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A comparative study of the Initial Neolithic chipped-stone assemblages of Ulucak and Uğurlu

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Abstract

This article focuses on the Initial Neolithic (ca 6850–6500 cal. BC) lithic assemblages of Ulucak and Uğurlu in the Aegean region of Turkey. Ulucak and Uğurlu are among the earliest Aegean Neolithic sites, and their lithic industries were managed with specific traditions and skills, quite different from what we know of the industry for other regions such as central Anatolia, Cyprus and the Levant, and even some other areas of the Aegean. This article presents the results of the study of the chipped-stone assemblages of Ulucak and Uğurlu, and aims to demonstrate how they contribute to wider theories about the Neolithisation of the Aegean.

Özet

Bu makale Türkiye'nin Ege Bölgesinde yer alan Ulucak ve Uğurlu yerleşmelerinin Ön Neolitik tabakalarında (MÖ 6850–6500) bulunan yontma taş alet endüstrisini ele almaktadır. Bu çalışma, Batı Anadolu'nun en erken Neolitik yerleşimi olan Ulucak ve Uğurlu'daki yontma taş alet endüstrisinin, Anadolu, Kıbrıs, Levant ve Ege'nin diğer bölgelerinden bildiğimiz endüstrilerden oldukça farklı bir gelenek ve beceriyi yansıttığını göstermektedir. Bu makalede Ulucak ve Uğurlu'nun yontma taş alet endüstrisine dair çalışmanın sonuçları sunulmakta ve bu sonuçların Ege'nin Neolitikleşmesi ile ilgili teorilere nasıl katkıda bulunduğu tartışılmaya çalışılmıştır.

The beginning of the Neolithic way of life in the Aegean is still a matter of debate, as there appears to be no consensus regarding its chronological onset or the modalities of its process (Perlès 2001; King et al. 2008; Reingruber 2011; Perlès et al. 2013; Dawson 2014; Kotsakis 2014; Sampson 2014; Horejs et al. 2015; Çevik, Abay 2016; Lazaridis et al. 2016; Çilingiroğlu 2017; Douka et al. 2017; Erdoğu 2017a; Kılınç et al. 2017). These discussions show that the mechanism of the Neolithic transition of the Aegean is a complex issue, which requires careful study of persisting and variable components, such as lithic industries, in order to determine traditional and innovative elements. The study of lithics reflects the polarised views concerning the development of the Neolithic in this region: some scholars insist that new lithic technologies were brought by 'newcomers' (Perlès 2001; Horejs et al. 2015), while others see a strong continuity in lithic traditions running between the last indigenous foragers and the first farmers (Kaczanowska, Kozłowski 2008; Carter et al. 2016). This present study of the earliest Neolithic lithic assemblages of Ulucak and Uğurlu aims to reveal the management of chipped stone peculiar to this period, and to characterise the similarities and differences observed at the two sites in terms of raw material selection through to production methods and tool types. We will also compare these aspects with the management and traditions of the Late Mesolithic chipped-stone industries of the Aegean and with those of the Neolithic communities of the beginning of the seventh millennium beyond the Aegean. We will see that the comparative study of the chipped-stone industries of these two early Neolithic sites provides a significant contribution to an understanding of the Neolithisation of the Aegean.

The influence of the French anthropological and archaeological school of thought (Vitezović 2013) has seen technology be increasingly accepted as a culturally

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driven phenomenon. The concept of the operational sequence (*chaîne opératoire)* was developed by André Leroi-Gourhan (1964), and this approach has since been applied to a broad spectrum of components of material culture, especially chipped-stone industries (Soressi, Geneste 2011). The techniques and methods used by prehistoric knappers have also been identified thanks to ethnoarchaeological comparisons and experimental studies (Crabtree 1968; Tixier 1984; Pelegrin 1988; 2012; Inizan et al. 1999).

Pierre Lemonnier (1992) concludes that technologies consist not only of things and means used by societies to act upon their physical environment, but also social productions themselves. He conceives technology as a system consisting of several components, including matter, energy, objects, gestures in sequence and knowledge, all of which are interdependent and display multiple interactions between each other. Lemonnier (1993) also considers technological choices, and, according to him, these choices depend more on cultural values and social relations than on the inherent benefits of the technology in question. Technical choices may also be used as markers to express social identities (Lemonnier 1993). More precisely, technologies can be used as signs for individual or group identities, ethnic differences, social status and prestige (Vitezović 2013). Maria Dobres and Christopher Hoffman (1994) view operational sequences and products of technology as part of a society's structure and/or habitus. According to them, technology is 'meaning' in making, and therefore the production process of an object is itself culturally and socially constituted (Dobres 2001; Ingold 1990; Edmonds 1998). Dobres and Hoffman also advocate for the study of practice when analysing past technologies. According to them, by studying practices we are able to access the social relationships of the people making and using a particular technology. These practices might have been learned through interactions with both people and the material culture itself (for example Knappett 2005).

Within a technological process, the sequence of physical actions needs to be tactical and to include target-specific planning, structuring and sequencing. This is refered to as know-how. According to Jacques Pelegrin (1990), know-how is an unconscious form of memory. It is intuitive, connected with body movements and can be learned only by repetition. Strategic planning and know-how can be derived from the cultural habitus of technological knowledge. Thus the concept of habitus has been applied to technological style. Michael Dietler and Ingrid Herbich (1998) suggest that the habitus concept can be very useful when conceptualising technological style, because it allows for the craftworker to be flexible in terms of innovation while still following general cultural tendencies.

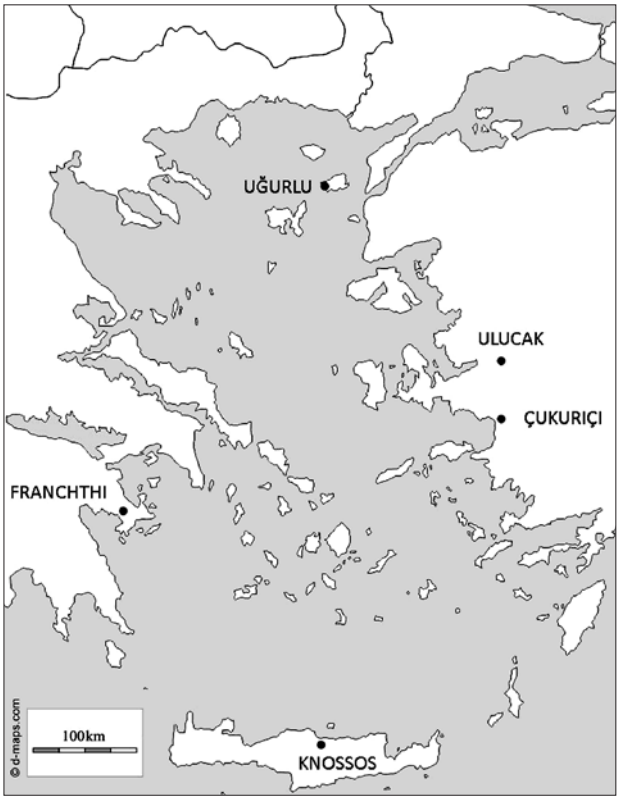


Fig. 1. Map showing the early seventh-millennium Neolithic sites mentioned in the text.

In this article, the practice of the same techniques and the use of similar types of tools and raw materials by the Neolithic population of western Anatolia will be discussed in the light of this view.

The Initial Neolithic at Ulucak and Uğurlu

The earliest Neolithic occupations at both Ulucak and Uğurlu (fig. 1) differ from the following levels by the almost complete absence of pottery or any other clay finds. Such an absence or extreme scarcity of baked-clay artefacts has also been noticed in Knossos X on Crete, Phase IX at Franchthi Cave in the Peloponnese, in the basal level (XIII) at Çukuriçi and possibly at some sites in Thessaly (Perlès 1990a; Efstratiou et al. 2004; Horejs et al. 2015: 304). A well-developed agricultural system and four-tiered herding system, including sheep, goat, cattle and pig, with a limited role for wild animals, are also shared features at all these early seventh-millennium sites, with the exception of Franchthi where the presence of domestic pigs and bovids is not certain (Perlès 2001: 47). Considering their chronological proximity, the similarities in their subsistence patterns and other material evidence, the earliest Neolithic sites of the Aegean region should be considered as belonging to the same process: the Initial Neolithic. This does not mean, however, that this process was completely homogeneous across the region.

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Ulucak VI has been explored in Trench L13 and partly in Trench L12, which together cover an area of about 135m^2. Two adjacent rectangular structures (Buildings 42 and 43), with mud-plastered walls, have been excavated. The investigated parts of Buildings 42 and 43 cover about 14m^2 and 25m,^{2} respectively. Both have red-painted, lime-plastered floors and cobble-paved hearths in one corner. Red-on-cream-painted wall fragments were found in Building 42. Both structures were deliberately covered with a green and sterile clay layer before abandonment. The buildings appear to have been left clean, except for a few animal parts, grinding stones and a bone implement; these seem to be related to abandonment rituals. In front of the buildings was a courtyard, in which a total of 13 circular and cobble-paved hearths and ovens were discovered. The courtyard hearths and ovens relating to Building 42 were rebuilt at least three times on the same spots. The buildings occupy about one-third of the excavated area, however, none of the chipped-stone artfacts recovered during excavation was found inside them. All the chipped stones analysed here come from the courtyard area (Çevik, Abay 2016).

Only 12m^2 of Uğurlu VI have been excavated. This phase is represented in two deep trenches (BB20–21 and CC21) in the eastern part of the settlement (Erdoğu 2017b). Phase VI in BB20–21 is divided into four layers. White-coloured clay floors, identified as 'soft lime', separate these layers. In the earliest layer, VI.4, part of an oval building with a sunken floor was discovered. In layer VI.3, a 10cm-diameter posthole, supported with stones, was found in the northern part of the trench. Three horns (including one large bull horn) and two ovicaprid skulls were discovered on the floor, as well as a chipped-stone workshop area with large quantities of waste. Three stone beads, two bone awls and a shaft straightener were also found on the floor. The following layer, VI.2, contained a 1.5m-diameter circular structure with a 30cm × 30cm central hearth. Layer VI.1 represents the transition between phases VI and V. Clear archaeological features were observed in this layer, specifically an oval sunken mud-plastered basin and a hearth, ca 50cm in diameter, and a destroyed lime-plastered floor painted red. Three bone spatulas, two stone chisels, stone and shell beads, and some pottery sherds were discovered.

No architectural structures were identified in Trench CC21, with the possible exception of scattered clusters of stones directly overlying the virgin soil. Bone awls and spatulas, stone and shell beads, and some pottery sherds were found. In addition, chipped stones were found in all the levels and surfaces excavated.

Absolute dates for Ulucak VI and Uğurlu VI

Sixteen AMS dates are available for Ulucak VI (Çevik, Abay 2016): five from seeds, five from charcoal and six from bone collagen. They are calibrated with a range of ca 6850–6500 cal. BC based upon a Bayesian calibration. Five AMS radiocarbon dates are currently available for Uğurlu VI: three from Trench BB20–21 and two from Trench CC21. The dates from Trench CC21, retrieved from bone collagen, are calibrated with a range of ca 6640–6500 cal. BC (table 1).

For each sample, δ^{13}C values were added to the table as quality-control measures (see Millard 2014). Bayesian chronological modelling of radiocarbon dates (Bayliss 2009), using OxCal and the General Outlier Model of Christopher Bronk Ramsey (2009) as well as the IntCal09 radiocarbon calibration dataset (Reimer et al. 2009), has been applied to Uğurlu and Ulucak. If we consider the five dates from Uğurlu Phase VI and two dates from the following early Phase V, the 'Start Boundary' lies around 6823 cal. BC (95.4%) and the 'End Boundary' at around 6574 cal. BC (95.4%). The 'Start Boundary' for the 16 dates from Ulucak VI is around 6857 cal. BC (95.4%) and the 'End Boundary' is around 6484 cal. BC (95.4%).

Ulucak VI and Uğurlu VI chipped-stone industries

It is important to emphasise that the total area excavated for all Initial Neolithic sites across the Aegean region remains quite small, and that, currently, Ulucak and Uğurlu have yielded the largest lithic assemblages of all these sites (table 2). A total of 1,980 chipped stones from Ulucak VI and 1,635 from Uğurlu VI have been studied (Guilbeau, Erdoğu forthcoming; the small difference in the quantity of chipped stones considered in the present paper is due to the fact that here we include those from area CC21). At both sites, examples of waste and debris are numerous, and tools are well represented.

Raw materials

We have distinguished 'local' raw materials as those sourceable within a 1–2 hour walk from the site; 'regional' raw materials are those available within the course of a daytrip or a little more; 'exogeneous' raw materials are those from areas located more than a few days distant from the site. At both Ulucak and Uğurlu, some chipped stones were significantly altered and their raw material cannot be recognised. Both industries employed a range of raw materials, but the proportion of each differs (table 3; fig 2). Ulucak and Uğurlu are located in contrasting environments, and thus the availability of raw materials differs. The raw material procurement strategies may reflect these differences.

Local raw materials. Local raw materials at Uğurlu include poor-quality siliceous rocks (five examples made on flint). Good-quality radiolarite-jasper pebbles were also found, but are too small (no more than 5–10cm) and too rare to be used extensively. Only four chipped stones of this raw material were recovered from Uğurlu VI.

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Site	Sample no.	Material: pretreatment	$\delta^{13}C$	Conventional age BP	Calibrated BC (2 sigma)
Ulucak VI	Beta-345837	Bone collagen: collagen extraction with alkali	-20.2	7990±40	7057–6756
Ulucak VI	Beta-269727	Charcoal: acid/alkali/acid	-25.5	7950±50	7041–6691
Ulucak VI	Beta-345838	Bone collagen: collagen extraction with alkali	-19.4	7940±40	7032–6691
Ulucak VI	Beta-345839	Bone collagen: collagen extraction with alkali	-20.3	7930±40	7032–6682
Ulucak VI	Beta-250265	Charcoal: acid/alkali/acid	n.a.	7910±50	6863–6649
Ulucak VI	Beta-317542	Seed	-22.6	7870±40	6834–6604
Ulucak VI	Beta-317544	Seed	-22.7	7850±50	6840–6590
Ulucak VI	Beta-269729	Charcoal: acid/alkali/acid	-25.4	7850±50	6840–6590
Ulucak VI	Beta-405666	Bone collagen: collagen extraction with alkali	-19.5	7840±30	6766–6598
Ulucak VI	Beta-31743	Seed	-22.1	7830±40	6812–6589
Ulucak VI	Beta-269731	Bone collagen: collagen extraction with alkali	-20.4	7820±50	6816–6506
Ulucak VI	Beta-317538	Seed	-22.3	7810±40	6708–6560
Ulucak VI	Beta-250266	Charcoal: acid/alkali/acid	n.a.	7770±50	6682–6481
Ulucak VI	Beta-317539	Seed	-22.1	7730±40	6638–6478
Ulucak VI	Beta-269730	Bone collagen: collagen extraction with alkali	-20.0	7710±50	6637–6465
Ulucak VI	Beta-269728	Charcoal: acid/alkali/acid	-25.9	7680±50	6612–6441
Uğurlu VI	Beta-448093	Charred material: acid/alkali/acid	-27.0	7890±30	6831–6644
Uğurlu VI	Beta-427241	Charred material: acid/alkali/acid	-25.5	7820±40	6774–6566
Uğurlu VI	AA106098	Bone collagen: collagen extraction with alkali	-20.5	7760±30	6646–6505
Uğurlu VI	Beta-448092	Charred material: acid/alkali/acid	-25.3	7740±30	6641–6634
Uğurlu VI	AA106099	Bone collagen: collagen extraction with alkali	-20.5	7690±40	6604–6456

Table 1. Conventional and calibrated radiocarbon dates from Ulucak and Uğurlu (n.a. = not accessible).

	Ulucak VI	Uğurlu VI	Çukuriçi XIII	Knossos X	Franchthi Cave
Beginning of the Neolithic	6857 cal. BC	6823 cal. BC	6833 cal. BC	6970–6590 cal. BC	First part of 7th millennium
Total area excavated	135m²	12m²	8m²	Max. 15m²	ca 16m²
Total number of lithics studied	1,980	1,635	206	394	864

Table 2. Absolute dates, areas excavated and quantities of chipped stones from the Initial Neolithic sites of the Aegean region (for Çukuriçi, see Horejs et al. 2015: 305; for Knossos X, see Conolly 2008: 75; Douka et al. 2017; for Franchthi Cave, see Perlès 1990b: 97; 2001: 71; Perlès et al. 2013).

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		Ulucak		*Uğurlu*	
		Quantity	*%*	*Quantity*	*%*
Exogeneous raw material	Obsidian	10	0.5	13	0.9
Regional raw materials	Flint/chalcedony	1,633	82.5	1,404	95.8
Local raw materials	Flint/radiolarite	0	0	9	0.6
	Quartz	306	15.4	14	1.0
Unknown provenance	Rock crystal	31	1.6	24	1.6
	Flint	0	0	1	0.1
	Total	**1,980**	**100**	**1,465**	**100**

Table 3. Raw materials of the Ulucak and Uğurlu chipped-stone assemblages (the 170 artefacts of unrecognisable raw materials from Uğurlu are not included).

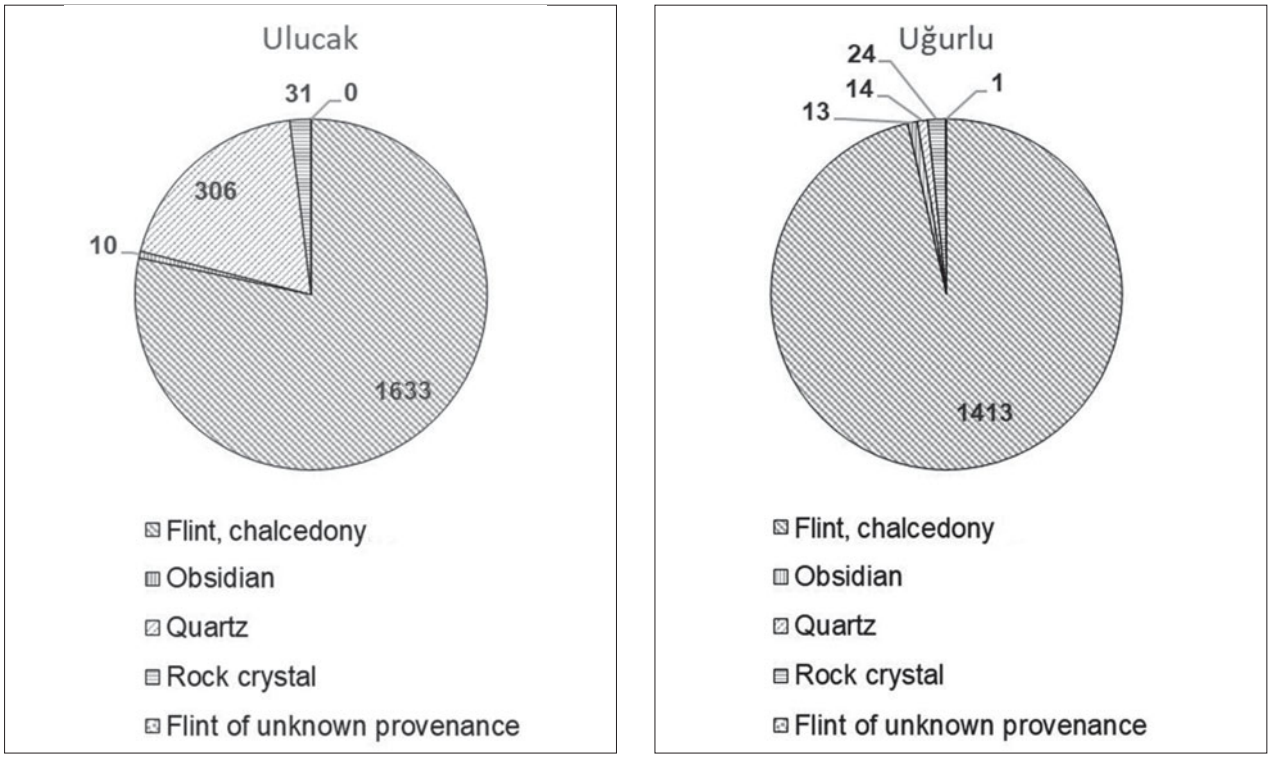


Fig. 2. Proportions of raw materials in the chipped-stone assemblages of Ulucak and Uğurlu.

Quartz is available in the immediate vicinity of both sites. At Ulucak, it may well have been obtained from secondary sources, such as Nif Çayı, a tributary of the Gediz river, located a few hundred metres from the site. This seems to have been an important resource for the knappers, as 306 chipped quartz stones have been recovered (about 15.4% of all the Ulucak chipped stones). Various forms of quartz with different ratios of crystallisation were employed. At Uğurlu, the use of quartz remained marginal (14 examples = 1% of the chipped-stone assemblage). Here, the quartz pebbles are generally too small (no more than 5–10cm) and not really suitable for chipped-stone production.

Regional raw materials. At both sites, regional raw materials were the most important resource (82.5% at Ulucak and 95.8% at Uğurlu). Flint sources have not yet been found in close vicinity to Ulucak, and the exact provenance of the flint extensively used in the chipped-stone industry remains unknown. However, it seems unlikely that these raw materials come from very far away, and the closest source for chalcedony is near Çaldağ, about 35km from Ulucak, even if its presence at the site is limited (30 examples = 1.5%).

As for Uğurlu, surface surveys of the eastern part of the island on which the site sits have revealed the presence of substantial flint outcrops, and the characteristics of these

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raw materials are similar to those of the flint used at the site. As the distance of the outcrops from Uğurlu is more than 20km and as traversing the island is even today very difficult because of the topography, we consider these raw materials to be regional; a return trip would probably have taken more than a day during the Neolithic. These regional outcrops could provide large blocks of good-quality stone.

Exogeneous raw materials (obsidian). Obsidian is a minor but persistent component of the Ulucak and Uğurlu lithic assemblages throughout their occupation. During the earliest Neolithic phase, it represents 0.5% of the Ulucak chipped-stone assemblage (ten examples) and 0.9% of the Uğurlu assemblage (13 examples).

XRF analysis undertaken by Marina Milić indicates that all the Ulucak samples come from Melos, and that sources at both Adamas and Dhemenegaki were exploited (Milić 2014). For the Uğurlu assenblage, macroscopic examination and XRF analysis show that at least ten obsidian artefacts also come from Melos. However, three obsidian blades, not yet chemically analysed, show a slightly different aspect (two are slightly translucent, one is semi-opaque and brownish), and these may not come from Melos.

Unknown provenance. Even though it remains a rare raw material, the frequency of rock crystal is noticeable at both sites (31 artefacts at Ulucak = 1.6%; 24 at Uğurlu = 1.6%). Its provenance is not clear yet, but, at least at Uğurlu, a local/regional origin is possible since outcrops have been discovered on a mountain slope on the island (Burçin Erdoğu, personal observation). In addition, one blade made from a beige-brown flint with whitish inclusions from an unknown provenance has been recovered from Uğurlu.

Raw material procurement strategy

Even though the environments of Ulucak and Uğurlu are very different (i.e. Uğurlu is a volcanic island settlement and Ulucak is located on a plain some distance from the sea), the raw material procurement strategies do not appear to differ substantially. In both cases, regional flint/chalcedony is by far the most abundant raw material exploited. Obsidian from Melos is the only raw material that we find on both sites, but it is marginal. Almost as rare as obsidian, rock crystal is notable because it almost disappears from both sites after the Initial Neolithic.

The similarities in the procurement of raw materials are reflected in the *chaînes opératoires*, methods and techniques used to exploit them.

Chaînes opératoires*, methods and techniques*

The *chaînes opératoires*, methods and techniques depend, obviously, on the quality of the raw materials and their mode of procurement, but also on other factors, such as the skill of the knappers and the demand for different kinds of blanks for the toolkit.

Local raw materials: an expedient production of flakes. At both sites, local raw materials were used for flake production, as coarse-grained quartz cannot be used for blade production. At Uğurlu, the local radiolarite/jasper could be used to produce blades, but only small ones because of the dimensions of the blocks. Among the five Uğurlu Phase VI chipped stones made from this raw material, there are no blades, but only flakes and one flake core. These flakes were knapped on site by expedient and unskilled direct percussion with a hard stone.

Regional flint: flake production and blade production. At Uğurlu, regional flints were knapped on site for flake production by direct percussion with a hard stone. Furthermore, there is evidence of blade production performed by the pressure technique. In comparison with Ulucak, blades are especially numerous (table 4), but a direct comparison between the frequency of flakes and blades at each site can be misleading. At both sites we were able to identify even very small fragments of blades, but all the small chips that were not identified as such were considered as debris and are especially numerous (at Uğurlu 823 of the 1,404 chipped stones made on regional flint).

The organisation of the blade production is not completely clear yet. At Ulucak, the presence of a blade core with regular negatives indicates that at least some blades were made locally (fig. 3:10). At Uğurlu, there are no blade cores, but the presence of reshaping flakes (29 examples), rejuvenation flakes (ten), flakes coming from blade cores (ten) and a crested blade (fig. 4:4) suggest that at least some of the 298 blades were made on site. However, the blades are far too numerous in comparison with the chipped stones related to their debitage. Therefore, it may be that knapping activities took place at another part of the site, not yet excavated, and/or that some blades were introduced to the site as blanks.

The straightness of the edges and dorsal ridges, the regularity of the thickness, the straightness of the profile associated sometimes with the smallness of the platform and the 'lightness' of the section (i.e. blades with a low thickness/width ratio) all indicate the use of the pressure technique at both sites (figs 3:11–12, 4:1, 3; see Tixier 1984; Pelegrin 1988). Most of the blades are quite narrow (an average of about 9mm at Uğurlu, even less at Ulucak). On the basis of Pelegrin's experimental results, most were detached by pressure with a hand-held baguette (mode 1), shoulder crutch (mode 2) and/or, for Uğurlu, a short crutch used in a sitting position (mode 3) (Pelegrin 2012: 479). At Uğurlu, there are also numerous larger pressure blades

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	Ulucak		*Uğurlu*	
	Quantity	*Percentage*	*Quantity*	*Percentage*
Unknapped	10	0.6	0	0
Knapping waste	108	6.6	823	58.6
Flakes	1,281	78.5	183	13
Cortical flakes			37	2.6
Shaping flakes			7	0.5
Laminar flakes	20	1.2	1	0.1
Flake cores	40	2.4	6	0.4
Blade cores			0	0
Flakes from blade core			10	0.7
Reshaping flakes			29	2.1
Tablets, rejuvenation flake	1	0.1	10	0.7
Crested blades	173	10.6	1	0.1
Undercrested blades			2	0.1
Technical blades			8	0.6
Lateral blades			17	1.2
Central blades			270	19.3
Total	**1,633**	**100**	**1,404**	**100**

Table 4. Regional flint/chalcedony at Ulucak and Uğurlu: technical categories.

compatible with a pressure debitage using a long crutch in a standing position (mode 4), but none of the blades examined so far required the use of a lever device (mode 5) to be detached from the core, as found in the levels of the next phase, where the mean width of the blades is slightly higher.

At Ulucak, many blades were detached by percussion, while at Uğurlu this technique is marginal. If we consider the higher frequency of pressure blades at Uğurlu and the absence of blades made with mode 4 of the pressure technique from Ulucak, it may be proposed that the pressure technique, attested at both sites, was more developed at Uğurlu than at Ulucak.

Exogeneous raw material: obsidian pressure blades. The pressure technique was also used to produce obsidian blades. At Ulucak, two of the obsidian finds are flakes, while the other eight are blade/bladelets made with modes 1 and 2 of the pressure technique, and even mode 4 for one of them (fig. 5). At Uğurlu, ten of the obsidian arefacts are small blade fragments and two are small debris (fig. 6). Six obsidian blades were made by the pressure technique (mode 1 or 2, pressure in the hand). Two blades made from obsidian of a different colour and texture from the others are slightly wider (about 15mm) and may have been detached by mode 3 of the pressure technique (with a small crutch).

For both sites, the presence of flakes and debris is too limited to suggest a local production of these blades.

Undetermined provenance: rock-crystal flakes and blades, and a flint blade. At the site of Ulucak, rock crystal was exclusively used for flake production. At Uğurlu, there are some debris examples, one elongated flake and four fragments of very small blades at least partly made with the pressure technique (mode 1, pressure in the hand). From the same site, a blade made from flint of unknown provenance was probably manufactured by indirect percussion.

Tools

Tools are more frequent at Ulucak (264 of 1,980 artefacts = 13.3%) than at Uğurlu (95 of 1,635 artefacts = 5.8%) (table 5). It is not possible to say if this difference is meaningful because at Uğurlu the area excavated is too small to be sure that the lithic material collected is completely representative of the industry across the site. There is no clear relation between raw material and typology.

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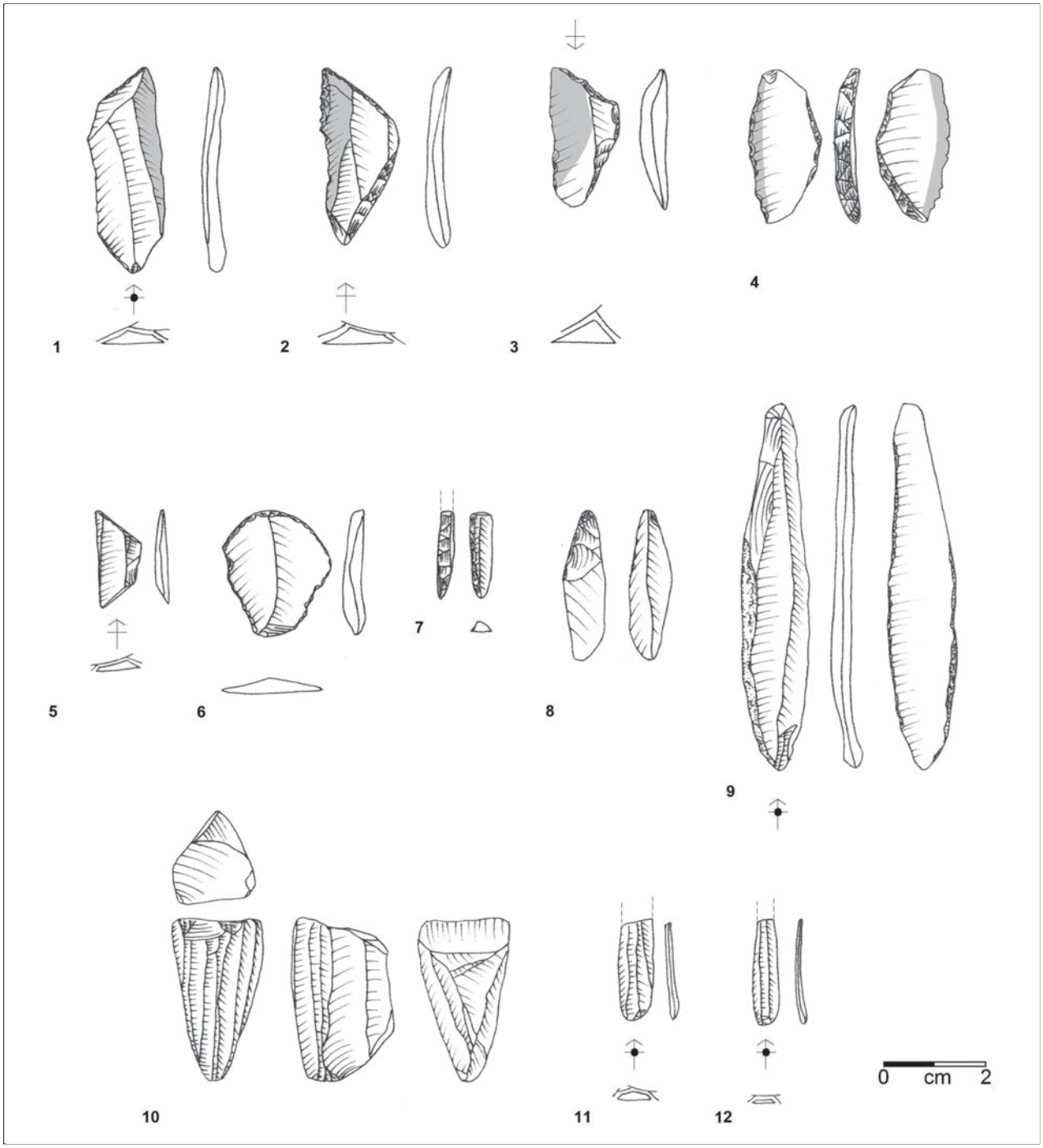


Fig. 3. Chipped-stone (flint) artefacts from Ulucak VI. 1–4: sickle blades; 5: trapeze; 6: end scraper; 7: backed blade; 8: borer; 9: lateral blade; 10: unipolar pressure core; 11–12: pressure bladelets.

However, there is a link between blanks and tools; for instance, scrapers were preferentially made on flakes and truncations on blades.

For both assemblages, most of the tools are flakes and blades used directly without any retouch or with a lateral retouch that may correspond in some cases to one or several phases of resharpening (190 of 264 examples at Ulucak; 70 of 95 examples at Uğurlu) (fig. 3:9). The lateral retouch of some blades is so deep and regular that they can be considered as backed blades (five at Ulucak – fig. 3:7 – three at Uğurlu); the unretouched edge may have been the active part of these tools.

Sickle inserts are quite frequent: 37 at Ulucak, six at Uğurlu (figs 3:1–4, 4:5–7). Their morphology is not homogeneous, but there are some similarities. Most are made on blade segments (but not all), several present one or two truncations (three at Ulucak, two at Uğurlu) and several have an abrupt back (three at Ulucak, one at Uğurlu).

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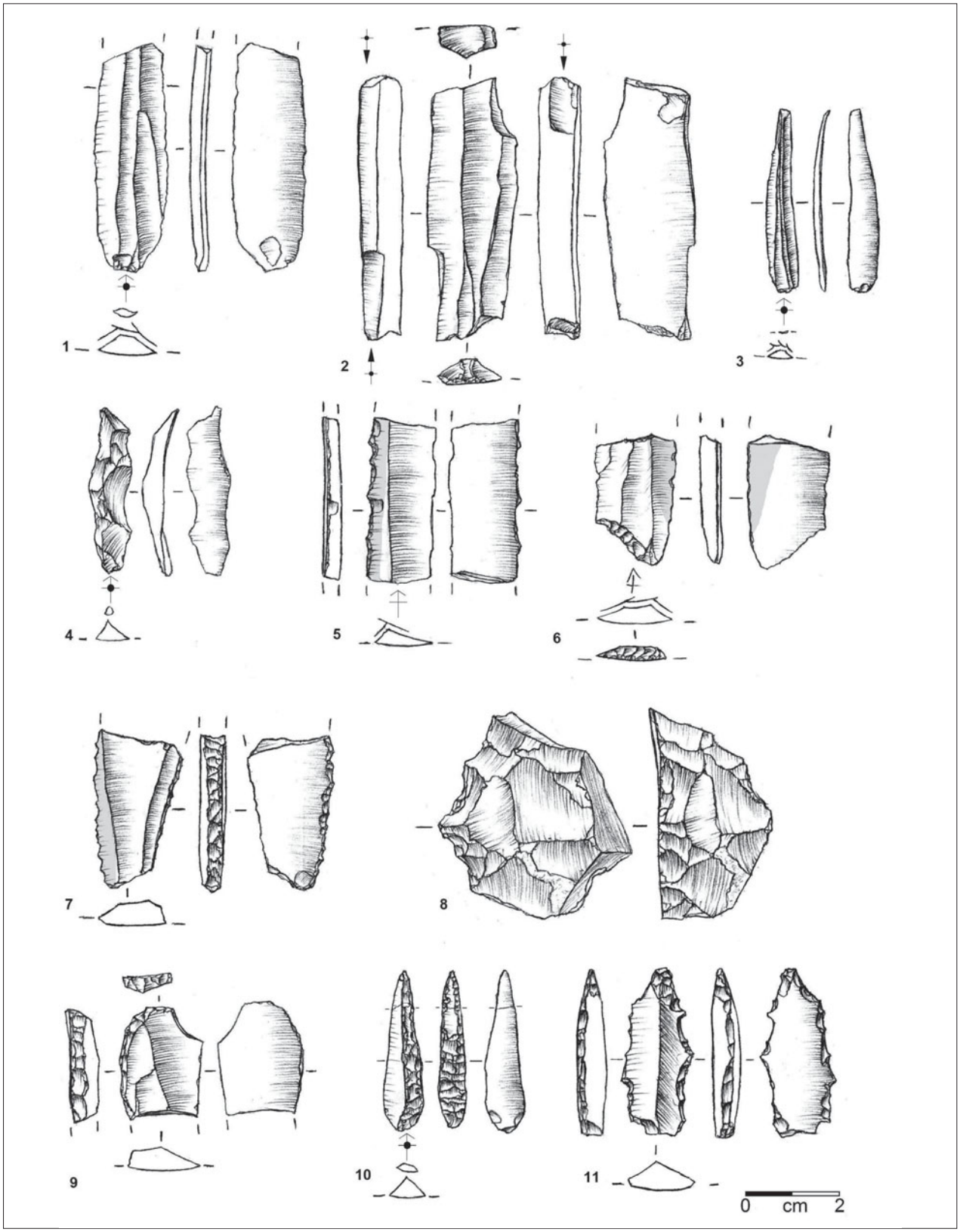


Fig. 4. Chipped-stone (flint) artefacts from Uğurlu VI. 1: pressure blade; 2: blade made by indirect percussion with burins; 3: pressure blade; 4: crested blade; 5–7: sickle inserts; 8: denticulate; 9: blade with an abrupt back; 10: point/beak; 11: borer.

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Fig. 5. Obsidian blades from Ulucak VI.

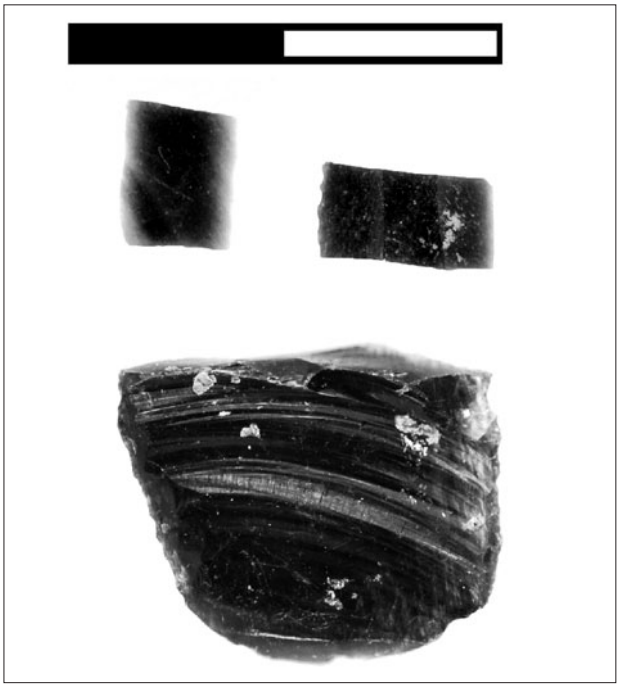


Fig. 6. Obsidians from Uğurlu VI.

	Ulucak		*Uğurlu*	
	Quantity	*Percentage*	*Quantity*	*Percentage*
Used	138	52.3	59	62.1
Retouched	52	19.7	11	11.6
Sickle inserts	37	14	6	6.4
Scrapers	11	4.2	3	3.2
Borers	6	2.3	2	2.1
Truncations	5	1.9	1	1
Backed blades	5	1.9	3	3.2
Splintered pieces	4	1.5	4	4.2
Notches	3	1.1	1	1
Denticulates	2	0.7	0	0
Burins and burin spalls	1	0.4	4	4.2
Points	0	0	1	1
Total	**264**	**100**	**95**	**100**

Table 5. The toolkits of Ulucak and Uğurlu.

The other categories of tools are less frequent (scrapers, denticulates, drills: figs 3:6, 8, 4:8–11). Burins are extremely scarce: there is just one at Ulucak (fig. 3:8) and three burin spalls and one burin at Uğurlu. The latter is the blade made from flint of unknown provenance noted above; it presents three burin facets made on truncations (fig. 4:2). There is no projectile point at all, and only one small point (or beak) at Uğurlu (fig. 4:10).

Comparisons

Ulucak and Uğurlu

Even though there is some variation in terms of raw material procurement (for example the frequency of quartz at Ulucak), the *chaînes opératoires*, techniques (for instance the presence of larger pressure blades at Uğurlu) and toolkits, the similarities between the Ulucak and Uğurlu chipped-stone industries are far stronger than their

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differences, especially given that these two sites sit in two very distinct geographical contexts.

In order to compare the chipped-stone industries effectively, we need to consider the economies of each site and the activities undertaken by their Initial Neolithic communities. In both cases, agriculture and animal husbandry were probably the most important activities; there is no evidence in the material culture of another specialisation and, at least for Ulucak VI, there is strong evidence of the importance of agriculture and animal husbandry (Çilingiroğlu, Çakırlar 2013: 23; Erdoğu 2017b). The almost total absence of tools clearly related to hunting (projectile points, microliths used as arrowheads) is consistent across the two sites. The frequency of sickle inserts is also appropriate for farming communities, although the number of sickle blades is strikingly higher at Ulucak than at any other site in the region. There are many ways to harvest cereals, and the morphology of the sickle varies greatly through time and between regions (see, for example, Ibáñez et al. 2017; Mazzucco et al. 2017). For instance, at Uğurlu, sickle inserts of Phase V are different: almost all are segments of blades, a little longer than those of Phase VI, and the glossy surface is parallel to the edge, whereas it is rather oblique for the earlier phase (with one exception). Thus, it can be observed that the sickle inserts from Uğurlu VI and Ulucak VI are more similar than those of Phases VI and V at Uğurlu.

Furthermore, technical choices are significant. For instance, the presence of pressure blades, at least partly made at these two sites, indicates the presence of highly skilled knappers able to perform different modes of this production technique, including mode 4 at Uğurlu.

However, comparisons at a larger scale are required in order to have a more complete understanding of the level of homogeneity of the chipped-stone industries of these two sites.

Other Aegean sites

There are just three other sites securely dated to the Initial Neolithic in the Aegean region: Çukuriçi in western Anatolia, Knossos on Crete and Franchthi Cave in the Peloponnese (table 6; Perlès 1990b; Perlès et al. 2013; Horejs et al. 2015; Reingruber 2015; Douka et al. 2017). Thanks to the ^{14}C dates recovered from three samples (wheat and an unidentifiable cereal) from Phase XIII and four dates from Phase XII (Horejs et al. 2015), we know that the 'Start Boundary' of Çukuriçi is around 6833 cal. BC (95.4%) and the 'End Boundary' is around 6582 cal. BC (95.4%). At Knossos, Bayesian chronological modelling was recently applied to all dates from the 1997 excavations (Douka et al. 2017). The start of the earliest Aceramic phase (level 39) is 6970–6590 BC (95.4%). The Initial Neolithic phase of Franchthi is also dated to the first part of the seventh millennium (Perlès et al. 2013).

Çukuriçi shows features very similar to those of Ulucak and Uğurlu; caution is required, however, given that only 206 chipped stones have been recovered from the earliest phase, which has been excavated across a small area (about 8m²: Horejs et al. 2015; Milić, Horejs 2017). First, in terms of raw material procurement, the use of a local/regional flint and the relative importance of quartz are notable. The frequency of obsidian at Çukuriçi (34%) is far higher than at Ulucak (0.5%) and Uğurlu (0.9%), but this raw material – acquired from Melos – is far less frequent in the earliest phase than in later phases (Horejs et al. 2015: 305). Another similarity is the striking presence of rock crystal, even if it remains quite rare. As at Uğurlu and Ulucak, this raw material almost completely disappears during the next phase.

Regarding debitage techniques, once again the use of the pressure technique, on both obsidian and local/regional flint, can be observed. As at Uğurlu, pressure blades are smaller than in later phases, but there are already some quite large ones (Horejs et al. 2015: 307). The toolkit of Çukuriçi shows some features that are different from those of Ulucak and Uğurlu – such as the presence of a projectile point with a round base – but, again, the differences are less important and probably less meaningful than the similarities. For instance, at least one of the sickle inserts has a truncation and there are no burins at all. The presence of a lunate made on a rock-crystal flake is also notable.

All these elements suggest that the management of the chipped-stone industry at all three sites – Ulucak, Uğurlu and Çukuriçi – reflects almost the same set of traditions and skills.

In the southern part of the Aegean, the Initial Neolithic lithic industry of Knossos on the island of Crete has been studied by several scholars (Conolly 2008; Kaczanowska, Kozłowski 2008). However, as at Çukuriçi, chipped stones are not numerous (394 examples: Connolly 2008: 75; 376 examples: Kaczanowska, Kozłowski 2008: 73). In contrast to Ulucak and Uğurlu, the most dominant raw material is Melian obsidian (262 examples = 69.7%); nonetheless, the

	Beginning of the Initial Neolithic
Ulucak VI	6857 cal. BC
Uğurlu VI	6823 cal. BC
Çukuriçi XIII	6833 cal. BC
Knossos X	6970–6590 cal. BC
Franchthi Cave	First part of the seventh millennium

Table 6. Earliest Neolithic occupation in the Aegean (for Çukuriçi XIII, see Horejs et al. 2015; for Knossos X, see Douka et al. 2017; for Franchthi Cave, see Perlès et al. 2013).

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site is relatively close to Melos and the difference in terms of raw material procurement between this site and the Turkish ones is not really meaningful. Flint, quartz, radiolarite and chalcedony are the other raw materials used at Knossos (114 examples = 30.3%). All the materials were knapped using the direct percussion technique to produce flakes and rare blades. One possible pressure blade has been found, but it may be contamination from later levels (Kaczanowska, Kozłowski 2008: 73). This clearly indicates that the knappers of Knossos did not practice the pressure flaking technique; thus they apparently did not have access to the skilled know-how evident at Uğurlu, Ulucak and Çukuriçi.

The toolkit is obviously constrained by the irregular morphology of the blanks. Splintered pieces are the most frequent tool type; there are seven backed pieces, two microliths and two sickle inserts, but no burins. Tristan Carter and colleagues (2016) argue that this industry is a mix of 'Aegean Mesolithic' technical traditions and innovations coming from regions already occupied by Neolithic farmers. In their opinion, there may be a link with central Anatolia: they cite the presence of bipolar cores or *pièce esquillées* and the presence of a few blades, including that made by the pressure technique (Carter et al. 2016: 96–97). However, as stated above, the association of the pressure blade with the early level is far from secure and, in this period (early seventh millennium), the pressure technique was extremely marginal at Çatalhöyük and restricted to the production of very small blades (Sean Doyle, communication at the European Association of Archaeologists Conference, 7 September 2018); moreover, the bipolar blade production attested at Çatalhöyük is completely absent from Knossos. Finally, the absence from Knossos of the characteristic projectile point is another feature that distinguishes the lithic traditions at this site from those of central Anatolia. For Małgorzata Kaczanowksa and Janusz Kozłowski (2008: 77), the characteristics of the Knossian industry belong to the local Mesolithic tradition; the differences from the latter can be explained by new technical tasks linked with the new way of life. However, this hypothesis too can be questioned (see below).

Following Catherine Perlès, during the Initial Neolithic, Franchthi Cave was occupied by Mesolithic communities who had regular contact with Neolithic communities and, via these contacts, acquired some characteristic products of the Neolithic, for instance sheep, goats and cereals (Perlès et al. 2013: 1012). The chipped-stone management of the Initial Neolithic differs significantly from that of the Final Mesolithic (Perlès 1990a: 94). Among the 864 chipped stones of the Initial Neolithic, obsidian is well attested (9%), while it is absent from the assemblage of the previous period. Blades made from obsidian and flint are not rare, and some were most probably made by the pressure technique, as at Ulucak, Uğurlu and Çukuriçi. The difference here is that it is not clear whether or not these blades were manufactured on site. The toolkit is also different from that of the Mesolithic, but notches remain the main category and burins are still absent. Geometrics (trapezes) were already present during the previous phase; however, they were made on pressure blades during the Initial Neolithic. Furthermore, the appearance of *pièces esquillées* should be noted (12 examples: Perlès 1990a: 98). Unlike the other Initial Neolithic sites of the Aegean region, there are no sickle inserts.

Thus, the largely homogeneous group – in terms of their chipped-stone industries – of Ulucak, Uğurlu and Çukuriçi cannot be extended to include Knossos and Franchthi.

The northern Balkans and the Marmara region

The northern Balkans, i.e. Greece, Bulgaria and Turkish Thrace, was apparently occupied by Mesolithic communities at the beginning of the seventh millennium (Reingruber 2016). However, this conclusion remains conjectural since we have almost no data for this period or earlier ones.

In the eastern part of the Marmara region, on sand dunes near the Black Sea, several chipped-stone scatters have been found. Some are attributed to the Palaeolithic, while others are dated to the Neolithic (Esin 1992; 1994; Reingruber 2016). Most are attributed to the Epipalaeolithic to Mesolithic period, mainly on the basis of typology, leading to the characterisation of the so-called Ağaclı group (Gatsov, Özdoğan 1994; Kartal 2011). The main feature of this lithic industry is the use of local raw materials to produce irregular blades. While the use of the pressure technique was suggested initially (Özdoğan, Gatsov 1998: 213), later studies led to the conclusion that all knapping was performed by percussion (Özdoğan 2011: 30; 2017: 201). There are also examples of microliths, such as trapezes and scalene triangles (Gatsov, Özdoğan 1994; Kartal 2011: 21). The lack of precise chronological attribution is a problem even though one can suppose that the Marmara region was quite densely occupied during the Late Mesolithic (Özdoğan 2011).

In terms of raw material procurement, knapping techniques and typology, there is no evidence of a link between the industries of the Ağaçlı group and those of the Initial Neolithic sites of the Aegean region. However, researchers who work in the Marmara region have suggested that many of the characteristics of the chipped-stone industries of the Early Neolithic sites indicate a continuity from Mesolithic technical traditions (Gerritsen, Özbal 2016: 206). Unfortunately, the supposed similarities between the industries of these periods are not described.

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Barcın is the earliest Neolithic site known so far in the Marmara region. Several ^{14}C dates recovered from Phase VI material indicate that the site was founded ca 6600 cal. BC, at least 100–200 years later than the foundations of the Aegean Initial Neolithic sites (Gerritsen et al. 2013; Gerritsen, Özbal 2016). In terms of the chipped-stone industry, the presence of pressure blades and bullet cores is notable. Furthermore, large blades were made with the indirect percussion technique. There are also large scrapers (including circular ones), perforators and drills (Gatsov, Nedelcheva 2011; 2016). There are no burins, no arrowheads, no segments and only a few trapezes from insecure stratigraphic contexts (Gatsov et al. 2011: 135). In many ways, the characteristics of this industry differ from those of the sites attributed to the Ağaclı group and are closer to those of Uğurlu, Ulucak and Çukuriçi (in terms of techniques and typology). However, Barcın was not founded before Uğurlu, Ulucak and Çukuriçi, and thus we cannot find here the origins of the traditions observed in the Aegean region.

The Lake District

In the Lake District, evidence of Neolithic communities goes back as early as the beginning of the seventh millennium (Duru 2012). Bademağacı and Höyücek are probably dated to ca 7000–6500 cal. BC. There is no published information regarding chipped stones recovered from the earliest Neolithic levels of Bademağacı, but excavations of the early levels of Höyücek demonstrate that flakes are more numerous than blades and tools are very rare (Balkan-Atlı 2005). Retouched blades and bladelets, sickle blades and scrapers are common tool types. Unfortunately, these data remain too general to make useful comparisons with the industries of Ulucak and Uğurlu.

In the southern part of this region, Girmeler was occupied as early as the ninth millennium BC, and also during the late eighth and the early seventh millennia. The early layers date to ca 8200–7900 cal. BC and the late to ca 7400–7000 cal. BC (Becks, Polat-Becks 2013; Takaoğlu et al. 2014). The chipped-stone assemblage of Girmeler consists of flakes, but there are also some flint blades used as sickles. No obsidian was found in the early layers, but some Anatolian and Melian obsidian chipped stones were found in the late eighth- and early seventh-millennia BC layers (T. Takaoğlu, personal communication May 2018).

Central Anatolia

We have to travel further afield to find more information for this period. In central Anatolia, Çatalhöyük is clearly the most important site, and its chipped-stone industry is well documented (Conolly 1999; Carter, Milić 2013; Kayacan 2015). Closer to the obsidian outcrops of Cappadocia, we also have data from Tepecik (Bıçakçı et al. 2012).

At both sites, obsidian from Göllüdağ and Nenezidağ is the most frequent raw material. At Tepecik, the near exclusivity of obsidian is logical, as the outcrops are very close, but, at Çatalhöyük, more than 150km from the source, this raw material can be considered as exogeneous. The earliest lithic industry of the Konya plain is flake-based, and thus far removed from the Aegean lithic tradition. At about 7100–6700 cal. BC the chipped-stone industry of Çatalhöyük was characterised by microliths, some opposed platform blades, scrapers made from rejuvenation flakes and bifacial preforms (Carter, Milić 2013). The pressure technique is attested from the beginning of the occupation, but only for rare, very small blades. It is only around or just before 6500 BC that this technique becomes far more frequent and standardised (Carter, Milić 2013; Kayacan 2015: 325; Sean Doyle, communication at the European Association of Archaeologists Conference, 7 September 2018). At Tepecik, blades were detached by direct percussion with a soft stone from bipolar cores (Bıçakçı et al. 2007; 2012). Many blades were retouched as projectile points. This method and technique allowed the production of thick, naturally pointed blades which were especially adapted for retouch or even used directly as points (arrowheads or spearheads). There are also some flint blades with denticulate retouch used as sickles (Denis Guilbeau, personal observation 2017).

Consequently, the management of the chipped-stone industry is completely different from that of all the Initial Neolithic sites in the Aegean – not only from those of Ulucak, Uğurlu and Çukuriçi but also from those of Knossos and Franchthi. Central Anatolian chipped-stone-traditions do not appear to have spread to western or northern regions, except at some sites not well characterised or precisely dated, such as Keçiçayırı in the region of Yenişehir and Küçükçekmece in the region of Istanbul, which have yielded evidence of bipolar blade knapping (Aydıngün 2009; Gatsov, Nedelcheva 2016). Several pointed arrowheads were also found in the Lake District, but from the second half of the seventh millennium BC (Balkan-Atlı 2005; Duru 2012). These must have been distributed as finished artefacts.

Cyprus

Cyprus is also considered a significant region for the study of the development of the Neolithic and as a possible origin for supposed Neolithic settlers in the Aegean. Apart from its geographical position, the island is important for various reasons. First, the Neolithic developed here as early as it did in the Near East (Knapp 2010). Second, the occupation of the island and evidence of regular relations with the Near East suggest that at least part of the Neolithic community was composed of skilled sailors (Bar Yosef Mayer et al. 2015); this is important in the context of the

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suggestion that seafaring Neolithic communities arrived in the Aegean. Last, it is notable that, as at the Initial Neolithic sites of the Aegean and unlike those of central Anatolia or the Levant, there is no evidence of pottery for the first part of the seventh millennium (Le Brun, Daune-Le Brun 2009). However, the differences between the chipped-stone industries are pronounced. At Khirokitia, the knappers used local raw materials for the unskilled production of flakes and short-blade knapping performed by percussion (Astruc 2001). This indicates that the skills employed were far below those evidenced at Ulucak, Uğurlu and Çukuriçi. As at Knossos X, the Cypriot toolkit is constrained by the morphology of the blanks. It is characterised by the frequency of backed pieces, truncations, notches and sickle inserts. However, the presence of several burins and blades with a tang distinguishes the assemblage of this site from those of the Initial Neolithic sites of the Aegean region (Astruc 2001).

The Levant

Despite their relative proximity, at the beginning of the seventh millennium, the chipped-stone industries of Cyprus and the Levant were very different. For instance, the pressure technique, well attested in the northern part of the Euphrates basin, may be present in coastal Syria, for example at Ras Shamra where prismatic cores are attested (Borrel 2007: 13), and may be attested at Mersin-Yumuktepe (Altınbilek-Algül 2011). It seems to be absent from or not very characteristic of the southern Levant sites (Borrell, Khalaily 2016).

The main characteristics of the toolkit are different from those of the Aegean sites. Projectile points are attested across the whole region (Altınbilek-Algül 2011; Borrell, Khalaily 2016). Burins are also attested at some sites, such as Ras Shamra (de Contenson 1992: 2.103). The morphology of the sickle inserts varies from one region to another, but, most of the time they correspond to fragments of regular blades with a characteristic denticulate retouch on one or both edges (de Contenson 1992: 2.96; Barzilai, Getzov 2008; Bocquentin et al. 2014).

Discussion and concluding remarks

Analysis of the chipped-stone industries of Ulucak and Uğurlu shows that the sites shared a common strategy in terms of raw material procurement, debitage and toolkit management. Furthermore, some of the skills evidenced, like the mastering of the pressure technique, suggest that these similarities should not to be reduced to physical characteristics (the availability of raw materials and technical functions), but correspond to the same traditions and habitus.

The notion of habitus (Bourdieu 1977) refers to habitual behaviour, which has an unspoken basis of embodied tradition. It can be acknowledged that an artefact is created by an individual or a community with a specific cultural background and societal principles that structure both conscious and unconscious actions. Knappers at both Uğurlu and Ulucak shared a set of manufacturing techniques that were guided by local tradition and reflect a shared habitus. A shared habitus might therefore engender identification between similar social groups. One may consider that the daily practice of lithic use by the members of a society may play an active role in producing and reproducing this local tradition, societal principles and social identity. The archaeological study of social identity is a difficult task because of the multidimensional and fluctuating nature of identity construction processes. Although the Neolithic of western Anatolia did not leave abundant discernible material traces, it seems that, after the Initial Neolithic, the local community of western Anatolia created and reproduced social boundaries and affiliations at different levels simultaneously.

The published data from Çukuriçi suggest that it too shared similar features (Horejs et al. 2015). The differences from Knossos are important and should not be reduced to contextual characteristics. The Initial Neolithic phase of Franchthi Cave also shows distinct features – such as the frequency of notches and the presence of trapezes, as in the Final Mesolithic, and the absence of sickle inserts (Perlès 1990a; Perlès et al. 2013: 1004). Therefore, it must correspond to another tradition. Nonetheless, the presence of evidence of use of the pressure technique indicates that the knowledge and know-how implied by this technique were transmitted in this region (Perlès et al. 2013: 1004).

It seems that the people of western Anatolian were in contact with each other and did engage in certain shared traditions, as evidenced by the common use of particular raw materials (obsidian from Melos), a four-tiered animal management system, the absence of pottery, red-painted lime plaster, etc. Similar practices can be a fundamental aspect of what it is to be a member of a specific social group. However, some groups are more prone to technological routine than others (see, for example, Lemonnier 1993).

In the Aegean, some raw materials, such as obsidian, might also have played an important social role in establishing and maintaining networks of long-distance communication. The presence of a few obsidian pieces in the basal layers of Uğurlu and Ulucak indicate that an obsidian network was already established at least at the beginning of the occupation of these settlements. In addition, some flint blades from Uğurlu and some obsidian blades from Ulucak and Uğurlu were made by different modes of the standing pressure technique, including mode 4 at Uğurlu. In all cases known so far, whatever region and period are considered, this technique was always mastered by specialists in the socio-economic sense (Perlès 2001: 208 n.19). Thus,

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knappers produced blades not only for their own community but also for other communities (Guilbeau forthcoming). The presence of such large pressure blades suggests there were groups of specialised knappers in the Aegean from the beginning of the Neolithic (Guilbeau forthcoming).

It may be important to consider here Brian Hayden's view (1998) that some technological achievements were initially developed as prestige technologies and later evolved into more practical applications. Catherine Perlès claims that mobile specialised knappers, who also possessed skills and knowledge associated with seafaring and quarrying, were the main agents in the distribution of Melian obsidian during the Neolithic period throughout southeastern Greece up to Thessaly (Perlès 1990b; Perlès, Vitelli 1999). Within this context, it might be that the specialised knappers who distributed some artefacts, such as the mode 4 pressure blades, may have been perceived by the Aegean Neolithic communities as privileged and of a higher status.

The origins of the chipped-stone tradition of the Initial Neolithic Aegean are not clear yet. Securely dated Late Mesolithic sites are rare. The chipped-stone industries of the Aegean Mesolithic sites (from the ninth to the mid-eighth millennium) were mainly based on local raw materials, even when these were of poor quality. Exogenous raw materials, especially obsidian from Melos, were always marginal and even absent from Franchthi Cave at the end of this period (Perlès 1990a: 85). In the wider Aegean, the skills of the knappers were limited; they produced mostly irregular flakes by direct percussion with a hard hammer. The toolkit was adapted to these irregular blanks and was linked with the activities performed by these communities, like hunter-gathering and fishing. Notches and denticulates are numerous; backed tools are frequent, too. While they are present during the Late Mesolithic at Franchthi, geometrics are absent from most Mesolithic sites (Sampson 2014).

The Neolithisation of the Aegean is problematic. The complete absence of the pressure technique from this region before the Initial Neolithic is noteworthy. It seems that the management of chipped-stone industries (knapping methods and techniques) at Mesolithic sites on the Aegean islands is different from that of the Initial Neolithic sites of Uğurlu, Ulucak and Çukuriçi. At Knossos, the rarity of the pressure technique indicates the absence of knappers able to perform this technique. The debitage techniques are expedient, as in the Mesolithic. However, it would be incorrect to conclude that there was a continuity between these periods, because, unlike the pressure technique, the skills involved in these expedient productions were limited and did not require a long apprenticeship. Thus, they did not require transmission from one group to another. Furthermore, the relative abundance of obsidian and the presence of tools linked with agricultural practices (two sickle inserts) indicate a clear break from the lithic management of the Mesolithic.

The comparison with Franchthi is more nuanced: the presence of pressure blades at this site, alongside a production of crude flakes as in the Final Mesolithic (Perlès 2001: 46), indicates the presence of knappers who possessed the same knowledge and know-how as the knappers of the three western Anatolia sites. Conversely, if these blades were not made at the site, it may indicate that the inhabitants were connected with networks for the distribution of such artefacts. However, at the same time, the dominance of notches in the toolkit, the presence of a lunate and a trapeze, and the absence of sickle inserts are all evidence suggesting continuity with the Final Mesolithic (Perlès 1990a: 105). Consequently, we agree with Perlès' hypothesis that the site was still occupied by hunter-gatherers who had regular contact with Neolithic communities (Perlès 1990a: 116).

If we go beyond this region, for instance to the Marmara region and the Lake District, once again the lack of precise data regarding the late eighth and the early seventh millennia BC is problematic. Girmeler is the only promising site for understanding this period preceding the Aegean Initial Neolithic and the Neolithisation of the Aegean. Unfortunately, the site has offered insufficient data to be decisive.

The only secure comparable information for the lithic traditions of the Initial Neolithic in the wider region comes from central Anatolia, but, as seen above, the lithic traditions of this area are distinctive from those of the Aegean (for instance, the absence of the pressure technique for large blades, the importance of skilled bipolar blade production and the frequency of projectile points). In contrast to Carter and colleagues (2016), we assume that there is no link, direct or indirect, between central Anatolia and the Initial Neolithic sites of the Aegean region.

If we go south, Cyprus also shows characteristic traditions, with, for instance, an absence of the pressure technique. During the first half of the seventh millennium, this technique was mastered in southeastern Turkey and may be attested at Mersin-Yumuktepe (Altınbilek-Algül 2011) and also in coastal Syria (Borrell 2007). This suggests that the skills involved in this technique come from there (Horejs et al. 2015: 323). However, the toolkits of the sites of these regions show distinctive features, especially with the presence of projectile points, the morphology of sickle inserts and the presence of burins. Furthermore, if we consider the other components of the material culture, for instance the presence of pottery, it can be observed that the communities of these regions practised traditions that were distinctive from those of the Initial Neolithic communities of the Aegean.

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All these observations demonstrate that the chipped-stone industry of the Aegean Initial Neolithic in western Anatolia was managed with specific traditions and skills, and was quite different from what we know of it in other regions, and even in other parts of the wider Aegean, such as Crete. It seems that there was a vast array of technological traditions in the Aegean during this period, and the origins of these traditions and skills remain unknown. Furthermore, the comparative analysis of lithic technologies within the Aegean region appears to indicate that multiple social identities were represented as early as the Initial Neolithic, beyond the basic dichotomy of farmers and hunter-gatherers. Considering that Uğurlu, Ulucak and Çukuriçi had similar subsistence patterns, symbolism and technology, it is reasonable to suggest that they likely originated from the same source.

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