TECHNOLOGY AND USE OF SPACE IN THE PRODUCTION OF OBSIDIAN BLADELETS AT TELL SEKER AL-AHEIMAR

12

Seiji Kadowaki (Nagoya University Museum),
Kenji Nagai (Tohoku University of Art and Design)
and **Yoshihiro Nishiaki** (The University of Tokyo, The University Museum)

ABSTRACT
This article is concerned with the social context of obsidian chipped stone production among Late Neolithic communities in Upper Mesopotamia, discussing how space was used in the production of obsidian bladelets by examining the spatial distribution and discard behaviour of obsidian chipped stones at Tell Seker al-Aheimar. The production technology of obsidian bladelets at the site is more complicated and standardised than the expedient flake production using local flint cobbles. However, currently available data do not show any evidence for workshop production even in the area that contains debitage concentrations. The examination of the depositional contexts and the discard behaviour of the obsidian refuse indicate that the production of obsidian bladelets was principally carried out in domestic areas. Further investigations are necessary to clarify whether or how obsidian bladelets were distributed from producers to users.

INTRODUCTION
One of the characteristic archaeological phenomena in the Late Neolithic of Upper Mesopotamia is the distribution of obsidian across broad geographic areas. The research on this subject encompasses the sourcing of obsidian and its distributional patterns (e.g. Renfrew, Dixon and Cann 1966; Cauvin et al. 1998; Maeda 2003; Carter and Shackley 2007), the technology and typology of obsidian chipped stones (e.g. Nishiaki 1993, 2000; Conolly 1999a), the function of obsidian tools (e.g. Anderson 1994), and the symbolic/social meanings in the consumption of obsidian (e.g. Healey 2001, this volume; Maeda 2007). Addressing such issues as trade networks, craft specialisation, and social reproduction, each of these studies selects its own focus of examination from amongst a range of human activities that intersect the long, complicated life-history of obsidian tools, from raw material acquisition, distribution, to production, and then use. However, the discard of obsidian has rarely been a central issue, despite its potential relevance to various aspects of past human behaviour (e.g. Tani 1995). This paper presents a pilot study of the production technology and the discard behaviour of obsidian chipped stones in an effort to show an approach to clarifying the social contexts of the chipped obsidian industries in Late Neolithic communities.

The social context of the lithic industry is related to at least two issues that have been addressed in the study of obsidian artefacts. The first is the organisation of production or the degree of specialisation in the production of obsidian chipped stones. The possibility of specialised production of obsidian artefacts is suggested on the basis of the high skills and standardisation that researchers identify in the pressure debitage of regular blades/bladelets from single-platform cores (e.g. Conolly 1999b:795; Healey 2001: 392; Arimura 2003:160-161). The second is the social significance in the consumption of obsidian. The idea that obsidian artefacts do not merely reflect functional, utilitarian needs is based on the selective use of obsidian or particular raw material types of obsidian for special artefacts, such as vessels, mirrors, and ornaments (Healey 2001:392-396, this volume), as well as for specific types of chipped stones, such as projectile points and corner-thinned blades (Maeda 2007, this volume). These studies interpret the selective use of obsidian as a kind of social action that leads to the negotiation of social status of those possessing obsidian, or to the materialisation of the identity of community members who made and used obsidian tools.

The above two lines of research represent two different ways of interpreting the roles of obsidian in past human societies. The first views obsidian as the material correlate of social relations behind production activities, while the second regards obsidian as a material means for reproducing social relations. These contrasting views are, however, not mutually exclusive and may be complementary, because a single human activity, such as production or use of obsidian, can be interpreted as a practical behaviour, a social action, and an ideological practice at the same time. Considering such multiple lines of interpretation, we do not commit *a priori* to a particular interpretive approach. Instead, this paper aims to examine the social context of lithic production that can contribute to a wide range of subsequent interpretations.

For this purpose, it is important to seek solid archaeological evidence regarding the manufacturers, users, and possessors of obsidian artefacts. The apparent technological complexity, for example, the pressure flaking of blades/bladelets, does not necessarily point to the existence of specialised production (Borrell 2007:13). Rather, specialised production is primarily defined by the restricted number of production units in comparison to the number of consumption units (Costin 1991, 2001:276). In addition, the interpretation of obsidian in terms of social negotiation or social reproduction depends on our understanding of who was involved in such social processes. Were the processes occurring at the level of the whole community or only among selected individuals or households who had preferential access to obsidian?

One effective approach to identifying the producers or users in the archaeological record is to examine the spatial distribution of artefacts and the contexts in which they are deposited. Of course, in practice, such spatial and contextual analyses are usually not straightforward for various reasons such as the horizontal limitation of excavated areas, the difficulty in demonstrating the contemporaneity of deposits, and the complicated site formation processes that may have altered the traces of past human activities.

In spite of these challenges, this paper aims to show the significance of consulting the spatial and contextual information by presenting a preliminary study of the obsidian assemblages from the Neolithic settlement of Tell Seker al-Aheimar (Nishiaki and Le Mière 2005). This study pays particular attention to the production of obsidian bladelets at the site, since its technology shows a marked contrast to other technologies associated with locally available flint (Nishiaki 2007). Our study focuses on building levels dated to ca. 7000 cal. BCE, at the transition from the late Pre-Pottery Neolithic B (PPNB) to the Pottery Neolithic period, when the production of obsidian artefacts became quite popular in this community and left several concentrations of obsidian debitage. By examining the technology and discard behaviours that deposited the obsidian concentrations in these levels, the paper shows how space was used in the production of obsidian chipped stones. The results will then be discussed in terms of the social contexts surrounding the production of obsidian bladelets at the site.

THE CONSUMPTION OF OBSIDIAN IN THE CHIPPED STONE INDUSTRY AT TELL SEKER AL-AHEIMAR

The site of Seker al-Aheimar is located on the right bank of the Khabur River in northeastern Syria (Figure 12.1). The settlement forms an oval mound, covering an area of 300 m x 180 m with a height of 11 m above the surrounding surface. The northern slope of the tell has been the focus of investigations since the year 2000. Five sectors (A-E) have been opened for excavations, which have exposed a long, continuous sequence of

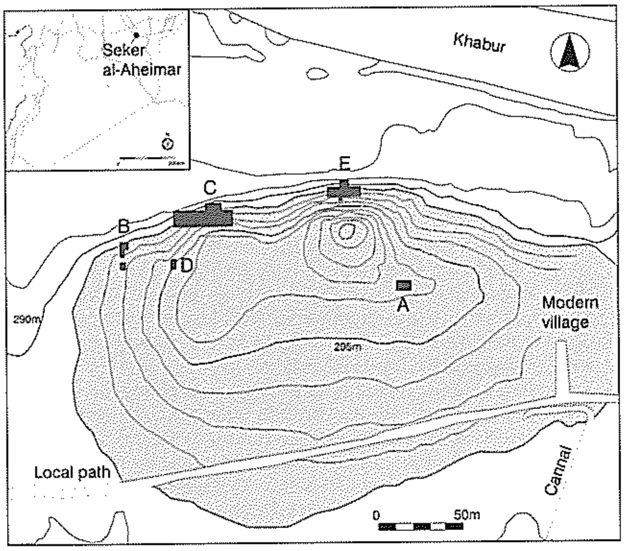


Figure 12.1. *Tell Seker al-Aheimar. Plan of the site and excavation areas.*

occupations from the late Pre-Pottery Neolithic B to the Proto-Hassuna phase of the Late Neolithic period (Nishiaki and Le Mière 2005; Bader and Le Mière, this volume). The radiocarbon dates for the occupation range from 7100 to 6500 cal. BCE.

The chipped stone technology at Seker al-Aheimar is characterised by the use of several different kinds of raw materials, including local and non-local flint as well as obsidian (Nishiaki 2007:Tab. 3). Local flint occurs in the form of small cobbles that rarely exceed 10 cm in length, and are used for the production of flakes from minimally prepared cores. Non-local flint and obsidian are of better quality than local flint cobbles and were imported in various forms. For example, items of dark brown flint were imported as finished products, such as projectile points, while yellowish brown flint and obsidian were imported as finished products of various blade tools as well as in the form of prepared cores (or core blanks) for local blade/bladelet production (Nishiaki and Nagai 2011). These cores of yellowish brown flint or obsidian have single platforms that were rarely facetted except in the case of recycled cores (Figure 12.2:1-2). The platform is situated nearly perpendicular to the working surface that often extends around the whole periphery of the platform, so that the cores frequently assume a 'bullet-form', which could have had other forms in earlier stages of core reduction (Wilke 1996). The very regular form of the core and its parallel flaking scars suggest that pressure debitage was employed in core reduction (Inizan, Roche and Tixier 1992; Wilke 1996).

In this way, the chipped stone assemblage at Tell Seker al-Aheimar includes many blades and bladelets made of imported flint and obsidian. However, the core technology appears to have been limited to the production of small blades and bladelets. This is indicated by the bi-modal distribution of the width of pressure flaked blades (Figure 12.3). Obsidian blades are the major component of the group that displays the smaller size range, whereas the group of larger blades is mainly made of flint. Large blades were probably imported as fin-

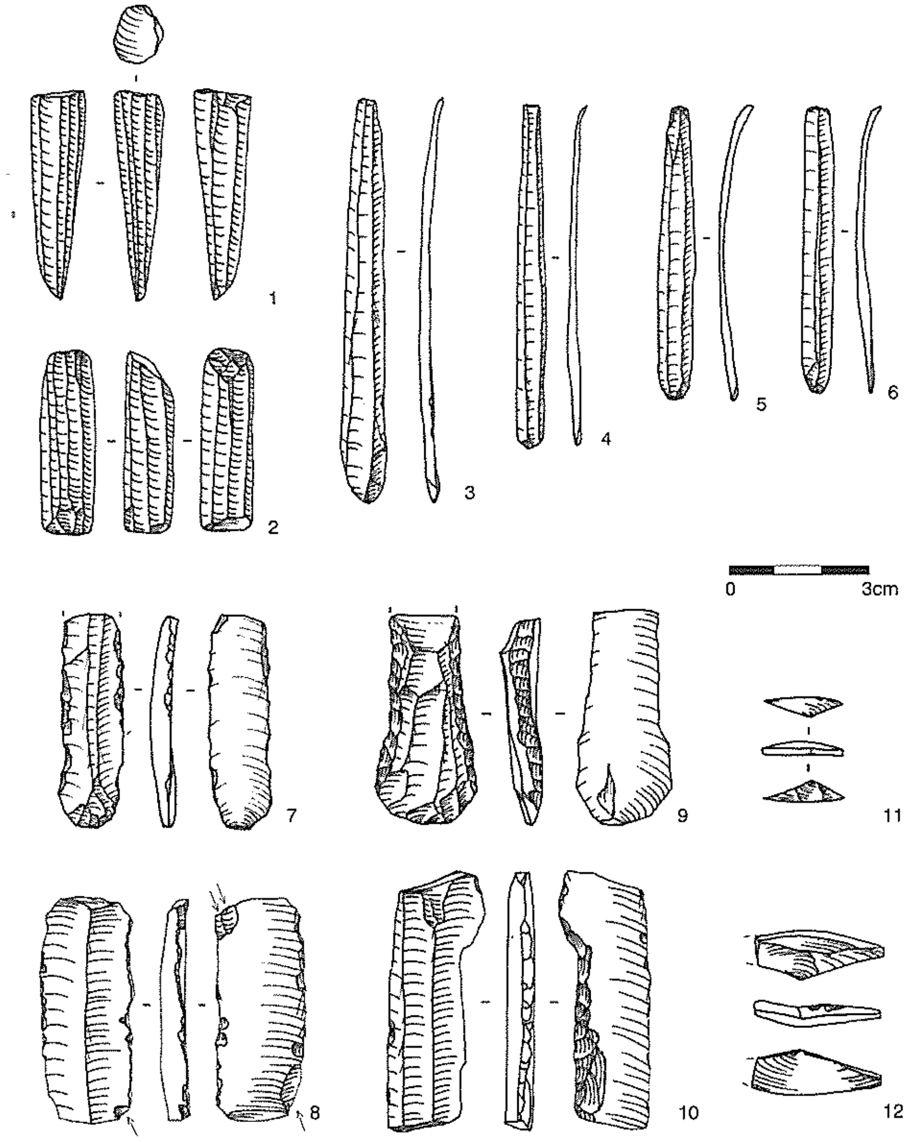


Figure 12.2. *Tell Seker al-Aheimar. Obsidian chipped stones. 1, 2: bullet cores; 3-6: bladelets; 7: retouched blade; 8: corner-thinned blade; 9, 10: Cayönü tools; 11-12: side-blow blade-flakes (1-4, 8-12: Pottery Neolithic; 5-7: late Pre-Pottery Neolithic B).*

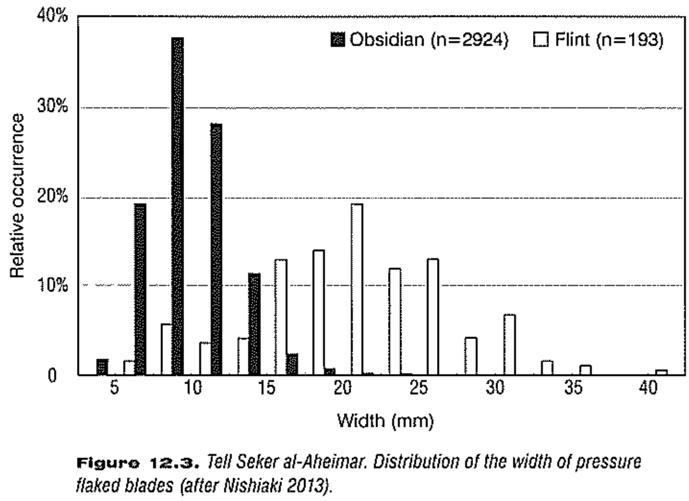


Figure 12.3. *Tell Seker al-Aheimar. Distribution of the width of pressure flaked blades (after Nishiaki 2013).*

ished products or tool blanks, because the excavations have not recovered cores or core-reduction waste that reflect the local production of large blades.

In sum, the obsidian industry at Tell Seker al-Aheimar involves two kinds of reduction processes. The first made use of obsidian imported in the form of finished products or blades, which were then locally modified into types recognised as Çayönü tools, corner-thinned blades, and side-blow blade-flakes (Figure 12.2:7-12). The second strategy involved the import of core blanks, which were then transformed into single-platform cores to manufacture bladelets (Figure 12.2:1-6).

THE SPATIAL DISTRIBUTIONS OF OBSIDIAN CHIPPED STONES

As an initial step for detecting the production loci of obsidian bladelets, we examined the spatial distribution of obsidian artefacts. Figure 12.4 shows a plan of Level 7 in Areas E11-13 in Sector C, which dates to the early 7th millennium cal. BCE at the beginning of the Late Neolithic period. The excavations revealed two rectangular buildings with mud walls in the eastern area. Partially eroded by the tell slope, the remaining part of the northernmost building consists of small cell-like rooms with gypsum plaster floors. The southern building comprises a broad room with a free-standing wall, connected to a narrow additional space to the east. Both rooms are paved with gypsum plaster. Buildings are not very well preserved in the western area, although another rectangular building appears to have existed there. Between the eastern and western

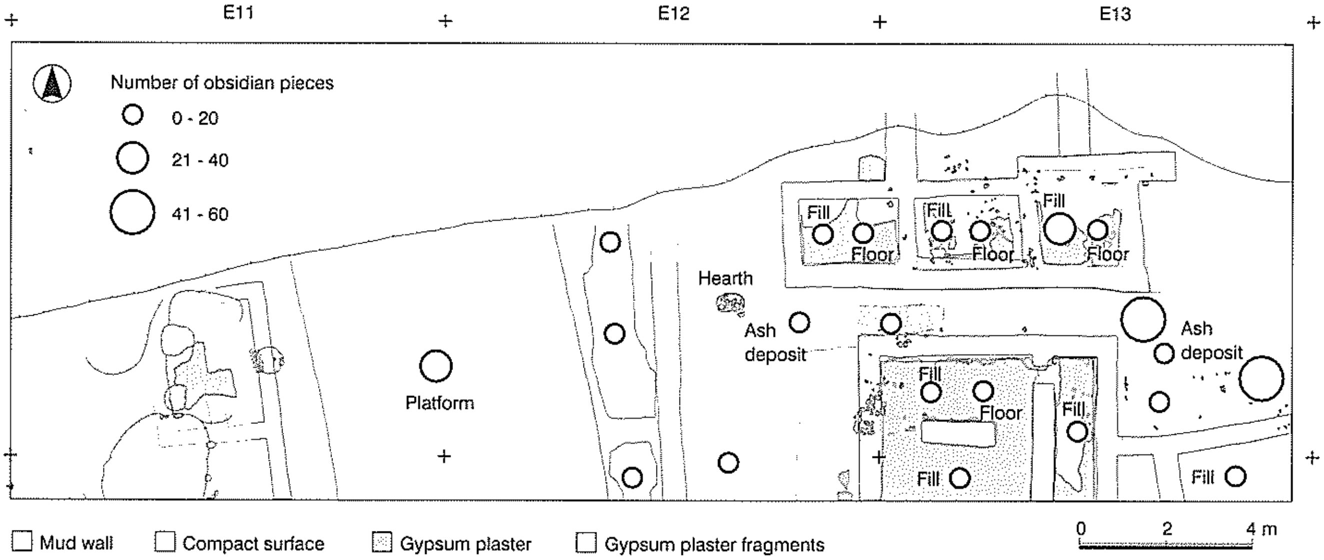


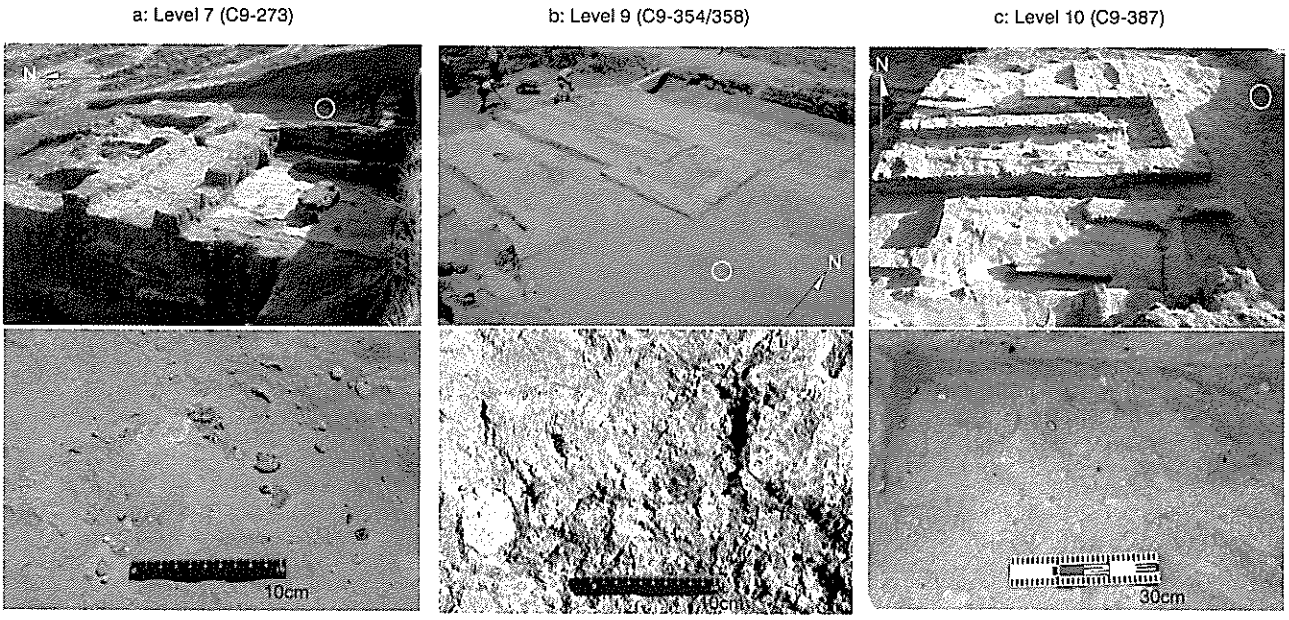
Figure 12.4. *Tell Seker al-Aheimar. Spatial distribution of obsidian artefacts at Level 7 in Areas E11-13 in Sector C.*

structures there is an open space that is associated with a platform constructed of mud slabs. The external area beside the platform is paved with gypsum fragments.

From among the various deposits excavated in this level, we selected for analysis those immediately located on building floors and outdoor surfaces as well as the fills of rooms, pits, and hearths. In addition, we selected ash deposits from the eastern external area. The spread and frequency of obsidian pieces from these selected contexts are illustrated in Figure 12.4. The results show that obsidian artefacts are concentrated in the outdoor area at the eastern end, adjacent to the rectangular building. This outdoor area contains ash deposits. On the other hand, the central outdoor area, which is associated with a platform and paved surfaces, yielded very few obsidian pieces.

In addition to what is shown in Figure 12.4, a concentration of obsidian debitage was discovered in the ash deposits associated with Level 7 in the eastern area (Figure 12.5a; Nishiaki 2008). This concentration included more than 3000 obsidian pieces clustered tightly in an area of about 10 cm diameter and 2-3 cm depth. These samples are not included in the counts in Figure 12.4. In Levels 9 and 10, too, each of which dates to the end of the late PPNB, two clusters of obsidian debitage were recovered in the same eastern external space with ash deposits (Figure 12.5b-c). Indeed, the eastern part of Area E13 continued to be used as an external area devoid of building structures over several levels. A similar arrangement of buildings is observed at this location spanning the late PPNB to early Pottery Neolithic levels. This remarkable continuity indicates that the introduction of pottery did not significantly affect the use of space in the settlement.

Figure 12.5. *Tell Seker al-Aheimar. The locations of three obsidian concentrations indicated by circles (top) and shown in close-up (bottom). A: Level 7; B: Level 9; C: Level 10.*



Summarising the above, the ashy eastern area in Area E13 is characterised by a denser distribution of obsidian pieces than other contexts. The following examines what activities were involved in the production and deposition of the obsidian concentrations.

WASTE MANAGEMENT BEHAVIOUR AT SEKER AL-AHEIMAR

As a first step in the analysis, it is important to realise that artefact concentrations do not necessarily indicate a locus of production. Crucially, the deposition may have experienced various accretion or depletion processes through natural or cultural agents (LaMotta and Schiffer 1999). The influence of cultural formation processes, including cleaning, dumping, recycling, and scavenging, are particularly relevant in sedentary settlements such as Seker al-Aheimar (Goring-Morris 1994; Verhoeven 1999; Panja 2003).

During the excavations of the eastern external area with obsidian concentrations, it was noted that the sediments are loose, containing a large amount of ash and refuse, such as animal bones and fragments of gypsum plaster in addition to chipped stones. Furthermore, the subsequent analyses of sediment samples from this area detected a relatively high density of grass phytoliths and fecal spherulites in comparison to other contexts, such as building floors, indicating that plant and animal dung were deposited in this area (Portillo et al. 2010). These depositional characteristics suggest that this area was primarily used for discarding domestic refuse.

A similar conclusion, though without pytholith analyses, was reached for similar midden deposits in other parts of the settlement. The most typical example is in Sector B, which is located at the northwestern corner of the tell (Figure 12.1). There, we opened two excavation trenches in the 2000 and 2003 seasons and excavated to a depth of more than 6 m. The deposits of this area consist of alternating layers of black, dark brown, and orange sediments and white ash, and there were very few traces of architectural remains (Nishiaki 2001). The ashy deposits contained a large number of faunal remains and Neolithic artefacts, including fragments of gypsum plaster, lithics, and pottery sherds. These depositional characteristics led us to interpret this part of the settlement as used for garbage disposal. The absence of sherds in lower layers suggests that the deposits accumulated from the late PPNB to the beginning of the Late Neolithic period.

In addition, several large refuse pits found in Sector C contained ashy sediments with abundant animal bones and various kinds of artefacts. Altogether, such depositional traits were repeatedly observed in contexts that we believe represent rubbish dumps, such as large pits and spaces devoid of architecture at the periphery of the settlement. We take this combination of traits to be a signature of the refuse character of the excavated deposit.

Another characteristic aspect of discard behaviour is the low density of refuse in rooms. At Seker al-Aheimar, only a small number of artefacts are usually recovered from deposits on floors and in room fills, as exemplified by the distribution of obsidian in Figure 12.4. This pattern is also observable

	C9-273 (Level 7)		C9-354 & 358 (Level 9)		C9-387 (Level 10)	
Retouched tool	1	0.0%	1	0.5%	2	0.3%
Blade (Width≥12mm)	0	0.0%	0	0.0%	3	0.4%
Bladelet	78	2.3%	36	16.4%	58	7.3%
Micro-bladelet (Width<3mm)	78	2.3%	24	10.9%	73	9.1%
Flake	264	7.8%	15	6.8%	33	4.1%
Chip (Max. length<10mm)	2922	86.8%	144	65.5%	622	77.9%
Chunk	18	0.5%	0	0.0%	0	0.0%
CTE	4	0.1%	0	0.0%	7	0.9%
Core	2	0.1%	0	0.0%	0	0.0%
TOTAL (Mass)	3367 (41.0g)	100.0%	220 (9.3g)	100.0%	798 (18.2g)	100.0%

Table 12.1. *Tell Seker al-Aheimar. Inventory of obsidian artefacts from the three obsidian concentrations.*

in the flint chipped stones. Because the rectangular buildings are likely to represent residential structures, the refuse from activities performed in the rooms must have been removed. In fact, a pilot study of thin sections of soils from building floors in Level 10 found almost no microscopic inclusions either in room fills or on floors. These contexts contain tubular and circular voids from plant remains, and only small quantities of limestone, charcoal and animal bones. While the presence of animal bones and charcoal fragments indicates cooking activities, their low densities provide evidence for regular, extensive cleaning of the gypsum plaster floors (Maher in press). On the basis of the above considerations of waste management, the following section examines the production and discard behaviours that contributed to the formation of the obsidian concentrations.

TECHNOLOGICAL EXAMINATION OF THE OBSIDIAN CONCENTRATIONS

The obsidian assemblages from the concentrations show similar patterns in their inventories (Table 12.1). Their major component is chips which are microdebitage (maximum length <10 mm) with discernible dorsal and ventral faces, followed by flakes and bladelets with only a few retouched tools (Figure 12.7:13-14). Some core fragments and core-trimming elements (CTE) are also included. These compositions are quite different from those of other contexts without obsidian concentrations. For example, Figure 12.6 compares one of the obsidian concentrations (C9-387 in Level 10) with a collection that is not spatially concentrated from a refuse pit in Level 10 (C13-92 and C13-100). It should be noted that the mesh size was slightly larger for sieving the latter samples (2.5 mm) than the former (1 mm). Nonetheless, the compositions of the two assemblages clearly differ from each other. It is evident that the collection from the refuse pit shows much higher proportions of retouched tools and bladelets with very few chips, which would certainly have been caught by the 2.5 mm mesh.

The assemblages from the concentrations include debitage types that are likely the by-products of bladelet production. Some are core fragments, one of which retains a part of the striking platform and a working surface (Figure 12.7:1). Another piece is probably from the distal end or the dor-

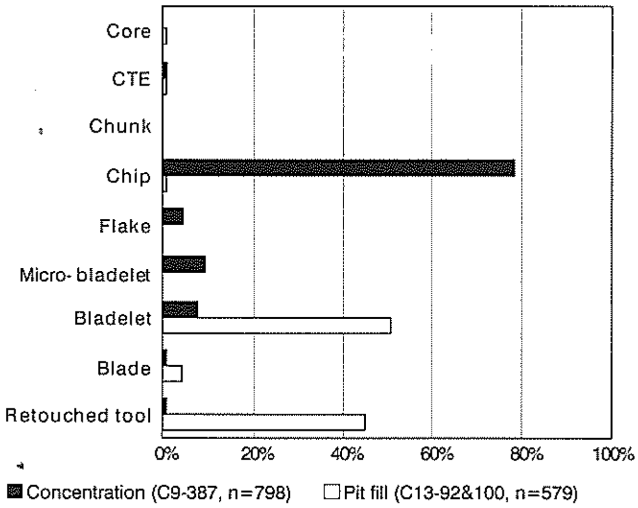


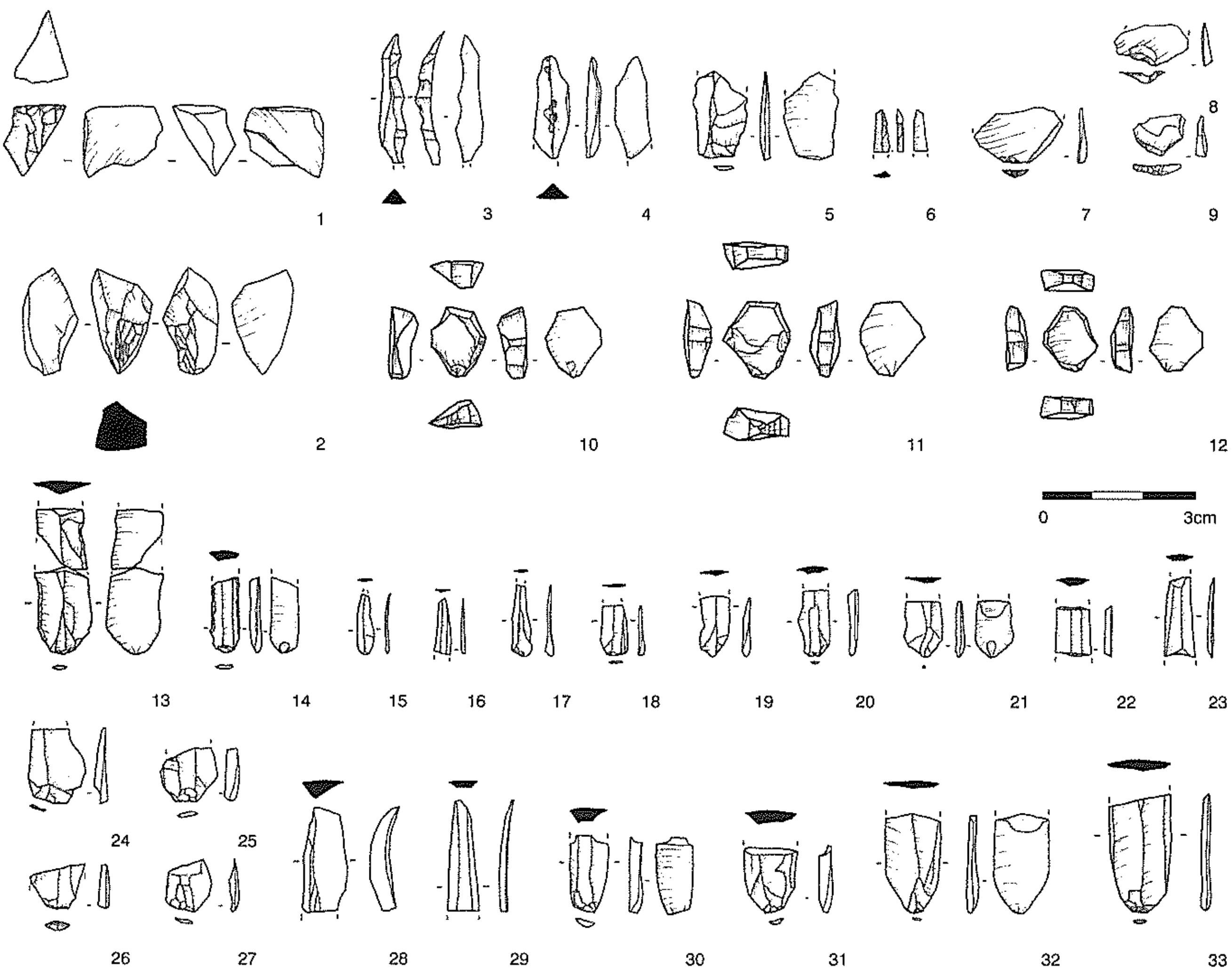
Figure 12.6. *Tell Seker al-Aheimar. Comparison of obsidian inventories between one of the concentrations and a pit fill in Level 10.*

Figure 12.7. *Tell Seker al-Aheimar. Obsidian artefacts from the concentrations. 1-2: core fragments; 3-6: bladelets with perpendicular flaking scars; 7-12: core tablets; 13, 14: retouched bladelets; 15-33: bladelets (1-9, 14-33: C9-273; 10-12: C9-387; 13: C9-358).*

sal part of a core (Figure 12.7:2). In addition, there are some bladelets with perpendicular flaking scars (Figure 12.7:3-6), which created crested ridges or trimmed the edge of cores.

Other kinds of core-reduction debitage include core tablets. Very thin tablets likely resulted from rejuvenating the striking platform of cores (Figure 12.7:7-9). One of the concentrations (C9-387) also included six relatively thick (ca. 5 mm) core tablets (Figure 12.7:10-12). They show regular bladelet scars on their entire periphery, indicating that the core had a bullet form. Five of them are made of the same obsidian type, and two of them refit. Because no bladelets were removed between the sequential removals of thick core-tablets, they are likely to represent the intentional destruction of an abandoned core (or cores) rather than careful platform rejuvenation. The thick core-tablets could possibly have been used as tools, but no clear traces of use can be observed at least with the naked eye. Either way, these pieces are the by-products of bladelet production from prismatic cores.

The assemblages also include a number of bladelets, many of which are very small (Figure 12.7:15-33). In this study, a bladelet with a width less than 3 mm is classified as a 'micro-bladelet'. Micro-bladelets are rarely discovered in other contexts. Figure 12.8 compares the distribution of the width of blades/bladelets between the three obsidian concentra-



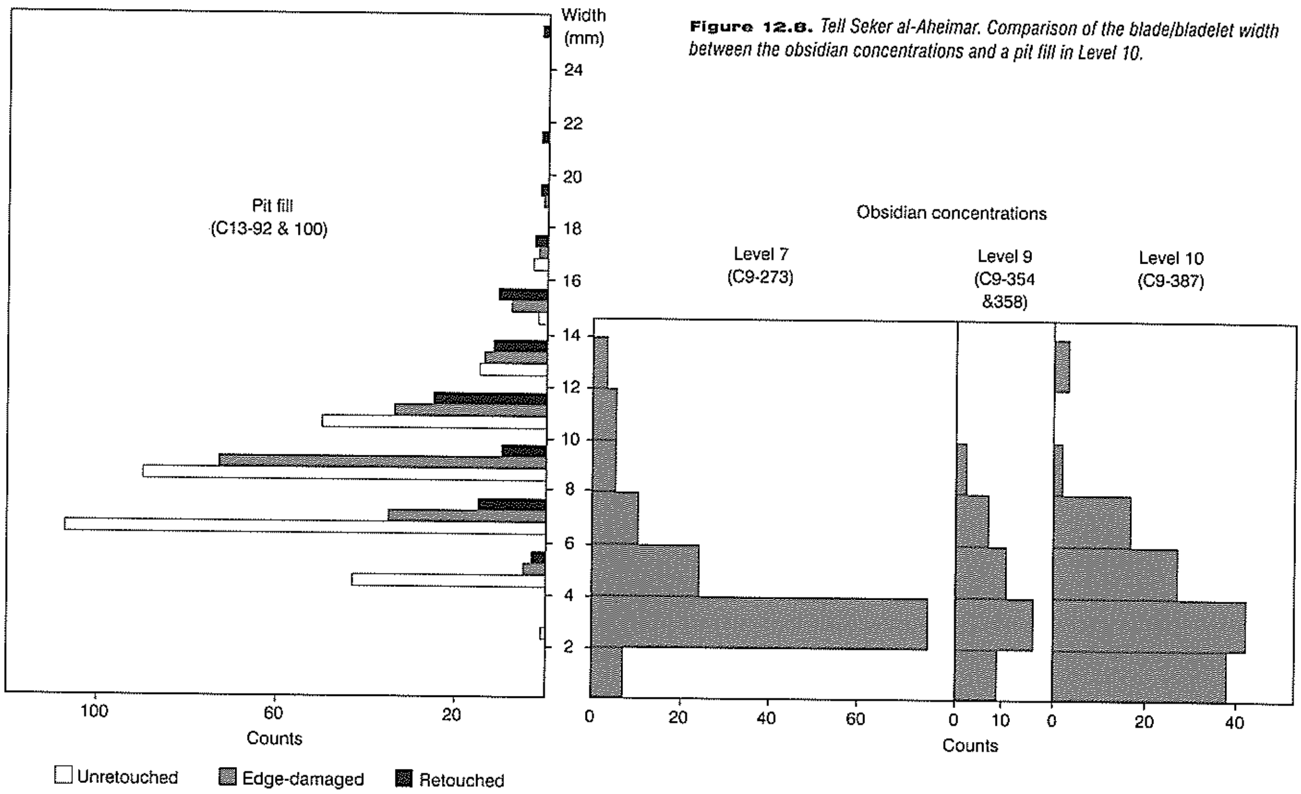


Figure 12.8. *Tell Seker al-Aheimar. Comparison of the blade/bladelet width between the obsidian concentrations and a pit fill in Level 10.*

tions and a refuse pit in Level 10 (C13-92 and C13-100). The blades and bladelets from the pit have been divided into retouched, unretouched, and edge-damaged pieces. The graph shows that bladelets from the obsidian concentrations tend to be narrower than any kind of bladelet recovered from the refuse pit. This is partly because the mesh size for sieving the pit fill (2.5 mm) was slightly larger than that used for collecting the obsidian concentrations (1 mm). However, the size of the micro-bladelets is well below the size range of retouched and edge-damaged bladelets. They are too small to have functioned as tools.

The micro-bladelets are probably part of the by-products of core-maintenance, particularly the removal of overhangs at the platform edge. According to Whittaker (1994:98-105), irregular platform edges need to be trimmed to avoid accidents in subsequent flake removals. Very small bladelets are also reported in the obsidian assemblages from early Classic Maya sites in Mesoamerica (Clark and Bryant 1997:117-118). These Maya bladelets are known as 'ribbon flakes', and they are interpreted as the by-products of overhang removals at the platform edge of obsidian prismatic cores. After conducting a bit of experimental archaeology ourselves, we are able to confirm that micro-bladelets or ribbon flakes are indeed produced by trimming the platform edge during the production of bladelets from a prismatic core (Figure 12.9).

In sum, the above technological observations indicate that the three concentrations of obsidian debitage represent waste that resulted from the production of bladelets rather than the disposal of used tools. If so, how were these obsidian concentrations deposited? In the following, we analyse the formation processes of the assemblages.

EXAMINING DISCARD BEHAVIOUR

As mentioned earlier, the ashy deposits containing the obsidian concentrations also include other refuse such as flint, animal bones, and shell (Table 12.2). The proportion of obsidian is very high in the sample from C9-273 (Level 7), but this reflects a difference in the sampling method. For this sample we only collected sediments from the very narrow area that contained the obsidian concentration (Figure 12.5a). The two other samples represent sediments that include the obsidian concentrations and the surrounding areas. Thus, the latter two samples should be more representative of the overall composition of the refuse in this area. The admixture of different kinds of refuse fits our expectations for domestic middens.

However, these assemblages each consist of only a limited number of obsidian raw material types as defined by colour, translucency, and the presence or absence of banding (Table 12.3). The homogeneity of obsidian types is the most obvious for the sample from C9-273 (Level 7), which consists of green, translucent, plain obsidian. This is followed by the

Table 12.2. *Tell Seker al-Aheimar. Materials recovered together with the three obsidian concentrations.*

	C9-273 (Level 7)		C9-354 & 358 (Level 9)		C9-387 (Level 10)	
Obsidian	3367	96%	220	13%	798	16%
Flint	21	1%	87	5%	115	2%
Clay object	0	0%	2	0%	0	0%
Bead	0	0%	0	0%	1	0%
Bone	115	3%	1341	81%	4016	80%
Shell	0	0%	8	0%	92	2%
TOTAL	3503	100%	1658	100%	5022	100%

Colour	Translucency	Banding	C9-273 (Level 7)	C9-354&358 (Level 9)	C9-387 (Level 10)
Green	Translucent	Banded	0%	37%	2%
		Un-banded	100%	44%	11%
Black	Translucent	Banded	0%	1%	0%
		Un-banded	0%	4%	83%
	Opaque	Banded	0%	0%	0%
		Un-banded	0%	10%	4%
Grey	Opaque	Un-banded	0%	1%	0%
Transparent		Banded	0%	1%	0%
Unidentifiable			0%	2%	0%
TOTAL			100% (n=3367)	100% (n=220)	100% (n=798)

Table 12.3. *Tell Seker al-Aheimar. Obsidian raw material types observed in the three concentrations.*

sample from C9-387 (Level 10), which mostly comprises black, translucent, plain obsidian. Finally, the sample from C9-354 and C9-358 (Level 9) includes the greatest variety of obsidian types, but most of them are green, translucent obsidian. This type was subdivided by the presence or absence of banding, but it is quite likely that the reduction of banded obsidian produced both small obsidian pieces with banding as well as unbanded pieces. We conclude that, even if obsidian concentrations were deposited together with other kinds of refuse, the obsidian debris of each concentration is likely to have originated from a single event, or at most a few such events.

Refuse size is often an effective indicator of the formation processes of archaeological deposits (e.g. Healan 1995; Schiffer 1996:267-269; Wandsnider 1996; Brown 2001). A general expectation, derived from ethnographic observations and experimental lithic production, is that primary refuse derived from human activities, particularly lithic production, tends to contain a large volume of small debitage. Furthermore, the contents of primary refuse are often altered by the cleaning of activity areas, which usually removes large obtrusive waste more intensively. Thus, secondary refuse dumps are characterised by the inclusion of larger objects. On the other hand, small refuse often escapes cleaning and remains in the activity areas, thus leaving archaeological deposits containing high ratios of small objects.

At Tell Seker al-Aheimar, small flakes and chips are the major components of the obsidian concentrations, accounting for 70-90% of the collections. The abundance of small flakes and chips would indicate that the obsidian debitage represents primary refuse from core reduction activities. However, as mentioned above, the area that yielded these assemblages consists of midden deposits that contain a large amount of secondary ash and refuse. The abundant recovery of small chipped stone in the refuse dump seems contradictory, because large pieces are expected to be the targets of cleaning.

To investigate this problem, we examined the size-frequency distribution of obsidian pieces in comparison with those of flint and bone fragments recovered from the same contexts. The results show two different size-distribution patterns (Figure 12.10). The first is a normal distribution, which is observable for bone fragments from all levels, flint from Levels 9 and 10, and obsidian from Level 9. The peak of their size distribution is at 4-8 mm, and frequencies clearly decrease in categories smaller than 4 mm. This pattern fits our expectation that small pieces escaped cleaning activity and were not included in the secondary refuse.

However, there is a second size-distribution pattern, which is similar to the so-called power-law distribution (or fractal distribution; Brown 2001). This distribution, showing that the frequencies of pieces increase as their sizes becomes smaller, is expected for primary refuse of lithic reduction. This pattern applies to obsidian from Levels 7 and 10, and to flint from Level 7. Although frequencies are somewhat low in the category of 1-2 mm, this is probably because we used a sieve with 1 mm mesh to collect the samples. Because the diagonal line of a 1 mm square is greater than 1 mm, some pieces of this size probably escaped and are underrepresented in the samples. Thus, the size-sorting patterns of the obsidian concentrations from Levels 7 and 10 are likely to fit those of primary refuse. Does

Figure 12.9. *A bullet core and selected bladelets detached from the core, experimentally produced by Kenji Nagai. Small, irregular bladelets were detached when trimming the overhang at the striking platform of the core. The bladelets with tapering end are the products in the process of maintaining the outline of the core, which can be further reduced.*

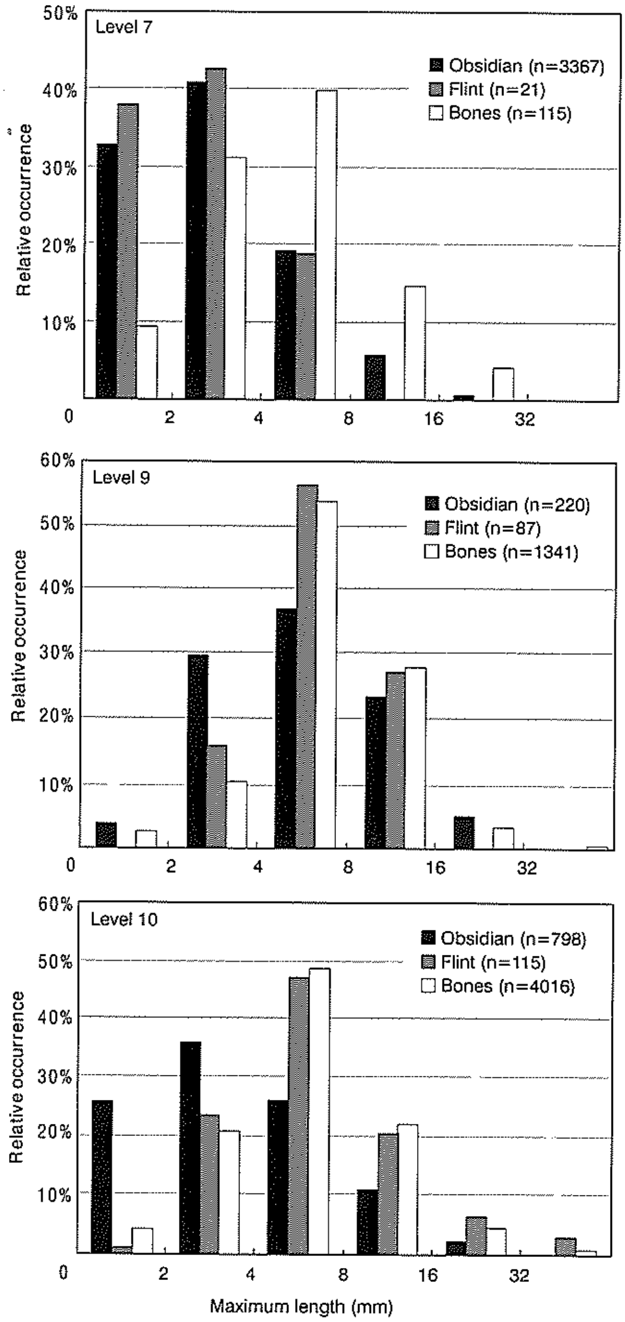


Figure 12.10. *Tell Seker al-Aheimar. Size-frequency distributions of obsidian, flint, and bone samples from the three obsidian concentrations.*

this mean that core reduction took place in the area that appears to have been used as a refuse dump?

The obsidian chipped stones in Levels 7 and 9 were tightly clustered in a very narrow area (10-15 cm in diameter; Figure 12.5a-b). Chips and flakes should have been dispersed more widely, if core reduction was performed at this spot. Thus, the tight clustering of debris is likely to have occurred as re-deposition. The idea of re-deposition is compatible with the size-sorting pattern of the obsidian concentration in Level 9, which shows a decrease in number in the smallest range since larger pieces were selectively collected by cleaning. On the other hand, the samples in Level 7 include a great volume of small chips, making them look like primary refuse, although their packed deposition suggests an intentional dump. Thus, the contents and the context of recovery appear to stand in contradiction with each other. One possible explanation is that this material represents an intensive collection and careful dump of obsidian debris. For example, Clark's ethnoarchaeological study in Lacandon Maya reports the production of chipped stones above a cloth intended to catch all the debitage (Clark 1991:66-67). Similar practices are likely to have been involved in the formation of the obsidian concentration in Level 7.

The obsidian concentration in Level 10 covers somewhat wider area (ca. 1 m in length, (Figure 12.5c). It is difficult to determine how widely obsidian debitage gets dispersed during the production of bladelets. As suggested by the experimental production of bullet cores (Wilke 1996), bladelets are pressure-flaked by using a small, hand-held device for immobilising a core, which is occasionally trimmed by percussion. The delicate work involved in the reduction of bullet cores may have caused the debitage to be dispersed over a restricted area. Another scenario is that these obsidian pieces were originally deposited in a tight cluster similar to the other assemblages, and subsequently dispersed by post-depositional processes such as trampling or sheet wash.

THE USE OF SPACE AND THE SOCIAL CONTEXT OF PRODUCTION

The above technological and spatial examinations suggest at least two alternative ways of using space in the production of obsidian bladelets. The first has the production taking place in the eastern external space in Area E13 itself, as indicated by the obsidian concentration of Level 10. The assemblage here is dominated by a single obsidian raw material type and includes the waste that resulted from bladelet production. Furthermore, the debris retains numerous small chips, the size-sorting pattern of which resembles a fractal distribution, which points to their primary depositional nature. The second use of space, suggested by the samples in Levels 7 and 9, has the production of bladelets occurring in places other than the eastern external area. Chipped waste was collected there and then dumped in the eastern area.

In either case, the locations where bladelet production took place do not appear to have been specialised locations for chipped stone manufacture. The eastern external area is filled with ashy deposits that contain a wide range of refuse, such as lithics, fragments of gypsum plaster, animal bones, plants, and animal dung, as described earlier. It is likely that the main use of the area was a dump for domestic refuse. If some activities took place in this area, including lithic production, they must have been sporadic, small-scale events. In fact, a single obsidian type accounts for the majority of the concentration in Level 10 (n=798), which weighs only 18 g in total (!), indicating that the knapping was an isolated event.

When bladelet production was carried out elsewhere, as suggested for Levels 7 and 9, it is difficult to determine where exactly it occurred. However, the obsidian refuse dumped in the eastern area gives hints as to how the production loci were maintained. Similar to the Level 10 concentration, each of those from Levels 7 and 9 is dominated by a single obsidian type, and their mass is quite small (41 g in Level 7; 9 g in Level 9). The refuse mainly consists of small bladelets, flakes, and chips, as examined earlier. These traits of the refuse indicate that the production loci had to be cleaned thoroughly after a single or perhaps a few knapping events. Such intensive cleaning of waste suggests that the place was not a specialised area for the production of chipped stones. The manufacture probably took place in general activity areas, where obsidian flakes had to be removed to avoid impeding the subsequent use of the area for other purposes.

At Seker al-Aheimar, one of the spaces that likely received such intensive cleaning is the building with the gypsum plaster floor (Nishiaki and Le Mière 2005). In fact, macroscopic remains are rarely found on gypsum plaster floors, as demonstrated in this case by the distribution of obsidian artefacts (Figure 12.4). According to the micromorphological examination of three building floors in Level 10, even microscopic remains were rarely included either in room fills or floors (Maher in press). Because no obsidian fragments were identified with certainty in this preliminary study of soil thin-sections, further investigation is required to determine whether activities carried out within domestic buildings included the production of obsidian bladelets.

In sum, the depositional contexts and the discard behaviour of the obsidian concentrations suggest that the production of obsidian bladelets was not performed in a specialised area, but probably took place where other activities were also carried out, such as in general activity areas or, occasionally, in midden areas. Such inferences of the production loci lead us to propose that obsidian bladelets were most likely produced in domestic contexts. This interpretation of the social context of obsidian bladelet production is compatible with the general expectations of other researchers, who interpret the mixture of production debris with domestic refuse as evidence for a low intensity of production (Costin 2001:280-281) or for part-time production (Moholy-Nagy 1997:308-309).

We do not exclude the possibility that areas beyond the trenches examined in this study (Areas E11-13, covering 10 m x 30 m) may contain concentrations of obsidian refuse on a much greater scale. In any case, even if workshops for obsidian bladelets existed elsewhere, they were probably quite rare, given the fact that large workshops of pressure flaked blades/bladelets have not been reported in other Neolithic sites, unless they are located near the raw material sources (Borrell 2007; Cauvin et al. 1998). Instead, the current data from Levels 7, 9, and 10 of Seker al-Aheimar suggest that the production of obsidian bladelets was principally organised at a small-scale at the level of the household during the transitional period from the late PPNB to the Late Neolithic.

This view of the organisation of obsidian bladelet production can provide a working hypothesis for the investigation of other Neolithic communities that produced bladelets from non-local obsidian. For example, examining the obsidian artefacts from Çatalhöyük, Conolly (1999b:90-91) demonstrated a spatial pattern, in which the larger houses, Mellaart's so-called 'shrines', tend to yield more obsidian points, prismatic blades, and prismatic blade cores. This leads him to suggest a 'localisation of production' and an 'extra-household, but intra-kinship' scale of production. More recently at Çatalhöyük, Carter and Shackley (2007:449-450) compared obsidian assemblages from Building 1 with those from Building 3, pointing out that the latter house yielded obsidian production debris, while the former mostly contained end-products. Based on this observation, they suggest that different households may have adopted the production technology of prismatic blades at different times and to a different degree. Collectively, these studies suggest that the manufacture of obsidian bladelets at Çatalhöyük was principally organised at the level of the household, similar to Levels 7, 9, and 10 of Seker al-Aheimar. However, they also point to variations among households in the scale or intensity of obsidian bladelet production. In light of this, our future study of Seker al-Aheimar will examine how production loci are distributed in wider areas including multiple household lots, so that we can discuss whether households produced obsidian bladelets for their own consumption or for exchange with other households. Another approach to this question is to conduct controlled manufacturing experiments, which will allow us to assess the correspondence between the number of bladelets and the amount of by-products (Clark 1997).

While the above discussion centred on the organisation of production, the context of obsidian bladelet production can also be interpreted in terms of its social significance to Neolithic communities. At Tell Seker al-Aheimar, the waste of obsidian bladelet production was concentrated in midden areas near domestic buildings in Levels 7, 9, and 10, which show remarkable continuation of a similar building arrangement (Figure 12.5). The repetitive construction of domestic buildings in the same location likely represents the continuous occupation by the same household over generations. If so, the repetitive occurrence of obsidian concentrations near the domestic buildings indicates that the practice of obsidian bladelet production also continued in association with the household.

According to experimental studies of prismatic cores (Wilke 1996; Clark and Bryant 1997) and our own experimental production of obsidian bladelets from bullet cores (Figure 12.9), obsidian bladelet production involves technological knowledge and skills that cannot be easily improvised, but, rather, require learning from exemplary artefacts or master knappers. Given this technological intricacy, in addition to the continuation of a standardised technology over generations, the manufacture of obsidian bladelets at the level of the household should have been upheld through teaching-learning interactions among household members.

To interpret the technological succession in the household in terms of its social consequence, we draw on a perspective that regards a household not as a static social group for daily production and consumption, but as a domain for dynamic social relations that are embedded in wider socio-political contexts (cf. Robin 2003). This approach to households has been adopted by Near Eastern archaeologists, who investigated the active roles of architecture, the use of space, and mortuary practices in the reproduction and transformation of Neolithic households (Banning and Byrd 1987; Verhoeven 1999; Kuijt 2000, 2008; Hodder and Cessford 2004; Kadowaki 2007). Within this interpretive framework, we argue that the succession of obsidian bladelet technology was not just the transmission of information over generations, but, rather, can be considered part of social practices that maintained human relationships in the household through the periodic enactment of regulated teaching-learning interactions. In this sense, the obsidian bladelet production from Levels 10 to 7 at Tell Seker al-Aheimar was not merely an outcome of the household's continuous occupation, but it was also a medium that contributed to the cultural reproduction of the household, a process that could have been influenced by a wide rage of material and behavioural media, encompassing architectural constructions, patterned uses of space, commemorative activities such as rituals and mortuary practices, and apparently practical domestic activities, such as replastering of floors, sweeping, food preparation, and craft production that included obsidian bladelets. Currently, we have little evidence about how the performance and inheritance of the production of other crafts, such as flint artefacts, pottery and gypsum objects, was socially embedded in Neolithic communities, including Tell Seker al-Aheimar (but see Castro Gessner, this volume, and Starzmann, this volume). This paper highlights the importance of examining the social context of craft production activities to obtain insights into their social consequences, particularly in relation to the household, which many studies suggest is a key to understanding the social fabric of early agricultural communities in the Neolithic Near East (e.g., Flannery 2002; Banning 2003; Wright and Garrard 2003; Hodder and Cessford 2004; Byrd 2005; Düring and Marciniak 2006; Kadowaki 2006).

CONCLUDING REMARKS

This paper examined the spatial distribution and discard behaviour of obsidian chipped stones, in order to understand how space was used in the production of obsidian bladelets. At Tell Seker al-Aheimar, the production of obsidian bladelets is technologically distinct from expedient flake production using local flint cobbles. However, '[t]echnological complexity… does not automatically imply the existence of specialists' (Borrell 2007:13). In fact, currently available data at the site do not show any evidence for workshop production, even in those areas where we find debitage concentrations. The depositional contexts and the discard behaviour of the obsidian refuse indicate that the production of obsidian bladelets was principally carried out in domestic areas. However, it is still unclear how obsidian bladelets were distributed from producers to users. To answer this question, we need to examine how the amount of by-products corresponds to the number of bladelets actually produced. Future study should also investigate other areas of the site to determine whether or not restricted numbers of households in the community were in charge of producing obsidian bladelets. Despite these future challenges, this pilot study has presented an effective approach for clarifying the social context of obsidian chipped stone production by Late Neolithic communities in Upper Mesopotamia.

ACKNOWLEDGMENTS

We are grateful to Dr. Bassam Jamous, Dr. Tammam Fakouch, Dr. Michel al-Maqdassi, Mr. Ahmed Taraqji and the entire staff of the Directorate General of Antiquities and Museums, Syria, for permission to conduct our research at Seker al-Aheimar. We also appreciate the local assistance kindly provided by Mr. Abdul Mashih Bagdoo, Mr. Orhan Nano, Mr. Khaled Ahmo, Mr. Maufaqa Daher and other staff at the Department of Antiquities, Hassake, as well as by Dr. Suleiman Alyas and Ms. Rodina Harfouch. This project is financially supported by the Takanashi Foundation (2000 and 2011), the Japan Society for the Promotion of Science (2001-2009), the Grant-in-Aid for Young Scientists B of the JSPS KAKENHI (23720382), and the Mitsubishi Foundation (2002-2005). We thank anonymous reviewers for their useful and insightful comments on this paper. We also extend thanks to Dr. Kevin Gibbs for clarifying our English text.

REFERENCES

Anderson, Patricia C. 1994. Reflections on the Significance of Two PPN Typological Classes in Light of Experimentation and Microwear Analysis: Flint 'Sickles' and Obsidian 'Çayönü Tools'. In *Neolithic Chipped Stone Industries of the Fertile Crescent*, edited by Hans G. Gebel and Stefan K. Kozlowski, pp. 61-82. Berlin: ex oriente.

Arimura, Makoto. 2003. The Lithic Production System in the Northwestern Levant from the LPPNB to the Early Pottery Neolithic: a View from Tell el-Kerkh 2. In *Archaeology of the Rouj Basin: A Regional Study of the Transition from Village to City in Northwest Syria*, edited by Takuya Iwasaki and Akira Tsuneki, pp. 155-165. Tsukuba: Department of Archaeology, University of Tsukuba.

Banning, Edward B. 2003. Housing Neolithic Farmers. *Near Eastern Archaeology* 66:4-21.

Banning, Edward B., and Brian F. Byrd. 1987. Houses and the Changing Residential Unit: Domestic Architecture at PPNB 'Ain Ghazal, Jordan. *Proceedings of the Prehistoric Society* 53:309-325.

Borrell, Ferran. 2007. Single-Platform Blade Knapping in the Middle Euphrates Valley During the Mid VIIIth Millennium cal. B.C. *Anatolia Antiqua* 15:1-16.

Brown, Clifford T. 2001. The Fractal Dimensions of Lithic Reduction. *Journal of Archaeological Science* 28:619-631.

Byrd, Brian F. 2005. *Early Village Life at Beidha, Jordan: Neolithic Spatial Organization and Vernacular Architecture*. Oxford: Oxford University Press.

Carter, Tristan, and M. Steven Shackley. 2007. Sourcing Obsidian from Neolithic Çatalhöyük (Turkey) Using Energy Dispersive X-Ray Fluorescence. *Archaeometry* 49 (3):437-454.

Cauvin, Marie-Claire, Alain Gourgaud, Bernard Gratuze, Nicolas Arnaud, Gérard Poupeau, Jean-Louis. Poidevin and Christine

Chataigner (eds). 1998. L'obsidienne au Proche et Moyen Orient: du volcan à l'outil. BAR International Series 738. Oxford: Archaeopress.

Clark, John E. 1991. Flintknapping and Debitage Disposal among the Lacandon Maya of Chiapas, Mexico. In *The Ethnoarchaeology of Refuse Disposal*, edited by Edward Staski and Livingston D. Sutro, pp. 63-78. Tempe: Arizona State University.

Clark, John E. 1997. Prismatic Blademaking, Craftsmanship and Production: An Analysis of Obsidian Refuse from Ojo de Agua, Chiapas, Mexico. *Ancient Mesoamerica* 8:137-159.

Clark, John E. and Douglas D. Bryant. 1997. A Technological Typology of Prismatic Blades and Debitage from Ojo de Agua, Chiapas, Mexico. *Ancient Mesoamerica* 8:111-136.

Conolly, James. 1999a. *The Çatalhöyük Flint and Obsidian Industry: Technology and Typology in Context.* BAR International Series 787. Oxford: Archaeopress

Conolly, James. 1999b. Technical Strategies and Technical Change at Neolithic Çatalhöyük, Turkey. *Antiquity* 73:791-800.

Costin, Cathy L. 1991. Craft Specialization: Issues in Defining, Documenting, and Explaining the Organization of Production. In *Archaeological Method and Theory III*, edited by Michael Schiffer, pp. 1-56. Tucson: University of Arizona Press.

Costin, Cathy L. 2001. Craft Production Systems. In *Archaeology at the Millennium: A Source Book*, edited by Gary M. Feinman and T. Douglas Price, pp. 273-327. New York: Springer.

Düring, Bleda S., and Arkadiusz Marciniak. 2006. Households and Communities in the Central Anatolian Neolithic. *Archaeological Dialogues* 12 (2):165-187.

Flannery, Kent. 2002. The Origins of the Village Revisited: From Nuclear to Extended Households. *American Antiquity* 67 (3):417-433.

Goring-Morris, Nigel. 1994. Aspects of the PPNB Llithic Industry at Kfar HaHoresh, Near Nazareth, Israel. In *Neolithic Chipped Stone Industries of the Fertile Crescent*, edited by Hans G. Gebel and Stefan K. Kozlowski, pp. 427-444. Berlin: ex oriente.

Healan, Dan M. 1995. Identifying Lithic Reduction Loci with Size-Graded Macrodebitage: A Multivariate Approach. *American Antiquity* 60 (4):689-699.

Healey, Elizabeth. 2001. The Role of Obsidian at the Halaf Site of Domuztepe, Southeast Anatolia. In *Beyond Tools: Redefining the PPN Lithic Assemblages of the Levant*, edited by Isabelle Caneva, Cristina Lemorini, Daniela Zampetti and Paolo Biagi, pp. 389-398. Berlin: ex oriente.

Hodder, Ian, and Craig Cessford. 2004. Daily Practice and Social Memory at Çatalhöyük. *American Antiquity* 69 (1):17-40.

Inizan, Marie-Louise, Hélène Roche and Jacques Tixier. 1992. *Technology of Knapped Stone.* Meudon: Cercle de Recherches et d'Études Préhistoriques.

LaMotta, Vincent M., and Michael Schiffer. 1999. Formation Processes of House Floor Assemblages. In *The Archaeology of Household Activities*, edited by Penelope M. Allison, pp. 19-29. London: Routledge.

Kadowaki, Seiji. 2006. Ground-Stone Tools and Implications for the Use of Space and Social Relations at 'Ain Abū Nukhayla, a PPNB Settlement in Southern Jordan. In *Domesticating Space: Construction, Community, and Cosmology in the Late Prehistoric Near East*, edited by Edward B. Banning and Michael Chazan, pp. 53-64. Berlin: ex oriente.

Kadowaki, Seiji. 2007. Changing Community Life at a Late Neolithic Farmstead: Built Environments and the Use of Space at Tabaqat al-Bûma in Wadi Ziqlab, Northern Jordan. PhD Thesis, University of Toronto.

Kuijt, Ian. 2000. People and Space in Early Agricultural Villages: Exploring Daily Lives, Community Size, and Architecture in the Late Pre-Pottery Neolithic. *Journal of Anthropological Archaeology* 19:75-102.

Kuijt, Ian. 2008. The Regeneration of Life: Neolithic Structures of Symbolic Remembering and Forgetting. *Current Anthropology* 49 (2):171-197.

Maeda, Osamu. 2003. Prehistoric Obsidian Distribution in the Rouj Basin. In *Archaeology of the Rouj Basin: A Regional Study of the Transition from Village to City in Northwest Syria*, edited by Takuya Iwasaki and Akira Tsuneki, pp. 167-184. Tsukuba: Department of Archaeology, University of Tsukuba.

Maeda, Osamu. 2007. Meaning of Obsidian Exchange and Obsidian Use at Akarçay Tepe. In *Systèmes techniques et communautés du néolithique précéramique au Proche-Orient*, edited by Laurence Astruc, Didier Binder and François Briois, pp. 245-254. Antibes: APDCA.

Maher, Lisa. 2009. *Seker al-Aheimar Thin Sections: Preliminary Report.* Unpublished Report Filed at The University Museum, The University of Tokyo.

Moholy-Nagy, Hattula. 1997. Middens, Construction Fill, and Offerings: Evidence for the Organization of Classic Period Craft Production at Tikal, Guatemala. *Journal of Field Archaeology* 24 (3):293-313.

Nishiaki, Yoshihiro. 1993. Anatolian Obsidian and the Neolithic Obsidian Industries of North Syria: A Preliminary Review. In *Essays on Anatolian Archaeology and its Surrounding Civilizations*, edited by H.I.H. Prince Takahito Mikasa, pp. 140-159. Wiesbaden: Harrassowitz.

Nishiaki, Yoshihiro. 2000. *Lithic Technology of Neolithic Syria.* BAR International Series 840. Oxford: Archaeopress.

Nishiaki, Yoshihiro. 2001. Tell Seker al-Aheimar, the Upper Khabur, Syria: The 2000 Season. *Orient Express* 2001 (2):35-37.

Nishiaki, Yoshihiro. 2007. Patterns of Flint Exploitation and Use at the Neolithic Settlement of Tell Seker al-Aheimar, Northeast Syria. In *Chert Availability and Prehistoric Exploitation in the Near East*, edited by Christophe Delage, pp. 87-103. BAR International Series 1615. Oxford: Archaeopress.

Nishiaki, Yoshihiro. 2008. Excavations at Tell Seker al-Aheimar, Hassake: The 2007 Season. *Chronique Archeologique en Syrie* 3:53-61.

Nishiaki, Yoshihiro. 2013. PPNB Flint Blade Production at Tell Seker al-Aheimar, the Upper Khabur, Syria. In *The Neolithic Archaeology in Upper Mesopotamia and Beyond*, edited by Yoshihiro Nishiaki, Kaoru Kashima and Marc Verhoeven. Tokyo: University of Tokyo Press.

Nishiaki, Yoshihiro, and Marie Le Mière. 2005. The Oldest Pottery Neolithic of Upper Mesopotamia: New Evidence from Tell Seker al-Aheimar, the Khabur, Northeast Syria. *Paléorient* 31 (2):55-68.

Nishiaki, Yoshihiro and Kenji Nagai. 2011. Obsidian Knappers at the Late PPNB Consumer Settlement of Tell Seker Al-Aheimar, Northeast Syria. *Paléorient* 37(2): 91-105.

Panja, Sheena. 2003. Mobility Strategies and Site Structure: a Case Study of Inamgaon. *Journal of Anthropological Archaeology* 22:105-125.

Portillo, Marta, Rosa M. Albert, Seiji Kadowaki, and Yoshihiro Nishiaki. 2010. Domestic Activities at Early Neolithic Tell Seker al-Aheimar (Upper Khabur, Northeastern Syria) through Phytoliths and Spherulites Studies. In *Des hommes et des plantes: exploitation du milieu et gestion des ressources végétales de la préhistoire à nos jours*, edited by Clair Delhon, Isabelle Théry-Parisot and Stéphanie Thiébault, pp. 19-30. Antibes: APDCA.

Renfrew, Colin, J. E. Dixon and J. R. Cann. 1966. Obsidian and Early Cultural Contact in the Near East. *Proceedings of the Prehistoric Society* 32:30-72.

Robin, Cynthia. 2003. New Directions in Classic Maya Household Archaeology. *Journal of Archaeological Research* 11 (4):307-356.

Schiffer, Michael. 1996. *Formation Processes of the Archaeological Record.* Salt Lake City: University of Utah Press.

Tani, Masashi. 1995. Beyond the Identification of Formation Processes: Behavioral Inference Based on Traces Left by Cultural Formation Processes. *Journal of Archaeological Method and Theory* 2 (3):231-252.

Verhoeven, Marc. 1999. *An Archaeological Ethnography of a Neolithic Community: Space, Place and Social Relations in the Burnt Village at Tell Sabi Abyad, Syria.* Istanbul: Nederlands Historisch-Archaeologisch Instituut in het Nabije Oosten.

Wandsnider, LuAnn. 1996. Describing and Comparing Archaeological Spatial Structures. *Journal of Archaeological Method and Theory* 3 (4):319-384.

Whittaker, John C. 1994. *Flintknapping: Making and Understanding Stone Tools.* Austin: University of Texas Press.

Wilke, Philip J. 1996. Bullet-Shaped Microblade Cores of the Near Eastern Neolithic: Experimental Replicative Studies. In *Neolithic Chipped Stone Industries of the Fertile Crescent, and Their Contemporaries in Adjacent Regions*, edited by Stefan K. Kozlowski and Hans G. Gebel, pp. 289-310. Berlin: ex oriente.

Wright, Katherine, and Andrew Garrard. 2003. Social Identities and the Expansion of Stone Bead-Making in Neolithic Western Asia: New Evidence from Jordan. *Antiquity* 77:267-284.

9

PALMA EGYPTOLOGY PAPERS ON ARCHAEOLOGY OF THE LEIDEN MUSEUM OF ANTIQUITIES

INTERPRETING THE LATE NEOLITHIC OF UPPER MESOPOTAMIA

O.P. NIEUWENHUYSE

R. BERNBECK

P.M.M.G. AKKERMANS

J. ROGASCH

BREPOLS

This publication has been made possible by the generous support of the Netherland-America Foundation, Inc.

Design: Chiel Veffer Vormgeving, Amsterdam

D/2013/0095/105

ISBN 978-2-503-54001-6

Printed in the E.U. on acid-free paper

Front cover: *Anthropomorphic figurine, Tell Sabi Abyad, Syria*
Back cover: *Vessel with bucrania design, Fıstıklı Höyük, Turkey*