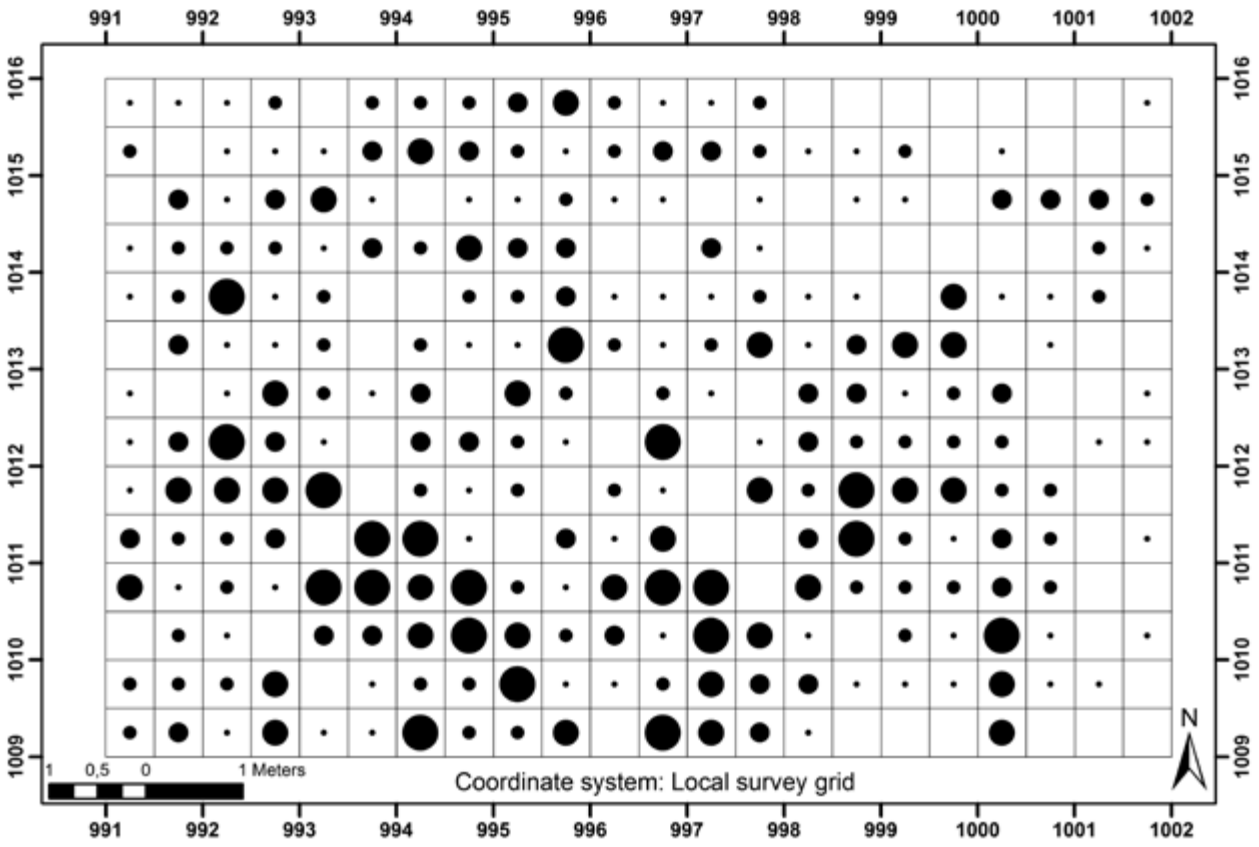


Fig. 25 Spatial distribution of Early Neolithic flint artefacts (N=562). The approximate borders of the site were recorded in the east, north and west due to their location on top of a narrow spur, but note the continuation of artefacts towards the south. The size of individual circles refers to the number of artefacts per quarter square meter, ranging between 1 and 7 (© DAI Orient Department/Ph. Drechsler).

الشكل ٢٥: التوزع المكاني للمصنوعات الصوانية العائدة إلى العصر الحجري الحديث المبكر (N=562) وقد دُوِّنت الحدود التقريبية للموقع في الشرق والشمال والغرب بسبب وقوعها على قمة الرعن الضيق، لكن لاحظ استمرارية المصنوعات باتجاه الجنوب. ويشير قياس الدوائر الفردية إلى عدد المصنوعات في كل ربع متر مربع، بما يتراوح بين ١ و ٧ (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

high number of preparation flakes, only few distinct target pieces and blanks further modified into tools were found. Therefore the artefact concentration is considered a flint workshop for the manufacture of tool blanks that were carried away. Accordingly, high quality flint raw material crops out along a prominent cliff line only few hundred meters towards the south.

The flint artefact assemblage is characterised by a bidirectional core reduction strategy to obtain regular blades from a single removal surface. The back of the cores is often carefully formed into a crest, resulting in a 'naviform' shape of the core. In addition, cores with natural or flat backs likewise occur. Core preparation started with the shaping of the back of the core and an initial blank removed from the intended removal surface. Subsequently, the two opposing striking platforms were prepared, originating from the prospective removal surface. An increase in plain striking platform remains of secondary crested pieces indicates that the latter core preparation flakes were regularly removed after the striking platforms were established. Consecutive blade removal was carried out from both opposite striking platforms. The frequent occurrence of core edge pieces indicates careful control over the convexity of the removal surface. A broad variety of debitage attributes suggests a flint knapping technique that made use of direct percussion with a soft hammerstone.

Although cores and core preparation flakes clearly indicate that the lithic industry was oriented towards the production of blades, the overwhelming majority of artefacts collected at HAR5251 fall into the realm of preparation flakes. As a consequence, the majority of desired target products must have been removed from the locality. Remaining blades either did not fulfill the standards for further use, or suggest that part of the target products were further modified into tools on the spot.

The spectrum of documented tools is restricted. Besides one scraper and two retouched blades, two

distinct borers as well as three bases of arrowheads were found. An interesting aspect are the preservation conditions of the tools: With the exception of the arrowheads, all tools are completely preserved, indicating either their use and subsequent discard on spot, or their discard directly after manufacture due to insufficient qualities. The contrary is plausible for the arrowheads: The exclusive occurrence of bases indicates the exchange of broken arrow tips. Therewith the tool spectrum suggests the repair of hunting equipment as an additional activity to the production of tool blanks.

The presence of additional tools at locality HAR5251 suggests a raw material procurement strategy and flint knapping activities embedded into a broader variety of tasks. On the other hand, the very small number of flint tools, their restricted spectrum and the fact that all of the tools can be associated with the repair of hunting equipment do not contradict a purposeful stay oriented towards the production of tool blanks. The latter scenario is even more plausible if one considers the significant absence of target products: The majority of blades must have been removed from the scenery for further use somewhere else.

The according localities of tool use, potentially more distinct settlements, remain speculative. While localities with according flint industries in the Asaila area have exclusively been described as flint workshops[35], H. Kapel[36] describes Qatar-B sites that represent hypothetical areas of habitation on the eastern and southeastern parts of the Qatar Peninsula as sites where higher proportions and a broader spectrum of flint tools exist.

Also it cannot be excluded that Early Neolithic populations once preferred the habitats along the Ur-Shatt River[37] and the advancing shores of the Persian Gulf[38]. In analogy of later Neolithic, the sea always provided rich and predictable resources preferentially occupied by human populations. However, the basin of the Arabian Gulf is entirely covered by sediments of marine and aeolian origin and does not provide any access to flint raw material. The closest and easiest accessible flint sources for populations living along the western shores of what later becomes the Central Gulf area are the high quality flint outcrops in Qatar that protrude widely into the basin of the Arabian Gulf. It is therefore plausible – but unfortunately hardly provable – that people living along the Gulf shores purposefully visited the Asaila area for the manufacture of tool blanks.

The emergence of bifacial industries in Qatar – intensive surface sampling at locality HAR5800

Significant technological differences between the Early and Middle Neolithic raise questions about the emergence of bifacial industries in Eastern Arabia and the transition between the Early and the Middle Neolithic, thus about cultural continuity during the Neolithic in Eastern Arabia. Unfortunately, the period between the 7th and 5th millennium BCE is almost unknown in the entire Gulf region. Only one radiocarbon date from Shagra A in southeastern Qatar indicates that bifacial industries appeared as early as the late 7th millennium BCE,[39] suggesting a rather short time span between the Early Neolithic Qatar-B industry and the development of Middle Neolithic traditions[40].

Intensive pedestrian surveys in the center of the Asaila depression led to the discovery of dense scatters of flint artefacts within survey units 78, 93 and 108 during the field campaigns in 2014 and 2015. Typologically diagnostic, bifacially chipped implements that were found at these localities include bifacial foliates, bifacial knives and bifacially chipped tanged arrowheads that show clear reminiscences of the Arabian Middle Neolithic. Spatially associated with flint scatters HAR5484 and HAR5486, two patches of ashy sediment containing small pieces of unidentified charcoal were discovered. According to archaeological investigations at locality HAR5800, such patches of ash represent the remains of spatially poorly defined combustion features (see below). Subsequently sampled for radiocarbon dating in spring 2014, two radiocarbon dates obtained from these ashes consistently fall into the late 7th and early 6th millennium BCE (Tab. 1).[41] Therewith comprehensive archaeological investigations in the area provided the opportunity to study the early Middle Neolithic occupation in the Asaila area and technological aspects of the associated flint artefact assemblages in greater detail.

35 *Cf.* above, Inizan 1980; Inizan 1988.
36 Kapel 1967, 31–32.
37 Rose 2010.
38 Lambeck 1996.
39 Inizan 1988.
40 *Cf.* Pelegrin – Inizan 2013, 84.
41 *Cf.* Drechsler *et al*. 2016.

Lab. code	Locality	Material	^{14}C age BP	1-sigma range cal BC	2-sigma range cal BC
MAMS-24274	HAR5484	ashy sediment	7479±23	6411–6269	6424–6255
MAMS-24275	HAR5486	ashy sediment	7094±23	6006–5928	6019–5914

Tab. 1 Radiocarbon dates obtained from two patches of ashy sediment adjacent to bifacially chipped flint artefacts. Sediment collected for dating was sampled in a depth between 5 and 10 cm below the present surface. AMS datings carried out at Klaus-Tschira-Archäometrie-Zentrum Heidelberg. Calibrated by applying IntCal13 (Reimer et al. *2013) und SwissCal 1.0 (L. Wacker, ETH Zürich) terrestrial calibration curves.*

الجدول ١: تم الحصول على تواريخ الكربون المشع من رقعتيْ ترسب رمادي متاخمتين لمصنوعات صوانية ثنائية الوجه ومتشظية. وقد أُخذت عينات الترسب التي جُمعت للتأريخ على عمق يتراوح ما بين ٥ و ١٠ سم تحت سطح الأرض الحالي. قام بعمليات التأريخ بمنهج ‹قياس طيفية الكتلة بالمعاجل› مركز كلاوس–تْشيرا لعلم الآثار القياسي في هايدِلْبِرغ. وقد أجريت المعايرة بتشغيل IntCal13 (Reimer et al. 2013) و SwissCal 1.0 (L. Wacker)، الكلية الفدرالية التقنية في زيورِخ (ETH Zürich) أقواس المعايرة الأرضية.

Locality HAR5800

Locality HAR5800 is situated close to the eastern edge of survey unit 93 (*cf.* Fig. 2). Distances to the surrounding plateaus are about 1.15 km to the north, 1.8 km to the east, 1.4 km to the south and 3.0 km to the west. During systematic pedestrian surveys in 2014, four localities with high densities of flint artefacts on the surface were recorded in this area within a radius of about 50 m: HAR5484 (SQS14-203), HAR5485 (SQS14-204), HAR5486 (SQS14-205) and HAR5487 (SQS14-206).

A revisit of the area in February 2016 revealed a dense scatter of flint artefacts including two stemmed arrowheads with barbs and several fragments of foliate points about 10 m southwest of locality HAR5485, just outside the site polygon recorded in 2014. The fact that this particular flint scatter was not visible in 2014 suggests an ongoing exposure of artefacts in the area. Additional minor flint scatters, not recorded in 2014, were further observed in the wider surroundings (Fig. 26). It was therefore decided to subsume these localities under the new parent Heritage Area number 5800 (HAR5800). The presence of spatially well-defined artefact scatters and patches of ashy sediment raised hope that taphonomic processes such as the relocation of artefacts and soil erosion only minimally influenced the location of artefacts in space and the artefact composition of the assemblages.

Study area and methodology

Parent Heritage Area 5800 represents an almost continuous scatter of flint artefacts that covers an area of approximately 3000 square meters. The pristine character of the exposed artefact scatters called for a minute documentation of the exact spatial location of individual artefacts. Therefore, a local excavation grid was established, enabling the documentation of artefacts and features using a Total Station. A study area of 15 m × 15 m (225 m^2) was selected for investigation, with the major flint artefact concentration located in the northwestern part.

Surface sampling

Surface sampling of the predefined study area included the complete recording and recovery of artefacts visible on the surface: All individual artefacts (flint > 15 mm, limestone fragments > 20 mm, all pieces of shell) were individually measured in all three dimensions, got unique find IDs, and were removed from the field for further technological studies.

Surface cleaning

Surface sampling alone could not document all artefacts within the study area. The center of the Asaila depression is a highly dynamic environment characterised by shifting sand. The fast accumulation of thin sand sheets, but also the removal of sand by strong winds, changes the visibility of artefacts on the surface permanently. It was therefore decided to remove the uppermost layer of sediment in part of the study area to record potential artefacts and structures in the ground. Therefore a 1 m × 1 m grid was established across the western part of the study area. This grid formed the basis for subsequent surface cleaning. The basic spatial units for surface cleaning were quarter square meters. Surface cleaning itself was defined as the systematic removal of the uppermost layer of sediment that comprises the deflation horizon and the topsoil down to a depth of approximately 3 cm to ensure the complete recovery of artefacts from the surface (Fig. 27). All removed sediment, about

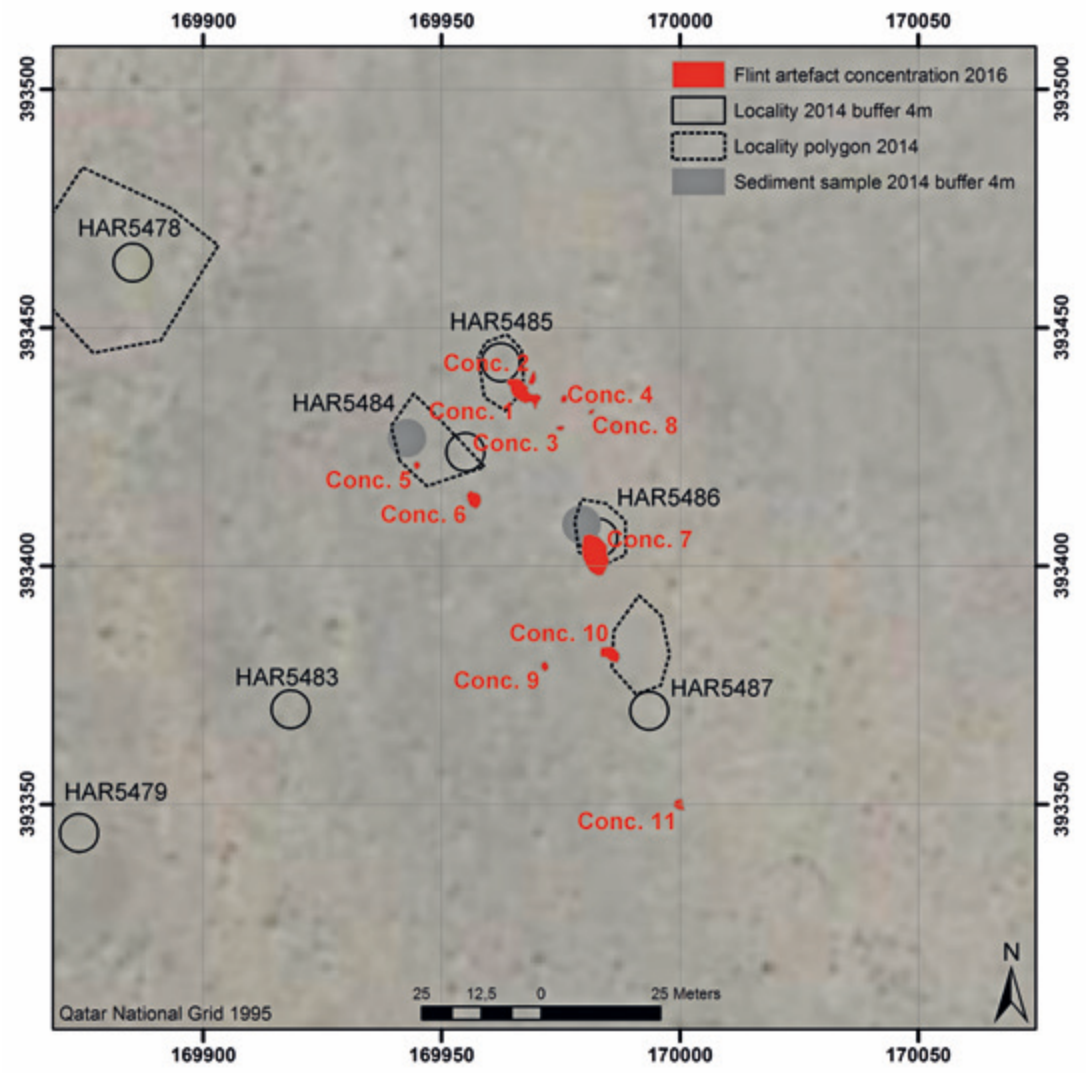


Fig. 26 Localities HAR 5484, HAR 5485, HAR 5486 and HAR 5487 surveyed in 2014 in relation to flint artefact concentrations 1–11 documented in spring 2016. All recorded concentrations are subsumed under the parent heritage area number HAR 5800 (© DAI Orient Department / Ph. Drechsler).

الشكل ٢٦: المواضع HAR5484 و HAR5485 و HAR5486 و HAR5487 التي جرى المسح فيها ربيع عام ٢٠١٤ بالنسبة إلى تركزات المصنوعات الصوانية ١–١١ التي وُثقت في ربيع عام ٢٠١٦. وقد صُنّفت كل التركزات الموثقة تحت منطقة التراث المحدثة رقم HAR5800 (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

Fig. 27 Surface cleaning at locality HAR 5800 (© DAI Orient Department / photo: A. Lienig).

الشكل ٢٧: تنظيف السطح في الموضع HAR5800 (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصورة: أ. لينغ).

Fig. 28 Combustion feature, view towards south. Note the irregular outline and sharp boundary towards the south, while ashy sediment fades into the sandy sediment towards north. The dark ashy spot on the right probably marks one location of the original fire place (© DAI Orient Department/photo: Ph. Drechsler).

الشكل ٢٨: منظر باتجاه الجنوب لبنى الاحتراق. لاحظ الخط الخارجي غير المنتظم والحدود الواضحة باتجاه الجنوب، في حين أن الترسب الرمادي يتلاشى نحو الترسب الرملي باتجاه الشمال. ولربما تمثل بقعة الرماد الغامقة على اليمين موضعًا واحدًا للموقد الأصلي (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصورة: ف. دْرِكسلَر).

10 l per quarter square meter, was screened with a mesh size of 2 mm. All artefacts > 5 mm were kept for further analyses and assigned to their according quarter square meter.

In total, 616 quarter square meters in the western part of the predefined study area were investigated in this way, equivalent to 66.6 % of the entire study area. The spatial distribution of artefacts, mostly small flint chips (debitage < 15 mm) that represent flint knapping waste, provides insights into the range of taphonomic processes. Further, surface cleaning was essential to document the spatial boundaries of charred organic remains/ashes to clarify their exact nature of a combustion feature ("fire place") discovered in squares 1020/1034, 1021/1034, 1022/1034 and 1023/1034, and to obtain material suitable for radiocarbon dating.

Features

A single small spot of dark sediment with embedded charcoal particles became visible northeast of the main artefact concentration (Conc. 1) during the collection of artefacts from the surface. During subsequent surface cleaning, it appeared that this spot was part of a larger, irregular-shaped patch of ashy sediment. It covers an area of approximately 3.3 square meters and shows a distinct spatial boundary towards the south and east, but fades out into the surrounding sand in the north and west with intermingled singular dark spots (Fig. 28). Despite its poorly defined spatial boundaries, the spatially restricted occurrence of ash and its spatial association with a dense scatter of flint artefacts verifies its designation as an anthropogenic feature, most plausibly the remains of a fire place. One radiocarbon date obtained from a piece of charcoal sampled within the combustion feature falls into the late 7th/early 6th millennium BCE (Tab. 2), well corresponding to the radiocarbon dates obtained from similar patches of ashy sediment at localities HAR5484 and HAR5486 (Tab. 1; Fig. 26).

In contrast to other Neolithic fire places in Arabia it was not paved or outlined by stone. Probably, only a shallow pit was dug in the surface before firing. This likewise explains the irregular shape of the ash concentration that was not hold together by confining elements. Although the dominating shamal wind regime is usually associated with northwesterly winds, periodic shifts with wind coming from south or southeast during the occupation of the site might also explain the sharp boundary on one and the fading out area on the other side as well as the location of the flint artefact concentrations south and west of the ashy spot. Except for three pieces of flint (1 debitage, 2 pieces of shatter) the area north and northwest of the combustion feature is, unlike almost all other parts of the investigated area, void of any significant amount

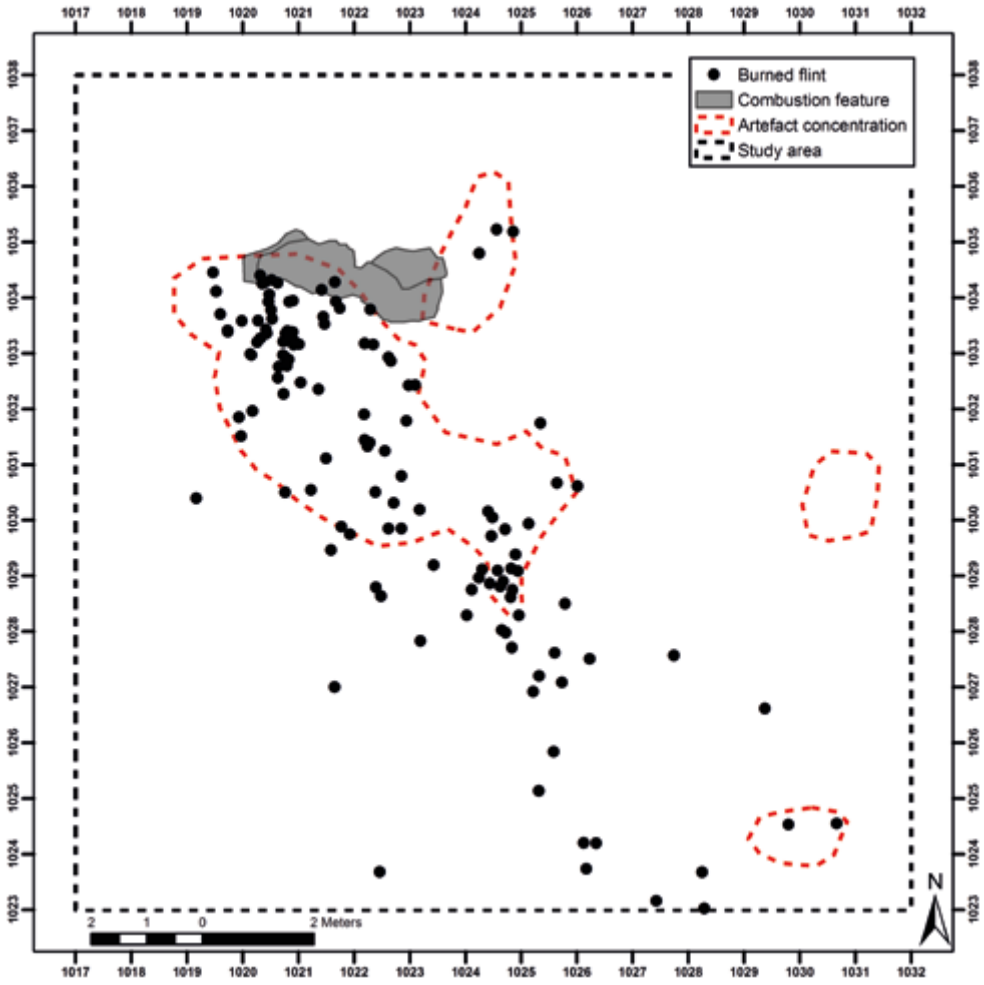


Fig. 29 Spatial distribution of burnt flint on the surface of the study area in relation to the combustion feature and flint artefact concentrations (© DAI Orient Department / Ph. Drechsler).

الشكل ٢٩: التوزع المكاني للصوان المحترق على سطح منطقة البحث بالنسبة لموضع بنى الاحتراق وتركزات المصنوعات الصوانية (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

Lab. code	Find-ID	Material	^{14}C age BP	1-sigma range cal BC	2-sigma range cal BC
Poz-91495	HAR5800-2946	charcoal	7120±40	6033–5929	6066–5909

Tab. 2 Radiocarbon dates obtained from a piece of charcoal collected within the boundaries of the combustion feature (Find-ID HAR5800-2946). AMS dating carried out at Poznan AMS facilities. Calibrated by applying IntCal13 (Reimer et al. *2013) terrestrial calibration curve.*

الجدول ٢: تم الحصول على تواريخ الكربون المشع من قطعة فحم أُخذت ضمن حدود بنى الاحتراق (Find-ID HAR5800-2946). تمت عمليات التأريخ بمنهج ‹قياس طيفية الكتلة بالمعاجل› في مرافق بوزنان لـ‹قياس طيفية الكتلة بالمعاجل›. وقد أجريت المعايرة بتشغيل IntCal13 (Reimer et al. 2013) أقواس المعايرة الأرضية.

of finds. It is therefore likely that humans were not using this area at all, probably in an attempt to avoid fumes. Considering the amount of ash, it appears as a long-term, reused installation that might have seen some shift in its location. Within the fire place, finds appear only sporadically.

The distribution of burned flint on the surface shows a clear spatial association with this combustion feature (Fig. 29). A second cluster of burned flint appears about 6.5 m towards the southeast, suggesting a second, similar installation. Nevertheless, no ashy sediment was observed in this area.

Finds

In total, 7667 material remains of human activities were recovered from the study area of HAR5800 both from the surface and during surface cleaning: 7576 pieces of flint – both artefacts and natural pieces, 25 marine gastropods, two eggshell fragments, 59 pieces of limestone as well as five pieces of pottery. With this general composition, the artefact assemblage is characteristic for the material remains of a prehistoric occupation. The only category of artefacts that contradicts this assumption is the pottery. Five very small

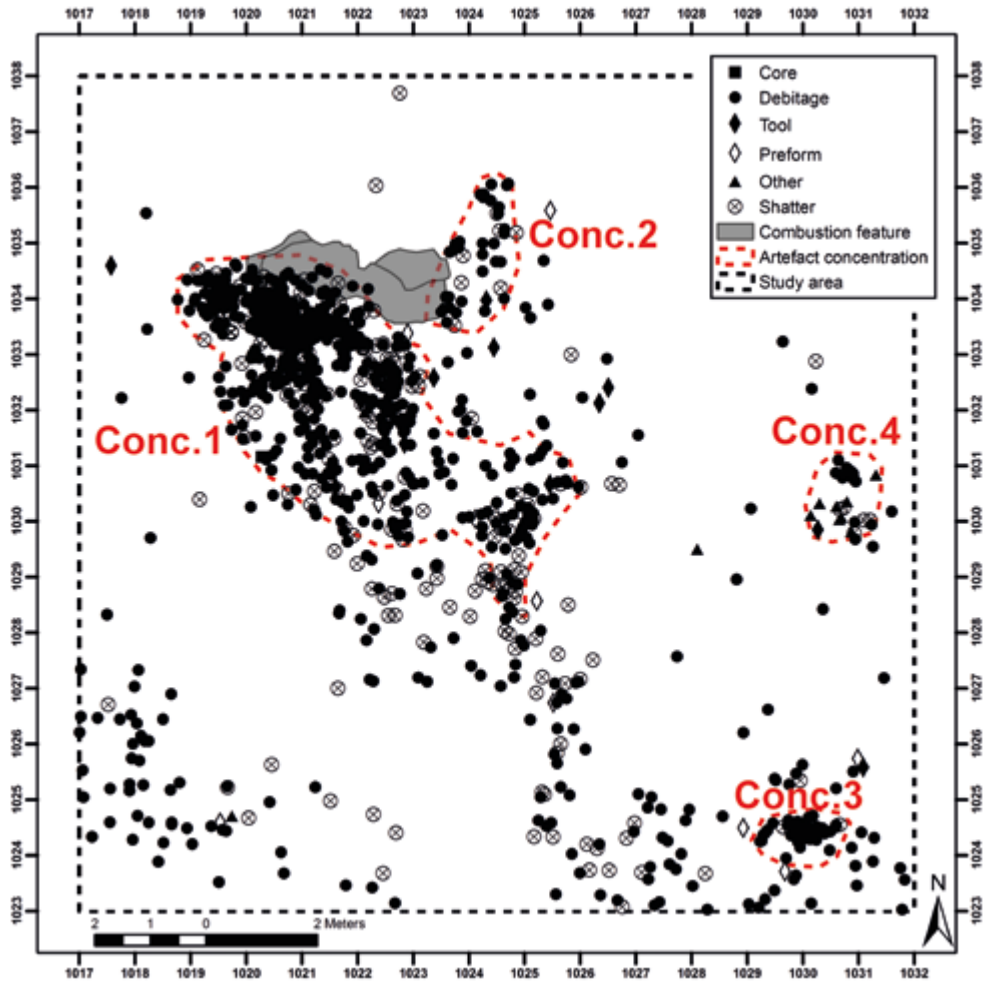


Fig. 30 Spatial distribution of flint artefacts within the study area (© DAI Orient Department/Ph. Drechsler).

الشكل ٣٠: التوزع المكاني للمصنوعات الصوانية ضمن منطقة الأبحاث (حقوق النشر محفوظة لمعهد الآثار الألماني– قسم المشرق / ف. دْرِكسلَر).

fragments of pottery with a respective weight < 0.1 g were recovered during screening. The spatial distribution of these pottery fragments does not correlate with the main flint artefact concentrations. Therefore, these pieces, determined with reservation as "Pale Yellow Gritty Ware"[42], have to be considered as an intrusive component.

Spatial analysis of finds

Aim of the spatial analysis of material remains resulting from past human activities is the identification of the organisation of space. At locality HAR5800, the analysis is based on two different, complementary datasets. While artefacts visible on the surface were documented with a spatial accuracy of approximately 1 cm, all artefacts originating from surface cleaning are only assigned to their quarter square. Therefore, main arguments derive from the spatial distribution of artefacts collected from the surface, supported by results from surface cleaning.

An initial inspection of the study area revealed four spatially distinct concentrations of flint artefacts on the surface (Fig. 30): The main concentration 1 (Conc. 1) dominates the northwestern part of the study area and covers an area of approximately 9 m by 4 m, with its longest axis oriented NW-SE. It is located in a sandy area directly adjacent to slightly higher ground in the west that is covered by gypsum crystals. In this concentration, a total of 589 flint artefacts were collected from the surface. Beside the artefacts themselves, no evidence for the presence of architectural remains or installations was visible on the surface. Several flint tools were immediately recognised within Conc. 1, among them broken bifacial foliates as well as two stemmed arrowheads. This concentration can be separated into a northern part that shows a high density of smaller flakes and chips, and a southern part where artefact densities in-

42 Pers. comm. Christine Kainert; *cf.* Yaşin-Meier 2014, 262–268.

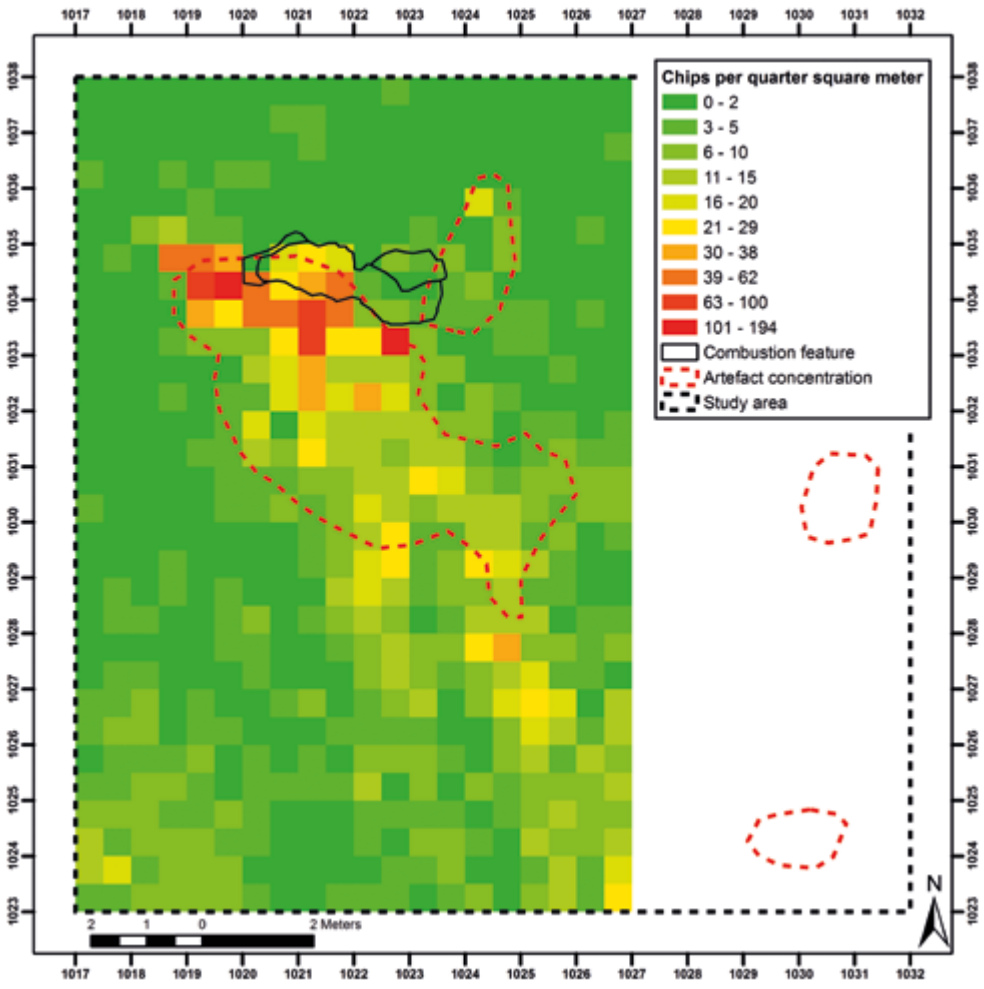


Fig. 31 Spatial distribution of chips (debitage < 15 mm in their largest dimension) (© DAI Orient Department / Ph. Drechsler).

الشكل ٣١: التوزع المكاني للرقاقات (عمليات الطرق < ١٥ مم ببعدها الأكبر) (حقوق النشر محفوظة لمعهد الآثار الألماني – قسم المشرق / الصورة: ف. دْرِكسلَر).

crease again. In between, a continuous but less dense scatter of flint was observed. This whole concentration is spatially associated with a slight, north-south oriented depression in the ground. Concentration 2 (Conc. 2), consisting of 34 flint artefacts, is located directly north of Conc. 1, on slightly raised ground build up by sand and small patches of grass, and covers an area of 3 m by 1.5 m. It is characterised by the occurrence of several larger flint blocks, in part unworked pieces of natural flint, and limited numbers of flint chipping debris. In contrast, flint concentration 3 (Conc. 3, 43 flint artefacts) and 4 (Conc. 4, 24 flint artefacts), located 10 m south-west and 8 m west of Conc. 1, represent spatially well defined, dense clusters of chipping debris, again associated with bifacial foliates. Both are of small size, covering 1.4 m^2 (Conc. 3) and 1.8 m^2 (Conc. 4) respectively.

In northern part of Conc. 1, two spatially separated areas exist with artefact densities above 50 pieces per square meter, suggesting intensive flint knapping activities within a restricted area. The spatial correlation between these spots and high numbers of chips in the underlying sediment (Fig. 31) proofs flint knapping in this particular area close to the combustion feature. A similar area with a high density of flint artefacts can be identified within the center of Conc. 3. It is therefore plausible to argue that flint knapping was the dominant action at this spot as well.

Besides flint artefacts, a total of 210 pieces of unworked, natural pieces of flint were collected from the surface of the study area. They range in weight between less than 1 g to up to 162 g. As flint does not crop out within the Asaila depression, it has to be brought in by humans. These pieces of unworked flint predominantly occur in association with the four artefact concentrations within the study area, though these pieces can be related with flint knapping activities. Most plausibly, larger blocks represent potential, but actually unused raw material for the production of flint tools by shaping (*façonnage*). In contrast, small pieces might have resulted from unsuccessful knapping with unsuitable raw material blocks. Worth noting is the high number of unworked flint that shows traces of burning (N=108; 51.4 %).

The assumption that human activities within the study area focused on flint knapping finds its confir-

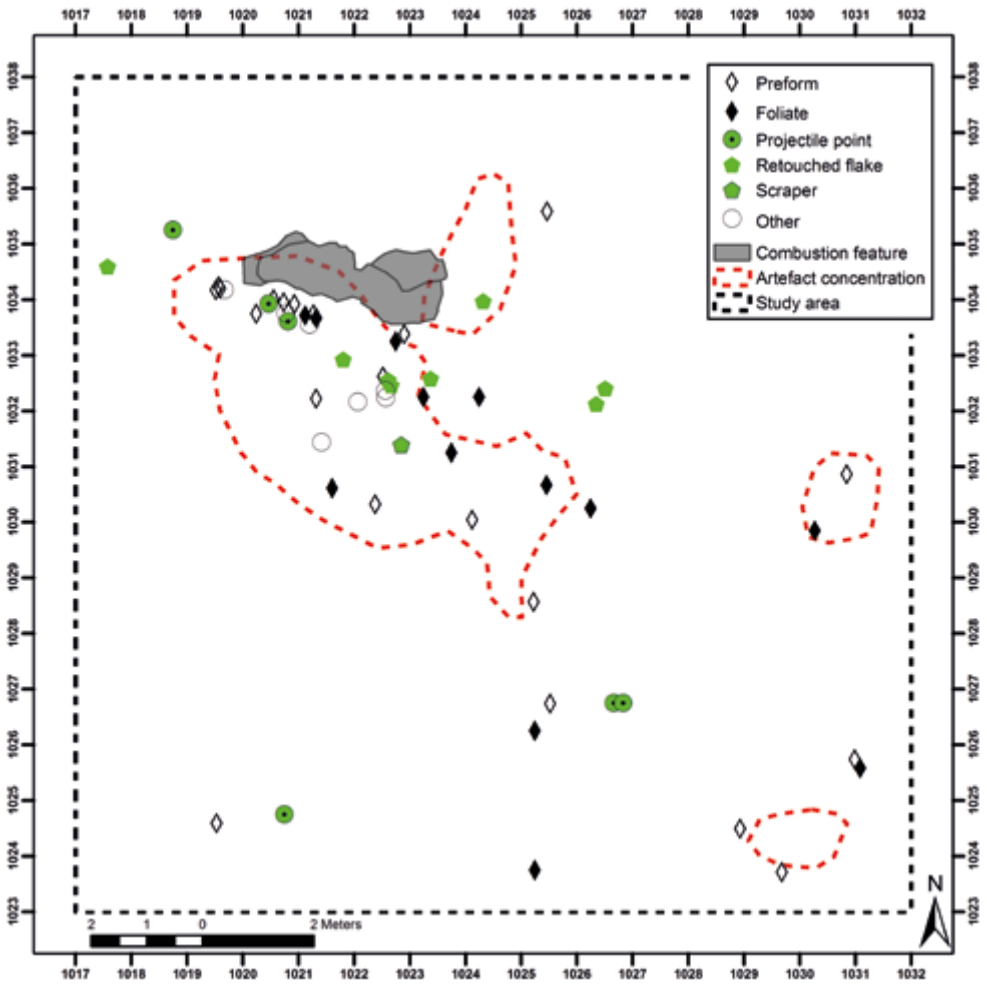


Fig. 32 Spatial distribution of flint tools (© DAI Orient Department/Ph. Drechsler).

الشكل ٣٢: التوزع المكاني للأدوات الصوانية (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

mation when considering the spatial distribution of bifacial preforms, remaining from the early abandonment, as well as the distribution of bifacial foliates broken during the process of production (Fig. 32). Their spatial distribution correlates particularly well with the two areas of highest artefact densities within Conc. 1, but they were likewise found in the southern part of Conc. 1 as well as in close spatial association with Conc. 3 and Conc. 4. Based on the spatial distribution of preforms, broken bifacial foliates and production waste, it can be concluded that the production of bifacial foliates was the major task within the area of Conc. 1, Conc. 3 and Conc. 4. The different character of Conc. 2, both in terms of artefact densities and composition of the assemblage (predominance of retouched flakes over bifacial foliates and their preforms), suggests that flint artefact use and discard, i.e. domestic activities in a broader sense, outweighed flint knapping *sensu strictu*.

A total of six projectile points (arrowheads) were documented within the study area. Two pieces were found on the surface, spatially associated with Conc. 1, while the other four projectile points appeared during surface cleaning independent from flint artefact concentrations. Especially the latter occurrences suggest that the production of arrowheads was not the major focus of flint knapping. While three of the six arrowheads show minor or severe damage, the other three seem to be completely preserved. It is therefore plausible to argue that the replacement of projectile points was not part of flint knapping, but an element of domestic activities *sensu latu*. The assumption that the study area was not exclusively reserved to flint knapping finds its confirmation in the spatial distribution of scrapers and retouched flakes. They were predominantly found outside and between the artefact concentrations 1 and 2, but still in the vicinity of the combustion feature. As not all prehistoric activity is represented in lithic concentrations they may have been used for tasks that – unlike flint knapping - are not reflected in any preserved material remains. Therefore the combustion feature should be considered as the spatial focus of human activities within the study area.

Further indicators for domestic activities within the study area are a total of 25 marine gastropods and

Fig. 33 Grinding stone, indicating domestic activities in the study area (© DAI Orient Department/photos: C. Hölzl).

الشكل ٣٣: حجر رحى يشير إلى نشاطات سكنية في منطقة الأبحاث (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الصور: ك. هولْتْسِل).

two pieces of Ostrich eggshell. While the eggshell pieces might have been parts of a broken container made from Ostrich egg[43], the function of the gastropods remains vague as their nutritional value is low. It cannot be excluded that they were collected on the coast for the production of personal adornment[44], although none of the pieces shows convincing traces of reworking. Mollusc shells almost exclusively occur within the northern part of Conc. 1 close to the combustion feature.

The presence of pieces of solid rock within the study area also refers to human activities: The natural sediment infill of the Asaila basin consists of aeolian sand. Therefore, any large pieces of stone have to be brought in by humans from the limestone plateaus surrounding the depression, representing manuports. The spatial distribution of solid rock, almost exclusively limestone, does not indicate any clear spatial patterning. It is predominantly associated with Conc. 1, but also occurs at Conc. 2 and Conc. 4. With the exception of one grinding stone (Fig. 33), pieces do not show clear traces of workmanship.

Flint artefact analysis

A basic attribute analysis was carried out with all flint artefacts collected from the study area with the aim to characterise the whole assemblage and to present in detail potential differences between individual flint artefact concentrations within the study area. A total of 898 flint artefacts were collected from the surface, while surface cleaning yielded 6284 artefacts, including 5093 chips. In addition, 394 pieces of unworked flint were documented both from surface sampling and cleaning.

The artefact assemblage collected from the surface is dominated by debitage (N=835; 93.0 %) while cores are remarkably underrepresented (N=1; 0.1 %). The only flint artefact formally resembling a core is a slab of raw material with only few and irregular removal negatives qualifying the piece as an initial core, but also as a tested raw material slab. Noticeable is a high number of bifacial preforms (N=21; 2.3 %). Tools account for 2.8 % (N=25) of the assemblage collected from the surface. Dominating tool forms are bifacial foliates (N=8), retouched flakes (N=8) and projectile points (N=2) (Fig. 34).

Debitage is dominated by thinning flakes (N=290) that are characterised by an acute exterior platform angle, a triangular or rectangular shape, thin cross-section and minute remains of the removal surface (Fig. 35). Most other pieces of debitage (recorded as "other", N=541) do not show all characteristics of thinning flakes, but clearly fall into the same realm. In contrast, evidence for the production of tool blanks from cores is weak (Fig. 36). Among 835 pieces of debitage, only two pieces were recorded as blanks. These characteristics of the assemblage suggest the predominance of the concept of *façonnage*, while a specific primary production could not be observed.

Both technological and typological differences between individual artefact concentrations are only marginal (Fig. 37). Fragments of bifacial foliates and their preforms occur at Conc. 1, Conc. 3 and Conc. 4, while they are absent at Conc. 2. Nevertheless, the presence of thinning flakes at all four artefact concentrations suggests that bifacial shaping was carried out

43 Potts 2001.
44 *Cf.* de Beauclair 2008; de Beauclair 2010; Kiesewetter *et al.* 2000.

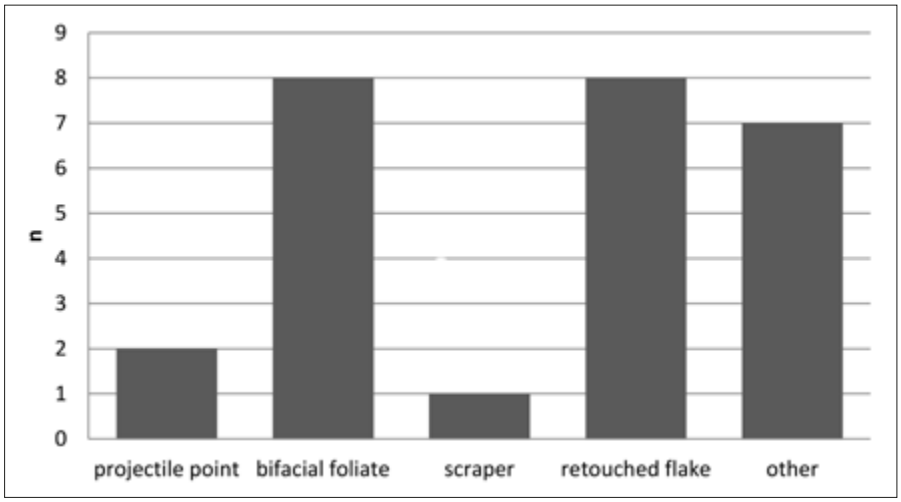


Fig. 34 Tool types, surface collection (N=25).

الشكل ٣٤: نماذج الأدوات، مجموعة عثر عليها على السطح (N=25).

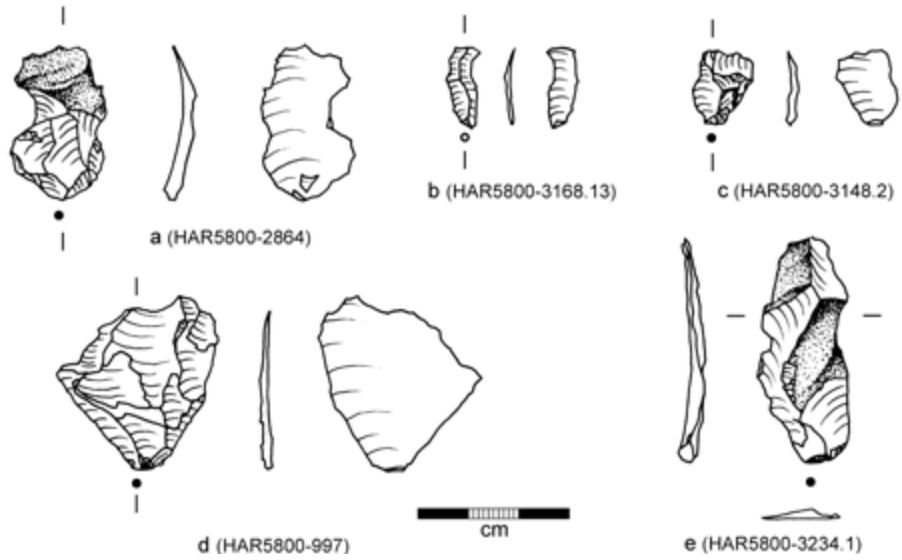


Fig. 35 Examples of thinning flakes resulting from bifacial shaping (© DAI Orient Department/drawings: C. Kainert/ K. Schmitt/ M. Probst/S. Kunze).

الشكل ٣٥: أمثلة من الشظايا المرققة الناتجة عن عملية التشكيل على الوجهين (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ك. كايزَت / ك. شِمت / م. بْروبست / س. كُنْتْسِه).

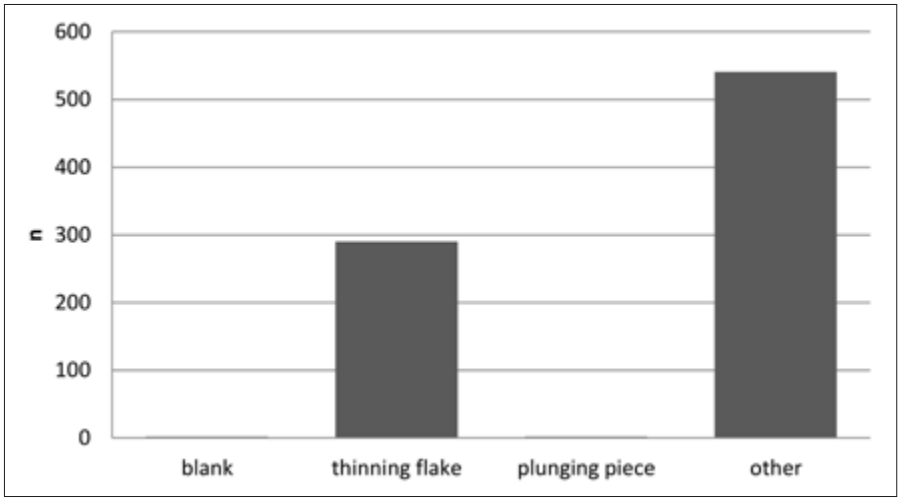


Fig. 36 Debitage types, surface collection (N=835).

الشكل ٣٦: نماذج الطرق، مجموعة عثر عليها على السطح (N=853).

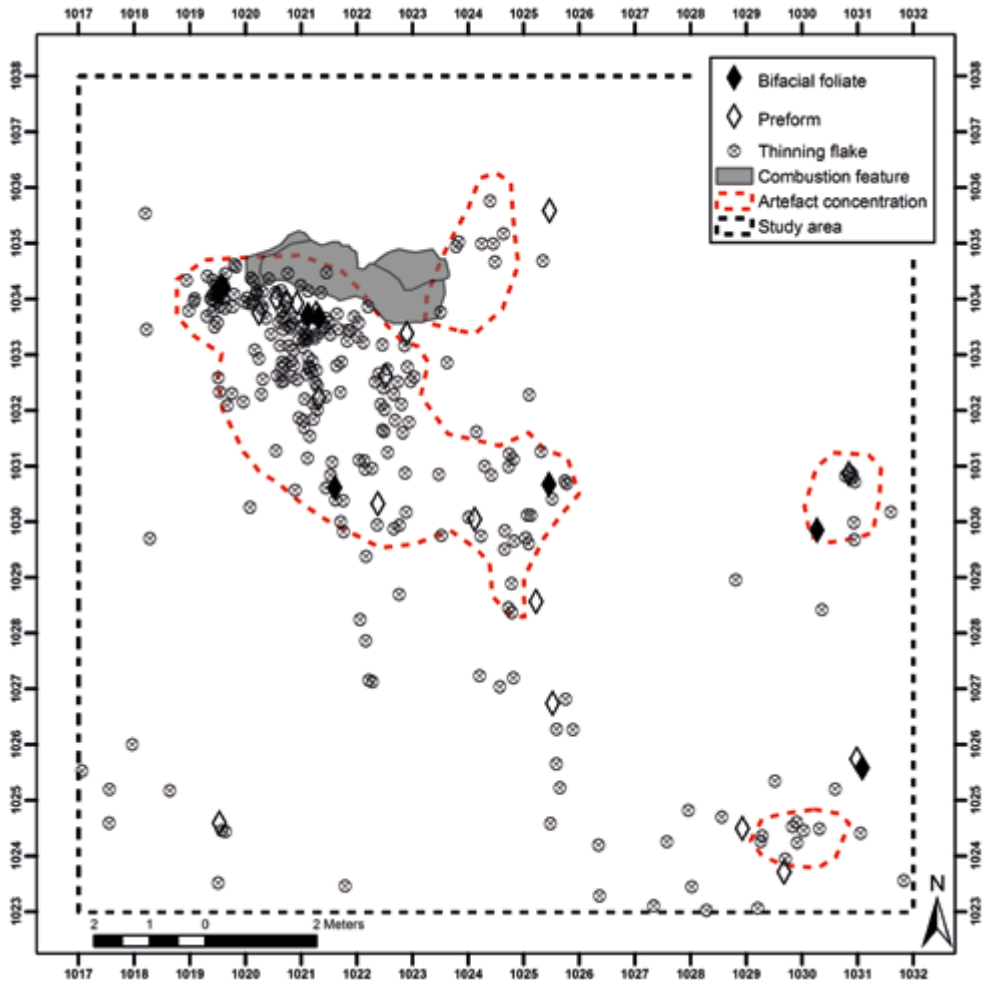


Fig. 37 Spatial distribution of bifacial foliates, bifacial preforms and thinning flakes (© DAI Orient Department / Ph. Drechsler).

الشكل ٣٧: التوزع المكاني لـ«ورقيات الشكل» الثنائية الوجه والأشكال الأولية الثنائية الوجه والشظايا المرققة (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دُرِكسلَر).

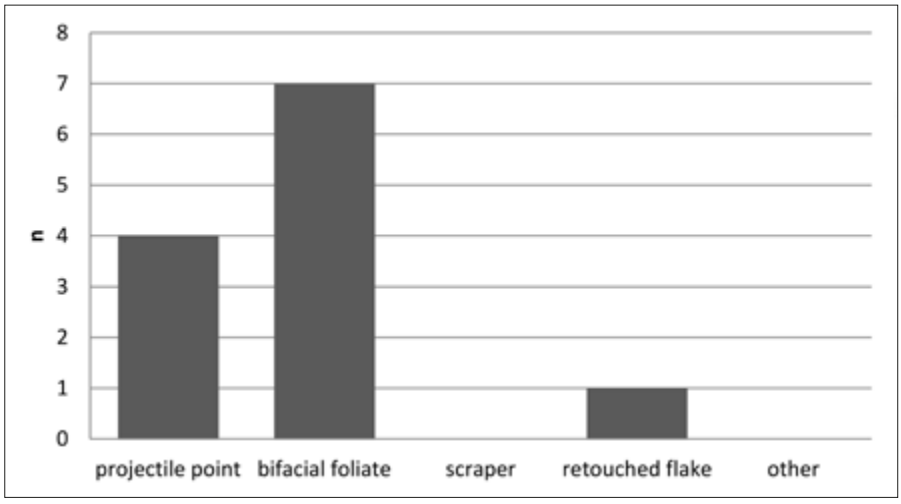


Fig. 38 Tool types, surface cleaning (N=12).

الشكل ٣٨: نماذج الأدوات، مجموعة عثر عليها خلال تنظيف السطح (N=12).

in all four areas. Remarkable is the broader spectrum of flint tools within Conc. 1. This can be either related to a broader spectrum of activities carried out within this area, or is the result of the greater number of artefacts in this concentration.

The flint artefact assemblage obtained during surface cleaning closely resembles the assemblage from the surface collection. Debitage is by far the dominating element (N=1172; 98.4 %), supplemented by bifacial preforms (N=4; 0.3 %) and tools (N=12; 1.0 %). Numerically most important are a total of 5093 chips (debitage < 15mm) representing chipping debris. In contrast, cores are completely absent. Tools are dominated by bifacial foliates (N=7) and projectile points ("arrowheads", N=4) (Fig. 38).

To proof flint knapping on spot, a special attempt was made to refit individual pieces of flint artefacts. The spatial distribution of 11 successful refits clearly confirms flint knapping at the northern part of Conc. 1, but also indicates minor taphonomic disturbances within this concentration (Fig. 39).

Tool types are almost exclusively restricted to bifacial foliates (Fig. 40) and their preforms. The predominance of broken bifacial foliates as well as the high proportion of bifacial thinning flakes makes it plausible that the flint artefact concentrations Conc. 1, Conc. 3 and Conc. 4 represent the remains of flint workshops for the manufacture of foliates. The fact that the flint raw material is highly diverse and not locally available nevertheless suggests that this manufacture was embedded in other daily activities. Likewise, the predominance of retouched flakes and the absence of bifacial foliates and their preforms in Conc. 2 indicate task-specific domestic activities within the study area.

The large number of bifacial foliates and stemmed and barbed arrowheads (Fig. 41) as "index fossils" of the Middle Neolithic in Arabia place the assemblage typologically into this era. Although the flint artefact assemblage shows reminiscences to the Arabian Bifacial Lithic Tradition *sensu* Edens[45], both the radiocarbon datings obtained from ash samples collected in the immediate surrounding of the study area and the specific shape and size of the arrowheads suggest that this artefact assemblage belongs to an earlier phase of the Arabian Middle Neolithic.

Beyond tool types and debitage counts – insights into the lithic industry from locality HAR5800

The integrity of the investigated features at locality HAR5800 is attested by the clear spatial boundaries of the four flint concentrations and their apparent spatial relation to the combustion feature. As explained, the characteristics of documented debitage and tools can best be interpreted as the remains of a flint knapping workshop where bifacial tools, especially foliates, were manufactured in addition to other domestic activities. Taking into consideration individual artefacts more information about human behaviour at the site can be obtained.

Raw material exploitation made strong use of the existing shape of flint pieces that can be acquired on the plateaus around the Asaila depression. Raw material is not only accessible on their surface, but can also be obtained from outcropping deposits in primary context. Its tabular shape that is especially evident in the latter case provides a natural core configuration that can be easily reduced to bifacial tools. While the tabular flint is up to 5 cm thick it can be as thin as only 4 mm as evidenced by a tanged point (*cf.* Fig. 41 h). Both sides of this point are covered with weathered natural surfaces (desert varnish) and only peripheral retouch was applied along the edges to shape the tool. Retouch left unweathered negatives, attesting to the greater age of the pristine surfaces. While this is an extreme but not singular case (*cf.* Fig. 41 e. g), tabular pieces of raw material were used in numerous instances. However, as with the tanged point, those pieces were not always nodules with tabular shape and chalky cortex common at primary outcrops, but rather weathered pieces of shatter (e.g. HAR5800-2028). As the arid desert environment caused intense structural stress within the flint, heat fractures that detached entire sherds of flint are commonly observed. Therefore it is possible that some of the very thin raw material pieces that were used for tool production were in fact weathered thermoclasts.

Larger thermoclasts were also tested for their suitability as raw material (Fig. 42 a). Cortical or weathered surfaces can not only be seen on tested cores or preforms, but also on artefacts that represent very late stages of foliate manufacture, again hinting to a rather flat shape of the original piece of raw material (*cf.* Figs. 35 a, 40 a). Several artefacts can be classified as preforms (HAR5800-1922, HAR5800-1915, HAR5800-0311). Some very early preforms might also be grouped among tested pieces of raw material with only a few initial flake removals (*cf.* Fig. 42 a–b). The use of tabular pieces of raw material, entire nodules or thermoclasts, attests to an opportunistic use of preexisting shapes for the manufacture of bifacial tools.

45 Edens 1982.

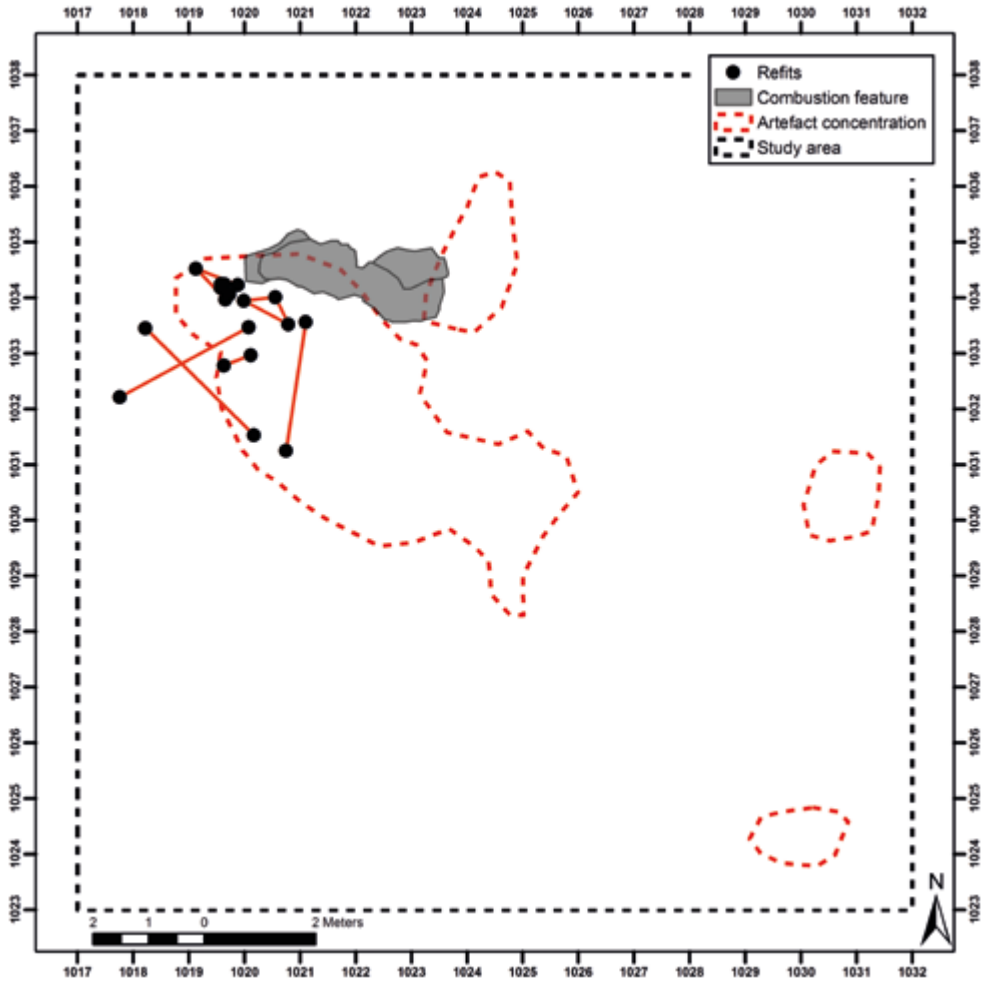


Fig. 39 Refits of flint artefacts (© DAI Orient Department/Ph. Drechsler).

الشكل ٣٩: قطع مصنوعات صوانية مشغولة من جديد (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / ف. دْرِكسلَر).

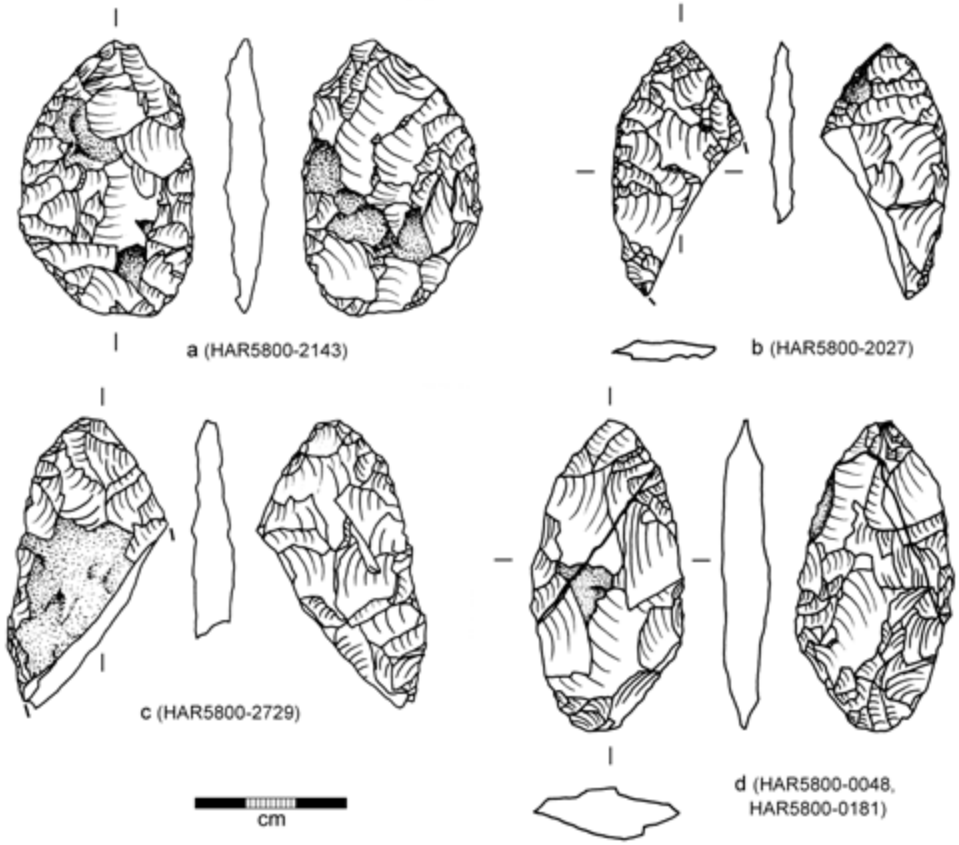


Fig. 40 Completely preserved (a), broken (b and c), and broken and refitted (d) bifacial foliates (© DAI Orient Department/drawings: C. Kainert/ K. Schmitt/M. Probst/ S. Kunze).

الشكل ٤٠: ‹ورقيات شكل› ثنائية الوجه حُفظت كاملة (a) ومكسورة (b و c) ومكسورة ثم مشغولة من جديد (d) (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ك. كاينَرت / ك. شِمت / م. بْروبست / س. كُنْتْسِه).

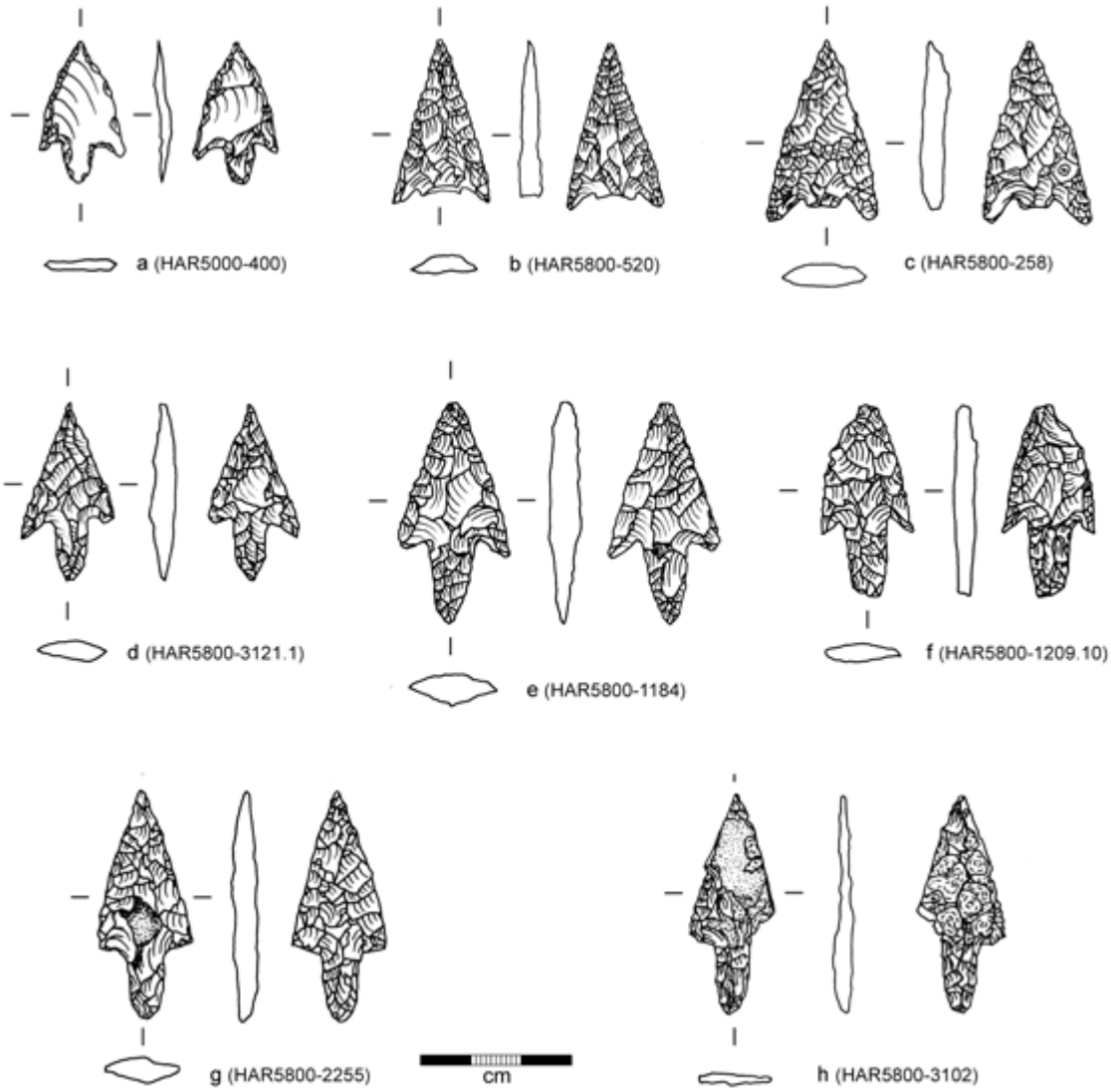


Fig. 41 Spectrum of arrowheads from locality HAR5800. a. Stemmed and barbed arrowhead made of a small flake with marginal bilateral retouch. – b–e. Stemmed and barbed arrowheads with bifacial retouch. – f. Potential preform of a stemmed and barbed arrowhead with bifacial retouch. – g–h. Stemmed and winged arrowheads with bifacial retouch (© DAI Orient Department/drawings: C. Kainert/ K. Schmitt/M. Probst/ S. Kunze).

الشكل ٤١: سلسلة من رؤوس السهام من الموضع HAR5800. a. رأس سهم لاذع ذو ساق صُنع من شظية صغيرة هُذّبت تهذيبًا طفيفًا على الجانبين. – b–e. رؤوس أسهم لاذعة ذات سيقان تم تهذيبها على الوجهين. – f. شكل أولي محتمل لرأس سهم لاذع ذو ساق هُذّب على الوجهين (HAR5800-1209.10). – g–h. رأسا سهمين مجنحان ذوا ساقين هُذّبا على الوجهين (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ك. كاينَرت / ك. شِمت / م. بْروبست / س. كُنْتْسِه).

Other flint artefacts provide insight into the knapping accidents that led to the discard of the fragmented foliates. Many pieces still bear cortical surfaces of varying extent and overambitious attempts to remove those parts may have eventually fractured the tool. This kind of knapping accident is especially evident for the discarded fragment HAR5800-2028 (Fig. 43). The misadjusted blow not only removed a flake and cortex, parts of which still can be seen, but resulted in an overshot flake that removed a large piece of the original preform and most parts of the opposite edge. Most foliate fragments are caused by fractures that are the result of wrongly executed blows, the fracture clearly originating from one platform edge and traveling through to the other side and thus different from other types like bending fractures caused by trampling and other taphonomic processes. A bifacially worked flat axe that was broken in half (Fig. 44 b) is probably the result of such a bending fracture. Detached foliate tips also fall within the category of knapping accidents. It can be argued that while the tabular shape of the reduced flint pieces did not require time-consuming core preparation for subsequent bifacial shaping, removing the cortex on the

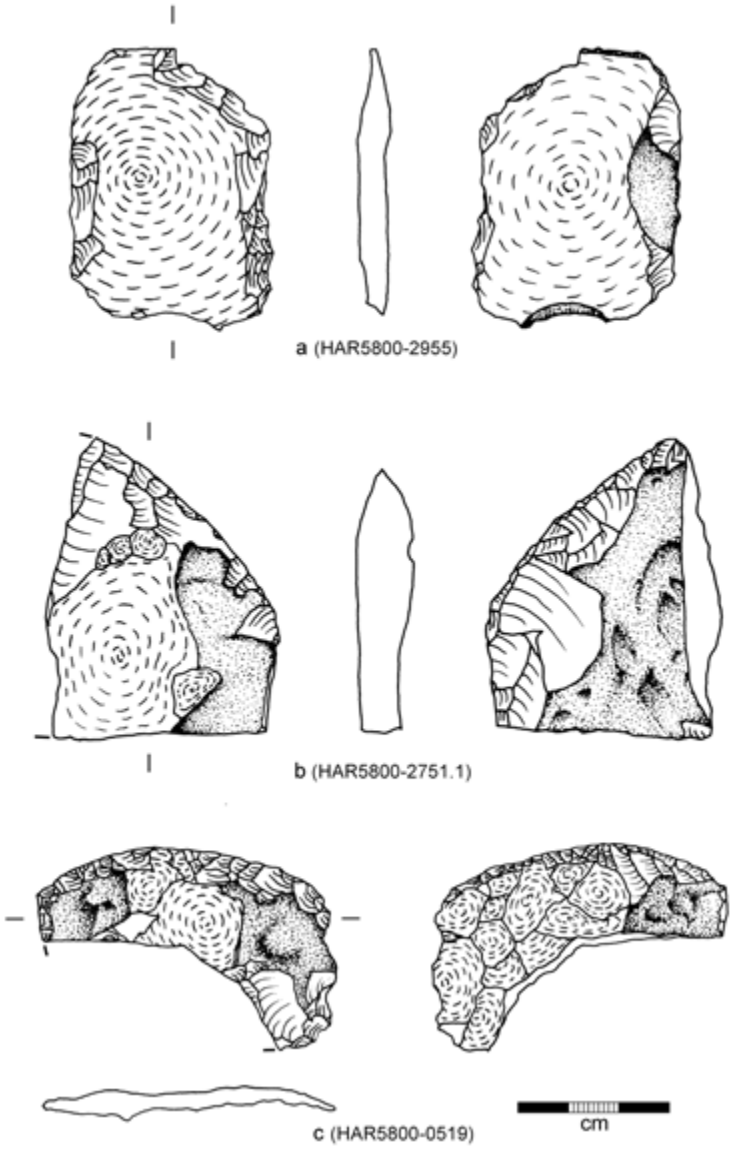


Fig. 42 Secondary modifications made on suitable pieces of flint raw material. a. Laterally irregular retouched thermoclastic piece potentially representing a preform. – b. Laterally convex retouched flat flint nodule potentially representing a preform. – c. Tile knife (© DAI Orient Department/drawings: C. Kainert/K. Schmitt/S. Kunze).

الشكل ٤٢: تعديلات ثانوية أُجريت على قطع ملائمة من مواد الصوان الخام. a. قطعة فتاتية–حرارية هُذّبت تهذيبًا غير منتظم على الجوانب ومن المحتمل أنها تمثل شكلًا أوليًا. – b. عقدة صغيرة مسطحة من الصوان هُذّبت لتمسي محدبة على الجوانب ومن المحتمل أنها تمثل شكلًا أوليًا. – c. ما يسمى بـ«سكين القرميد» (مكشطة قشرية) (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ك. كاينَرت / ك. شِمت / س. كُنْتْسِه).

surface, on the other hand, proved difficult. Wrongly executed attempts to achieve this goal often led to the destruction of the foliate and a large number of knapping accidents. However, these claims are highly tentative and must be corroborated by further field work, quantitative analysis of lithic assemblages, and comparative approaches to better understand the human acquisition and choice of raw material, and the influence of available raw material on bifacial technologies.

Chronological and cultural context

The 7th and early 6th millennium BCE represents an almost unknown period in Eastern Arabia. Broadly contemporaneous with the LPPNB/PPNC and early Pottery Neolithic in the Levant and Mesopotamia and the appearance of the first farming communities in the Zagros region, sparse archaeological information also comes from the southern and western part of the Arabian Peninsula[46]. The lithic industries are diverse and rely both on the concept of debitage and *façonnage* with a distinct bifacial component.

On the Qatar Peninsula, locality HAR5800 finds its closest parallels in terms of flint artefact technology, typology and dating at the "fishermens hut" at Shagra, excavated by M.-L. Inizan in 1981[47]. Located in southeastern Qatar about 12 km away from the present day coast, an oval structure of 5 m × 3 m delimited by upright standing sandstone slabs was

46 Charpentier 2008; Crassard 2008; Crassard *et al*. 2006; Crassard *et al*. 2013; Fedele 2009; Hilbert 2013; Uerpmann *et al*. 2013.

47 Inizan 1988.

Fig. 43 Bifacial preform with negative of overshot flake that split the artefact in half (© DAI Orient Department/drawings: M. Probst/S. Kunze).

الشكل ٤٣: شكل أولي ثنائي الوجه تركت عليه شظية ناتئة الأعلى سالبها وقسمت المصنوعة إلى نصفين (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: م. بْروبست / س. كُنْتْسِه).

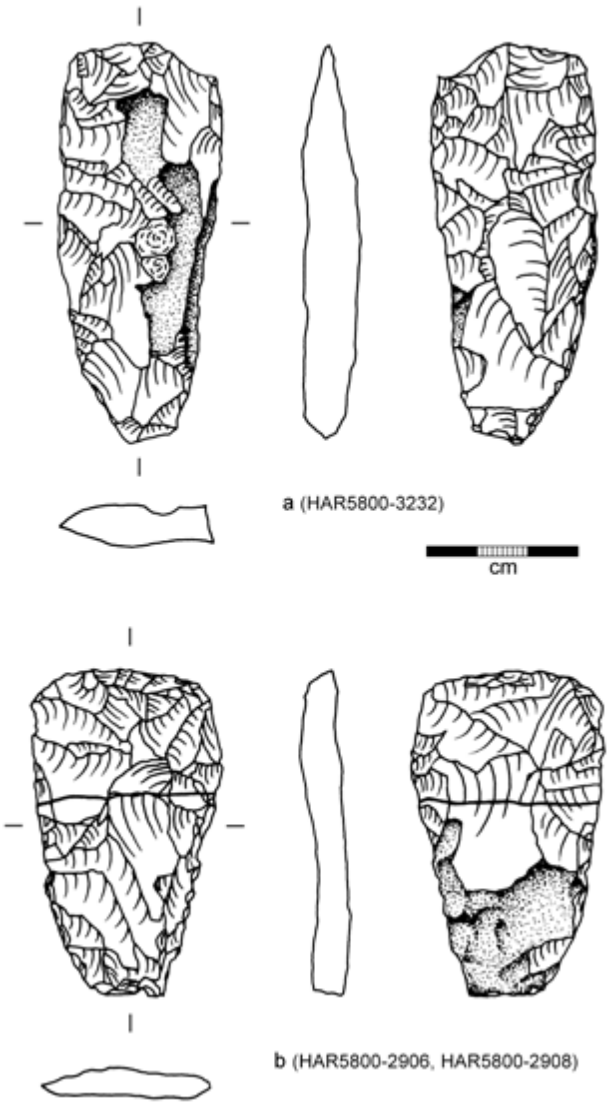


Fig. 44 Flint axes (© DAI Orient Department/drawings: K. Schmitt/S. Kunze).

الشكل ٤٤: بلطات صوانية (حقوق النشر محفوظة لمعهد الآثار الألماني–قسم المشرق / الرسوم: ك. شْمِت / س. كُنْتْسِه).

documented. Interpreted as the foundation of a small hut or shelter, associated finds of more than 2000 flint artefacts indicate substantial flint knapping activities. Comparable to locality HAR5800, flint raw material does not crop out locally at Shagra, but was brought to the place over a distance of about 20 km. The artefact assemblage at Shagra shows close parallels to HAR5800: Besides tested raw material slabs, cores are absent, while the spectrum of blanks is dominated by flakes. Characteristic element of the tool assemblage are bifacial foliates in different stages of production. All knapping stages were carried out on the site with soft hammer percussion. Other categories of tools are under-represented. The tool spectrum includes projectile points, end- and side scrapers, one denticulated flake and one *pièce esquillée*.[48]

Once located on the coast line, the excavators interpreted Shagra A as the remains of a not permanently inhabited but frequently revisited camp of stone-knapping fishermen. According to finds of marine shell (of low nutritional value) and fish remains, their subsistence was based on marine resources. Direct dating evidence for Shagra A is sparse. Only one radiocarbon date was obtained from marine shell, resulting in a radiocarbon age between 6046 and 5647cal BCE 2 sigma (Gif-5938: 7520±90 BP, calibrated with Calib Rev. 6.1, Marine calibration curve, Delta R = 180±53), therewith contemporaneous with the two radiocarbon datings obtained from ashy sediments at locality HAR5800.

Besides strong similarities between Shagra A and HAR5800, several differences are worth noting. This concerns first and foremost the absence of architectural remains at HAR5800. Further, the broad spectrum of unknapped stone artefacts at Shagra A is without parallels at HAR5800: With the exception of one grinding stone, neither hammer stones nor polishers nor stone beads were found in Asaila. The absence of permanent installations and a more restricted spectrum of artefacts at HAR5800 therefore suggest a more ephemeral character of the settlement, plausibly related to a less well predictable terrestrial subsistence base: Although well-watered during moisture periods and potentially covered by dense stands of grasses, the Asaila depression provides only restrict-

48 Inizan 1988.

ed space for hunting and grazing within a generally drier landscape.

Based on evidence from Shagra A and HAR5800, flint industries on the Qatar peninsula that date into the late 7th/early 6th millennium BCE differ remarkably from the previous, blade based Qatar-B assemblages: Neither tool typologies nor technological traits show any common characteristics. It can be only speculated about the reasons for this distinct break in lithic traditions. Possible are both superior technological innovations or the intrusion and displacement of populations. In contrast, the flint artefact assemblages at both localities show common characteristics with the subsequent Arabian Middle Neolithic, i.e. a strong bifacial component and a poorly developed primary production.

Conclusions

Archaeological investigations in the Asaila area aimed to identify Neolithic settlement patterns and subsistence strategies. To approach these complex subjects, a broad spectrum of methodologies has been applied. During initial, short reconnaissance surveys in 2012, the high potential of the area for more detailed investigations was proofed. Subsequently, systematic pedestrian surveys were carried out that allowed for the identification of functionally diverse settlement patterns at least from the Early Neolithic until modern times.[49] Detailed investigations of two localities of particular interest in 2015 and 2016, one locality with a representative Qatar-B assemblage (HAR5251) and one locality with a rich bifacial component (HAR5800), included the collection of artefacts for further technological and typological studies and surface cleaning/scraping to get a complete record of all artefacts.

In part divergent results from these investigations clearly demonstrated the strengths and weaknesses of the different methodologies: Reconnaissance surveys, often kindly supported by colleagues from Qatar Museums, provided an exceptional overview of the diversity and spectrum of archaeological remains in the Asaila area. With minimal efforts in time, the most visual archaeological sites in the area were recorded. In addition, the exact location of the Qatar-B "type site" Asaila 36 was rediscovered during these initial visits. On the other hand, the results from the reconnaissance surveys did not allow for any conclusions about the actual frequencies of archaeological remains and therewith reconstructions of past population dynamics.

More comprehensive insights into population dynamics, settlement patterns and land use strategies enabled systematic surveys in the Asaila area. Due to high efforts in time and personal, only 8% of a predefined survey area covering the Asaila depression and its surrounding could be investigated during pedestrian surveys. Despite clear restrictions in the studied areas, the results from these systematic surveys allowed for a detailed reconstruction of the settlement history in the Asaila area.

Although systematic surveys allowed for the recording of the great majority of remains from past human activities visible on the surface, these investigations clearly lack information about anything hidden in the ground. The benefits of invasive field work can be easily demonstrated if comparing the frequencies of recorded flint tools (i.e. artefacts with secondary modifications) from localities with a distinct Qatar-B component: While only one tool was recorded among 15 localities documented during systematic surveys, a total of 8 tools were found during detailed investigations at locality HAR5251. Therewith the results from the soundings at locality HAR5251 are more consistent with the previous findings from investigations at Acila 36[50] than the results obtained during surveys alone.

Besides methodological uncertainties, terminology provides major pitfalls for archaeological work in Qatar. This concerns first and foremost the "prehistoric" Stone Age periods that still lack a well-established chronological, typological and technological framework. Initial archaeological investigations by the Danish Archaeological Mission in the Gulf established a quadripartite division of the Stone Age of Qatar, with a tentative correlation of Qatar-A with the Paleolithic, Qatar-B with Mesolithic/Levantine Pre-Pottery Neolithic and Qatar-C and Qatar-D with two different Neolithic cultures[51]. Later studies by the *Mission Archéologique Francaise à Qatar*[52] proved this classification almost wrong, assigning the Qatar-A, -C and -D assemblages to one Neolithic complex.

The resulting twopartite division of the "Stone Age" in Qatar remains valid until today: Archaeological surveys in the Asaila area recorded two distinct – and easily distinguishable – lithic industries. One industry is based on the concept of *debitage*. It is characterised by a well-defined blade production from bidirectional, 'naviform' cores using direct per-

49 Drechsler *et al.* 2016.
50 Inizan 1988.
51 Kapel 1967.
52 Inizan 1988.

cussion with a soft hammerstone. Primary and secondary crested pieces and core-edge pieces indicate a careful core preparation. With these characteristics, this lithic industry is in full accordance with the Qatar-B industry initially defined by H. Kapel[53] and later technologically described by M.-L. Inizan[54]. To avoid any terminological confusion, the term "Qatar-B", although considered as problematic, was finally kept. It first and foremost refers to technologically and typologically widely homogenous artefact assemblages that are almost exclusively known from the Qatar Peninsula. The dating of the according assemblages remains elusive due to the lack of associated datable material. Based on technological reminiscences to the Levantine PPNB, a (tentative) dating of the Qatar-B industries *sensu strictu* to the 7th millennium BCE remains plausible. With these characteristics, the Qatar-B assemblages have been (economically and chronologically) assigned to the Early Neolithic in Arabia.[55]

Technological similarities between the Qatar-B flint artefact assemblages and the Levantine PPNB have often been noted[56] although cultural implications of these similarities remain a subject of ongoing debate[57]. Recent investigations in the northwestern part of the Arabian Peninsula provide increasing evidence for the intrusion of Levantine PPN populations into these areas[58]. Especially the absence of environmental barriers between the southern Levant and Eastern Arabia make population movements between these two regions plausible.[59] Nevertheless, the material evidence for this Neolithic dispersal from the Levant remains conspicuously weak. It comes from Qatar[60], but also few places in northwestern[61] and eastern[62] Arabia. This sparse evidence either suggests a short and episodic character of the Levantine dispersal that only sporadically left visible traces without major impact on local populations,[63] or rather rapid adaptations to new environmental and social conditions, resulting in the development of completely new traditions of flint knapping technologies.

The second archaeological entity that has been associated with the Neolithic in Qatar shows technological and typological reminiscences to the "Arabian Bifacial Lithic Tradition" *sensu* Edens[64]. In contrast to the Qatar-B assemblages it shows a poorly developed, flake-based primary production. Suitable pieces of flint raw material are often directly transformed into tools. More refined artefacts such as arrowheads and leaf shaped bifacial points clearly indicate the predominance of the concept of *façonnage* for the production of flint tools. With these characteristics, the according assemblages demonstrate parallels to Middle Neolithic industries on the Arabian mainland that date into the time frame between the late 6th and early 4th millennium BCE.[65] To avoid the somewhat cumbersome and – as regards content – questionable term "Qatar-A, -C, -D", the general term "Middle Neolithic" has been adopted for according assemblages documented during the surveys in the Asaila area.

Archaeological field work in the Asaila area resulted in a comprehensive, complex and partly contradictory picture of settlement patterns. Besides widespread evidence for modern activities in the area that focus on farming, animal husbandry and leisure activities, a dense Neolithic occupation was recorded, while the intermediary periods are sparsely represented.[66]

Two functionally diverse settlement patterns were identified for the Early and Middle Neolithic. During the Early Neolithic, the Asaila area was repeatedly visited for the acquisition of flint tool blanks. The predominance of cores and core preparation flakes designate the localities with Early Neolithic artefacts as flint workshops, while blanks suitable for the transformation into tools were only rarely found. The exclusive use of local flint raw material as well as a clear spatial relationship between the location of Early Neolithic sites and outcrops of high quality natural flint reconfirms the designation of the localities as workshops. Nevertheless, a limited spectrum of flint tools discovered at the more extensively studied locality HAR5251 that includes borers, retouched blades and scrapers as well as broken arrowhead bases suggests a limited spectrum of additional activities centering around the repairing of the (hunting) equipment. However, distinct evidence for domestic activities in the Asaila area was not found. It is therefore plausible to argue that people visited the region only sporadically for their supply with flint tool blanks and potentially grazing of domestic animals and hunting: It can only be hypothesised that the corresponding settlements were located in other regions of the Qatar

53 Kapel 1967.
54 Inizan 1980; Inizan 1988.
55 Drechsler 2007; Drechsler 2009.
56 Kapel 1967; Pelegrin – Inizan 2013; Uerpmann – Uerpmann 1996; but see Scott-Jackson *et al*. 2015 for a contradicting view.
57 Crassard – Drechsler 2013; Crassard *et al.* 2013; Drechsler 2009; Uerpmann *et al*. 2009.
58 Crassard *et al*. 2013; Guagnin *et al.* 2017.
59 Drechsler 2009.
60 Kapel 1967; Pelegrin – Inizan 2013.
61 Crassard *et al*. 2013; Ingraham *et al.* 1981.
62 Masry 1997.
63 Pelegrin – Inizan 2013.
64 Edens 1982; Edens 1988.
65 Charpentier 2008; Drechsler 2009; Uerpmann 1992.
66 Drechsler *et al*. 2016.

Peninsula, or along the now submerged shorelines of the transgressing Arabian Gulf[67].

Due to the lack of stratified archaeological sites in the Asaila area, the transition from the Early to the Middle Neolithic cannot be documented sufficiently. Major differences in settlement pattern and flint technology are indicative for major social and economic dynamics. According to radiocarbon datings, lithic assemblages clearly reminiscent to Arabian (bifacial) lithic traditions appear in the area during the late 7th/early 6th millennium BCE. Against initial assumptions based on geomorphological studies, one focus of human occupation was the Asaila depression itself. Flint scatters that were found together with the remains of combustion features and a broad spectrum of flint and ground stone tools suggest domestic activities and more intensive and prolonged settlement activities.

Representatively for localities with these early bifacial industries, locality HAR5800 was investigated in greater detail. Systematic surface sampling and surface cleaning revealed four spatially distinct flint artefact concentrations. The main artefact concentration was primarily the result of intense flint knapping activities for the production of bifacial foliates. Finds of broken foliates as well as their preforms and numerous distinct thinning flakes and chipping debris proof the production of bifacial foliates on spot. The spatial association of these remains of flint knapping with a combustion feature, but also finds of marine shell, ostrich eggshell as well as one grinding stone, point to additional domestic activities. The broad spectrum of flint raw material and the fact that flint raw material was not available within the Asaila depression indicates that flint knapping, but also raw material procurement, was embedded into daily tasks.

The availability of fresh water for humans and animals, but also for plants, makes the Asaila depression a suitable place for hunting, but also herding. The ephemeral character of the early Middle Neolithic occupation at HAR5800, the absence of architectural remains, but also the broad spectrum of raw material suggests a mobile society and therewith qualifies the locality as a temporary camp site. Similar scatters of flint artefacts in the direct vicinity of the study area, but also at other parts of the Asaila basin, suggest that Asaila was intensively occupied by human groups during the late 7th/early 6th millennium BCE.

Considering the blade-based Qatar-B industries as an outcome of the Neolithic dispersal over the Arabian Peninsula during the course of the 7th millennium BCE, the appearance of a completely different flint industry at the end of that millennium is unexpected. It suggests that the establishment of cultural elements characteristic for the Arabian Middle Neolithic was a rather fast, but enduring process.

On the basis of artefacts recorded during systematic surveys alone it is not possible to discern localities resulting from human activities during the late 7th/early 6th millennium BCE from localities that date into later phases of the Middle Neolithic. Evidence for substantial settlements along the coast of Qatar that date into the 5th millennium BCE[68] at least implies a continuous inland occupation during moister phases of the Middle Holocene.

Addresses

Dr. Philipp Drechsler
philippdrechsler@yahoo.de

Mathias Probst
malbonalupo@gmail.com

67 Lambeck 1996.
68 Drechsler 2014; Inizan 1988; al-Naimi *et al*. 2011; Smith 1978 a; Smith 1978 b.

Bibliography

al-Naimi, F. – Price, K. M. – Cuttler, R. – Arrock, H.
2011 Reassessing Wādī Debayan (Wādī al-ḶabayKān): An Important Early Holocene Neolithic Multi-Occupational Site in Western Qatar (Poster). Proceedings of the Seminar for Arabian Studies 41, 239–244.

Al-Yousef, M.
2003 Mineralogy, Geochemistry and the Origin of Quaternary Sabkhas in the Qatar Peninsula, Arabian Gulf (PhD-thesis, Faculty of Earth Sciences, University of Southampton).

Banning, E. B.
2002 Archaeological Survey. Manuals in Archaeological Method, Theory, and Technique (New York).

de Beauclair, R.
2008 Funerary Rites in a Neolithic Nomad Community in Southeastern Arabia: The Case of al-Buhais 18, Documenta Praehistorica 35, 143–152.
2010 Ornamental Objects as a Source of Information on Neolithic Burial Practices at al-Buhais 18, UAE and Neighbouring Sites, in: L. Weeks (ed.), Death and Burial in Arabia and Beyond. Multidisciplinary Perspectives, British Archaeological Reports. International Series 2107 (Oxford) 11–15.

Beech, M. – Cuttler, R. – Moscrop, D. – Kallweit, H. – Martin, J.
2005 New Evidence for the Neolithic Settlement of Marawah Island, Abu Dhabi, United Arab Emirates. Proceedings of the Seminar for Arabian Studies 35, 37–56.

Carter, R.
2010 Appendix IV. Radiocarbon Dates from H3, As-Sabiyah and Ubaid-Related Neolithic Sites in the Gulf, in: R. Carter – H. Crawford (eds.), Maritime Interactions in the Arabian Neolithic (Leiden) 291–295.

Charpentier, V.
2008 Hunter-Gatherers of the "Empty Quarter of the Early Holocene" to the Last Neolithic Societies: Chronology of the Late Prehistory of South-Eastern Arabia (8000–3100 BC). Proceedings of the Seminar for Arabian Studies 38, 93–116.

Crassard, R.
2008 The 'Wa'shah Method': An Original Laminar Debitage from Hadramawt, Yemen. Proceedings of the Seminar for Arabian Studies 38, 3–14.

Crassard, R. – McCorriston, J. – Oches, E. – Al-Aziz Bin ʿAqil, ʿA. – Espagne, J. – Sinnah, M.
2006 Manayzah, Early to Mid-Holocene Occupations in Wādī Ṣanā (Ḥaḍramawt, Yemen). Proceedings of the Seminar for Arabian Studies 36, 151–173.

Crassard, R. – Drechsler, P.
2013 Towards New Paradigms: Multiple Pathways for the Arabian Neolithic, Arabian Archaeology and Epigraphy 24, 3–8.

Crassard, R. – Petraglia, M. D. – Parker, A. G. – Parton, A. – Roberts, R. G. – Jacobs, Z. – Alsharekh, A. – Al-Omari, A. – Breeze, P. – Drake, N. A. – Groucutt, H. S. – Jennings, R. – Régagnon, E. – Shipton, C.
2013 Beyond the Levant: First Evidence of a Pre-Pottery Neolithic Incursion into the Nefud Desert, Saudi Arabia, PLoS ONE 8/7; doi:10.1371/journal.pone.0068061.

de Cardi, B.
1978 Qatar Archaeological Report. Excavations 1973 (Oxford).

Drechsler, P.
2007 Spreading the Neolithic over the Arabian Peninsula, Proceedings of the Seminar for Arabian Studies 37, 93–109.
2009 The Dispersal of the Neolithic over the Arabian Peninsula. British Archaeological Reports. International Series 1969 (Oxford).
2011 Places of Contact, Spheres of Interaction. The 'Ubaid Phenomenon in the Central Gulf Area as Seen from a First Season of Re-Investigations at Dosariyah, Eastern Province, Saudi Arabia. Proceedings of the Seminar for Arabian Studies 41, 69–82.
2014 The Palaeolithic and Neolithic in South Qatar – Insights from Two Seasons in the Field, Zeitschrift für Orient-Archäologie 7, 276–289.

Drechsler P. – Engel, M. – Brill, D. – Gerber, C.
2016 The Asaila Depression, an Archaeological Landscape in Qatar. Proceedings of the Seminar for Arabian Studies 46, 1–18.

Edens, C.
1982 Towards a Definition of the Western Rub' al Khali 'Neolithic [sic]', Atlal 6, 109–124.
1988 The Rub al-Khali 'Neolithic' Revisited: The View from Nadqan, in: D. T. Potts (ed.), Araby the Blest (Copenhagen) 5–43.

Fedele, F. G.
2009 Early Holocene in the Highlands: Data on the Peopling of the Eastern Yemen Plateau, with a Note on the Pleistocene Evidence, in: M. D. Petraglia – J. I. Rose (eds.), The Evolution of Human Populations in Arabia (Dordrecht/Heidelberg/London/New York) 215–236.

Glover, E. – Beech, M. J.
2005 The Environment and Economy of an Ubaid-Related Settlement on Dalma Island, United Arab Emirates, Paléorient 31, 97–107.

Guagnin, M. – Shipton, C. – Martin, L. – Petraglia, M.
2017 The Neolithic Site of Jebel Oraf 2, Northern Saudi Arabia: First Report of a Directly Dated Site with Faunal Remains, Archaeological Research in Asia 9, 63–67.

Hardy-Guilbert, C.
1980 Recherches sur la periode islamique au Qatar, in: J. Tixier (ed.), Mission Archéologique Française au Qatar 1 (Qatar) 121.

Hilbert, J.
2013 Khamseen Rock Shelter and the Late Palaeolithic-Neolithic Transition in Dhofar, Arabian Archaeology and Epigraphy 24, 51–58.

Ingraham, M. L. – Johnson, T. D. – Rihani, B. – Shatla, I.
1981 Saudi Arabian Comprehensive Survey Program: Preliminary Report on a Reconnaissance Survey of the Northwestern Province, Atlal 5, 59–84.

Inizan, M.-L.
1978 Première mission archéologique française à Qatar, Paléorient 4, 347–351.

Inizan, M.-L.
1980 Sur les industries à lames de Qatar, Paléorient 6, 233–236.
1988 Préhistoire à Qatar. Mission archéologique française à Qatar 2 (Paris).

Kapel, H.
1967 Atlas of the Stone-Age Cultures of Qatar. Reports of the Danish Archeological Expedition to the Arabian Gulf Vol. I (Aarhus).

Kiesewetter, H. – Uerpmann, H.-P. – Jasim, S. A.
2000 Neolithic Jewellery from Jebel al-Buhais. Proceedings of the Seminar for Arabian Studies 30, 137–146.

Lambeck, K.
1996 Shoreline Reconstructions for the Persian Gulf Since the Last Glacial Maximum, Earth and Planetary Science Letters 142, 43–57.

Masry, A. H.
1997 Prehistory in North Eastern Arabia. The Problem of Interregional Interaction (London).

Neff, U. – Burns, S. J. – Mangini, A. – Mudelsee, M. – Fleitmann, D. – Matter, A.
2001 Strong Coherence Between Solar Variability and the Monsoon in Oman Between 9 and 6 kyr ago, Nature 411, 290–293.

Pelegrin, J. – Inizan, M.-L.
2013 Soft Hammerstone Percussion Use in Bidirectional Blade-Tool Production at Acila 36 and in Bifacial Knapping at Shagra (Qatar), Arabian Archaeology and Epigraphy 24, 79–86.

Potts, D. T.
2001 Ostrich Distribution and Exploitation in the Arabian Peninsula, Antiquity 75, 182–190.

Preston, G. W. – Thomas, D. S. G. – Goudie, A. S. – Atkinson, O. A. C. – Leng, M. J. – Hodson, M. J. – Walkington, H. – Charpentier, V. – Méry, S. – Borgi, F. – Parker, A. G.
2015 A Multi-Proxy Analysis of the Holocene Humid Phase from the United Arab Emirates and its Implications for Southeast Arabia's Neolithic Populations, Quaternary International 382, 277–292.

Reimer, P. J. – Bard, E. – Bayliss, A. – Beck, J. W. – Blackwell, P. G. – Bronk Ramsey, C. – Buck, C. E. – Cheng, H. – Edwards, R. L. – Friedrich, M. – Grootes, P. M. – Guilderson, T. P. – Haflidason, H. – Hajdas, I. – Hatté, C. – Heaton, T. J. – Hoffmann, D. L. – Hogg, A. G. – Hughen, K. A. – Kaiser, K. F. – Kromer, B. – Manning, S. W. – Niu, M. – Reimer, R. W. – Richards, D. A. – Scott, E. M. – Southon, J. R. – Staff, R. A. – Turney, C. S. M. – van der Plicht, J.
2013 IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0–50,000 Years Cal BP, Radiocarbon 55/4, 1869–1887.

Rose, J. I.
2010 New Light on Human Prehistory in the Arabo-Persian Gulf Oasis, Current Anthropology 51, 849–883.

Scott-Jackson, J. E. – Rose, J. I. – Scott-Jackson, W. – al-Naimi, F.
2015 Found: The Palaeolithic of Qatar. Proceedings of the Seminar for Arabian Studies 45, 329–336.

Smith, G. H.
1978 a Al-Da'asa, Site 46: An Arabian Neolithic Camp Site of the Fifth Millennium, in: B. de Cardi (ed.), Qatar Archaeological Report: Excavations 1973 (Oxford) 53–79.
1978 b Two Prehistoric Sites on Ras Abaruk, Site 4, in: B. de Cardi (ed.), Qatar Archaeological Report: Excavations 1973 (Oxford) 80–106.

Tixier, J. (ed.)
1980 Mission archéologique française à Qatar 1 (Doha).

Uerpmann, H.-P. – Potts, D. T. – Uerpmann, M.
2009 Holocene (Re-)Occupation of Eastern Arabia, in: M. D. Petraglia – J. I. Rose (eds.), The Evolution of Human Populations in Arabia (Dordrecht/Heidelberg/London/New York) 205–214.

Uerpmann, H.-P. – Uerpmann, M. – Kutterer, A. – Jasim, S. A.
2013 The Neolithic Period in the Central Region of the Emirate of Sharjah (UAE), Arabian Archaeology and Epigraphy 24, 102–108.

Uerpmann, M.
1992 Structuring the Late Stone Age of Southeastern Arabia, Arabian Archaeology and Epigraphy 3, 65–109.

Uerpmann, M. – Uerpmann, H.-P.
1996 'Ubaid Pottery in the Eastern Gulf – New Evidence from Umm al-Qaiwain (U.A.E.), Arabian Archaeology and Epigraphy 7, 125–139.

Yaşin-Meier, D.
2014 The Pottery – First Preliminary Report, in: C. Gerber, The German-Qatari South Qatar Survey Project: The 2012–2013 Season, Zeitschrift für Orient-Archäologie 7, 248–274.

Inhaltsverzeichnis

Mesopotamien und regional übergreifende Themen

Levante

Arabische Halbinsel und der Region verwandte Themen

المحتوى

شبه الجزيرة العربية ومواضيع مرتبطة بالإقليم