

Edited by  
Boris GASPARYAN  
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# STONE AGE OF ARMENIA



Kanazawa University

2014

Institute of Archaeology and Ethnography of  
the National Academy of Sciences of  
the Republic of Armenia

Gfoeller Fund of America Corporation, Armenian Branch

Center for Cultural Resource Studies, Kanazawa University

# STONE AGE OF ARMENIA

*A Guide-book to the Stone Age Archaeology in  
the Republic of Armenia*

Edited by

Boris GASPARYAN

Makoto ARIMURA

*Scientific advisory board:*

*Pavel AVETISYAN, Sumio FUJII*

Monograph of the JSPS-Bilateral Joint Research Project

Center for Cultural Resource Studies,  
Kanazawa University

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*Stone Age of Armenia. A Guide-book to the Stone Age Archaeology in the Republic of Armenia.*

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Edited by Boris Gasparyan, Makoto Arimura

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# INTRODUCTION

Our initial reason for producing this volume was to publish the proceedings of the workshop titled “Stone Age in Armenia”. This workshop was organized by staff at the Institute of Archaeology and Ethnography of the National Academy of Sciences of the Republic of Armenia, and Kanazawa University, Japan, with the support of the Armenian Branch of the Gfoeller fund of America Corporation. The main aim of the workshop was to share and exchange a growing body of knowledge emerging from archaeological investigations by researchers in Armenia. Additionally, organizers – who included the authors of this paper – invited young researchers and graduate students to make presentations at the workshop, since it was thought their involvement would be indispensable to the future development of the field of archaeology. The workshop was held in the library at the Institute of Archaeology and Ethnography, Republic of Armenia, on 5 March 2013 (Figure 1). Fifteen talks were given, introducing the latest results from field studies and scientific analyses dating from the Paleolithic, Neolithic, and Chalcolithic periods. Although the workshop was quite long and tiring, participants filled the room with a palpable sense of excitement (Figures 2-8).

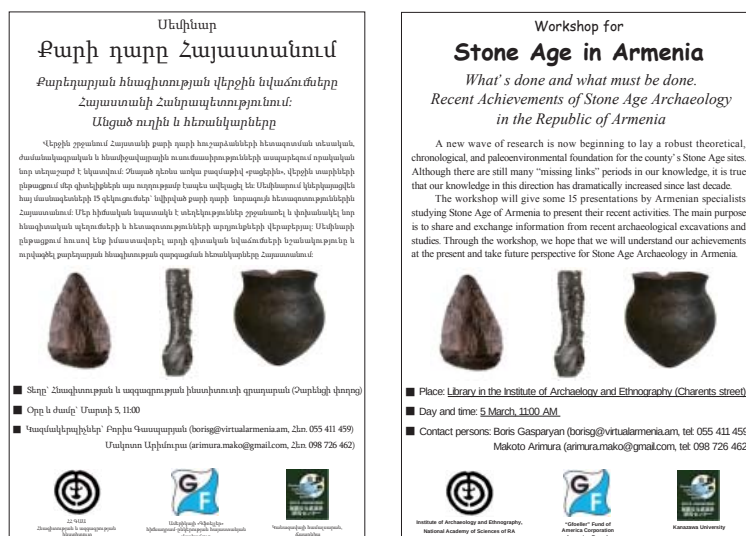


Figure 1  
Announcement posters for the workshop in Armenian and English.



Since some authors prepared their papers after the workshop's conclusion, and others not in attendance expressed interest in contributing to the series of papers, we decided to prepare a monograph presenting recent findings of archaeological research conducted on the Stone Age sites in the Republic of Armenia.

By means of this publication, we hope that readers will become aware of our achievements to date, and come to understand the future prospects for Stone Age archaeology in Armenia. In addition, this workshop marks the beginning of cooperative efforts between Armenian and Japanese archaeologists - after all, both countries have unique and long-standing historical-cultural traditions in this field.

Pavel Avetisyan

*Director of the Institute of Archaeology and Ethnography, the National Academy of Sciences of the Republic of Armenia*

Sumio Fujii

*Director of the Center for Cultural Resource Studies, Kanazawa University, Japan*



Figure 2  
Participants and audience in the workshop.

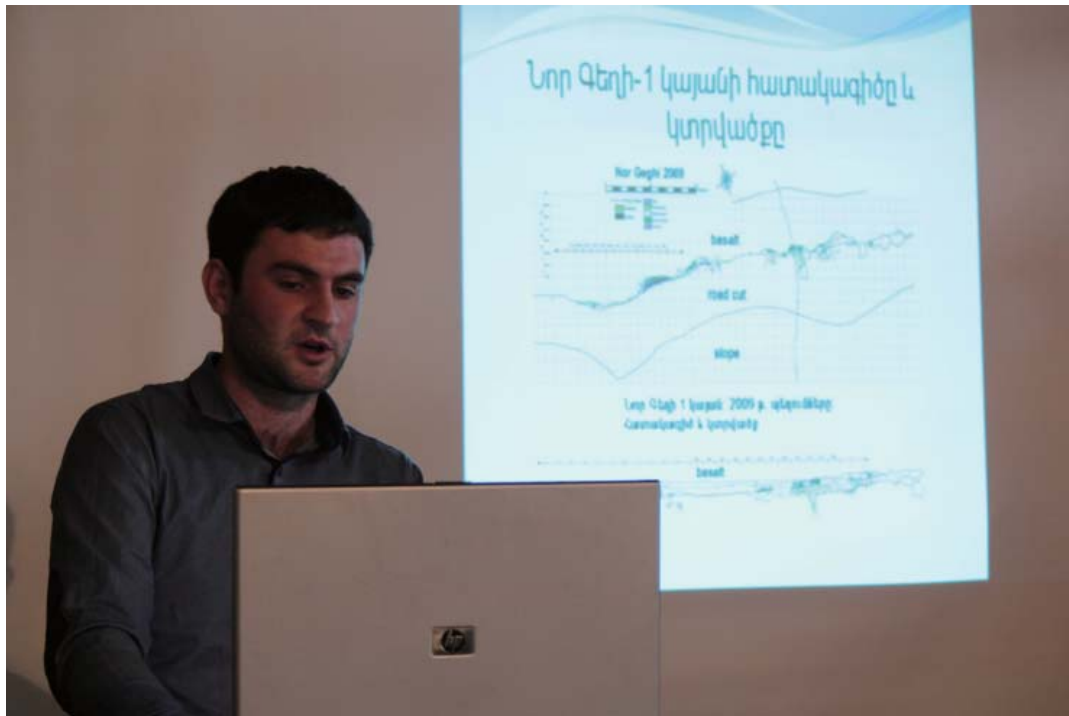


Figure 3  
Presentation by Karen Azatyan.

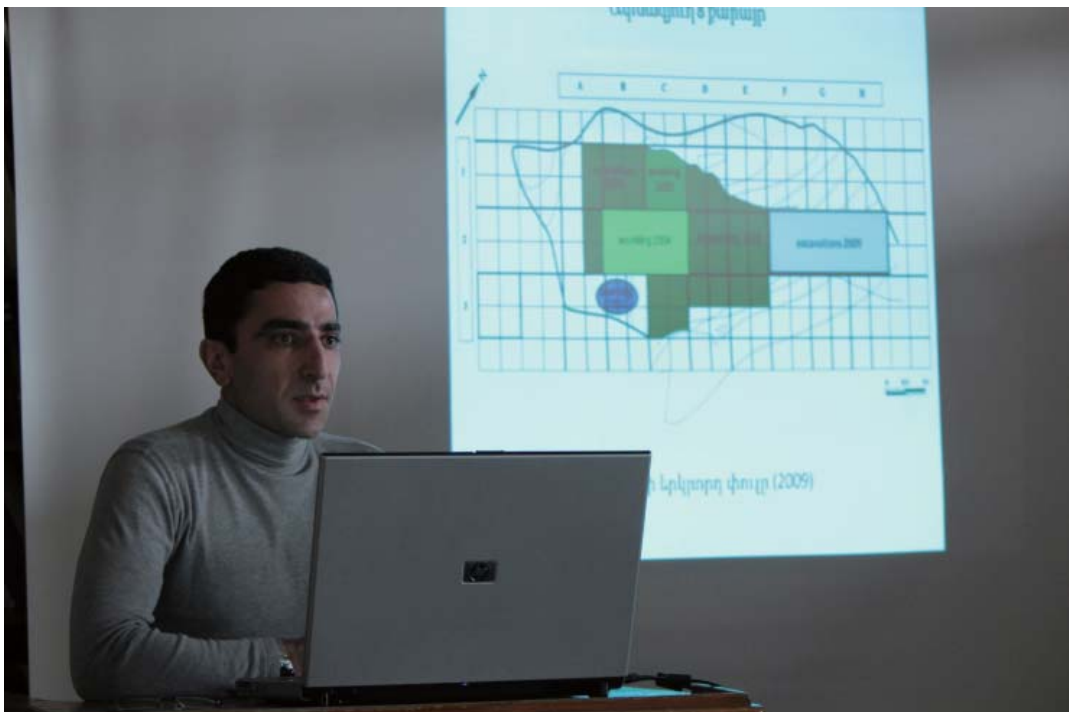


Figure 4  
Presentation by Arthur Petrosyan.



Figure 5  
Presentation by Diana Zardaryan.



Figure 6  
Participants and audience in the workshop.



Figure 7  
Young participants.



Figure 8  
Participants and audience in the workshop.



# RECENTLY DISCOVERED LOWER PALEOLITHIC SITES OF ARMENIA

Boris Gasparyan, Daniel S. Adler, Charles P. Egeland and Karen Azatyan

## 1. Introduction

Situated within a natural cul-de-sac between the Black and Caspian Seas and the Greater Caucasus, the southern Caucasus, a term that commonly refers to the modern republics of Armenia, Azerbaijan, and Georgia, lies at the meeting point of Africa, Europe, and Asia. The region's favorable climate and rich natural resources have attracted human populations throughout Paleolithic times, which is borne out by an extremely prolific record of Paleolithic occupation (Lyubin 1984; 1989; 1998). It is also thought that the southern Caucasus was an important refuge for humans during Pleistocene glacial periods and, thus, served as a core from which recolonizations of Eurasia occurred (Bar-Yosef 1994; Finlayson 2004; Dennell *et al.* 2011; Dalén *et al.* 2012 ).

The modern Republic of Armenia is located at the heart of this corridor and will therefore play a pivotal role in our understanding of the Paleolithic settlement of the southern Caucasus and, indeed, beyond. Until recently, the Lower Paleolithic record of Armenia was based exclusively on open-air artifact scatters situated directly on, or in close proximity to, obsidian outcrops that lacked any stratigraphic context. These sites were nonetheless widely considered from the late 1940s and early 1950s through the early 1980s as the oldest evidence of human occupation within the borders of the Soviet Union (Panichkina 1950b, pp. 22, 68, 99; Zamyatnin 1950, p. 128; Sardaryan 1954, pp. 72, 170; Okladnikov 1956, pp. 26-29; Yefimenko *et al.* 1956, pp. 18-19; Pershits *et al.* 1982, p. 83; Praslov 1984, p. 42). While the importance of stratified Lower Paleolithic sites was certainly recognized, all attempts by Soviet scholars (S. Sardaryan, M. Panichkina, V. Lyubin, H. Ghazaryan)



to discover such evidence proved unsuccessful (Panichkina 1950, pp. 24-25; Klein 1966, pp. 4-5; Ghazaryan 1986).

The spectacular record from Dmanisi in late 1980s (Georgian Republic), dated to between 1.85 and 1.78 million years ago, demonstrates that the southern Caucasus was home to Paleolithic peoples by at least the Early Pleistocene (Lordkipanidze 1998; Gabunia *et al.* 2000; de Lumley *et al.* 2002; Tappen *et al.* 2007; Ferring *et al.* 2011). Given the proximity of Dmanisi to Armenia, there is every reason to assume that archaeological sites of similar age would be discovered in Armenia, and this assumption has spurred new archaeological surveys throughout the country (Gasparian 2010).

This article is a preliminary attempt to summarize Lower Paleolithic data from the Soviet period and provide a brief description of the recently implemented surveys and test excavations which reveal that several sites have great potential to preserve *in situ* occupations. Future work will target these areas for systematic excavation.

## **2. Background on Lower Paleolithic research in Armenia**

The collections of lithic artifacts by the French archaeologist Jacques de Morgan near the sources of obsidian and adjacent areas (Mt. Arteni, Hrazdan and Kasakh Rivers valleys) at the end of the 19th century contain some Lower and Middle Paleolithic forms. While thinking that Armenia and the Caucasus as a whole were not populated during the Paleolithic period, Morgan attributed these finds to the end of the Archaeolithic period (Upper Paleolithic by his definition). This opinion hindered further research of the Paleolithic in Armenia by at least 30 years (de Morgan 1909, p. 191-192, Fig. 48-49, 51). In 1933 the geologist A. Demyokhin, who studied mineral springs in the middle stream of the Hrazdan River, discovered a small group of stone artifacts in Arzni containing typical Late Acheulian handaxes (Bayburtyan 1938, pp. 195, 216, Figures 1 and 4; Zamyatnin 1947, p. 19, Figure 1 a-c; Panichkina 1950b, pp. 74-75, Figure 20: 1-2, Figure 21: 2-3; Demyokhin 1956). Those finds stimulated the further study of the Paleolithic period in Armenia by placing them into a systematic context.

During 1944-1949, re-visiting the areas investigated by Morgan and Demyokhin, S. Sardaryan (Armenian SSR Academy of Sciences), S. Zamyatnin and M. Panichkina (Academy of Sciences of the USSR and Leningrad State Hermitage) surveyed the middle reaches of the Hrazdan River canyon (Arzni, Nurnus and Argel) and Mt. Arteni (Satani-dar, Areguni blur, Yerkaruk blur). They assembled a large collection of Paleolithic artifacts from numerous open-air

sites which were located in close proximity to obsidian raw material sources. Based on detailed typological description of the surface collections Sardaryan, Zamyatnin and Panichkina separated over 1,000 lithic artifacts produced from obsidian and dacite (diabase according to Zamyatnin and doleritic basalt according to Panichkina). The collections included different types of handaxes and coarse chopping tools, picks, tools produced on so-called “Clactonian flakes”, discoidal and Levallois cores, discoidal tools, unmodified flakes and blades, retouched flakes, knives, coarse points, Levallois points, side scrapers and coarse borers, all considered characteristic of the Lower Paleolithic (Zamyatnin 1947; Panichkina 1950a; 1950b, pp. 12-14, 23-80, 99-101, Tables V-X; 1951; 1952; 1953; Sardaryan 1954, pp. 16-19, 43-100, 169-171; 1967, pp. 37-60; Klein 1966, pp. 3-14).

Based on classification and typology, as well as comparison of the assemblages to similar sites from the Caucasus, Crimea, Western and Eastern Europe, the Middle East and Africa, Panichkina and Sardaryan attributed the earliest complexes of Satani-dar to the Chellean and Acheulian. While each scholar offered a slightly different interpretation of whether the earlier or later phases of the complexes was present, they placed the division between Chellean and Acheulian at the base of the first chronological chart of the Lower Paleolithic of Armenia. In addition, based on the Western European chronology, Sardaryan suggested an age for the Lower Paleolithic of Armenia between 800,000 – 100,000 (Panichkina 1950b, pp. 23-80, 99-101; Sardaryan 1954, pp. 43-100, 169-171).

Between 1950-1970 numerous Lower Paleolithic finds were recorded in Armenia widening the geographic extent of their distribution. In 1953 geologist A. Aslanyan discovered the Jajur open-air site in the Shirak Depression of northwestern Armenia (Aslanyan 1956; Lyubin 1961, p. 66). In 1959 L. Barseghyan reported finding limestone Acheulian handaxes near the cave of Gheasi-kar on the slopes of the Papakar Range in Noyemberyan district of northeastern Armenia (Barseghyan 1959). Geologist H. Sargsyan discovered the first Acheulian handaxe in the basin of the Urut River near the village of Privolnoe on the Tashir Plateau of northern Armenia in 1965 (Gasparyan *et al.* 2005, pp. 17-18). Lower Paleolithic occupation in the Aparan Depression of central Armenia was recorded by the discovery of the Lusagyugh open-air site by S. Barkhudaryan with surface collection of Acheulo-Mousterian obsidian implements in 1969 (Petrosyants 1988: 37). In any case, all of these finds were fortuitous in nature.

In 1958 continuing the tradition of the Leningrad school, V.P. Lyubin (Institute of Archaeology of the Academy of Sciences of the USSR) conducted new surveys and studies in the area of Mt. Arteni and Mt. Gutanasar (Hrazdan-Kotayk Plateau) in the frame of the Caucasian



expedition of the Institute of Geography of the Academy of Sciences of the USSR. Among the finds in the areas of Kaghsi, Matash and Verin Talin, he recorded Lower Paleolithic as well (Lyubin and Balyan 1961). The most significant discoveries by Lyubin were made between 1958-1963 on the slopes of Mt. Gutanasar in close proximity and directly on obsidian outcrops where numerous Acheulo-Mousterian open-air sites of Jraber (I-X), Fontan (I-II) and Kyondarasi (I-IV) were discovered (Lyubin 1961; 1984, pp. 61-62, 76, Fig. 19; 1989, pp. 88-92; 1998, pp. 136-153; Kulakov 1991; Lyubin and Beliaeva 2006). Trying to study the materials of the Acheulo-Mousterian open-air sites of Armenia, Lyubin was the first researcher to combine the methods of technological analyses, formal typology and experimental archaeology developed by S.A. Kulakov and A.E. Matyukhin. He concluded that most of the Late Acheulian open-air sites of Armenia lying in close proximity or directly on obsidian outcrops represented long and short-term specialized workshops for specific types of blank production (Lyubin 1965; 1978; Kulakov 1991; Matyukhin 1981; 2001). Lyubin also made the first attempts to analyze the materials of the Caucasian Paleolithic from the regional perspective, discussing general questions such as site formation, environment, climate, chronology and social behavior (Lyubin 1970; 1972; 1981; 1984; 1989; 1998).

A new wave of systematic study of Lower Paleolithic sites in Armenia began with the expedition for the study of the Stone Age sites of Armenia based on the decision of the Presidium of the Academy of Sciences of the Armenian SSR in 1967 headed by Professor H.A. Martirosyan. The most important finds made by the members of the expedition during two years of intensive investigation from 1967-1968 in the canyons of the Hrazdan, Azat and Ughtakunk Rivers (tributaries of the Araxes River) and adjacent areas was the discovery of the Yerevan and Lusakert groups of Middle Paleolithic caves in the Hrazdan River gorge. In addition numerous Lower Paleolithic open-air sites (Arzni, Dzoraghbyur, Yerablur, Abovyan, Hatis, Akunk) were recorded here and in the surroundings of Mt. Hatis (Martirosyan 1968; 1969; 1970; 1974, pp. 25-28; Karapetyan and Yeritsyan 1969; Karapetyan 1983a; 1983b).

Since 1967 systematic excavations of Yerevan and Lusakert caves started under direction of B.G. Yeritsyan (Institute of Archaeology and Ethnography of NAS RA). Between 1970-1990 the main focus of Paleolithic studies was concentrated in the Hrazdan River canyon and adjacent areas of the Hrazdan-Kotayk Plateau (slopes of Mt. Gutanasar and Hatis) making it the “center of gravity” of such studies in Armenia. Between 1970-1976, in parallel with Lusakert, small scale excavations were implemented in numerous caves of Hrazdan some of which – Hamo-1, Zovuni, Karashamb – yielded Lower Paleolithic finds (Azizyan 1979; 1982; Azizyan *et al.* 1975; Azizyan and Lyubin 1983; Chagharyan *et al.* 1972; Yeritsyan and Ghazaryan 1977). In addition many new

open-air sites were discovered and studied in the middle reaches of the Hrazdan River (Argel-1, Argel-2) and along the edge of the Hrazdan-Kotayk Plateau (Zar, Radiokayanin kits gyugh, Kaputan). At some previously known sites (e.g. Jraber, Nurnus, Hatis) additional collections and studies were implemented (Yeritsyan and Ghazaryan 1977; Yeritsyan and Korobkov 1979; Yeritsyan 1991; Yeritsyan *et al.* 1996; 1998).

Starting from 1983 H.P. Ghazaryan (Institute of Archaeology and Ethnography of NAS RA) started investigating a series of open-air sites situated between the villages Akunk and Zar on the southern slopes of Mt. Hatis in direct proximity to obsidian raw material sources. As a result ten open-air sites were discovered and studied – Late Acheulian (Hatis-1-4 and 6-9), Mousterian (Hatis-5) and Neolithic (Hatis-10). The special methodology, spectrum of scientific questionings and scale of investigations of the Hatis open-air sites constituted a new step in the history of study of the Stone Age of Armenia. The main focus was concentrated on the study of Hatis-1, yielding rich collection of handaxes (420 among a total of 2,100 finds), one third of which are finished tools. While attributing the industry of Hatis-1 to at least two phases of the Late Acheulian, Ghazaryan did a test trench at the site, trying to record *in situ* materials. Based on his publication, the thickness of the five lithostatigraphic layers in the trench measured 1.3-1.5 m, and bedrock was not encountered. All the layers were dense with obsidian implements including bifaces that were identical to the ones collected from the surface. In general, the assemblages from each layer are homogeneous (Ghazaryan 1985; 1986; Lyubin 1989, pp. 150, 154, Fig. 87)<sup>1</sup>.

In 1990 another Late Acheulian site was documented by G.E. Areshian in the limits of the Aparan Depression, on the left bank of the Kasakh River, between the villages of Kuchak and Vardenis, where obsidian implements (handaxes, Levallois cores, Levallois points, side scrapers, notched tools, knives) were collected. Areshian proposed that this occupation might be related to the shore of a Pleistocene lake formed in the Aparan Depression during the last interglacial. Further investigations of Paleolithic sites in the Aparan Depression confirmed this prediction (Areshian 1991)<sup>2</sup>.

During the last decade of the 20th century (1990-2000) because of the collapse of the Soviet Union and lack of funding, intensive study of the Lower Paleolithic sites of Armenia, and the Stone Age as a whole, stopped. Work was implemented through a new strategy of small-scale surveys

1. Unfortunately, most of the research implemented by H. Gazaryan at Hatis remains unpublished.

2. Areshian's dating was based on old representations about the timing of Late or Upper Acheulian in Armenia spanning around 140-100 ka BP, meanwhile his observations about occupation of paleolake shores by Paleolithic inhabitants of Armenia were significant and proved by future investigations in Ararat, Shirak, Lori and Aparan Depressions (see Gasparyan *et al.* 2003; 2004; 2005; 2007b; Gasparian 2010).

and reconnaissance investigations, having the aim to re-examine the location, geomorphological and cultural distribution of previously known sites and discover new and perspective landmarks for future investigation. Such kind of works were implemented by B. Gasparyan in the Hrazdan-Kotayk Plateau (Hatis-11-21, Zar-1-10), the northern flanks of the Ararat Depression (Mushakan, Voskevaz, Agarak, Aghavnatun, Tsaghkalanj, Dalarik), the Shirak Depression (Aghvorik or Yeni-Yel, Tavshut) the Tashir Plateau (Metsavan, Siskyatskaya, Pechka), the Kasakh River basin and the Aparan Depression (Mulki, Aparan). These surveys yielded important records from the Lower Paleolithic as represented by numerous sites and single finds (Gasparyan 2007a; 2007b; Gaspariyan 2010; Gasparyan and Sargsyan 2003; Gasparyan *et al.* 2003; 2004; 2005; Yeritsyan 2010; Yeritsyan and Tadevosyan 2005; Yeritsyan and Gasparyan 2010). Besides Hatis and Zar, where obsidian predominates, mapping of finds represented mainly by implements made of basalt, dacite and flint (massive cores, choppers, picks and other pebble tools, coarse bifaces and handaxes) showed their possible relationship to the shore lines of lakes that existed in those areas during the Pleistocene, traces of which were confirmed by lacustrine deposits (see below). Most of the data that resulted from this work served as the basis for future investigations and was brought to life through international cooperation and joint projects in the time frame of the 21st century (see Gasparyan and Arimura, this volume). In summary, the Lower Paleolithic of Armenia continued to be based on large numbers of unstratified open-air localities. Therefore, subsequent investigations focused on finding *in situ* sites to gain a deeper understanding of the initial stages of habitation in this area.

### **3. Lower Paleolithic record of Armenia during the 21st century**

Recent investigations having the aim to recover Lower Paleolithic stratified sites in Armenia were conducted in 2000 by the team of the Institute of Archaeology and Ethnography of the National Academy of Sciences of the Republic of Armenia led by B.G. Yeritsyan at Mushakan-1. The site is located in the northeastern foothills overlooking the Ararat Depression, where rich outcrops of flint exist. Surface collections from an area of about 1.5 ha yielded more than 5,500 implements including artifacts manufactured on jasper, chalcedony, limestone, sandstone, felsite and quartzite. Test trenches excavated in the various parts of the site yielded similar finds but without indications of a clear stratigraphy. The Mushakan-1 complex is dominated by choppers, bifaces, cleavers, and the “archaic” cores and flakes corresponding to them. Given the fact that local flint sources were used for a long time, even by knappers of the Bronze and Iron Ages, separating the Paleolithic artifacts from the entire assemblage is practically impossible, even if there are pebble tools, which

typologically can be attributed to the Pre-Acheulian or Early Acheulian (Figure 1). As a whole Mushakan-1 can be interpreted as a repeatedly visited workshop located directly near the flint sources (Gasparian 2010; Yeritsyan and Tadevosyan 2005; Yeritsyan and Gasparian 2010).

Since 2000 the Armenian-French team has conducted another survey in Aghvorik (once known as Yeni-Yol) looking for new evidence of Lower Paleolithic sites near the obsidian and dacite outcrops on the northern side of the Shirak Depression. A rich record of implements characteristic of Acheulo-Mousterian sites includes some artifacts which can even be attributed to the Early Acheulian with thick bifaces and trihedral pieces. However, these sites lack reliable contextual information (Fourloubey *et al.* 2003, p. 7; Gasparian 2007a; 2007b; Gasparian 2010). New interesting finds of Acheulian handaxes were collected by the expedition of the Shirak Regional Museum during the excavations of Haykadzor Medieval cave complex in the Akhurian River canyon from 2001-2002. Those finds are presumed to be related with Middle Pleistocene lacustrine deposits underlying the tuff lavas in the proximity of the cave. Numerous finds of Pre-Acheulian and Acheulian implements were systematically collected directly near those deposits in the Shirak Depression which yielded rich collections of Quaternary fauna<sup>3</sup> (Yeganyan and Khachatryan 2002; Gasparian 2007b; Gasparian 2010).

The potential presence of lake-margin and alluvial environments of Plio-Pleistocene age in Armenia and the region is especially significant given that Dmanisi itself is thought to have been in close proximity to a lake (Gabunia *et al.* 2000), and early hominid occupation of well-watered habitats such as riparian woodlands and lake-margins is well-documented in East Africa at both Olduvai Gorge and sites in the Turkana Basin. Records of Lower Paleolithic sites and single finds in the proximity of lacustrine deposits and potential embankments of paleolakes in the Ararat, Shirak, Lori and Aparan Depressions support the hypothesis that this was one of the main habitation models for the early hominids in the territory of Armenia (Egeland *et al.* 2010). While testing this hypothesis a site called Aghavnatun-1 on the southern foothills of Mt. Aragats, overlooking the Ararat valley at the point of its junction with the main valley was chosen for test

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3. The southern Caucasus has experienced volcanic activity more-or-less continuously throughout the late Miocene and well into Holocene times. These processes, in addition to creating dramatic stratovolcanoes like Mt. Aragats (4,095 m) and Mt. Ararat (5,165 m), produced a series of basins (e.g. Aparan, Lori, Pampak, Vorotan) that were filled by lakes during the terminal Pliocene and into the early stages of the Middle Pleistocene. These lakes likely provided habitats conducive to human occupation, and the lacustrine deposits they left behind are generally well-suited to the preservation of macro- and microfossils. Further uplift and volcanic activity along with climatic changes caused the disappearance of most of these lakes after about 1.0 ma. The modern landscape was formed through subsequent river incision and glacial activity (Joannin *et al.* 2010; Ollivier *et al.* 2010, pp. 323-325).

excavations. The area of the site is formed by the Lower to Middle Pleistocene andesite-dacite and dacite lavas that are interspersed with the tuffs and tuff lavas of Mt.Aragats. The Late Pleistocene andesitic-basalt lavas bypassed the area of the site without covering it. The southernmost limits of the tuff cover, starting from the foothills of Aragats, gradually changes into the Ararat Depression. The beds of the tuff covers are cut through by shallow valleys and canyons where, on both sides of the dried-up river beds among sections of redeposited loose sediments, around 160 lithic implements made from low quality dacite were collected. Dacite raw material is present in the area in the form of massive pebbles, boulders, and rolled slabs. The majority of the artifacts collected from the surface are massive cores and flakes without any traces of secondary modification, and pebble tools – choppers, choppings, and picks. Bifacial tools are present as well, including thick and massive handaxes without traces of additional thinning of the working profiles (Figure 2). In general, the Aghavnatun-1 complex of stone implements is distinguished by its massive and archaic character. It is most likely that the site appears as a result of activity of a small group of an Early Acheulian population occupying the banks of a river draining into the Pleistocene lake of the Ararat Depression and settling down directly on the surface of the tuff plateau. The majority of the implements from Aghavnatun are well preserved and the presence of small flakes and irregular pieces and unfinished products opens the possibility of finding *in situ* cultural remains in an undisturbed context (Gasparian 2010). Starting from 2009 excavations of the site discovered *in situ* early Middle Paleolithic occupation in a palesol layer resting on the surface of volcanic ash and pyroclastic material. It is possible that future work will bring to light a stratified record of the Acheulian component of the site, which for now is known only from surface finds, suggesting a complex taphonomic history for the site.

As it was stressed before, the spectacular record from Dmanisi (Georgian Republic), dated to between 1.85 and 1.78 million years ago (Ferring *et al.* 2011), demonstrates that the southern Caucasus was home to Paleolithic peoples by at least the Early Pleistocene. However, additional evidence in the region for what is currently the oldest human presence outside of Africa remains elusive. Besides Dmanisi, in fact, it is not until the Middle Pleistocene with its Late Acheulean technologies that a reasonably secure case for human occupation of the southern Caucasus can be made. Given how rare well-preserved Lower Paleolithic sites are, and the fact that the initial discovery of the Early Pleistocene finds from Dmanisi was made more-or-less by accident during the excavation of the village's Medieval complex, GIS-assisted modeling was employed to help isolate areas for survey. The initial objective was to identify a dispersal corridor through which human groups leaving Africa via the Levant may have passed on their way into the Lesser

Caucasus. A simple least cost path analysis based on slope traced a corridor through the Lori Depression, and it was this result that initially led to consider northern Armenia, and the Debed River Valley in particular, as a general target region. Based on factors such as land cover, slope, and elevation, the next phase of the modeling classified locations along the Debed as being “unsuitable,” “suitable,” or “very suitable” to the preservation of Paleolithic occurrences (Egeland *et al.* 2010).

The modern Debed River passes through the northern ranges of the Lesser Caucasus and is contained within northeastern Armenia’s Lori Depression. While archaeological research has been conducted intermittently along the Debed and its tributaries since the late 19th century (de Morgan 1889; 1909; Yeritsov 1882), it is only within the past decade or so that systematic work on the area’s Paleolithic record has emerged. Based on this predictive modeling, a 2009 reconnaissance survey implemented by Lori Depression Paleoanthropological Project (LDPP) in the Debed Valley with particular attention on the Lower Paleolithic, recovered 437 artifacts from a total of 23 open-air scatters. All phases of the Paleolithic are represented among the finds, although nearly 70% of the diagnostic material is of Middle Paleolithic manufacture. Of particular interest for the Lower and Middle Paleolithic record are the Haghtanak sites, which are examined below. The four Haghtanak sites lie between 500 and 512 m asl and are situated to the north and east of the Debed. Like most of the Debed sites, a majority of the diagnostic material (70%) shows Middle Paleolithic affinities. With a total of 117 surface artifacts including diagnostic and undiagnostic pieces, Haghtanak-3, which overlooks the Debed from atop a basalt plateau, is the richest single site in the survey area. Most of the artifacts were probably unearthed by the commercial geological trenches that dot the surface. They furthermore reveal that several meters of artifact-bearing sediments cap some parts of the plateau. The LDPP’s ongoing archaeological trenching, which has recovered additional artifacts including an attractive handaxe flaked from limestone, confirms this finding. Of particular note is the hint of a Pre-Acheulean component with the recovery of a handful of pieces reminiscent of Oldowan chopper forms (Figure 3). We stress, however, that this assertion is based on surface finds and we readily acknowledge the difficulty of assigning isolated pieces to this Paleolithic technocomplex. We hope further excavations will securely confirm or refute this hypothesis. No faunal material has yet been identified at Haghtanak-3 or any of the other sites in the Haghtanak group (Egeland *et al.* 2011; 2014).

The Armenian-Russian team, which since 2003 is working in the northern Armenian Tashir Plateau on the southern slopes of the Javakheti Range in the area adjacent to Dmanisi, also recorded a series of Acheulian open-air habitation sites near the lacustrine deposits of the Lori Depression (Dolukhanov *et al.* 2004; Aslanian *et al.* 2006; 2007, Lyubin 1989, pp. 136-168;



Lyubin and Beliaeva 2006; 2010). Recent claims have been made for Early Pleistocene lithic artifacts from the sites of Karakhach (1.94–1.75 Ma or older) and Kurtan (<1.43 Ma) (Presnyakov *et al.* 2012). However, questions exist concerning the authenticity of the published lithic artifacts from Karakhach and their stratigraphic relationship to the dated samples. Likewise, the lithic artifacts from Kurtan, some of which are unambiguously the result of human agency, are not stratigraphically associated with the dated ash that was sampled from the opposite wall of the quarry. Finally, based on Presnyakov *et al.* (2012) it would appear that neither site has undergone detailed geoarchaeological analyses that would provide the critical data necessary to assess the stratigraphic context of the lithic artifacts or the taphonomic processes that affected their final distribution within the excavated sediments. Until these major issues are resolved it will remain impossible to interpret the meaning of these artifacts and their relevance to debates on the earliest occupation of the southern Caucasus.

Another open-air site, Dashtadem-3 in northern Armenia, was studied by the same team and represents the best excavated and documented site of its kind. The site is reported to contain bifaces and Levallois artifacts within a thin deposit (<1m thick) of homogeneous “humusized” brown loamy “soil” sitting on porphyritic andesite bedrock (Kolpakov *et al.* 2009). The excavators argue that these artifacts are *in situ* and contemporaneous, and based on techno-typological analyses they attribute them to the Late Acheulian (Kolpakov *et al.* 2009). However, in the absence of direct chronometric estimates and detailed geoarchaeological analyses it might alternatively be suggested that the artifact accumulation at Dashtadem-3 resulted from discrete hominin activities, separated perhaps by tens of thousands of years, that were repeatedly eroded, sometimes down to the underlying bedrock and later incorporated into a thin deposit of sediment. Subsequent pedogenic processes, perhaps dating to the Holocene produced the impression of a “stratified” site in which bifaces, Levallois technology, and pottery appear to be archaeologically contemporaneous when in fact it represents a geological palimpsest.

An interesting collection of Oldowan type tools (mainly choppers) manufactured from local pebbles washed by the Arpa River (limestone, sandstone, granite) was discovered while excavating the front slope of the Areni-1 cave (Figure 4). Stratigraphic observations showed that those implements did not appear to be *in situ* with a stratigraphic position between the slope colluvium and the Chalcolithic occupation horizons. Meanwhile their excellent state of preservation, the existence of small flakes and debris, and refitting have shown that the initial source of those implements is nearby and that they are washed from a very short distance. Such a potential location can be the platform-like area near the entrance of the cave, which, based on

geomorphological observations around the cave might represent the Lower Pleistocene terrace of the Arpa River<sup>4</sup>. Future excavations are targeted to open the surface of the terrace with preserved sediments containing Lower Paleolithic occupations. If so, Areni-1 would be the first cave site with traces of the earliest human occupations in Armenia (Gasparian 2010).

During the last decade impressive progress was made in the direction of study of Acheulo-Mousterian sites located in close proximity or directly at the obsidian raw-material sources in the area of the Hrazdan-Kotayk Plateau and the Hrazdan River canyon. Especially new efforts in re-examining the Hatis group of Paleolithic open-air sites was undertaken by the American-Austrian team (Gasparian 2010). In addition, the Armenian-American joint expedition in the framework of the Hrazdan Gorge Paleolithic Project discovered new potential localities and sites for future investigation in the areas of Kaghsi, Fontan and Jraber on the Hrazdan-Kotayk Plateau. Another significant finding was the recently discovered (2008) site of Nor Geghi-1, located in the Hrazdan Gorge. Nor Geghi-1 is a stratified, open-air site along a former river channel which is tentatively ascribed to the late Middle Pleistocene. The low-energy alluvial deposits containing the archaeological material have undergone pedogenesis and are sandwiched between two basalts. The lithic artifacts come from a buried paleosol within the alluvial strata and document the variable technological behaviors of the site's late Middle Pleistocene occupants prior to and including OIS 9c. The assemblage contains an unexpected mix of techno-typological elements often associated with either the Late Acheulian (e.g. ovate and triangular bifaces; large, thick flakes, Mode 2) or the early Middle Paleolithic (e.g. truncated faceting, denticulates, Levallois blades, Mode 3). The sediments at Nor Geghi-1 were completely decalcified in antiquity, so that no faunal remains are preserved. As this is the first stratified late Middle Pleistocene site in Armenia, and in fact, the broader region as a whole, Nor Geghi-1 holds great potential for our understanding of the earliest phases of the Middle Paleolithic, specifically in terms of the new technological and perhaps cultural adaptations that accompanied the local transition from the Lower to the Middle Paleolithic (Adler *et al.* 2009; 2012; Gasparian 2010).

In addition, the record from Nor Geghi-1 is opening new possibilities for the cultural and chronological interpretation of many Acheulo-Mousterian open-air sites located in the vicinity. The first Soviet scholars, including Zamyatnin, Panichkina and Sardaryan, interpreted these sites by separating the collections into two different chronological-cultural groups or phases – Late Acheulian (handaxes) and Early Mousterian (small handaxes and Levallois products). The next generation of Soviet researchers including Lyubin, Yeritsyan and Ghazaryan preferred to use

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4. S. Nahapetyan, personal communications.



the term Acheulo-Mousterian without providing such divisions of the surface materials, but also without considering them as transitional. Meanwhile the view from Nor Geghi-1 is telling us that this might be a single transitional industry. If so, the recently discovered and preliminarily studied open-air site of Jraber-17 may represent the same assemblage combination as in Nor Geghi-1 with a coexistence of Mode 2 (bifaces; large, thick flakes) and Mode 3 (tools manufactured on the bases of Levallois blades) (Figures 5 and 6).

#### 4. Concluding remarks

Recent international collaborative projects for the search and excavation of stratified Lower Paleolithic archaeological sites in Armenia are very close to bearing fruit. Potential *in situ* Pre-Acheulian sites have been discovered in the Debed River valley, the Ararat Depression, the Arpa River Valley, and the Shirak Depression. New data on Acheulian occupations, especially those located in the vicinity of obsidian and dacite raw material sources, have emerged as well. The Aghavnatun group of sites in the Ararat Depression and the Hatis group in the Kotayk Plateau are particularly noteworthy. Perhaps the most significant findings have been made by studying the Paleolithic sites of the Hrazdan River Valley and the Hrazdan-Kotayk Plateau related with the discovery and study of the open-air site of Nor Geghi-1. This stratified and securely dated late Middle Pleistocene site (>300 ka) in the Hrazdan River canyon is elucidating our understanding of the transition from the Late Acheulian to the Middle Paleolithic, i.e. outlining the possible chronological boundary between the Lower and Middle Paleolithic in Armenia.

The current state of Paleolithic research in Armenia remains based almost entirely on surface or shallow sub-surface concentrations recovered from ancient river terraces or hillsides across the country. Presumably early but undated sites are dominated by choppers, bifaces, cleavers, and “archaic” cores and flakes made almost exclusively on dacite, basalt, and limestone, while assemblages attributed to the Late Acheulian are reported to contain evidence of Levallois technology alongside biface production and occasionally the routine exploitation of obsidian (Lyubin 1989; Lyubin and Belyaeva 2006; Doronichev 2008; Doronichev and Golovanova 2003; 2010; Kolpakov 2009; Gasparian 2010).

While bypassing the questions of discussion of the Armenian Lower Paleolithic from the regional perspective or their comparison with the other sites we can stress that the vast majority of known Lower Paleolithic sites in Armenia appear to have been affected to varying degrees by the dynamic interplay between a variety of accretional and erosional forces. As such they represent

useful taphonomic case studies but are of limited value for the interpretation of past hominin behavior. Most archaeologists working in the region recognize these interpretive limitations and are aware that such sites contain mixed archaeological material traditionally associated with distinct “cultures” and time periods. Meanwhile the growing body of the newly conducted research inspires a hope for the discovery of more such promising sites as Nor-Geghi-1 with its exceptional stratigraphic and geoarchaeological context.

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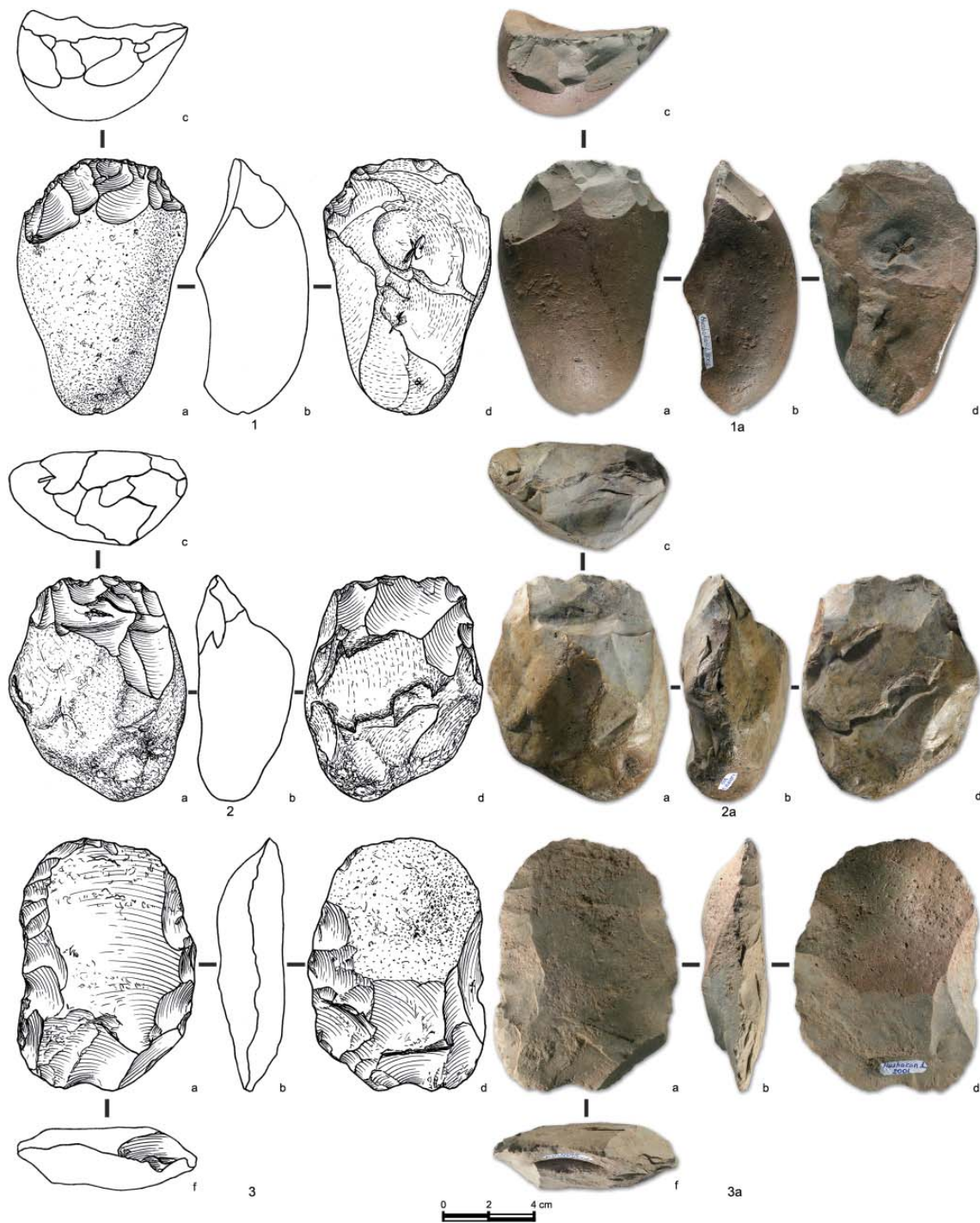


Figure 1

Mushakan-1 open-air site. 1-1a, 2-2a. Choppers (flint); 3-3a. Biface on cortical flake (flint).



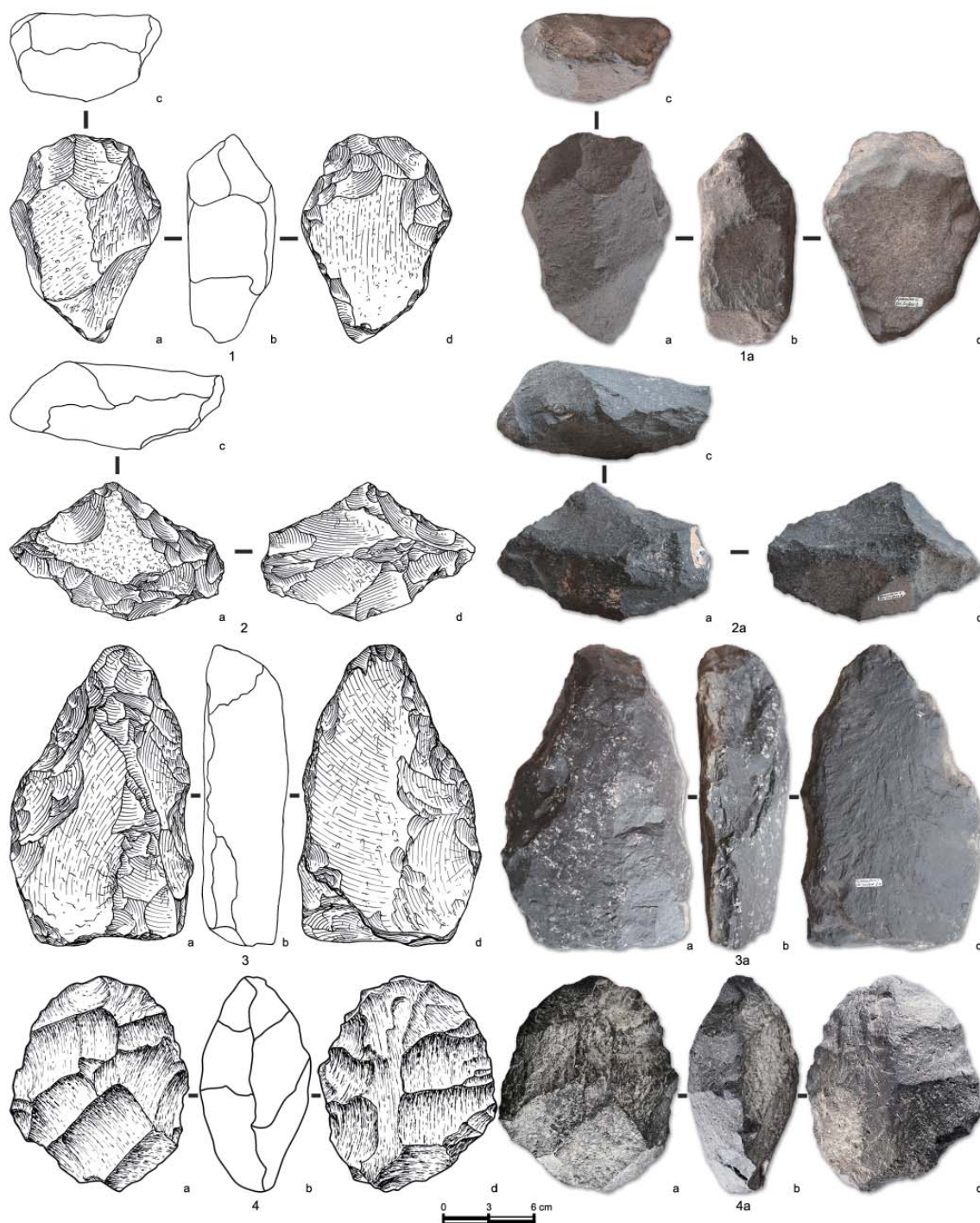


Figure 2

Aghavnatun-1 open-air site. 1-1a. Chopper (basalt); 2-2a. Pick (basalt); 3-3a. Partial biface on a huge flake (dacite); 4-4a. Biface (dacite).

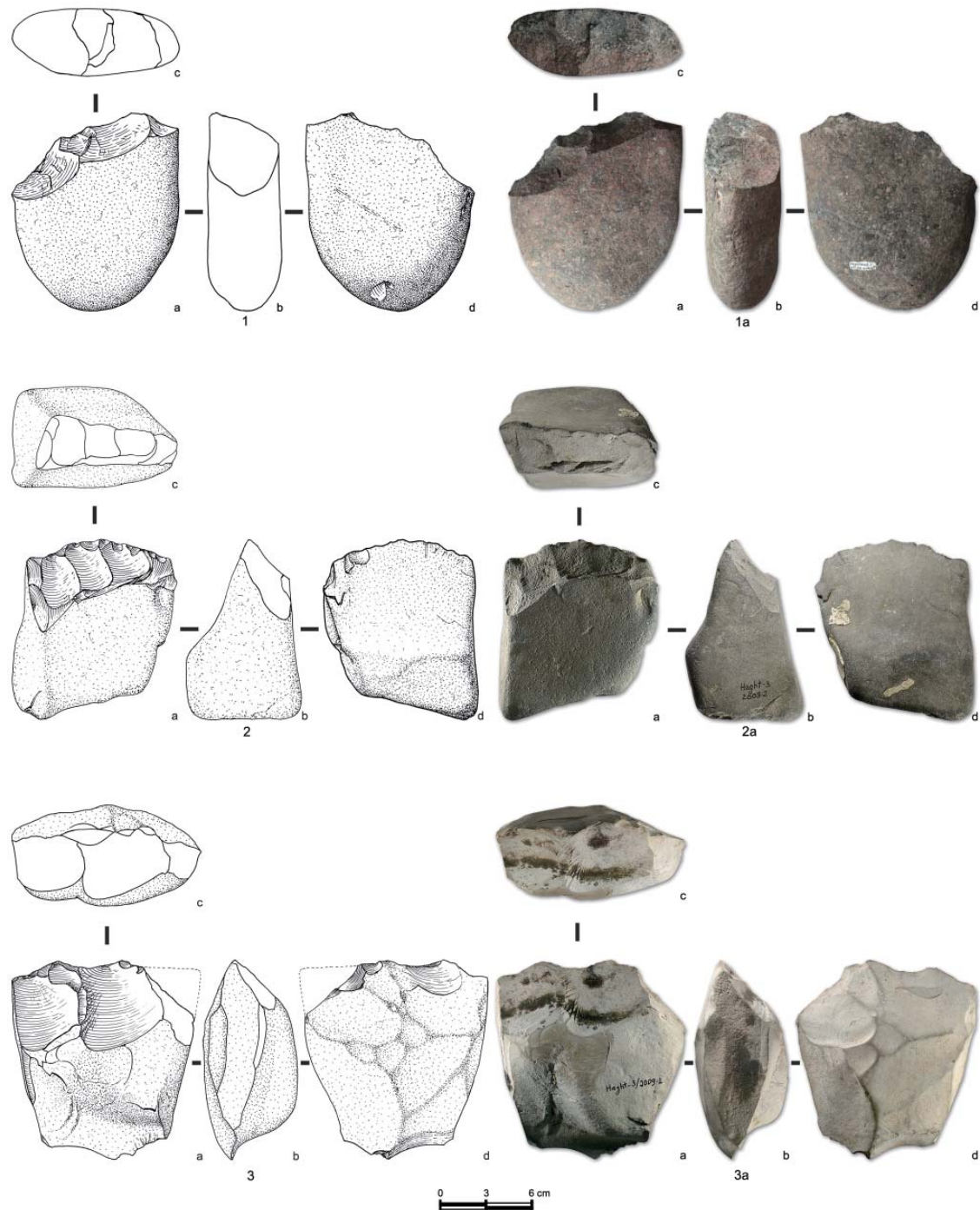


Figure 3  
Haghtanak-3 open-air site. 1-1a – 3-3a. Choppers (1-1a, 2-2a: basalt; 3-3a: limestone).



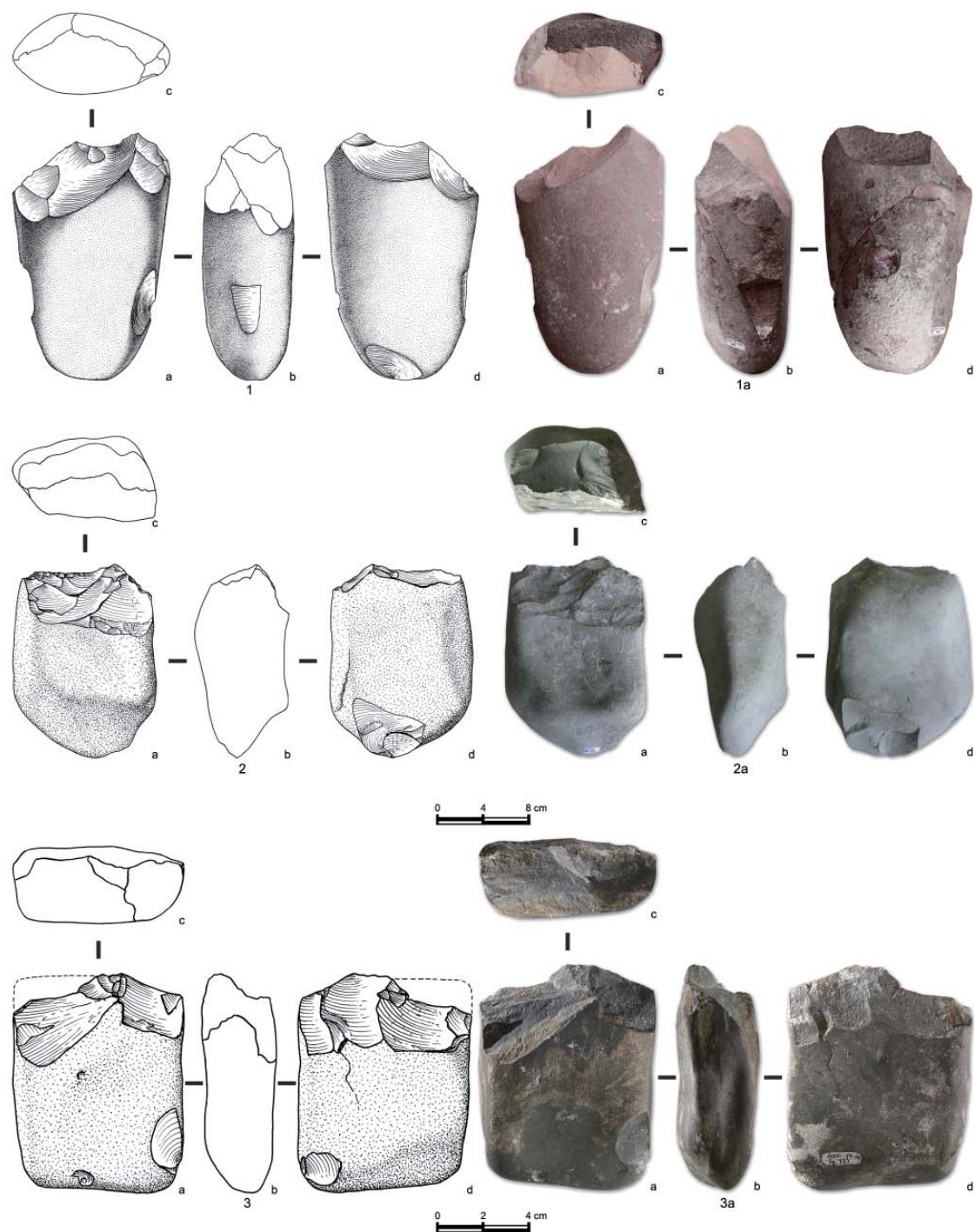


Figure 4  
Areni-1 cave. 1-1a – 3-3a. Choppers (limestone).

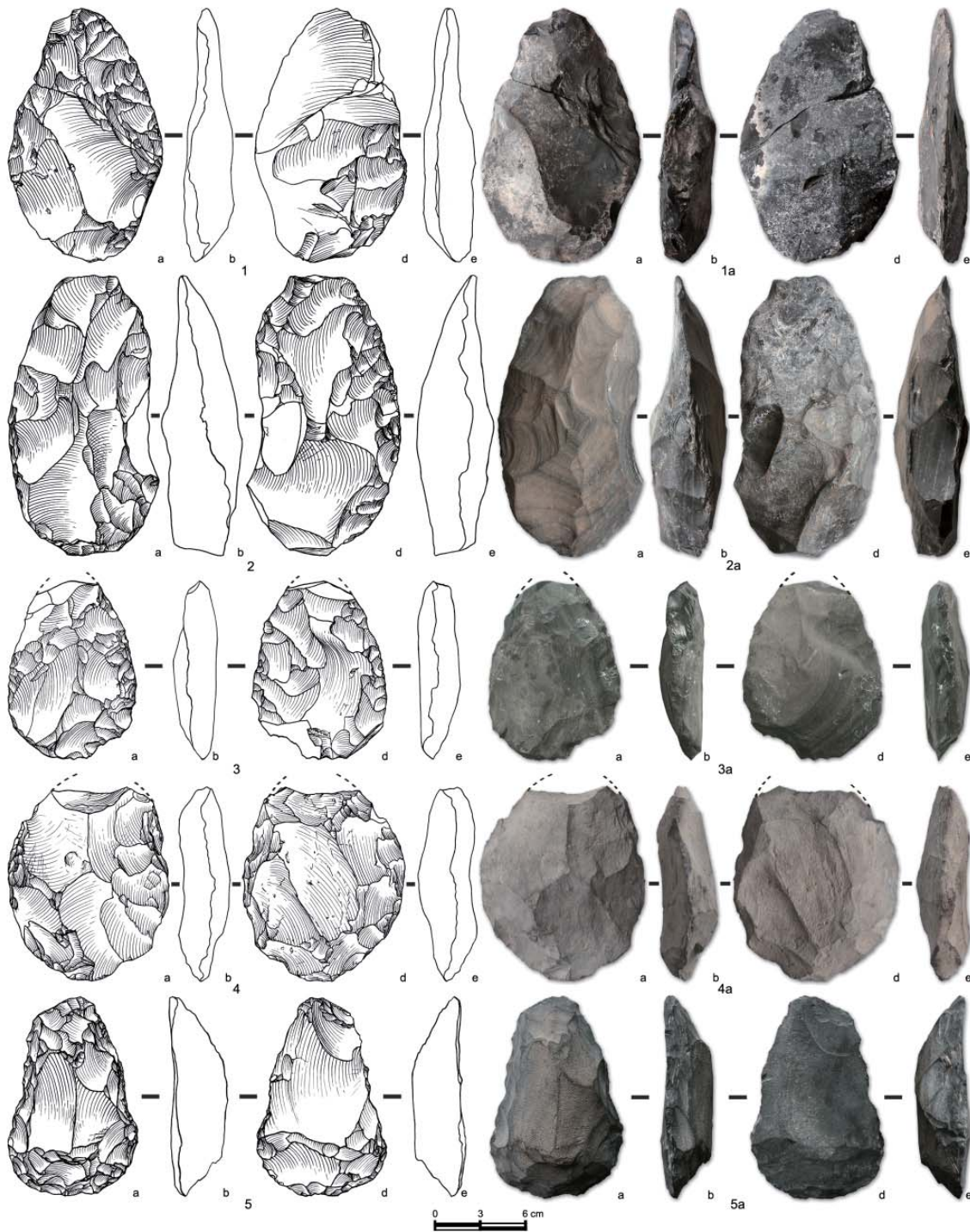


Figure 5

Jraber-17 open-air site. 1-1a – 5-5a. Bifaces (1-1a – 3-3a: obsidian; 4-4a – 5-5a: dacite).



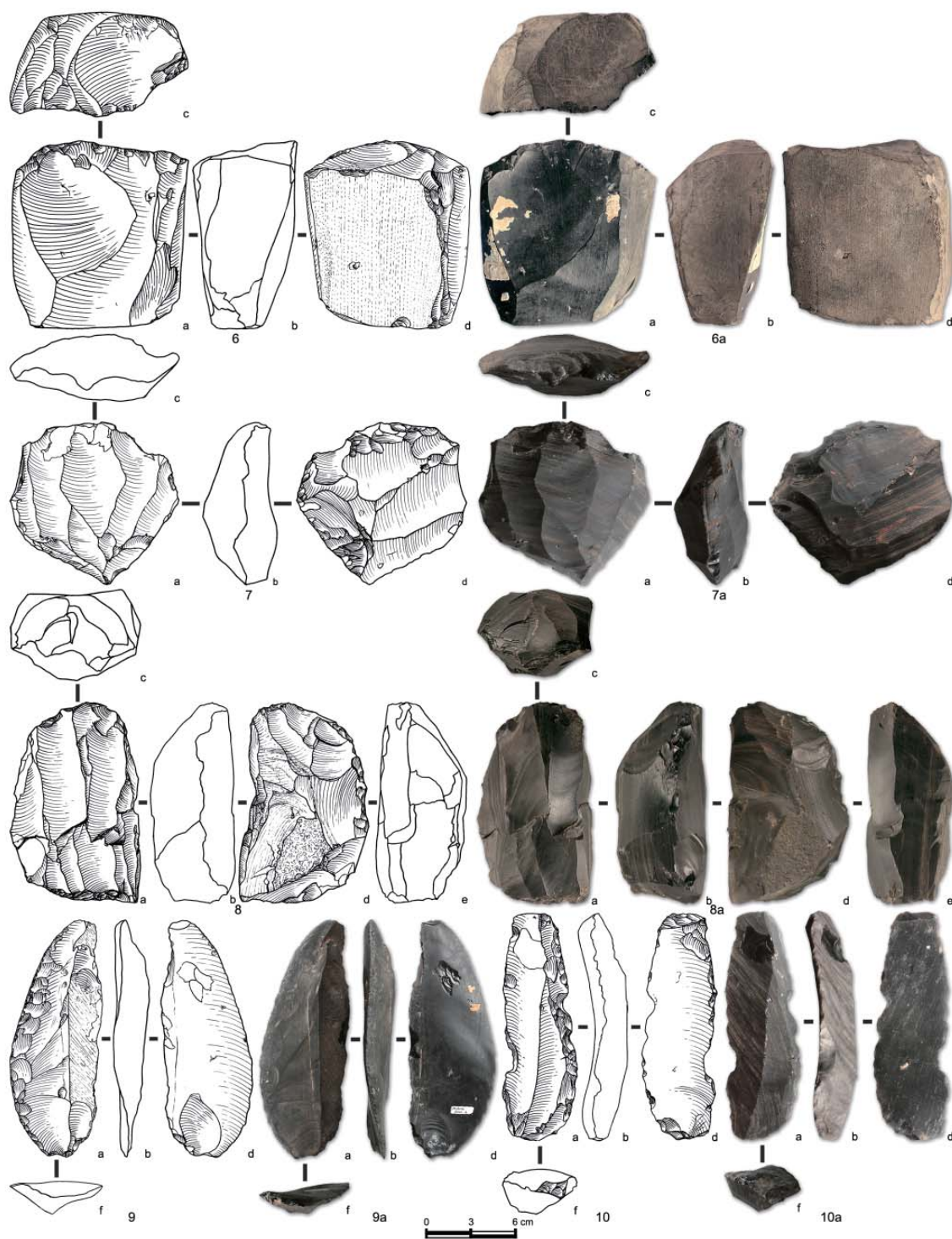


Figure 6

Jraber-17 open-air site. 1-1a – 2-2a. Levallois cores (obsidian); 3-3a. Protoprismatic, bidirectional core (obsidian); 4-4a. Side scraper (obsidian); 5-5a. Retouched flake with truncated and faceted end (obsidian).

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