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Őskoros Kutatók IX. Összejövetelének konferenciakötete

THE ARCHAEOLOGY OF RITUAL

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A rituálé régészete

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Miskolc, 2015. október 14–16.

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2015. október 14–16. között a miskolci Herman Ottó Múzeum rendezte meg a IX. ΜΩΜΟΣ konferenciát, vagyis az Őskoros Kutatók IX. Összejövetelét. E konferenciasorozat 1997-ben indult útjára, és hagyományosan kétévente, mindig egy meghatározott témakörben ad lehetőséget az ősrégészet kutatóinak újabb eredményeik bemutatására. Debrecen, Szombathely, Kőszeg és Százhalombatta után Miskolc városa először adott otthont a programnak.

A konferencia témája ezúttal *„A rituálé régészete"* volt, a tematika kidolgozását az ELTE BTK Régészettudományi Intézetének kutatói segítették. A felvezető és összefoglaló előadásokon túl a *Strukturált depozitumok; Rituális cselekvésmódok és rituális specialisták; Rituális tér (rituális építmények, rituális táj, rituális térhasználat);* valamint a *Temetkezések mint rituális cselekvésformák* altémák köré rendeződött a program. A konferencia fő célja az volt, hogy közösen számba vegyük azokat a jelenségeket, melyek ebben a körben értelmezhetőek, ütköztessük az eltérő megközelítéseket, interpretációkat, és közös fogalmi keretet alakítsunk ki – hiszen a kutatás így tud megújulni, fejlődni.

Ezeknek a céloknak csak részben tudtunk megfelelni, a konferenciát mégis eredményesen zártuk. A három nap alatt 31 előadás hangzott el, mellettük 12 poszter is bemutatásra került. A résztvevő 120 kutatót és érdeklődőt rendhagyó módon fogadó „Pannon-tenger Múzeum" hangulatos helyszínnek bizonyult, és sokat jelentett, hogy a szervezésben a Múzeum munkatársai és a közel 40 fős Régészeti Tár egy emberként vett részt.

Az esemény óta eltelt négy évben több kutató munkája is megjelent, így ebben a kötetben tizennégy tanulmány kapott helyet. A közlések a konferencia altémáit felbontva, immár időrendi sorrendben, a kőkorszaktól a vaskor végéig foglalkoznak a „rituálé régészetével", eredményeiket egy kulturális antropológiai tanulmány egészíti ki. A kötet kiadása egy sikertelen pályázatot követően a Herman Ottó Múzeumban anyagi nehézségekbe ütközött, emiatt a Szervezők nevében szeretnénk megköszönni az ELTE BTK Régészettudományi Intézetének a lehetőséget, és különösen Váczi Gábor áldozatos munkáját, amelynek révén a *Dissertationes Archaeologicae* sorozat *Supplementum* köteteként végül mégis hozzáférhetővé válhat a kutatás és az érdeklődők számára.

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Methods of Identification for Ceramics with Traces of Secondary Burning and their Occurrences in Mortuary and Ritual-related Assemblages

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Abstract
Among archaeological assemblages recovered both from settlement sites and burial grounds, the presence of ceramics with traces of secondary burning is a relatively common phenomenon.[1] The identification of such traces can nuance the interpretation of the archaeological contexts within which these ceramics occur. In case of cremation burials, it can highlight the details of the cremation process. However, most publications seem to mention secondarily burnt ceramics either when the pieces are clearly severely burnt, deformed or blistered, despite these cases being only partial representations of the whole phenomenon. Based on previous experience, three levels of secondary burning can be distinguished on archaeological ceramics: slight, moderate and severe secondary burning. This more detailed classification could aid the reconstruction of funerary rituals. The recognition and the correct identification of such ceramic pieces can provide details on whether a certain vessel (or vessel types) was/were placed on the funeral pyre or was only tangentially involved in the cremation process. The degree of secondary burning is related to the position of the object and the time it spent in the fire or in contact with radiating heat. By the examination of the sherds, it can also be revealed whether their breakage occurred before or after the secondary burning event. Methods of identification presented in this paper have the potential to provide further insights into both cremation burials and ceramic assemblages found at settlements or even into ritual deposits by shedding light onto the biographies of objects.[2] Most of the findings presented here were observed on the Late Bronze Age mortuary assemblage of Balatonendréd-Öreghegy (Hungary), excavated by the team of Zsolt Petkes in 2011. The fine-excavation of the burials and the restoration of the finds were carried out by the Laboratory of Archeolore Ltd., where Gábor Váczi continues to process the finds.[3]

Brief overview of the relationship between prehistoric ceramic firing technologies and secondary burning of objects

In archaeological research, it has long been understood that ceramics can be fired in two ways: in an oxidizing or in a reducing atmosphere,[4] which in many cases, also serves as the basis of typological classification. Unglazed clay objects fired in an oxidizing atmosphere turn red, orange or yellow. Firing under an entirely reducing atmosphere produces black vessels, while a predominantly reducing process with slight oxidizing effects results in grey or light brown coloured ceramics. During the many years I spent as a ceramicist in the field of experimental archaeology, I often wondered what colour could have originally been in the mind of prehistoric potters when producing ceramics in the first place. Is there a way to determine

1 Popescu 2010, 213.
2 Appadurai 1986; Gosden – Marshall 1999.
3 Váczi 2020, see in this volume.
4 Rye 1981; Ilon 1996, 143; Antoni et al. 2012, 151.

whether there was a culturally prescribed template according to which ceramics were made to look?[5] Since all of the above-mentioned colours and their variations occur in prehistoric ceramic assemblages, my enquiry seemed like a wild goose chase at first, however, there were a couple of corresponding features to guide me along. During the restoration phase and while preparing the illustrations for publications of the Late Copper Age Baden and Middle Bronze Age Vatya assemblages I noticed that ceramics unearthed in cemeteries were typically dark brown, whereas vessels discovered at settlement sites tended to be more on the yellowish or reddish side. This observation led me to the conclusion that the colour of the vessels in these funerary assemblages had most possibly reflected the colours the potters initially intended to achieve, while ceramics from settlement sites could have been exposed to a number of different factors during their life cycles.

Even until recently, archaeological research has routinely viewed the reducing firing of ceramics as a widespread and commonplace practice during prehistoric times.[6] Scholars who share this opinion consider the black or dark grey coloured ceramics as outcomes of a response to an unforeseen technological difficulty, assuming that the dark colour of the vessels did not reflect the original intention of the potters. This theory, however, has been refuted by the works of Sandy Budden and Joanna Sofaer showing that, as opposed to the varying levels of skill reflected by the shaping and the decorating of vessels, the quality of firing appears to be fairly uniform. They concluded that the firing of ceramics was presumably a seasonal communal event which could have been under the control of individuals of great experience.[7] Other studies have further emphasized the conscious choices expressed throughout the firing process.[8] Judit Antoni and her colleagues also point out the absence of kilns in the ethnographic analogues (i.e. among present-day communities who produce vessels of similar appearance to prehistoric ceramics), therefore it is feasible to assume that ceramic wares were fired in pits or in a bonfire. No matter which method was used, the patchy surface of prehistoric ceramics can only be a consequence of the objects being in direct contact with the surrounding fuel during the firing process. Although in the case of grated kilns of later periods, where a grate separates the vessels from the firebox, stains can also occur on ceramics where they came into contact with each other or the kiln walls, but the intensity and the pattern of these stains are very different from the ones documented on prehistoric ceramics.

Heating and cooling represent the most critical phases of the firing process; these are also the stages when thermal shock is most likely to occur, leading to firing errors. When vessels are fired in a pit or stacked on top of each other (vessels and the fuel placed in the centre), the heap has to be sealed by a protective layer of soil and/or broken ceramic sherds in order to achieve the reducing atmosphere. During the first stage of firing, the fuel should not be exposed to too much oxygen. If the fuel is set alight before the chemically bound water evaporates from the raw clay objects, it will cause the vessels to burst. The fragments exploding off the surface leave distinct lenticular or flake-like scars on the vessels.[9] These firing errors can often be found on archaeological ceramics, like on the vessel discovered in grave 863 of the Bronze

5 Gosden 2005.
6 Antoni et al. 2012, 151.
7 Budden – Sofaer 2009, 13.
8 Udvardi – Radics 2011, 176; Crandell et al. 2015.
9 Rye 1981, Fig. 91.

Age cemetery of Dunaújváros-Duna-dűlő.[10] It is important to note, however, that these scars are often accompanied by traces of secondary burning,[11] as illustrated by examples from the Late Iron Age cemetery of Sajópetri *(Fig. 15)*. In some instances, when such explosions occur on already fired vessels, these are likely to have been the results of some kind of liquid being stored in the pot right before it came into contact with the fire, or at least the ceramic was still slightly damp. In order for scars to form, a sudden rise of temperature was necessary, during which the water had no time to evaporate gradually from the clay material. Such phenomena were repeatedly observed during experimental archaeological firing processes.[12]

The heating phase comes to a close with the complete charring of the fuel. In the following stage, as the charcoal gradually begins to combust, it gives out additional heat, raising the temperature inside the pit or bonfire: the process takes place largely without the presence of oxygen. However, as soon as the charcoal turns into ash, its volume decreases significantly, which cause the pit-fill or bonfire to slowly collapse. The protective layer sealing the contents from the outside loosens and in some places collapses onto the vessels. As the smouldering charcoal gains access to more and more oxygen through these openings, the intensity of the combustion accelerates. This final stage is needed to be overlooked and controlled by an experienced potter. When the firing reaches its maximum temperature, the cooling phase begins, requiring further care and skill. It is not advisable to allow the accelerating firing process to run its full course: if the entire protective layer collapses in among the vessels or the openings become too large, the outside air, which is cooler by hundreds of degrees, would move in between the still glowing vessels, causing them to crack. These cracks are mostly perpendicular to the rim, sometimes ending typically in a 'Y'-shape or form a spider web-like pattern.[13]

The reconstruction of vessels, whose fragments were of various colours, marked a turning point in my ceramics-related enquiries. In some cases, one half of the matching fragment was bright yellow while the other was black *(Fig. 17.2)*, which made me wonder about the kind of impact the vessel could have endured after it was broken. One possibility was that the discolouration was due to the composition of the surrounding matrix (i.e. the soil) the sherds were sitting in. Despite of being a feasible possibility, how can any substance have such an intense effect on the colour of ceramic sherds? In addition, the matching fragments generally came from the same area, which made an environmental factor as a possible cause fairly unlikely. Following this logic, if the phenomena were to be caused by a generic taphonomic factor, then it should have been observed on a larger sample size of ceramic assemblages. In the end, experimental archaeology provided the answer. For my experiment, I fired replicas of prehistoric vessels in a pit covered by a mixed layer of soil and broken sherds in a similar way as described earlier. By the end of the firing process the colour of the fragments incorporated in the mixed soil layer resembled the colours observed on archaeological ceramics. Moreover, as the cover layer collapsed, the sherds scattered within relative proximity to each other, some of which became oxidized, while others were re-fired in a reductive atmosphere, changing their colour accordingly. Therefore, it can be ascertained that the colour changes of already fired ceramics occur when these wares are exposed to high enough temperatures

10 Vicze 2011, Pl. 190.1.

11 Fülöp – Váczi 2016, Fig. 3; Vuković 2015, Fig. 7: on the shoulder and on the handle; Popescu 2010, Fig. 1.7: near the base; Gucsi – Szabó 2018, Fig. 22.1.

12 Gucsi 2001, 197.

13 Fülöp 2020, see in this volume.

that can induce the chemical processes of oxidation or reduction once again. This theory has recently been proven by experiments carried out by Spanish researchers.[14]

Ceramic descriptions such as "fired to a red colour, patchy firing or poorly fired" crop up frequently in publications until today. These descriptions, however, appear to suggest that the colour and texture of the given archaeological find represents its original state, failing to take the 'biography of the object' into account, namely that ceramics had in fact been impacted by a variety of different physical and chemical factors while intact, during their use-lives and even after their disposal, when broken or buried.[15] Therefore, during the recording process I would propose to aim for a clear and factual description for each sherd, e.g. 'red, patchy, structurally weak' etc., without confusing the original firing methods with the current condition of ceramics.

Fig. 1. Marks on the bowl's belly indicate the impact left by deliberate breakage, along with traces of 'mosaic-like' pattern of secondary burning. Balatonendréd-Öreghegy, grave 177, vessel no. 4.
1. kép. Tál, melynek hasán szándékos törés nyomai és másodlagos égés okozta mozaikosság látható. Balatonendréd-Öreghegy, 177. sír, 4. edény.

Publications which include black-and-white photographs of reconstructed vessels (particularly if there is little contrast in colour between the matching fragments) do not do much justice for ceramics that underwent secondary burning. Despite the peculiar 'mosaic-like, multi-coloured' patterning of secondarily burnt ceramics that occur regularly among archaeological assemblages,[16] this conspicuous detail has only been specifically referred to by István Eke.[17] In a paper by Marietta Csányi, there is a reference to a vessel fragment (marked no. 49) from pit no. 3 describing it as "well burnt".[18] Ceramic vessels with 'mosaic-like, multi-coloured' patterns are most likely to occur in assemblages from settlement sites *(Fig. 17.3)*.

14 Felipe et al. 2019.
15 Gosden – Marshall 1999.
16 This category of secondarily burnt ceramics can be found in numerous studies, the following represent only a few examples: Bondár 1996, Pl. 122.11, Pl. 126.25–26, Pl. 133.78, Pl. 135.91, Pl. 146.179, Pl. 148.191, Pl. 174.359; Gherdán et al. 2012, Fig. 5.1; Szabó 1992, Pl. I.15, Pl. LXII.5, Pl. LXIX.2; Domboróczki 2005, Fig. 5: the altar, at the top of the picture; Stolba 2002, Pl. 136.g; Vuković 2014, Fig. 7, Fig. 12; Vuković 2015, Fig. 3; Csányi 1996, Pl. IV.1, Pl. IX.5; Felipe et al. 2019, Fig. 1; Michelaki 2008, Fig. 11b.
17 Eke 2008, Find no. 14 from House no. 1, Fig. 2.3.
18 Csányi 1996.

Fig. 2. 'Mosaic-like' secondary burning pattern on a distorted cooking pot. Balatonendréd-Öreghegy, grave 177, vessel no. 5. *2. kép.* Deformálódott főzőedény, melyen másodlagos égés okozta mozaikosság látható. Balatonendréd-Öreghegy, 177. sír, 5. edény.

Their typical finding-circumstances are in the foundations of ovens,[19] or among the debris of burnt-down domestic buildings. Pit fills or any archaeological deposit might also contain such fragments. However, from this paper's point of view, the most important detail is that they can also be found in graves. An outstanding example was documented in grave no. 177 at Balatonendréd *(Figs 1–2)*. Here, I would like to emphasize that in order for the 'mosaic-like, multi-coloured' patterning to be produced on secondarily burnt ceramics, two necessarily criteria have to be fulfilled. The first condition is that the object has to be broken. The breakage could occur before the object (re-)enters the fire (see the marks on the belly of the bowl left by the impact of deliberate breakage shown in *Fig. 1*). The breakage, however, can be caused by thermal-shock while the intact vessel is in the fire. Although the outcomes of these processes might appear similar, the traces left by deliberate breaking should not be confused with the fragmentation caused by the thermal-shock of secondary heat exposure *(Fig. 2)*. To clearly identify deliberate breaking, it is necessary to record marks of impact *(Figs 1, 16)*, or other circumstances that can verify that the object was deliberately damaged (*Fig. 7*, described in detail in the last chapter). The other condition is that the fragments need to be scattered around various locations within the fire-zone to be exposed to either oxidizing or reducing atmospheres. This latter criterion tends to happen naturally as the sherds fall into the fire, onto and in amongst the fuel. However, ceramics will not always be 'mosaic-like, multi-coloured' following their exposure to secondary heat. Objects that do not break into pieces before or during the secondary burning event will have a more uniform appearance.[20] The colour of these objects can be changed in some areas *(Figs 13, 17)* or on their entire surface *(Figs 7–8, 15)*.

19 Bondár 1987, Fig. 4.7–4.8; Vuković 2015, Fig. 3.
20 Popescu 2010, Fig. 1.1–2, Fig. 1.4, Fig. 1.7.

Fig. 3. The reconstruction of the secondary burning process during an archaeological experiment.
3. kép. Másodlagos égés folyamatának rekonstruálása kísérleti régészet segítségével.

On settlements, ceramics with traces of secondary burning are often linked to burnt-down domestic buildings.[21] However, fragments of secondarily burnt ceramics are also known from the deposits recovered from a Late Bronze Age well.[22] In another case, 18 cups unearthed from an Early Bronze Age pit at the site of Baks-Homokbánya were likely to have suffered the effects of secondary burning as the excavation report and the supporting photographs suggest.[23] A recently published structured deposition from Budajenő also contained a large number of secondarily burnt vessels.[24] It is perhaps not a coincidence that all these four archaeological contexts can be interpreted as having links to some kind of ritual practice.[25] Previous studies had repeatedly emphasized, that fire plays a highly important role in transition rituals, charged with variety of symbolic meanings.[26] In addition, the secondary burning of ceramics can also occur during everyday fire-related activities. This could be, for example, the burning domestic refuse. In one of my experiments, the fragments of a vessel were placed on top of dry garden twigs (piled up to 50–60 cm high as well as wide), which fuel combusted in about 15 minutes. As a result, the originally same-coloured fragments turned to different shades *(Fig. 3)*. These colour changes happened even in a relatively low-temperature environment, in short time, which prompted me to think about the possible classification of the extent and intensity of particular secondary burning events, as it will be discussed in detail below.

Unlike at settlements, the effects of secondary burning on ceramics recovered from cremation burials can primarily be related to the pyre, where the body was cremated. In these cases, however, it is only possible to say that the secondarily burnt ceramics accompanying the burials were, at one point in their use-lives (after their initial firing) fired again, before being placed in the grave. Unfortunately, it cannot be claimed unanimously that this particular event took place on the funerary pyre, but I would suggest, it is a more realistic scenario than assuming that the vessels were thrown into the fire during a separate ceremony. Notwithstanding, to produce such high temperatures similar to the ones the severely secondarily burnt ceramics were exposed to, would have required a significant amount of additional costs and resources.

21 Csányi – Tárnoki 2013.
22 Fülöp 2020, see in this volume.
23 Fischl et al. 1999, 79, Figs 7–9.
24 Gucsi – Szabó 2018.
25 Brück 2011.
26 Szeverényi 2013; Tringham 2013.

Fig. 4. Vessel showing signs of severe secondary burning with an older chip on its rim. During the secondary burning event, its rim opened widely along a crack, its neck also became distorted. Balatonendréd-Öreghegy, grave 234, vessel no. 4.
4. kép. Erős másodlagos égés nyomait mutató edény, peremén egy régebbi csorbulással. A másodlagos égés során pereme a repedés mentén szétnyílt, nyaka is deformálódott. Balatonendréd-Öreghegy, 234. sír, 4. edény.

Fig. 5. Vessel with traces of severe secondary burning. During the secondary burning event, multiple cracks opened on the rim, causing the entire object to become distorted. Balatonendréd-Öreghegy, grave 273, vessel no. 7.
5. kép. Erős másodlagos égés nyomait mutató edény. A másodlagos égés során több repedés keletkezett a peremén, melynek hatására az egész tárgy deformálódott. Balatonendréd-Öreghegy, 273. sír, 7. edény.

Fig. 6. Vessel showing signs of severe secondary burning. During the secondary burning event, multiple cracks opened on the rim. The original shape of the object is strongly distorted. Balatonendréd-Öreghegy, grave 309, vessel no. 3.
6. kép. Erős másodlagos égés nyomait mutató edény. A másodlagos égés során több repedés keletkezett a peremén. A tárgy eredeti formája erősen deformálódott. Balatonendréd-Öreghegy, 309. sír, 3. edény.

Ceramics with traces of severe secondary burning

This category consists only of distorted or molten ceramics,[27] exposed to temperatures of 1100–1200 degrees Celsius or above.[28] Their fabric is often blistered, foamy, lightweight almost sponge- or slag-like, with surfaces resembling glass *(Figs 19–20)*. Crusty surfaces occur frequently, which tend to form net-like cracks *(Fig. 8)*.[29] The originally burnished surfaces are mostly diminished *(Figs 4–6)*. Due to thermal-shock, objects showing signs of severe secondary burning often have cracks opening perpendicular to their rims *(Figs 4–6, 8)* making them difficult to refit afterwards. In some extreme cases, the exact reconstruction of the original form becomes impossible.[30] These ceramics are typically oxidized, their colour ranges from bright red or orange to ash-grey, sometimes with purple *(Fig. 5)* or white spots and patches.[31] In some cases, the nature of the distortion can provide indications on the position of the object when it was exposed to secondary heat. *Figure 2* shows a pot, which was possibly on its side when the temperature reached the required degree for the distortion to occur. The vessel

27 Gucsi – Szabó 2018, Fig. 13.
28 Hoeck et al. 2012, 662; Gherdán et al. 2012.
29 Szabó 1992, Pl. XXX. 4; Gucsi – Szabó 2018, Fig. 40.1.
30 Fülöp – Váczi 2016, Fig. 1.
31 Gucsi – Szabó 2018, Fig. 40.2.

demonstrated by *Figure 6* stood on its base, implied by the downward and outward slanting distortion of the rim. The position of ceramics with traces of severe secondary burning (known from cremation burials) is most likely to be reconstructed in the middle of the pyre. Presumably, these objects were placed on the abdomen and chest of the deceased. Severely secondarily burnt ceramics are generally recognized and mentioned by researchers in publications.[32] However, vessels showing signs of severe secondary burning represent the smallest group among the three categories described here.

Fig. 7. Vessel with traces of moderate secondary burning. Its rim was chipped multiple times, before the secondary burning event took place, and the handle was broken off deliberately afterwards. Balatonendréd-Öreghegy, grave 162, vessel no. 3.
7. kép. Edény közepes erősségű másodlagos égés nyomaival. Pereme a másodlagos égést megelőzően több alkalommal csorbult, fülét pedig az égést követően szándékosan letörték. Balatonendréd-Öreghegy, 162. sír, 3. edény.

32 Bader 1979; Bergmann 1982; Kalicz-Schreiber et al. 2010, Grab 304, Taf. 132.5, Grab 331, Taf. 150.5; Hoeck et al. 2012, 651, Fig. 2B; Kacsó et al. 2012.

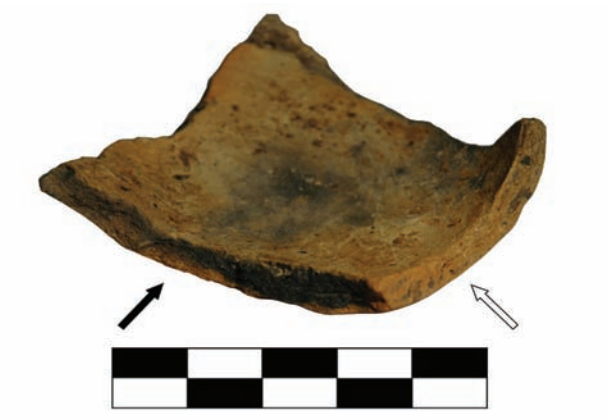
Ceramics with signs of moderate secondary burning

This category includes objects whose entire surface is discoloured *(Figs 7–8)*. Typically, discolouration means that the originally reductive, dark-toned, black, black-brown, brown-grey objects turned yellow, orange, red during the secondary burning event. In some cases, however, there may be black spots or patches observed on the objects.[33] Black spots form where the vessel surface is starved of oxygen. In practice, this usually means that certain parts of the vessel surface have come into contact either with the ground, or pieces of fuel. Taking three vessels as examples, Anca-Diana Popescu, defines black patches as the result of secondary burning, along with brick-red and grey spots illustrated by another case.[34] On these vessels (shown in her paper on Fig. 1.1–2) the effects of secondary burning were not limited to black patches, but changed the colour of the entire surface. Here it needs to be emphasized, that the presence of black (patches) and yellow shades on the same object is very typical amongst secondarily burnt ceramics *(Figs 17–18)*. According to my experience, the original colour of these vessels cannot be determined without doubt.

Fig. 8. Vessel showing signs of moderate secondary burning. Its rim was chipped multiple times, before the secondary burning event took place. The object is almost intact, only the upper part of the handle had been broken off after the secondary burning event took place. Balatonendréd-Öreghegy, grave 162, vessel no. 4.
8. kép. Edény közepes erősségű másodlagos égés nyomaival. Pereme a másodlagos égést megelőzően több alkalommal csorbult. A tárgy majdnem teljesen ép, csupán peremének felső része tört le a másodlagos égést követően. Balatonendréd-Öreghegy, 162. sír, 4. edény.

The fabric of ceramics with moderate secondary burning can sometimes become porous, while in a number of cases burnished surfaces are also lost *(Fig. 8)*, but more intriguingly their fabric quality can often be better than the rest of the ceramic assemblage from the same archaeological site (perhaps due to the secondary heat exposure producing a more robust ceramic texture). On this object *(Fig. 8)*, it is clearly visible that it was exposed to a robust thermal effect on the side opposite of the handle, where a vertical, long crack occurred, the burnished surface is completely gone and the surface is cracked in a net-like pattern, while the handle-side retained its sheen and intact surface. The definition (and observation) of ceramics with moderate secondary burning requires more attention in comparison to the prominent examples of severely burnt ceramics. The clearly identifiable pieces are those

33 Fülöp – Váczi 2016, Fig. 3.
34 Popescu 2010, 214–215.



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9. kép. Táltöredék közepes erősségű másodlagos égés nyomaival (restaurálás közben készült fotó). Balatonendréd-Öreghegy, 239. sír, 3. edény.

Fig. 10. Sherd of a bowl with traces of moderate secondary burning, in the process of restoration. Balatonendréd-Öreghegy, grave 159, fragment of vessel no. 4.
10. kép. Táltöredék közepes erősségű másodlagos égés nyomaival (restaurálás közben készült fotó). Balatonendréd-Öreghegy, 159. sír, 4. edény.

that have been broken before re-entering the fire, or cracked by thermal-shock during the secondary burning event. In these cases, the colour of the fracture surface is exactly the same as the adjacent surfaces *(Figs 9–12, 18.2)*. The secondary, oxidizing heat affects the existing fracture surfaces causing the ceramics to become uniformly yellow-orange-red (white arrows on *Figs 9–12, 18.2*), while erasing the typical 'sandwich structure' so characteristic to prehistoric ceramics. An already broken, secondarily burnt object can break further, making the sandwich structure visible on the most recent fracture surface (black arrows on *Figs 9–10*). The two types of fracture surfaces provide information on the chronological order in which they were formed: before or after the secondary burning event took place. This enriches the understanding of fragmentation[35] and could help to know better the biography of objects and to reconstruct certain phases of the cremation and the burial ritual in more detail.

Moderate secondary burning of vessels often involves effects of thermal-shock, resulting in the appearance of a small number of cracks. Even if the vessel remains complete and can continue to fulfil a certain function (such as secondarily burnt storage vessels can be used as burial containers or cracked bowls as cover bowls for urns), fracture surfaces along the cracks will certainly be oxidized. The observation and documentation of these details is only possible during the restoration process, after the vessel has been cleaned, ideally with the close collaboration between the archaeologist and the conservator. The recording of fracture surfaces has to take place before the sherds are being glued together and before the voids are filled with gypsum. The smaller the vessel, the less likely that it develops cracks when exposed to secondary heat, consequently the observation of secondary thermal effects is the most difficult in the case of vessels, like cups *(Fig. 17.1)*. However, if the object is complete, but its rim is damaged or chipped, the fracture surface of such scars tend also to reach the inner, darker layers of the 'sandwich structure'. If the old fracture surface is the same colour as the rest of the vessel, it can be inferred that it is indeed the result of secondary heat exposure *(Fig. 4,*

35 Chapman – Gaydarska 2006.

detail photograph). Fortunately from our perspective, cups, mugs and other ceramics are often damaged during their use-lives and are routinely included in burial and domestic assemblages. Vessels with use-wear had previously been observed at a number of excavations,[36] and even if in these cases only the most outstanding examples were recorded, it indicates that strongly damaged and reused ceramics were, in fact, placed in graves relatively frequently. Publications undertaking systematic recordings and statistical analyses on burial assemblages are still relatively thin on the ground. In the past few decades, scholars have begun to focus on these markers in archaeological assemblages, such as in the material of the Middle Bronze Age cemetery of Kisapostag,[37] the Late Bronze Age burial ground of Statzendorf,[38] Zanat,[39] Jobbágyi[40] and the Late Iron Age necropolis of Sajópetri.[41] The situation is similar in the case of deliberately crushed ceramics (likely to have taken place during the funeral ceremony), despite the prehistoric tradition of smashed objects being included in graves has long been recognised and dealt with by a number of studies.[42] The documentation of intentionally damaged objects is usually limited to metal objects. According to my personal experience, ceramics damaged during their use-life and deliberately broken ceramics both occur frequently in prehistoric cemeteries of the Carpathian Basin. Fortunately, these damaged vessels can increase the number of identified cases of slight and moderate secondary burning detected on prehistoric ceramics.

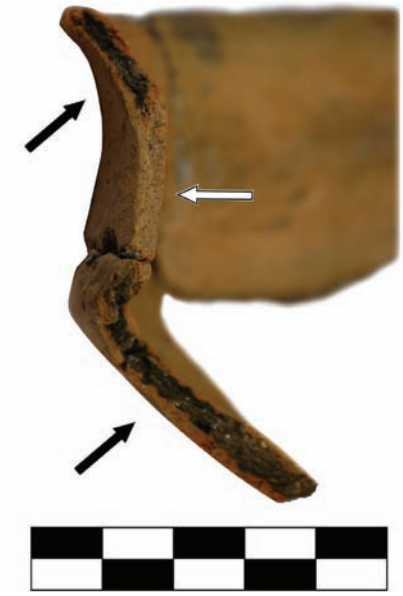

Fig. 11. Bowl with traces of moderate secondary burning. Balatonendréd-Öreghegy, grave 312, vessel no. 2.
11. kép. Tál közepes erősségű másodlagos égés nyomaival. Balatonendréd-Öreghegy, 312. sír, 2. edény.

Fig. 12. Bowl showing signs of slight secondary burning. Its rim was chipped before the secondary burning event took place. Balatonendréd-Öreghegy, grave 312, vessel no. 3.
12. kép. Tál gyenge másodlagos égés nyomaival. Pereme a másodlagos égést megelőzően csorbult. Balatonendréd-Öreghegy, 312. sír, 3. edény.

36 Zalotay 1957; Schreiber 1995.
37 Keszi 2015, 6.
38 Rebay 2006.
39 Udvardi – Radics 2011.
40 Kristóf Fülöp is currently in the process of collecting data for statistical analysis for his doctoral study, with the cemetery of Jobbágyi-Hosszú-dűlő being in its primary focus.
41 Tankó – Gucsi 2018.
42 Grinsell 1961; Soles 1999; Chapman 2000.

Ceramics showing signs of moderately (and slight) secondary burning are less likely to be mentioned by studies, but can be recognised on good-quality colour images. An example of this can be found in the Late Bronze Age cemetery of Zanat in grave 24 – vessel 2, and in grave 8/17 – vessel 2.[43] However, several other objects in this publication appear to be secondarily burnt, unfortunately, the images are not large enough to be able to clearly identify them as such.

It can also be helpful, if the secondarily burnt ceramics are decorated with encrustation. The production of lime is a well-known chemical process that transforms $CaCO_3$ into CaO causing the substance to shrink in the meantime. As a result, lime-based encrustation ornaments that have previously been inserted into already fired ceramics, will crack when exposed to secondary heat. Géza Szabó in his publication entitled *"Pannónia kincse"* presents encrusted motifs on several colourful, detailed, high-quality images.[44] At the bottom of page 46, the image on the left represents a nice example of the cracks on the lime-encrustation of a secondarily burnt vessel. By taking a closer look at the two rhytons (drinking horn-shaped objects), their encrusted decorations also appear to be cracked, especially in places where the encrustation is applied in wide bands.[45] No such cracks can be found on page 33 and 55, where several detailed macro-images of encrusted vessels are presented. These latter objects are all dark-brown or black, indicating that they were fired in a reducing atmosphere, which means, that this is indeed their original colour.

The changes observed on ceramics with signs of moderate secondary burning probably occurred at temperatures between 800 and 1000 degrees Celsius. In the case of burial assemblages, such objects are likely to have been exposed to secondary heat on the funerary pyre but farther away from the hottest part of the fire, perhaps around the head or the feet of the deceased.

Ceramics with traces of slight secondary burning

The majority of ceramics in this category are discoloured, a significant percentage of them only show partial discolouration *(Figs 13, 16, 17.1, 18.2)*. If we take a closer look at a bowl for instance from the Balatonendréd grave 162 *(Fig. 13)*, a long crack is visible running from its rim to the middle of its base. The breakage opens widely on the belly; a typical effect of thermal-shock. The big yellow patch on the base and on the lower side (where the crack also appeared) could indicate that the vessel was placed on, or thrown onto the still glowing remains of the pyre. Ceramic pieces showing signs of slight secondary burning are typically beige, yellow and pale orange in colour. For the identification of slightly secondarily burnt ceramics, the criteria set out for the moderately burnt group can also be applied (e.g. oxidized fracture surfaces). Vessels with traces of slight secondary burning were probably exposed to temperatures of 650–800 degrees Celsius over a relatively short period of time. In some special cases, where only the exterior surface was oxidized, the vessels turned yellow on the outside, while the interior remained dark. These pieces could have been positioned under the pyre, turned upside down, with mouth touching the ground *(Fig. 14)*.

43 Ilon 2011, Fig. 77.1; Fig. 77.3.
44 Szabó 2009.
45 The objects can be found in the upper right corner of page 49: BQ075J24, the other in horizontal position – BQ075J29 (based on Szabó 2010).

Fig. 13. Bowl with traces of slight secondary burning. Balatonendréd-Öreghegy, grave 162, vessel no. 2.
13. kép. Tál gyenge másodlagos égés nyomaival. Balatonendréd-Öreghegy, 162. sír, 2. edény.

It is important to highlight here, that the majority of cooking pots occurring throughout prehistory were shades of yellow, orange and red, either fired deliberately in an oxidizing atmosphere by craftspeople, or received the typical colour due to their function and the related cooking processes. Therefore, the identification of cooking pots must be carried out with consideration. Cooking pots discovered in the Late Bronze Age cemetery of Budapest-Békásmegyer are discussed in a separate section by the authors, mainly from a typological point of view, but the authors also specifically mention Protokalenderberg-type pots, which occurred only in brick-red or light-brown colours. Based on this observation the authors suggest that these pots were fired locally in an oxidizing atmosphere, as opposed to the typically grey, dark-grey, dark-brown or black pieces known from sites in Austria.[46] Since the burial assemblage was not analysed from the perspective of secondary burning and how it affected the appearance of mortuary ceramics, it is still open to interpretation whether the oxidized reddish colour range of Protokalenderberg-type pots observed here was not the consequence of these vessels being involved in the cremation process. With the exception of cooking pots, it can be said that in general: all prehistoric ceramics of yellow-orange-red colours are the outcomes of a secondary burning event (another exception can be the potting traditions of Neolithic cultures).

46 Kalicz-Schreiber et al. 2010, 255.

Fig. 14. Bowl with traces of slight secondary burning. Balatonendréd-Öreghegy, grave 211, vessel no. 4.
14. kép. Tál gyenge másodlagos égés nyomaival. Balatonendréd-Öreghegy, 211. sír, 4. edény.

Fig. 15. Vessel with traces of moderate secondary burning and with scars caused by thermal-shock. Sajópetri-Homoki-szőlőskert, grave 86/166.
15. kép. Edény közepes erősségű másodlagos égés nyomaival és hősokk okozta felületi sérülésekkel. Sajópetri-Homoki-szőlőskert, 86/166 sír.

For the better practical application of the method presented in this study, it has to be kept in mind that the three levels of secondary burning distinguished here are artificially created categories of a broad process involving several stages of transition. In practice, different parts of the same object could suffer different degrees of secondary burning *(Fig. 8)*. In my approach, if for example, a vessel (or sherd) is exhibiting slight secondary burning in 95% of its extent and is only severely burnt in 5% of its surface, then it has to be classified as a severely secondarily burnt object. In detailed descriptions, the different degrees of secondary burning can be mentioned, but the classification must consider the most prominent thermal effect. The reason behind this classification method is that at least one small part of the object has been exposed to the necessary heat and spent the necessary time under such conditions that induced the changes in its original physical and chemical structure.

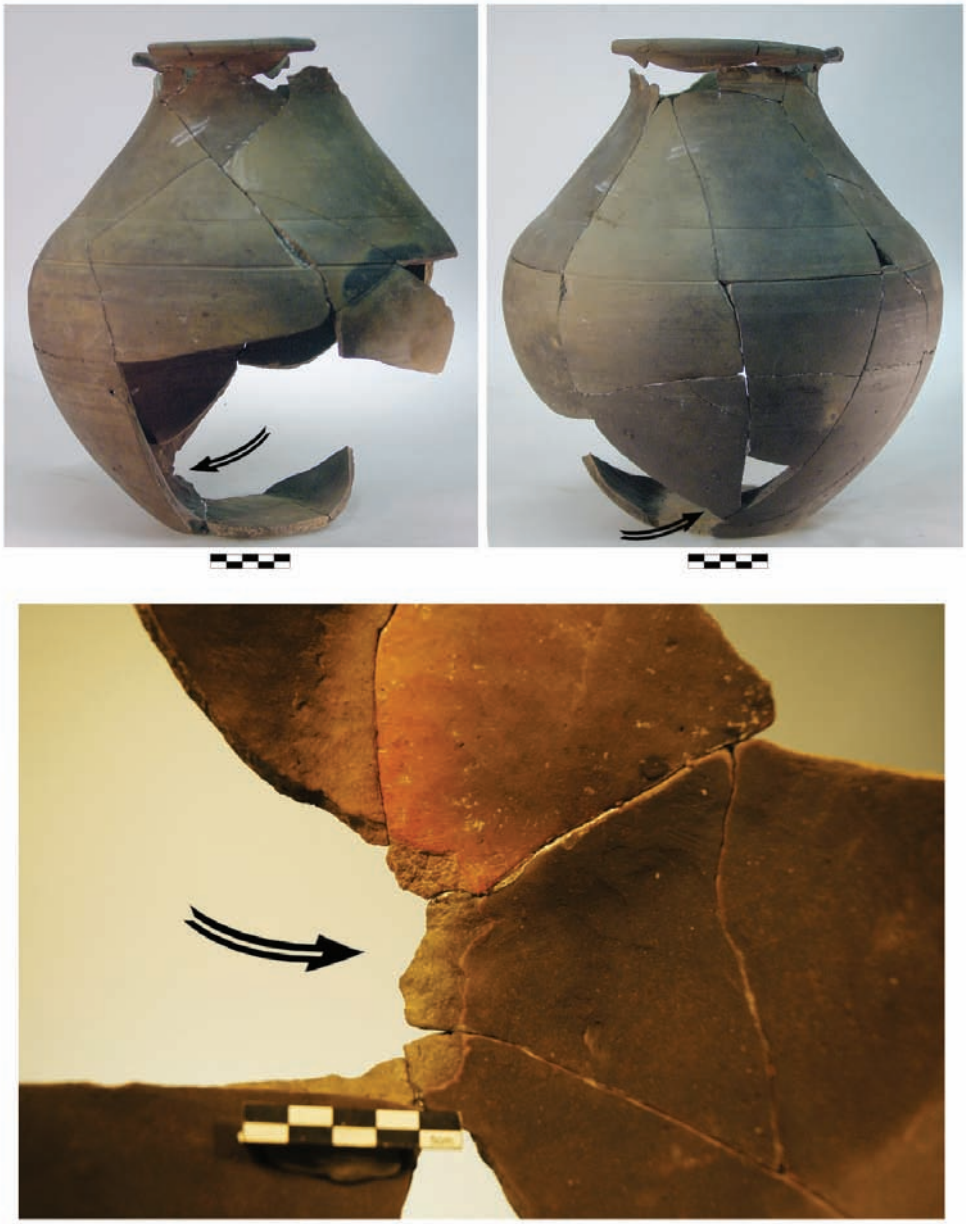

Fig. 16. Vessel showing signs of slight secondary burning with a mark left by the impact of deliberate breakage. Sajópetri-Homoki-szőlőskert, vessel no. 4, grave 78/152.
16. kép. Edény gyenge másodlagos égés nyomaival és szándékos törés okozta sérüléssel. Sajópetri-Homoki-szőlőskert, 78/152 sír, 4. edény.

Brief case studies of deliberately broken vessels with traces of secondary burning from prehistoric graves

The first example is a vessel, whose handle is missing, unearthed from a cremation burial (grave no. 162) at Balatonendréd *(Fig. 7)*. The scar left on the interior side of the rim is black (i.e. non-oxidized surface), suggesting that the handle broke off after the vessel was exposed to secondary heat. In this case, the accurate micro-excavation provided further information. In the undisturbed grave, the vessel was tilting with its rim downwards, leaning against the urn and the bowl, the latter covering the mouth of the burial urn. The vessel was complete when it was placed into the grave, its breakages occurred later due to the taphonomic process. Despite of the finding-circumstances, no fragment of the handle was recorded from the grave. Given the observations, it can be assumed, that the handle was deliberately broken off, after the cremation took place, but before it was deposited in the grave. A similar situation emerges in the case of vessel no. 4 from the same grave *(Fig. 8)*. The position of this vessel was almost identical, placed with its rim facing downwards, but in a slightly different orientation. The second vessel was still in one piece at the moment of excavation, almost intact except a broken handle. The upper part of the handle had been broken off after the secondary burning event took place.

Figure 16 illustrates vessel no. 4 from grave 78/152 (an inhumation burial), discovered in the Late Iron Age cemetery of Sajópetri-Homoki-Szőlőskert.[47] This vessel has a different 'story'. In this case, the vessel was deliberately broken first. Right above the base, a mark left by an unknown implement is clearly visible (shown by double arrows). The implement impacted the vessel from the outside. A couple of large fragments ended up in fire, where they suffered partial and slight secondary burning. This can be observed both on the exterior and on the interior surfaces as well, which turned into a 'mosaic-like, multi-coloured' pattern. Following the secondary burning event, the majority of the fragments (but not all of them) was collected and placed into the grave. Burnt animal bones found with the burial further support the assumption of a ritual activity taking place at the funeral involving burning or fire of some kind.

Summary

By distinguishing between the three categories of secondary burning detected on ceramics and providing descriptions for each class, we are able to better understand the process of prehistoric funerals. Instead of using expensive technology, these observations can be made by the naked eye. Nevertheless, it is necessary to define the extent of thermal effects for the three categories by means of further studies, in combination with the methodologies of experimental archaeology.[48]

As it was illustrated through a number of cases presented in this study, the secondary burning of ceramics is a very common phenomenon in Late Bronze Age burials in Hungary. There are also a large number of secondarily burnt ceramics documented in the graves of the Middle Bronze Age Transdanubian Encrusted Pottery Culture.[49] However, in the published burials

47 Szabó – Tankó 2018, 113–115, Fig. 84.
48 Fülöp 2018.
49 Based on the figures of Szabó 2009; Szabó 2010; Ilon 2018, Fig. 12, Fig. 57.

of the contemporary Vatya culture, I have found only one example among the ceramics from the urn cemetery of Százhalombatta.[50] There is a mug,[51] which, judged by the image, is a secondarily burnt piece. It is also apparent that the rim of the vessel was chipped before it entered the fire. Observations on the ceramics found in the Late Iron Age burials of Sajópetri indicate further cases of secondarily burnt ceramics *(Figs 15–16)*.[52]

The general lack of research in this topic so far does not allow us to draw any further conclusions regarding patterns of chronological changes or territorial differences in terms of secondarily burnt ceramics involved in mortuary practices. Although there are many secondarily burnt vessels that appear on the pages of publications, nevertheless the reasons of their inclusion had clearly been typological rather than analytical of firing processes.[53] However their archaeological contexts,[54] or their unusual features[55] have already brought them in the focus of scholarly attention.[56]

I believe, that the systematic collection and interpretation of data gained from secondarily burnt, deliberately damaged vessels and their use-wear, can open up a whole new perspective for the analysis of cemeteries (including mortuary practices) and for the understanding of special objects or structured deposits.

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References

Antoni, J. – Csupor, I. – Udvardi, B. 2012: Régi fazekasok öreg cserepei (Adalékok a korabronzkori fazekassághoz) (Old sherds of ancient potters [Contributions to Early Bronze Age pottery]). *Évkönyv és jelentés a Kulturális Örökségvédelmi Szakszolgálat 2009. évi feltárásairól (Field Service for Cultural Heritage 2009 Yearbook and Rewiew of Archaeological Investigations).* Budapest, 137–161.

Appadurai, A. (ed.) 1986: *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge.

Bader, T. 1979: Die Suciu de Sus-Kultur in Nordwestrumänien. *Prähistorische Zeitschrift* 54/1, 3–31.

Bergmann, J. 1982: *Ein Gräberfeld der jüngeren Bronze- und älteren Eisenzeit bei Vollmarshausen, Kr. Kassel. Zur Struktur und Geschichte einer vorgeschichtlichen Gemeinschaft im Spiegel ihres Gräberfeldes.* Kasseler Beiträge zur Frühgeschichte 5, Marburg.

50 Poroszlai 1990.
51 Poroszlai – Vicze 2004, Catalogue no. 130, Inv. no.: MM 87.36.1. in the Matrica Museum, Százhalombatta.
52 Szabó – Tankó 2018, 123–124, Fig. 91.
53 Metzner-Nebelsick – Jerem 2016, Fig. 4.4 (right lower corner), Fig. 5.4 (Inv. no.: 93.4.159.11.).
54 Ilon 2018, Fig. 23–25, Fig. 27: vessels from the deposit of Veszprém-Kádárta-Gelemér, feature 621.
55 Dani – Cséki 2017, Fig. 3.4: inside-decorated bowl from Tiszabercel, on page 202, its oxidized firing is mentioned; Fig. 10.2: bowl from Tiszanagyfalu; Fig. 12.2: askos from Szabolcs county; Fig. 23.1: a fragment described as 'cart-like' object (probably a broken pedestal of a suspension vessel) from Ófehértó.
56 Ilon 2018, Fig. 57: a bird-shaped vessel (askos) found together with 360 pieces of bronze tutuli at Felsőörs.
57 All photos by the author. Scale bar = 5 cm.

Bondár, M. 1987: Késő rézkori kemence Esztergom-Diósvölgyben (Spätkupferzeitliche Opfen in Esztergom-Diósvölgy). *Communicationes Archaeologicae Hungariae* 1987, 31–44.

Bondár, M. 1996: Early Bronze Age settlement patterns in South-West Transdanubia. *Antaeus* 22, 197–268.

Brück, J. 2011: Fire, Earth, Water: An Elemental Cosmography of the European Bronze Age. In: Insoll, T. (ed.): *The Oxford Handbook of the Archaeology of Ritual and Religion.* Oxford, 387–404.

Budden, S. – Sofaer, J. 2009: Non-Discursive Knowledge and the Construction of Identity Potters, Potting and Performance at the Bronze Age Tell of Százhalombatta, Hungary. *Cambridge Archeological Journal* 19/2, 203–220.

Chapman, J. 2000: *Fragmentation in Archaeology: People, Places and Broken Objects in the Prehistory of South-Eastern Europe.* London.

Chapman, J. C. – Gaydarska, B. I. 2006: *Parts and Wholes: Fragmentation in Prehistoric Context.* Oxford.

Crandell, O. – Ionescu, C. – Giurgiu, A. – Simon, V. – Trandafir, D. L. – Nagy, J. 2015: Pottery firing technology in the Late Bronze Age and Early Iron Age in NW Romania. In: B. Kiss, G. (ed.): *6th Mineral Sciences in the Carpathians Conference. Veszprém, 16–19 May, 2015, Abstracts.* Acta Mineralogica-Petrographica – Abstract Series 9, Szeged.

Csányi, M. 1996: Újabb adat kelet-magyarországi kora bronzkorunkhoz (Teleprészlet Tiszakürt határában) (New data to the Early Bronze Age of East Hungary). *Tisicum – A Jász-Nagykun-Szolnok Megyei Múzeumok Évkönyve* 9, 45–75.

Csányi, M. – Tárnoki, J. 2013: Túrkeve-Terehalom – a tell 2. települési szintje. Étkészlet a bronzkori házból (A dinner set from a Bronze Age house in level 2 of the Túrkeve-Terehalom settlement). *Tisicum – A Jász-Nagykun-Szolnok Megyei Múzeumok Évkönyve* 22, 13–29.

Dani, J. – Cséki, A. 2017: Kora bronzkori művészeti tendenciák a Felső-Tisza-vidéken (Early Bronze Age art trends in the Upper Tisza region). In: Dani, J. – Kolozsi, B. – Nagy, E. Gy. – Priskin, A. (szerk.): *ΜΩΜΟΣ VIII. Őskoros Kutatók VIII. Összejövetelének konferenciakötete. Őskori művészet – Művészet az őskorban, Debrecen 2013. október 16–18.* Debrecen, 201–232.

Domboróczki, L. 2005: A Körös-kultúra északi elterjedési határának problematikája a Tiszaszőlős-Domaháza-pusztán végzett ásatás eredményeinek fényében (The problem of the Northern extension of the Körös Culture in the light of excavation results from Tiszaszőlős-Domaháza). *Archeometriai Műhely* 2005/2, 5–15.

Eke, I. 2008: A Szegvár-Kontra-parti késővaskori telep (Late Iron Age settlement from Szegvár-Kontra-part). *Zalai Múzeum* 17, 149–164.

Felipe, C. V. – Bellón, J. M. – Bellón, B. 2019: An Experimental Approach to Fire-Induced Alteration of Pottery Fabrics. *EXARC.net* 2019/2. (https://exarc.net/issue-2019-2/mm/crafter-experimental-approach-fire-induced-alteration-pottery-fabrics?fbclid=IwAR1uCl6O0UpNyzE4i4GUStBjZK2q86KtMG-shXJwyIVAus2U6ejN3zNdqhQ)

P. Fischl, K. – Kiss, V. – Kulcsár, G. 1999: Kora és középső bronzkori település Baks-Homokbánya (Csongrád megye) lelőhelyen (Früh- und mittelbronzezeitliche Siedlungen auf dem Fundort Baks-Homokbánya [Komitat Csongrád]). *A Móra Ferenc Múzeum Évkönyve – Studia Archaeologica* 5, 77–190.

Fülöp, K. 2018: Why is it so rare and random to find any pyre sites? Two cremation experiments to understand the characteristics of pyre sites and their investigational possibilities. *Dissertationes Archaeologicae* 3/6, 287–311.

Fülöp, K. 2020: The Ritual Role of Wells beyond their Everyday Water-providing Function: A Late Bronze Age well from Pusztataskony-Ledence (A kutak rituális szerepe a mindennapi vízadáson túl.

Egy késő bronzkori kút Pusztataskony-Ledencéről). In: Csengeri, P. – Kalli, A. – Király, Á. – Koós, J. (szerk.): *ΜΩΜΟΣ IX. A rituálé régészete. Őskoros Kutatók IX. Összejövetelének konferenciakötete. Miskolc, 2015. október 14–16.* Dissertationes Archaeologicae – Supplementum 3, 171–192.

Fülöp, K. – Váczi, G. 2016: A késő bronzkori hamvasztásos temetkezés: összetett esemény kevés maradvánnyal (Late Bronze Age Cremation Burials: A Complex Event with Few Remains). *Magyar Régészet, Online magazin, 2016 tavasz* (*Hungarian Archaeology, E-journal, 2016 spring).* (http://files.archaeolingua.hu/2016TA/Fulop-Vaczi_H16S.pdf / http://files.archaeolingua.hu/2016TA/Fulop-Vaczi_E16S.pdf)

Gherdán, K. – Horváth, T. – Tóth, M. 2012: Lehetőségek a kerámia-kőzettani kutatásokban. Esettanulmány egy több-periódusú lelőhelyen (Balatonőszöd – Temetői-dűlő, M7/S-10 lelőhely) (Potentials in a ceramic petrography research. A case study at a multy-period site [Balatonőszöd-Temetői-dűlő, M7/S 10]). In: Kreiter, A. – Pető, Á. – Tugya, B. (szerk.): *Környezet – Ember – Kultúra. A természettudományok és a régészet párbeszéde. Magyar Nemzeti Múzeum Nemzeti Örökségvédelmi Központ 2010. október 6-8-án megrendezett konferenciájának tanulmánykötete (Enviroment – Human – Culture. Dialogue between Applied Sciences and Archaeology. Proceedings of the conference held between 6th and 8th of October 2010 by the National Heritage Protection Centre of the Hungarian National Museum).* Budapest, 291–305.

Gosden, Ch. 2005: What Do Object Want? *Journal of Archeological Method and Theory* 12/3, 193–211.

Gosden, Ch. – Marshall, Y. 1999: The Cultural Biography of Objects. *World Archaeology* 31/2, 169–178.

Grinsell, L. V. 1961: The Breaking of Objects as a Funerary Rite. *Folklore* 72/3, 475–491.

Gucsi, L. 2001: A bronzkori speciális házikerámiák használatának kérdése (The Question of the Use of Special Domestic Pottery in the Bronze Age). In: Dani, J. – Hajdú, Zs. – Nagy, E. Gy. – Selmeczi, L. (szerk.): *ΜΩΜΟΣ I. "Fiatal Őskoros Kutatók" I. Összejövetelének konferenciakötete. Debrecen, 1997. november 10–13.* Debrecen, 195–198.

Gucsi, L. – Szabó, N. 2018: Examination and possible interpretations of a Middle Bronze Age structured deposition. *Dissertationes Archaeologicae* 3/6, 217–285.

Hoeck, V. – Ionescu, C. – Metzner-Nebelsick, C. – Nebelsick, L. D. 2012: Mineralogy of the ceramic slags from the Bronze Age funerary site in Lapus, NW Romania. *Geological Quarterly* 56/4, 631–646.

Ilon, G. 1996: A késő halomsíros – kora urnamezős kultúra temetője és tell-települése Németbánya határában (Das Gräberfeld und Tell der Späthügelgräber- Frühurnenfelderkultur in der Gemarkung Németbánya). *Pápai Múzeumi Értesítő* 6, 89–208.

Ilon, G. 2018: Veszprém megye bronz- és kora vaskora. *A Laczkó Dezső Múzeum tudományos ismeretterjesztő muzeológiai magazinja, LDM online* 2. (http://www.ldm.hu/sites/vmmuzeum.infornax.hu/files/publikaciok/ldm_online_2_2018_1.pdf)

Ilon, G. 2011: A temető keltezése (The dating of the cemetery). In: Kvassay, J. (szerk.): *Szombathely-Zanat késő urnamezős korú temetője és a lelőhely más ős- és középkori emlékei. Természettudományos vizsgálatokkal kiegészített anyagközlés (The Late Urnfield period cemetery from Szombathely-Zanat supplemented by an assessment of Prehistoric and Medieval settlement features and interdisciplinary analyses).* VIA. Kulturális örökségvédelmi kismonográfiák (VIA. Monographia minor in cultural heritage) 2. Budapest, 135–173.

Jaeger, M. – Staniuk, R. – Müller, J. – Kulcsár, G. – Taylor, N. 2018: History of the Bronze Age Habitation. In: Jaeger, M. – Kulcsár, G. – Taylor, N. – Staniuk, R. (eds): *Kakucs-Turján: A Middle Bronze Age multi-layered fortified settlement in Central Hungary.* Studien zur Archäologie in Ostmitteleuropa 18. Bonn, 97–118.

Kacsó, C. – Metzner-Nebelsick, C. – Nebelsick, L. D. 2012: Kontinuität und Diskontinuität im Bestattungsverhalten der spätbronzezeitlichen Eliten in Nordwestsiebenbürgen am Beispiel der Hügelnekropole von Lapus in Nordwestrumänien. In: Bérenger, D. – Bourgeois, J. – Talon, M. – Wirth, St. (Hrsg.): *Gräberlandschaftender Bronzezeit. Internationales Kolloquium zur Bronzezeit, Herne, 15.-18. Oktober 2008.* Bodenaltertümer Westfalens 51. Darmstadt, 457–475.

Kalicz-Schreiber, R. – Kalicz, N. – Váczi, G. 2010: *Ein Gräberfeld der Spätbronzezeit von Budapest-Békásmegyer.* Budapest.

Keszi, T. 2015 Pont, pont vesszőcske – hová lett a fejecske? (Question of Headless Figures on Bronze Age Urns). *Magyar Régészet, Online magazin, 2015 tél (Hungarian Archaeology, E-journal, 2015 winter).* (http://files.archaeolingua.hu/2015T/Keszi_H15T.pdf / http://files.archaeolingua.hu/2015T/eng_Keszi_15T.pdf)

Metzner-Nebelsick, C. – Jerem, E. 2016: Das älterurnenfelderzeitliche Grab 159 aus Sopron-Krautacker – Ein Beitrag zur Rolle von Gold als Bestandteil der Tracht. *Antaeus* 34, 11–34.

Michelaki, K. 2008: Making Pots and Potters in the Bronze Age Maros Villages of Kiszombor-Új-Élet and Klárafalva-Hajdova. *Cambridge Archaeological Journal* 18/3, 355–380.

Popescu, A.-D. 2010: Deliberate Destruction of Pottery During the Bronze Age: A Case Study. In: Bolohan, N. – Măţău, F. – Tencariu, F. A. (eds): *Signa Praehistorica. Studia in honorem magistri Attila László septuagesimo anno.* Honoraria 9. Iaşi, 213–227.

Poroszlai, I. 1990: Vatyai urnatemető Százhalombattán (Urnengräberfeld aus der Vatya-Kultur in Százhalombatta). *Archaeologiai Értesítő* 117, 203–214.

Poroszlai, I. – Vicze, M. (szerk.) 2004: *Százhalombatta története a bronzkortól napjainkig. A százhalombattai "Matrica" Múzeum állandó kiállításának katalógusa.* Százhalombatta.

Rebay, C. K. 2006: *Das hallstattzeitliche Gräberfeld von Statzendorf in Niederösterreich.* Universitätsforschungen zur prähistorischen Archäologie 135, Bonn.

Rye, O. S. 1981: *Pottery Technology: Principles and Reconstruction.* Manuals on Archaeology 4, Washington.

Schreiber, R. 1995: *Bronzkori urnatemető Szigetszentmiklós határában. (Das bronzezeitliche Urnengräberfeld von Szigetszentmiklós).* Ráckevei Múzeumi Füzetek 2, Ráckeve.

Soles, J. S. 1999: The ritual "killing" of pottery and the discovery of a Mycenean Telastas at Mochlos. In: Betancourt, P. P. – Karageorghis, V. – Laffineur, R. – Niemeier, W. D. (eds): *Meletemata. Studies in Aegean Arcaeology Presented to Malcolm H. Wiener as He Enters his 65th Year.* Aegeum 20. Liège, 787–792.

Stolba, V. F. 2002: Handmade Pottery. In: Hannestad, L. – Stolba, V. F. – Šceglov, A. N. (eds): *Panskoye I. Vol. 1. The Monumental building U6.* Archaeological Investigations in Western Crimea 1. Aarhus, 180–200.

Szabó, G. 1992: A Dunaföldvár-Kálvária tell-település kora bronzkori rétegsora és Őskori leletek Kölesd-Téglagyár lelőhelyről (Die Schichtenreihe der Tellsiedlung von Dunaföldvár-Kálvária zur frühen Bronzezeit). *A Wosinsky Mór Múzeum Évkönyve* 17, 35–204.

Szabó. G. 2009: *Pannónia kincse. A mészbetétes edények népének bonyhádi temetője (Schatz von Pannonien. Das Gräberfeld der inkrustierten Keramik von Bonyhád).* Szekszárd.

Szabó, G. 2010: A Dunántúli mészbetétes edények népe kultúrájának kialakulása és belső időrendje a Bonyhádon feltárt temetőrészlet tükrében (Ausgestaltung der Kultur und innere Zeitordnung des Volkes des inkrustierten Gefäße wom Transdanubien – im Spiegel des in Bonyhád freigelegten Friedhofteiles). *A Wosinsky Mór Múzeum Évkönyve* 32, 101–128.

Szabó, M. – Tankó, K. 2018: La nécropole celtique à Sajópetri–Homoki-szőlőskert. In: Szabó, M. (dir.) – Czajlik, Z. (ass.) – Tankó, K. (ass.): *La nécropole celtique à Sajópetri-Homoki-szőlőskert.* Budapest, 9–224.

Szeverényi, V. 2013: Bronzkori „háztűznéző": szándékos házégetés és anyagi metaforák a Kárpát-medence kora és középső bronzkorában (Deliberate house-burning and material metaphors in the Early and Middle Bronze Age of the Carpathian Basin). *Őrségészeti Levelek (Prehistoric Newsletter)* 13, 215–232.

Tankó, K. – Gucsi, L. 2018: Observations technologiques, défauts de fabrication et dégâts dus à l'utilisation, relatifs à la céramique funéraire du second âge du Fer mise au jour à Sajópetri. In: Szabó, M. (dir.) – Czajlik, Z. (ass.) – Tankó, K. (ass.): *La nécropole celtique à Sajópetri-Homoki-szőlőskert.* Budapest, 373–408.

Tringham, R. 2013: Destruction of Places by Fire – Domicide or Domithanasia. In: Driessen, J. (ed.): *Destruction: Archaeological, Philological, and Historical Perspectives.* Louvain, 89–108.

Udvardi, B. – Radics, A. 2011: Restaurálás közbeni megfigyelések a zanati temető kerámiáin. In: Kvassay, J. (szerk.): *Szombathely-Zanat késő urnamezős korú temetője és a lelőhely más ős- és középkori emlékei. Természettudományos vizsgálatokkal kiegészített anyagközlés (The Late Urnfield period cemetery from Szombathely-Zanat supplemented by an assessment of Prehistoric and Medieval settlement features and interdisciplinary analyses).* VIA. Kulturális örökségvédelmi kismonográfiák (VIA. Monographia minor in cultural heritage) 2. Budapest, 175–180.

Váczi, G. 2020: Az urnás-hamvasztásos temetkezés eseménysorának elemzése az urnamezős időszak balatonendrédi temetőjének példáján (Event Analysis of Cremation Burials by the Example of the Urnfield Period Cemetery at Balatonendréd). In: Csengeri, P. – Kalli, A. – Király, Á. – Koós, J. (szerk.): *ΜΩΜΟΣ IX. A rituálé régészete. Őskoros Kutatók IX. Összejövetelének konferenciakötete. Miskolc, 2015. október 14–16.* Dissertationes Archaeologicae – Supplementum 3, 193–214.

Vicze, M. 2011: *Bronze Age Cemetery at Dunaújváros-Duna-dűlő.* Dissertationes Pannonicae 4/1, Budapest.

Vuković, J. 2014: Archaeological Evidence of Pottery Forming Sequence: Traces of Manufacture in Late Neolithic Vinča Assemblage. In: Vitezović, S. – Antonović, D. (eds): *Archaeotechnology. Studying Technology from Prehistory to the Middle Ages.* Belgrade, 177–198.

Vuković, J. 2015: Secundarna upotreba, ponovna upotreba i recikliranje keramičkih posuda: podaci iz kasnoneolitske Vinče (Secondary use, reuse and recycling of ceramic vessels: evidence from late Neolithic Vinča). *Archaica* 3, 111–126.

Zalotay, E. 1957: *Kelebiai bronzkori temető.* Régészeti Füzetek 6, Budapest.

A másodlagosan égett kerámiák meghatározásának módszere és azok előfordulása hamvasztásos temetkezésekben, valamint rituális cselekvésekkel összefüggésbe hozható leletegyüttesekben

A régészeti kerámialeletekben (települések és temetők anyagában is) általánosan előfordulnak másodlagosan égett kerámiák. Meghatározásuk növelheti az egyes kontextusok értelmezési kereteit, a hamvasztásos temetkezések esetében a halottégetés rítusának részleteire világíthat rá. Felismerésük általában csak az erősen másodlagosan égett daraboknál történik meg, mely tárgyak látványosan deformálódnak, felhólyagosodnak. Különbséget tehetünk azonban gyengén, közepesen és erősen másodlagosan égett kerámiák között. Ezzel a differenciáltabb csoportosítással lehetőség nyílik a temetkezési rítusok részletesebb megismerésére. Meghatározásukkal elemezhetővé válik, hogy mely kerámiatípusok hozhatók kapcsolatba a halotti

máglyára helyezés szokásával. A másodlagos égés foka összefüggésben áll a tárgyaknak a halotti máglyán elfoglalt pozíciójával, illetve a tűzben eltöltött idejükkel. A kerámiák vizsgálatával meghatározható az is, hogy összetörésük a tűzbe kerülésük előtt vagy után történt. A bemutatott vizsgálati módszer elterjedése és standardizálódása után összehasonlíthatóvá válhat a kerámiatárgyak hamvasztásos temetkezésekben betöltött szerepe és az azokkal végzett különböző cselekmények, az egyes kultúrák és korszakok egymáshoz hasonló vagy egymástól eltérő temetkezési rítusainak gyakorlataiban. Az elemzett leletek a Balatonendréd-Vaklápa-Öreghegy lelőhelyen 2011-ben Petkes Zsolt vezetésével feltárt késő bronzkori urnasírokból származnak. Restaurálásuk az Archeolore Kft.-ben történt. A leletanyag feldolgozását Váczi Gábor végzi.

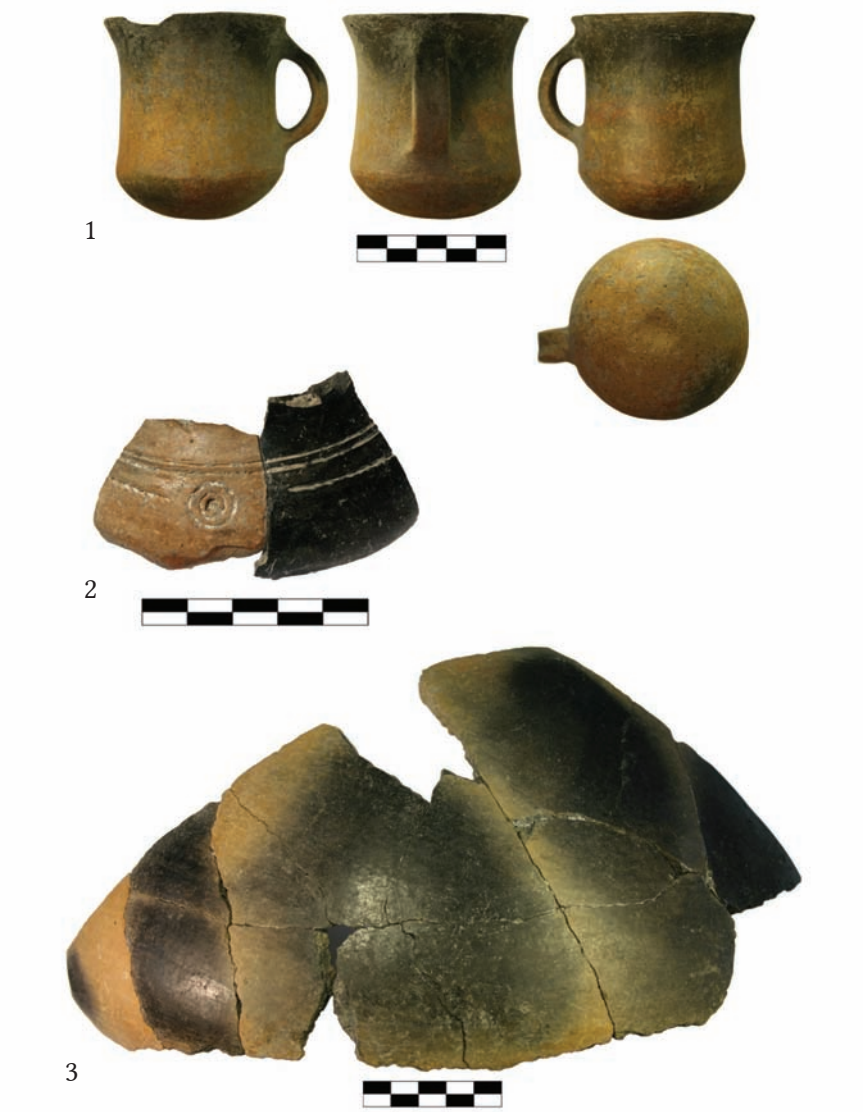

Fig. 17. 1 – Partial secondary burning pattern. A cup from Kakucs-Turján (KEX 2014–16, Trench 2, Inv. no.: F2_050341 (See its *in situ* position at Jaeger et al. 2018, Fig. 21), 2 – 'Mosaic-like' pattern on a Csór-type cup (Transdanubian Encrusted Pottery Culture) from Kakucs-Turján (KEX 2014–16, Trench 1, vessel no. 13, 3 – 'Mosaic-like' pattern on a belly-shoulder part of a storage vessel from Kakucs-Turján (KEX 2013–16, Trench 1, vessel no. 48).
17. kép. 1 – Részleges másodlagos égés okozta mintázat. Kakucs-Turjánról származó bögre (KEX 2014–16, 2. árok, ltsz.: F2_050341) (*in situ* helyzetben ld. Jaeger et al. 2018, 21. kép), 2 – Csóri típusú bögre töredéke „mozaikossággal" Kakucs-Turjánról (KEX 2014–16, 1. árok, 13. edény) (dunántúli mészbetétes kerámia kultúrája), 3 – Tárolóedény vállán látható „mozaikosság" Kakucs-Turjánról (KEX 2013–16, 1. árok, 48. edény).

Fig. 18. 1 – Partial and slight secondary burning detected on a sherd of a bowl from Kakucs-Turján (KEX 2013–16, Trench 1, Inv. no.: F1_133365) (Jaeger et al. 2018, Fig. 11d), 2 – Partial and slight secondary burning on a sherd of a bowl from Kakucs-Turján (KEX 2013–16, Trench 1, Inv. no.: F1_050695).
18. kép. 1 – Részleges és gyenge másodlagos égés nyomai egy Kakucs-Turjánról származó táltöredéken (KEX 2013–16, 1. árok, Inv. no.: F1_133365) (*in situ* helyzetben ld. Jaeger et al. 2018, 11d. kép), 2 – Részleges és gyenge másodlagos égés nyomai egy Kakucs-Turjánról származó táltöredéken (KEX 2013–16, 1. árok, Inv. no.: F1_050695).

Fig. 19. Severe secondary burning that caused a sherd to develop a foamy, slag-like surface. Kakucs-Turján (KEX 2013-16, Trench 1, Inv. no.: M1_02001).
19. kép. Erős másodlagos égés, mely hólyagos, salakszerű felületet hozott létre a kerámiatöredéken. Kakucs-Turján (KEX 2013-16, 1. árok, Inv. no.: M1_02001).

Fig. 20. Severe secondary burning on a sherd resulting in a foamy, slag-like appearance. Kakucs-Turján (KEX 2013–16, Trench 1, Inv. no.: M1_05321).
20. kép. Erős másodlagos égés, mely a kerámiatöredék hólyagos, salakszerű megjelenését okozta. Kakucs-Turján (KEX 2013–16, 1. árok, Inv. no.: M1_05321).

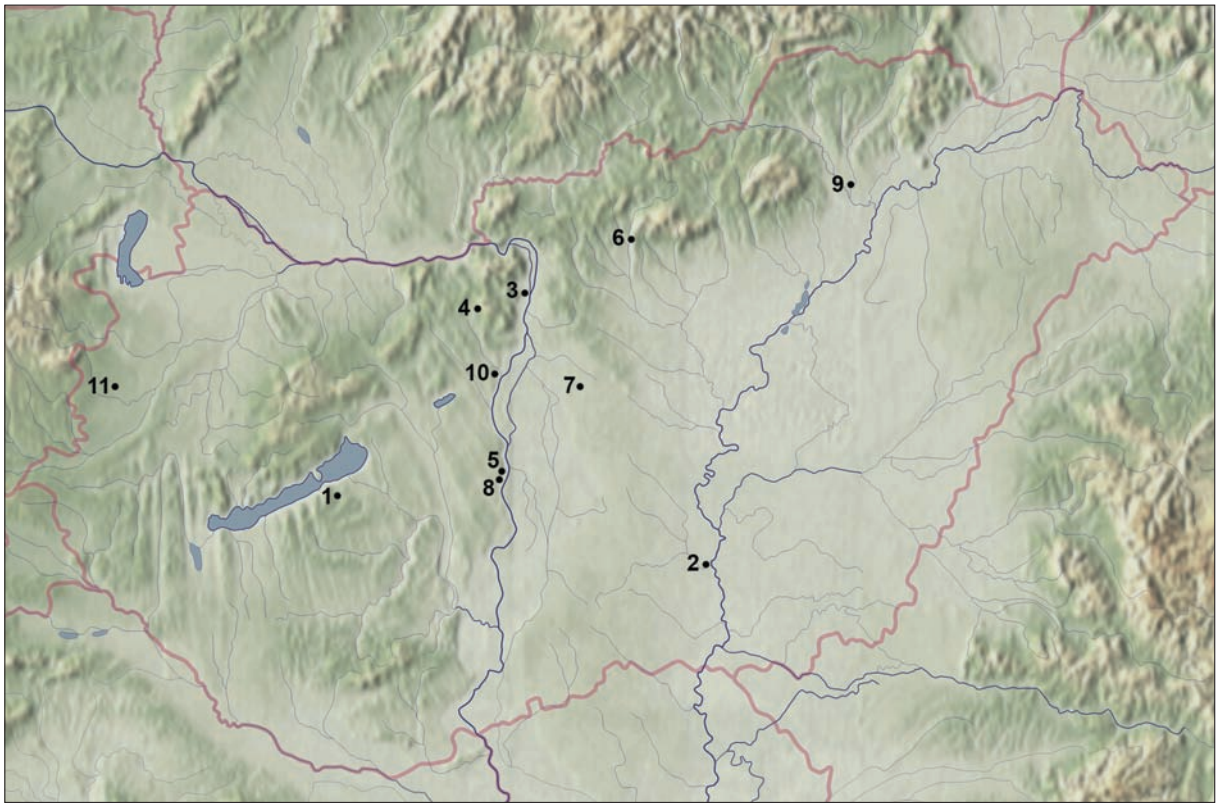

Fig. 21. Archaeological sites mentioned in the text: 1 – Balatonendréd, 2 – Baks, 3 – Budapest-Békásmegyer, 4 – Budajenő, 5 – Dunaújváros, 6 – Jobbágyi, 7 – Kakucs, 8 – Kisapostag, 9 – Sajópetri, 10 – Százhalombatta, 11 – Szombathely-Zanat. Map: ©Institute of Archaeology, Research Centre of Humanities.
21. kép. A cikkben említett régészeti lelőhelyek: 1 – Balatonendréd, 2 – Baks, 3 – Budapest-Békásmegyer, 4 – Budajenő, 5 – Dunaújváros, 6 – Jobbágyi, 7 – Kakucs, 8 – Kisapostag, 9 – Sajópetri, 10 – Százhalombatta, 11 – Szombathely-Zanat. Térkép: ©Bölcsészettudományi Kutatóközpont, Régészeti Intézet.