Le Ministère d'Education et de la Recherche
L'Université „Valahia" Târgovişte
Faculté de Sciences Humaines

ANNALES
D'UNIVERSITÉ „VALAHIA"
TARGOVISTE

SECTION
d'Archéologie et d'Histoire

Tome VI-VII

Târgovişte
2004/2005

CUPRINS

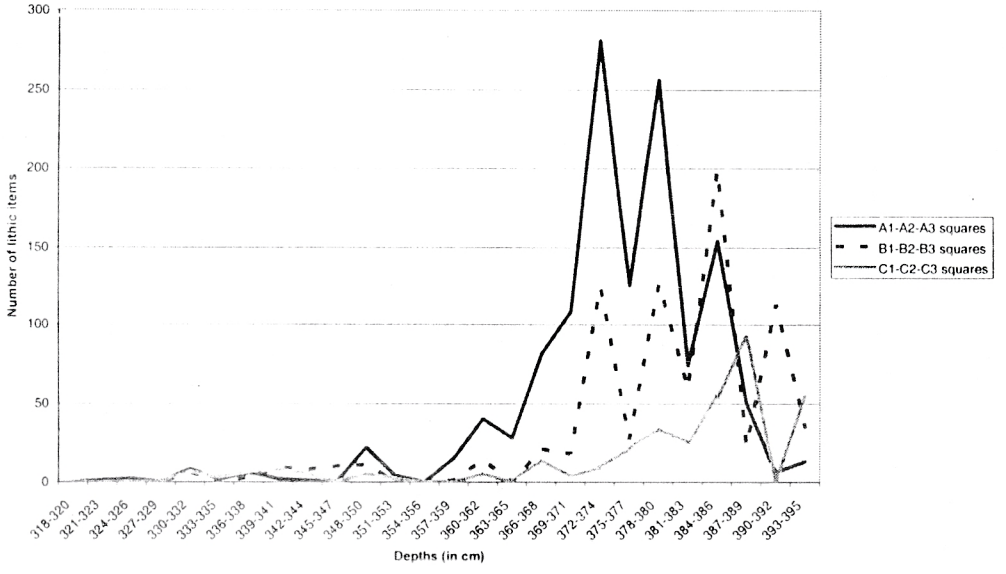
TECHNOLOGICAL AND FUNCTIONAL OBSERVATIONS REGARDING BACKED IMPLEMENTS FROM POIANA CIREŞULUI, PIATRA-NEAMŢ

*Loredana Niţă**

The Paleolithic site of Poiana Cireşului is located on the right bank of Bistriţa River, in the eastern part of Romanian Carpathians. The site was excavated in 1963, 1968 (Căpitanu, 1969; Scorpan, 1976) and 1989 (unpublished). Since 1998, a research group from the „Valahia" University of Târgovişte has resumed the excavations with the support of the National History Museum of Piatra Neamţ and the National Museal Complex „Curtea Domnească" from Târgovişte. To this moment, four cultural levels have been identified, labeled as Epigravettian (the first two) and Gravettian (the next two).

The lower Gravettian level, discovered between 3,60m and 3,95m depth, in the sandy-loess deposit at the bottom of the stratigraphical column, has yielded large combustion areas, some poorly preserved faunal remains, and numerous lithic items. A simple statistical processing of the primary field data highlighted several distinct levels of artifact accumulation (*Chart 1*). The upper part of this sequence offered an AMS uncalibrated date of 26,070+/-340 BP (Beta 206707), the oldest available date for the Gravettian on the Bistriţa Valley so far.

Chart 1: PN-PC, S V, 2003-2004, Lithics' density, Lower Gravettian Layer



The lithic material consists of 3225 items, out of which 2.97% are tools (end-scrapers, burins, one side-scraper, retouched blades and bladelets, *Gravette* points, *micrograveltes* and backed bladelets). The assemblage is largely made of siliceous sandstone (48.77%) and black schist (12.80%); tools, cores and few byproducts typical for the last stages of the debitage sequence mostly represent the Cretaceous flint (17.15%). As the typological spectrum is largely dominated by backed implements, the present study aims at the analysis of these implements from a more complex point of view than the basic typological approach attempted so far.

I. The technological analysis

I.1. General frame of reference

In order to classify a lithic product according to its specific location in the debitage sequence (*chaîne opératoire*), each technological stage along with the characteristic products has to be defined (Perlès, 1991; Karlin, Bodu, Pélégrin, 1991; Geneste, 1991).

* loredana_nita2003@yahoo.com; Universitatea „Valahia" din Târgovişte, Facultatea de Ştiinţe Umaniste, Catedra de Istorie, str. Lt. Stancu Ion, nr. 34 - 36, Târgovişte, 130105, Dâmboviţa.

➢ I – raw material procurement

The first stage can be illustrated by blocks of raw material, abandoned for no specific reason, with small changes or none whatsoever **(Ist technological class).** Their occurrence within the lithic assemblage may be reduced by the deployment of this stage outside the site.

➢ II – taking off the cortex and preparing for debitage

The main products of this stage are the cortical flakes and/or blades **(IInd technological class)**, along with the flakes resulted from the setting up of the flaking surface.

➢ III – the debitage

This stage begins with the detachment of a crested blade, followed by several non-cortical blades/bladelets **(IIIrd technological class)**. When the convexities required have worn out, the striking platform or the flaking surfaces are rejuvenated by detaching a new crested blade (*néocrête*) **(IIIrd A technological class)** or a core tablet **(IIIrd B technological class).** At the end of the debitage process, the exhausted core may be abandoned, used in obtaining several last flakes, or it may be transformed in a tool (especially if is a former bladelets core).

➢ IV – selecting suitable blanks and transforming them into tools

The resulting products are typical flakes or burin spalls **(IVth technological class).**

➢ V – rejuvenation, recycling or abandoning exhausted tools **(Vth technological class).**

I.2. Backed implements from Poiana Cireşului *(Table 1; Charts 2, 3)*[1]

The common raw material used for backed implements is the Cretaceous flint, having as origin the Prut Valley, about 150 km away from the site. Some of the items are also made of black schist, siliceous sandstone or menilith.

Usually, stage III is a decisive one in producing the backed implements, especially *Gravette* points, since most of their features depend on the quality of the blanks: a straight back, a straight profile and a narrow cross-section of the blades. Stage IV is responsible for bringing into shape the final product:

➢ *Gravette* points are rarely found in one piece and they are 8-10mm wide and 3-4mm thick. The proximal end is often thinned by a flat, inverse retouch *(retouche sécondaire d'amincissement) (Fig. 1).* One of the long edges, usually the right one, is affected by a steep, direct retouch that crosses sometimes the highest ridge on the dorsal surface of the blank *(Fig. 2).* The distal end is either straightly/obliquely truncated, or pointed, due to the convergence of the retouched edge with the unretouched one, or to the flat, inverse retouch that can affect one or both sides of the tip *(Fig. 3).* Most of the items are represented by proximal fragments, followed closely by medial and distal fragments.

➢ backed bladelets *(Fig. 4)* are straight, thin blanks, (2-3mm thick and 6-8mm wide), with one of the long edges modified by a direct retouch, either steep or *grignotante* (one that affects an extremely narrow surface of the lateral edge). The proximal and the distal end do not show any kind of specific preparation, like thinning the base or pointing the tip. They are represented by all sorts of fragments, mostly proximal and medial, with triangular or trapezoidal cross-section.

➢ the *microgravettes (Fig. 5, 6)* are items shaped almost exactly like the *Gravette* points, while the difference lies in their dimensions: 2-3mm thick, 5-6mm wide. There are no whole fragments within the inventory, most of the items being represented by proximal and medial fragments.

Table 1										
	Types of fragments								Total	
Items	complete		proximal		medial		distal			
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Gravette points	4	11.76	14	41.17	8	23.52	8	23.52	34	99.97
Backed bladelets	4	13.79	10	34.48	10	34.48	5	17.24	29	99.99
Microgravettes	0	0	4	36.36	4	36.36	3	27.27	11	99.99

Chart 2: Backed implements - thickness representation

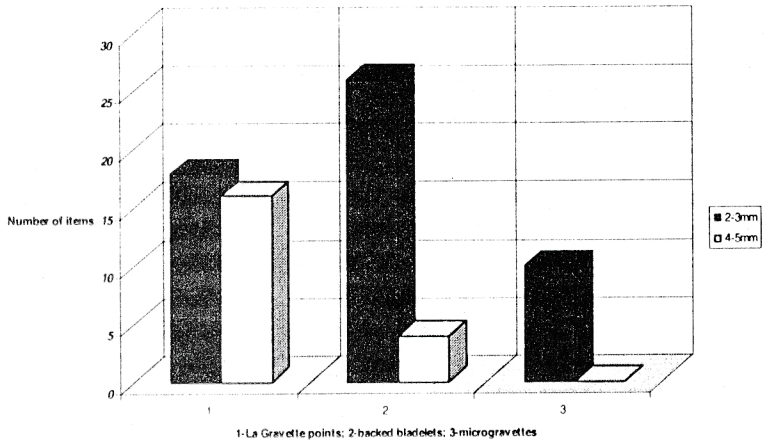
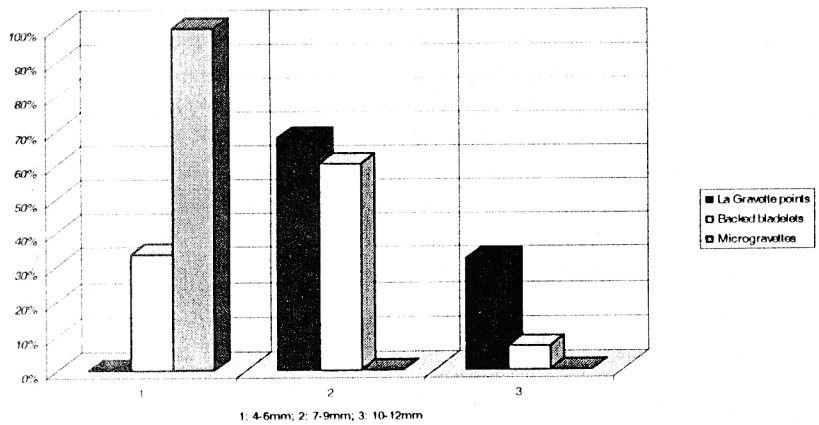


Chart 3: Backed implements - width representation



II. The functional analysis

Determining a specific function for backed implements represented the main goal of several studies (O'Farrell, 1997; Perpère, 2000; Derndarski, 2003, 2004), according to which *La Gravette* points could have been most frequently used as hafted projectile elements. Their characteristic features, like the standardized morphology, the low weight, the elongated shape, the sharp edge and the pointed tip allow aerodynamically performances and high penetration force.

The experimental approach (Odell, Cowan, 1986; Fischer, 1990; Dockall, 1997) has underlined several patterns of damages that occur when projectile elements are submitted to a violent impact, at a high speed.

Abrasive wear:

- linear polishes/striations, due to the detachment of small flakes or chips from the distal end of the point upon penetration and contact with resistant material such as bone.
- edge-rounding/dulling appear like microscopic smoothing of the proeminence and flake scar ridges along the edges and surfaces of a tool. "This damage pattern is to be expected when the point has moved around in the haft during use and bindings and the shaft come in contact with the surface and edges of the tool" (Dockall, 1997, p. 324).

Fractures:

- the step teminating bending fracture, perpendicular to the longitudinal axis of the point *(fracture en marche)* generates a force wave that will meet the surface opposed to the impact point at an angle of 90°.
- spin-off fractures (length>/=2mm) *(languette)* are identified by a cone initiation from a bending fracture surface that removes portions of the surface of the projectile point. "Bending fractures that result from forces that are perpendicular to the projectile point face and length of the point will initiate spin-offs only on

one surface. If spin-offs are present on both surfaces of the bending fracture, it is possible that they are the result of torsion or movement of the projectile or point fragments in the target" (Dockall, 1997, p. 327).

➢ the lateral macrofracture (*ébréchure sécondaire burinante*) causes the detachment of a bladelet, initiated from the tip, affecting one of the lateral edges of the point. This type of fracture can be easily mistaken for the negative of a bladelet resulting from a burin blow.

There are also other factors to be considered when analyzing the extent, position and orientation of different fractures. Among those factors, raw material physical characteristics, the morphology and the orientation of the point, as well as the speed and weight of the projectile are the most significant.

While it has become clear that at least some of the backed implements may have served as projectile points, the debate concerning the hafting system, the specific kind of projectile (spear or arrow), and the propulsion device (spearthrower or bow) still goes on. The traces of use produced by shooting with the bow are more pronounced and extensive, especially in the case of breaks by flexion and burin removals. Also, the throws with the spearthrower cause more breaks than shots with the bow. The frequency of breakage of the flint points might also be related to the point of impact on the animal. In the end, it seems that the simple morphological and morphometric criteria used for the majority of Paleolithic points do not allow a secure discrimination between arrowheads and spear points (Cattelain, 1997).

Other possible functions of the *Gravette* points might be related to their use as borers (Giourova, Schtchelinski, 1994), or knives (O'Farrell, 1997), in which case the points show specific use-wear, like scarring of the apical end and micropolish on the lateral edges.

So far, the functional analysis of the backed implements from Poiana Cireşului had as a focus only the macroscopic traces of use, especially the fractures related to their possible use as hafted elements of a throwing device. One medial and two proximal fragments of *Gravette* points display lateral macrofracture or step terminating bending fractures. One proximal and one medial backed bladelets fragments show step terminating fractures. One proximal *micrograveţte* fragment shows lateral macrofracture and one medial *micrograveţte* fragment shows step terminating fracture. In the case of the medial fragments, the fractures are situated in the distal third of the pieces. None of the distal fragments of *Gravette points*, backed bladelets or *micrograveţtes* appear to have been originated from an impact-related fracture; this is consistent with the general assertion that proximal and medial fragments are most likely to return to the site with the hafts, and the distal fragments usually get lost while hunting/processing the prey (Geneste, Plisson, 1989). Most of the rest of the items display undiagnostic types of fractures, that could be linked to a variety of other factors, such as trampling, or accidents happened during manufacture. Post-depositional breakage, however, can be ruled out, since the ridges on the dorsal side of the items appear fresh and not slightly smoothed.

III. Discussion

One major issue of interest in defining the lithic assemblage from the lower Gravettian level seems to be the rarity of tool types such as end-scrapers (2 items) and burins (3 items), alongside the numerous backed implements and, possibly, fragmented distal points[2]. A toolkit formed mainly by hypothetical projectile elements might be seen as proof of a specialized occupational level. At this point, only 6 backed implements, out of a total of 70, seem to have been used in hunting purposes, which cannot support an explicit definition of this occupational level as a hunting camp. In turn, a future microscopic identification of use-related traces could reveal a whole new set of tasks performed with the support of (some) backed implements, like cutting or piercing. Maybe an accurate microwear study could also provide interesting information about the functions of the unretouched fragmented blades, with only slight deterioration of the long sides.

Another point of interest could be the possible connection of the Gravettian from Poiana Cireşului with other well-dated analogous cultural layers, like those on the Prut Valley, given the AMS dating of 26,000 BP available for the upper part of this sequence and the significant use of Prut flint as raw material. Establishing such a connection would imply the development of numerous levels of analysis, within a particularly multipart approach, whose basic data is still unavailable to us. Some preliminary observations on the *Gravette* points from Mitoc-Malu Galben[3] highlighted few distinctions between those and the *Gravette* points from Poiana Cireşului, from which we will only mention the most obvious. The *Gravette* points from Mitoc are shaped on large blades, mostly over 10 mm wide and up to 80 mm long, while at Poiana Cireşului the same items do not exceed 8-10 mm in width, and approximately 55 mm in length.

There are various issues to be taken into account when trying to identify technologic similarities between two or more lithic assemblages. Producing diverse types of blanks, in order to obtain the same final product could be due to different technological options, related to access to good quality raw material, type and intensity of the rejuvenation process, or traditions, and also different functions intended for the final product, related to pray choice, type of hafting, or type of tasks performed. Hopefully, future developments of the lithic analysis will begin to clarify this problem.

NOTES:

[1] The mesurement of the backed implements has recorded only the maximum values of width and thickness. Also, the items listed in Table 1 do not include heavily fragmented or unfinished pieces (*ébauches*).

[2] There are still some doubts regarding the identification of four items as distal fragments of the so-called *pointes à face plane*.

[3] The author would like to thank Professor Vasile Chirica, who generously allowed the comparison with the Gravettian lithic collection from Mitoc Malu Galben.

REFERENCES:

Cattelain, P., (1997) – Hunting during the Upper Paleolithic: Bow, Spearthrower, or Both?, in H. Knecht (ed.), *Projectile Technology*, Plenum Press, New York, pp. 213-240;

Căpitanu, V., (1969) – Descoperiri paleolitice în județele Neamț și Vaslui, *Carpica*, II, pp. 6-17;

Derndarsky, M., (2003) – Functional analysis of the microgravettian points and backed bladelets of Stillfried/Steinschlägeratelier-preliminary results, in T. Tsonev, E. Montagnari-Kokelj (eds.), *The Humanized Mineral World: Towards social and symbolic evaluation of prehistoric technologies in South Eastern Europe*, Proceedings of ESF workshop, Sofia, 3-6 September 2003, E.R.A.U.L., 103, Liège, pp. 51-57;

Derndarski, M., (2004) – Microwear analysis and curated tools: Grubgraben AL I, a case study, in J.A. Svoboda, L. Sedlachkova (eds.), *The Gravettian along the Danube*, Actes du Colloque de Mikulov (20-21 novembre 2002), The Dolni Vestonice Studies 11, Brno, Institute of Archaeology, pp. 142-152;

Dockall, J.E., (1997) – Wear Traces and Projectile Impact: A Review of the Experimental and Archaeological Evidence, *Journal of Field Archaeology*, 24, 3, pp. 321-331;

Fischer, A., (1990) – Hunting with Flint-Tipped Arrows: Results and Experiences from Practical Experiments, in C. Bonsall (ed.), *The Mesolithic in Europe*, John Donald Publishers Ltd., Edinburgh, pp. 29-39;

Geneste, J.M., (1991) – L'approvisionnement en matiéres premières dans les systèmes de production lithique: la dimension spatiale de la technologie, in R. Mora, X. Terradas, A. Parpal, C. Plana (eds.), *Tecnologia y Cadenas Operativas Liticas*, U.A.B., 15-18 Enero 1991, Treballs d'Arqueologia, I, pp. 1-36;

Geneste, J.M., Plisson, H., (1993) – Hunting Technologies and Human Behavior : Lithic Analysis of Solutrean Shouldered Points, in H. Knecht, A. Pike-Tay, R. White (eds.), *Before Lascaux : Re-Examining the Early Upper Paleolithic*, CRC Press, Boca Raton, Florida, pp. 117-135 ;

Giourova, M.E., V.E. Schtchelinski, (1994) – Étude tracéologique des outillages gravettiens et épigravettiens, in B. Ginter, J.K.Kozlowski, H. Laville (eds.), *Temnata Cave. Excavations in Karlukovo Karst Area, Bulgaria*, Jagellonian University Press, vol. 1/2, pp. 123-168;

Karlin, C., Bodu, P., Pelegrin, J., (1991) – Processus techniques et chaînes opératoires, comment les préhistoriens s'approprient un concept élaboré par les ethnologues?, *Observer l'action technique: des chaînes opératoires, pour quoi faire?*, Éd. CNRS, pp. 101-117;

O'Farrell, M., (1997) – *Approche technologique et fonctionnelle des pointes de La Gravette : une analyse archéologique et expérimentale appliquée à la collection de Corbiac (Dordogne, fouille de F. Bordes)*, Diplôme d'Etudes Approfondies en Anthropologie, Université de Bordeaux I;

Odell, G.H., F. Cowan, (1986) – Experiments with Spears and Arrows on Animal Targets, *Journal of Field Archaeology*, vol. 13, pp. 195-212;

Perlès, C., (1991) – Économie de matières premières et économie de debitage; deux conceptions opposées?, *25 Ans d'Études technologiques en Préhistoire.*, XIèmes Rencontres internationales d'archéologie et d'histoire d'Antibes, Éd. APDCA, Juan-Les-Pins, pp. 35-45;

Perpère, M., (2000) – La chasse au Gravettien. Données archéologiques d'après les industries de L'Abri Pataud, Les Eyzies de Tayac, Dordogne, (France), in Z. Mester, A. Ringer (dirs.), *À la recherche de l'homme préhistorique*, E.R.A.U.L., 95, Liège, pp. 199-205;

Scorpan, C., (1976) – O nouă așezare paleolitică pe Valea Bistriței, *Memoria Antiquitatis*, IV-V, 1972-1973, pp.255-257.

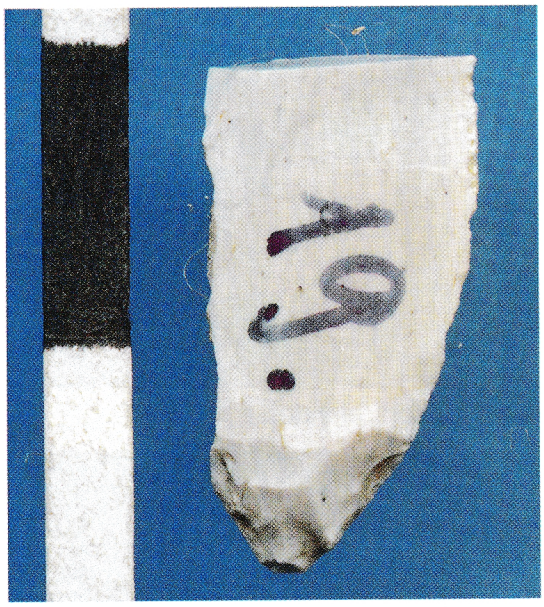


Fig. 1 - proximal end with flat, inverse retouch

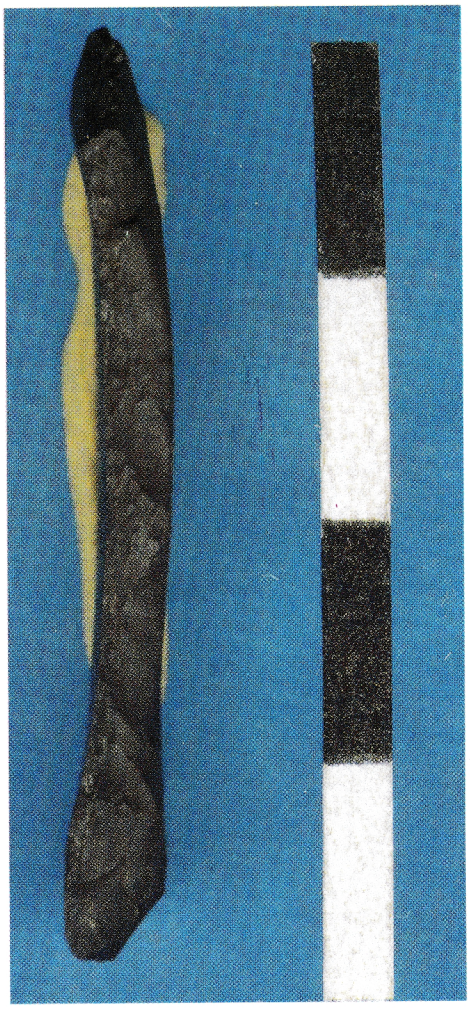


Fig. 2 - Direct, steep retouch of the backed surface

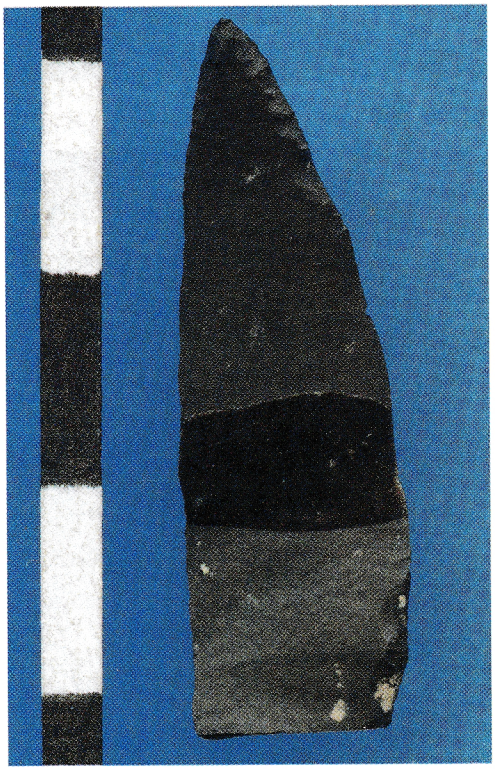


Fig. 3 A - Pointed distal end

Fig. 3B - Truncated distal end

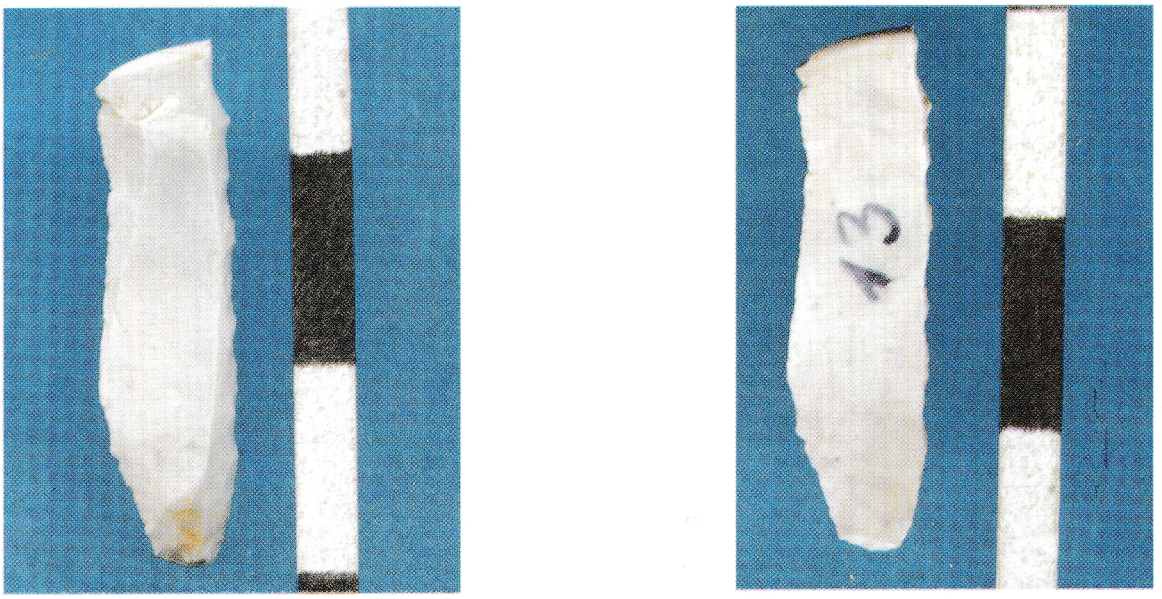


Fig. 4 - Backed bladelet (dorsal and ventral side)

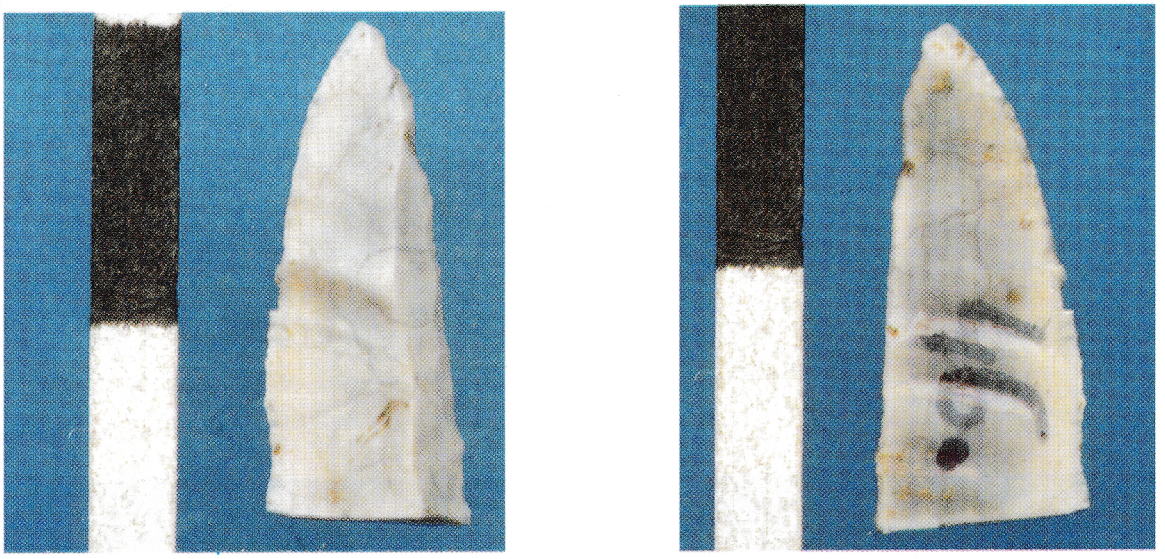


Fig. 5 - Microgravette (dorsal and ventral side) with pointed distal end

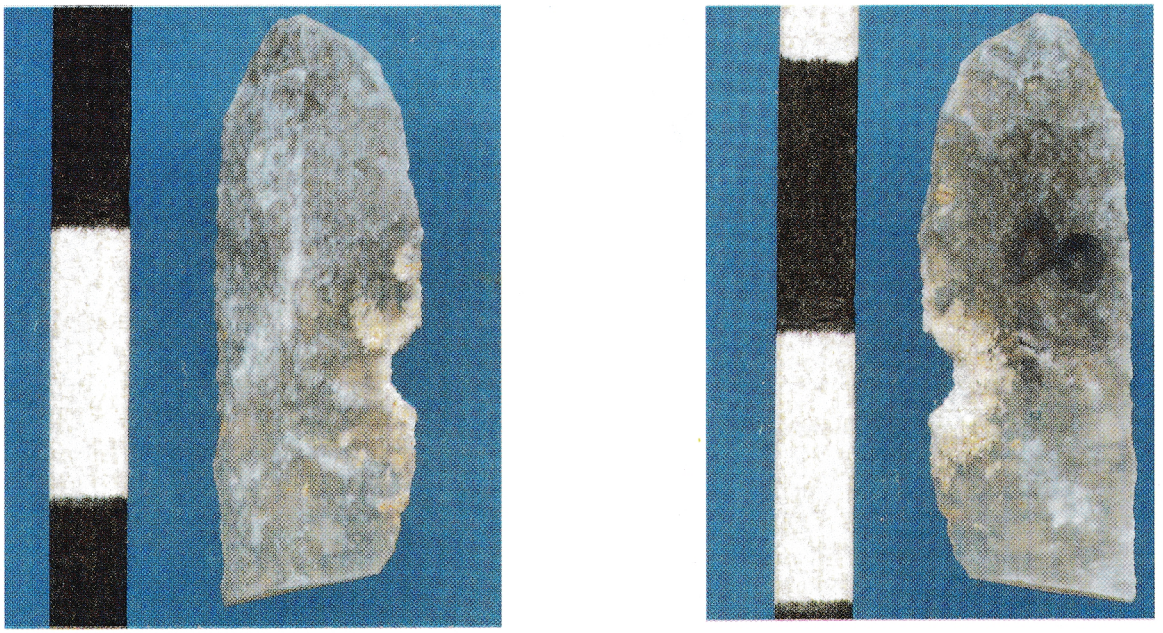


Fig. 6 - Microgravette (dorsal and ventral side) with flat, inverse retouch on the proximal end