

## **L. Meignen Report**

### ***The excavation of Mousterian deposits in Dzudzuana cave, Republic of Georgia- season 2007***

#### **The team of the expedition:**

*Dr L. Meignen* (CEPAM-CNRS UMR 6130, France), archaeologist

*Dr. T. Meshveliani*- (Georgian State Museum, Republic of Georgia) archaeologist, co-director of the excavations

*Dr. Anna Belfer-Cohen*, (Institute of Archaeology, Hebrew University, Israel) archaeologist, lithic analyst

*Dr. Ofer Bar-Yosef* - (Department of Anthropology, Harvard University, USA) archaeologist, lithic analyst

*Dr. Nino Djakeli* - (Georgian State Museum, Republic of Georgia) archaeologist, registrar

*Dr. Guy Bar-Oz* - (Haifa University, Israel) Faunal analyst

*Mr. Reuven Yeshurun*- (Haifa University, Israel) Graduate student, faunal analyst

*Dr. P. Goldberg* -(Boston University, USA), geo-archaeologist

*Mr. Z. Matskevich* -(Harvard University, USA), graduate student, archaeologist

#### **Participating specialists**

*Dr. L. Rusishvili* (Institute of Archaeology, Academy of Science, Tbilisi, Republic of Georgia)- palaeobotanist

*Dr. E. Boaretto* (Weizmann Institute, Israel) Radiocarbon dating

*Dr. N. Mercier* (CNRS-UMR 5060 Bordeaux, France)- TL dating

A team of 11 local workers, some of them working with the Dzudzuana expedition since a long time, have been of great help in different domains : mostly organizing the wet sieving of all the sediments, washing the lithics and bones, digging for some of them.

The grant allowed by the Leakey Foundation has been essential for the basic organization of the field season :

- renting a house for all the team, including a lab where the time-consuming activity of careful picking of all the dried sediments has been organized in good conditions

- renting a second car for the every day transportation of the group from Sackere to the cave, a quite complicate trip as the roads are in a very bad state (following the collapse of the Soviet Union)
- repairing the old Russian jeep of Dr Meshveliani which was also necessary for the transportation of part of the team
- per diem food and paying the wages for a local cook

Meanwhile the team has worked in quite good conditions, even if drinking water needs to be brought to the house and electricity was not always available. But our georgian colleagues were of great help in solving cheerfully all these every day difficulties.

Beside the expenses of the every day life, a large part of our budget was dedicated to analysis, mainly dating (C14 dates carried out in the Weizmann Institute of Science, Israel ; Dr E. Boaretto) and micromorphological studies (sample preparation by « Spectrum analysis » Oregon, and analysis of thin sections by Prof. P. Goldberg)

The airfares for most of the team have been granted by different institutions, except for Meignen (on the Leakey foundation budget).

### **Research Goals of the Proposed Project**

The Caucasus region is a potentially important region for the study of the Middle Paleolithic and Upper Paleolithic due to its geographical position and its topography (a mountainous area). Results already available suggest a late and abrupt transition to the Upper Paleolithic, which makes it an excellent candidate to a Neandertal refugium. However, even if the dates constraining the Middle to Upper Paleolithic limit in the area are reliable, till now they come from only one site (Ortvale Klde ; Adler and Tushabramishvili 2004 ; Adler et al. 2008). The proposed project was to add an other case ( in Dzudzuana cave) that would enhance the importance of these records for understanding the geography and chronology of the late Middle Paleolithic and the earliest Upper Paleolithic in Eurasia.

This was partly an exploratory work in that the intact Middle Paleolithic deposits had not yet been defined and recovered during the previous excavations (directed by T. Meshveliani and O. Bar-Yosef since 1996). And we must sincerely thank the Leakey Foundation which granted to us all its confidence in this risky project.

In fact the probability that the Middle Paleolithic deposits are there was quite strong.

This was suggested by several indications

- many other caves in this region demonstrate intact Middle Paleolithic deposits under the Upper Paleolithic layers, including the well studied Ortvale Klde cave which is located less than 5 km apart, in the same topographic situation
- in the last field seasons in the front part of Dzudzuana cave, a few Mousterian elements were been found at the base of unit D, in direct contact with the broken uneven bedrock
- the bottom of this Upper Paleolithic unit (D) has been dated from 32,140 +/-500 y, a time period very close to the Middle /Upper Paleolithic limit in the neighbouring Ortvale Klde cave
- and finally, the preliminary work done inside the cave by Meshveliani and Bar-Yosef team indicated a better state of preservation of the deposits in the inner part of the cave, less affected by water action.

Following these observations, the idea was thus to explore the possibility that *in situ* Middle Paleolithic materials exist in the interior of the cave (= Upper area). And the main purpose was, if found, to pinpoint the date of the final Middle Paleolithic in the site and check whether the changes happened at the same time in the 2 different close caves, Ortvale and Dzudzuana. If so, the hypothesis of late survival of Neandertals in this mountaineous area could be envisaged.

Thus, in the context of this grant proposal, we proposed to carry out an additional season of excavations at Dzudzuana cave, in search of the Middle Paleolithic deposits inside the hall (= Upper area), by employing modern excavation techniques. Uncovering the Mousterian deposits in Dzudzuana would enhance our knowledge of the paleo-behaviour of late Neanderthals in the region and would disclose whether Modern humans hunters left behind similar remains.

### **Data already available :**

The site of Dzudzuana Cave is located on the bank of the Nekressi, a tributary of the Kvirila River, approximately 550 meters above sea level. The cave is large and elongated, emerging as a tunnel from which a small creek flows. The new series of excavations by Meshveliani and Bar-Yosef (1996-2003) were carried out in ca.16 square meters at the front (= Lower Area) and the inner (= Upper Area) parts of the cave (Meshveliani et al. 1999). The total depth of the Upper

Palaeolithic deposits is about 4,5 m in the Lower Area. In the Upper Area, few square meters were opened in these excavations in order to follow the stratigraphical sequence inside the cave.

At the entrance of the cave (Lower area), the overall stratigraphy of the Upper Paleolithic deposits, below Unit A (the Eneolithic that dates by 4 radiocarbon readings to ca. 6 000 cal B.P.), is as follows;

**Unit B** is a series of clay lenses interspersed with lenses of small gravel, mostly weathered limestone fragments originating in the ceiling and the walls of the cave. Their presence reflects two processes- the frost shattering on one hand and the flow of the mini-creek inside the cave. As a result the lithics and the bones are interspersed among and between the lenses and one cannot reconstruct the original spatial distribution of the human occupations in this unit. The industry is characterized by high frequencies of end-scrapers that always outnumber the burins, microgravettes and retouched bladelets.

**Unit C** presents a somewhat similar character with clay lenses and fewer gravel lenses. The lithic industry is dominated by carinated cores that facilitated the production of numerous bladelets. Carinated cores were previously considered as marker of the Aurignacian culture. But recently, Bar-Yosef et al. refuted this attribution based on technological and typological criteria (Bar-Yosef et al. 2006). A large assemblage of bone points was provided by this unit. A few deer teeth pendants occur as well. While most of the artifacts were produced from flint or chert (available within 10 km away from the site, mostly on the plateau) obsidian was brought from as far as 100 Km away. The main tool types are endscrapers, burins, a special point known as Sakajia point (resembles a wider variety of Gravette point) and many different retouched and backed bladelets. Obsidian industry is also present.

**Unit D** is also clay dominated but with very few gravel lenses. The amount of excavated deposit does not surpass three cubic meters in the Lower Area. It is not a rich layer, encompassing single platform cores, endscrapers among which a typical oval one that was also found in Ortvale Klde layer 4, numerous retouched bladelets and a few bone points.

## **2007 field season**

In order to test the presence of the Middle Paleolithic layers in the inner part of the cave (=Upper area), we dug the squares already open in the previous excavations (I15, I16, I17, I18, I19, J15, H16, H17, H18, H19), and went much deeper in 2 squares, I18 and I19, trying to reach the bedrock in this zone (see fig.2).

We focused our attention on this deep sounding established at 2 m away from the western cave wall. On purpose, we did not dig this sounding in the central part of the cave, as clearly the small creek running along the eastern wall sporadically reaches the center of the cave. Thus it could have been the source of post-depositional disturbance.

The deep sounding was more than 2,3m thick at the end. The encountered deposits were poor in archeological remains ; thus the excavation went quite fast at the beginning. But unfortunately, going deeper, the sounding was partially occupied by the western wall which spreads into the eastern direction. This change made the excavation much more complicate (with only 1m2 available for the excavator...).

Finally, at the end of the season, after digging during 4 weeks, we reached the bedrock, but unfortunately without finding the Middle Paleolithic level. The archeological sequence exposed on more than 2m, contains only Upper Paleolithic remains. In fact, lithics are few, but characteristic technical and typological artefacts have been recovered which allowed to make the stratigraphic connections with the Lower area sequence.

On the contrary, all along this sequence, we found a lot of big bones (mostly Bovids and *Capra caucasicus*) that we collected systematically and sent some of them to the C14 lab in the Weizmann Institute (E. Boaretto) for dating.

Thus, in absence of Middle Paleolithic archeological finds, we invested all our energy in trying to make more detailed study of the Upper Paleolithic from this area.

The stratigraphical sequence observed in the inner part of the cave mostly concerns units C and D, both of them thicker in this zone than in the Lower area precedently described.

Due to its development in the inner part of the cave (= upper area), **Unit C** was subdivided in 5 sub-layers

- C1 silty sandy layer
- C2 stony layer rich in blocks in a yellow clayey matrix ; rare archaeological material
- C3 black plastic clay rich in manganese and with a strong concentration of archaeological material
- C4 yellow sandy clay layer, with abundant archaeological material.
- C5 stony yellow plastic clay layer

**Unit D** (dug only in our deep sounding in I18,I19)

Layer rich in very altered stones in a dark clayey matrix; poor in archaeological finds.

As we said at the beginning of this report, Dzudzuana cave is an important site for the study of the beginning of the Upper Paleolithic in the Caucasus zone and for the understanding of the processes involved in its onset.

Available radiocarbon readings were previously scarce in the Republic of Georgia (Liubin 1989) even if their number slightly increased more recently with the researches developed in places such as Ortvale Klde for instance (Adler et al. 2006). It was thus of prime importance for the team working on the Upper Paleolithic in Dzudzuana cave (directed by O. Bar-Yosef, A. Belfer-Cohen and T. Meshveliani) to obtain a well documented sequence of dating. Our work in the inner part of the cave came as a good complement to the previously acquired data from the Lower area.

Following this research program, finally, Dzudzuana cave provides the prehistorian community working in the Caucasus area with a serious and detailed chronological framework for the study of Upper Paleolithic cultural manifestations. All the results of these studies (dating, geology, palynology, lithic technology, archeozoology) have been largely exposed in a paper recently published in *Antiquity* (Bar-Yosef et al. , *Antiquity*, 85 (2011), 331-349).

The grant that we received from the Leakey Foundation largely helped to go further in the dating process and in the geological study.

The dating of the lower unit (unit D) containing an Upper Paleolithic rich in tools, cores, debitage, obsidian and bone tools (with a predominance of endscrapers and awls and points) indicates occupations of the cave as early as 34,5 to 32,2 ka cal BP, more or less contemporaneous with layer 4 in Ortvale Klde (the closest well studied site) even if the dates in this cave may indicate a slightly earlier occupation. Comparable lithic industries have been recovered also in Mezmaiskaya cave (North of the Caucasus mountain ridges), dated to c. 38,2-36,8 ka cal BP (Golovanova et al. 2006, Adler et al. 2008) )which could indicate a relatively fast dispersal of the Upper Paleolithic populations across the Caucasus mountains, a phenomenon quite different from the observed situation for the Middle Paleolithic period during which the same high mountains seem to have been a barrier in the human exchanges (Adler et Tushabramishvili 2004, Adler et al. 2008, Meignen et Tushabramishvili 2006, Bar-Yosef et al., 2011).

Thus even if we were not successful in our initial project (recovering the Middle Paleolithic in Dzudzuana cave), we fully and positively « exploited » the grant from the Leakey Foundation in order to better document the early period of the Upper Paleolithic in the Caucasus region.

### **Short bibliography**

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figure 1 map showing the main Upper Paleolithic sites in the Caucasus area

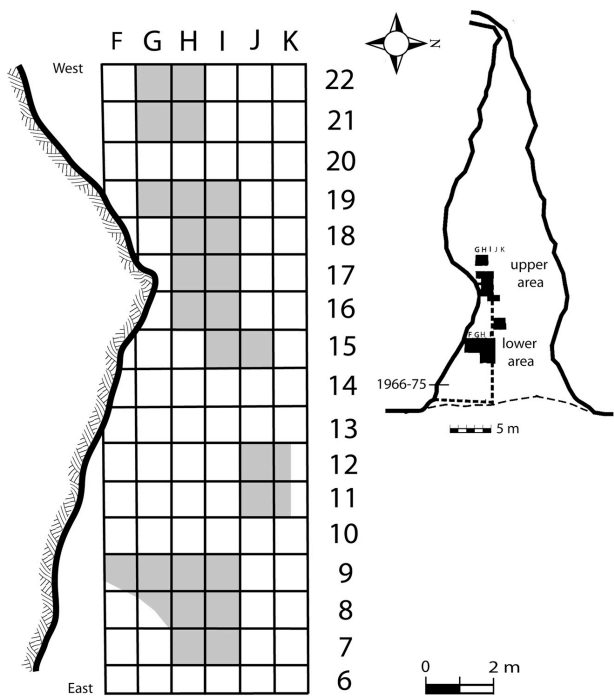


figure 2 : map of the excavation areas

**Radiocarbon dates from Dzudzuana.** Note that the lower area (marked as LoAr) of the cave (squares F-I 7-9) produced earlier dates.

Layer	Material	Square & Area	Elevation	Lab #	$\delta^{13}C$ ‰ PDB	Age <sup>14</sup> C BP $\pm$ 1 $\sigma$	Age cal BP $\pm$ 1 $\sigma$
A	Bone	<i>LoAr</i>		TB 315a		5700 $\pm$ 130	6372-6649
A	Bone	<i>LoAr</i>		TB 315b		6300 $\pm$ 170	6992-7373
A	Bone	<i>LoAr</i>		TB 316a		4600 $\pm$ 130	5073-5461
A	Bone	<i>LoAr</i>		TB 316b		5500 $\pm$ 92	6207-6391
A	Charcoal	K11a; <i>LoAr</i>	315-325	RTT-5700		5560 $\pm$ 40	6318-6393
B	Bone	I9a; <i>LoAr</i>	465-470	RTT-3282		11500 $\pm$ 75	13 272-13 529
B	Bone	I9a; <i>LoAr</i>	420-425	RTT-3821		13250 $\pm$ 70	15 770-16 591
B	Bone	H7a; <i>LoAr</i>	525-530	RTT-3278		13860 $\pm$ 90	16 890-17 300
C	Bone	I9c; <i>LoAr</i>	565-570	RTA-3433	-18.9	21220 $\pm$ 200	24 997-25 763
C	Bone	I8d; <i>LoAr</i>	570-575	RTA-3434	-19.4	20 980 $\pm$ 150	24 728-25 551
C	Bone	H9c; <i>LoAr</i>	575-580	RTA-3435	-18.7	21 930 $\pm$ 190	25 874-26 734
C	Bone	H8d; <i>LoAr</i>	590-595	RTT-3822	-18.99	20 620 $\pm$ 155	24 290-24 886
C	Bone	G8c; <i>LoAr</i>	600-605	RTT-3823	-19.1	23 240 $\pm$ 200	27 592-28 227
C	Charcoal	G9a; <i>LoAr</i>	635-640	RTT-4341	-25.2	23 125 $\pm$ 175	27 231-28 124
C	Charcoal	H7a; <i>LoAr</i>	635-640	RTT-4339	-26.5	22 490 $\pm$ 180	26 725-27 645
C	Bone	G22b; <i>UpAr</i>	170-175	RTT-5741	-18.5	25 300 $\pm$ 570	29 574-30 943
C	Bone	H19b; <i>UpAr</i>	255-260	RTT-4334	-18.9	20 333 $\pm$ 155	23 954-24 598
C	Bone	I18c; <i>UpAr</i>	285-290	RTT-5742	-18.5	20 400 $\pm$ 320	23 898-24 766
C	Bone	I17d; <i>UpAr</i>	295-300	RTT-5743	-18.8	21 200 $\pm$ 350	24 860-25 888
C	Bone	I19c; <i>UpAr</i>	320-330	RTT-5744	-19.0	19 920 $\pm$ 300	23 410-24 285
C	Bone	I18b,d; <i>UpAr</i>	300-310	RTT-5746	-18.4	20 700 $\pm$ 340	24 201-25 172
D	Bone	F7b; <i>LoAr</i>	630-635	RTA-3436	-18.9	27 150 $\pm$ 300	31 638-32 072
D	Bone	G9d; <i>LoAr</i>	635-640	RTA-4338	-23.9	27 450 $\pm$ 275	31 833-32 354
D	Bone	F7b; <i>LoAr</i>	635-640	RTA-3437	-18.58	27 400 $\pm$ 300	31 798-32 326
D	Bone	F7b; <i>LoAr</i>	640-645	RTT-3438	-19.2	30 350 $\pm$ 400	34 228-34 962
D	Charcoal	G8b; <i>LoAr</i>	630-635	RTT-4340	-25.9	26 990 $\pm$ 260	31 531-31 937
D	Charcoal	G9c; <i>LoAr</i>	645-660	RTT-4336	-23.4	26 320 $\pm$ 260	30 759-31 520
D	Charcoal	G6a; <i>LoAr</i>	685-695	RTT-4701	-23.8	32 140 $\pm$ 500	35 682-37 558
D	Bone	I19a; <i>UpAr</i>	390-400	RTT-5745	-18.9	27 260 $\pm$ 775	31 165-32 689
D	Bone	I18b; <i>UpAr</i>	410-420	RTT-4747	-18.6	29 445 $\pm$ 1015	32 784-34 550

RTA and RTT = Weizmann Institute of Science, TB = Tbilisi University. Dates calibrated with CalPal-online (CalCurve: CalPal 2007 HULU). The exact stratigraphic provenience of the TB dates is unknown. The lower area (*LoAr*) is separated from the upper area (*UpAr*) for clarity.