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An unusual toolset from Late Neolithic – Early Copper Age graves in Hungary: Preliminary results

Un ensemble inhabituel d'outils provenant d'inhumations du Néolithique final et du Chalcolithique récent en Hongrie : résultats préliminaires

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Abstract: This paper aims to call attention to a peculiar male-specific toolset consisting of two or three items of yet unproven function which occurred in several Late Neolithic (Lengyel culture) and Early Copper Age (Tiszapolgár culture) burials at Alsónyék-Bátaszék (Southern Hungary) and Tiszapolgár-Basatanya (Eastern Hungary), respectively. The utensils, which were found on top of each other but not at a specific place in the grave, are a (1) ca. 40-50 cm long polished antler "stick", (2) a proximal part of an aurochs scapula without any modification, but displaying rounded edges and hand polish in certain cases, and (3) a modified cattle or deer (long) bone (usually a metatarsal) whose diaphysis displays the characteristic concave shaping and sharp edges due to continuous scraping with a chipped stone tool; previously named "hide beamer" in the Hungarian literature.
Since scraped bones may serve as a source to gain bone powder for colouring production, Raman spectroscopy analyses were conducted on ceramics from three graves. Although our investigation did not support the use of bone powder in the paints of these ceramics, these results, based on a small sample size, do not completely rule out the use of bone powder in Alsónyek. Based on analogies from the specialist literature, we suggest that the scapula tool, combined with the antler stick, formed a hafted shovel-like tool that could have been used in various applications, such as stone and clay mining, earthmoving, and agricultural work. As the listed materials leave different traces on the bone, use-wear analyses shall decipher the purpose of these shovel-like tools. If contact with clay were to be revealed on the scapula tools, this and the presumed role of the scraped bones would point even more confidently towards pottery. Besides tracing the research history of these three utensils and sharing our preliminary results in ceramic analyses, we propose further investigations to better understand the role of this unique toolset, which is so far known only from the Hungarian Late Neolithic and Chalcolithic.
Keywords: Antler and bone objects, male-specific toolset, grave offering, Raman spectroscopy, Late Neolithic, Early Copper Age, Hungary.

Résumé : Quatre-vingt-huit objets osseux provenant de 47 tombes du Néolithique final (culture de Lengyel) à Alsónyék-Bátaszék (sous-site 5603/1), dans le sud de la Hongrie, ont récemment été étudiés (fig. 1). Il s'agit d'une assez grande variété d'objets en os, en bois de cerf et en défense de sanglier, dont certains semblent avoir eu une fonction inconnue. Outre les types d'outils les plus courants et les plus fréquents, tels que les pointes (35 % de l'assemblage), des lames et des grattoirs, fabriqués à partir de défenses fendues de sanglier ou de porc (23 %) ont été découverts, ainsi que les hameçons et les harpons à tête basculante (14 %). Trois objets formant un ensemble particulier ont également été retrouvés dans quelques inhumations (fig. 2). Ce même ensemble d'outils semble également avoir été découvert dans d'autres sépultures de la culture de Tiszapolgár, dans le cimetière du début du Chalcolithique de Tiszapolgár-Basatanya, dans le nord-est de la Hongrie (tabl. 1).
Cet ensemble, objet de cet article, se compose donc de trois objets :
(1) une « tige » en bois de cerf d'une cinquantaine de centimètres de long, dont l'extrémité distale a été supprimée et la surface irrégulière du bois a été lissée par décorticage du tissu compact, puis polissage (fig. 3a) ;

(2) une extrémité proximale d'omoplate d'aurochs non travaillée, mais dont les bords arrondis sont polis (fig. 3b) ;
(3) un os long (probablement un métatarse) de bovidé, ou de cerf, modifié. Une dépression semble avoir été creusée par un raclage vigoureux avec un outil en pierre taillée. Cet objet est aussi nommé « hide beamer » (fig. 3c et 3d).

Ces objets, regroupés par deux ou par trois, sont trouvés superposés dans les tombes. Ils sont généralement à côté du dos de l'inhumé ou, moins souvent, à côté de la main ou la jambe. Ils sont associés à des sépultures masculines contenant peu, ou parfois beaucoup, de biens funéraires similaires – à l'exception d'un cas à Alsónyék-Bátaszék (tombe 2175) qui contenait un individu féminin dont les bijoux et le riche mobilier indiquent un rang social élevé (tabl. 1).

Ces outils, dont la fonction n'a pas encore été identifiée, sont similaires aux pièces découvertes dans des fosses à déchets à Alsónyék-Bátaszék et dans d'autres établissements contemporains en Hongrie ou ailleurs en Europe centrale et orientale. Cette fréquence témoigne de leur utilisation répandue. L'analyse fonctionnelle de certains de ces objets et des reconstitutions expérimentales suggère que l'outil sur omoplate, emmanché ou non avec la tige en bois de cerf, aurait pu être utilisé comme grattoir ou comme pelle lors d'activités d'exploitation minière, de terrassement, d'activité agricole ou pour le traitement de peaux ou de plantes.

L'os long comportant la dépression concave accompagnée de traces de raclage a également été associé à diverses activités de fabrication : grattoir à peau, polissoir à céramique ou encore affûteur d'os. Les études sur ces objets remontent à la fin du XIX^e siècle. Des analyses tracéologiques récentes n'ont pas permis de mettre en évidence des marques d'usure évidentes sur ces objets, mais ces derniers ont en commun de porter des plages à bords anguleux, ce qui indique un entretien régulier de cette partie supposée active. Il a été suggéré que ces objets servaient à produire de la poudre d'os par reclage de la diaphyse. Cette poudre aurait ensuite été utilisée comme un des composants de la peinture blanche et noire que portent plusieurs céramiques de l'époque, comme l'indiquent les analyses réalisées sur des échantillons datés du Néolithique final au début de l'âge du Fer en Hongrie. De récentes analyses Raman des peintures de quelques céramiques d'Alsónyék-Bátaszék n'ont toutefois pas permis d'identifier la présence d'os (fig. 4). Nos recherches sur ce sujet se poursuivront en impliquant un échantillon issu de ce site et couvrant une échelle chronologique et spatiale plus étendue (300-400 ans). Des études tracéologiques des outils sur omoplate d'Alsónyék-Bátaszék et de Tiszapolgár-Basatanya sont également suggérées pour comprendre leur fonction dans les activités quotidiennes des populations des cultures de Lengyel et de Tiszapolgár.

Mots-clés : objet en bois de cerf, objet en os, outil masculin, offrande funéraire, spectroscopie Raman, Néolithique final, âge du Cuivre ancien, Hongrie.

INTRODUCTION

Background for the topic

The topic of this study is the recently studied animal bone material recovered from the Lengyel graves (ca. 4760–4450 cal. BC; Osztás et al. 2016, p. 223, fig. 25) of the site Alsónyék-Bátaszék, subsite 5603/1 in Southern Hungary (fig. 1). Of the 622 graves examined, 47 also contained animal bones. The majority (88 items) of this assemblage represented a great variety of bone, antler, and tusk implements (Gál, forthcoming). Bone points (35% of total tools), blades and scrapers made from split tusks of wild boar or pig (23%), as well as hooks and toggle harpoons (14%) were the most common types of utensils. Besides them, three peculiar objects—an antler stick, the proximal part of an aurochs scapula, and a hide beamer-looking concave metatarsus – also occurred in a few graves (figs. 2-3).

These unusual objects, placed in graves in twos or threes and seemingly forming a toolset, have already been noticed in the coeval Grave 3060 at Alsónyék-Bátaszék, subsite 10B and in some Early Copper Age—Tiszapolgár culture (ca. 4420–4280 cal. BC; Raczky and Siklósi, 2013, p. 562, table 2)—graves at Tiszapolgár-Basatanya in Eastern Hungary. They were either presumed as items used in ritual activities (Zalai-Gaál et al., 2011, pp. 68–71) or interpreted independently of each other (Bognár-Kutzián, 1963, pp. 307–313).

When revisiting the subject, this paper aims to present the new results and draw attention to this peculiar tool set, which has so far only been observed in Late Neolithic – Early Copper Age graves excavated in present-day Hungary, and to come closer to understanding the role of the objects by relying on coeval parallels from outside of our country.

Research history

The presence of the aurochs' scapula with antler (stick) and/or the scraped bone object was discussed in the Tiszapolgár-Basatanya monography by Ida Bognár-Kutzián. The connection between the scapula and the antler was even highlighted in the case of Grave 13 where these two objects were found in line and the scapula's edge "had sunk deep to the bottom of the grave" (Bognár-Kutzián, 1963, pp. 55–56, fig 24a). Despite this, she did not classify these scapulae as bone tools (Bognár-Kutzián, 1963, pp. 307–313), but interpreted them as insignia, similar to wild boar or pig jaws (Bognár-Kutzián, 1963, pp. 377–384).

The concave bone tool seems to have been introduced by Mór Wosinsky already at the end of the 19th century when he studied the bone implements from the eponymous site of the Lengyel culture. Based on ethnographic parallels, he associated this object with hide working (Wosinszky, 1890, p. 84; 1893, p. 125). A few decades later, János Banner referred to the specimens from Hódmezővásárhely-Kökénydomb (Tiszapolgár culture)

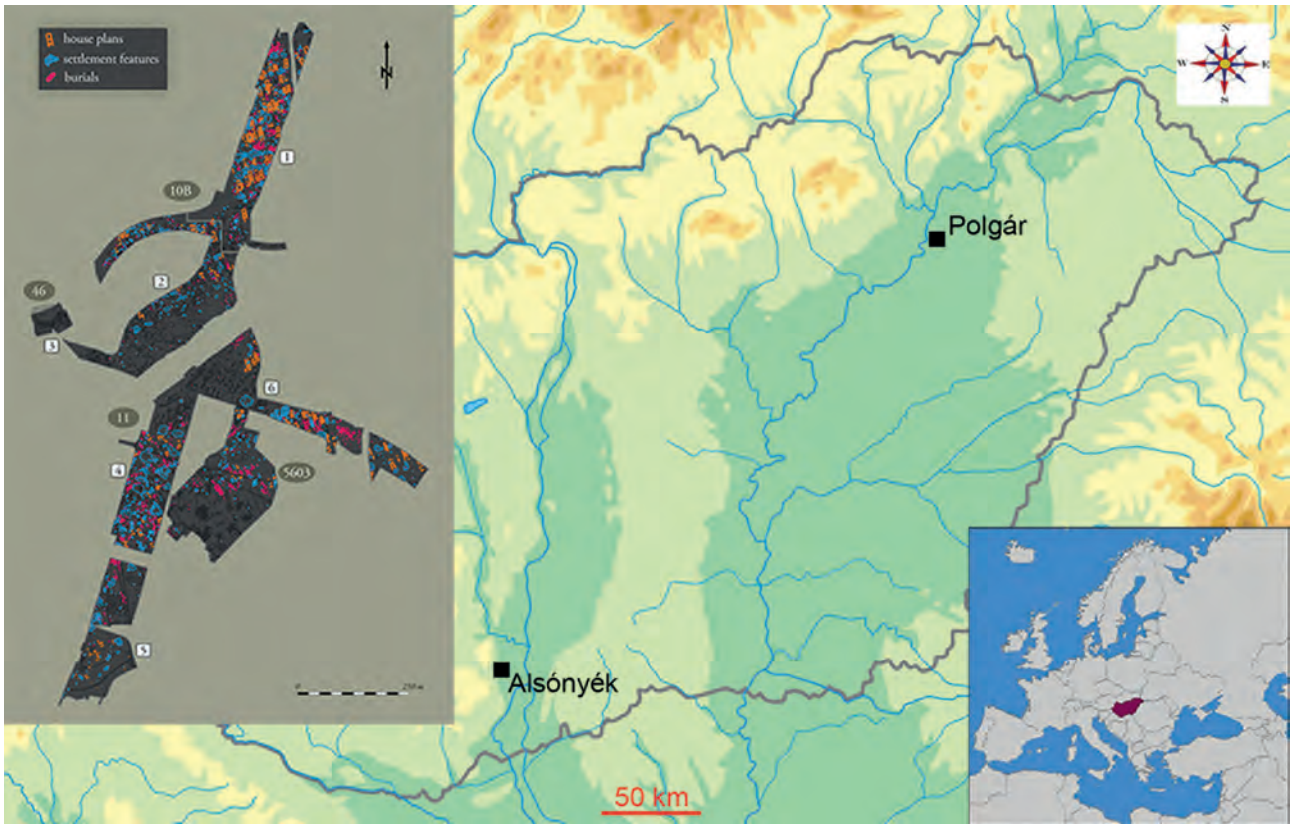

Fig. 1 – The geographical location of sites Alsónyék-Bátaszék and Polgár (Tiszapolgár-Basatanya).
At the top left: The map of Alsónyék-Bátaszék with the subsites and the Lengyel culture features.
***Fig. 1** – Situation géographique des sites d'Alsónyék-Bátaszék et de Polgár (Tiszapolgár-Basatanya).*
En haut à gauche : plan d'Alsónyék-Bátaszék, avec les sous-sites et les caractéristiques culturelles de Lengyel.

as "whetting bones", believing that the sharp folds running along the characteristic surfaces were created by the renewal of the tips of the bone awls (Banner, 1930, pp. 84–85, p. 136, plate 5). Jiří Neustupný also held this view regarding the finds from Bohemia, adding that this type of utensil could also be used for woodworking (Neustupný, 1952).

However, the most widespread interpretation of the scraped bones during the 20th century is associated with the name of S. A. Semenov. Based on the ethnographic parallels of antler and bone scrapers, he identified the specimens found at the Late Neolithic site of Luka-Vrublevetskaya (Southwestern Ukraine) as pot burnishers (Semenov, 1964, pp. 183–185, figs. 98–99). This interpretation, originally published in 1957 (in Russian), has been adopted by many Hungarian (Deszk-B cemetery grave 3: Bökönyi, 1959, p. 56; Bognár-Kutzián, 1963, p. 309; Zengővárkony: Dombay, 1960, p. 227, figs. 95, nos. 3 and 21; Tiszapolgár-Basatanya: Bognár-Kutzián, 1963) and foreign archaeologists (Alexandrescu, 1961; Russel, 1990, p. 532, fig. 14, no. 7; Ursulescu et al., 2002, pp. 52–53, fig. 10, nos. 1–5 and fig. 11).

At the dawn of the 21st century, researchers again associated this tool with leatherworking. Based on historical and ethnographic parallels in Europe and North America, they assumed that the characteristically concave tool with continuously renewed edges was used to clean the hides fixed to a tree trunk, similar to tanners, and therefore the type was renamed as "hide beamer" (Choyke and Schibler, 2007, pp. 60–61; Kalicz et al., 2010, p. 60–61; Tóth, 2013a, pp. 184–185).

To study use-wear on them, experimental archaeologist Markus Klek tested the type on replicas of tools that had been used for a short time and for a long time. He concluded that although the type was effective for wet cleaning the skin of animals at least the size of a red deer, it was not as effective for the hides of smaller animals and that rib scrapers were more suitable for this task. He also suggested that the scraped bones might have been used for other purposes, such as peeling bark (Klek, 2009 and 2011).

In the following years, however, use-wear analyses performed with a stereomicroscope refuted all of the above assumptions. Z. Tóth examined dozens of specimens from the Late Neolithic sites of Alsónyék-Bátaszék, Aszód-Papi földek, and Öcsöd-Kováshalom in Hungary (Tóth, 2013a, 2013b and 2013c), while A. Vornicu examined specimens from Precucuteni II–III culture sites of Isaia-Balta Popii and Târgu Frumos-Baza Pătule in Romania (Vornicu, 2013 and 2014). None of them noticed any typical use-wear resulting from working (Tóth, 2013a, pp. 181–182; Tóth, 2013b, p. 258; Vornicu, 2013, p. 205; Vornicu, 2014, p. 148). They also found that the non-specific marks visible on some specimens (Tóth, 2013b,

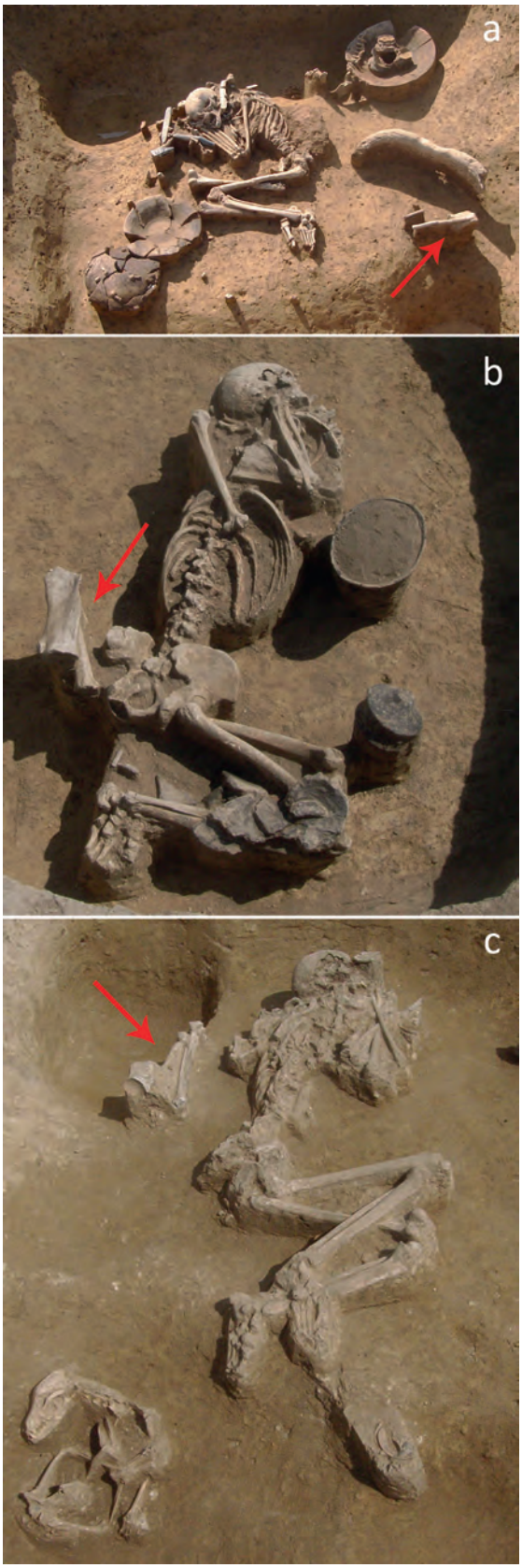

Fig. 2 – Burials from the site of Alsónyék-Bátaszék showing the in situ location of grave goods: a. Grave 3060, subsite 10B; b. Grave 1984, subsite 5603/1; c. Grave 1991, subsite 5063/1.
***Fig. 2** – Sépultures du site d'Alsónyék-Bátaszék montrant l'emplacement in situ du mobilier funéraire : a. tombe 3060, sous-site 10B ; b. tombe 1984, sous-site 5603/1 ; c. tombe 1991, sous-site 5063/1.*

p. 258) may have resulted from the handling (Vornicu, 2013, p. 205).

Both researchers suggested that the scraped bones were not used for work, but for extracting bone powder, which could have been a component of the white paste used to decorate pottery (Tóth, 2013a, pp. 183–184; Vornicu, 2013, pp. 205–206; Choyke, 2015, p. 248; Ursulescu et al., 2020, p. 119). To our knowledge, no such elemental analysis has been carried out in Romania, but we have several pieces of evidence from our country regarding such use of bone powder. Bone was also found in the white and black paint of an unusually decorated vessel found in a Late Neolithic (Tisza culture) grave pit at the site of Pusztataskony–Ledence 1 (Raczky and Anders, 2010, p. 196). Another research group has shown that the use of bone powder for the production of white paint continued in the Great Plain during the Early Copper Age (Parkinson et al., 2010). The latter study, by summarizing the results from previously published Transdanubian sites, showed that this method persisted through the Late Copper Age to the Middle Bronze Age. Moreover, bone powder was even used to decorate ceramics in the Early Iron Age (Parkinson et al., 2010, table 2).

1. MATERIAL AND METHODS

1.1 Material

The peculiar toolset consisting of two or three items was recovered from eight male burials (Graves 677, 927, 964, 968, 1821, 1984, 1991, and 2795) and a female burial (Grave 2175) among the recently studied 622 Lengyel graves at the site of Alsónyék-Bátaszék, subsite 5603/1 (table 1). The toolset under study consisted of the following items:

- a ca. 30–50 cm long antler stick carved from the beam and usually intensively polished after removing the compacta (fig. 3a; Bognár-Kutzián, 1963, plate 29, no. 3; plate 60, nos. 2 and 4; plate 70, no. 14; plate 86, no. 5);
- a proximal part of an aurochs scapula without traces of modification, only displaying hand polish and rounded edges in certain cases (here fig. 3b; Bognár-Kutzián, 1963, p. 55, fig. 24b; p. 91, fig. 40);
- a bone object, usually made of a long bone (most often the metatarsal) of cattle or deer, with one or more concave surfaces (figs. 3c and 3d). On the tool, formerly called a "hide beamer," the epiphyses are intact, while the diaphysis has characteristic concave, sharp-edged surfaces formed as a result of the scraping with the stone blade. The continuously scraped bone walls became so thin during prolonged use (Bognár-Kutzián, 1963, plate 86, no. 6) that the object eventually broke in two (Tóth, 2013b, p. 252, fig. 2). Sometimes an articulating tarsal bone also accompanied the metatarsal (fig. 3d), which probably served as a handle or for suspension.

Site	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B
Subsite	5603	5603	5603	5603	5603	5603	5603	5603	5603	10B
Grave no.	927	1821	1984	1991	2795	677	968	964	2175	3060
Sex	M	M	M	M	M	M	M	M	F	M
Age (year)	45–55	20–24	25–29	40–50	30–34	30–34	30–39	30–34	25–34	40–50
Offering										
Aurochs trophy										x
Vulture wing tip										x
Dog skeleton				x		x	x	x		
Wild boar or pig jaw										
Antler stick	x	x		x	x				x	x
Aurochs scapula tool	x	x	x	x	x				x	x
Concave scraped metatarsal			x	x						
Blade or scraper made from split tusk of wild boar or pig			x	xx				x		
Toggle harpoon							x			
Bone awl	x									x
Hafted antler tool										
Bevel-ended antler tine	x									x
Antler tine handle	x									
Food										
Total animal offering	**5**	**2**	**3**	**6**	**2**	**1**	**2**	**2**	**2**	**6**

Site	T-B	T-B	T-B	T-B	T-B	T-B	T-B	T-B	T-B	T-B	T-B
Subsite											
Grave no.	13	29	35	38	39	42	52	53	60	61	67
Sex	M+Ch	S (M)	M+2Ch	M	M	M	M	M	M	M	M
Age (year)	35		30–35	35	50–55	18–19	25	25–30	50–55	18–20	60
Offering											
Aurochs trophy											
Vulture wing tip											
Dog skeleton						x	x	x		x	x
Wild boar or pig jaw	x	x	x	x	x	x	x	x	x	x	x
Antler stick	x	x	x			x	x		x		x
Aurochs scapula tool	x	x	x	x	x	x	x		x		x
Concave scraped metatarsal		x	x	x	x		x		x		x
Blade or scraper made from split tusk of wild boar or pig	xx	x	x		x		x		xx		
Toggle harpoon											
Bone awl						x				x	x
Hafted antler tool							x		x		x
Bevel-ended antler tine			x								x
Antler tine handle							x				
Food		x					x	x	x	x	x
Total animal offering	**5**	**6**	**6**	**3**	**4**	**5**	**9**	**3**	**8**	**4**	**9**

Table 1 – Summary of graves comprising the offerings of animal origin in the Lengyel culture graves at Alsónyék-Bátaszék and Tiszapolgár culture graves at Tiszapolgár-Basatanya. Abbreviations: A-B = Alsónyék-Bátaszék; T-B = Tiszapolgár-Basatanya; M = male; F = female; Ch = child; S = Symbolic grave. Light grey shading: symbolic offerings. Framing highlights the studied tool set.

***Tabl. 1** – Inventaire des tombes comprenant les offrandes d'origine animale dans les tombes de la culture Lengyel à Alsónyék-Bátaszék et les tombes de la culture Tiszapolgár à Tiszapolgár-Basatanya. Abréviations : A-B = Alsónyék-Bátaszék ; T-B = Tiszapolgár-Basatanya ; M = homme ; F = femelle ; Ch = enfant ; S = Tombe symbolique. Nuance gris clair : offrandes symboliques. La bordure noire met en évidence les outils étudiés.*

Fig. 3 – Polished antler stick (a) and aurochs scapula (b) from Grave 3060 at Alsónyék-Bátaszék, subsite 10B. Scraped metatarsals from cattle (c) and red deer (d) from Graves 1984 and 1991 at Alsónyék-Bátaszék, subsite 5603/1.
***Fig. 3** – "Tige" de bois de cerf poli (a) et omoplate d'aurochs (b) de la tombe 3060 à Alsónyék-Bátaszék, sous-site 10B. Métatarsiens raclés de bovins (c) et de cerf élaphe (d) des tombes 1984 et 1991 à Alsónyék-Bátaszék, sous-site 5603/1.*

1.2. Methods

The animal bones were identified using a reference collection as well as manuals used by zooarchaeologists for the study of remains from archaeological excavations (e.g. Schmid, 1972). The measuring of bones was carried out by a digital calliper (0.1 mm) according to the standard developed by A. von den Driesch (von den Driesch, 1976). The distinction between the skeletal parts of cattle and its wild ancestor, the aurochs, was possible using a large database of osteometric data (e.g. Bökönyi, 1988 and 1995).

Raman spectroscopy analyses were conducted on four ceramics found in a pit (Pit 3033 at subsite 10B) and three burials (Grave 212 at subsite 10B; Graves 128 and 962 at subsite 5303/1). These analyses were carried out at the National Archaeological Institute, Hungarian National Museum, in Budapest, Hungary, using a Renishaw inVia Qontor Raman microspectrometer. Diode-pumped solid-state lasers with a 532 (green) and 785 nm (red) excitation wavelength were used to illuminate the samples, displaying ~0.5 mW on the sample surface, focused with a Leica 50× (N.A. = 0.50) objective. The instrument was used with standard confocality and 1200 grooves/mm optical grating. The measurements were carried out with varying exposure times to achieve the best possible noise to signal ratio. To identify phases based on their Raman spectra, the RRUFF (https://rruff.info/; Lafuente et al., 2015) database was used.

2. RESULTS

The presence of the antler stick placed over an aurochs scapula in a grave was highlighted some years ago when introducing Grave 3060, an outstandingly rich male burial in the Lengyel culture graves of Alsónyék-Bátaszék, subsite 10B (fig. 2a). Since these objects were found in context with symbolic items such as an auroch frontlet and a vulture wing tip, we assumed they were also used in ritual activities (Zalai-Gaál et al., 2011, pp. 68–71).

Nevertheless, the scapula with the antler stick—sometimes accompanied by the scraped concave bone—has recently been noticed in six of the 622 Lengyel culture graves uncovered in subsite 5603/1 of Alsónyék-Bátaszék (Gál, forthcoming). Moreover, these three objects also occurred in nine of the 70 Tiszapolgár culture graves at Tiszapolgár-Basatanya (table 1; Bognár-Kutzián, 1963). In addition, several fragments of these types of tools were registered by the Cambridge Museum as originating from the destroyed graves during the excavation held at this site in 1929 (Bognár-Kutzián, 1963, pp. 22–33, plate 11).

The studied tools were found in twos or threes within the graves in the following combinations:
- the antler stick and the scapula on top of each other (figs 2a and 2c);
- the auroch scapula near or on top of the scraped bone (fig. 2b; Bognár-Kutzián, 1963, p. 91, fig. 40);
- all three objects on top of each other (here fig. 2c; Bognár-Kutzián, 1963, p. 111).

According to the grave photographs and drawings, the toolset did not have a special place within the burial. It was often deposited behind the deceased (fig. 2) or—less frequently—at the hand or leg of the buried person (Bognár-Kutzián, 1963, figs. 34a, 41, 52 and 59). Nevertheless, it appears to have been a male-specific toolset, as it was found in male burials, except for Grave 2175 at Alsónyék-Bátaszék, subsite 5603/1. This burial belonged to a woman whose jewellery and well-supplied grave indicated her high social status (table 1). It is noteworthy, however, that sex identification at both sites has so far been based only on physical anthropological analyses (Bognár-Kutzián, 1963, p. 349; Köhler, 2012; Bánffy et al., 2016).

Another feature of the graves containing this toolset is that they belonged to adults, either buried alone or together with one or more children (Graves 13 and 35 at Tiszapolgár-Basatanya), or represented a "symbolic grave" of an adult man, such as Grave 29 at the same site (Bognár-Kutzián, 1963). The latter did not contain any human bones, but it was presumed to have been dug "in memory of a man" (Bognár-Kutzián, 1963, p. 380).

The objects under study came to light from burials containing few and many donations alike. There was no correlation between their occurrence and the presence of other grave goods such as dog offerings, which might have pointed to interments of hunters or animal breeders, as suggested by Ida Bognár-Kutzián (Bognár-Kutzián, 1963, pp. 377–386). The frequency of other tools and symbols in these graves – such as the wild boar or pig tusk scrapers at Alsónyék-Bátaszék and the wild boar or pig jaws at Tiszapolgár-Basatanya, however, is noteworthy. These objects also seem to have been male-specific grave goods since they were found in men's graves at Alsónyék-Bátaszék, subsite 5603/1, Tiszapolgár-Basatanya (table 1), and Aszód-Papi földek alike (Siklósi, 2007, pp. 193–194). The only exception was Grave 20 at Alsónyék-Bátaszék, which belonged to an adult woman and contained a pig tusk object and a fishhook as well. The latter utensil was also typical of male burials (Gál, forthcoming).

Based on the aforementioned ceramic examinations conducted at some Hungarian sites, we initiated a similar analysis of the Lengyel vessels found at both Alsónyék sites. Due to the poor preservation of the white paint and the limited possibilities, so far, ceramics from one settlement feature (subsite 10B, pit 3033) and three burials (subsite 10B, Grave 212; subsite 5303/1, Graves 128 and 962) have been examined. However, Raman spectroscopy analysis of the paints did not support the use of bone powder: the white colour was made from calcite, the red from hematite, and the black from carbon (here fig. 4; Aradi, 2024).

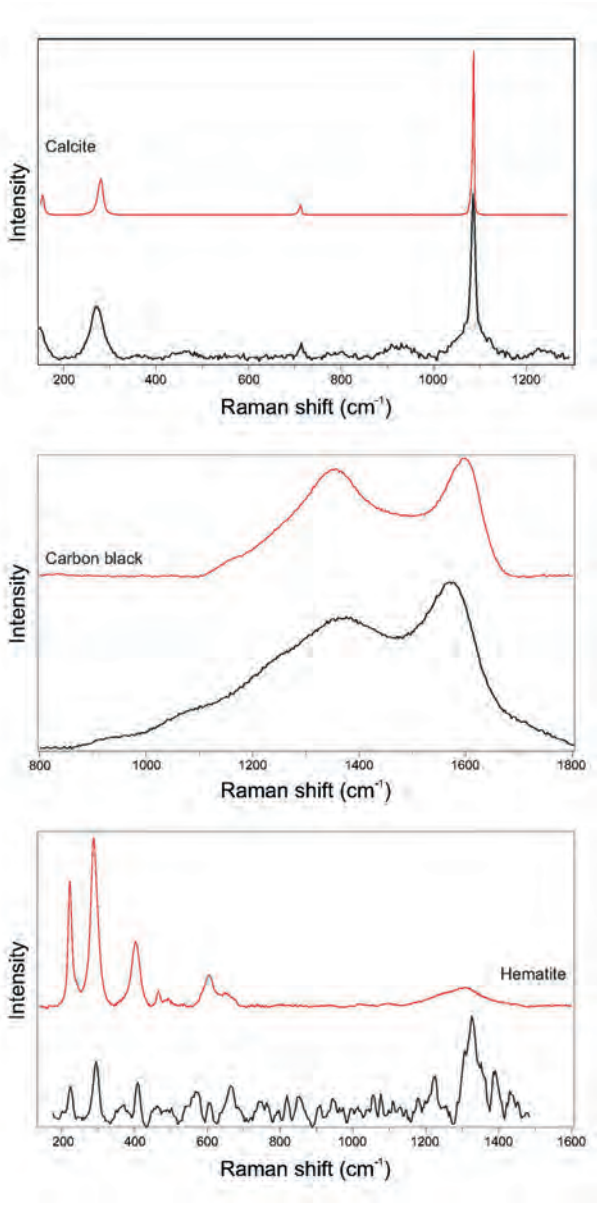

Fig. 4 – Raman spectra (black line) of white (top graph), black (middle graph), and red paints (bottom graph) in sample M6-2012.5603.962.1 compared to spectra of calcite, carbon black, and hematite (red line).

***Fig. 4** – Spectres Raman (ligne noire) des peintures blanches (graphique du haut), noires (graphique du milieu) et rouges (graphique du bas) dans l'échantillon M6-2012.5603.962.1, comparés aux spectres de calcite, de charbon et d'hématite (ligne rouge).*

3. DISCUSSION AND CONCLUSION

Although our recent analyses conducted on the paints of ceramics originating from two subsites (10B and 5303/1) at Alsónyék ended with a negative result, it is worth mentioning that they were based on a small sample size, and thus do not completely rule out the use of bone powder at this site. On the one hand, during the 300–400 years of the Lengyel settlement, animal bones and

shells may have been used alternately, or even mixed, as is also the case at some Middle Bronze Age sites in Transdanubia (Roberts et al. 2008). On the other hand, white paint may have been needed for other purposes besides the decoration of ceramics, e.g. wall or body painting. The turning of scraped bone chips into powder seems to be supported by the context of one of the specimens found at Obre I in present-day Bosnia and Herzegovina, as one of the scraped bones was lying on a grinding stone (Sterud and Sterud, 1974, p. 235).

Although it is important to emphasise that, apart from the graves of Alsónyék and Tiszapolgár, this type has only been found in one other Polish male burial (Janisławice, early Tardenois) that was extremely rich in stone and bone tools (Chmielewska, 1954), the frequency of scraped bones in waste materials certainly indicates the widespread and continuous use of the tool. Dozens of scraped bones have been found in Neolithic and Copper Age waste pits in Hungarian (Tóth, 2013b; see also footnote 1), Romanian, and other Central and Eastern European sites (Alexandrescu, 1961; Tóth, 2013a and 2013b; Vornicu, 2013 and 2014).

According to our current knowledge, the distribution area of the type is outlined in an east-west direction from Ukraine to Austria, and from south to north from Bosnia-Herzegovina and Serbia to Poland. One may also find references to (much) more distant parallels, but it cannot be decided beyond doubt that the Yakutian tool—originally published as a bone awl (Okladinov, 1955, p. 90, fig. 23, no. 4)—truly belongs to the type under examination. As for the specimen from Dviete (Latvia), there is only a reference without a precise description or depiction (Bibikov, 1953, p. 116).

The use of scraped bones also appears to be more widespread chronologically than previously thought (Tóth, 2013b, p. 258). The pieces unearthed at the sites of Obre I. and Janisławice, as well as Kutná Hora-Denmark (the Czech Republic, early period of the Řivnáč culture; Kyselý, 2012, p. 42) suggest that this type of bone tool was used from circa 6000 BC to 2800 BC.

The raw material for the scraped bones was various skeletal parts (but mainly long bones) of medium- and large-sized mammals, such as wild boar, deer, and cattle (Tóth, 2013b, p. 255, tables 1–2), which indicates that neither the shape nor the size of the bones were carefully selected. The frequency of cattle and deer metatarsals, however, suggests that the limb bones of these two most widespread large domestic and wild animals were the most preferred raw material.

The preference for the metatarsal bone over other skeletal parts may be justified by the fact that there is no meat on this portion of the limb, which is why they are usually cut from the carcass whole. Its long, regular, square cross-sectional shape and thick bone wall allowed for easy handling and the extraction of the largest possible amount of bone powder. The intact epiphyses served as handles. The tarsal bone(s) found with some specimens may even indicate the extension of the handle if remaining in the dry skin together with the tendons (here fig. 3d; Bognár-Kutzián, 1963, p. 86; Choyke and Schibler, 2007, p. 61, fig. 19).

The scapula tool in the toolset was always made from an aurochs' shoulder blade (Bognár-Kutzián, 1963, p. 381; Zalai-Gaál et al., 2011, p. 69). This selection suggests that its larger size than the deer or cattle scapula was important for its use. The size of scapula tools from Alsónyék varied between 11.4–19.2 cm, which indicates the gradual wear of the tools. This seems to be supported by the varying degrees of hand polish visible on their surface. The dimensions of the scapulae from Tiszapolgár were not published, but the specimen found in Grave 38 resembles the best-preserved piece from Alsónyék (Bognár-Kutzián, 1963, p. 55, fig. 24b).

In addition to the fragmentation and use-wear of the scapula tools and antler sticks, the fact that they were also found in settlement waste pits, similar to the scraped bones, also indicates the widespread use of the tools. As long as the scapula fragments may easily be identified as food remain, the carefully crafted antler sticks cannot be missed. A 17 cm long fragment (the handle) of an antler stick was identified from Feature 49 in subsite 10B in Alsónyék (Gál et al., 2013). This waste pit also comprised a 20 cm long fragment of an aurochs scapula that displayed scraping marks similar to those on the metatarsal bones discussed above. This occurrence of the scapula tools suggests that these skeletal parts could be used in two ways: as a composite tool with the antler stick and as a scraped bone. Since none of the scapulae found in burials had any scraping marks, there are at least two explanations regarding the function of such scapula tools. We may presume that scapulae from the dismembered carcasses were sometimes immediately turned into shovel-like tools, while other scapula fragments—randomly picked from butchery and food remains—were scraped for the bone powder. It cannot be excluded, however, that these two functions followed each other during the lifetime of a tool, i.e. the remains of a broken shovel continued to be used as a scraped bone for extracting bone powder.

The joint occurrence of antler and scapula tools has been reported from several Early Neolithic (~4000 BC) flint quarries in Sussex, England. Red deer antlers were used to make wedges, picks and hammers for loosening limestone, and the handles of scapula shovels for collecting debris (Curwen, 1937, pp. 99–102, figs. 20–21). The scapula tools were made from deer, ox and pig shoulder blades by removing the spine (*spina scapulae*). This small modification made it easier to handle the tool, either with or without an antler (or wooden) handle. The antler handles were also of various types and probably varied according to need, access to raw materials and the technical skills of the carver, from simple straight to more complex T-shaped (Curwen, 1937, p. 101, fig. 21, nos. 2–5). Recent experiments using both unhandled and differently handled scapula tools with limestone debris have shown that this type of bone can be easily transformed into shovel-like tools by using strips of rawhide for attaching (Mansfield, 2022).

Coeval parallels with even more complex designs (including a haft hole drilled through the articulation surface) as well as simple scapula scrapers were also found in French and German sites (Sidéra, 2000; Steppan, 2001). These tools have been associated with woodworking, leather processing and plant softening. The widespread use of scapula implements is also supported by specimens from the Hemudu culture circle in China (7000–5000 BP), which may have been involved in agricultural work (earthmoving, weeding, etc.). Recent experiments on dozens of replicas ranging in size from 13 to 30.5 cm have shown that smaller shovels were more efficient (Xie et al., 2017).

The juxtaposition of scapula tools and antler sticks in the Alsónyék and Tiszapolgár graves suggests that they may also have been shovel-like composite tools. In those burials in which the antler (stick) was missing from near the scapula, the handle may have been made of wood.

Since most of the chipped stone tools from Alsónyék were made of Mecsek radiolarite (Szilágyi, 2019), originating from the Eastern Mecsek, located 30–50 km from the site, it is conceivable that hafted scapula tools were used in these mines. Nevertheless, the scapulae could also have been used in many other areas, such as clay mining, earthmoving, agricultural work, etc. As the listed materials leave different traces on the bone, use-wear analyses shall decipher the purpose of these shovel-like tools. If contact with clay were to be revealed, this and the presumed role of the scraped bones would point even more confidently towards pottery.

Although at the present stage of our research, the function of the scraped bones is hypothetical, and further investigations are needed to elucidate the role of the shovel-like tool, the frequency of this tool set in male burials at two Late Neolithic – Early Copper Age sites in Hungary offers the rare possibility of relating certain tools to the sexual division of labour. The research and discussion of this topic are of great importance in the field of social sciences, as they are essential for understanding the social, political, and economic structures of communities. This issue, in which ethnoarchaeology and historical analogies played a major role, has also been present in archaeology for a long time, but these methods are limited. Recently, by combining different disciplines and methods, such as technological and use-wear analysis of the grave goods, investigations of work-related lesions on the osteological material, isotopic analyses for searching mobility and nutrition, significant results have been achieved in this area (Masclans et al., 2021). Our preliminary results, combined with similar methods, shall contribute to research for exploring the division of labour between people of different biological sexes in Central-Eastern Europe.

On the other hand, since domestic and ritual spheres may have been more closely intertwined in prehistoric contexts, the interpretation of this bone toolset shall also take into account ritual aspects that currently are beyond our understanding.

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NOTE

1. See Gál E., Osztás A., Somogyi K., Szilágyi K. (2013) – *Késő neolitikus leletek az alsónyék-bátaszéki lengyeli telepről (Tolna megye)*, Poster presentation at the 8th Meeting for the Researchers of Prehistory, Debrecen, 16-18 October 2013.

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