DISSERTATIONES ARCHAEOLOGICAE

ex Instituto Archaeologico Universitatis de Rolando Eötvös nominatae

„Hadak útján”

A népvándorláskor fiatal kutatóinak XXVI. konferenciája

GAZDASÁG – KERESKEDELEM – KÉZMŰVESSÉG

26th Conference of Young Scholars on the Migration Period

ECONOMY – TRADE – CRAFTSMANSHIP

Supplementum 2. | 2018

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A *„Hadak útján" – A népvándorláskor fiatal kutatóinak konferenciáját* először 1990-ben, Szentesen rendezték meg nagy érdeklődés közepette. A rendezvény hiánypótlónak számított, korábban ugyanis nem volt lehetősége a pályakezdő népvándorlás koros régészeknek, hogy saját korosztályuk körében megosszák egymással tudományos eredményeiket. Már az első találkozó interdiszciplináris együttműködésre törekedett: régészek mellett történészek, művészettörténészek és nyelvészek is előadást tartottak; az előadások alapján készült tanulmányok külön kötetben jelentek meg. A konferencia elnöki tisztjét az első alkalom óta dr. Tomka Péter, a Kárpát-medencei népvándorlás kor kiemelkedő kutatója tölti be.

A szentesi konferencia egy sikeres sorozat első állomása lett: 2015-ben, Révkomáromban a kezdeményezés már negyedszázados születésnapját ünnepelhette. A „Hadak útján" 26. találkozójának megszervezését – a sorozat történetében először – az ELTE BTK Régészettudományi Intézete vállalta magára. Témájául a népvándorlás kori gazdaság, kereskedelem és kézművesség kérdésköreit választottuk. 2016. november 3–4-én összesen 47 előadótól mintegy 32 előadást hallhattunk, amelyeket témakörök szerint több szekcióba – kapcsolatrendszerek, kereskedelem, gazdálkodás és háztartások, anyag és technológia, valamint kézművesség – soroltunk. Ezek közül most 13 előadás jelenik meg írásos formában is, részben magyarul, részben azonban – a megjelenésnek teret biztosító folyóirat, a *Dissertationes Archaeologicae* irányelvei alapján – angol és német nyelven. Reméljük, hogy az idegen nyelvű kiadás segítségével a konferencián bemutatott sokrétű és gyakran új módszertani megközelítésre támaszkodó eredmények a nemzetközi kutatás számára is hozzáférhetővé válnak.

Budapest, 2018. október 1.

A konferencia eddigi helyszínei

1990 Szentes
1991 Nyíregyháza
1992 Sátoraljaújhely
1993 Visegrád
1994 Szenna
1995 Velem
1996 Pécs
1997 Veszprém
1998 Eger
1999 Szeged – Domaszék
2000 Székesfehérvár
2001 Simontornya
2002 Gyula
2003 Keszthely
2004 Várgesztes
2005 Nagykovácsi
2006 Nagyvárad
2007 Kecskemét
2008 Győr
2010 Budapest – Szigethalom
2011 Szeged
2012 Visegrád
2013 Veszprém
2014 Esztergom
2015 Révkomárom
2016 Budapest
2017 Debrecen
2018 Mosonmagyaróvár

Bone and Antler Working in the Avar Cemetery of Bodajk

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Abstract
Six objects (belt attachments, comb, sabretache closer, needle case, bow brackets) dated to the end of the 6th century to the middle of the 7th century made of hard animal materials have been discovered in the cemetery of Bodajk (County Fejér, Hungary) from the Avar period. The objects were observed with optical light microscopes; the raw material of the belt attachments, bow brackets and comb were verified as red deer antler, while the needle case and sabretache closer as animal bone. The acquisition of the animal bones is easy, while the gathering of the shed antler or hunting deer stag requires more organisation. The average quality of manufacturing shown by the objects buried together with the deceased is rather good, made by experienced craftsmen with throughout knowledge of the raw material's properties. The manufacturing process is complex, different techniques used. The decorated antler comb could have been traded to the site.

During preparation of my Master thesis in 2014, a question raised about the strap ends and fittings, more precisely of what hard animal material they are made of? With the help of Zsuzsanna Tóth we were able to find an answer to this matter as well as the manufacturing processes. After searching for parallels for my thesis, we examined the strap-end from Alattyán and the belt fittings from Börcs and studied the grave goods made of hard animal materials at the cemetery of Bodajk. Our aim was to find out the relationship between bone and antler materials and their manufacturing.

Bodajk-Homoki dűlő is situated in county Fejér, at the subregion of Mór. The Avar graves came to light in 2010 after a public announcement in the museum. The cemetery is located northeast to present-day Bodajk. In August and September 2010 and November 2011, 129 graves were registered. In the summer of 2016 further 37 graves were found *(Fig. 1)*.[1]

The cemetery's edge was not found at either side of the excavation area. Besides the Avar graves, ditches and a rectangular building with piles were found in the territory. The number

1 The objects went through optical microscopic study at the Archaeometry Laboratory at the ELTE-FH IA. A ZEISS SteREO Discovery V.8 zoom-stereomicroscope (zoom range 6.3–80x) was used for the study. Photo documentation was made by a Zeiss AxioCam MRc 5 microscope camera. The micrographs were manipulated by AxioVision 4.9.1. software. We obtained the microscopes with the help of the project „KMOP-4.2.1/B-10-2011-0002: *Interdisciplinary and innovative research directions and development of background for industrial co-operation and introduction of teaching new educational technologies at Eötvös Loránd University (ELTE).*

of destroyed graves caused by an underground spring in the central part of the cemetery cannot be estimated, though. The bone and antler objects studied by us were situated relatively close to each other, four of them in the northern part of the cemetery.

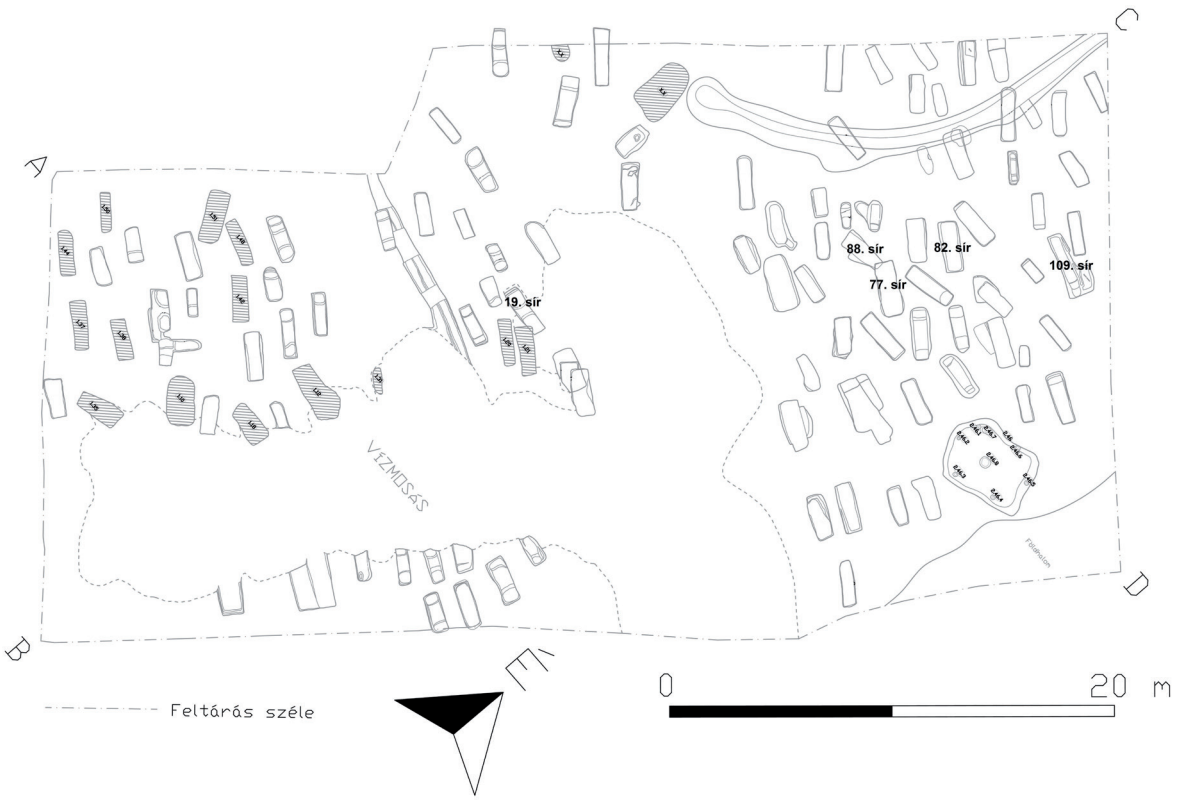

Fig. 1. Map of the cemetery in 2011

The antler belt attachments

Belt fittings made of red deer antler (*Cervus elaphus* L. 1758) were found near the deceased in the graves N77 and 88. The corner of the two graves were connected. Probably Grave 88 disturbed Grave 77 where the disturbance reached the deceased's skull. Four strap ends and two shield-shaped fittings were found in Grave 77. The belt was strengthened with an iron buckle. The elements of the belt were situated at the right side of the grave, in a heap. Two large strap-ends were near the pelvis of the deceased in the Grave 88.

Four strap-ends *(Fig. 2)* of the same size and two shield-shaped fittings *(Fig. 4)* were found in Grave 77, all made of red deer antler. The deceased in the disturbed grave is an adult.[2] A Csákberény-group pottery (*Gruppe ID/c*),[3] an animal bone, different sized iron rings and an iron tube came to light together with the belt accessories. The strap-ends are narrow, rectangular in shape with rounded bottom. At the opposite side (at the 'head') there are two holes *(Fig. 3)*.[4] The length of the objects is approximately 5 cm. Its width lies between 1.7 and 1.9 cm. Two

2 Many thanks to Piroska Rácz (King St. Stephen Museum, Székesfehérvár) for determining and diagnosing the bones.

3 Vida 1999, 75, Abb. 17.

4 In the work of A. MacGregor, the rivet holes of the strap-ends made of bone and antler are the holes for the iron nails. These object are dated to the 9th century (MacGregor 1985, 105).

Fig. 2. Four strap ends in the Grave 77

Fig. 3. Hollowing at the backside for fixing

lined ring-and-dot motifs were carved on all of them. The difference is only in the number of motifs, on one exemplar there are five ring-and-dot motifs, on the rest only 3–3.[5] The diameter of the ring-and-dot motifs varies between 5.88 and 7.45 mm. The different sizes may be caused by applying the motifs by free-hand. Rivet holes can be found in all of them, their diameters are between 5.51 and 5.98 mm. The holes' wall is flat and vertical. Similarly to the

5 The surface of the piece with Inv. Nr. 2011.02.23.11. is heavily eroded, the number of ring-and-dot motifs can be hardly seen.

ring-and-dot motifs they were made with fine metal tools. At the back plate of the strap-ends a rectangular shaped recess can be found *(Fig. 3)*. In two of these dents, small black dots were found, which we described as ash crums. The front boards of two strap-ends were russet coloured which may have been caused by great heat. On the backside, the evidence of the heat was not visible.

Traces of use are hardly seen due to fragmented surfaces and restoration. The rivet holes at the strap-end (Inv. Nr. 2011.02.23.05.) are deformed, maybe because of use or failed drilling.

Inventory number	2011.2.23.5.	2011.2.23.9.	2011.2.23.10.	2011.2.23.11.
Length	5.1 cm	5 cm	4.8 cm (the bottom is damaged)	4.2 cm (damaged)
Width	1.9 cm	1.7–1.9 cm	1.8–1.85 cm	1.8 cm
Thickness	–	–	–	–
Ring-and-dot motifs	in two lines, 5 pieces	in two lines, 3 pieces	in two lines, 3 pieces	in two lines, 3 pieces (faded motifs)
Diameter of ring-and-dot motifs	5.88–6.3 mm	6–7.12 mm	5.63–7.45 mm	undefinable
Rivet holes	5.54–5.98 mm	5.7 mm	5.51 mm	undefinable
Sinkinged backplate	yes	yes	yes	yes
Traces of use	deformed rivet holes	–	undefinable	undefinable
Fastening	rivet holes and sinkinged backplate sewing or usage of non metal rivets	rivet holes and sinkinged backplate sewing or usage of non metal rivets	rivet holes and sinkinged backplate sewing or usage of non metal rivets	rivet holes and sinkinged backplate sewing or usage of non metal rivets
Surface	few black dots in the sinkinged area	few black dots in the sinkinged area	russet surface, caused by great heat	russet surface, caused by great heat

Tab. 1. The details of the strap-ends in Grave 77

The six pieces of strap-ends decorated with ring-and-dot motifs were made by two different sized drills with three bits. One of the drill's tip was barb, while the other tool was sharp. The row of the patterns were probably planned, but not delineated since the ring-and-dot motifs are hanging out of the row. During the process of drawing the motifs neither the strap-end nor the drill has been fixed since the diameters of the motifs are different. Ash crums can be found in the deeper areas of the surface and deposited probably after the entombment as post depositional changes. Hypothetically the ash grains could have remained from polishing the surface, but after long term use, they would surely have disappeared so we dismissed this explanation.

There are two possible ways of fixing the antler strap-ends to leather stripes. Five strap-ends had double boreholes *(Fig. 3)*. In the wall of the hole we could not find remains of metal. If they were really meant as fixations, non-metallic rivets may have been used, probably attach-

ing the leather and antler fitting with sewing. Rectangular, 1.6–2 cm wide depressions were visible at the backside of all six strap-ends with the depth of 1–1.5 mm. Extra layers could have been fitted in the sinked areas for a better fastening to the leather. At the sinked areas we did not find traces of sticking.

Fig. 4. Shield-form fittings in the Grave 77

Only two shield-form fittings *(Fig. 4)* came to light from Grave 77. Both have heavily eroded surfaces with horizontal cracks. During restoration, the surface was thickly covered with a highly reflective substance, cotton fibres embedded in it. For this reason, only macroscopic use-wear could been observed. Width of the objects varies between 1.75 and 2.3 cm, their lengths are 2.5 and 2.85 cm. Their shape resembles of a shield with lightly bulging top, horn-shaped corners at the sides, concave sides and convex end. The piece with Inv. Nr. 2011.2.23.12. was fragmented; however the shield-like shape was identifiable. Their raw material was red deer antler as well. None of the pieces were decorated. Two bored holes were situated at each side near the convex bottom at 16.2 mm distance. The size of the holes is 4.49–5.78 mm and 5.04-5.96 mm. The holes to the right, made with sharp metal tool without fixing neither the tool nor the object, were slightly larger on both specimens.

Inventory number	2011.2.23.12.	2011.2.23.13.
Length	2.85 cm	2.5 cm
Width	2.2–1.75–2.1 cm	1.8–2.3 cm
Depth	–	–
Holes	4.49–5.78 mm	5.04–5.96 mm
Use-wear	probably asymmetrical rivet hole	–
Fixation	Iron rivet, 1 cm	Iron rivet, 1 cm
Surface	from place to place black spots	from place to place black spots

Tab. 2. Details of the shield-shaped fittings of Grave 77

Recessions which had been observed in case of the strap-ends could be not observed this time. These objects were fixed more simply with a 1 cm long rivet.

Fig. 5. Strap-ends in the Grave 88

At Grave 88 a 25–35 year-old man lay undisturbed. His grave goods were a Csákberény-group pottery (Gruppe ID/f),[6] two iron knives, one of them was in a case with bronze fittings, a bow (solidated with antler brackets), iron rings and animal bones. In the filling earth of the grave we also found an iron hoe. The two red deer (*Cervus elaphus* L. 1758) antler strap-ends *(Fig. 5)* were at the right side of the right pelvis. The iron belt was between the legs. Regarding the raw material for the strap-ends, the characteristic features of the red deer antler – more porous structure than bone, more numerous osteons and nutrition holes – was easily identifiable. The spongy tissue was clearly visible at the backside of the strap-end with bored hole. The objects could have been manufactured out of antler tines based on the light bending and thinness.[7] Final steps of the manufacture, such as abrasion of the surfaces and polish due to use could not have been identified because of the covering the object's surfaces with shiny varnish. The lengths of the strap ends are 7 and 5.25 cm long. Their width are 2 and 1.7 cm. Their thickness is 0.5 cm. The strap ends are oblong shaped, with rounded edges at one side. On the largest strap end's front-board three rows of ring-and-dot motif can be seen, above the rows there is an iron nail *(Fig. 6.a)*. The common diameter of the ring-and-dot motif *(Fig. 6.b)* is between 4.7 and 4.94 mm.[8] A 1–1.5 mm deep, rectangular shaped dent is around the iron nail on the backside of the strap end. On the shorter strap end (length 5.25 cm) two rows of ring-and-dot motifs can be found at the head and two boreholes at the end of the rows. The average diameter of the ring-and-dot motifs is 3.2 mm. The boreholes are not part of the motif rows, their distance is less than the dot-and-ring motifs. The average diameter of holes is 2.6 mm. A similar deep, rectangular shaped dent is on this backside of the strap end.

Two different tools were used for engraving the motifs into the antler according to the diameter of the motifs. In both cases three pointed drills were used. At the larger strap ends, the width of the drill's mid-point was 1.3 mm. The engraving of the motifs was probably made by free hand, without fastening the drill or the antler. The rows were probably planned, but not delineated. Some ring-and-dots don't fit sharp in the row and the distance

6 Vida 1999, Abb. 17.

7 Since the compact tissue compared to the spongy tissue is thinner at the tines as at the beam. Like this, the bending of the spongy tissue observed at the backside of the strap-ends gives a good base to the identification

8 The smallest diameter of the motif was 4.4 mm, the shape was mismade.

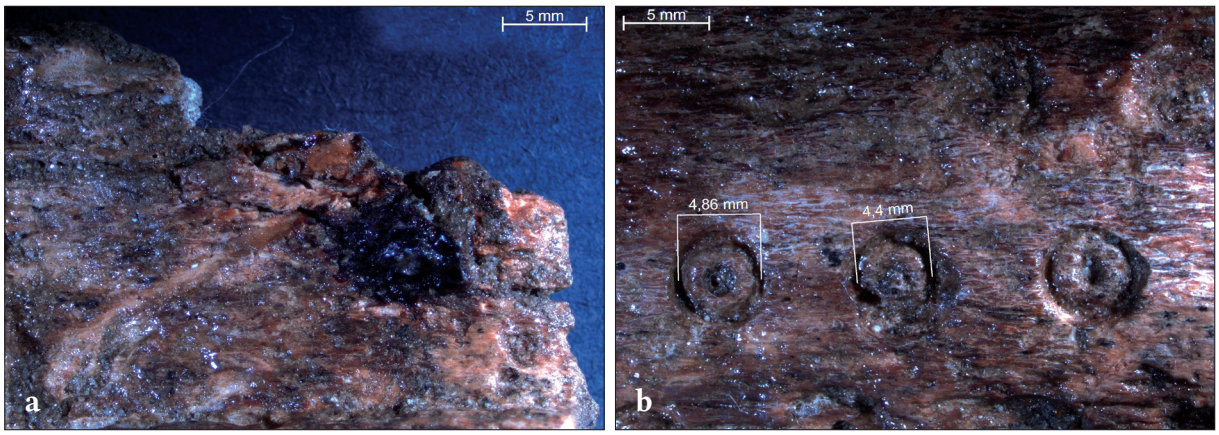

Fig. 6. a – Fixing iron nail, b – Ring and dot motifs

between them is also different. The boreholes on the small strap-end were made by sharp tool attested by the high wall of the holes.

Traces of use could be identified on the strap-ends of Grave 88, the surfaces of the objects were so markedly worn. Despite their bad conditions, the asymmetrical fray could be seen. The raggedness of the motifs at strap-ends with boreholes can also be caused by intense erosion.

Several grey and black dots were registered at the backplate of the strap-end with boreholes. We identified this as post depositional ash remains, since no traces of burning was visible at either side of the objects.

Inventory number	With iron nail (Inv. Nr.: 2011.2.34.3.)	With holes (Inv. Nr.: 2011.2.34.11.)
Length	7 cm	5.25 cm
Width	2 cm	1.7 cm
Depth	0,5 cm	0.5 cm
Ring-and-dot motifs	in 3 rows, 7–8 pieces	in 2 rows, 6 pieces
Diameter of ring-and-dot motifs	between 4.4 and 4.94 mm (inner drill: 1.31 mm)	3.21 mm
Holes	–	2.6 mm
Sinkinged backplate	yes, rectangular shaped area, depth: 1–1.5 mm	yes, rectangular shaped area, depth: 1–1.5 mm
Use-wear	the third ring-and-dot motif on the right row	pale decoration motifs, which can refer to rough usage or erosion
Fixation	with iron nail and sinkinged backplate	with iron nail and sinkinged backplate, maybe sewed to the leather or fastened with organic nails
Surface	–	greyish-black dots, maybe ashes

Tab. 3. Details of strap-ends from Grave 88

Belt fittings from Bodajk have two analogies from the Carpathian Basin: in Alattyán-Tulát Grave 37 was a single strap-end and Börcs-Nagydomb Grave 1 where a complete belt with fittings came to light. The strap-end was found at the right side of the hip-bone of the adult man.[9]

9 Kovrig 1963, 12.

At Börcs the belt was undisturbed at the waist.[10] From both graves the belt parts were made of red deer antler (*Cervus elaphus* L. 1758).[11] The piece from Alattyán is similar to the strap-end types from Bodajk. This is rectangular shaped with rounded edges as well. Its decoration is punched dots in rows separated with incised line. Fastening to the belt was carried-out with iron nail and a borehole. The iron nail is framed with incised lines. Belt parts from Börcs have a wide range in forms: rectangular shaped strap-end with rounded end, double-circle fittings and shield shaped small strap-ends with hanging mount *(„Hängebeschläge")*. The adult man of Grave 37 in Alattyán had a silver, small spherical pendant and a pressed silver, small spherical pendant.[12] In the grave of Börcs there were iron arrowheads, an iron knife, a rectangular iron buckle, a pouch fastener *(„Taschenbügel")*, a spindled bone barrel, and a double disc shaped belt mount made from silver just like the one made of antler.[13]

Ilona Kovrig dated the grave from Alattyán to the middle of the 7th century.[14] Péter Tomka had similar conclusions of the grave at Börcs, dating the belt parts from the end of 6th century to the beginning of 7th century.[15] Both graves from Bodajk had one-one Csákberény-group typed ceramic which could be easily dated. Besides these bronze buckles, iron rings, iron buckles, a hack and bone brackets were the grave belongings. The end of the usage of Csákberény-group typed vessels was in the late 620's and 630's. This confirms Péter Tomka's estimation that the antler belt-ornaments can be dated back to the end of 6th century and the beginning of the 7th century, end of the first third of 7th century. In Grave 88 P/D shaped hanger cut from plate to the iron case was found, which has two analogies in Hungary (Kunpeszér-Felsőpeszéri út, Homokbánya Grave 8 and Makó-Mikócsa halom Grave 240) and one from Serbia (horsemen's grave in Pančevo).[16]

Comb

Grave 19 is situated at the centre part of the excavation area on the edge of the gulch. The antler comb with case *(Fig. 7)* was on the right side of the 25–35 year-old man's thighbone with dot-and-ring motifs upwards. The choice, preparation as well as the processing of the material requires an experienced master in bone and antler working.

10 We had the opportunity to examine the strap-end from Alattyán-Tulát and the belt-set from Börcs-Nagydomb with optical microscope at the Archaeometry Laboratory (ELTE-IAS). Many thanks to Dr. Gergely Szenthe (Hungarian National Museum, Budapest – archaeologist, art curator), to Andrea Nagy (Rómer Flóris Museum, Győr – archaeologist, head of department) and Péter Tomka (archaeologist) to allow us to examine these objects. We also want to thank Gabriella Nádorfi and Frigyes Szücsi (King St. Stephen Museum, Székesfehérvár – archaeologists) for allowing us to examine the bone tools from the cemetery of Bodajk.

11 Ilona Kovrig determined the material of strap-end correctly: antler. Kovrig 1963, 135.

12 Kovrig 1963, 12.

13 Tomka 2005, 137–143.

14 Kovrig 1963, 135. The base of the dating this grave was the pressed trefoil mount, dating to the first half of the 7th century, using as horse harness mounts (Garam 2005, 170). This type of mount came to light from graves with byzantine coins (Békéscsaba-Reptér), like Tiberius II. Constantine (579–582) (Garam 1992, 139; Somogyi 1997). The second base of the dating comes from the earring with small spherical pendant, which can be dated to the middle of the 7th century (Kovrig 1963, 136).

15 Tomka 2005, 167, 175. Examining the dating of the men's graves, the first of them is the Grave 1 in Börcs, burying him in the 6th century. Tomka 2005, 175.

16 Balogh 2016, 281, 70, Fig. 8. The horsemen's grave from Pančevo is dated in the beginning of the 7th century. Ivanišević – Bugarski 2008, 55. The P/D shaped sword attachments can be dated to the second third of the 7th century. Simon 1991, 285–312, Catalogue.

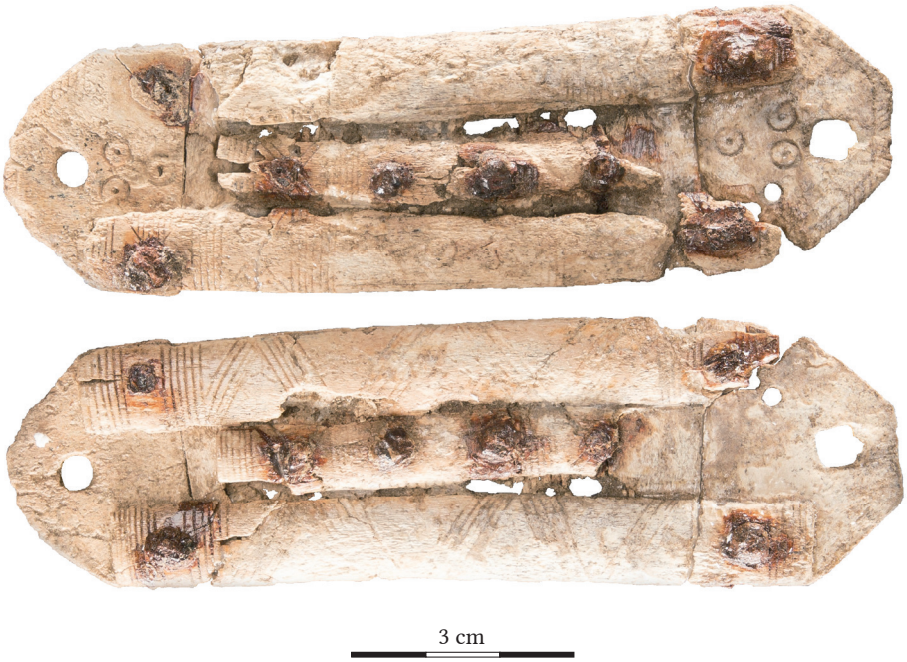

Fig. 7. Comb with case from Grave 19

The double sided composite antler comb is 11.9 cm long and 3.4 cm wide with the case included. The tooth plates were fastened with front and back supporting plates riveted with iron nails. The case is consisted of two side-plates and two spacer-plates. The comb can be locked in the case with the help of an iron nail on one side of the case at the side-plate.[17]

The comb and the case are decorated with different motifs. The rivets are framed and decorated with vertical, collateral multiple incised lines on the front plate *(Fig. 8.a)*. The backside of the rivets is decorated with a pair of incised lines forming an 'X' shape. The spacer-plates are decorated with six vertical incised lines and five 'V' shaped incised lines. The iron rivets are also framed with multiple vertical incised lines. The number of the vertical, collateral incised lines are different.[18] The other side of the comb is decorated, too. On the backside of the comb, the back plate is decorated the same way as the front plate, although the decoration of spacer-plates are different. The iron rivets are framed with multiple (9 lines) vertical incised lines, and the same 'X' shaped[19] doubled incised lines can be found on the backside of the rivets. The 'X' motif is not filled with other incised lines. Three dot-and-ring motifs are applied between the rivets on the spacer plates, connected on the bottom to the top with an angular single incised line *(„laufender Hund", Fig. 8.b)*. The diameter of the dot-and-ring motifs varies between 7.98 and 8.08 mm. The case's side plates are decorated with three dot-and-ring motifs arranged in a triangular form, while the edges of the side plates are decorated with perpendicular incised lines to the edge, closed on their bottom with a side-to-side incised line.

17 The nomenclature of the comb's parts see: Bárány – Hajnal 2010, Fig. 2.

18 There are 7 lines on the right side of the nail, while at the left side minimal 4 (this section is damaged) in the right top corner of the spacer-plate. Bottom right corner: on the right side of the nail 6, at the left minimum 5 (this part is damaged, too) lines. Left bottom corner: at the right side 6, at the left side 8 lines. In the left upper corner: 6–6 lines at both sides.

19 Zsófia Masek calls this motif the hourglass at Rákóczifalva Grave 8A/679/826. The filling motifs of the comb from Bodajk differs: there are vertical incised lines not with dense lattice pattern in the upper and bottom triangle sections. Dating: Hun-period (Masek 2016, 107, Cat. 20.)

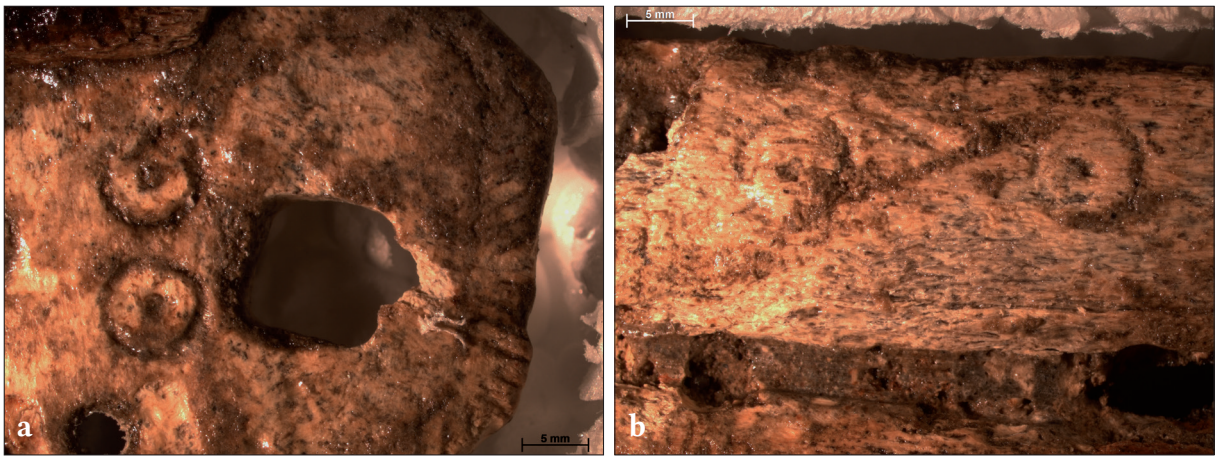

Fig. 8. a – incisions decorating the edge, b - *„Laufender Hund“* motif on the comb

The incised 'V' shaped lines were probably made by a ruler-like tool, since the lines are collateral but their interspace is different, made by free hand *(Fig. 9.a)*. The boreholes of the side plates of case were made by an iron drill, the bigger ones are dingy. Normally the teeth of the tooth plates are cut out with a saw,[20] but due to the poor preservation, we were not able to see saw marks on the comb from Bodajk, and the width of teeth was not measurable as well.[21] The diameter of dot-and-ring motifs arranged in triangular shapes on the side plates were uniformed (7 mm), made with the same tool certainly *(Fig. 9.b)*. Although the diameter of dot-and-ring motifs was different from the ones on the side plate on the spacer-plates, their diameters were 8 mm. The marginal differences do not prove that they were made with multiple drills. The drill certainly was not fixed while the motifs were drawn.[22] The hole on the case has a diameter of around 4 mm, thus we suppose that different drills were used for the motifs and for the holes.

Eight more combs with cases were found in the Carpathian Basin *(Fig. 10)*: Budapest III. Pusztadombi út 11, Grave 12 (H),[23] Hajós-Cifrahegy Grave 168 (H),[24] Komárom-Munkás-

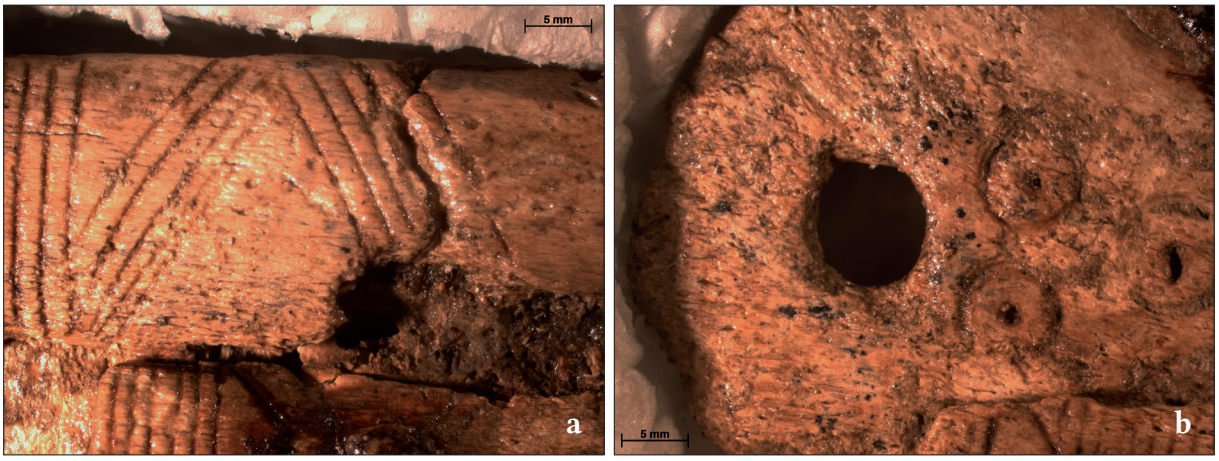

Fig. 9. a – Differently spaced parallel lines, b – Ring-and-dot motifs arranged in triangle

20 MacGregor 1985, 55.
21 We were able to measure the tooth width only in one case, which was 1.74 mm.
22 One of the dot-and-ring motif is acuminated on the right-side plate, while some circles were drawn several times on the left side plate.
23 Nagy 1998a, 29–30, Abb. 11. Nagy 1998b, Taf. 34, Taf. 142.
24 Balogh 2013, 283, Fig. 543, Tab. 24.

negyed Grave 7 (SK),[25] Pécs-Köztemető Grave 33 (H),[26] Pilismarót-Öregek-dűlő Grave 7 (H),[27] Szeged-Fehértó A Grave 248 (H),[28] Tiszafüred-Majoros Grave 171 (H)[29] and Vác-Kavicsbánya Grave 386 (H).[30] They are all double-sided combs in cases. The cases are rounded, the side-plates are punched (boreholes) on one or both sides. The cases have 10–13 cm average length. The only exception is the comb on Pusztadombi út in Budapest with an exactly measurable length of 8.8 cm.[31] Out of eight graves, only in two (Tiszafüred and Pécs-Köztemető) were the cases placed near the deceased. Four deceased were women, three men, and in one case the gender was not identifiable, although the deceased was an adult. In the last case neither the age nor the gender was identifiable.[32] Combs with cases placed in women graves came to light between the chest and head.[33]

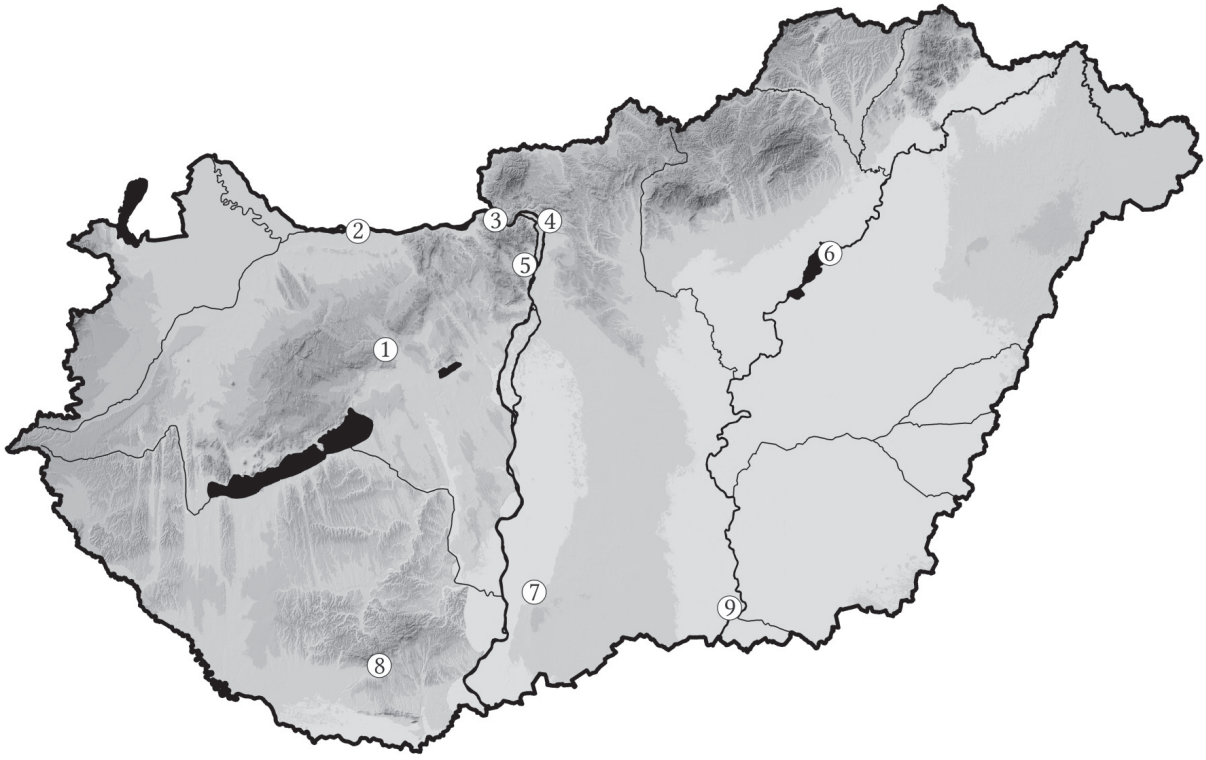

Fig. 10. Map of the range of combs with cases. 1 – Bodajk-Homoki-dűlő, 2 – Komárom, 3 – Pilismarót, 4 – Vác-Kavicsbánya, 5 – Budapest-Pusztadombi út, 6 – Tiszafüred, 7 – Hajós, 8 – Pécs-Köztemető, 9 – Szeged-Fehértó A

25 Trugly 1982, 8–9, Tab. II.
26 Kiss 1977, 96, Pl. XXXVI.
27 Szabó 1975, 255, Fig. 3.
28 Madaras 1995, 40, Pl. 27.
29 Garam 1995, 26, Abb. 10, Taf. 72.
30 Tettamanti 2000, 87–88, Taf. 20.
31 Nagy 1998a, Taf. 142.
32 Women: Vác-Kavicsbánya Grave 386 (Tettamanti 2000, 87), Pilismarót-Öregek-dűlő Grave 7 (Szabó 1975, 255), Szeged-Fehértó A Grave 248 (Madaras 1995, 40) and Hajós (Balogh 2013, 252). Men: Tiszafüred-Majoros Grave 171 (Garam 1995, 26), Budapesti-Pusztadombi út 11, Grave 12 (Nagy 1998, 29) and Bodajk-Homoki-dűlő (Pásztor 2015, 99). Unidentified adult: Pécs-Köztemető Grave 33 (Kiss 1977, 96). Unidentified individual: Komárom-Munkásnegyed Grave 7 (Trugly 1982, 8–9).
33 The comb was found at the left scapula in the grave in Hajós (Balogh 2013, 252), in the Pilismarót grave near the chest, in the Szeged grave the comb was at the left clavicle. In the Vác-Kavicsbánya grave the placement of the comb can't be identified because of the disturbance (Pásztor 2015, Table 2).

Five of them are located relatively close to each other, in the north-eastern part of Transdanubia. Combs from Pécs, Szeged and Hajós are in the southern part of the country, and the one from Tiszafüred is situated in the valley of the River Tisza.

The nine graves with their belongings can be dated from the first third of 7th century to the end of the 7th century, but their presence at the end of 6th century – beginning of 7th century cannot be excluded either.[34]

Sabretache closer

A sabretache closer *(Fig. 11)* (Length: 5.35 cm; Width: 2.15 cm; Thickness: 1.2 cm) made of animal bone was uncovered under the left arm of the man (40–50 years old) buried in Grave 82.

Fig. 11. Sabretache closer from Grave 82

The sabretache closer was made of an easy accessible raw material, a scapula of a large ungulate (horse or cattle), decorated on the caudal surface. Fixation was maintained by several transversal holes through the bottom of the *spina scapulae*. The method of the scapula sectioning is no longer visible but the smoothness of the sides suggests that the shape was given by sawing, following the surface was then smoothed by abrasion.

34 The Tiszafüred piece could be one of the earliest ones, the wide leaf-like spear from the grave can be dated to the 6th–7th century or the first third of the 7th century (Csiky 2009, 84). Early types are the ones from Bodajk, Budapest and Vác with plate strap-ends and pressed, triangular shaped fittings, dated to the first third of 7th century by Éva Garam (Garam 2001, 46). Adrien Pásztor dates the yellow and black beads from the second quarter of the 7th century to the middle third of 7th century (Pásztor 1996, 49). Polyhedron shaped and corded beads were placed in the grave of Szeged dated between 570–660 (Pásztor 2008, 233). Z. Čilinska dates them between the 7th–8th century on the other hand. (Čilinska 1975, 87). László Madaras dates the grave in Szeged to the Early Avar Period, the rectangular mouth shaped ceramic date to the end of the 6th century (Vida 1999, 129). Gergely Szenthe dated the Grave 386 in Vác to the first period of the cemetery (first half of 7th century) (Szenthe 2014, 115, Fig. 13). The millet beads from Pécs can be dated to the last third of 7th century. From the grave in Pilismarót early typed cylindrical shaped ear pendant came to light which dates the grave (Pásztor 1986, 129). The grave from Komárom (Komárno) can't be dated.

Fig. 12. a – Modified decorative pattern, the original sketch line was not removed, b – The intention of incise hexagonal pattern not always successful.

Decoration was applied by incision and the deeper motifs were carved. The pattern is well placed, symmetric and well-composed, it was very likely pre-drawn. There is a spot where the decorative pattern was changed but the sketch line was not removed *(Fig. 12.a)*. The sketch lines and the final motifs were carried out by free hand, especially by round lines angularness (angular lineage) is well detectable *(Fig. 11)*. The decoration of the sabretache closer tries to follow the double band rope motif *(„Strickornament I")*, but on one side it changes to parallel double band formation *(„Zweizeiliges Flechtbandmuster")*.[35]

Scale lines were first divided into quadrangles then the corners were carved deeply out to obtain the desired hexangle form, which was not always successful *(Fig. 12.b)*. Such decoration is likely the imitation of the bead string motif.

Black particles, embedded most often in the deep carved and incised lines of the surface were studied with low magnification. These are most likely ash particles deposited after burial.

The objects show distinctive use-wear, heavy rounding is visible at the entire surface. The decoration is heavily worn at the corners and attachment holes of the decorated side, the depth of the carved and incised lines increased significantly. Since the object was thickly covered with proofing, the shine cannot be used to identify the mode of use.

The grave can be dated based on the presence of the belt attachments. The silver inlayed strap end and the pressed trefoiled and shield-shaped mounts give a date between the end of the 6th century and the second third of the 7th century.[36]

35 Nagy 1998a, Abb. 41.

36 The best analogy for the pressed trefoiled and shield-shaped mounts came from Vác-Kavicsbánya Grave 271 (Tettamanti 2000, 62) and Solymár Grave 25 (Török 1994, 11, Taf. XI). Gergely Szenthe dates the grave from Vác to the middle third of the 7th century, third quarter of the 7th century (Szenthe 2014, 115), Gyula Török dates the grave in Solymár to the second third of the 7th century (Török 1994, 44). The dating of the damasqued strap-end from Bodajk, analogies can help us: Zsuzsanna Hajnal dates the object from Kölked to the second quarter of the 7th century (Hajnal 2012, 627), Max Martin dates them from the second quarter of the 7th century to the third quarter of the 7th century, while Lívia Bende dates the belt-ornaments from Pitvaros to the turn of the 7th–8th century (Bende 2000, 206). After Bendegúz Tobias the sabretache closer is from group 7c4 which can be dated to the Early and Middle Avar Period (Tobias 2011, 283). For pictures and grave goods see Pásztor 2015.

Fig. 13. Bone needle case from Grave 109

Fig. 14. Root etching on the surface. Barb left behind by shallow sawing and braking down the epiphysis

Bone needle case

A woman (from Grave 109) of 45–60 years had a needle case made of animal bone *(Fig. 13)* as grave good laid by her right pelvis. On her other side, a 5–8 year old child was buried reversely. The needle case (Length: 4.1 cm; Diameter: 1.3–1.55 cm) has a round diameter, the surface is arranged into three zones divided by threefold channelling. The surface preservation is poor, densely covered by root etching *(Fig. 14)*. Larger part at one side of the object is restored, the rest covered thickly up with varnish.

A small ruminant (sheep/goat) shin bone (tibia) was used for the needle case, which is an easily available raw material, neither the species nor the skeletal element is special.[37]

After the cleaning of the bone from the periosteum the first step of the manufacturing process was the removal of the epiphyseal ends by sawing around and then breaking them down. As memento of this there is a small barb left over at one side of the diaphysis, since the bone did not break at the desired fore-sawn line *(Fig. 14)*. This barb was not removed during the latter phases of the manufacturing since they did not hold it for necessary. The surface was decorated with sawing, threefold lines are situated near the ends and at the middle, with larger empty places in-between them. The depth of the decorations is slightly changing. The overall design is not very aesthetic, not much effort was put into it.[38] This is underlined by the slightly oblique threefold lines in the middle part and the non-matching incisions. The borders of the wide empty bands towards the incised lines are scraped a bit deeper emphasising these bands by giving them more plasticity.

Really exact dating of the grave is not possible since beneath the bone needle case only a twisted silver earring was found at the left ear of the deceased.

Antler bow brackets

Several antler bow brackets with parallel sides *(Fig. 15)*, typical for the early Avar age were found near the pelvis and legs of a 25–35 year old male in Grave 88 together with antler belt attachments (see before).

37 Same materials can be found in the cemetery of Csákberény-Orondpuszta within the turned needle cases (László 2015, 216) or at Felgyő-Kettőshalmi-dűlő cemetery's needle cases (Kőrösi 2010, 113).

38 In the Avar cemetery of Budakalász Alice Choyke (1995, 229–230) observed as well, that not much attention was paid to the aesthetic appearance of these needle holders. She observed as well, that this tool type was found with both sexes, and such can be held part of the personal accessories.

Fig. 15. Antler bow brakets from Grave 88

The raw material of the bow brackets is red deer antler. The remains of the spongy tissue is still visible at the inner side. The objects are thin and narrow. Based on the relative strong bending and thin compact tissue they could have been made of longer tines, most probable middle tine, but beam as raw material cannot be excluded as well. In the latter case larger portion of the compact tissue must have been removed to reach final thickness.

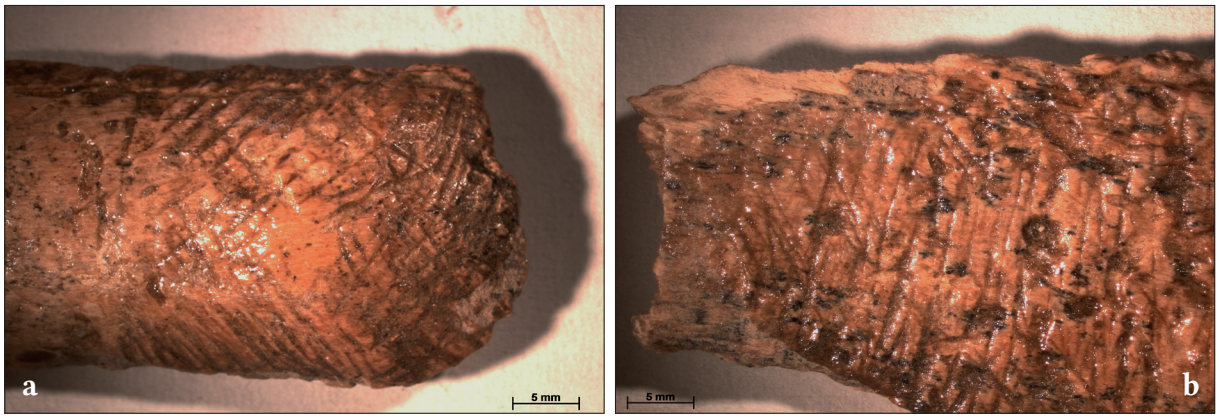

Fig.16. a–b – Irregular incisions roughing the surface for better fixing

The manufacturing process can be reconstructed as following: the tine was sawn lengthwise in half. Then pearling was removed from the outer side. Based on the even thickness and straight parallel sides, the surfaces could have been finally smoothed with abrasion. Evening of the surface could have taken place during the preform production or afterwards. After that, the ends and sides were notched and the object fixed on the bow body.

Incisions of the ends and notching the sides are more likely due to functional rather than aesthetical purposes.[39] Density and thickness of the incised lines are varying, there are

39 See Choyke 1995, 229.

several abandoned then newly started lines following the natural curvature of the raw material. The incised lines fill the surface quite erratically *(Fig. 16.a–b)*. Design of the incised lines of facilitation for fixation at the bow's body at the sides is similar to the ones at the ends.

There is an incised design resembling a "chicken leg" on one piece *(Fig. 17)*. It is inevitably incised but the explanation as decoration, even as ideograph seems to be exaggerative, although the explanation as producer's initial is plausible.

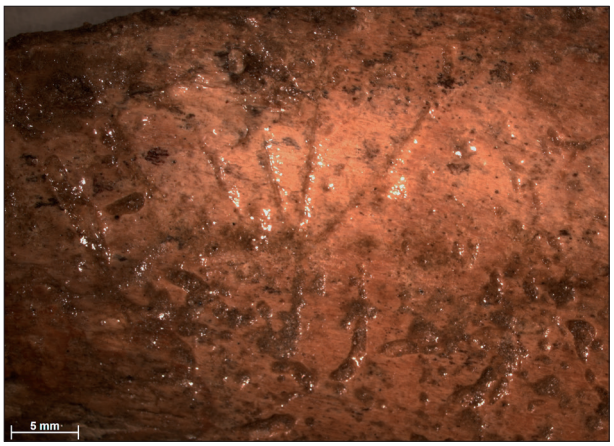

Fig. 17. "Chicken leg" motif incised on one of the bow brackets.

Conclusion

In wider timescales, four out of the five graves can be dated from the end of 6th century to the middle of 7th century. Remarkable finds are the Csákberény-group type vessels, the plate belt-ornaments and also the pressed belt fittings. The Csákberény-group type vessels were used from the end of the 6th century until the first third of 7th century. Still these types of vessels require further investigations. The comb with case could be found in the first half of the 7th century. The pressed belt mounts have analogies after the first third of the 7th century.

Based on the observation of the grave goods made of hard animal materials at the site, the manufacturing quality is good. Small and large ungulate bones and red deer antler were used as raw material. Most of the objects found as grave goods were made of red deer antler and only a few made of animal bones. While the acquisition of animal bones was rather easy e.g. from kitchen refuse or aimed selection of domestic animal bones at the settlement, red deer antler was more complicated to obtain. Gathering shed antler needs organisation. Since it is a seasonal act, the knowledge of shedding time, resting place or moving habits of the animals are essential. In case of hunted antler, the killing of the animal is the difficulty itself. Based on the observation of the objects themselves, the distinction of them being made out of shed or hunted antler is not possible.

Red deer antler is the raw material of the bow brackets as well as of the belt attachments. In case of the bow brackets, this was definitely a practical choice thus the selection of antler was made wishing to exploit its lengthwise elasticity and stability. In case of the belt attachments we do not know about such a clear practical motive, more likely we have to think of it as a long term tendency, already observed in the Bronze Age, making richly decorated personal ornaments and parts of the garments more often of antler, than of bone.[40]

The examined objects show clear preference regarding raw material as well as a composite, carefully planned manufacturing process. The bone needle case, seems to be and exception, since it rather seems to be a rough-and-ready work, but all the others are really carefully

40 Choyke 1987.

planned regarding the choice of the raw material and skeletal element.[41] The manufacturing process consists of multiple steps, using several different methods, processes and techniques, suggesting extensive craftsmanship. The decoration is well spaced, the motifs are well planned, occasionally translating decoration used on metal objects to bone and antler raw materials. Although in case of the belt attachments and sabretache closer the decoration was carried out by free-hand, suggesting that qualified craftsmen were technically able to do such a complicate job, of creating delicate objects like this, a perfect imitation of the decoration used on metal objects was not essential. It is rather a translation of idea, originally used on metal into other medium, personal ornaments, made of hard animal materials.

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41 Choyke 1997.

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