

TRACKING THE NEOLITHIC IN THE NEAR EAST



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TRACKING THE NEOLITHIC IN THE NEAR EAST

*Lithic Perspectives on Its Origins,
Development and Dispersals*

*The Proceedings of the 9th International Conference
on the PPN Chipped and Ground Stone Industries of the Near East,
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In memory of the late Ofer Bar-Yosef and Carole McCartney

Towards Understanding the Early Neolithic in the Zagros Mountains

Results of New Investigations of the Austro-Iranian Team in Ilam Province, Iran

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Abstract

In October 2018 a joint Austro-Iranian survey project was initiated in the Sirvan-Chardavol district of the Ilam province in central-west Iran with an aim to set up the basis for the investigation of long-term occupations in the central Zagros. This paper presents the first outcomes of the pilot survey study carried out by the prehistoric part of the team and focuses on lithic assemblages documented in the valleys of the two tributaries of the Seymareh River. Techno-typological studies of chipped stone artefacts recorded in the course of the survey provide new insights into the occupation of the Sirvan-Chardavol Valleys, which can be attributed to the periods from the Middle Palaeolithic until the Bronze Age. Preliminary results suggest the lack of permanent Early Neolithic settlements in the Sirvan Valley and can be contrasted to the evidence of the neighbouring Chardavol Valley. Initial identification of possible Neolithic find scatters provides a contribution to the research in the highlands of the central Zagros, and it outlines the potential for the future excavations of short-term and long-term occupations in the region, which differentiate in their geomorphological and geographical setting, but also in terms of the use of raw materials, which likely influenced the Neolithic chipped stone tool production patterns.

Chipped stone technology, survey, Early Neolithic, PPN, Zagros, Iran

1. Introduction

Archaeological investigations in central-west Iran, especially those from the past two decades, have highlighted the importance of the central Zagros in the context of the Neolithisation processes in southwest Asia (Darabi 2012, 2015; Matthews and Fazeli Nashli 2013), in particular concerning the subsistence patterns at the onset of farming. New data on the incipient cultivation of plants, and management of animals prior to their domestication in this area (Zeder 1999, 2008, 2011; Zeder and Hesse 2000; Riehl *et al.* 2013; Weide *et al.* 2018) has reopened the discussion on the multiple origins of

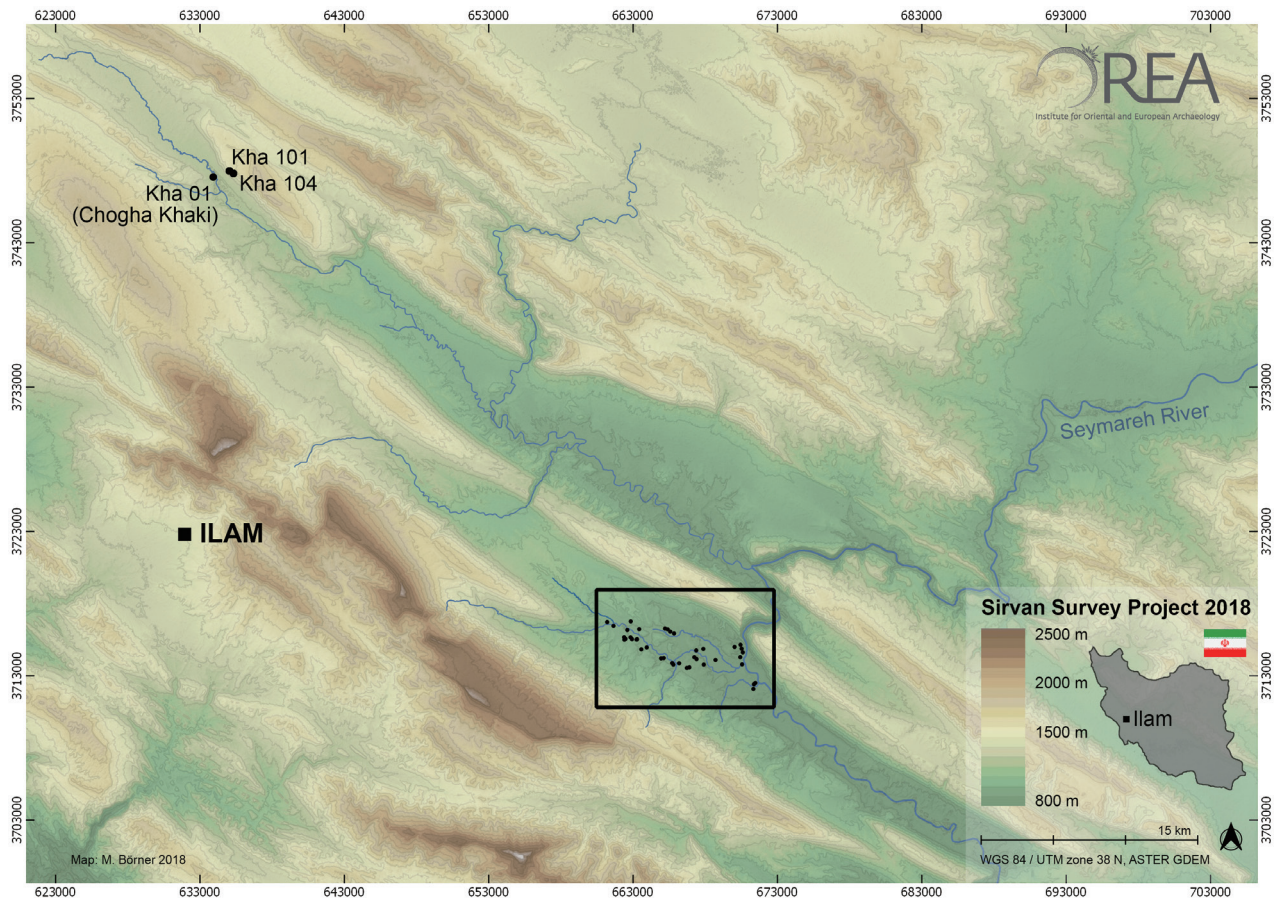


Fig. 1 Investigated areas in the Sirvan and Chardavol Valleys (Map: M. Börner/OREA archive).

agriculture and shed more light on the questions that were initiated in the pioneer research of the American, Danish, Canadian and Japanese teams in western Iran in the 1960s and 1970s (Braidwood 1960; Braidwood *et al.* 1961; Egami 1967; Fukai *et al.* 1973; Mortensen 1974; Smith 1976; Hole *et al.* 1969). In addition, likely independent Early Neolithic population in the Zagros region has been supported by the latest a DNA studies (Broushaki *et al.* 2016).

Although there is an obvious discrepancy in the number of sites and overall data volume in contrast to the outcomes of the extensive research in the Levant, as outlined in more detail in the reviews by H. Darabi (2015) and B. Helwing (2014), new interdisciplinary investigations and (re)excavations of key sites in the highlands and the Zagros foothills are filling the gaps in understanding of the formation and development of the Neolithic (contributions by Matthews *et al.* 2013a, Darabi *et al.* 2013, Conard *et al.* 2013, Niknami *et al.* 2013, Alibaigi 2013 in Matthews and Nashli 2013; Conard and Zeidi 2013; Matthews *et al.* 2013b; Mortensen 2014; Darabi *et al.* 2019). On the other hand, the latest publications also tackle the topics of symbolism, special (potentially non-domestic) architectural features and long-distance exchange networks (Matthews *et al.* 2013b; Darabi 2016; Barge *et al.* 2018; Richter

et al. 2021), and as such open up new horizons for future debates on the matter of complexity within the Neolithisation process in the Zagros.

Despite the lack of knowledge about the cultural evolution of the pre-sedentary communities and the transition from the Epipaleolithic, which falls into the Younger Dryas and the earliest Holocene (c. 11,000-9500 BC) (Darabi 2012), lithic studies have greatly contributed in delineating major technological trends in the Eastern Wing of the Fertile Crescent. They provide a good basis for the discussion of the cultural and chronological differences within the Early Neolithic period between the Levant, Upper Mesopotamia and the greater Zagros region (Kozłowski 1994, 1999; Kozłowski and Aurenche 2005). Within western Iran, patterns in the production of chipped stones can now be differentiated between the Neolithic of the highlands and lowlands, while the recent studies have brought new concepts in recognising the development of the Mlefatian industry (Tsuneki 2013; Nishiaki 2013; Nishiaki and Darabi 2018), which is best characterised by the use of the pressure technique in bladelet making (Kozłowski 1994; 1999).

This paper deals with the preliminary results of the survey of two micro-regions in the Ilam province in central-west Iran focusing on the presentation and discussion of lithic assemblages with the aim to contribute to the recording of potential Early Neolithic occupations in the highlands of the central Zagros. Taking into account that only one survey season could be conducted so far, the paper offers first insights into the lithic scatters documented in the Sirvan and Chardavol Valleys.

2. Survey area and project goals

The Austro-Iranian joint project in the central Zagros is part of the collaboration between the Research Institute of Cultural Heritage & Tourism (RICHT) and the Iranian Center for Archaeological Research (ICAR), and three institutes of the Austrian Academy of Sciences (former OREA – Institute for Oriental and European Archaeology, former IKAnt – Institute for the Study of Ancient Culture and IfI – The Institute for Iranian Studies). The pilot survey in the Sirvan-Chardavol district in Ilam province (Fig. 1) was initiated in 2017 and conducted in 2018 with the aim to set up the basis for the examination of diachronic settlement patterns focusing on two sustainable cultural phenomena taking place during the prehistoric and historical periods – the Neolithisation process and the transition from Antiquity to the Islamic Middle Ages (Horejs *et al.* in preparation). The study area represents the valleys of two tributaries of the large Seymareh River – Sirvan and Chardavol, which were previously not investigated in a systematic way after the initial survey in the 1990s (Vanden Berghe and Tourovets 1992). Furthermore, archaeological sites in the area have been recorded and registered by the Ilam branch of the Iranian Cultural and Tourism Organisation (ICHTO), which also supported our survey together with the team from the Ilam Museum.

The main objective of the part of the survey aiming to discover prehistoric sites was the documentation of landscape use varying from the short-term to long-term occupations, by focusing on documentation of finds on visible artificial mounds, river terraces and high plateaus. The methodology of the extensive and intensive survey in the chosen areas employed geomorphological and topographical study, GIS mapping, technological and typological analyses of collected surface finds, and further geoarchaeological analyses of raw materials.

After the small team visited the Sirvan-Chardavol district in October 2017, when this micro-region of Ilam province was initially inspected, the pilot study campaign took place between May 20th and 31st in 2018. In the course of the two-week survey the area between Sarab Kalan and the junction of the Sirvan and Seymareh Rivers at Tang-e Sazbon (Sazbon Gorge) in the Sirvan district and the tell site of Chogha Khaki in the Chardavol district were investigated in more detail. Based on

surface finds and remains of architectural structures and historical monuments 43 locations were registered by the interdisciplinary international team of prehistorians and historians, of which 24 findspots were recorded as prehistoric, dating between the Middle Palaeolithic and the Bronze Age. Aside from Chogha Khaki and two additional prehistoric locations in the direct vicinity of the tell, the rest of the find spots are located in the Sirvan Valley (see Fig. 3 for their chronological attribution). An overview with more detail on survey methodologies, environmental aspects including geography, geomorphology and raw materials, including the diachronic assessment of primary datasets is given in the first written report of the survey team by Horejs *et al.* (in preparation), whereas the further text in this paper focuses on prehistoric lithic finds and their cultural contextualization of the Neolithic in the wider region.

3. The Sirvan valley

The investigations of the Sirvan Valley took place in the area with an elevation between 700-900 m above sea level, in the western-most highland areas of the central Zagros (Figs. 1 and 2). The Sirvan River is the small right tributary of the Seymareh, which enters the area from the east, while the broader landscape is characterised by roughly parallel straight mountain ranges and longitudinal valleys extending in a northwest-southeast direction (Horejs *et al.* in preparation).

Two findspots contained small scatters of finds on the top of the natural mound (Sir 127) and southern slope of the promontory (Sir 232) with Middle Palaeolithic artefacts (patinated retouched flakes). These finds are also the oldest evidence for a prehistoric presence in the Sirvan district. Frequent Chalcolithic and rare Bronze Age ceramic sherds were attested in association with lithics (radiolarite nodules, irregular larger blades and wide retouched blades and flakes) and were distributed within the whole area (Fig. 3). In addition, nine locations with chipped stone artefacts made of radiolarite, silicified limestone and chert, mainly cortical flakes and rarely retouched flakes, occasional blades, and non-characteristic pottery were documented, and assigned as “prehistoric” without further chronological determination. These finds were located on hill flanks, higher and lower terraces, eroded lime plateaus, and were mainly disturbed without bearing the original cultural sediments. It seems that the majority of finds from these locations were made of local radiolarite (in colour varieties from red to dark red and brown), which is encountered also as small nodules and river pebbles. The second possibly local raw material according to its occurrence in find spots is dark grey and greenish chert, which requires further analytical determination in the future.



Fig. 2. Overview of the Sirvan Valley (Photo: B. Milić/OREA archive).

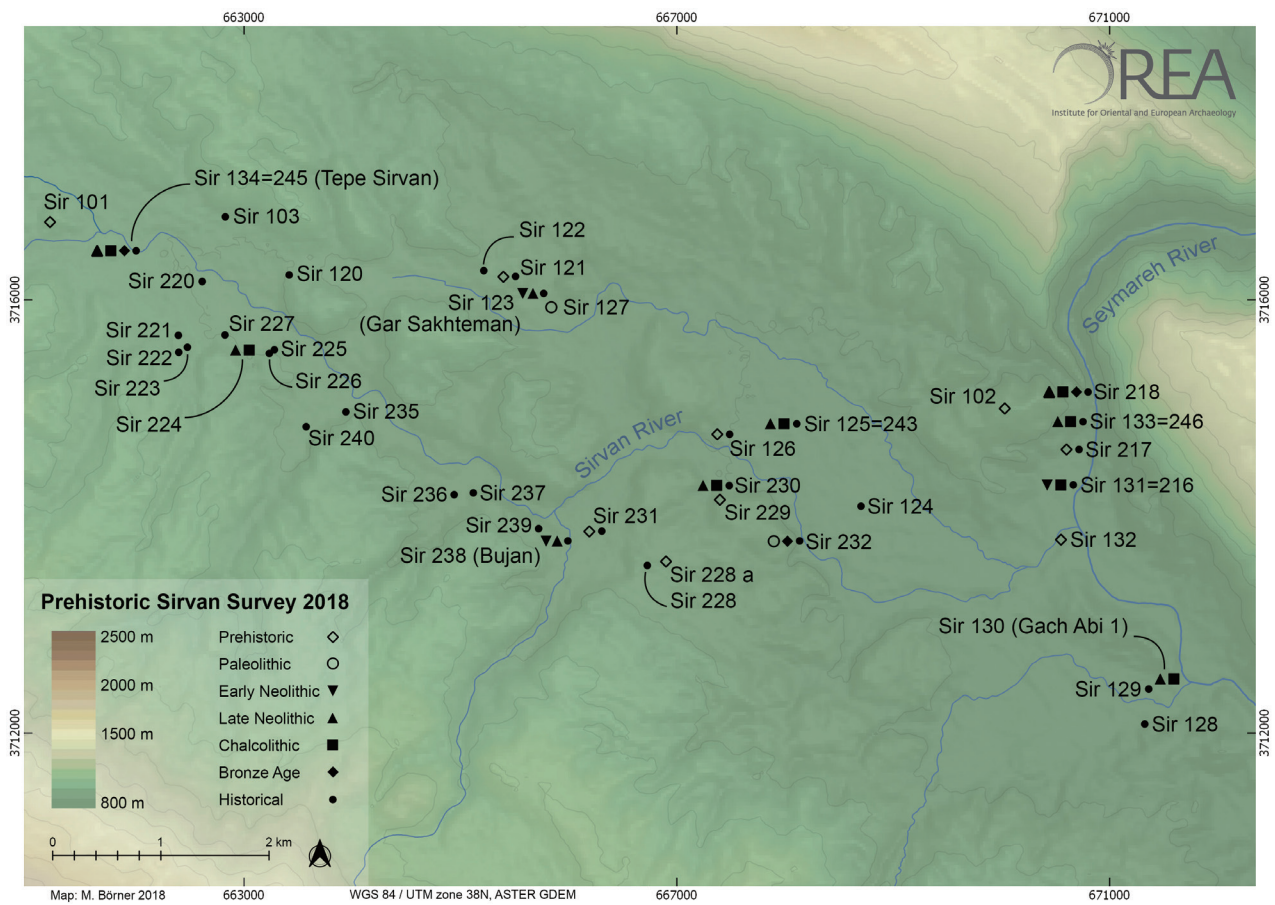


Fig. 3. Distribution of surveyed locations within the Sirvan Valley (Map: M. Börner/OREA archive).

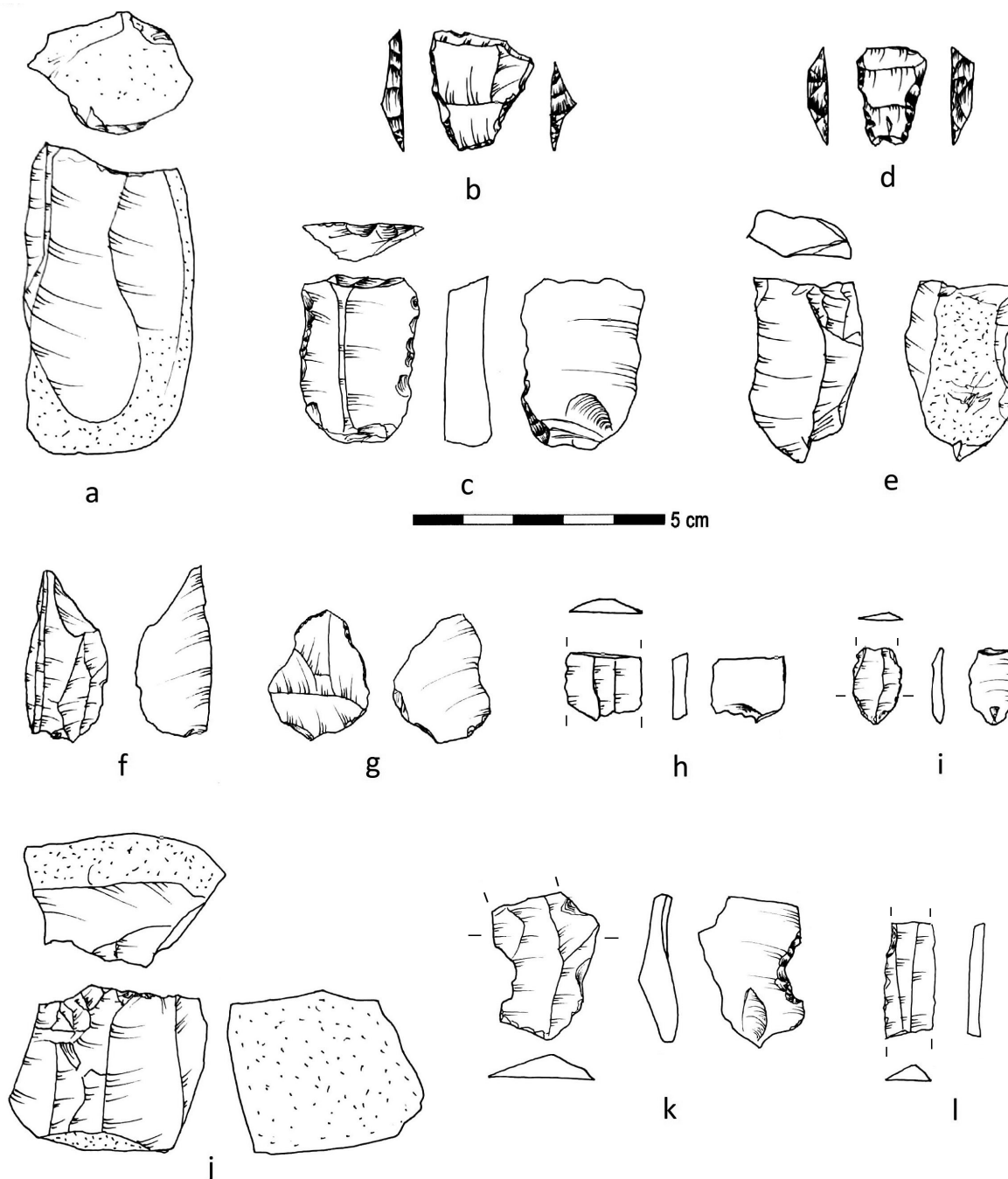


Fig. 4 Cores and chipped stones tools from the Sirvan Valley; Sir 130: Gach Abi (a-c), Sir 134: Tepe Sirvan (d), Sir 123: Gar Sakhteman (e-i), Sir 238: Bujan (j-l) (Drawings: B. Milić/OREA archive).

Finally, four locations with more characteristic chipped stone artefacts that might be broadly dated to the Neolithic period, some of which were in association with possible Neolithic pottery, are given in the following sections (see Sir 123, Sir 130, Sir 238 and Sir 134 on Fig. 3).

Sir 123 (Gar Sakhteman) yielded chipped stones, stone blocks, a few pottery sherds and grinding stones, which were scattered on different levels of the slope on a natural ridge covered by conglomerate, which was on

top of the limestone bedrock and significantly modified by ploughing activities. Despite possible relocation of finds, the concentration of chipped stones was documented in the upper part of the flank with exposed sediments. Eighteen chipped stone artefacts were recorded, amongst which there were blade and flake cores made on river pebbles with preserved natural surface, a rejuvenation flake with the remains of bladelet core reduction, a pressure blade, and small retouched and used flakes and a scraper

(Fig. 4: e-i). The raw material is significantly different from the frequent radiolarite, and it shows some purple, light grey/white and dark grey chert varieties.

Sir 130 (Gach Abi 1) is the location on the lower river terrace at the confluence of the Sirvan into the Seymareh River. The lithic scatter is recorded in the direct vicinity of the site of Gach Abi (129), which is already registered as an historical tell site. The area with the concentration of chipped stones was likely a part of a larger terrace, which is currently undefined in size, due to its extension into the slope with ploughing activities. In total 25 chipped stones were collected, of which 6 were tools. A core on a radiolarite river pebble with a large portion of remaining natural surface (Fig. 4: a), and cores on flakes occur in the assemblage, and are followed by a number of small (up to 20 mm) to medium-sized flakes (20-50 mm), flake-like-blades and rare wider blades. Blade and bladelet reduction was carried out from single platformed cores. Retouched tools are made on wide irregular blades and small flakes. In addition, there is a trapeze in grey-purple chert found in the same location within the survey of historians from the same team during their visit to the tell site (Fig. 4: b).

Sir 238 (Bujan) is a site located on a remaining river terrace at the confluence of the Sirvan River and its tributary. A couple of pottery sherds (prehistoric and historic) were found together with a concentration of chipped stones and a hammerstone. Out of 44 pieces of chipped stone only 6 were tools – retouched flakes and notched and used blades. Cores were made on radiolarite pebbles and other raw materials (Fig. 4: j). Unidirectional core reduction is recognised in both assemblages of cores and flake blanks, although multidirectional flake knapping was also confirmed. Blades are rare in the assemblage in contrast to flakes, which range from small to large sized (less than 20 mm to up to 70 mm long), being both cortical and non-cortical. Although the material is likely to be mixed in terms of chronology, a few more characteristic pieces were documented. These were made of different raw materials and are also technologically different from the majority of artefacts in the assemblage. Light beige, brown and grey notched (Fig. 4: k), retouched and used blades/flakes, of which a couple were made by pressure technique (Fig. 4: l) are attested here.

Sir 134 (Tepe Sirvan) is a well-known large tell site of almost 100 m in diameter (De Meyer 2004) situated in the middle of the plain and in the north-western end of the Sirvan Valley. As mentioned previously, earlier investigations of the tell were conducted aiming to document architectural remains on the top of the large mound, and in the course of the 2018 survey the team collected new data (based on pottery and architectural remains), which speak in favour of a long occupation stretching possibly from the Late Neolithic/Chalcolithic to the Early Islamic period. Only 5 flakes and blades were

collected from the tepe by the prehistoric team, however a single retouched tool, a trapeze (Fig. 4: d) is important for the chronological determination of the earliest potential occupation of the site (see following discussion in the later sub-heading).

4. The Chardavol valley and the tell site of Chogha Khaki

The second region investigated in the course of the survey was the Chardavol Valley, which was primarily visited in order to inspect the site of Chogha Khaki and its direct surroundings (Fig. 5). Chogha Khaki is located to the northwest of Asemanabad city next to the village of Seyd Nazari, belonging to the Shirvan-Chardavol County of Ilam province. The average altitude of the mound is 1210 m, while the prehistoric occupations were formed on a natural elevation. The mound and the intermountain valley of Asemanabad are hemmed in by the mountains of Ghalacheh, Pohan, Manesht and Bankol, which run in a northwest-southeast orientation. On the northern side of the mound, the most important water source for ancient residents was the old and currently dried up Asemanabad River, locally known as Sorkh Jub. Its course ran over the northeast and east slopes of the mound.

A. Motarjem was first to investigate Chogha Khaki in 2000, reporting the Neolithic and Chalcolithic settlements from the site based on a surface assemblage of sherds and stone tools (Motarjem 2000: 10). Later on, the mound was studied as part of the general survey of Asemanabad Valley by A. Nouroollahi, who attributed it to the Early Neolithic (without pottery) and Late Neolithic (with pottery) according to ceramic sherds and lithic finds (Nouroollahi 2003: 25 and 26). The mound was registered in 2003 as a National Cultural Heritage (Pirani 2003). In 2012, as part of a sounding operation, D. Davoudi excavated test trenches around the site, seeking to demarcate the main area of the prehistoric occupation. He estimated the real core area of the site to be about 3.1 ha, large parts of which are presently covered by agricultural fields. As regards to cultural material, his ensuing report cited lithics and ceramics of the Neolithic period, a few Chalcolithic pottery sherds, and a single historic sherd. From the 1.5 × 1.5 m Test Trench N1, he also reported architectural remains of stone foundations. The small finds consisted of chipped stone artifacts made of flint, limestone and obsidian. With the exception of obsidian with unknown origin, the raw materials for the remaining artifacts all seem to have been procured from the immediate surrounding area. Based on the study of production technology of the material from Chogha Khaki, parallels with the assemblages from East Chia Sabz, Chogha Bonut, Tepe Abdul Hossein, central Zagros, and Tamar Khan in Iraq were previously suggested (Davoudi 2014: 184–185).



Fig. 5. The mound of Chogha Khaki in Chardavol district (Photo: B. Milić/OREA archive).

In the first visit to the site in May 2017, the Austro-Iranian team recorded only a couple of chipped stone artefacts from the top of the mound alongside the absence of pottery, while a more systematic surface collection was conducted in October 2018. Towards the end of the two-week survey in Ilam province, the investigations focused on the find documentation and measurements of Chogha Khaki, suggesting that the site is preserved in an elliptic shape of c. 250 m in diameter and 8 m in height (Horejs *et al.* in preparation). Furthermore, detailed examination of the site was expanded to an inspection of the tell's direct vicinity including potential lithic sources.

The chipped stone assemblage from the site was gained through the hand-picking of all visible artefacts from three locations – top of the mound, southwest slope and northeast slope. All together 312 artefacts were recorded, of which 5 were obsidian. Different chert varieties can be macroscopically differentiated to medium- and fine-grained, and ranging in colours from white, light grey to dark grey and grey with stripes, beige, brown, green, and very fine pinkish and purple good quality chert (see the

varieties on Fig. 6). Natural surface was recorded on a small number of artefacts, some being silicified limestones, while there is a number of finds that demonstrate a fire influence (recognised either from the change of colour or presence of potlid scars). It is currently unclear whether the change of colour comes from postdepositional fire exposure or the raw material was initially heated prior to knapping. Obsidian finds are greyish and greenish and should be additionally analysed to determine their provenance. Preliminary technological and typological study was conducted by the first author with the aim to gain information concerning the modes of production, the ratio between blade(let)s and flakes, core reduction strategies and types of tools.

In the course of technological analyses cores, flake and blade blanks, core preparation and rejuvenation elements and possible knapping waste were differentiated. The group of cores and core fragments (n=8) ranging in size from 20-30 mm speak in favour of on-site bladelet and flake production, and they indicate an extensive exploitation bearing in mind the existence of fully exhausted specimens

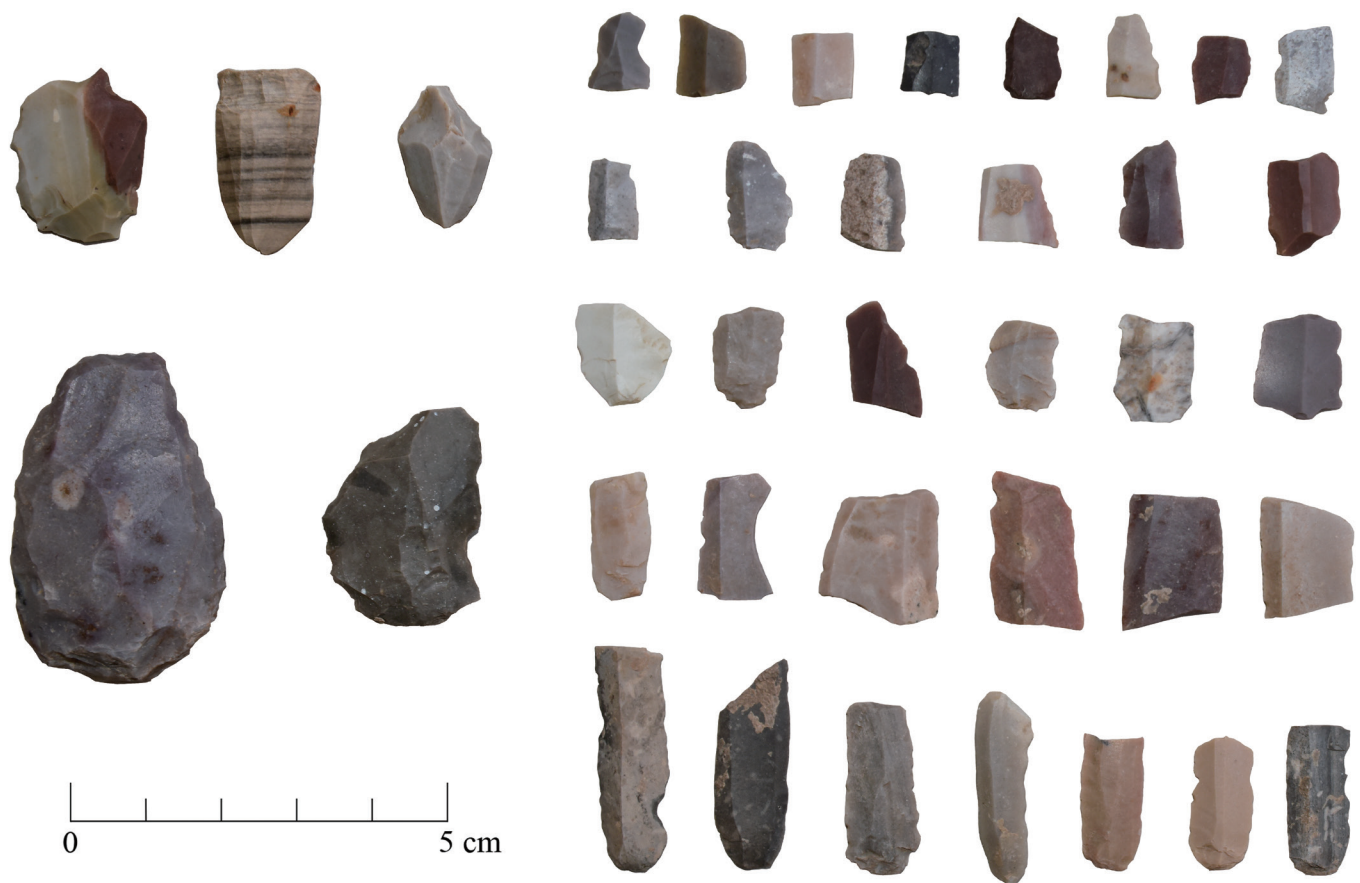


Fig. 6. Cores, flake tools and pressure blades from the assemblage of Chogha Khaki (Modified after photos by F. Ostmann/ OREA archive).

and those which attested to a changed knapping direction towards the end of the knapping sequence. Core reduction from single platform cores was recorded, alongside which there are conical pressure bladelet cores and percussion mixed bladelets and small-flake cores. Hinged terminations also support the abovementioned full exploitation of small nodules. The presence of a couple of core rejuvenation elements and a small amount of knapping waste (angular pieces) and burning debris go hand in hand with the suggested production and use on-site. The core maintenance elements can be defined as plunging and crested/lateral blades, and knapping surface correction flakes, tablets, which certainly come as remains from the pressure reduction of small bladelet cores. The ratio between blade(let)s and flakes is 56% to 44%. Although the flakes are rather abundant in the assemblage, they are mainly unidirectional and less than 15% of flake blanks is modified or used. The first impression is that besides flake blanks aimed for use in tools, a large amount of non-cortical thin and small flakes (less than 20 mm) can be associated with the blade(let) or mixed flake-blade production. Blades and bladelets derive from the unidirectional pressure

and percussion reduction, which seem to be more or less equally used based on blanks only. 31% of blade blanks have retouch or use traces. Pressure blade(let)s range in size, and their widths and thicknesses inform us about the use of different modes of the pressure technique – from hand pressure, through pressure with a short crutch to possible standing pressure with a long crutch (modes 1-4 following the experimental study of Pelegrin 2012).

The toolset from Chogha Khaki contains retouched and used blades and flakes and their fragments, and consists of 31% of the assemblage. Most of the tools were made on blade blanks, however, a number of undetermined retouched flake fragments was recorded. Tool types made on blade blanks are laterally retouched blade(let)s, backed bladelets, notched blades, borers, oblique truncations and a single burin (Fig. 7). Within the assemblage a small number of used tools without modification was recorded. Retouched flakes are mainly comprised of end-, side- and circular scrapers, notched flakes, and flakes with lateral retouch, while the majority of modified blanks cannot be further determined due to high fragmentation of flake tools (Fig. 6: middle).

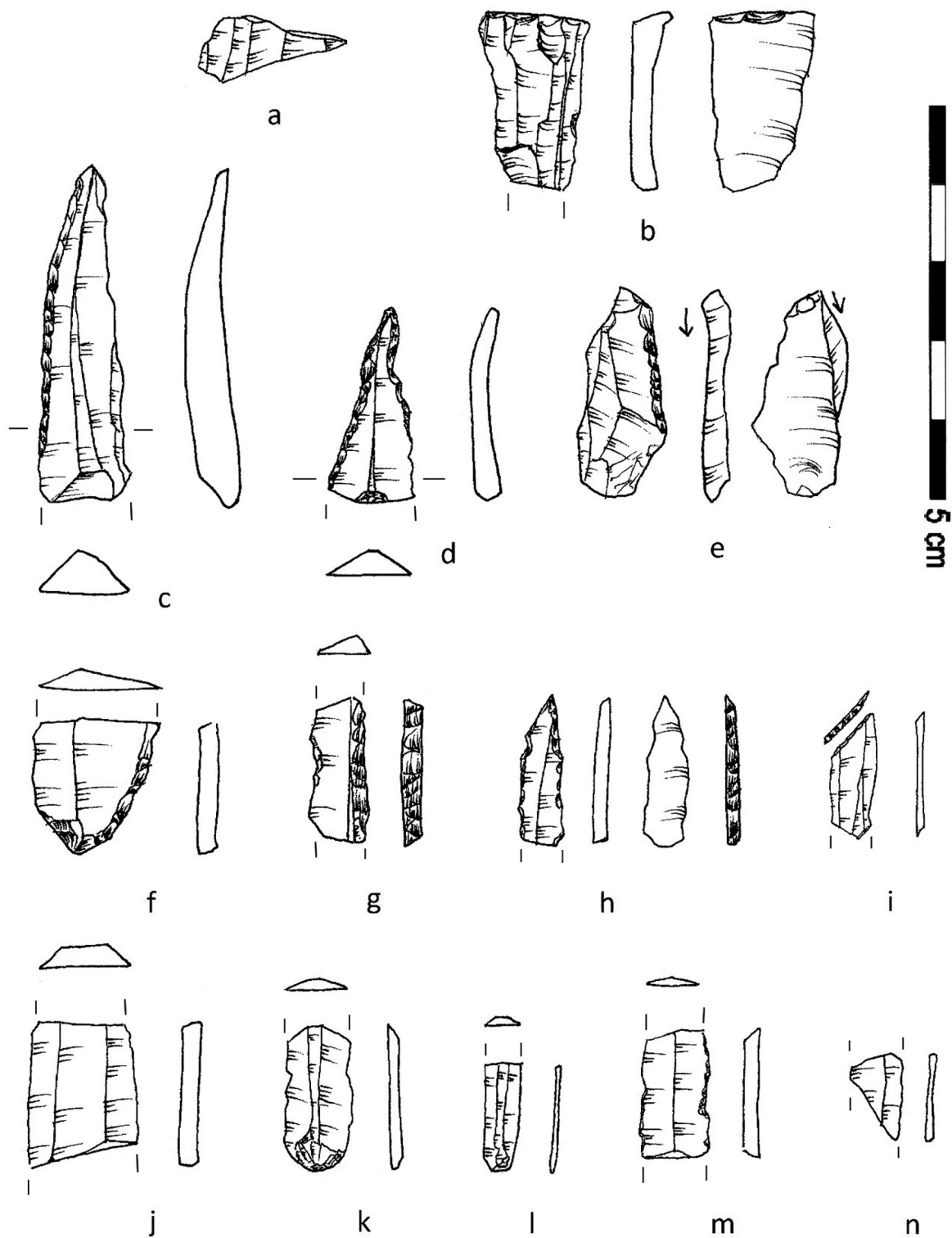


Fig. 7. Selected chipped stone artefacts from Chogha Khaki: core maintenance elements (a-b, chert), drills (c-d, chert), burin (e, chert), retouched blade (f, chert), backed bladelets (g-h, chert), oblique truncation (i, chert), unretouched pressure blade(let)s (j-l, chert; n, obsidian), used bladelet (m, obsidian) (Drawings: B. Milić/OREA archive).



Fig. 8. Ground stones (mortars) documented from the surface of the Chogha Khaki (Photos: F. Ostmann/OREA archive).

Other types of lithics were also documented at Chogha Khaki. Besides a hammerstone, ground stones which are likely to be mortars in limestone with multiple cavities between 10-20 cm in diameter were decontextualized on the slopes of the mound (Fig. 8).

Finally, an extension of the surface survey was made in the vicinity of the tell site with new prospects to examine the relationship of Chogha Khaki with its immediate surroundings. Visible rock shelters and alongside the southwest flanks on the rock wall opposite the mound were documented and are likely to have been used during the Neolithic according to pottery remains and the potential source of knappable raw material (Horejs *et al.* in preparation; see locations of Kha 101 and 104 on fig. 1). These outcomes from the research of our team member M. Händl will be further examined in collaboration with the Raw Material Lab in Vienna, in order to attest the geochemical composition of the raw material sources and archaeological artefacts from the site.

5. Discussion of the context of survey finds

The Neolithic chipped stone industry of the central Zagros in Iran has been characterised based on analysed assemblages from sites such as Ganj Dareh, Tepe Asiab, East Chia Sabz, Chogha Golan, Sheik-e Abad (Pullar 1975; Kozłowski 1999; Zeidi and Conard 2013; Vahdati Nasab *et al.* 2013; Darabi 2015; Nishiaki 2016; Thomalsky 2016; Richter *et al.* 2021). However, not all sites from the region have been extensively published, and are still awaiting detailed analyses to define sites-specific technologies, which started emerging as very informative for understanding the potential regional differences within the broader Zagros area (Darabi 2016; Nishiaki and Darabi 2018; Richter *et al.* 2021). New investigations in line with the revision of old chronologies provide, therefore, key data for defining differences in production and use of tools within the long-lasting Mlefatian, which covers

the Early Neolithic (Early Mlefatian), early phase of the Late Neolithic (Late Mlefatian) and the late phase of the Late Neolithic (Post-Mlefatian) (Kozłowski 1999). After the work of Nishiaki and Darabi (2018) on the East Chia Sabz chipped stones, a new concept of the Pre-Mlefatian prior to 8200/8000 BC has been suggested on the basis of technology and typology, where the reduction of cores by pressure techniques for the production of bladelets coincides with percussion in a rather mixed bladelet-flake production. This differs greatly from the typical record from the 8th until the mid-6th mill. BC, which follows the manufacture of bladelets and blades (in the later stage), supporting the use of tools such as backed bladelets, geometric microliths and sickle blades (Kozłowski 1999; Kozłowski and Aurenche 2005; Nishiaki 2013). Although the Mlefatian industry characterises the Eastern Wing of the Fertile Crescent, the sites in the central Zagros of Iran bear considerable typological differences from those reported in the Iraqi Zagros. Previous work (*e.g.* Kozłowski 1999) and the outcomes of the recent CZAP – Central Zagros Archaeological Project demonstrate very similar core reduction strategies between the sites in central-west Iran and eastern Iraq, however, the distribution of obsidian and the abundance of Çayönü tools (*e.g.* Matthews *et al.* 2018; Matthews *et al.* 2020) contrasts the evidence from the central-Zagros in Iran, where the presence of obsidian tools is very rare or absent.

The material discovered in the course of the survey in the Sirvan-Chardavol district demonstrates distinctive production patterns determined after the study of production techniques, used raw materials and presence of tools. Despite the fact that the evidence for the Neolithic in the Sirvan Valley is still very scarce, four lithic scatters were outlined due to the presence of pressure blade(lets) and characteristic tool types. Recorded pressure blades and small-sized retouched blades and flakes (notched tools, thumbnail and end-scrapers, laterally retouched bladelets) from the sites

Sir 123 (Gar Sakhteman) and Sir 238 (Bujan) were significantly different in raw materials from the rest of the assemblage, which partially relates to blade reduction strategies, and is therefore of interest for the future examination of findspots. Due to the use of local radiolarite, which comes in small sized pebbles in its raw state, it is possible that an opportunistic knapping was carried out on the local materials, which therefore limits more detailed chronological attribution, making these assemblages potentially mixed. On the other hand, besides the material which attested to a unidirectional production of blades and flakes and small-sized tools from Sir 130 (Gach Abi 1), a geometric microlith – wide trapeze appears as a characteristic tool speaking in favour for the Neolithic dating of the find spot. Trapezes were documented from a number of Early Neolithic sites in the central Zagros, such as Asiab, Guran, Abdul Hosein (Kozłowski Plate XVIII, XX, XXII) and can be attributed to the period from the late 8th and 7th mill. BC in Iran (Kozłowski and Aurenche 2005: 126). Trapezes remain in use in the later phases of the Neolithic, however major examples come from the Fars region in southwest Iran (Abe 2011; Nishiaki 2013). Finally, although the pottery from Tepe Sirvan (Sir 134) suggests the earliest dating of the large tell site to the Late Neolithic, the discovery of a single trapeze from the slope of the tepe can potentially testify to the beginning of the occupation even earlier in the Neolithic according to given comparisons in central-west Iran.

In contrast to the evidence from the Sirvan Valley, the neighbouring Chardavol provided the best evidence for the presence of the Neolithic in the surveyed region. Previous work on the tell site of Chogha Khaki suggested its dating to the Early and Late Neolithic (Davoudi 2014), however new techno-typological study of the collected material from the 2018 field campaign gives more insights about the chipped stones. The characteristic blade(let) assemblage, with the presence of cores and core maintaining elements supports on-site production by pressure technique, which coexists with an abundant group of flakes, although likely to be at least partially also related to the reduction of blade(let)s. The technological characteristics and toolset from the site inform us about the undoubted attribution to the Mlefatian industry at Chogha Khaki, and therefore go in line with the previous dating of the site. However, according to the 2018 collection, it is possible to suggest the beginning of the use of the site from the Early Mlefatian phase (end of the 9th and 8th mill. BC) based on the presence of backed bladelets, oblique truncations and borers, and the virtual absence of sickle blades, geometrics and typical bullet cores. The entire span of the site occupation should be further investigated, and the existence of the wider blade(let)s and obsidian that has been documented will be of importance for future studies.

6. Concluding remarks and future directions

The river valleys in the Sirvan-Chardavol district of Ilam province testify to intensive occupation during early prehistory, starting as early as the Middle Palaeolithic. The pilot survey conducted by the Austro-Iranian team in spring 2018 outlined the potential for future investigations, which are planned to carry on with a focus on the expansion of intensive survey and further documentation of finds followed by test sondages and excavations of the few locations of interest. Despite the partially mixed character of surface finds from the Sirvan Valley, geomorphological, topographic, geographical and the study of surface find collections yielded basic information about favourable locations in the valley which were used by the early prehistoric communities. The hill-flanks alongside the river basin provided most of the remains of prehistoric use in the Sirvan region, with numerous find scatters on terraces and natural plateaus around the elevations between 700-900 m. On the contrary, the flood lands of the Sirvan River do not seem to have been intensively used in earlier prehistory, except in the case of already existing natural mounds. Based on the lithic scatters from the Sirvan Valley, new data provides evidence for short-term occupations in the region, which contrasts with the results of the examination in the Chardavol Valley at the site of Chogha Khaki and its direct vicinity. These preliminary results add to the research output about the development of the Early Neolithic, use of raw materials and integration of the region in the long distance exchange networks and use of different geographical landscapes in the central Zagros and therefore emphasize the importance of Seymareh tributaries which are highly promising for gaining new insights into the Neolithisation process in the central Zagros and to be conducted in future seasons.

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