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J. van der Made, 2004.
Table 1. Taxonomic identification of fossils recovered from Azokh Cave. (p. 167)

Resumen

Si bien el Cáucaso ha sido tradicionalmente considerado un posible obstáculo de acceso a Europa, los recientes hallazgos hacen que deba ser considerado como ruta importante de migración desde Africa hacia Europa. Aún más relevante es que esta ruta de migración fue empleada por los primeros homínidos africanos en momentos mucho mas tempranos de lo que se pensaba en un principio, así como por especies de homínidos europeos, Neandertales, poco antes de su extinción. Ha quedado también en esta región el testimonio de la presencia de otras especies de homínidos del Pleistoceno medio (*H. heidelbergensis*). De esta forma, los ultimos descubrimientos indican que diferentes especies de homínidos han estado ocupando este área durante los últimos 2 millones de años.

La geomorfología y configuración de esta región ha cambiado desde que estos homínidos atravesaron el territorio. Algunas indicaciones pueden obtenerse a partir de nuestros trabajos de prospección en el norte de Armenia. Los fósiles y restos arqueológicos recuperados en las excavaciones de Azokh Cave (Nagorno-Karabagh) cubren el lapso de tiempo entre los primeros homínidos africanos en Europa y los últimos Neandertales, proporcionando un conocimiento mas extenso de las poblaciones humanas en el Cáucaso durante el Pleistoceno.

Palabras clave: Homínidos, Caucaso, Cueva de Azokh, Migración, Corredor Transcaucásico.

Abstract

*Recent discoveries of fossil remains from the Caucasus have overturned previous theories that this mountainous range comprised a barrier to hominid migrations. These finds indicate that the Caucasus was an important migration route for early African hominids and that this region was also occupied by hominid species from Europe, such as the Neanderthals, just prior to their extinction. The Causcasus was also a crossing place for other middle Pleistocene human species (*H. heidelbergensis*). Thus, this region was occupied by several different hominids species during the last two million years.*

Evidence of the change in the geomorphology and topograpgy of the Caucasus region during the last two million years is indicated by reconaisance fieldwork we conducted in northern Armenia and Nagorno-Karabagh (southern Caucasus). Fossil and archaeological remains from excavations at Azokh cave, re-opened by us in 2002, may bridge the gap between the first African hominids in Europe and the last Neanderthals, providing more extensive knowledge of human occupation of this region during the Pleistocene.

Key words: *Hominids, Caucasus, Azokh Cave, Migration, Transcaucasian Corridor.*

Azokh Cave and Northern Armenia

Yolanda Fernández-Jalvo[1], Tania King[2], Peter Andrews[2], Norah Moloney[3], Peter Ditchfield[4], Levon Yepiskoposyan[5], Vardges Safarian[6], Manuel Nieto Díaz[1] & Anoush Melkonyan[7]

Introduction

The Georgian site of Dmanisi in the southern Caucasus, has yielded several hominid fossils since 1991. Remains were initially considered to be closest to an archaic form of *H. erectus*, *Homo* sp. cf. *ergaster* (Gabunia *et alii*, 2000). After the discovery of a third skull in 2001, these authors stated that "*It now seems more likely that the first humans to disperse from the African homeland were similar in grade to H. habilis (sensu stricto)*" (Vekua *et alii,* 2002: 88). A new and robust mandible has indicated this could be a new species - *H.georgicus* nov.sp. (Gabunia *et alii*, 2002). Palaeomagnetic dating of the lava underlying the unit containing the hominid fossils has provided an age as old as ~1.7 Ma (Gabunia *et alii*, 2000) and ^{40} Ar/^{39} Ar dating of the volcanic ash gives an age of 1.81 +/- 0.05 Ma (de Lumley *et alii*, 2002). These remains are, therefore, of the earliest hominids outside Africa in Europe.

1. Museo Nacional de Ciencias Naturales, Madrid, Spain. yfj@mncn.csic.es; mcnd153@mncn.csic.es

2. The Natural History Museum, London, UK.; t.king@nhm.ac.uk, p.andrews@nhm.ac.uk

3. Institute of Archaeology, University College of London, U.K.; n.moloney@ucl.ac.uk

4. RLAHA, University of Oxford, U.K.; peter.ditchfield@archaeology-research.oxford.ac.uk

5. Institute of Man, Yerevan, Armenia; levon@armhealth.am

6. Artsakh State University, Stepanakert, Karabagh

7. Armenian Academy of Sciences, Yerevan Armenia; anusch@freenet.am

In 1993, Mezmaiskaya Cave (Russia) in the northern Caucasus provided another astonishing find (Golovanova *et alii*, 1999) –the presence of Neanderthals in Eurasia at a later date and more oriental latitudes than previously thought. Recent radiocarbon dating has estimated the specimen to be ~29,000 years old and, therefore, the Caucasus has yielded the remains of one of the latest living Neanderthals (Ovchinnikov *et alii,* 2001). Mitochondrial DNA (mtDNA) has successfully been extracted from one of the individuals from Mezmaiskaya Cave and phylogenetic analysis has confirmed that Neanderthal's mtDNA types have not contributed to the modern human mtDNA pool.

Northern Armenia is an interesting area due to both the proximity to Dmanisi, which is only 20 km from the Armenian border, and the fact that much of northern Armenia, like Dmanisi, is situated in the Javacheti mountain range. Thus, the geomorphology, tectonics and volcanism of both areas are similar. Quaternary deposits in northern Armenia were surveyed by our team during 1999 and 2001. Some of the deposits examined have provided evidence of human activity. The geology of these outcrops has also afforded a better understanding of the favourable preservation conditions that were present at the site of Dmanisi. Another area of interest in the southern Caucasus is Azokh cave, which is situated adjacent to the village of Azokh in the district of Chadrut in Nagorno-Karabagh. This site has also yielded human remains together with Achelian stone tools and associated fauna. A hominid mandible fragment was found in initial excavations in 1968 by Mammadali Guseinov who named the site "Azykh Cave". The analysis of this

fossil mandible has indicated its similarities to hominids from L'Arago in France (Kharitinov, 1989 and Gadziev & Guseinov, 1970 referred to by Lioubine, 2002; Kasimova, 2001). During the 2002 exacavations a complete stratigraphic sequence from the middle Pleistocene to the Holocene was recorded. Abundant remains of middle Pleistocene fauna and Acheulian tools are contained within these deposits. Reported here are the preliminary results of our investigations in Armenia and Karabagh as well as the results of the reconaissance work carried out in northern Armenia in 1999 and 2001.

Northern Armenia

The main aim of our research is to increase the present understanding of the Trans-Caucasian Corridor (Fig.1a). More specifically, our research focuses on the understanding of the southern part of this region, which we refer to as the Armenian Corridor (King *et alii,* 2003; Fig.1b).

Geological reconnaissance fieldwork conducted in Armenia during 1999 and 2001 focused on Quaternary sediments in the vicinity of the Javacheti mountain range (Fig. 2). The area investigated encompassed northern and western Armenia to evaluate the potential of these sediments for the understanding of hominid occupation and migration through this region (Fig. 2). Some of these localities provided evidence of human activity and/or were potential sites of palaeontological interest.

Miocene-Quaternary orogenesis is largely responsible for strong continental volcanism in all volcanic provinces of the Armenian Highland (Karapetian *et alii*, 2001). The Northern surveyed areas are characterized by extensive plateaux lavas. Caves, within this largely basaltic plateaux lavas, were also examined. Some of these caves are located near the towns of Stepanavant (1357 m above sea level –a.s.l.), Alaverdi-Odzun (960 m –a.s.l.), and Shnokh (558 m –a.s.l.). With the exception of Shnokh (see below), these caves lack sediments in contrast to other caves within Jurassic or Cretacic host rocks (e.g.: Enokavan). The absence of sediments is probably due to the lack of karstic activity and strong wind erosion. Most of these basaltic caves are not deep and sediments only contain modern bones, some of them exposed on the surface. Most of these modern bones show definite sub-aerial modifications, probably because the lava strongly holds daily and seasonal thermo changes at the cave entrance. Near the town of Shnokh, one cave in basalts contained cave sediments. This cave faces S-SW to the river valley. Sediments are whitish sands and cave breccias, which laterally become more homogeneous. At the front of the cave, sediments contain debris of obsidian, burnt macro-mammals bone fragments and charcoal remains. Samples were collected to recover small mammals and obtain a chronological approach, but sediments were very poor in rodent fossils.

Localities investigated at Katchnap'ur and Medzavan are close to the border with Georgia. Quaternary lavas from the Javacheti volcanic range cover this area. Katchnap'ur is located at UTM: zone 38, 430148E/4548582N (1672 m –a.s.l.). The lava, exposed on the surface, is more crystalline than the lava present at Alaverdi and Stepanavan, and contains xenoliths of other igneous rocks. The lava on top of the hills has a clear E-W alignment and is almost parallel to the present river channel. The road from Katchnap'ur area to Eni-El (where an important obsidian outcrop is situated) (UTM: zone 38, 420482E/4544343N, 2243 m –a.s.l.) did not reveal any deposits.

At Medzavan, quartz stone tools were found exposed on the surface as a lag deposit following erosion of the sediments. Medzavan illustrates a strong erosion that could be related to the continental uplift that characterises the area. Continental uplift, compressive tectonics, low mean sea level, and erosion prevalent over sedimentation in wide areas in the Caucasus region between slightly later than 1.7 and around 1.6 Ma have discussed by Aguirre & Carbonell (2001). We have also found a strong periglacial influences in Quaternary sediments of the area, (Fig. 3) near Urut (1686 m) and possible evidence of periglacial isostasy.

In the vicinity of the town of Norashen (1550 m –a.s.l.), a palaeo-channel contained some abraded stone tools, brought by the stream from another site that could not be located. The outcrop is mainly formed by flood plain sediments. Near the town of Ajrum (533m –a.s.l.) we found a wide and thick flood plain deposit. At least 3 palaeosols were sampled. However, the fossil remains found reworked and out of context. Flood plain sediments were frequently recorded in the Quaternary areas explored, especially at the North and North-East of Armenia.

A small number of lithic artefacts were collected during the 2001 survey season in Northern Armenia. They were generally recovered as single surface finds from different locations. The 28 pieces (19 flakes, 3 blades and 6 fragments) are primarily of obsidian and chert, and to a lesser extent of dacite and other siliceous rocks. With the exception of one piece, all rock types are locally available. None of the typological pieces can be claimed with any security to be diagnostic of a particular period although microliths do not occur in Eurasian Lower and Middle Palaeolithic assemblages. Blade technology, once believed to be the hallmark of the Upper Palaeolithic, is not uncommon in the Middle Palaeolithic (Clarke, 2002; Bar-Yosef & Kuhn, 1999) and is also common in post-Palaeolithic contexts. As forms such as scrapers and notches occur throughout prehistory, association and context are important when attempting to place such pieces chronologically.

Deep gorges carved in basaltic plateaux by river beds are the dominant landscape within the Northern part of Armenia and South of Georgia. These basaltic plateaux lavas often contain sediments trapped between subsequent lava flows with the upper units baked by the overlying lavas and often palaeosols can be distinguished within these sediments and, in some cases, lavas adapt to the palaeo-geomorphology.

In summary, strongly eroded sediments were observed in areas close to the Javacheti range in the northern part of

Fig. 1. Aerial view of the Caucasian mountainous range. The earliest hominids outside Africa have been found at Dmanisi (Georgia) with Olduwan technology. Azokh Cave (Nagorno-Karabagh) has an extensive record from Acheulian technology to Mousterian, and a mandible of a middle Pleistocene hominid has been recovered from this site in 1968. Mezmaiskaya Cave (Russia) yields one of the latest living Neanderthals.

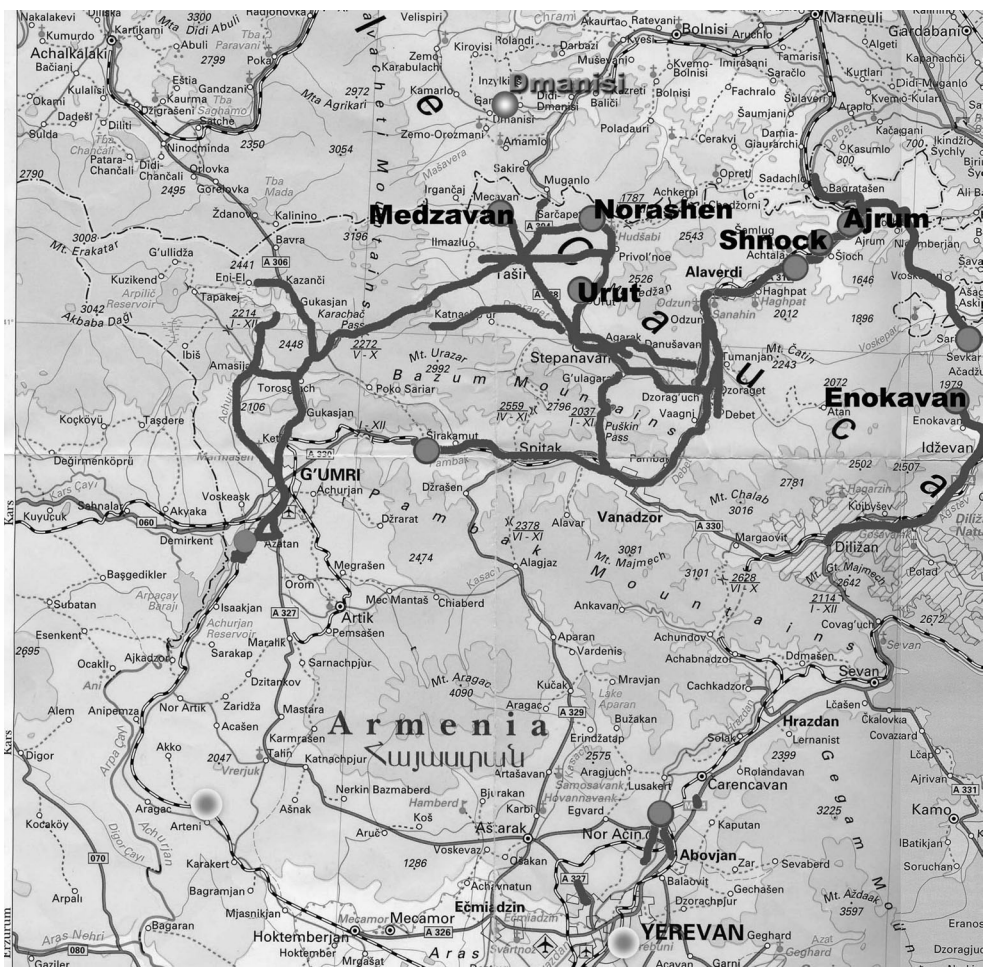

Fig. 2. Geological reconnaissance fieldwork in Northern and Western Armenia during 1999 and 2001 focused on Quaternary sediments. Red Dots indicate localities that provided evidence of human activity and/or were potential sites of palaeontological interest, some of them mentioned in the text.

Fig. 3. Alluvial sediments of pebble conglomeratic sandy matrix. The top of the series is affected by tepee periglacial ice expansion (detail of image). Both sides of the old sediment are eroded by a more modern alluvial homogeneous dark-red coloured sediment, rich in gastropods. This erosion can be related to the uplift either by periglacial isostasy or tectonic uplifts.

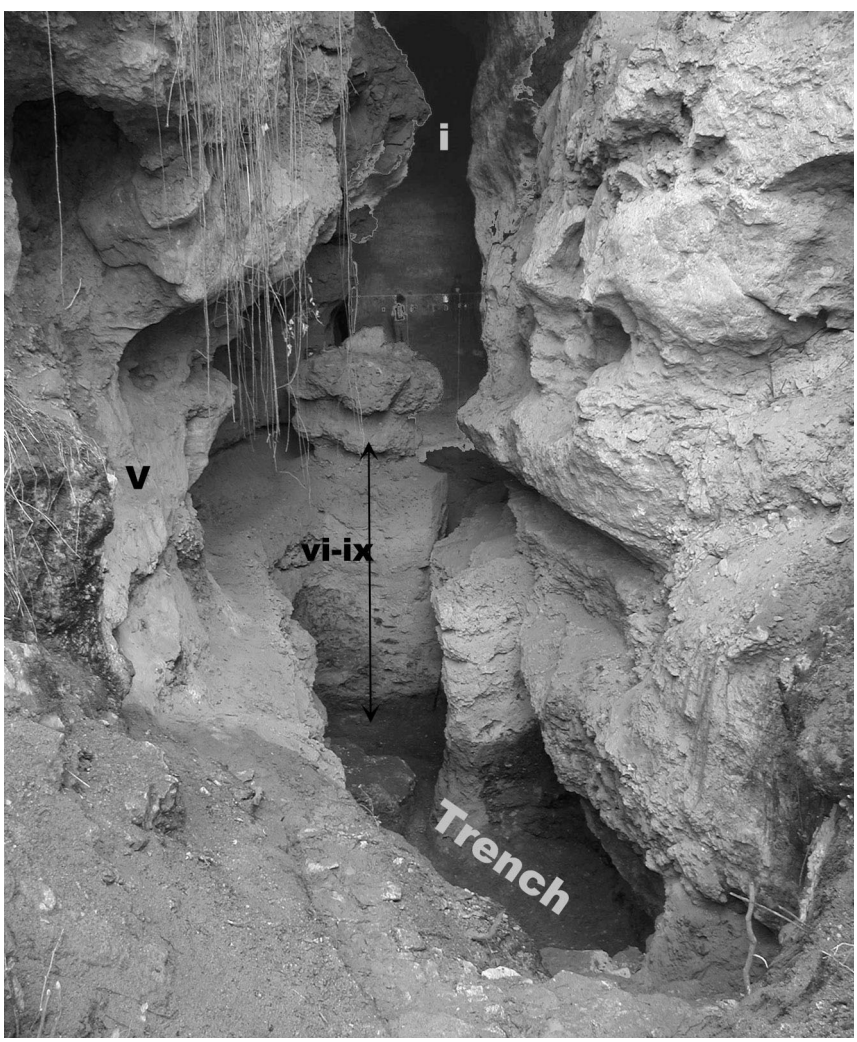

Fig. 4. Azokh Cave entrance view in 2002. The cave, originally filled with sediments almost to the top of the cave roof, has been exhaustively excavated. This picture shows the trench dug by previous teams. Previous works in the cave left some remains of original sediments at the sides of the entrance (unit V) and deeper within the cave (970 m^3 approx from the original 3405 m^3 deposit). At the right side of the picture, conchoidal scars on the rock shows evidence of explosives used during exploitation by previous teams.

Armenia. This strong erosion could be related to the uplift either by periglacial isostasy or tectonic compression. Sediments deposited on top of the Quaternary lava flows have then been removed by this erosion and remains contained within them are reworked in mixed and weathered assemblages.

The site of Dmanisi (UTM: zone 38, 445185E/4576361N, 931 m –a.s.l.) has many similarities to several of the sites in North Armenia described above. The Masavera lava, named after the river in the vicinity of Dmanisi site, originated from the Javacheti volcanic range. This lava flow, with a positive palaeomagnetic signal, overlaps and partially covers Cretaceous limestone deposits. Flood plain sediments, covering the Masavera lava, were deposited by a rapid and low-energy lava flow (Gabunia *et alii*, 2000), and contain abundant fossil hominids, stone tools and fauna associated. This fossil bearing unit, which also has a positive palaeomagnetic signal, has been assigned to the Olduvai Subchron (calibrated at 1.77 Ma). Above these hominid-fossil bearing sediments, colluvial sand-gravels were deposited and a calcrete layer was formed, probably due to underground water movement or soil piping (Gabunia *et alii* 2000). Above this calcareous layer, a palaeosol was formed with reverse palaeomagnetic polarity assigned to Matuyama chron (calibrated at 1.07 Ma). In addition to the characteristics of the sediments that were favourable to bone preservation, the extraordinary good fortune of Dmanisi was that a Medieval town was built on top of these sediments, thereby helping to arrest the erosion of the sequence.

In general, the area surrounding Dmanisi and northern Armenia is characterized by plateaux lavas (mostly basalts) thickening away from the more mixed geology (including limestone platforms) in Lesser Caucasus to the north. Moving to the south and away from the Lesser Caucasus (i.e. from sites like Dmanisi), the carbonate saturation of the ground water in these areas decreases giving progressively poorer conditions for bone preservation (i.e. in the areas around Aleverdi and Stepanavan). Further south, the lavas thin out onto more deformed carbonates, which gives better conditions for bone preservation . Further exploration of these areas is required.

Isostasy and tectonic uplifts that affects the region has been calculated to be of 14mm/year today (Karapetyan pers.com). Gorges carved by rivers into the basaltic plateaux have a depth of several tens to over a hundred metres. Further data is needed to correct these positive and negative topographies. Such corrections may provide a more accurate reconstruction of the topography, environment and climate of this region during the Pleistocene when it was inhabited by hominids.

Survey and excavation in Nagorno-Karabagh

The Javacheti and Karabagh regions of the Armenian Corridor explored have great potential for the discovery of further human remains, stone tools and associated fauna. Several cave sites have been surveyed in south eastern Karabagh in 2002. The partially excavated cave at Azokh (originally containing a volume of 3405 m^3 deposit) was found to contain undisturbed sediments (970 m^3 approx.) at the sides of the entrance and deeper within the cave (Fig. 4). Another partially excavated cave at Tughlar contained an abundance of fossils and Upper Palaeolithic obsidian tools. As obsidian is not local to this region, its presence may suggest interchange between human groups. Excavations at Azokh Cave were re-opened by us in the summer of 2002. The excellent preservation conditions of this cave together with fossils recovered from successive units representing different fossilization environments will allow us to apply new methodologies for the extraction and analysis of ancient DNA, as well as affording a better understanding of fossil DNA preservation processes. The sequence ranges in age from a few thousand years at the top of the series -Neolithic and Medieval remains are mixed in Bed I, several layers of hearths are in Bed II- to several hundred thousand years at the bottom, that need radiometric dating. Hominid remains recovered in the 1960s were considered to date to 600,000 years ago (Lioubine, 2002). Thus, this site is extremely rich.

Azokh Cave

Azokh Cave is located in the district of Chadrut, in the Mountainous Karabagh Range of the eastern Armenian uplands (39 37.06" N, 46 59.30" E, 962 metres –a.s.l.). The cave was partially excavated from the 1960s until the 1980s, and a hominid mandible was found in association with fauna and *Acheulian* stone tools. Publications on recovered material from Azokh cave have tended to be of a preliminary nature, and have not been widely disseminated. A recent publication by Kasimova (2001) gives a more detailed description of the morphology of this mandible, presently housed in Baku, Azerbaijan, and includes photographs, measurements and X-ray images of the fossil. All features described suggest that this mandible resembles other middle Pleistocene hominid remains such as L'Arago and Sima de los Huesos (A. Rosas, pers.com. 2003). Unfortunately, the exact location of this mandible has not been precisely described by Guseinov's reports. As Kasimova (2001) denounces, Guseinov placed the mandible in a publication of 1973 in the third horizon of unit V, providing an age of 250ka, but in 1985 the mandible was referred to the fifth horizon of unit V, providing an age of 350-400ka. This uncertainty may in part be due to poor description of the stratigraphy at the site –horizon thickness was never clearly stated (see Lioubine, 2002). Moreover, previous excavations at the cave were not carried out in a fully systematic and rigorous way. Evidence for the use of explosives at the site was found by us in 2002. The age of these deposits is also poorly understood since radiometric dating of the material was not undertaken.

In 2002 we re-opened excavations at Azokh Cave with the aim of conducting long-term and systematic excavation of fossil and archaeological material. An aerial grid that is a fixed reference

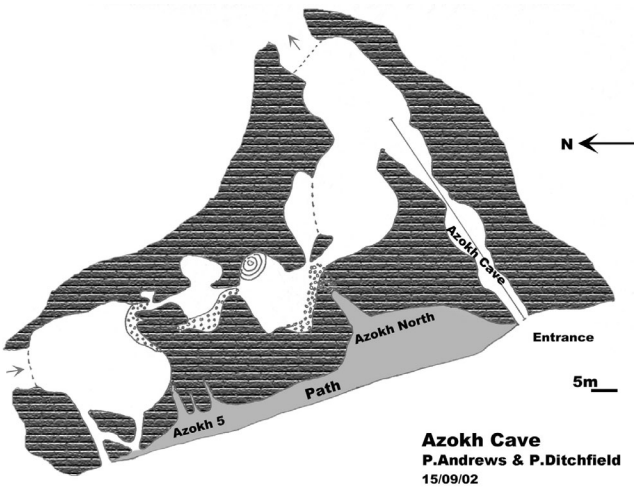

Fig. 5. Topography of Azokh Cave by P.Andrews and P.Ditchfield during last season in 2002. The site of Azokh Cave mentioned in this paper refers to the main entrance shown in the map as "Azokh Cave". The complete cave, however, extends deeper in dark galleries and halls inhabited by a large community of bats. Inner sediments have not provided fossils. Several new entrances have been discovered during this geological reconnaissance fieldwork that will be surveyed and excavated during next seasons.

against which finds are precisely recorded in three dimensions was erected. Stratigraphical, taphonomic, taxonomic, archaeological, and palaeoecological analyses have been carried out in 2002. The geomorphology of Azokh Cave and the surrounding area was also investigated during this season.

The fossil chamber at Azokh Cave is a side branch of the main cave system (Fig. 5). The cave entrance is southwest-facing and is at an elevation of 962 metres above sea level, situated just outside the village of Azokh, 200 metres above the village part way up a steep slope.

This site is situated within an extensive phreatic system running in a south-easterly direction in the vicinity of the cave outcrop. At the point where the side chamber enters the phreatic system, the trend of the cave system turns almost at a right angle to run north-eastwards. In two cases the boulder chokes can be linked with further side branches to the open air, and one of them –the closest to the fossil chamber– is associated with another cave entrance system that appears to have fossiliferous deposits in the floor of the cave. The top of these sediments is at a similar height to Bed-I of the main cave chamber (Fig. 6), and the thickness of these sediments is about ten of metres. There is the possibility that this new entrance may contain similar sediments to the main cave chamber.

The sediments in the fossil chamber were derived in part from movement from within the cave. During the excavations in 2002, the geological work included stratigraphical reconnaissance. The composite stratigraphical section for Azokh cave is shown in Fig. 6, the scale up the side is in meters and the bed numbers in roman script is our tentative of correlation with previous published works.

The present cave entrance opens out on to a shallow valley running approximately north to south, with a dry water course running along the bottom of the valley. At the time of cave formation, however, this valley was probably not formed except in incipient fashion, and drainage was probably to the east or northeast. The reconstruction of the geomorphology of the area where the known parts of the cave are present today is therefore of a low domed hill, considerably higher than the present hill and formed as a pericline in the folded limestone.

From the mouth of the cave to the inner part of the cave, five areas, according to the depth, were distinguished and widely correlated with previous stratigraphy (Fig. 7). The **trench** placed 6 metres below the ground, at the very entrance of the cave, comprising most of the unit VI to unit IX. The top sediments covering the trench were removed and it was found that in fact the bedrock was, at least partially, reached. The **lower platform** (from the top of unit VI to the bottom of the series still untouched) at the ground level. The **middle platform** (half way of unit V exposed) and the **upper platform** (unit IV to I exposed). Fossil remains were clearly visible on upon inspection of the section (Units III-IV-V). In contrast to statements in the literature by previous teams, Bed IV, referred as only rich in small mammals, has been observed to have a rich content in both large and small mammals.

Overburden sediments that accumulated on the excavation areas during the 20 years of previous excavation (more than 3 metric tonnes) were evacuated from the cave and dry-sieved on site. Fossils from different units mixed with modern bones and artefacts were recovered from the sieved overburden. Fossil remains recovered from these sediments include a variety of different taxa such as large bovids, cervids of all sizes, pig, rhino, wolf, fox, badger, porcupine, lagomorphs, insectivores, bats and very abundant bear remains, as well as stone tools. These collections are now held at the Museum of Stepanakert . The *in situ* fossil collection is currently on short-term loan to the Museo de Ciencias Naturales and The Natural History Museum for further analyses. In addition, dating of charcoal and sediment samples taken during the 2002 season is currently ongoing (isotopic U/Th, C, termoluminiscence, ESR and palaeomagnetic methods, and aspartic acid racemization). Large mammal remains recovered from the *in situ* excavations have been identified by J.van der Made (Museo Nacional de Ciencias Naturales). A summary of the identifiable fragments and fossils is listed in Table 1.

Bear remains are currently being analysed by T.Torres and J.E.Ortiz (ETSI de Minas of Madrid). Dimensions of identifiable cranial remains (left M^2, talonid left M_1, Right M^2, Left I_3) and post-cranial elements (I and III phalanges, metapodials, and long bones, i.e. a complete fibula) indicate a single bear species at Azokh cave (Beds V and IV), *Ursus spelaeus.* The dental remains of these bears are currently undergoing aspartic acid racemization analysis in order to provide proxy dating for these beds (Torres *et alii*, 2002).

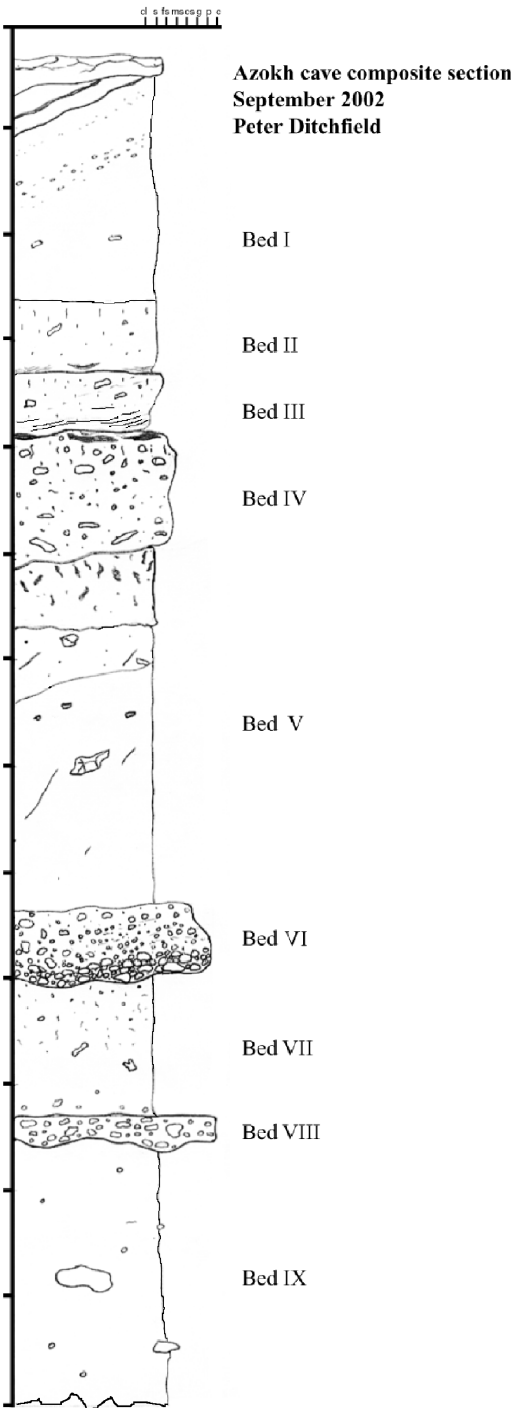

Fig. 6. Stratigraphic section of Azokh Cave deposits. Units have been correlated to descriptions and nomenclature stated by previous teams. Bed I has hearths, pottery and tools indicating Holocene Age. Beds II and III have yielded in previous excavations Mousterian stone tools. Bed IV was described by Guseinov (in Lioubine, 2002) as sterile unit, but we have found very abundant fossil remains. Bed V has yielded human remains and Achelian stone tools. Bed VI, according to Guseinov (in Lioubine, 2002), corresponds to early Acheulian. Bed VII to the bottom of the series have been characterized by Guseinov (in Lioubine 2002) as pebble culture (Olduwan or Mode 1).

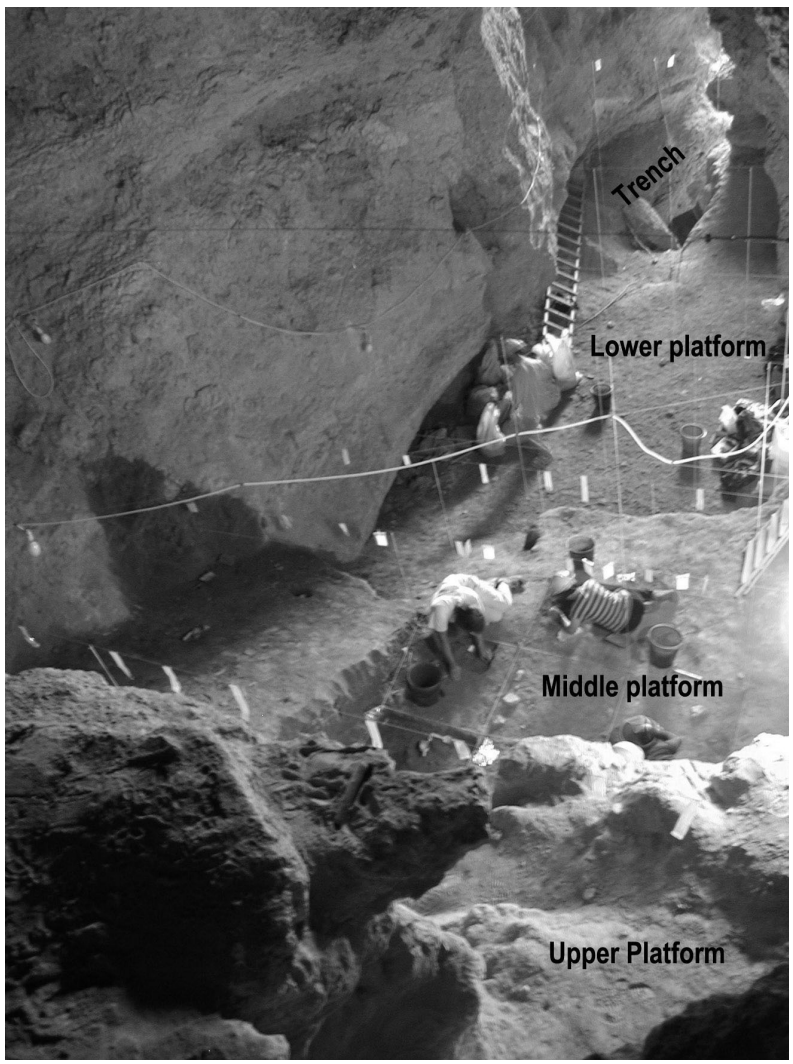

Fig. 7. Excavation area during 2002 season. Trench is the area dug by previous teams. Lower platform corresponds to Bed VI. Middle and Upper platforms were also partially dug by previous teams, and reopened by us during 2002 season. Three metric tons were removed to reach the in situ sediment at Middle platform.

The excavated sediments were wet-sieved using three grid sizes (2mm 1mm and 0,5 mm). Sorting of the wet-sieved material begun during the 2002 field season and due to the richness of the deposits, it is now being completed in Yerevan and the Natural History Museum. Thus, information about small vertebrate taxonomy (e.g.: rodents, reptiles, amphibians) and taphonomy is not yet available.

With regard to the lithics, the 2002 investigations at Azokh Cave resulted in the retrieval of 17 stone artefacts (scraper, flakes, fragments and a blade). Most were recovered from the sieving of overburden and some pieces were derived from the slope in front of the cave. In addition, some lithics were recovered from the excavation at Bed V. The lithics are made on a variety of raw materials: obsidian, fine grained lava, quartzite, variously-coloured cherts and limestone. Some chert occurs in the cave itself, others are local to the region, but one type (banded grey and brown) appears to be from a non-local source. The quartzite (a split quartzite cobble) is most likely from nearby river sources. There are no local lava or obsidian outcrops in the area - the nearest volcanic region is at least 60 km distant and the nearest known obsidian sources may be up to a 5-hour drive from Azokh.

Most of the lithic pieces were unretouched. The few modified tools include scrapers (Fig.8), retouched fragments and a retouched blade. A predominance of plain platforms indicates simple production procedures although there is evidence of faceting, suggesting some technological complexity. Of particular interest is a chert fragment with a lip at its proximal end that may indicate soft hammer use.

The limited number of lithics recovered from Azokh Cave in 2002, in particular from the excavation trenches, is insufficient to allow detailed discussion. Similarities between lithics recovered from the earlier excavations at Azokh and those from the 2002 season can be seen in the use of chert and range of raw materials, the overall technological simplicity with a slight hint of emerging complexity, and the presence of scrapers. Guseinov assigned the industries from Units V and VI into the Acheulian tradition (Middle and Early respectively). However, the presence of well defined scrapers in association with evidence of faceting, disc cores and Levallois typology might indicate a younger rather than older age for the industries. Results of samples recently taken for dating and future excavations may help resolve such problems.

Fig. 8. Stone tool (scraper) recovered from Middle platform during 2002 season (Bed V).

Analysis and future directions.

Northern part of Armenia Pleistocene is of great interest in terms of the Pleistocene palaeontological record due to its situation within a migration route from Africa. However, the rapid uplift that has occurred in this area, the subsequent erosion of Quaternary sediments, and the anomalous conditions of fossil preservation are a serious potential problem for the preservation and recovery of fossil remains. Nonetheless, there is much exploration and careful study of this region that remains to be conducted.

Azokh Cave is located at the most meridional (southern) side of the Trans-Caucasian Corridor and has yielded strong evidence of hominid activity. The age of these deposits bridges the gap between other sites in this region. Fossils of middle Pleistocene hominids have already been recovered from Azokh Cave and the possibility remains that further hominid fossil will be discovered at this site. It is also significant that Mousterian tools, as well as late Pleistocene faunas and evidence of human occupation during Holocene (hearths) are also preserved at this site. Azokh Cave is, therefore, an important site in terms of the investigation of Pleistocene-Holocene human populations and associated fauna along this migration route.

Caves are one of the best sites to preserve organic matter, because the thermal history of caves does not show strong variations, and the average temperature is moderately low (bellow 20°C). These conditions are present at the area excavated in 2002, which is more than 30 metres away from the entrance, protected from ultra-violet radiation and temperature fluctuations. In addition, successive units are characterised by different fossilisation environments that provide the opportunity to apply new methodologies to study DNA taphonomy.

The age of the deposits contained in Azokh Cave using a number of different dating techniques including aspartic acid racemization analysis, ESR and isotopic dating is currently in

TABLE 1. Taxonomic identification of fossils recovered from Azokh Cave.

SPECIES	MATERIAL	BRIEF DISCUSSION
Canidae indet. (*Cuon*?)	Right calcanaeus	*Vulpes vulpes* was cited from unit VI and *Canis aureus* from unit V (see Lioubine, 2002). However, the present specimen is about one third larger than in *Vulpes vulpes* and *Vulpes praeglacialis* from l'Escale (Bonifay, 1971) and *Canis aureus* (material in the MNCN). Possibly the specimen is of the size of *Cuon alpinus*, but no comparisons with that species have yet been made.
Cf. *Stephanorhinus*	Nasals	The bone consists of a flat and thin slightly curved plate and a perpendicular spine, forming a symmetrical T-shape. The symmetry excludes a scapula. The bone resembles the nasals and bony nasal septum of a rhino. However the fact that the bones is so thin (at the border 1 mm) and narrow (some 6 cm across) and with a smooth dorsal surface seems strange. Probably the bone belonged to a juvenile or a female.
Dama sp.	End of the tine of an antler Distal left tibia Right D^2	The tine of the antler is slightly flattened, and recalls the little tines that come out of the palmations of fia fallow deer, rather than the tines of a red deer. The distal tibia has characters 3 and 4 of Lister (1986) as in *Dama*. Its size is rather large for a fallow deer, but inferior to that of a red deer. The D^2 has the lingual surface with concavo-convex profile, if seen from the front or back, as in *Dama* and unlike in *Cervus*, where it tends to be slimly convex. The specimen is smaller than in *Cervus*.
Cervus elaphus cf. *priscus*	Left metacarpal Right P_4 (germ), Right M_2 Fragment of tine of an antler Anterior fragment of a metatarsus shaft Fragment of pelvis (?) Thoracic vertebra, juvenile (?)	The metacarpal has the morphology of *Cervus elaphus* according to 6 of the 7 criteria listed by Lister (1996), character 2 not being indicative. The metapodial is robust and has an index 100 x distal width / length that is 58, which is in the range of *Cervus elaphus* (56-66; n=17), more robust than in *Dama dama* (65-70; n=14), *Dama mesopotamica* (63-68; n=5) and *Axis* (63; n=1) and less robust than in *Megaloceros solilhacus* (45-52; n=16) and *Megaloceros giganteus* (39-53; n=58). The size of the metacarpal is in the range of *Cervus elaphus* and is larger than in *Dama* and smaller than in *Megaloceros*. The size is slightly smaller than in *Cervus elaphus acoronatus* and *Cervus e. spelaeus*, but is comparable to *C. e. priscus*. The P_4 has the anterior fossid closed by a posterior extension of the paraconid. This morphology is common in *Cervus elaphus*, but not so in *Dama*, where the fossid is open lingually, or closed by a crest that is directed anteriorly from the metaconid. The size of the specimen is in the middle of the ranges of *C. e. priscus* from Bilzingsleben (data from Van der Made, 1998). The lower molar is much worn and most of the morphology is gone. Its size and enamel thickness conform a M_2 of *C. e. priscus*. The antler fragment has a surface with irregular ridges, like *Cervus*, and unlike *Dama* where the ridges tend to be lower and more regular.
Cf. *Capra aeagrus*	Juvenile distal metapodial articulation, left of axis of foot. Right P^4	The P^4 has a caprine morphology; it is very high crowned and has a flat buccal surface. The distal metapodial has a crest in the middle that remains high dorsally, and its plantar and dorsal width are about equal and the external dorsal surface is even a little raised. This is a caprine morphology. Both specimens are smaller than their homologues in *Ovis antiqua*, but are in the range of the species of *Hemitragus* and *Capra*, which are all about equally large.
Ursus spelaeus	Cranial and postcranial remains	Work in progress.

progress. These analyses will provide the first absolute dating of Azokh Cave deposits (King *et alii*, in prep.). The current research and excavation team consists of several specialists in different disciplines of Geology, Archaeology, Palaeontology, Geo- and Biochemistry; a doctoral research project on the fossil cave bears from Azokh is currently being carried out by A. Melkonyan. This team envisages to continue systematic excavations and survey of other caves adjacent to Azokh and surroundings in 2003 and foreseeable future years.

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