The Late Halafian Lithic Industry of Tell Kashkashok I, the Upper Khabur, Syria

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This paper presents the flaked flint and obsidian assemblages excavated in 1990 from Tell Kashkashok I, northeast Syria. Albeit a small collection selected from limited excavations, they represent one of the rare Halafian lithic assemblages that help define the lithic craft tradition of the Syrian Jazireh during this period. The analysis shows that the assemblages belong to the Late Halafian industry characterized by the common use of the following: imported raw materials, elaborate techniques for blank production including pressure debitage, snapped rectangular blades and crescent-shaped flake-blades with backed edges for sickle elements, bifacial knives made on tabular flint, and the rare manufacturing of burins. The literature survey reveals that these traits are recognized in the Early-Middle Halafian and the Late Pottery Neolithic industries of the Syrian Jazireh, suggesting that the Halafian lithic tradition of the region was established through indigenous cultural development. At the same time, the survey reveals that they do not occur in the neighboring regions as a package but in different combinations by regions. Future research into those regionally different patterns would provide a means to interpret the complex Halafian cultural dynamics from a perspective not examined in prior research that emphasized pottery analysis.

Keywords: Halaf culture, Syrian Jazireh, obsidian, sickle element, pressure debitage

I. Introduction

Halafian culture occupies a unique position in the late prehistory of Northern Mesopotamia with its geographic distribution widespread on an unprecedented scale. Originating from the Jazireh plain in the final seventh millennium BC, this cultural entity expanded to the neighboring regions during the following centuries of the sixth millennium BC (see Breniquet 1987; Akkermans and Schwartz 2003; Cruells and Nieuwenhuyse 2004; Campbell 2007; Nieuwenhuyse 2007). The high-quality painted pottery industry, the most diagnostic marker of this culture, has been identified across the regions of the northern part of the Fertile Crescent from the Levant, Southeast Anatolia, and the Jazireh plain to the western foothills of the Zagros Mountains (Fig. 1). The geographic distribution is far wider than that of the previous major cultural entities of Hassuna, Samarra, Pre-Halaf, and others requiring a competent interpretation to understand how this unique cultural pattern emerged. Previous studies identified different manifestations of the Halafian ceramic traits by region; thus, a distinction was made among the core region, Halaf-related region, and the regions where Halafian pottery can be recognized merely as trade items (e.g. Davidson and McKerrell 1976; Roaf 1990).

In order to contribute to interpreting the Halafian cultural phenomenon, this paper examines the lithic industry, which is one of the most poorly documented aspects of the Halafian cultural

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phenomenon. Studies of the lithic craft, which can reflect different facets of the Halafian tradition, would provide a different dimension to interpret the complex Halafian socio-cultural dynamics.

The major difficulty in addressing the Halafian lithic industries is the relative paucity of technical reports using a modern methodological approach. The related assemblages available from the Jazireh are from only a few settlements, e.g., Shams ed-Din on the Upper Euphrates (Azoury and Bergman 1980), Sabi Abyad I on the Balikh (Copeland 1989; 1996), and Tell Umm Qseir on the Middle Khabur (Maeda 1998). When reviewing data from the neighboring regions, there is not much scope for expanding the list considerably: reports on the Halafian lithics are from Domuztepe of South Anatolia (Campbell and Healey 2011), Ain el-Kerkh of the el-Rouj Basin (Arimura 1999), Fistikli Höyük of the Upper Euphrates (Starzmann 2013), Banahilk of northern Iraq (Watson 1983), and Girikihaciyan of Southeast Anatolia (Watson and LeBlanc 1990). In this regard, any detailed report on Halafian lithic assemblages would be welcome to fill part of the gap in our present knowledge. The Late Halafian lithic assemblage described in this paper is from Tell Kashkashok I (hereafter, Kashkashok I) of northeast Syria, situated in the heartland of Halafian culture. Although the assemblage represents only a small collection selected from limited excavations, it nevertheless is an important addition to the poorly constructed lithic database of the Halafian period. This paper discusses its preliminary implications for understanding the chronospace variability of Halafian craft traditions.

II. Excavations of Kashkashok I
Tell Kashkashok represents a complex of archaeological sites situated approximately 20 km northwest of Hassake, Syria (Fig. 1). It consists of at least four mounds, I to IV, distributed along Wadi al-Aweij, a tributary of the Khabur River. Due to the construction of a dam on the wadi, three mounds were excavated in salvage campaigns: Kashkashok I and III by a Syrian mission between 1987 and 1990 (Antoine Suleiman, personal communication) and Kashkashok II by a Japanese mission in 1987 and 1988 (Matsutani 1991). Additional field campaigns were carried out in 1989 and 1990 to obtain geological (Courty 1994) and chronological data (Hole 2001). Kashkashok IV was left unexcavated because of a modern village covering the mound. Kashkashok I is a small mound on the right bank of the wadi, covering an area of about 50 m in diameter and less than 2 m in height. The excavations by Antoine Suleiman revealed about 3-m thick cultural deposits, divided into three architectural levels, each defined by building remains such as ovens and plastered floors (Tsuneki 2004). Although details of the excavations are yet to be published, separate articles on the excavated materials have provided a general picture of this settlement. Pottery analysis reveals that the main occupation belongs to the Late Halaf, with a few traces of the Middle and the Final Halafian occupations (Tsuneki 2004, 70). The excavated archaeological records include a typical set of Late Halafian clay female figurines (Belcher 2014) and animal remains indicating sheep and goat herding (Zeder 1998). A single radiocarbon date has been obtained from the excavation wall, 1 to 1.3 m below the surface (Hole 2001), which indicates a period of 5831 to 5580 cal. BC (AA30497). According to the current Halafian chronology (see Campbell 2007), the latest range of this time span seems applicable to the Kashkashok I occupation.

The lithic collection available for the present study consists of thirty-six flint and seventy-four
obsidian artifacts obtained from three levels, Phase I being the oldest (Table 1). When divided into specific stratigraphic contexts, this modest collection becomes even smaller, with less than thirty pieces at the most in each sub-level (A/B). Further, the major components of the collection are regular blades and blade tools along with a small amount of flake debitage and flake tools. This anomaly of the present collection for a prehistoric material undoubtedly reflects the selected sampling inevitable during the rescue work due to the construction of a dam, and limits its analytical possibility. Accordingly, the following analysis will be directed to a culture-historic examination rather than an in-depth investigation aiming to reconstruct detailed operational chains and spatial settlement structures. The statistics provided below should also be interpreted with caution.

III. The Kashkashok I Lithic Collection
1. Raw Material
Flint artifacts comprise 32.7% of the total lithic remains (36/110). In terms of texture and color, they can be grouped into at least three types (Table 2). The most common among them is the fine-grained flint with brownish colors (nineteen pieces; brown flint). The color, defined according to the Munsell Color Charts, shows a wide variety of hues from brownish black (7.5YR 3/1) and grayish brown (7.5YR 4/2) to brownish gray (7.5YR 4/1). Black flint is also included in this group, for black is considered to be the result of thermal alteration on originally brownish flint. The surface is often lustrous. The cortex rarely remains on this type of flint. The second group, slightly less common than the first, is composed of grayish flints (fourteen pieces; gray flint), whose colors range from gray (2.5Y 7/1.5) and light gray (2.5Y 7/1) to grayish yellowish orange (10YR 7/2) and so on. The texture is generally fine, but less so than brown flint, showing a gritty surface in some cases. Specimens with cortex are absent from this group. The third group is represented by only three pieces, all relatively coarse-grained flints colored grayish yellow brown (10YR 4/2), dull brown (7.5YR 5/3), or light brownish gray (5YR 7/2). The dull brown artifacts have visible bluish-brown mottles.

The mound of Kashkashok I is situated on one of the deflated Pleistocene terraces of Wadi Aweji, where small flint cobbles, including Middle Paleolithic artifacts, are sparsely scattered (Nishiaki 2000b). Perhaps these terraces served as sources of coarse-grained flint for the Halafian inhabitants. The texture and the colors of the terrace cobbles are almost identical to those of Kashkashok I. In addition, two of the coarse-grained flints in the present sample retain water-rolled cortex, typical of the flints available on the terraces. On the other hand, flints resembling the brown and the gray flints could not be collected. The assemblages of brown and gray flints do not include flake debris from core reduction on site (Table 6). This observation is in accordance with the interpretation of viewing them as non-local, although how far their sources are from the settlement is yet unknown. Likewise, the limited sample size of the present collection does not permit argument on whether the non-local flint was brought into the settlement in the form of finished products or reduced on site.

The raw material more commonly identified is obsidian, constituting about two-thirds of the total lithics, 67.3% (Table 1). The obsidian artifacts are mostly composed of retouched and unretouched blades, with a few simple flakes and core-edge elements. The amorphous shape of the
latter indicates their derivation from the latest stage(s) of core reduction. Notably they include only one specimen with the cortex (retouched blade). Although the frequency of each category cannot be taken at face value, due to the nature of the present sample, it is likely that at least some stages of core reduction have occurred on site while most of the obsidian were brought to the settlement in the form of already decortified material. The colors of the obsidian are mostly greenish-black and grayish semi-translucent black. While these color variations may correspond to different sources, geo-chemical analysis is needed to verify any such estimates. Worth mentioning is an obsidian piece of a unique color: a large splintered piece of black obsidian with reddish brown spots in parts (Fig. 4: 7; Fig. 6: 2).

2. Flint Artifacts
The composition of the flint assemblage is obviously biased by the selected sampling of standardized blades and blade tools. Among the thirty-six specimens, twenty-nine are retouched tools, five are unretouched blades, and the remaining two are core-edge elements (Table 3; Figs. 2, 3). The blade blanks indicate the use of elaborate core reduction technology. Most of the blades have a punctiform butt with traces of abrasion on their exterior platform surface and with a tiny lip on the bulbar surface. The widths of these blades are between 9.3 and 24.5 mm, with an average of 16.2 mm (thirty-one pieces; s.d. = 4.00). Considering the standardized form and size, the blades must have been produced by elaborate techniques. Some of the blades with parallel lateral edges/dorsal ridges and a small butt show the features diagnostic of pressure debitage (e.g. Fig. 2: 4, 6, 7; see Pelegrin 2000; 2012). Cores for blade production, although absent from the present collection, are considered as a single-platform because of the uni-directional dorsal scars of blanks. One of the core edge elements, probably from a core platform area, indicates the use of a plain platform (Fig. 2: 2).

Evidence for flake production is sparsely represented in the collection. Only two pieces are proof of flake blanks, both retouched into tools: a denticulate (Fig. 2: 8) and a retouched flake (Fig. 2: 9). These two are similar in that they are drawn from coarse-grained flint. While different approaches may have been used on locally available coarse-grained flint and on non-local brown and gray flints, this possibility cannot be explored further using the present sample.

The twenty-nine retouched tools consist of the following types (Table 3).

**Bifacial knife:** This is a unique piece in the present collection (Fig. 2: 3). It is a bifacial knife made of fine-grained brownish gray flint. The retouch was made with careful pressure flaking to create a pointed end and sharp edges. The other end is broken. On both surfaces, the central parts were left unretouched but highly polished, leaving striations mostly running along the longer axis of the blank (Fig. 6: 1). The polishing was obviously made before retouching the edges. The thickness is quite uniform, about 5.5 mm on an average. The elaborate polishing was apparently to create a tabular blank, a form of flint often used for such tools at other settlements as well.

**Sickle elements:** Representing the most standardized tool category at Kashkashok I, there are fourteen flint blades with sickle gloss and/or black stain from bitumen. These blades can be divided into two morphological types. The more common type is a simple rectangular one, represented by twelve pieces. Seven of them are proximal blades with a snapped distal end (Fig. 3: 1–5), five
are medial blades with both ends snapped and/or truncated (Fig. 3: 6–9), and the remaining is a complete blade with marginal retouch on the back (Fig. 3: 10). The other type consists of two pieces, which are crescent-shaped blades with oblique backing retouch on both ends (Fig. 3: 11, 12). Blanks of these specimens are probably percussion blades, rather thick and non-standardized in comparison with the other ones.

In general, the working edge of these sickle elements retains a series of tiny retouch scars (e.g. Fig. 3: 1, 2), most of which may have been due to use rather than intentional modification. Backing retouch is also limited to the margin of blade edges (e.g. Fig. 3: 3–5, 8, 10). Thus, the sickle elements of Kashkashok I are simple in form. The distribution of sickle gloss and traces of bitumen suggest that they were principally hafted in parallel to a handle. A smaller number of elements, whose gloss distributes along one end of the working edge only, suggests hafting to the handle in an oblique way (Fig. 3: 5, 10, 12).

**Borers**: Four specimens are classified as borers. They have one pointed end enhanced by steep retouch on both lateral edges. The retouch on three of them is applied to the dorsal surface only (Fig. 2: 4), while on the remaining ones alternating retouch is seen on both surfaces (Fig. 2: 7). The pointed end of the latter is heavily worn out due to its use in a rotating motion.

**Burins**: Two blades bearing a transversal burin blow at one end are part of the collection (Fig. 2: 5, 6). The burinated ends show a steep edge, at nearly right angles to the ventral surface. These blows may have been made to section the blank to obtain a desired length rather than to produce a burin working edge.

**Denticulate**: This is a retouched flake with a serrated edge along one side (Fig. 2: 8). The serrated edge is made by irregular inverse retouch. The blank is a core-edge flake with a plunging end that is also retouched by inverse flaking.

**Retouched blades**: There are six blades with retouched scars along one or both edges. The retouches are finely made to create a nibbled edge. These blades exhibit morphological features closely resembling those of the sickle elements, and in fact they might have been used as such without leaving visible sickle gloss. Their size being similar to that of the sickle elements matches this interpretation, too (Table 4). However, a notable difference is seen in the raw material used. The brown flint was commonly used for retouched blades, while the gray flint was used for sickle elements (Table 6).

**Retouched flake**: There is a single piece of retouched flake in the present collection (Fig. 2: 9). Two small direct retouch scars are visible along one edge of the partially cortical flake.

### 3. Obsidian Artifacts

There are twenty-eight debitage and forty-six tools in the obsidian assemblages. Most of them are blades or blade tools. There are only four specimens on flake blanks: two unretouched flakes and two retouched flakes (Table 5). The blade blanks have parallel lateral edges and dorsal ridges (Fig. 5), and their widths are concentrated mostly between 12 and 16 mm with an average width of 14.3 mm (sixty-six pieces; s.d. = 4.02). Judging from the morphological and technological traits, the blades were mostly detached from the cores with pressure flaking. The exterior butt surface of the blades shows fine abrasion for platform preparation of the cores, and the butt itself is generally
very small. Cores are absent from the present sample, but the dorsal scar pattern of the blades indicates that they had a single-platform. Although a plunging blade (Fig. 4: 1) exhibits a few flake scars originating from the opposed platform, those scars are regarded as resulting from core preparation to create a convexity at the distal end of the core. The few flakes are most likely by-products from core preparation. At least some of the flakes show the use of a soft stone hammer, as evidenced by the bulb typical of this technique (Fig. 4: 4). The cores were prepared using a creasing method (Fig. 4: 2, 3).

The obsidian tool types are simple as follows (Table 5).

**Backed blades:** Two blades with oblique truncation retouch at the distal end were discovered (Fig. 5: 4). On both specimens, the retouch continues from the distal end to a part of the lateral edge to form a steep back. The working edge is left unmodified.

**Denticulates:** Many of the obsidian blades have more or less denticulated edges. Here, only blades with a continuous denticulation are referred to as denticulates. The illustrated specimens have working edges on both lateral edges, on which a series of bifacial flaking was made to create a denticulation (Fig. 5: 1, 2). However, it is unclear whether the denticulation was intentionally made.

**Notches:** The collection includes two blades with a notch on a lateral edge (Fig. 5: 3). The notch is made by rather steep and continuous direct retouch.

**Splintered pieces:** These tools have beveled edges at both ends, made by bifacial, often invasive, flakings. Five specimens are identified as such, all on blade blanks. There is an exceptionally large example made on a refreshing element of the working surface of a single-platform blade core (Fig. 4: 7). The other examples are on blades similar to ordinary blade tools and blades (Fig. 4: 6).

**Retouched blades:** These form the largest group of tools, which can be classified into three types according to the nature of retouch. The most standardized are blades with invasive retouch generally on the ventral surface (five pieces; Fig. 5: 10, 11). Their blanks are regular blades, both ends of which are snapped. The second are blades with regular retouch (nine pieces). A large variety of blanks are seen among them, from bladelets (Fig. 5: 5) to standardized narrow or wide ones (Fig. 5: 8, 9). The retouch patterns are also varied, apparently including pressure-flaking (Fig. 5: 5). Included in the third type are blades and bladelets with marginal retouch (twelve pieces; Fig. 5: 6, 7). The retouch is so marginal that it could be due to use.

**Retouched flakes:** There are two retouched flakes that represent the only tool type made on flake blanks. Regular or marginal retouched scars are visible (Fig. 4: 5).

**Corner-thinned blades:** This tool category was first defined by the present author at the nearby Proto-Hassuna site of Kashkashok II (Nishiaki 1990). The defining character is the burin-like lamellar retouch applied to one or more corners of the blade. The retouch obviously slants onto either the dorsal or ventral surface, hence thinning the corner. Based on retouch patterns, two types of corner-thinned blades have been defined (Nishiaki 2000a; 2008). The four corner-thinned blades of Kashkashok I completely fit in with the original definition typical of the Khabur Neolithic (Fig. 5: 12, 13). Especially remarkable is the location of thinned corners, which are positioned diagonally to dorsal and ventral surfaces, an identical trait to that noted at Kashkashok II.
IV. The Kashkashok I Lithic Industry from Chrono-Regional Perspectives
1. Chronological Perspective

The Khabur basin, together with Balikh Valley, constitutes the heartland of Halafian culture (see Nieuwenhuyse 2000; Cruells and Nieuwenhuyse 2004). The present data from Kashkashok I, although small in size and selected from a larger sample, can serve as a basis for examining chrono-spatial variability of the Late Halafian lithic craft. First, the chronological variability with reference to the Early Halafian material from Sabi Abyad I (Copeland 1996), the Balikh, and the Middle Halafian material from Umm Qseir (Maeda 1998), the Middle Khabur, is discussed. There is no detailed lithic data available although the eastern part of the Iraqi Jazireh, close to the Khabur, could also have been the heartland of Halafian culture.

Copeland (1996, 316) examined the stratified materials from Sabi Abyad I and emphasized a marked continuity in the lithic industry from the Pottery Neolithic to the Early Halafian, arguing that the major lifeways that were involved with lithic tools continued. This view is intriguing because the pottery industry made significant changes over this transitional time period (Nieuwenhuyse 2007). The data from Umm Qseir and Kashokashok I indicate the prevalence of the same lithic tradition into the Middle and Late Halafian periods as well. The raw material use, particularly of obsidian, represents a good example. The proportion of obsidian artifacts was quite high in the earlier Pottery Neolithic levels. Specifically, in Sabi Abyad I, it was 54.3% (Copeland 1996) and in Kashkashok II 32.7% (Nishiaki 1991). The common use of obsidian was maintained in the Early Halaf of Sabi Abyad I at 56.3% (Copeland 1996) and the Middle Halaf of Umm Qseir at 36.4% (Maeda 1998). Although the precise proportion cannot be estimated at Kashkashok I due to the nature of the sample (67.3%), the prevalent obsidian use in the Late Halaf of the Khabur Basin is probably a reality as repeatedly reported from survey or sounding sites in the region (Davidson and Watkins 1981; Nishiaki 2000b).

The common use of obsidian has also been reported from the Iraqi Jazireh sites including sites like Yarim Tepe II at 34.0% (Munchaev and Merpert 1981, 279; Merpert and Munchaev 1993) and Banahilk at 29.2% (Watson 1983). Arpachiyah also yielded plenty of obsidian artifacts (Campbell and Healey 2013). Yet, the similar and common use of obsidian does not necessarily indicate a continuity of the trade and distribution system of these exotic raw materials over the period of the Pottery Neolithic to the Halaf. There have been studies on trace elements showing the exploitation of more varied obsidian sources including those in the Southern Caucasus in the Halafian period (Cauvin and Chatignier 1998; Frahm et al. 2016).

Imported raw materials played an equally important role in flint use. The dual structure of flint industries in response to different types of flint at Kashkashok I was discussed earlier. Although the situation at the Early Halaf of Sabi Abyad I is not clear, Copeland (1996, 286) refers to the manufacturing of specific tool types on imported flints. A clearer picture has been reported from Umm Qseir. Maeda (1988) shows that the vast majority of flint artifacts are manufactured on locally available coarse-grained flint and only less than 5% are on non-local fine-grained flint. The description of the flint raw materials at Umm Qseir fits with that at Kashkashok I. Specifically, coarse-grained flint shows a “gray or light gray to brown” color while fine-grained flint consists of pieces with “dark brown, beige, gray or black” colors (Maeda 1998, 86–89). Apparently, the latter
contains both brown and the gray flints defined at Kashkashok I. Moreover, as at Kashkashok I, the coarse-grained flints were almost exclusively used for amorphous flake production and flake tools and the fine-grained ones were evidently favored for blade tools including sickle elements at Umm Qseir.

As at Umm Qseir, the original flint assemblage of Kashkashok I must have been dominated by flakes made of local flint. However, major tools for the farming community such as sickle elements and blade implements were manufactured largely on imported flint. A straightforward explanation for this phenomenon is to ascribe it to differences in raw material availability. No such good flint of a large size suitable for long blades and tabular knives as that on the Euphrates is available on the Khabur. The Halafian communities of the Khabur apparently relied upon imports to meet their requirements on a larger scale. The more common obsidian import may also have been part of this strategy. The current data are too sparse to examine the kind of social system that operated to accommodate raw material acquisition and consumption. Therefore, further examination using more data should contribute to a better understanding of the Halafian society of the Khabur.

In the meantime, it is important to note that this pattern indicates a continuation from the Middle to the Late Halafian periods on the Khabur. From a broader perspective, this dual structure of flint use dates at least to the Neolithic period (Nishiaki 1991; 2007). The Halafian system is distinguished by the more frequent consumption of gray flint, a type rarely identified in the earlier assemblages. Changes in the flint economy of the Halafian period could have occurred in the way it was used as well. Interestingly, the use of gray flint for sickle elements persisted even into the later period on the Khabur. At the Ubaid settlement of Beydar III, situated on the same wadi as Kashkashok I, although both brown and gray fine-grained flints were used, the gray ones were particularly preferred for manufacturing sickle elements (Nishiaki 2014) (Table 6).

In terms of techno-typology, three tool types deserve discussion. The first is the sickle element. The typological features of the sickle elements from the three settlements in question are virtually the same. They are characterized by a combination of narrow rectangular blades snapped/truncated at one or both ends and crescent-shaped flakes with backed retouch. The distribution pattern of sickle gloss and bitumen traces is similarly consistent at the Halafian sites in the Balikh and Khabur Valleys, showing the combination of parallel and oblique hafting (Nishiaki 2004). Any change in the proportion of these two types in the Halafian period remains to be determined. However, the more common occurrences of the rectangular type at Umm Qseir (Maeda 1998, 95) and Kashkakshok I (present study) seem to suggest a late feature of the Halafian industry, because the crescent-sickle elements were obviously more popular in the Early Halafian and the previous Pottery Neolithic periods (Copeland 1996; Nishiaki 2000a). This possible diachronic change may have been related to a change in the blank production technology toward more emphasis on pressure blade production. While pressure debitage was a phenomenon more commonly used on the obsidian in the Pottery Neolithic, this technique may have developed using imported, high-quality flint during the later Halafian times more frequently than before.

Second, the pressure-retouched bifacial knife of Kashkashok I attracts our attention (Fig. 2: 3). Parallels are found in the Early Halafian context of Sabi Abyad I, in which they are described as “tabular knives” made on tabular flint pieces covered with cortex on both surfaces (Copeland
1989, fig. 7.1: 2; 1996, fig. 4.7: 2). They do not necessarily possess a retouched point as noted on the Kashkashok I specimen. However, the unique configuration of the blank form and retouch pattern points to affinities between these two tool categories. Tabular knives are considered a southern trait (Copeland 1996, 317) because almost identical knives have been noted at Samarra sites to the south including Baghouz in Syria (Braidwood et al. 1944) and Samarra itself (Tani-ichi and Matsutani 1981, 123). In view of the strong influence of the Samarra culture on the formation of the Halaf culture (Nieuwenhuyse 2007), the occurrence of tabular or bifacial knives in the Halafian context cannot be considered a coincidence. Their morphological similarities to the ceramic scrapers made on reused sherds, popular at Halafian sites, also deserve further analysis (Tsuneki 2004). Whether the functions or uses are comparable to those of flint knives, the Middle Halafian lithic assemblage of Umm Qseir does not contain tabular knives; however, plenty of ceramic scrapers were recovered (Tsuneki 2004).

Third, a puzzling issue that presents itself concerns the obsidian tool typology. Corner-thinned blades comprise practically only the formalized tool type in the Kashkashok I collection (Fig. 5: 12, 13). This type of tool was originally defined as an important obsidian tool category of the PPNB to the Pottery Neolithic of the Jazireh (Nishiaki 1990; 2000a). As a matter of discussion, the corner-thinned blades in the Halafian contexts of Sabi Abyad I and Kashkashok I possess typological features that perfectly match the original definition. The question is whether they represent a typological continuity from the PPNB to the Halafian period. This statement should be evaluated with more data from other Halafian sites in the Jazireh. In the meantime, the following counterarguments are raised for future discussion: (1) the absence of corner-thinned blades from the Late Proto-Hassuna/Samarra site of Tell Boeid II (Nishiaki 2002) and the Middle Halafian site of Umm Qseir (Maeda 1998), both on the Middle Khabur; and (2) the possibility of the intrusion of corner-thinned blades from the earlier levels to the Halafian contexts. At Sabi Abyad I, Pottery Neolithic deposits are situated directly below the Halafian levels, and at Kashkashok I, there was a Proto-Hassuna settlement of Tell Kashkashok II nearby, whose inhabitants might have included the mound of Kashkashok I in their territory for daily activities.

2. Regional Perspective
The Halafian lithic industries of the Balikh and Khabur Valleys can be evaluated on a broader geographic scale through comparisons with contemporaneous assemblages from the neighboring regions with Halafian pottery. Limited information shows the following pictures.

The common use of obsidian is indicative of the Syrian Jazireh and its neighboring regions, including the Iraqi Jazireh. However, the proportion decreases away from the core region. Down to the south of the Tigris Valley, at Songor B in the Hamrin Basin, the percentage of obsidian is far less (Ohnuma 1981). However, the proportion may vary by settlements: Bulgarelli (1981) reports that obsidian comprised some 25 to 35% of the tools and tool blanks at Hassan, upstream of Songor B, while noting that these percentages are subject to changes when counts of unretouched flakes and wastes become available. Similarly, in the plain to the west of the Balikh Valley, the Late Halafian site of Kazane Höyük to the west of the Balikh in Southeast Anatolia yielded obsidian at less than 3% (Bernbeck et al. 1999). Settlements on the Euphrates Valley also show a rare use
of obsidian: 10.2% at Shams ed-Din (Azoury and Bergman 1980) and “a small number” only at Fistıklı Höyük (Starzmann 2013, 164). Further, obsidian was rarely used at Kosak shamali in the Halaf–Ubaid transitional period, its percentage being low (Nishiaki 2003). This is not the trend however in the upper stream of the Euphrates, Southeast Anatolia, which is closer to the obsidian sources. The Late Halafian assemblage of Girikihaciyan contains more than 30% obsidian pieces (Watson and Leblanc 1990). Likewise, further afield to the west in Southeast Anatolia, the Late Halafian community at Domuztepe enjoyed the use of obsidian at about 15% (Campbell and Healey 2011). These distinctive patterns of obsidian use should indicate different social responses to the local raw material environments. These are determined as a function of not only distance from the source areas but also social relationships between the communities (see Barge et al. 2018).

As noted earlier, the combination of snapped rectangular blades and crescent-shaped flakes with backed edges characterizes the sickle elements of the Balikh and Khabur Valleys. The same pattern is seen beyond the Jazireh from the Levant (e.g. el-Kerkh: Tsuneki et al. 1999), to Southeast Anatolia (e.g. Girikihaciyan: Watson and LeBlanc 1990), and to the Tigris Valley (e.g. Banahilk: Watson 1983). However, the Balikh–Khabur assemblages contain a much larger quantity of elongated rectangular blade elements. A similar pattern may also characterize the Halafian communities in the Iraqi Jazireh (Munchaev and Merpert 1981, 219). This trend may reflect the more popular use of pressure debitage in the Jazireh, especially in the later stages of the Halafian culture. In this regard, it is interesting that the situation on the Syrian Euphrates Valley seems to resemble that of the Balikh and Khabur. In the Middle/Late Halafian site of Shams ed-Din, elongated blade elements became predominant (Azoury and Bergman 1980) and continued to be common into the Halaf–Ubaid transitional phase as known at Kosak Shamali (Nishiaki 2003). However, when looking beyond the Syrian Jazireh at Girikihaciyan, glossed pieces are virtually limited to backed crescents (Watson and LeBlanc 1990, 87). The sickle elements from Domuztepe show rather irregular blade blanks, which were probably struck by percussion (Campbell and Healey 2011).

Bifacial knives or tabular knives comprise another typological element useful for regional comparisons. Similar tools have been widely distributed across the regions of the Halafian cultural landscape. Close parallels have been reported from the Early Halafian contexts (Munchaev and Merpert 1981, 275) in the Iraqi Jazireh.

In Southeast Anatolia, the Late Halafian specimen described as scraper in the report of Kazane Höyük belongs to a similar tool group, although it was made with unifacial retouch on a flake blank (Bernbeck et al. 1999, fig. 16-d). On the Upper Euphrates, a large bifacial knife from the Halaf–Ubaid transitional phase of Tell Kosak Shamali can be listed as a parallel (Nishiaki 2003. fig. 11.13: 5). The best parallels from the Levant include those from the Late Halafian settlement of Domuztepe in the western region of Southeast Anatolia. The excavators (Campbell and Healey 2011, 336) described that the bifacial knives were made on thin tabular flint and ground/polished on both surfaces. This construction precisely matched the features noted on the Kashkashok I specimen. In addition, two pressure-flaked knives, referred to as daggers, and a few tabular scrapers at Ain el-Kerkh in northwest Syria should also be considered related (Tsuneki et al. 1999; Arimura 1999). They occur in the El-Rouj 2d period, also made on high-quality flint,
equivalent to the Halaf period. The widespread occurrences of similar tools resemble the patterns of Halafian pottery, which are often considered to circulate as trade items. The fact that bifacial knives are often produced on imported flint (Copeland 1996, 286) supports this interpretation.

The other tool types available for geographic comparisons are limited. Some tool types often associated with the Halafian assemblages, such as transverse arrowheads (Miller 1982) and scrapers (Maeda 1998), are missing from Kashkashok I. These cannot be emphasized with the present small sample. The paucity of burins at Sabi Abyad I (3%: Copeland 1996), Umm Qseir (less than 2%: Maeda 1998), and Kashkashok I may be worth mentioning, for the relatively common occurrence of burins is known at the Late Halafian sites on the Upper Euphrates. Above all, in the Shams ed-Din assemblage, there are more burins than sickle elements (Azoury and Bergman 1980). Burins are common tools at the Late Halafian sites of Kazane Höyük (Bernbeck et al. 1999) and in the Halaf–Ubaid transitional phase of Kosak Shamali (Nishiaki 2003). Regardless of whether this contrast is meaningful, further examination of the evidence is prudent when more reports become available.

V. Conclusions

The small lithic artifact collection of Kashkashok I allows us to have a general idea about the Late Halafian lithic industry of the Khabur region. They exhibit a series of features in common with the known Halafian industries of the Syrian Jazireh. Important among these are the common use of imported obsidian and flint raw materials, elaborate techniques for blank production including pressure debitage, snapped rectangular blades and crescent-shaped flake-blades with backed edges for sickle elements, bifacial knives made on tabular flint, and the rare manufacturing of burins. These features are recognized in all the Early, Middle, and Late stages of the Halafian lithic tradition of the Syrian Jazireh. Moreover, they are evidently inherited from the preceding Pottery Neolithic industries of the Balikh and Khabur regions. Overall, our observations suggest that the Halafian lithic tradition of the Syrian Jazireh is considered an indigenous phenomenon of the region, despite the strong influence of the pottery industry from the south. This continuity, however, does not imply stagnation in lithic craft. The increasing employment of pressure debitage for flint blade production is a good example to show a notable development in the later stages of the Halafian culture.

On the other hand, the placement of this industry in a regional context is difficult to determine due to the lack of relevant data from the neighboring regions. A picture obtained from the limited information is that regions manifest the techno-typological elements noted above differently. The use of crescent-shaped flake sickle elements was a rather ubiquitous phenomenon across the Halafian sphere and even beyond, while sickle elements on rectangular blade segments were more popular in the Syrian Jazireh. Likewise, the occurrence of bifacial knives would crosscut these cultural-historical boundaries, and it may have involved a trade system. The patterns identified in this paper, although with limited data, support the statement made by Watson (1983, 573). Watson observed differences between the Halafian lithic assemblages from Banahilk and Amuq plain specifying that “the striking homogeneity of the painted pottery that has been noted from the northern Iraq across the northern Syria does not reflect similarity in all aspects of the technology
throughout the area.” Further research into the background of this entangled phenomenon, which is still in its infancy after more than thirty years, would open a window to view the complex Halafian cultural dynamics from a perspective unavailable from pottery analysis.

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**Figures**

Fig. 1: The Archaeological Sites Mentioned in the Text and Related Halafian Sites
Fig. 2: Flint Artifacts from Kashkashok I

1. Core-edge piece, Locus 97, Level IIIA, brownish gray flint (10YR 6/1); 2. Core-edge piece, Locus 116, Level IA, brownish black flint (7.5YR 3/1); 3. Bifacial knife, Locus unknown, brownish gray (7.5YR 4/1) with darker bands (the shaded areas indicate the polished surfaces before retouching); 4. Borer, Locus unknown, dull brown flint (7.5YR 5/3); 5. Burin or retouched blade with a burinated end, Locus 103, Level IIA, brownish gray flint (7.5YR 4/1); 6. Burin or retouched blade with a burinated end, Locus 110, Level IIB, grayish brown flint (5YR 4/2); 7. Borer with a highly worn tip, Locus 110, Level IIB, brownish black flint (7.5YR 3/1); 8. Denticulate on a plunging flake, Locus 116, Level IIB, light brownish gray flint (5YR 7/2); 9. Retouched flake on a partially cortical blank, Locus 42, Level IIB, bluish brown (7.5YR 5/3-10Y3/1).
Fig. 3: Flint Sickle Elements from Kashkashok I
(the shaded areas indicate the distribution of bitumen traces)

1. Sickle element, distal end snapped, Locus unknown, dull brown flint (7.5YR 6/3); 2. Sickle element, distal end
   snapped, Locus unknown, grayish brown flint (7.5YR 6/2); 3. Sickle element, distal end snapped, Locus 116, Level IA,
   brownish gray flint (10YR 6/1); 4. Sickle element, distal end snapped, Locus 105, Level IIA, grayish brown flint
   (5YR4/2-7.5YR6/4); 5. Sickle element, distal end snapped, Locus 106, Level IA, dull brown flint (7.5YR 6/3); 6. Sickle element,
   both ends snapped/truncated, Locus unknown, dull yellowish brown flint (10YR 7/2); 7. Sickle element, both ends
   snapped/truncated, Locus 92, Level IIB, dull orange flint (7.5YR 6/4); 8. Sickle element, both ends snapped/truncated,
   Locus 26, Level IIIA, brownish black flint (7.5YR 3/1); 9. Sickle element, both ends snapped/truncated, Locus 116, Level
   IA, brownish gray flint (7.5YR 4/1); 10. Sickle element, on unretouched blade, Locus 104, Level IIIA, light brownish gray
   flint (7.5YR 7/2); 11. Sickle element, obliquely truncated at both ends, Locus 107, Level IIIA, light gray flint (2.5Y 7/1);
12. Sickle element, obliquely truncated at both ends, Locus 116, Level IA, gray flint (10Y 5/1).
Fig. 4: Obsidian Artifacts from Kashkashok I

1. Retouched blade on a plunging blade, marginal retouch, Locus 118, Level IB; 2. Crested blade, Locus 114, Level IA; 3. Unretouched blade, with crested scars on the right side, Locus 105, Level IIA; 4. Unretouched flake, Locus 50, Level IIA; 5. Retouched flake, regular retouch, Locus 116, Level IA; 6. Splintered piece, Locus 107, Level IIIA; 7. Splintered piece, Locus 114, Level IA, black obsidian with red mottles.
Fig. 5: Obsidian Tools from Kashkashok I

1. Denticulate, Locus 92, Level IIB; 2. Denticulate, Locus 4, Level IIIB; 3. Notch, Locus 22, Level IIIA; 4. Backed blade, Locus 106, Level IA; 5. Retouched blade, regular pressure retouch (?), Locus 107, Level IIIA; 6. Retouched blade, regular retouch, Locus 123, Level IIA; 7. Retouched blade, marginal retouch, Locus 119, Level IA; 8. Retouched blade, regular retouch, Locus 35, Level IIIB; 9. Retouched blade, regular retouch, Locus 2, Level IIIB; 10. Retouched blade, invasive retouch, Locus 55, Level IIA; 11. Retouched blade, invasive retouch, Locus 104, Level IIIA; 12. Corner-thinned blade, Kashkashok type, Locus 112, Level IIA; 13. Corner-thinned blade, Kashkashok type, Locus 50, Level IIA.
Fig. 6: Flint and Obsidian Artifacts from Kashkashok I

1. Bifacial knife. See Fig. 2: 3 (length = 45 mm)
2. Splintered piece. See Fig. 4: 7 (length = 69 mm)
### Table 1: Raw Materials for Lithic Artifacts from Kashkashok I by Occupation Phases

| Phase   | IA % | IB % | IIA % | IIB % | IIA % | IIB % | Unknown % | Total % |
|---------|------|------|-------|-------|-------|-------|-----------|---------|
| Flint   | 7 | 50.0 | 0 | 0.0 | 9 | 31.0 | 6 | 7.1 | 5 | 21.7 | 1 | 9.1 | 5 | 41.7 | 110 | 100.0 |
| Obsidian | 7 | 50.0 | 2 | 100.0 | 20 | 69.0 | 10 | 52.6 | 18 | 78.3 | 10 | 90.9 | 7 | 58.3 | 74 | 67.3 |
| Total   | 14 | 100.0 | 2 | 100.0 | 29 | 100.0 | 19 | 100.0 | 23 | 100.0 | 11 | 100.0 | 12 | 100.0 | 110 | 100.0 |

### Table 2: Flint Types at Kashkashok I by Occupation Phases

| Flint type         | IA % | IB % | IIA % | IIB % | IIA % | IIB % | Unknown % | Total % |
|--------------------|------|------|-------|-------|-------|-------|-----------|---------|
| Brown flint        | 3 | 42.9 | 0 | - | 7 | 77.8 | 2 | 40.0 | 0 | 0.0 | 2 | 40.0 | 19 | 52.8 |
| Gray flint         | 3 | 42.9 | 0 | - | 1 | 11.1 | 1 | 11.1 | 3 | 60.0 | 1 | 100.0 | 3 | 60.0 | 14 | 38.9 |
| Coarse-grained flint | 1 | 14.3 | 0 | - | 1 | 11.1 | 1 | 11.1 | 0 | 0.0 | 0 | 0.0 | 3 | 8.3 |
| Total              | 7 | 100.0 | 0 | - | 9 | 100.0 | 9 | 100.0 | 5 | 100.0 | 1 | 100.0 | 5 | 100.0 | 36 | 100.0 |

### Table 3: Inventory of Flint Artifacts from Kashkashok I by Occupation Phases

| Phase   | IA % | IB % | IIA % | IIB % | IIA % | IIB % | Unknown % | Total % |
|---------|------|------|-------|-------|-------|-------|-----------|---------|
| Debitage | 1 | 14.3 | 0 | - | 2 | 22.2 | 2 | 22.2 | 1 | 20.0 | 1 | 100.0 | 0 | 0.0 | 7 | 19.4 |
| Core-edge pieces | (1) | (100.0) | (0) | - | (0) | (0.0) | (0) | (0.0) | (0) | (0.0) | (1) | (100.0) | (0) | (0.0) | (2) | (28.6) |
| Blades  | (0) | (0.0) | (0) | - | (2) | (100.0) | (2) | (100.0) | (0) | (0.0) | (1) | (100.0) | (0) | (0.0) | (5) | (71.4) |
| Total   | 7 | 100.0 | 0 | - | 9 | 100.0 | 9 | 100.0 | 5 | 100.0 | 1 | 100.0 | 5 | 100.0 | 36 | 100.0 |

### Table 4: Average Size of Sickle-Elements and Retouched Blades from Kashkashok I by Occupation Phases (standard deviation in parentheses)

| Phase   | Length | Width | Thickness |
|---------|--------|-------|-----------|
| Sickle elements |        |       |           |
| Phase IA (n=4) | 45.1 (24.42) | 15.1 (1.97) | 4.7 (2.16) |
| Phase IIA (n=2) | 51.5 (13.44) | 19.2 (6.65) | 4.6 (0.78) |
| Phase III (n=2) | 43.5 (0.71) | 14.9 (1.98) | 4.4 (1.27) |
| Phase IIIA (n=3) | 47.7 (8.51) | 14.1 (4.54) | 4.7 (0.83) |
| Unknown (n=3) | 43.4 (1.70) | 16.2 (0.98) | 4.4 (0.96) |
| Total (n=14) | 46.7 (14.82) | 15.6 (3.68) | 4.6 (1.33) |

| Retouched blades |        |       |           |
| Phase IA (n=1) | 35.0 | 18.0 | 3.8 |
| Phase IIA (n=3) | 47.8 (4.30) | 18.6 (6.80) | 5.4 (1.72) |
| Phase III (n=2) | 53.1 (17.06) | 17.8 (2.87) | 3.7 (1.07) |
| Total (n=6) | 47.2 (13.12) | 16.9 (4.53) | 4.3 (1.13) |
Table 5: Inventory of Obsidian Artifacts from Kashkashok I by Occupation Phases

| Phase          | IA % | IB % | IA % | IB % | IA % | IB % | Unknown % | Total % |
|----------------|------|------|------|------|------|------|-----------|---------|
| Debitage       | 3    | 42.9 | 1    | 50.0 | 2    | 100.0| 3          | 18.9    |
| Core-edge element | (1)  | (33.3) | (0) | (0.0) | (0) | (0.0) | (0)          | (0.0)    |
| Flakes         | (0)  | (0.0) | (0)  | (0.0) | (0)  | (0.0) | (0)          | (0.0)    |
| Blades         | (2)  | (66.7) | (1) | (100.0) | (8)  | (88.9) | (3)          | (100.0)  |
| Tools          | 4    | 57.1 | 1    | 50.0 | 2    | 100.0| 6          | 66.7    |
| Backed blade   | (0)  | (0.0) | (0)  | (0.0) | (1)  | (11.1)| (0)          | (0.0)    |
| Denticulates   | (0)  | (0.0) | (0)  | (0.0) | (1)  | (100.0)| (0)          | (0.0)    |
| Notches        | (0)  | (0.0) | (0)  | (0.0) | (0)  | (0.0) | (1)          | (8.3)    |
| Splintered pieces | (1) | (25.0) | (2) | (100.0) | (2)  | (100.0)| (1)          | (1.4)    |
| Invasive ret. blades | (0) | (0.0) | (0)  | (0.0) | (1)  | (100.0)| (0)          | (0.0)    |
| Edge-damaged blades | (1) | (25.0) | (1) | (100.0) | (2)  | (100.0)| (1)          | (8.3)    |
| Edge-damaged blades | (1) | (25.0) | (1) | (100.0) | (2)  | (100.0)| (1)          | (8.3)    |
| Total          | 7    | 100.0 | 2    | 100.0 | 20   | 100.0| 9          | 100.0    |

Table 6: Lithic Raw Material Use at Kashkashok I

| Types            | Brown flint % | Gray flint % | Coarse-grained flint % | Flint total % | Obsidian % |
|------------------|---------------|--------------|------------------------|---------------|-----------|
| Core edge elements | 1            | 5.3          | 1                      | 7.1           | 0         | 5.6       | 1          | 1.4        |
| Flake debitage   | 0             | 0.0          | 0                      | 0.0           | 0.0       | 0         | 2          | 2.7        |
| Blade debitage   | 3             | 15.8         | 2                      | 14.3          | 0         | 0.0       | 5          | 13.9       | 26        | 35.1      |
| Flake tools      | 0             | 0.0          | 0                      | 0.0           | 2         | 66.7      | 2          | 5.6        | 3         | 4.1       |
| Blade tools      | 10            | 52.6         | 1                      | 7.1           | 1         | 33.3      | 12         | 33.3       | 42        | 56.8      |
| Sickle elements  | 4             | 21.1         | 10                     | 71.4          | 0         | 0.0       | 14         | 38.9       | 0         | 0.0       |
| Knife            | 1             | 5.3          | 0                      | 0.0           | 0.0       | 0         | 1          | 2.8        | 0         | 0.0       |
| Total            | 19            | 100.0        | 14                     | 100.0         | 3         | 100.0     | 36         | 100.0      | 74        | 100.0     |