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About the organic material industry from the Gumelnița settlement Seciu - Prahova District

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Abstract: About the organic material industry from the Gumelnița settlement Seciu – Prahova District. The studied material was recovered during the prevention archaeological researches, in Seciu quarter, Boldești-Scăieni city (Prahova district). Based on the discovered archaeological material, the settlement can be framed in the Eneolithic Period, Gumelnița culture, stage A2, without excluding the possibility that the settlement may be founded somewhere at the end of stage A1. The organic material industry is represented by an ensemble formed by 25 pieces, 14 made of bone and 11 of antler. From the typological perspective, the chisels prevail, followed by points, not to mention the knapping rests or the pieces under fabrication, a fact that demonstrates a processing *in situ*.

Key words: Gumelnița culture, bone, antler, knapping techniques, adjusting techniques

In the summer of 2009, the Prahova Districtual Museum of History and Archaeology performed archaeological preventive researches in Seciu quarter, Boldeşti-Scăieni city, in the point *"La Pompieri"* (fig. 1). The research was necessary because the archaeological site was to be affected by a civilian construction. The archaeological objective Seciu *"La Pompieri"* situates at a 372 m altitude, on the peak of a hill. From a geomorphologic point of view, we are in the sub-Carpathian hills area, in the Teleajen river basin.

During the investigations were identified two inhabiting levels, the first one attributed to the Starcevo-Criş culture, the second one belonging to Gumelnița culture. The archaeological deposit in this site varies in thickness in accordance with the approached area, having maximum 1.50 m to the south, toward the northern and eastern limits having around 0.50 m. The deposition from the base of the archaeological level is 0.20-0.30 m thick. The discovered material, poor as it is, consists of fragmentary pottery and animal bones. Basing on the material, we were able to frame this archaeological level in a final stage of the Starčevo-Criş culture.

The second inhabiting level, with variable thickness in the southern area, has approximately 1.30 m, and towards north, at the edge of the site, 0.30 m. In this inhabiting level we identified three types of archaeological complexes, namely houses, wasting areas. All the identified dwellings are set on fire. They present under the form of agglomerations of burned adobe, more or less compact, 0.15-0.45 m thick. They are surface houses, with the flooring made of yellow clay, 0.08-0.12 m thick. We also discovered several traces of pole pits, with a diameter of 0.25-0.40 m. Due to the restrained research and of the destructions

provoked to the site by the contemporary constructions, we identified the dwellings only partially.

We also discovered areas with consistent "waste" that consisted in surfaces where were thrown materials that could enter into the "garbage" category. We defined this type of complex as "waste area", also present in the Gumelnița *tells* on the Danube valley. They are characterized as surfaces rich in fragmentary pottery, rarely rebounded off, fragmentary statues, fragmentary, torn or used tools, numerous bones and animal horns, ash, unburned and less burned adobe, burned wood, snail shells. These waste areas are placed above and below burned and abandoned dwellings, but also in the space between them. The thickness varies up to 0.50 m. The waste sedimentation is yellow-greenish, friable when the digging is fresh, becoming dusty when dried. It is probably rich in ash, but also in rests of unburned clay resulting from some constructions fitting. We notice the richness of the rough material of animal origins. The fact that this layer is relatively compact and in the same time horizontal, indicates probably a leveling executed before the building of the houses from the superior level. The inventory of the Eneolithic settlement is a specific one, a lot of pottery being discovered, anthropomorphic and zoomorphic plastic, tools made of silex, stone, bone, antler, osteological material, a copper piece, several human bones in unfunerary contexts. (A. Frînculeasa, O. Negrea, 2010)

The data obtained after the analysis of the fauna rests for the Seciu settlement, are similar with those from south Wallachia (A. Frînculeasa, O. Negrea, 2010). In Gumelnița culture, especially for the Lower Danube area, increases the weight of hunting and fishing. Sometimes the wild fauna (hunting) excels that of the domestic animals (breeding animals) (A. Bălăşescu, V. Radu, D. Moise, 2005).

Based on the discovered archaeological material, the settlement may be framed in the Eneolithic Period, Gumelnița culture. There are some elements that allow the framing of the discoveries in the stage A2 of Gumelnița culture, without excluding the possibility that the settlement could be founded sometime at the end of the stage A1. In this sense, I would like to underline the strong influences attributed to the cultural aspect Stoicani-Aldeni regarding the fine pottery (A. Frînculeasa, O. Negrea, 2010).

Table 1 – The typological picture of the organic material industry

Bone					Antler			
Chisels	Points	Phalanx	Undeter-mined	Knapping rests	Finished pieces	*Ebauches*	Supports	Knapping rests
7	3	1	1	2	4	1	5	1

ORGANIC MATERIAL INDUSTRY

In this paper we would like to analyze pieces processed on organic materials (bone and antler), discovered in the Eneolithic inhabitance level. The bone and antler industry, discovered at Seciu settlement, is represented by an ensemble formed by 25 pieces, 14 made of bone and 11 of antler. The raison of this separation between bone and antler pieces is connected to the different mechanical properties, in accordance with the longitudinal, radial and tangential axis, a fact that also determined the use of different techniques for their processing.

Under the aspect of repartition, from the typological point of view, the picture presents thus:

Bone

I. Chisels. As numerical weight, the chisels represent the main typological category. We identified seven samples, manufactured from bone, and only one sample on longitudinal fractured bone.

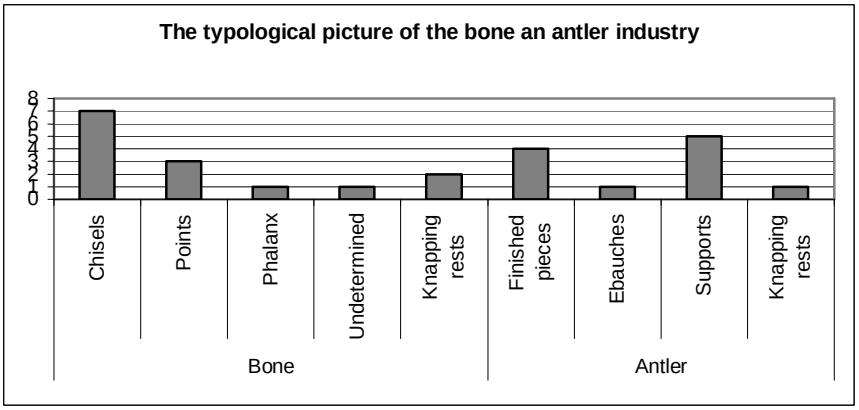
I.1. ***Chisel on longitudinal fractured bone*** (fig. 2/a). As raw material was used a tibia of *Sus*

scrofa. The piece presents a curved profile and convex-concave section. The proximal part is irregular; the mesial part has convex-concave margins, and the distal one convex extremity, bifacial, rectilineal-convex from the profile.

Morphometry: length – 110 mm, medium width – 20.3 mm, medium thickness – 8.5 mm.

Technique: the bone was fractured longitudinally, but also transversally – on the epiphysis level, by percussion, without a further regularization of the fracture margins. The adjusting of the active front begun at the distal level, with the abrasion of the fracture margins and of the extremity, towards the inferior face. The active part develops also on the superior face, but it proceeded mostly with the usage.

The marks (fig. 2/b) seem to demonstrate that the chisel was used in a scraping action, from the interior face, under a rather closed angle, from where the extension in surface of polishing and the presence, on microscopic level, of some scratches oblique face to the axis, on the interior face.



I.2. ***Chisels on longitudinal unfractured bone*** (fig. 2/c):

We are talking about six samples, with the bifacial active part. As base they chose the most diverse bones: ovine ulna, femur and metacarpus, *Canis familiaris* tibia, pig femur and radius.

Morphology: the proximal extremity is irregular at five of the samples, with gloving orifice. It was used the natural marrowy channel but, at three samples, after the removal of the epiphysis, the spongy tissue was perforated to the channel. The proximal part has biconcave (2) and indeterminate (3) margins, and rectangular (4) and indeterminate section (1). The mesial part doesn't present modifications of the anatomic morphology, so the sections are rectangular (4) and circular (1) and the margins convex-concave (5). The distal part has convex-concave section, convex-concave (3) and indeterminate (2) margins. The extremity is convex (2), rectilineal (2) and fractured (1). The extremities present, from the profile, a birectilineal morphology (1), convex-rectilineal (2) or biconvex (2).

Morphometry:

No.	Length	Medium width	Medium thickness
1	90	18	20
2	72	16	16
3	67	11	11
4	65	12	19
5	56	18	13

Technique: each of the pieces lacks in epiphysis. It seems to have been removed by percussion, without a further regularization of the margins. The perforation (fig. 2e) executed in the spongy tissue, seems to be a percussion type in one case and a rotation type in two cases. At mesial level no intervention took place on the bone. On distal level, was applied a percussion blow, in order to create the active front of the piece. No sample presented an integral regularization of the fracture margins, so the percussion marks are very visible (fig. 2d). The adjusting aimed only the superior area of the distal part and was executed by abrasion (fig. 3a), whose specific scratches are still present where the usage marks did not cover them.

Microscopically, the marks vary in accordance with the pieces usage fashion. At one of the pieces (fig. 3/b), are visible scratches parallel to the axis, long (probable because of the use), heteronymous by deep transversal scratches (repeated sharpening actions). Another sample (fig. 3/c), presents, on the superior and the inferior face, an extended beach with polishing aspect, which is visible including macroscopically. On the microscope, the marks are multiple: on the area with blunt aspect (*lisse*), at a magnification of 100x, appear scratches parallel to the axis, while towards the extremity, they are superposed by scratches perpendicular to the extremity. The action angle, regarding the inferior face, was very opened, thus the working material covering an extended surface from the superior face, creating the already mentioned beach. Finally, another example (fig.3/d) presents an active part strongly *emoussé*, rounded, reminding by its fitting of a point, but whose width determined us to frame the piece in the chisels category. On the superior surface we can see scratches parallel to the axis. Again on the superior face, at the extremity level, we can see chipping, but the piece continued to be used.

We preferred to discuss separately about the *chisel confectioned of ulna* of ovine (fig. 3/e), given the special morphology of this type of bone, which also needs a different processing technique.

Morphology: the proximal part has a removed extremity, with no fitting of the fracture margins. At mesial level, there was no intervention on the bone morphology. At distal level, the margins are convex-concave, with convex extremity, bifacial, biconvex from the profile.

Morphometry: length – 64 mm, medium width – 15 mm, medium thickness – 15 mm.

Technique: the epiphysis was removed, by percussion, without a regularization of the fracture margins. In the case of the chisel on ulna, two breakage seem to have been applied, which created two oblique sides, whose intersection, by means of regularization, led to a very sharp, convex active extremity. The fitting of the active part leads to a symmetry on the inferior and the superior faces, also due to the anatomic morphology. On both sides, the extremity has a brillant aspect, strongly *émoussé*
(fig. 3/f).

II. Points: the category of bone points is represented only by three samples, which differ after the bone type – the chosen base, but also after the execution technique. We are talking about a metapod of *Bos taurus*, femur of *Bos taurus/Cervus elaphus* and a rib of a big size animal.

II.1. The first exemplar (fig. 4/a) is a point made of bone longitudinally debited, entirely fasonated.

Morphology : we are treating with a distal fragment, to which adds two longitudinal fractures. The profile is straight, the section oval, convergent convex margins, on medial level and convergent rectilineal at distal level; the distal extremity is sharp.

Morphometry: the medium diameter is 10.2 mm (the only identifiable measure).

Technique. The longitudinal percussion was made by double groove (fig. 4/b), a fact that allowed a good control over the knapping direction. The fitting of the point was made by a longitudinal scraping (fig. 4/c), developed only on distal level, after which the entire surface of the piece was submitted to a very smooth grinding. On distal level, even on macroscopic one, are obvious scratches transversal to the axis, very fine, disposed on the entire circumference.

On proximal level, the piece presents two longitudinal fractures *en languette*, developed after two opposed plans, which could be the result of a gloving system. R. D. Guthrie (1983) and J. T. Pokines (1998), after experimental studies, demonstrated the extreme solidity of the bone points and the fact that most of the exemplars broke on the handle level.

The point is strongly *emoussé*, rounded (fig. 4/d). On distal level, we can see a series of scratches perpendicular to the axis, visible also macroscopically (probably by fasonage), but at a magnification of 200x, we identified numerous scratches parallel to the axis, which could be considered usage marks.

II.2. The second exemplar (fig. 4/e) presents a straight profile, convex-concave section, irregular margins, irregular proximal extremity and sharp distal extremity.

Morphometry: length – 99.15 mm, medium width – 32.3 mm, medium thickness – 20 mm.

Technique: the bone was fractured both longitudinally and transversally, at the epiphysis level, through direct percussion, with no further regularization of the fracture margins. Only on the extremity level, from both sides, was executed a regularization, by abrasion (fig. 4/f), whose short scratches, oblique face to the axis, are still visible. This meant to create the sharp morphology of the extremity.

II.3. The third exemplar (fig. 4/g) is a distal fragment, to which also adds a longitudinal fracture. The profile is curved, the proximal part fractured, irregular margins, convex-concave section. The distal part presents convex and convergent margins and sharp extremity.

Morphometry: unidentifiable, due to multiple fractures.

Technique: the fitting of the bone was made only on distal level but, unfortunately, a longitudinal fracture do not allow us to reconstruct exactly the piece morphology. It seems that two oblique fractures were applied, after which the fracture margins and the inferior face were regularized by abrasion (oblique scratches, fine, visible macroscopically), in order to create a sharp front. The point is blunt, with abrasion brands still visible (fig. 4/h).

III. Phalanx of *Bos taurus* (fig. 5/a)

Morphology: the piece conserve the anatomic morphology of the bone, only on the anatomic protuberances level we observe a flattening, resulted from an abrasion action.

Morphometry: length – 60.78 mm, medium width – 23.2 mm, medium thickness – 22.7 mm.

Technique: the protuberance areas, on the plantar face, developed a flat aspect, axis. We did not identified the cutting scratches, therefore the modified morphology is determined exclusively by the abrasion.

IV. Knapping rests. We identified two pieces of this category, extremely important because of the marks they conserve and which offers us information about the operations succession, during the operative chain. We are referring to a knapping rest with obvious brands of a double groove (fig. 5/c) and a rib fragment longitudinally debited, probably by percussion, whose inferior face was intensely abrade (fig. 5/d).

V. Undetermined. In this category we included a fragment of a piece, whose active part is fractured, thus we don't know if it is a chisel or a point. In exchange, the epiphysis was removed and in the spongy tissue applied a perforation, probably by boring.

Antler

Concerning the antler pieces, from 11 samples, nine are from *Cervus elaphus* antler, one of *Capreolus capreolus* and one of *Capra hircus.*

Starting from the inventory composition, even if it is composed of a reduced number of pieces, we identified four types of products resulted from the processing of antler:

- I. four finite pieces, alas only one entire sample,
- II. *ebauches* (intermediary pieces between base and finite object, meaning pieces in the process of fabrication) – a single exemplar,
- III. supports (un-retouched or unshaped products, derived from knapping, which could have been later transformed into finite objects) – five samples,
- IV. Knapping sub-products (finished rests, which resulted from the extraction of some bases and that cannot be reused anymore) – one sample.

I. Finished pieces

I.1. The first piece (fig. 5/e) is a thick nodule of *bois de chute*, with a 77 mm diameter, conserving the rosette. The branches were removed by direct percussion, around the entire circumference (fig. 5/f). In the nodule was made a perforation, disposed oblique face to the piece axis, with a rectangular morphology, made by cuts progressively deepened (fig. 5/g). Alas, the piece fractured at the perforation level and we don't know exactly the morphology and its functionality.

I.2. The second piece (fig. 6/a) is the only tool conserved in an almost intact state. The piece extremities are rectilineal, the section circular, the margins convex-concave. At medial level, they present a perforation with a rectangular morphology.

Morphometry: length – 196 mm, medium diameter – 33 mm, perforation diameter – 19 mm.

Technique: the entire surface of the antler was submitted to a very rigorous grinding (fig. 6/b), which removed the *perlure*, but also the great part of the knapping marks of the two extremities. Still, on microscope, we can still see the traces of the percussion scratches (fig. 6/c), superposed by grinding. At mesial level a perforation was made by progressively deepened cuts, thus the rectangular morphology (fig. 6/d).

We could not identify the function of this piece. At distal level, it was not used in a percussion action, because the surface has an increased polished aspect, with no specific marks for this operation. On proximal level, *spongiosa* is strongly affected and, for this extremity, can be invoked a hard, percussion action.

I.3. The third piece (fig. 6/e) was detached at one of the extremities from the branch by means of direct percussion, executed around the entire circumference. At this level begun a decortications action (removal of the *perlure*) by means of percussion, which was not extended at the level of the entire surface. At the opposite extremity, the piece presents a fracture in *dents de scie* (fig. 6/f) , which usually poses the problem of a usage fracture. We can see that the fracture took place at a perforation level, executed from both faces, seemingly by chipping, on a small surface still conserving the brands of this action.

I.4. The last piece is, unfortunately, fractured, both longitudinally and transversally, so we do not have many information. At one of the extremities, the antler was detached from the branch by means of percussion. At mesial level seems to have been made a perforation, through successive cutting, which conferred a rectangular morphology.

II. Ebauches (fig. 7/a) – are very important in a technological study because, based on them, we reconstitute the operational chain. We attributed only one piece to this category. It presents the marks of a percussion detachment from the branch, made on 2/3 of the circumference, followed by flexion. On mesial level begun a perforation action, from two faces, following a technique of successive chipping, the action not being finalized. On distal level, it was applied an action of chip removal, by means of percussion, transversally being applied the same technique (fig. 7/b). Alas, on distal leven, the piece is fractured, but the oblique sense of the detachment allows us to assume the beginning of a fitting of chisel type.

III. Supports – in this category we integrated five pieces: an point and two body fragments from an antler of *Cervus elaphus*, one point of an antler of *Capra hircus* and one branch of *Capreolus capreolus*.

The point of antler (fig. 7/f) is approximately 255 mm long and was detached by direct percussion, executed along the biggest part of the circumference, after which, for a small portion, applied flexion. On the antler surface appear, on mesial level, other two brands of direct percussion. The first branch fragment (fig. 7/d), with a length of 294 mm and a diameter of 46 mm, presents on two extremities detachments by percussion along the entire circumference, while a third extremity presents a lamellar detachment in longitudinal sense, realized by percussion and afterwards flexed. The second branch fragment is approximately 380 mm long and has a medium diameter of 45 mm. On proximal level it is fractured, probably post-depositional. On distal level, it presents two points breaks by flexing, in *dents de scie*.

The point from antler of *Capra hircus* (fig. 7/e) was detached by direct percussion on half a circumference, continued by flexion, for the removal from the skull.

The roebuck branch is fallen and not detached by percussion. We could not identify modifications of the antler morphology, but it represents a good support for the pieces confectioning.

IV. Knapping sub-products (fig. 7/c) – we are referring to only one specimen, resulted from the antler longitudinal knapping, by percussion.

Conclusions

The acquisition of raw material

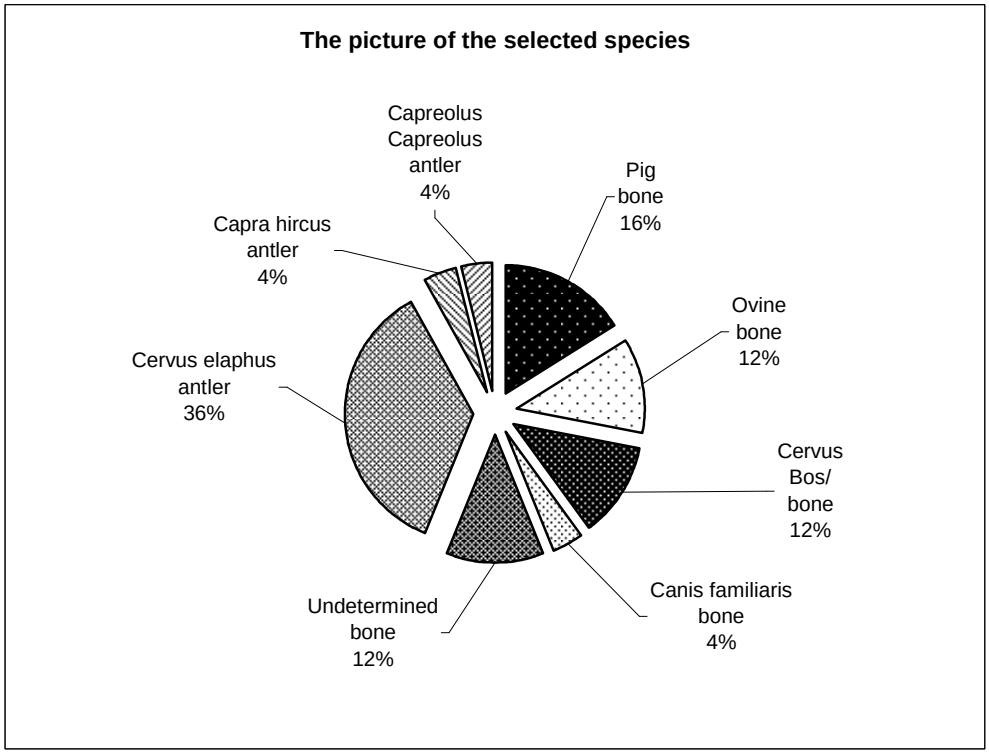
Two seem to be the sources for the acquisition of raw material: sub-products from the

consumed animals (bones, antler of *Capra hircus*) and collecting (*bois de chute*). In accordance with the season or the circumstances, like the use as food source (the extraction of the marrow) or as fuel, the transformation of the bone in different tools can be limited or replaced with silex pieces. In the same time, regarding the antler, its availability varies in accordance with the annual evolution cycle, therefore varies after the season. Furthermore, the anatomic morphology of the bone and antler limits the pieces form and dimensions. Despite these constraints, the two raw materials were used frequently, because the experimental studies proved that the pieces made from organic materials are more resistant than the lithic ones and, furthermore, are easier to fix. The observation is also valid in the Seciu settlement, because the lithic tools are less numerous, all of then fragmentary (A. Frînculeasa, O. Negrea, 2010).

Among the selected species, whose bones were used as support, we can enumerate the pig (four pieces), ovine (3), *Bos/Cervus* (3), domestic dog (1); and for the antler prevails, by far, *Cervus elaphus* (9). The weight is equivalent with that of the ostheologic rests from the settlement, a fact that demonstrates an economical production, with the use of the supports at hand.

Table 2 – The picture of the selected species

	Bone					Antler		
Species	Pig	Ovine	*Bos/ Cervus*	*Canis familiaris*	Undeter-mined	*Cervus elaphus*	*Capra hircus*	*Capreolus capreolus*
No. artifacts	4	3	3	1	3	9	1	1



The exploitation is local, with a knapping *in situ*, as it demonstrates the presence of the finished knapping rests (both of bone and antler), but also of the supports, matrices for the future pieces. We can assume a production surplus, meaning the depositing of some supports, which were to be transformed only when needed. In the case of the antler, it seems that the fallen antler (*bois de chute*) rests were used with preponderance.

The processing technique

For the bone, in the knapping stage, are attested two techniques:

- double *groove*, whose marks are visible both on a knapping rest and on a point;
- percussion, in the case of the active front fitting on chisels and for the removal of the epiphysis
- transversal knapping, but also for the longitudinal fracturing of the bone – longitudinal knapping.

The adjusting techniques are represented by scraping (for the points fitting), grinding (for the adjusting of the active part of some points) and abrasion (in order to finish the active part of the chisels and of the points).

Finally, the perforations were made by dotted perforation or boring, aiming the fitting out of a gloving system, in the case of the chisels.

For the antler processing, the longitudinal knapping, like the transversal one, involved the direct percussion, followed, in most cases, by flexion. For the adjusting stage, we identified two techniques: decortications by percussion and a rigorous grinding, which led to a total removal of the *perlure*. The perforations have a rectangular morphology, being made with a sawing technique, meaning successive cuts, progressively deepened, from two faces, until the end of the operation.

Despite the fact that the ensemble is quantitatively reduced, we can emphasize a varied range of domestic activities, proving a complex utilization of the sources offered mostly by the domestic animals, but also of collection (*bois de chute*). The types of identified tools, like the chisels or the points, correspond to processing actions of leather, wood or fiber, being used for perforation, knitting, peeling, degreasing, splitting wedge etc.

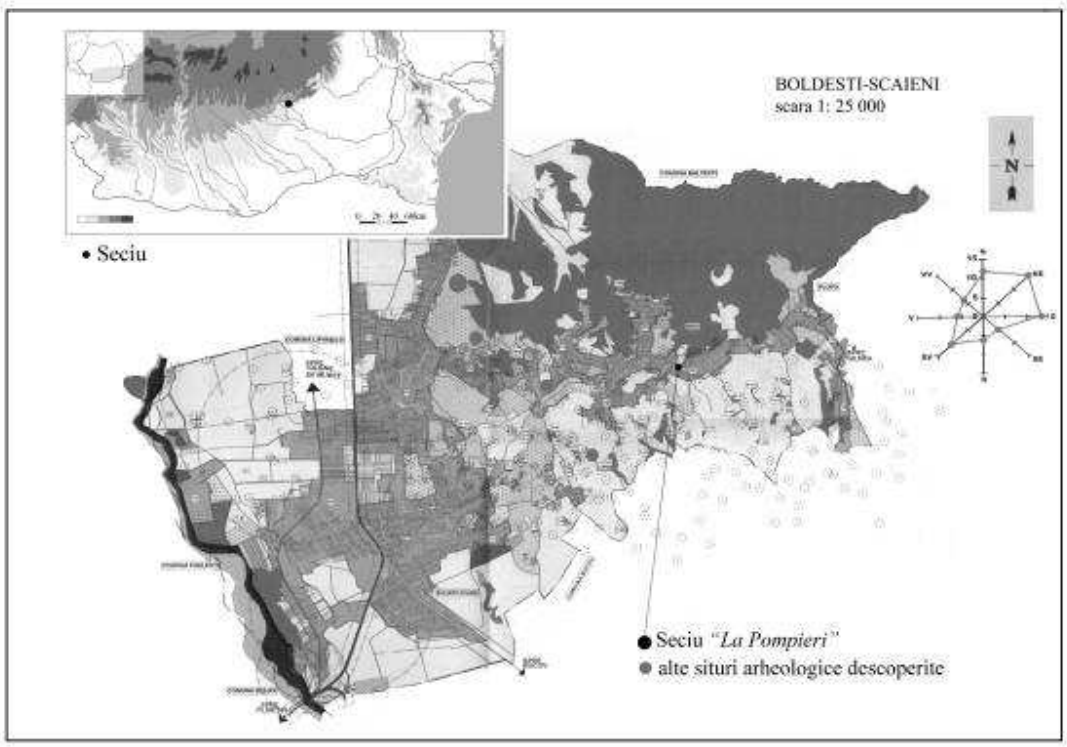


Figure 1 – Map of location of the settlement Seciu – Prahova district

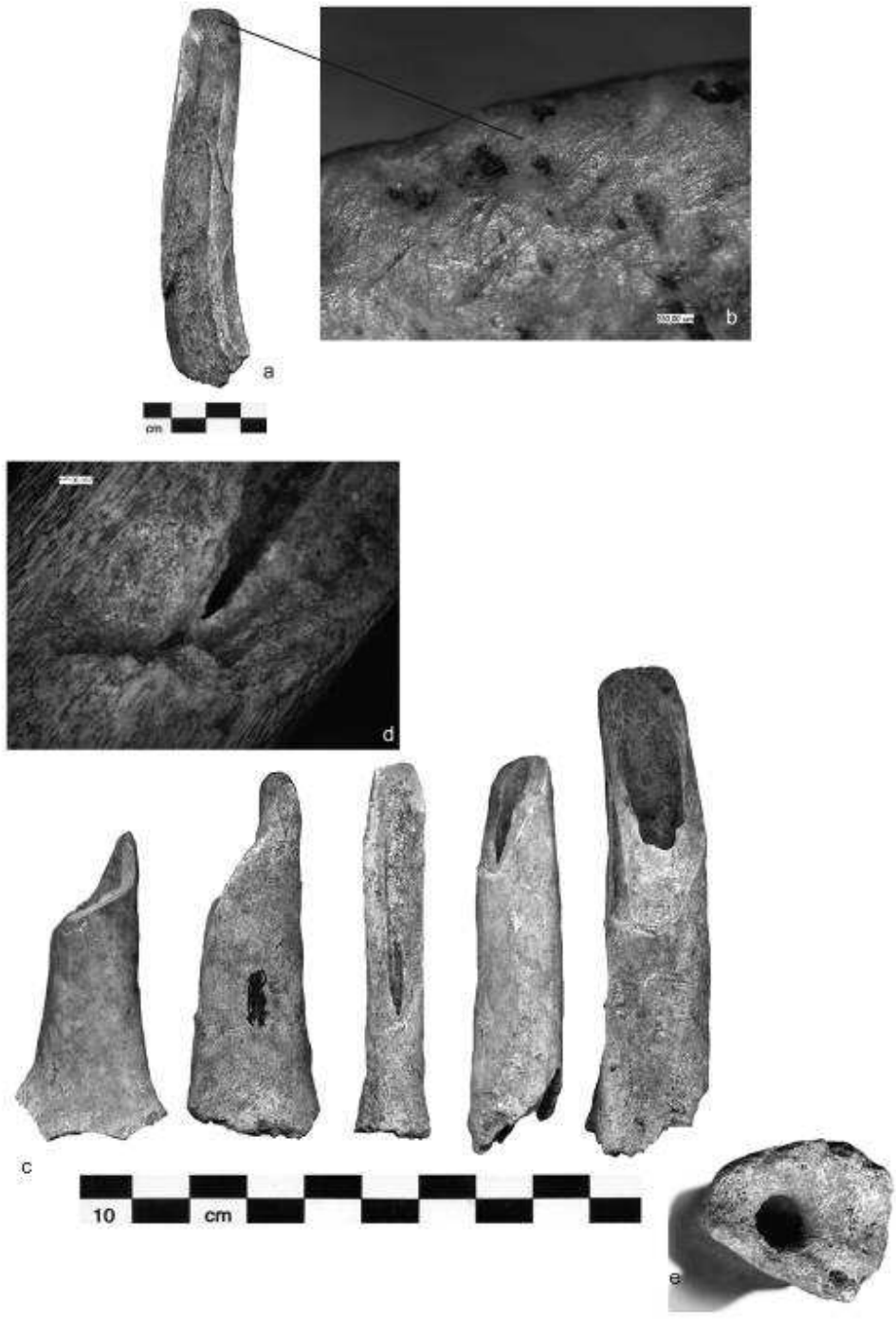


Figure 2 – Types of chisels:
2a – chisel on bone longitudinally fractured, 2b - marks on the distal extremity (enlargement 150x), 2c – chisel on bone longitudinally un-fractured, 2d – percussion mark (30x), 2e – proximal extremity perforation (2x)

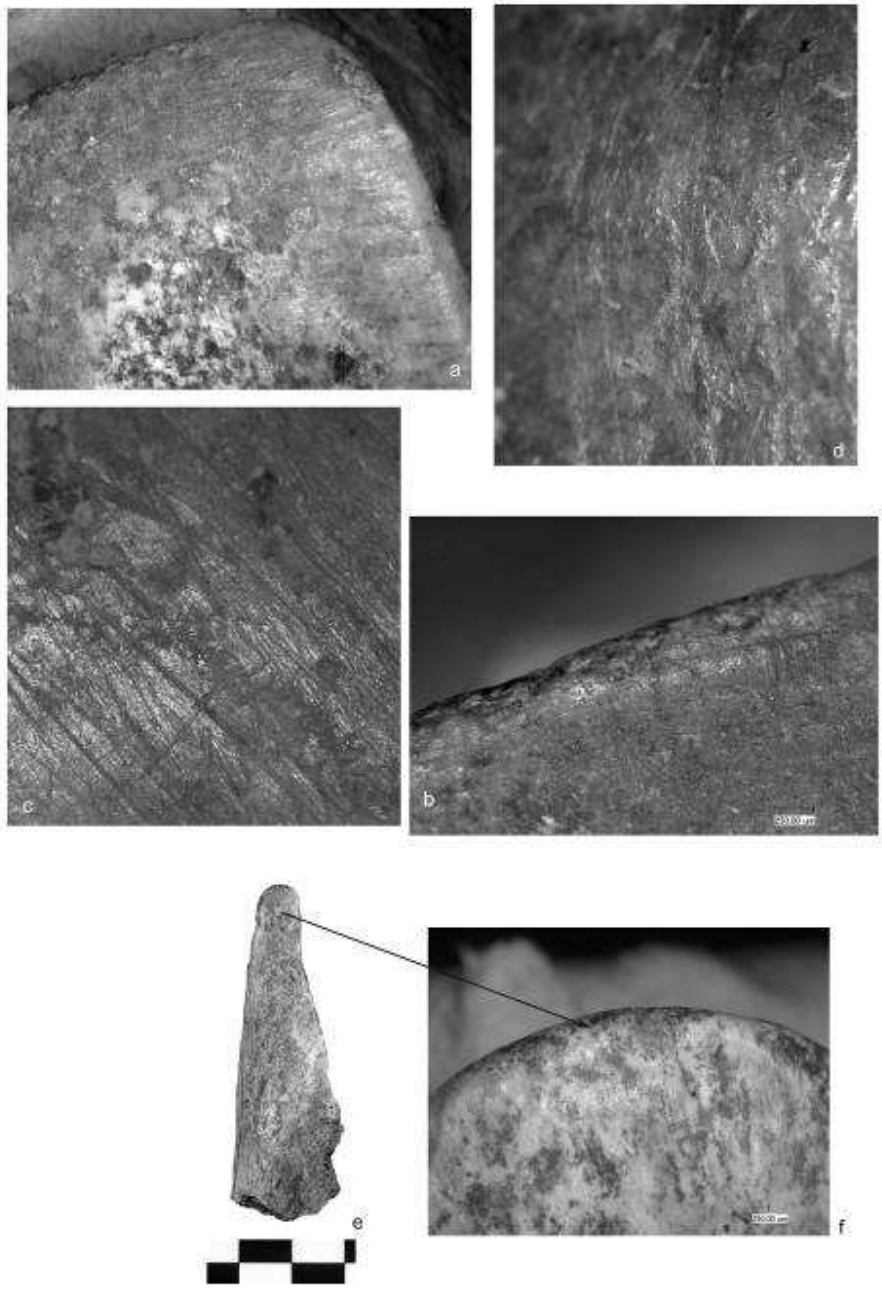


Figure 3 – Marks present on the chisels:
3a – abrasion percussion margins (30x), 3 b, c, d, f – marks of the distal extremity (100x, 100x, 150x, 50x), 3e – chisel confectioned on ulna

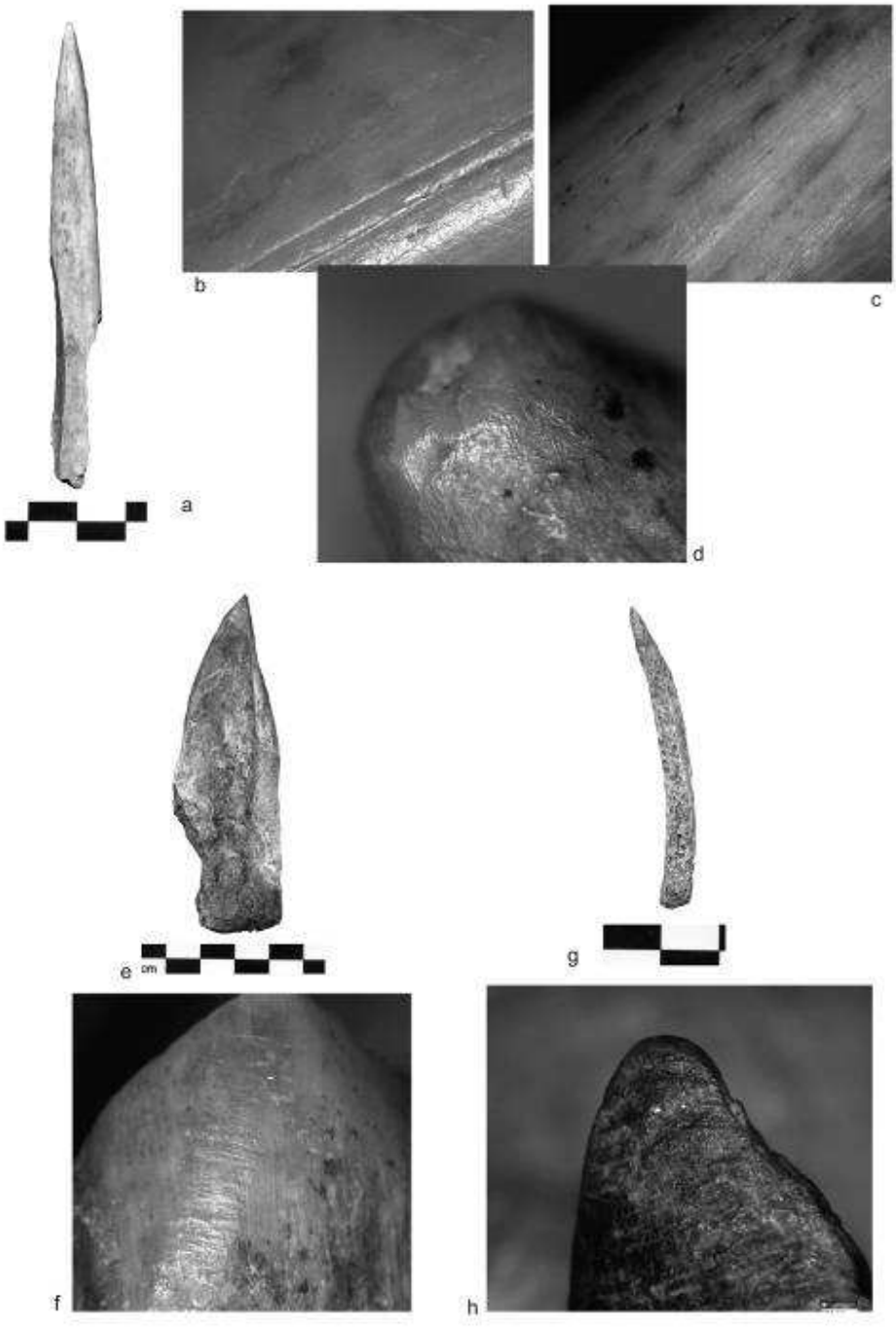


Figure 4 – Points:
4a – point on bone, entirely grinding, 4b – marks of groove (50x), 4c – marks of scraping, for the fitting of the point (50x), 4d – point *emoussé* (200x), 4e – point on bone longitudinally fractured, 4f – marks of abrasion of the distal extremity (50x), 4g – point on bone longitudinally fractured, 4h – point *emoussé*, with abrasion marks (100x)

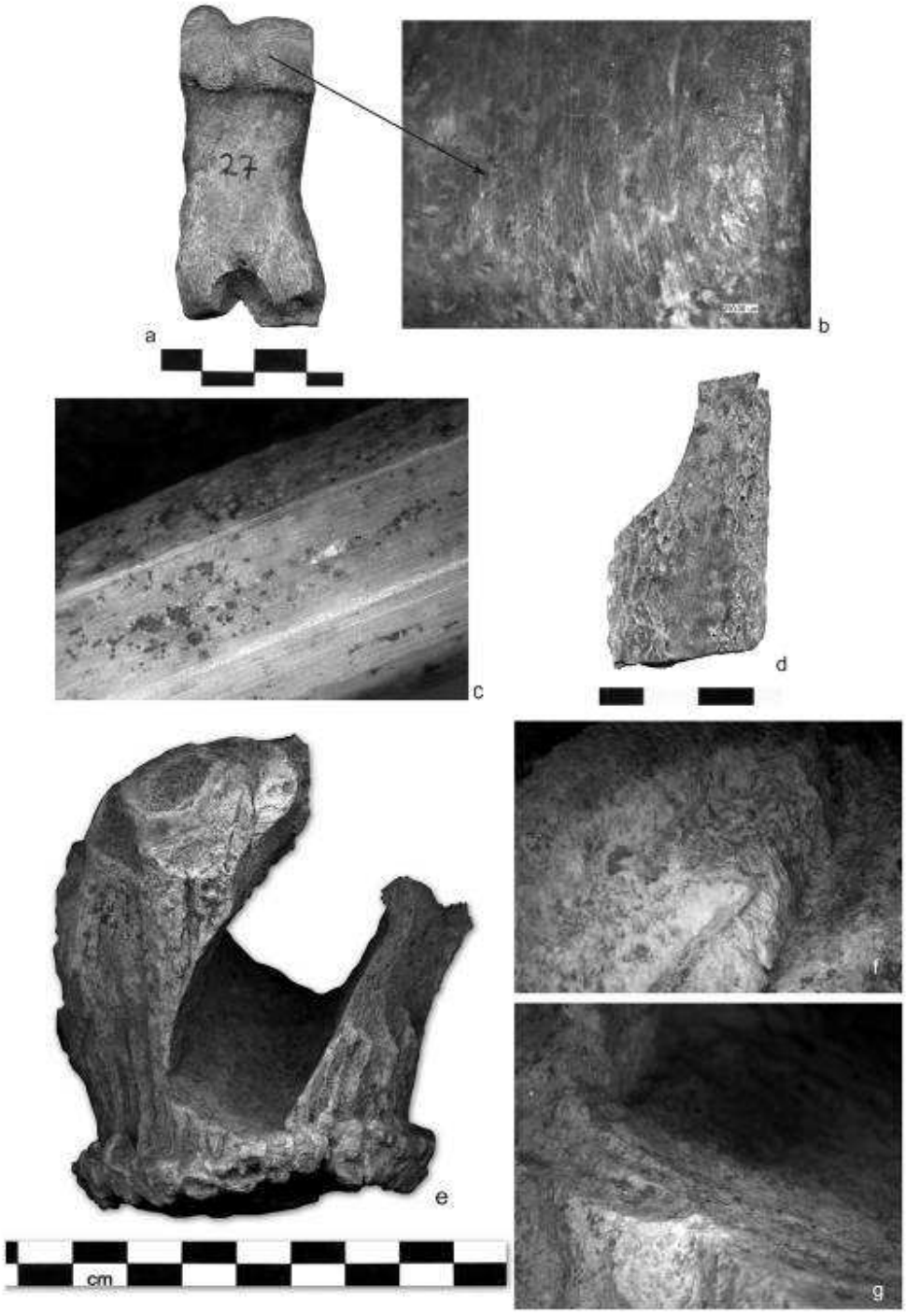


Figure 5 – Objects made of bone and antler
5a - phalanx, 5b – abrasion marks (50x), 5c – groove marks (30x), 5d – knapping rest, 5e – processed antler, 5f – marks of direct percussion (20x), 5g – perforation technique (20x)

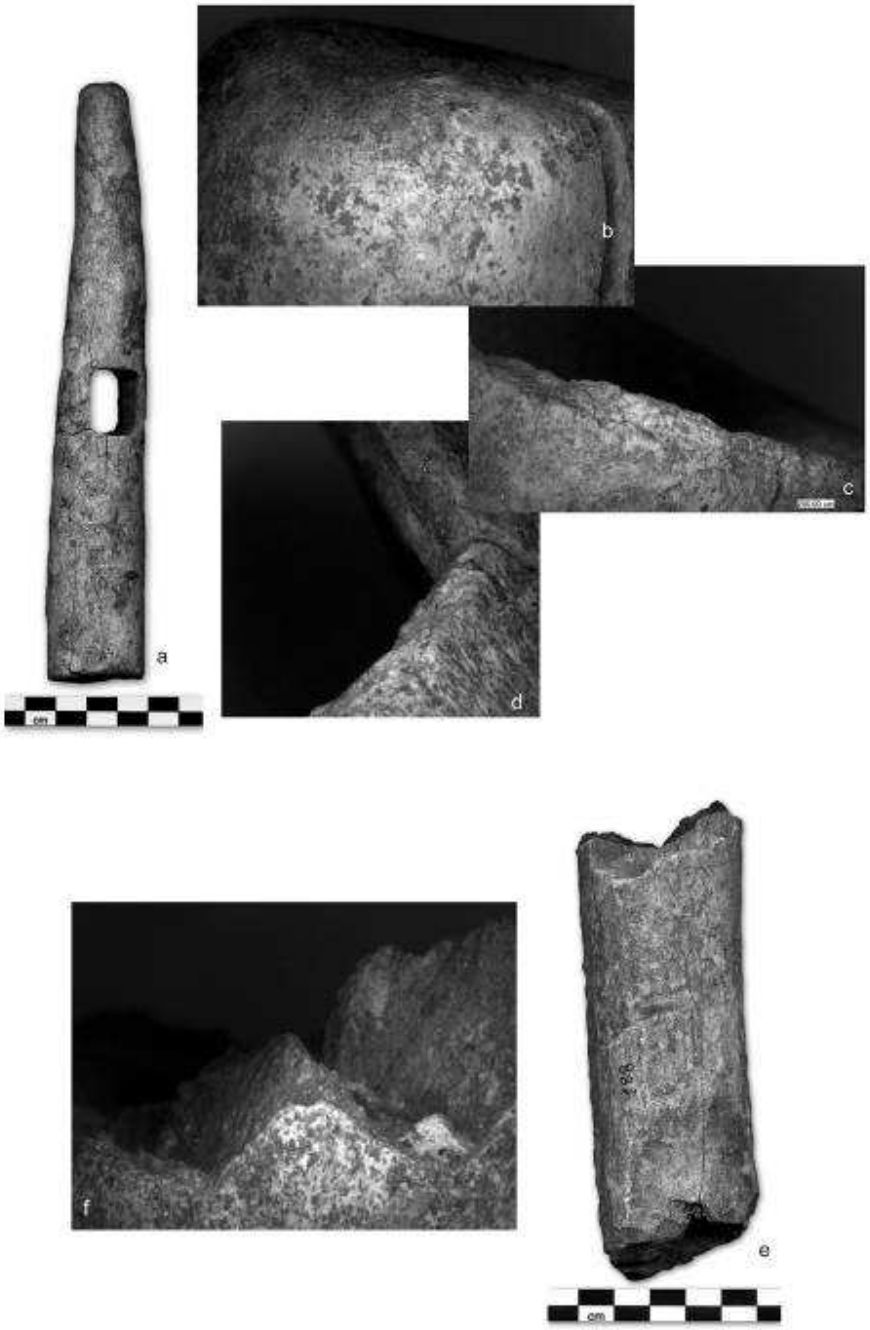


Figure 6 – Tools made of antler
6a – Unfragmented antler tool, 6b – grinding of the extremities (20x), 6c – marks of direct percussion (20x), 6d – perforation technique (20x), 6e – fractured piece from antler, 6f – breaking in *dents de scie* (20x)

Figure 7 – Pieces made of antler
7a – piece during processing, 7b – marks of the perforation action (20x), 7c – knapping sub-product, 7 d, e, f - supports

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