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## Long Upper Palaeolithic sequences from the sites of Poiana Ciresului, Bistricioara and Ceahlau-Dartsu (NE-Romania)

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**SUMMARY** - *Long Upper Palaeolithic sequences in Romania – Recent results from the sites of Poiana Ciresului, Bistricioara-Lutarie and Ceahlau-Dartsu (Bistrița Valley, NE-Romania)* - New data on three East Carpathian sites with a long Upper Palaeolithic sequence furnish proof of the Gravettian chronology compatible to Central and Eastern Central Europe. The <sup>14</sup>C data series on charcoal from cultural layers is consistent in all three stratigraphic sequences and fits together with geological observations concerning loess accumulation rates and soil formations. The assumption of a “Late Aurignacian” contemporary to the Gravettian in the Bistrița Valley as one of the key regions in South-Eastern Europe can be rejected. Mainly significant younger dates from A. Paunescu in the 1980’s (conventional datations) could be caused by mixed sample materials. Though the loess sequence of the Bistrița Valley contains only the Upper Pleniglacial, a correlation with long sequences in the Prut and Dnistr Valley could complement the chronology puzzle close to the limit of the radiocarbon method.

**RIASSUNTO** - *Sequenze estese del Paleolitico superiore in Romania* – Recenti risultati dai siti di Poiana Ciresului, Bistricioara-Lutarie e Ceahlau-Dartsu (Valle del Bistrița, NE-Romania) - I nuovi dati relativi a tre siti situati nei Carpazi orientali caratterizzati da una sequenza estesa del Paleolitico superiore forniscono la prova della cronologia gravettiana compatibile con quella dell’Europa centrale e orientale. Le serie di dati <sup>14</sup>C sul carbone provenienti dai livelli culturali è consistente in tutte e tre le sequenze stratigrafiche e si accorda con le osservazioni a carattere geologico riguardanti la velocità di accumulazioni del loess e la formazione del suolo. L’assunto di un “Aurignaziano tardo” contemporaneo con il Gravettiano nella Valle del *Districa*, considerata una delle regioni chiave nell’Europa sud orientale, può essere rifiutato. Datazioni decisamente più recenti forniti da Paunescu negli anni Ottanta (datazioni convenzionali) potrebbero essere dovute al fatto che i materiali raccolti erano mescolati. Sebbene la sequenza loess della Valle del Bistrița contenga solo il Pleniglaciale superiore, una correlazione con le lunghe sequenze nelle Valli del Prut e del Dnistr potrebbero completare il *puzzle* cronologico avvicinandosi al limite fornito dal metodo del radiocarbonio.

**Key words:** Romania, Upper Palaeolithic, Aurignacian, Gravettian, radiocarbon

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### 1. INTRODUCTION

The understanding of the Aurignacian/Gravettian transition has changed focus during the last decade. While former investigations mainly tried to define techno-typological units of artefact types and their evolutionary macro-trends, the evaluation of geoscientific data now provide surprising potential.

Contemporary data for both the Gravettian and the Late Aurignacian/Epi-Aurignacian were collected from several sites in Romania, Bulgaria, Greece and the former Yugoslavia (Kozłowski 1996, 1999). The continuity of the Aurignacian after 27 kyr BP – until the last glacial maximum (LGM) – was especially predicated for Eastern Romania. The Eastern Carpathian river valleys as well as the Moldavian plain with their huge loess deposits contain at least 100 Upper Palaeolithic sites (Haesaerts *et al.* 2003; Noiret 2004). Only a few of them were recovered by systematic fieldwork. The best investigated region in north-

eastern Romania is the Bistrița Valley, where rescue excavations were carried out in the late 1950’s, before the building of a dam flooded the lower terrace and some of the Upper Palaeolithic sites (Nicolăescu-Plopșor *et al.* 1966). Most of the 16 Upper Palaeolithic sites are situated on the terraces south of the river in the upstream Răpciuni Basin (Fig. 1). A few more were identified in the Bicaz Basin (Mogoșanu & Matei 1981, 1983) and two others (Lespezi and Buda) south of Piatra Neamț on the plain (Bitiri-Ciortescu *et al.* 1989). Near Piatra Neamț lies the pluristratified site of Poiana Ciresului, which was the focus of systematic research in three main stages: in the 1960s (Scorpan 1976), in the late 1980s (Bitiri-Ciortescu *et al.* 1989), and recently by our team (Cărciumaru *et al.* 2006). Fortunately, the sites with the richest archaeological layers from the upstream Răpciuni Basin are situated on the middle terrace (about 40m above the Holocene niveau) and have not been destroyed by the Bistrița storage lake. A. Păunescu continued the excavations in the Upper Bistrița Valley until the

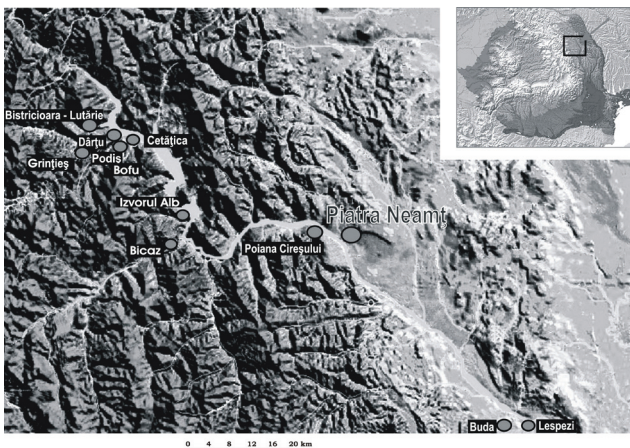


Fig. 1 - Upper Paleolithic sites on Bistrița Valley and location on Romania's map.

*Fig. 1 - Siti del Paleolitico superiore nella Valle del Bistrița e loro localizzazione sulla mappa della Romania.*

1980's. His  $^{14}\text{C}$ -datings in the 1980s produced amazing results: four of the pluristratified sites (Bistricioara, Dârțu, Cetățica I and II) provided  $^{14}\text{C}$ -dates of ca 25-21kyr uncal. BP for the Aurignacian and 24-18 kyr uncal. BP for the Gravettian (Păunescu 1996, 1998) (Tab. 1).

## 2. FIELDWORK IN 2005-06

The focus of this investigation is on new data from sites with long Upper Palaeolithic archaeological sequences. The sites of Bistricioara-Lutarie-I and Ceahlău-Dârțu in the Râpciuni Basin were thus the best choice, and were also the only two sites where it was possible to find the measurements of the older excavations. Therefore the new trenches can be pinpointed in the old plans (Figs 2-3). While the site of Cetățica-I can only roughly be relocated because of imprecise maps, the site of Cetățica-II is situated on the lower terrace and was flooded in the early 1960's.

### 2.1. Bistricioara-Lutarie I

The site is situated on the 40m terrace of the Upper Bistrița. A description of all investigations carried out so far was published by A. Păunescu (1998: 120-170). Given some landmarks, it was possible to correlate the 2006 trench with the plan of the excavations from 1957-58 and 1980-84 (Păunescu 1998: 121) (Fig. 2). The only old profile rich in content was situated in the site of Bistricioara-Lutarie-II, about 80 m from the new trench (Nicolăescu-Plopșor *et al.* 1966: 37). It was newly interpreted by A. Păunescu (1998: 122), when he tried to synthesize the pedological separated layers with the expected cultural units. Summarizing the publications, the stratigraphic-cultural succession is as shown in table 2.

The synthetic profile of stratigraphic units of the Bistrița Valley sites in connection with the general cultural succession (Nicolăescu-Plopșor *et al.* 1966: 17) confirms local observations in Bistricioara-Lutarie-II (Fig. 4). Our new profile contains the same stratigraphic units. The  $^{14}\text{C}$  data of the charcoal concentrations in "hearth 2, 3 and 4" fits in the European framework: the unspecific Aurigna-

cian inventory (called "Middle Aurignacian") now dates to about 27-28 kyr uncal. BP, and the lowermost Gravettian horizon to about 24-24.5 kyr uncal. BP (Tab. 1). In respect to the Aurignacian/Gravettian transition timeline, level II is the most interesting. It contains only Gravettian artefacts (Păunescu 1998: 138) and no single carinated piece or other Aurignacian implement. The lowermost level yielded only three typical carinated endscapers in an inventory of 1049 stone artefacts. A standardised bladelet production is missing, as is backed production in the lower Gravettian layer. While the technological change is not very clear, the different raw material procurement can be taken as the most significant feature of the cultural change. In accordance with the Romanian terminology, the local lithic raw materials are "black schist" (a type of lydite) and the local "menilith". The latter black or dark brown silicious rock is characterised by a rhythmic lamination, due to the alternation between opal and organic (calcedony) sequences. Besides siliceous sandstone, these local raw materials are mostly represented by rounded pebbles or prismatic blocks in the river gravels. A completely different picture is given by the import of Cretaceous flint, probably only sourced in the 200 km distance Prut Valley. In Aurignacian level I, silicious sandstone (42%) and black schist (30%) dominate, followed by 9% menilith, 8% flint and 7% black sandstone. In contrast, the lowermost Gravettian level II inventory of similar size is predominated by flint with a white-blue patina (37%), followed by black schist (30%), menilith (21%) and silicious sandstone (10%) (Fig. 5).

### 2.2. Ceahlău-Dârțu

The site of Ceahlău-Dârțu is situated on a plateau on the middle terrace of the right Bistrița shore, about 5 km downstream from Bistricioara-Lutarie. It was investigated from 1955-56 (Nicolăescu-Plopșor *et al.* 1966) and again in 1980-83 (Păunescu 1998, 192-237). With the 2006 trench we again touched the old section "S 37" (Fig. 3).

The stratigraphy and depth of the loess deposits is very similar to that of Bistricioara-Lutarie. The earlier researchers pointed out that two Aurignacian ashy layers (I and II) were embedded in the greyish, pseudomycelian loess. The two older  $^{14}\text{C}$  dates on layer I were won at a depth of 1.70 and 1.60 m and are approximately the same age as the Au-

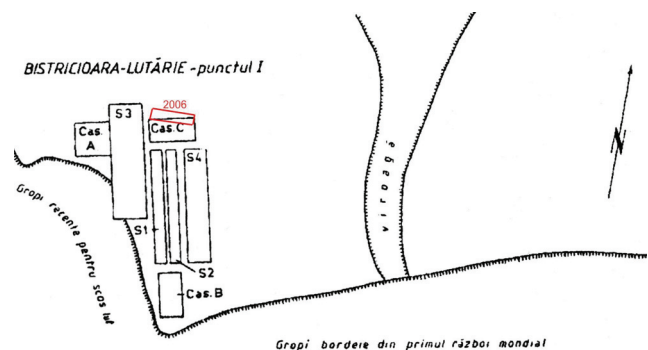


Fig. 2 - Plan of the excavations in Bistricioara-Lutarie I (after Păunescu 1998: 121).

*Fig. 2 - Piano degli scavi a Bistricioara-Lutarie I (da Păunescu 1998: 121).*

Tab. 1 - List of all radiocarbon dates from selected UP sites in the Bistrița Valley. Beta= Miami, Florida; Bln= Berlin; Erl= Erlangen; GrN= Groningen; Gx= Cambridge, Massachusetts.

Tab. 1 - Lista di tutte le datazioni al radiocarbonio da siti selezionati nella Valle del Bistrița. Beta= Miami, Florida; Bln= Berlino; Erl= Erlangen; GrN= Groningen; Gx= Cambridge, Massachusetts.

Cultural units after (Ploșor <i>et al.</i> 1966/ Păunescu 1998) → new determined	Archaeological site location	<sup>14</sup> C BP (Păunescu 1998)	Lab Number	<sup>14</sup> C BP (AMS Erlangen)	Lab Number
“Upper Gravettian” → Older Epigravettian	Cetățica I, level 3	19.760+/-470	GrN-14631		
	Poiana Cireșului			19.459+/-96 20.053+/-188 20.076+/-185 20.154+/-97	Erl-12162 Erl-9964 Erl-9965 Erl-12163
“Middle Gravettian” → Gravettian	Podiș, level 3	16.970+/-360	GrN-14640		
	Dârțu, level 3	17.860+/-190	GrN-12672		
	Bistricioara-Lutărie, level 4	16.150+/-350 19.055+/-925	GrN-10528 Gx-8730		
	Lespezi, level 2	17.620+/-320	Bln-805		
	Lespezi, level 3	18.110+/-300	Bln-806		
	Lespezi, level 5	18.020+/-350	Bln-808		
“Lower Gravettian” → Gravettian	Bistricioara-Lutărie, level 3	20.995+/-875 18.800+/-1200	Gx-8729 Gx-8728	21.541+/-155 22.181+/-112	Erl-11854 Erl-12164
	Cetățica I, level 2	23.890+/-290	GrN-14630		
	Buda, level 1	23.810+/-190	GrN-23072		
(“Pre-Gravettian/ Upper Aurignacian”) → Old Gravettian	Bistricioara-Lutărie, level 2	18.330+/-300 20.310+/-150 20.300+/-1300 23.450+2000/-1450	GrN-12670 GrN-16982 Gx-8726 Gx-8727	24.213+/-299 24.370+/-300 24.396+/-192	Erl-9968 Erl-9967 Erl-11855
	Poiana Cireșului “Gravettian II” layer			26.070+/-340 26.185+/-379 26.347+/-387 26.677+/-244 27.321+/-234	Beta 206707 Erl-9963 Erl-9962 Erl-11860 Erl-11859
“Middle Aurignacian” → Evolved Aurignacian	Cetățica II, level 2	21.050+/-650	GrN-14632		
	Dârțu, level 2	21.100+490/-460	GrN-16985		
	Bistricioara-Lutărie, level 1	23.560+1150/-980 24.100+/-1300 24.760+/-170 27.350+2100/-1500	Gx-8845 GrN-10529 GrN-11586 Gx-8844	26.869+/-447 28.069+/-452	Erl-9970 Erl-9969
	Dârțu, level 1	24.390+/-180 25.450+4450/-2850	GrN-12673 Gx-9415	30.772+/-643 35.775+/-408	Erl-9971 Erl-12165
“Lower Aurignacian” (?)	Cetățica I, level 1	>24.000	GrN-14629		
	Cetățica II, level 1	26.700+/-1100	GrN-14633		

rignacian from Bistricioara-Lutărie (Tab. 1). Level III and IV are Gravettian and level V represents an Epigravettian (Păunescu 1998, 192-237). The new investigation can confirm the Aurignacian dating with 35.5 kyr BP for the depth of 2.30m below the ground and 30.5 kyr BP for the depth of 2.17 m, measured both on charcoal remains (Tab. 1). They were sampled at the base of the greyish pseudomycelian loess, which is heavily calcified and contains many fossil root channels. One remarkable fact is the sharp boundary between the greyish pseudomycelian and the upper reddish loess-loam at about 1.30 m below the surface. That boundary

was obviously caused by water influence during soil formation – probably during the Late Glacial, which modified the texture and chemistry of the loess. This observation is supported by the pedogenetic lamination in its lower part, from 1.00-1.30 m below ground level. The boundary marks also the chemical front of the pedogenetic decalcification.

Clear differences can be again seen between the lithic assemblages (Păunescu 1998):

- Aurignacian I, lowermost level (484 artefacts): 54% silicious sandstone, 37% black schist, 6% menilith, 2% flint, 1% yellowish marne stone;



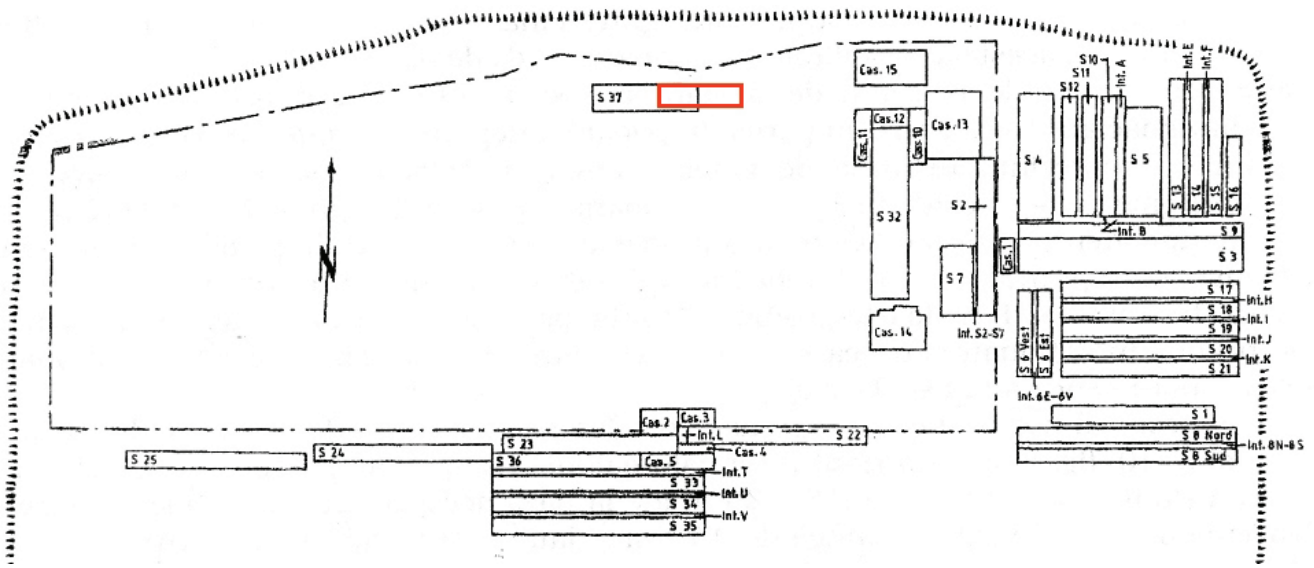


Fig. 3 - Plan of the excavations in Ceahlău-Dârțu (after Păunescu 1998: 193).  
 Fig. 3 - Piano degli scavi a Ceahlău-Dârțu (after Păunescu 1998: 193).

- Aurignacian II (level II from the bottom, 1112 artefacts): 57% silicious sandstone, 20% black schist, 12% menilith, 3% silicious spongolite (“silicolit”), 7% flint, 1% yellowish marne stone;
  - Gravettian I (level III, about 200 artefacts): 50% menilith, 45% flint, 5% black schist, 3 artefacts from silicious sandstone, 1 from black sandstone;
  - Gravettian II (level IV, 668 artefacts): 31% menilith, 59% flint, 7% black schist, 1% silicious sandstone.
- Again the main difference between the Aurigna-

cian and Gravettian is the different raw material use which changes from local sources to imported Prut flint (Fig. 6). In addition, the *pinus* macro-remains preserved as charcoal in the Aurignacian I layer mark a relatively temperate climate.

2.3. Poiana Cireșului

In addition to Bistricioara-Lutarie and Ceahlău-Dârțu in the upper Răpciuni Basin, the site of Poiana Cireșului – situated 60 km downstream near Piatra Neamț – is embedded in a huge loess sequence which was not redeposited. The human occupations of Poiana Cireșului took place at the confluence of the small river Doamna and the Bistrița, precisely in the spot where the river leaves the Eastern Carpathians mountain area (Fig. 1). The settlement is situated in a dominant position, on an erosion level cut into flysch deposits, roughly equivalent to the middle terrace of the Bistrița River. Due to the relatively soft bedrock, the area surrounding the slope was seriously

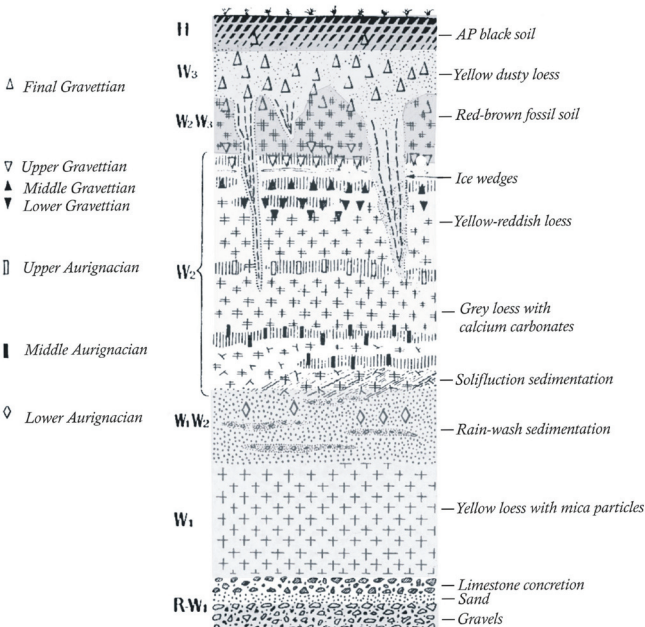


Fig. 4 - Synthetic profile of the Bistrița Valley (Nicolăescu-Plopșor et al. 1966: 17).  
 Fig. 4 - Profilo sintetico della Valle del Districa (Nicolăescu-Plopșor et al. 1966: 17)

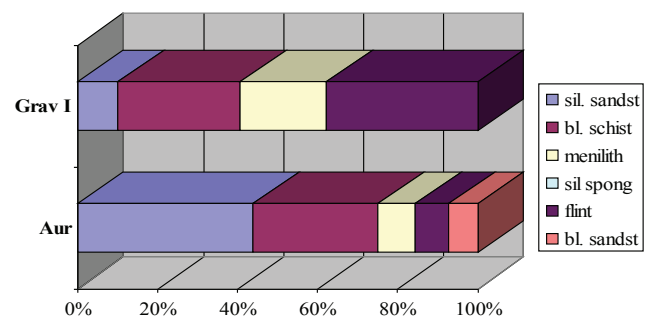


Fig. 5 - Bistricioara-Lutarie I. Spectrum of lithic raw materials (Aurignacian vs. Gravettian).  
 Fig. 5 - Bistricioara-Lutarie I. Spettro dei materiali litici grezzi (Aurignaziano vs Gravettiano).

Tab. 2 - General stratigraphic-cultural succession in the Bistrița Valley.  
 Tab. 2 - Successione stratigrafica-culturale nella Valle del Districa.

0.20/0.30 - 0.50/0.60 m	A reddish-brown soil formation free of cultural layers. It is covered by a very thin grey loess layer containing the uppermost Gravettian level VI (“Epigravettian”).
0.65/0.50 - 1.65/1.50 m	The whole Gravettian complex (levels II-V) is about 1m in depth according to Păunescu (1998) and begins with level II (“Pre-Gravettian”). Nicolăescu-Plopșor <i>et al.</i> (1966: 37) call this cultural layer “Aurignacien superieur”. At about 1.10 m Nicolăescu-Plopșor <i>et al.</i> (1966) describe a sedimentological change from the grey loess with pseudomycelian structures to decalcified reddish-yellowish loess.
1.10 - 1.80/ 1.90 m	Grey loess with pseudomycelian structures. In Bistricioara-Lutarie-II the lowest cultural layer “Aurignacian I” (= Aurignacien moyen) appears at 1.50 m as an ashy loess layer of about 0.20-0.30m. In other sections the “Aurignacian I” <sup>14</sup> C -samples were taken from 2.15 to 1.95 m (varying loess accumulation).
1.80/2.00 - 2.00/2.20 m	A reddish-greyish, reworked loess (0.2 m depth) without archaeological traces is deposited on the terrace base.

affected by erosion, landslides and anthropogenic activity. The only area spared by these erosion processes is the northern “promontory” (around 200 m<sup>2</sup>), which was a relatively flat area before anthropogenic changes (pathways) were made in historic times (Fig. 7). Today it is used as a meadow, marking the only glade on that forested slope. All archaeological investigations were concentrated here, while most of them uncovered only the uppermost Epigravettian layers. During the last phase of research (1998-2006) 47 m<sup>2</sup> were exposed through systematic excavation (Cârciumaru *et al.* 2006). Two Gravettian and two Epigravettian layers with a rich archaeological record have

been recovered since then (Cârciumaru *et al.* 2006: 323-328). Before 2005, five main stratigraphical units were identified from the top down to 3.50 m: a Holocene cambisol, a yellow Late Glacial loess, a decalcified tundra-gley; a heavily carbonated clay-loessic layer and a calcic olive sandy-loessic layer. The lowermost known Gravettian layer (II) was <sup>14</sup>C-dated to 26,070±340 uncal. BP (Beta 206707) (Cârciumaru *et al.* 2006: 321). This can be confirmed by four new AMS dates, ranging from about 26.0 to 27.5 kyr uncal. BP (Tab. 1).

Although more than 4 m in depth were excavated in the campaigns since 1998, the loess base was still not reached. In order to obtain a general view of the lower parts of the loess sequence, 16 drillings were made (Cârciumaru *et al.* 2006: 322). The length of the loess sequence was amazing, because in the eastern area of the plateau it reaches down to 7 m from the surface. The geological sequence from Poiana Cireșului displays clear similarities with the general stratigraphical succession from Bistrița’s middle terrace (Nicolăescu-Plopșor *et al.* 1966). The drills furthermore allow to complete this succession with some new information, such as the presence of two soils below the lowest excavated layer. These incipient gelic gleysoils (synonymous for “tundra gley”) formed under environmental conditions where loess sedimentation competes with pedogenesis and water-logging due to permafrost (Antoine *et al.* 2001). In 2006, we opened a trench up to 7.50 m below the ground in the central part of the settlement. Two more cultural layers are embedded in the soils below the Gravettian II, represented by a significant charcoal accumulation from 5.05-5.25 m and a second one at about 6.15 m below zero. The same observation was made from a drilling core nearby, where a bone fragment at a depth of 6 m and a flake at 6.80 m were found. A piece of charcoal from 6.90 m below zero could be dated to 55,923±12,196 uncal. BP (Erl-11858). Despite

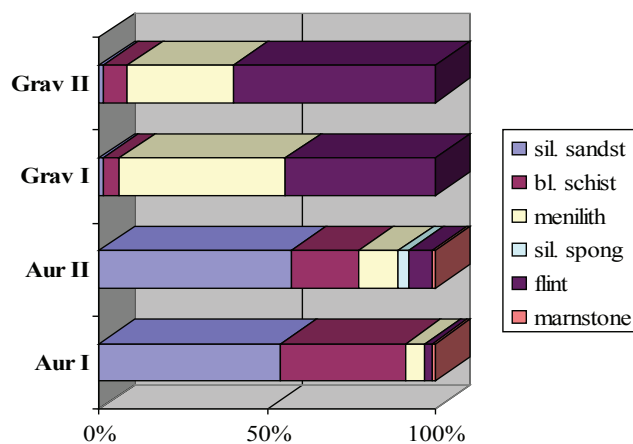


Fig. 6 - Ceahlău-Dârțu. Spectrum of lithic raw materials (Aurignacian vs. Gravettian).

Fig. 6 - Ceahlău-Dârțu. Spettro dei materiali litici grezzi (Aurignaziano vs Gravettiano).

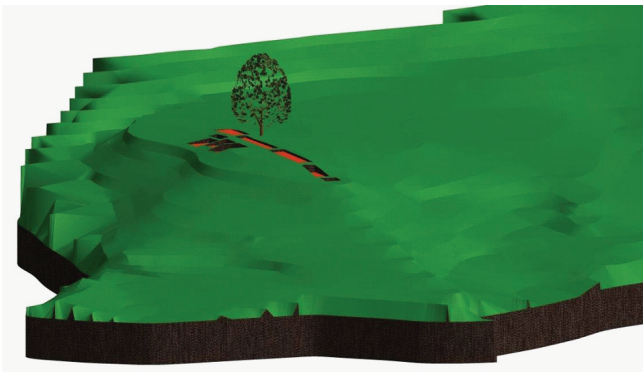


Fig. 7 - Poiana Cireșului. Topographic map, location of excavation (map source: University of Targoviste).

Fig. 7 - Poiana Cireșului. Mappa topografica, localizzazione dello scavo (fonte della mappa: Università di Targoviste).

the large error, the data indicates a long succession with basal loesses next to the limit of radiocarbon measurement. Looking ahead, Poiana Cireșului contains the best chance to record a long culture-bearing loess sequence with the relatively highest sedimentation rate known in the Bistrița Valley.

### 3. CONCLUSIONS

All three recently investigated sites display archaeological layers with questionable or only a few significant Aurignacian implements. The first occurrence of Gravettian inventories delivered AMS data compatible with Central and Eastern Central Europe. All data were measured from charcoal samples. The new data series is consistent in its stratigraphical order and fits together with geological observations of loess accumulation rates and soil formations (more detailed: Steguweit 2008). The significantly younger dates from A. Paunescu's sampling in the early 1980's could be caused by mixed materials, when in some cases bone and charcoal were sampled together.

The assumption of a "Late Aurignacian" contemporary to the Gravettian in the Bistrița Valley as one of the key regions in South-Eastern Europe can now be rejected (Hahn 1977: 11-28; 298-304). While the circulation of lithic raw materials (Prut and Dnistr flint sources) is evidence of connections to the Moldavian-Ukrainian plains and the Northern Black Sea region, a synchronous development of the material culture in the wide plains east of the Carpathians is most likely. In addition to a better <sup>14</sup>C record, other dating strategies provide a large potential for the Eastern Carpathians: The northern boundary of the Campanian Ignimbrite has not been investigated in Eastern Romania so far. Besides the long sequences in the Prut and Dnistr valley, the site of Poiana Cireșului also has the potential to help solve this puzzle.

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