Dead and cremated: on cremation burials in the Linear Pottery culture in Central Europe

Noémi Beljak Pažinová¹, Alena Bistáková²

¹ Constantine the Philosopher University in Nitra, Department of Archaeology, Nitra, SK
² Institute of Archaeology of the Slovak Academy of Sciences, Nitra, SK

ABSTRACT – Cremation was one of the permissible burial practices in the Linear Pottery Culture (LPC). This treatment has largely remained unexplained by previous research in Central Europe due to its descriptive nature. As a result, we present several thoughts on some key issues here. First, we discuss the current state of research in Central Europe, as well as some specifics with regard to the LPC and cremation. Second, we focus on two graveyards with exclusively or primarily cremation graves. Based on the current state of research, our goal is to evaluate the results obtained using a quantitative data analysis method, as well as an evaluation of the interpretation of cremation within the LPC population.

KEY WORDS – Central Europe; Linear Pottery culture; cremation; state of research; customary mode of disposal

Introduction

Linear Pottery culture (hereinafter LPC) played a key role in the Neolithization of Central Europe. It is a period of the early Neolithic farming communities, and is dated between the middle 6th and the second half of the 5th millennium BC (Manning et al. 2014).

Not much attention has been paid to the topic of cremation burials of the LPC in Central Europe so far, perhaps except for the study by Edith Hoffmann (1973). The main reason was the previously small number of LPC graves found in the burial context. The situation was changed by the discovery of the biritual burial grounds in Kleinhadersdorf, Austria (Neugebauer-Maresch, Lenneis 2015) and Kralice na Hané, Moravia (Šmíd 2006; 2012), and of the cremation cemetery in Modlniczka, Little Poland (Czekaj-Zastawny, Przybyla 2012).

The last person to deal with the analysis of the beginnings of cremation from the Mesolithic to the Early Neolithic with a focus on the LPC culture...
in the wide territory of Europe was Agnieszka Gil-Drozdz (2011), a decade ago. Therefore, the present study attempts to fill in this gap and utilize new data and information which have been added to the study of the topic. The concept of cremation within the presented archaeological material is used to indicate the burial rite, i.e. method of burial of a dead individual. According to Howard Williams (2004 Tab. 1) and Lise Harvig (2015) cremation can be defined as the use of fire to dispose of a body (burying a dead individual’s body), i.e. it is a process in which the dead body was partly or completely burned.

For the analysis, we selected two examples (burial grounds), which in the current state of research seem to be the most suitable for using the method of correspondence analysis1 (CA). CA (Greenacre 2007) works on a presence/absence basis. It does not consider the number of items in any individual grave. To qualify for the analysis, each object and variable must be represented twice (each burial must contain two or more grave good types; each grave good type must occur in two or more burials). For both selected sites a catalogue of burials and grave goods was available. Besides aspects about the body (sex and age), we recorded the grave goods associated with the burial (number and type of grave goods in each burial). We were looking for potential patterns between the grave goods themselves, and by adding in further information such as age and sex, we were able to see if these variables explain the variation seen in the dataset.

We intend to find out whether the obtained terrain information or the state of cemeteries itself, is suitable for this type of analysis and what results can be expected. We will study the place in which the cremation burials were situated, who was buried in them and what grave goods were added to the individuals’ graves. We want to know what it says about the buried individual, and if the burial method reflects the deceased person’s social identity.

Historical context of cremation in hunter-gatherer society

Fire has been part of prehistoric burial rituals since the Mesolithic, with its cleansing but also destructive power (Gray Jones 2017; Larsson, Nilsson Stutz 2014). The number of known Mesolithic cremation burials has increased significantly in the last two decades. In Europe approximately 22 sites are recorded, which seems to be a small number in comparison to more than 200 sites of Mesolithic inhumation graves with more than 2100 individuals (Grünberg 2000.1, 51–54, 170, 171; 2008.40, 54; Gray Jones 2017.Fig. 2.1; Little et al. 2017. Tab. 2). Specific features of burial rituals associated with Mesolithic cremations include, for instance, collecting or cleaning of bones before the burial (e.g., Hammelev, Gøngehusvej 7 – grave Æ) or, on the other hand, the custom when bones were not completely collected from the funeral pyre (e.g., Hermitage – pits A and B, Gøngehusvej 7 – grave N, Oirschot V, Coswig, Rotterdam, Heffingen?, la Chaussée-Tirancourt; see Gray Jones 2017.Tab. 2.1). The research is focusing on various methods of depositing the bodily remains in the ground (Fahlander 2012, Gray Jones 2017.41–45) as well as on interpretation of the variability in the number and typological composition of grave goods to confirm their active role in the burial ritual (Little et al. 2017.235–236). Within Central Europe, cremation in the Mesolithic was discovered in Poland and in the territory of the great Danube Bend on the border between Serbia and Romania (the region of the Iron Gate). In Poland, this includes the cremation of an adult male(?) in a shallow pit on the Wieliszew VII site and the cremation of several individuals (at least one child and other individuals) in a dwelling at the Pomorsko 1 settlement (Suglojowska 2006.196). Intentionally burned human skeletons were recorded in four Mesolithic graves at Mszano 14, which the author considers to be evidence of a combination of cremation and inhumation (Marciniak 1993.7).

In the Iron Gate region at the site of Vlasac, 18 contexts with burned human remains were examined between 1970 and 1971, and the number of documented cremations increased further between 2006 and 2007, when seven more cremation graves and at least six secondary cremations were found in skeletal graves (Borić et al. 2009.247–282, 2014.14, 20, Tab. 3). The phenomenon of secondary cremation consisted of disarticulation of some parts of the skeleton and their tanning/burning, while other parts of the skeleton remained without cremation (Borić et al. 2009.257). The secondary cremation on the site was characteristic of the Late Mesolithic and had the purification aim to prepare the spot for a new grave (Borić et al. 2009.272, 273). This habit
persisted until the transitional period of Mesolithic-Neolithic dating in the region between 6200–5900 BC (Borić et al. 2014.20, 25).

All in all, the Mesolithic cremations in Europe provide clear evidence that hunter-gatherers knew and used cremation as a method of disposal of human bodies. It is also obvious that cremation of the dead as well as depositing utility artefacts/tools on the pyre or in the grave were important aspects of the ritual behaviour of communities (Lenneis 2007). Some actions were undoubtedly associated with cooking or a funeral feast. We can conclude that the ritual depositing of cremated remains together with grave goods at a previously decided place was a characteristic feature of prehistoric life before the start of the Neolithic. It is also true that cremation was not the only burial practice at Mesolithic burial grounds (sites), but was closely associated with inhumation or another form of burial customs (Borić et al. 2014.20; Gray Jones 2017; Little et al. 2017).

Evidence of biological interaction between incoming farmers and local hunter-gatherers during the earliest stages of the arrival of farming in Neolithic Central Europe (the formative LPC phase) has also recently been proved based on bioarchaeological analysis of the remains of the interred at Brunn 2 site of the Brunn am Gebirge-Wolfholz complex, one of the oldest LPC sites (Nikitin et al. 2019). Furthermore, prior studies also found a limited presence of hunters-gatherers in the DNA of the LPC population (e.g., Shennan 2018; Lipson et al. 2017; Szécsényi-Nagy et al. 2015; Haak et al. 2010).

On the other hand, cremation was not often practised in the Starevo-Körös-Criş culture, which was the likely ancestor of the LPC in Europe (Bánffy et al. 2007). The oldest incineration grave is M7 from the settlement Gura Baciului (Starčevo-Criş culture) (Vlassa 1968.371–379). Until now, it is the only certain discovery for the Carpathian-Danubian Early and Middle Neolithic (Gligor, Bănciu-Crişan 2014.50). The find is unique not only for the peculiarity of the cremation grave in the given timeframe, but also for its position between the fragments of the house debris (complex P24), which relates to rituals committed to the priests of the time. The finding of a monumental stone head (stela) covering the burial emphasises the cult’s supremacy (Lazarović, Lazarović 2006.107, Fig. 6). Another discovery that demonstrates the Körös culture’s use of cremation is likewise cultic in nature. It was discovered in a secondary location on the outskirts of the tell Hőmezvásár-hely-Gorzsa I (Kovács-tanya). The lower part of an anthropomorphic container called the ‘Venus of Gorza’ contained evidence of charred skull fragments and grain (GazdapusztaI 1957.12, Tabs. I, III). Calcined bone fragments belonged to the skull of a 60-year-old male (Paluch 2012.182; Farkas 2005.13).

**Linear Pottery culture burial practices**

The LPC demonstrates the diversity of funeral customs. Generally left-sided crouched inhumations dominate, right-sided crouched positions, cremations, double graves, prone and supine positions are recurrent; partial burials, disarticulated bodies, cenotaphs, and post-mortem manipulations are also documented. In addition, cemeteries and burials in settlements coexist in most areas (Pechtl, Hofmann 2013; Bickle, Whittle 2013.46–48, 57–58, 107–114, 168–170; Hofmann, Orschiedt 2015; Zeeb-Lanz, Haack 2016).

With regard to documented burials in Central Europe, inhumations with cremated bodies lying mainly on their left sides prevailed (Lichter 2003.139; Kalicz, Makkay 1977; Oross, Marton 2012, 282–291). Burial districts/areas are first recorded in the Late LPC, e.g., in Austria, Kleinhadersdorf (Neugebauer-Maresch, Lenneis 2015) and in Slovakia, Nitra-Priemyslová ulica (Pavúk 1972). The proximity of burial grounds to settled areas, like in western Europe, e.g., in Elsloo, the Netherlands (Moddermann 1970) or in Arnoldsweiler, Germany (Cziesla, Ibeling 2014.125–150) is also confirmed. In Vedrovice, Moravia, dated to LPC I and LPC II, graves were located at a separate burial ground as well as in the residential area (Podborský 2002.9–21; Pettitt, Hedges 2008). The ritual burial ground Kalicte na Haně, Moravia, was also situated near the contemporary settlement (Šmíd 2012.14–15).

The dead buried in the residential area near houses were either in graves or settlement pits, e.g., in Slovakia – Štúrovo (Pavúk 1994.94–99); Hurbanovo-Bohata (Brezinová, Pažinová 2011.168–171), in Moravia – Žádovice (Čižmar, Geislerová 1997); Brno-Bohunicke (Dockalová, Čižmar 2008.43); in Hungary – Balatonszársz-kis-erdéi-dűlő (Marton 2008.197–198; Kreter et al. 2017.113); Harta-Gátörház (Kistárt et al. 2014.31–33); Füzesabony-Gubakút (Alfold/eastern LPC; Kalicz, Koós 1997; Bickle, Whittle 2013.64–66); Mezőkövesd-Mocsolyás (Szatmár II group/Alfold LPC; Raczky et al. 1997.28–33; Kalicz, Koós 2014.65–69); in Poland – Miechowice 4, Brześć Kujawski 3 (Grygiel 2004); Ludwinowo 7 (Czerniak, Kabaciński 2004.154–155); Stary Za-
mek (Kulczycka-Leciejewiczowa, Romanow 1985. 45–47). A burial directly connected with a house (foundations) has been confirmed in Little Poland (Kulczycka-Leciejewiczowa 2008.176) and in Slovakia (Bátora 1999).

Daniela Hoffman (2009.230–232) concluded that in both such cases it is a regular burial act, and thus that burials within settlements do not mean any exceptional burial tradition (Sonderbestattung in German), and this also undoubtedly applies to Central Europe. For instance, in Slovakia, the study of Michaela Niklová (2014) revealed that LPC burials at settlements became a fixed feature of funeral customs and are one of the hallmarks of this period.

In Germany, mass burials probably caused by violent conflicts (Talheim near Stuttgart, Wahl, Trautmann 2012; Schöcken-Killianstädten near Frankfurt, Meyer et al. 2015) and cases of post-mortem manipulation (e.g., Herxheim in southwestern Germany; Zeeb-Lanz 2019) have been discovered. In Central Europe, we can find some parallels too. Clear evidence for severe inter-personal violence was documented in Lower Austria (Asparn/Schlettz; Teschner-Nicola 2012). Secondary manipulation with remains has been discovered at the site of Bicske-Galagonyás (Makkay et al. 1996.20, 21, Fig. 6) in Hungary, where re-depositing of the upper left limb (femur, tibia, fibula) in the anatomic position beyond the head (without fingers) shortly after placing the dead in grave 1 occurred (end of LPC/Sopot-Bicske).

Post-mortem manipulation was also confirmed by a newly discovered LPC site in south-west Slovakia – Vráble, where ‘regular’ burials with the deceased in a crouched position were placed on either side of the large outer ditch within the settlement (Müller-Scheefel et al. 2021.66–69, Fig. 2). Besides that, the second category of mortuary treatment (‘irregular’ burial type) was represented here by three headless individuals (Müller-Scheefel et al. 2021.69, 70; Fig. 3.1, 2, 5), who were each placed in an extended position at the bottom of the outer ditch. These buried individuals show clear signs of post-mortem manipulation, the skulls were removed during the decomposition process. Possible open-air staging of the dead for a certain period presents a burial ritual not previously taken into consideration for the LPC. Such a practice could explain seemingly disturbed burials found also elsewhere (Müller-Scheefel et al. 2021. 74, 80).

As for the grave goods of the buried LPC individuals in Central Europe, older graves usually did not contain any goods (e.g., LPC graves at the burial ground in Balatonzsárszó – Kis-erdei-dőlő: Oross, Marton 2012.263), while the Late LPC graves or the Želiezovce group graves included burials with above-average grave goods: e.g., in Budapest-Nagytétény (Gallus 1936), Budakeszi-Szőlős kerti (Czene, Ottomany 2007; Czene 2008) and Baj-Medzi kanámi (Cheben 2000.72, Abb. 11.1, 12, 13). In general, we can state that graves without goods make up more than half of the known burials (Veit 1996.Tab. 4). We can use the cemetery in Nitra-Priemyslová ulica (Slovakia) as an example, where burials without grave goods made up as much as 62.2% of all graves (Peschel 1992.176).

Cremation in the LPC

Finds from the LPC contributed profoundly to the study of cremation graves and the beginnings of the cremation burial rite (Gil-Drozd 2011.11). As early as the beginning of the 20th century, the first birital burial ground of the LPC was discovered in Arnstadt, Germany (Hoffmann 1973.71). The twelve cremations discovered here, besides ten inhumations, represented the first case of a previously unknown method of depositing burned remains in small heaps and then covering them with vessels placed with their bottoms up. Other continuously appearing rather large birital burial grounds of the LPC in the territory of Germany (Aiterhofen-Ödmühle: 69 cremations and 159 inhumations; Wandersleben-Gotha: 132 cremations and 179 inhumations; Stephansposching: 31 cremations and 10 inhumations) and the Netherlands (Elsloo: 47 cremations and 66 inhumations) allowed wider considerations of the burial rites of the population. Christine Peschel (1992), for instance, found out that cremation burials at most birital burial grounds contain fewer grave goods. However, differences between individuals of different genders or ages were not noticeable. Based on the analysis of the burials, Peschel (1992.199) formed a hypothesis that individuals with lower social status were cremated, while the richer social class had full-body burials.

Norbert Nieszery (1995.17, 18, 43, 44) was among the first who suggested that cremation was the dominant form of burial in the Neolithic. He compared the number of uncovered graves with the coverage of LPC settlements and concluded that only around a fifth of the population is buried in the burial grounds, as most of the shallower cremation burials were eroded and destroyed by farming activities.
Iris Trautmann (2006.183, 185) presented some important insights with regard to the genesis and development of cremation in Europe. Based on the analysis of burnt bone remains of the LPC in Germany and their comparison with skeletal remains, Trautmann concluded that practising various funerary rites is a result of affiliation with different groups of the population, i.e. Mesolithic hunters and gatherers would often unite with a Neolithic population that had newly arrived in an area, still retaining their funerary traditions, in addition to the new customs practiced by Neolithic communities.

Overall, we can conclude that biritual cemeteries were once especially frequent in Central Germany, Bavaria, and the Netherlands (Jeunesse 1997). From a funerary perspective, while inhumations dominate, they coexist side by side with recurrent cremations in most areas. For example, the percentage of cremation burials is the following at selected sites: Elsloo 42%, Wandersleben 42.44%, Niedermerz 9.73%, Schwetzingen 4.45%, Fellbach-Oeffingen 7.27%, Altenhofen 30.13%, Stephansposching 75.61%, Arnsdorf 54.55%, Niederdorla 23.07% and so on (Moderman 1970; Nieszery 1995; Jeunesse 1997; Czechaj-Zastawny, Przybyła 2012.49, Fig. 31; Gerling 2012).

Moving to Central Europe (Fig. 1) the finds include mostly separate cremation burials. In Bohemia, a cremation burial of a five-to-six-year-old child, probably a male, was uncovered in a construction pit of the Late LPC near a longhouse in Litice near Plzeň (Braun 2001; Pavlík, Zápotočká 2007. 83). Other cremation burials are known from the Moravia region. In the south-west part of the settled area in Brno-Stary Lískovec, a cremation grave together with burned animal bones was documented (Dočkalová, Čízmář 2007. 34). In Prostějov-Čechůvky, three cremation burials were uncovered at the Kopaniny site, probably from a larger burial ground (Smíd 2011. 8). Cremated human remains were also documented at the LPC cemetery Vedrovice-Široká u lesa (Skutil 1941.28, 29). Nevertheless, their condition did not allow further analyses.

In Poland, a cremation burial of probably the Eastern LPC was discovered in Gródek Nadbužny in Little Poland, where the grave itself was documented by remains of burned bones, secondarily burned pottery fragments (probably from two globular vessels) and pieces of charcoal, arranged in an east-west direction (Kempisty 1962.284, 285). A possible LPC cremation burial (without finds, but near to a LPC clay extraction pit) is mentioned at Zwięcza 3 in south-eastern Poland (Debiec et al. 2014.107, 142), where pit No. 409 (31x30cm) contained the burned remains of an adult individual (maturus, 35–50 years old), probably a male.

In Slovakia, at the only LPC cemetery in Nitra–Priemyslová ulica, in addition to 72 inhumation burials of the Late LPC/Želiezovce group, at least eight groups of burned human bones of adults as well as children without preserved grave pits or associated grave goods have been reported (Pavúk 1972.39, 69).

Reliable evidence of cremation comes from the LPC cemetery in Kleinhadersdorf in Lower Austria, where up to 100 burials are estimated. Among them, there were 57 inhumations, 26 symbolic (empty) graves and at least four cremations (Neugebauer-Maresch 1992.5–6; Neugebauer-Maresch, Lenneis 2015). Altogether, seven graves with traces of burned bones were found at the site. However, only four of them (graves 37, 46, 54 and 82) were identified as cremation burials (Neugebauer-Maresch, Lenneis 2015).
In the book (Smid 2012) in the region of Olomouc (a.s.l.) of the Romêne flood plain in central Moravia, Kralice na Hané is located on the alluvial flat (214m a.s.l.) of the cemetery of the Late LPC (Smid 2012.53). An inhumation burial (grave 37a) was documented very close to grave 37. Similarly, inhumation burial 55 was located near to grave 54. The sizes and shapes of grave pits were difficult to identify, but it is probable that they were approximately circular, with diameters between 40 and 80cm. Grave 54 has larger dimensions – 139x116cm – and thus exceeds this range (Neugebauer-Maresch, Lenneis 2015.Tab. 5).

Grave goods were found only in two graves (37 and 54) and did not differ from grave goods in inhumation burials (Neugebauer-Maresch, Lenneis 2015. Tab. 13). They consisted mainly of pottery, flakes, adzes (grave 37) or a bone tool (grave 54). No other pyre cremation remains (e.g., ashes, charcoals) have been found. The remains of burned grave goods were not stated.

The discovery of the birital burial ground at the site of Kralice na Hané (Smid 2012) in Prostêjov district, Moravia, brings a significant change in our opinions on cremation in the LPC in Central Europe. Of equal importance is the cremation burial ground (39 graves) Modlîn, site 2 in Little Poland (Czekaj-Zastawny et al. 2011.53; Czekaj-Zastawny, Przybyla 2012). We deal with both cemeteries more in detail below.

Example 1. Kralice na Hané (Moravia) – birital cemetery of the Late LPC

Kralice na Hané is located on the alluvial flat (214m a.s.l.) of the Romêne flood plain in central Moravia, in the region of Olomouc (Smid 2012.10). During the construction of the industrial zone of Prostêjov in Kralice na Hané, a large multi-phase settlement was excavated in 2002–2012, including a LPC settlement. On the northern edge of the LPC settlement, a contemporary birital cemetery (Fig. 2) was discovered in 2005–2006. The results of the excavation were published with detailed descriptions of find contexts, a catalogue of graves and grave goods, anthropological analysis, etc. (Smid 2012; Strânská 2012).

The burial ground was situated along the northern edge of the LPC settlement. The cremation burials were only 0.3–0.4m below the current terrain. The estimated size of the cemetery is 1.8ha (dimensions: 300x60m). However, a considerable (central) part was destroyed in the second half of the 15th century because a pond was built, followed by the subsequent modern cultivation of soil (Smid 2012.15). The excavated area of the cemetery makes up only one-tenth of the burial site’s area. Seventy-eight graves in total were uncovered – there were 69 cremations, eight inhumations and one empty grave pit, as well as one burial of a child without the outlines of the grave pit (Smid 2012.9, 72, Obr. 5).

Dating of the cemetery

The older phase (stage LPC I–early II) of the cemetery was characterized mainly by inhumation burials of crouched individuals in rectangular to oval grave pits. From the total of 30 cremations with datable pottery, only three burials (graves 15/05; 20/05; 28/05) belonged to the older phase (LPC Ia, I/II). A change in the funerary rite occurred in stage LPC II (cremation was used exclusively from LPC IIb on) – as many as 26 burials belonged in this period (graves 1/05; HOPI 1/06; 6/05; 7/05; 9/05; 23/05; 26/05; 30/05; 31/05; 32/05; 1/06; 4/06; 5/06; 6/06; 7/06; 8/06; 11/06; 17/06; 18/06; 21/06; 22/06; 23/06; 24/06; 25/06; 26/06; 28/06). One grave (9/06) was dated as the youngest (LPC IIc/III). Another 39 cremations were not suitable for dating (Smid 2012.72–77).

Cremation graves2

Graves were detected on the level of topsoil and subsoil (approx. 0.3m deep). Grave pits were made up of clusters of burned small bones which were mainly situated in bowl-shaped depressions whose preserved depth varied from 2cm to max. 30cm. The grave pits were mainly circular in shape, with a diameter from 0.3m (13 examples), 0.4–0.5m (16 examples) or 0.52–0.7m (nine examples) to 0.74–0.9m (seven examples). In 19 cases, the shape of the grave pits was oval with the dimensions ranging from 0.3x0.4m to 1.05x0.65m. Any association between age, gender and size of the grave pit has not been confirmed (Smid 2012.108), e.g., in small pits with a diameter of 0.3m children (graves 16/05; 22/05; 11/06) as well as adults (graves 4/05; 11/05; 28/05; 26/06) were buried. Even a double burial (child and adult) was identified in a pit with a smaller diameter (grave 17/05). However, a young child (0.5–6 years old) in grave 18/06 was buried in a pit of 0.92x

2 In the book (Smid 2012), we noticed slight differences between the catalogue and the analytical parts. Thus, we follow exclusively the catalogue part when processing graves, their goods, dating and anthropological identification (Smid 2012.19–60). Where our results are identical and we adopt the previously discovered facts, we give the exact citation of the analytical part of this earlier study.
0.8m and an adult (grave 21/06) was deposited in a pit of 1x0.6m.

Almost half of the remains weighed less than 10g per burial (Stránská 2012.126). The surface colours of the burnt bones were grey to a blue-grey, the average temperature of burning reached approx. 550°C. The examined remains suggest uneven cremation depending mainly on the access of oxygen to individual body parts (Stránská 2012.126, Tab. 2). A funeral pyre was not discovered in the cemetery or its immediate vicinity (Smíd 2012. 109).

Immature individuals were buried in 16 graves (Infans I-III, or Infans III-juvenis). A child together with an adult was buried in two graves (3/05 and 17/05). In 26 cases, adults were buried. Two in juvenis-adultus age (grave 5/05 and 41/05), another two were identified as adultus I-II (grave 25/05 and 42/05), two others were older than 30 (grave 3/06 and 8/06), and the oldest individuals included one adult in adultus II-maturus I age (grave 27/05) and male adult in maturus I-II age (grave 30/05). Gender was identified only in three cremation burials. A woman was buried in grave 19/05, probably a man was deposited in grave 32/05, and the oldest individual was a man in grave 30/05.

Two superpositions were also found in the cemetery. In one case, inhumation burial 33/05 was in superposition with cremation grave 30/05 (Smíd 2008. 251). Another superposition was detected in grave

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**Fig. 2. Kralice na Hané, Moravia. Biritual cemetery. Location of LPC graves: a cremation, b inhumation (after Smíd 2012.0br. 6). Colour-coded graves suitable for correspondence analysis (child – green; adult – black).**
8/06, where a vessel dated to stage LPC IIb was in the upper part of the 'fill' of the grave pit with a vessel with archaic decoration at the bottom (LPC IIa), i.e. it could be a disturbance of an older cremation grave with a younger cremation grave (Šmid 2012.105).

**Grave goods**

Fifteen (10%) of cremation burials did not contain any grave goods. Nevertheless, many graves were disturbed or very shallow (just below the topsoil/subsoil), and thus it is very probable that grave goods were richer and the 'empty' graves originally contained something. Twenty (14%) cremations contained exclusively pottery preserved mainly in fragments. Vessels or their fragments were present in 45 graves (31%). Complete vessels were uncovered in grave 8/06, where two vessels deposited with their bottoms up were documented (Šmid 2012.49, Obr. 47), in grave 9/06, there were three vessels with their bottoms up (Šmid 2012.51, Obr. 48). One complete vessel (lying) occurred also in grave 21/06 (Šmid 2012.55, Obr. 53). Traces of fire were recorded also on most grave goods and vessels with traces of burning occurred also in inhumation burials (grave 33/05 and 46/05).

Nineteen graves contained polished stone industry. In 18 of them, children's or adults' adzes or their parts were found. One exemplar was also discovered in the double burial of a child and an adult 3/05. In one grave of an adult individual (grave 27/05), a complete stone hoe was found. Only seven adzes were not damaged (in graves 4/5, 9/05, 24/05, 38/05, 3/06, 21/06, 23/06), four others were perforated (in graves 1/05, 6/05, 45/05, 28/06) and otherwise damaged – it is not clear whether they bear traces of intentionally damaging or a result of internal tension caused by the high temperature of a pyre (Šmid 2012.83).

Chipped stone industry (mainly silex blades and flakes) was present in 10 burials in form of miniature burned fragments of former tools. They were present in children's burials (grave 15/05, 1/06 HOPI), but dominated mostly with adults or old men (graves 27/05, 30/05, 32/05, 4/06, 6/06). It was also found in the grave 3/05 where a child was buried together with an adult individual. In the other two graves (26/05 and 9/06), it was not possible to identify the age or gender of the buried. As for the number of flakes in individual graves, most often there was one example, with a maximum of three. Burial 30/05 with an older man (maturus HI) was an exception to this, as 12 fragments of burned silex blades were discovered among the cremation remains (Šmid 2012.32, Obr. 26).

Grinding stones (without visible traces of modification) were found in two graves (15/05 and 9/06); their central (symbolic) position was obvious, as other grave goods were arranged around them (Šmid 2012.82).

In three graves (12/05, 15/05, 31/05) the remains of bone (species: sheep/goat) pointed tools were preserved. It was even possible to restore the bone burin from grave 31/05 (Šmid 2012.Obr. 27.3). In the other two cremation graves the remains of meaty food (medial phalanx of sheep/goat with the child in grave 1/06 HOPI; radial bone of a rabbit with the adult in grave 27/05) were discovered (Šmid 2012. Tab. 8).

Red pigment (hematite) was recorded in nine (6%) cremation burials (graves 7/05, 8/05, 15/05, 23/5, 32/05, 41/05, 42/05, 1/06 HOPI, 6/06). It was found in the form of lumps of several millimetres up to 3.5mm, and its occurrence in the cemetery was not dependent on the age or gender of the buried individual (Šmid 2012.84). In a single child grave 15/05, a lump of raw graphite was confirmed (35mm long).

**Correspondence analysis**

Twenty-eight cremation burials with grave goods (Fig. 2) met the relevant CA criteria. The plot (Fig. 3) does not show significant deviations, and no notable hidden data are visible. However, the graves with mineral pigment show an interesting position. In total, lumps of red pigment were discovered in nine cremation burials – eight of them (apart from grave 8/05) were analysed. Four burials of probably adult individuals (graves 7/05, 23/05, 41/05, 42/05, 1/06 HOPI, 6/06) were found. It was found in the form of lumps of several millimetres up to 3.5mm, and its occurrence in the cemetery was not dependent on the age or gender of the buried individual (Šmid 2012.84). In a single child grave 15/05, a lump of raw graphite was confirmed (35mm long).
burial of a child with an adult (grave 3/05) nearby. In this case, we can assume that the grave goods of children corresponded with the standard tradition and did not exceed the conventions very much.

The last not very isolated group consisted of graves (probably adult men) containing adzes together with pottery (graves 4/05, 6/05, 9/05, 20/05, 3/06, 7/06, 21/06, 23/06, 25/06, 28/06). This combination was probably commonly used as well, although due to the small size of the sample, we cannot speak of a universal rule now. Nevertheless, certain artefacts might be associated with or point to specific identi-
ties and their combination, with other grave goods could provide information on the personality (sta-
tus) of the individual.

A comparison of cremation and inhumation burials from the biritual cemetery using the CA in Kralice was not successful, since – except for one in huma-
tion burial – none of them met the criteria of the CA. In the deepest grave 40/05, a 25–40-year-old woman was buried, crouched on her left side, with pottery and a grinding stone. As it was the only in humation burial suitable for CA, its information va-
ue was very low. No significant similarities were re-
corded in the basic comparison with cremation bu-
rials which also contained grinding stones, as their grave goods were richer and more varied.

Example 2. Modlniczka 2 (Little Poland) – cre-
mation cemetery of the LPC

Site 2 in Modlniczka (238 m a.s.l.) is located in the
valley of the Wedonka River (a small tributary of the
Rudawa) in western Little Poland (Czekaj-Zastawny et al. 2011). The cremation cemetery (39 buri-
als) was in a wet, seasonally watered part of the val-
ley (Czekaj-Zastawny, Przybyla 2012. Fig. 16; Cze-
kaj-Zastawny 2008). The burials were grouped on
about 70 acres in the eastern part of the site (Fig. 4), earlier occupied by a settlement of the Zofipole
phase. The graves did not form any bigger concen-
tration, but were rather clustered in several places
(Czekaj-Zastawny, Przybyla 2012. Fig. 2, Plan 1).
A few graves were dug into the ditch linked with the
eyearly settlement. In 26 cases outlines of cremation
pits were visible, and the others were marked by
concentrations of artefacts and burnt bones.

Chronological context of the cemetery
Due to the relatively small amount of pottery in gra-
vases, the chronological position of the burial ground
within the LPC is not very evident. Almost all pot-
tery fragments found in graves were decorated with
Music Note motives. Only grave 1109 contained frag-
ments with engraved lines and single Želiezovce not-
ches. Considering this, graves equipped with stone
artefacts only or not equipped at all may also come

Fig. 3. Correspondence analysis plot of Kralice na Hané cremation burials, on 1. and 3. principal axes (child – green; adult – black).
from the Music Note phase (Czekaj-Zastawny, Przybyła 2012.42–44).

The cremation cemetery in the eastern part of Site 2 in Modlniczka was possibly linked with the settlement dated to the Music Note phase and the turn of Music Note/Ωeliezovce phase located a few hundred metres apart (Modlnica, Site 5). It was situated on a loess elevation on a slope of the low river terrace, and two contemporary inhumation burials were discovered there, too (Czerniak 2010). There are no visible relations between the cremation cemetery with the nearer settlement Modlniczka 2 from the Zofiopole phase (Czekaj-Zastawny, Przybyła 2012.31).

Graves

All cremation burials in Modlniczka are pit graves. The original shapes of the grave pits are very poorly preserved (Czekaj-Zastawny, Przybyła 2012.Fig. 17–18), although various outlines have been found: oval with dimensions 100–185x60–120cm, circular with diameters 40–90cm, or rectangular with dimensions 60–130x45–110cm. The preserved parts were up to 30cm deep. The cross-section of pits was in all cases basin-like. They were filled with grey, grey-brown, or black-brown sand with burnt human bones and remains of the funerary equipment. In better-preserved pits two fill layers were visible – slightly lighter sand with scattered bone fragments and very small charcoal pieces. Pieces suitable for palaeobotanical analyses were exceptional, including one oak (Quercus sp.) fragment from grave 1354. Original grave pits had small depressions into which the remains of the pyre had been placed, possibly in organic containers (small sacks?). Oval and quasi rectangular pits were in three cases orientated N-S, in other three cases E-W, in two cases NW-SE, and in one case NE-SW (Czekaj-Zastawny, Przybyła 2012.56–62).

Among 39 graves (Szczepanek 2012.305–313), the sex of buried individuals has been determined in six cases (one woman – grave 1205; five men – graves 1087; 1213; 1423; 4688; 7496) and age in seven cases (woman Maturus, two men Adultus/Maturus, man Maturus, man Maturus/Senilis, one Adultus of undetermined sex, and one Infans). The remains from 14 graves have been determined as belonging to adults. For 17 graves no information on the buried persons is available.

No links between age, gender and the size of the grave pit have been established. However, only one child was identified at the burial ground (grave 1249), and thus this claim is not generally valid. The

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3 In the publication (Czekaj-Zastawny, Przybyła 2012), we noticed slight differences between the catalogue and the analytical parts. Thus, we follow exclusively the catalogue part when processing graves, their goods, dating and anthropological identification (Czekaj-Zastawny, Przybyła 2012.96–129).
adult woman (grave 1205) and the three grown men (graves 1087, 1213, 4688) were buried in smaller pits than the child. The largest grave pits were for adult individuals (graves 1061, 7427/7428) or adult men (grave 1423 and 7496).

No superpositions were documented at the burial ground. All burials were single graves, hence no grave included more than one individual (Szczepańek 2012.305).

**Grave goods**

Sixteen burials contained grave goods (Czekaj-Zastawny, Przybyła 2012.96–129). The other 23 graves were probably also equipped, but the goods were destroyed and poorly preserved. Generally, grave assemblages included adzes (13 graves), pottery (nine graves), and flint artefacts (nine graves). Altogether, 78 pottery fragments were recovered from grave pits (Czekaj-Zastawny, Przybyła 2012.38). Nine graves were equipped with pottery (23%). In four cases (graves 1145, 1354, 7422, 7496) potsherds came from one vessel, in other cases from up to 11 vessels (grave 1109). In grave 7427/7428 were altogether 35 potsherds (of which 14 fragments were from one vessel, 15 fragments from another vessel, four fragments from a third). All fragments found in the graves were either thin or medium-thick. For the most part, they were decorated. Whole vessels have not been documented. No traces of fire have been observed on potsherds.

Fourteen burials were equipped with stone tools. There were 17 adzes, four adze fragments, and 3 hoes (Czekaj-Zastawny, Przybyła 2012.41, 42). Most of these were made of amphibolite, probably from the Sudety Ms. Only two tools from graves 1218 and 1354 are of feldspar (Tębska 2012). Almost all adzes are burnt, usually on two-thirds of the length (from the blade). The grave inventory usually contained one or two adzes (e.g., grave 1423, determined as a man), or one adze and a pot (e.g., grave 7496, determined as a man). The male grave of Adulthus/Maturus (feature 1087) contained three items: an adze, a hoe, and a trapeze – functionally an arrowhead. The richest and most diverse equipment was found in grave 1061 (adult of undetermined sex): three whole adzes and one shoe-last tool fragment, one hoe, three flint artefacts, one obsidian artefact and 9 potsherds (Czekaj-Zastawny, Przybyła 2012.96–98, Pls. 29–31).

Nine graves were equipped with flint or obsidian (one case) artefacts (Trela-Kieferling, Zajac in press), ranging from one to eight of these (in grave 1061). Twelve artefacts were of the Cracow Jurassic flint, one of obsidian, and one of undetermined burnt rock. The obsidian artefact (from feature 1061) is a small single-platformed core for blades. The assemblage of tools includes a combined tool (burin + perforator) and a retouched blade from feature 1109, a trapeze (arrowhead) from feature 1087, a double truncated blade with sickle gloss from feature 1218, and a burin on truncation from feature 1249. The last mentioned example is a child grave, and the burin was in the grave together with an adze.

In grave 4688, identified as the burial of male aged Maturus/Senilis, apart from a hoe, four flint artefacts, and four potsherds, there was a unique perforated stone fragment of an oblong polished object made of white aplite, oval in cross-section (Czekaj-Zastawny, Przybyła 2012.105, 124, Pl. 42.2). It has a small opening (diameter approx. 5mm) in half of its length, bored from both sides.

**Correspondence analysis**

Eleven graves with grave goods met the CA criteria (Fig. 4). Since this is a small ensemble with unique graves, several divergences could be tracked (Fig. 5).

In any combination of main axes, the grave 4688, which has several distinctive attributes, was set apart from the others. It is the burial of the only male aged Maturus/Senilis, and apart from other grave goods he had a unique perforated stone artefact in the whole cemetery – a pendant(?). A separate position is also noted for the male Adulthus/Maturus grave 1087, with a trapeze arrowhead combined with an adze and a hoe. Nearby is the richest grave 1061 of another adult individual, which, in addition to a combination of adzes, hoes, obsidian core and flint tools also contains potsherds.

Smaller clusters form graves without potsherds containing a combination of adzes and flint tools such as a burin and blades (child grave 1249; adult grave 1218; adult grave 1040).

Another cluster is made of possible adult male graves 1109, 1354, 4619. These have in common a combination of potsherds, adzes and flint tools and a larger grave pit.

**Discussion**

The LPC cremation cemeteries presented in this study were certainly used for regular burials of peo-
ple from contemporary settlements. The cemetery in Kralice na Hané was in the immediate vicinity of a settlement. The neighbourhood whose inhabitants probably buried their dead in the cemetery in Modlnicza, Site 2, was only a few hundred metres from their last resting place. The cemeteries were used at least from phase LPC II to LPC II/III. During this period, biritual burials were used. In Kralice na Hané, human skeletons were recorded not only at the biritual burial ground, but also in pits right at the nearby settlement (Šmid 2012.110). In Modlniczka, Site 2, only cremation burials were uncovered. Nevertheless, two contemporary inhumation burials were found at the nearby settlement of Modlniczka, Site 5 (Czerniak 2010). This funerary tradition documents the considerably diverse spiritual world of the LPC communities. Biritual burying in Kralice na Hané was probably not used until the end of the cemetery’s existence, and it seems that cremation prevailed here in the later period as well. In both cases, however, we must bear in mind that only a small part of the original sacred area has been studied. Despite this, the burial grounds maintained their status as important places in the landscape for a long time, and they were used repeatedly. The progression from high quantities of inhumations in the east to their decline in the west in favour of cremations was also seen as chronological development at Aiterhofen-Ödmühle (Lower Bavaria). Cremations are here likewise believed to be a younger phenomenon (Nieszery 1995.89; Hahnekamp 2021.982, 983).

The fact that the burials found at both the above analysed sites were mostly undisturbed or not destroyed in the LPC period is important. Therefore, we can assume a certain form of indication of graves or long remaining memory of the buried individuals (see Chapman 2000.46). Naturally, we cannot be sure about the relations between the graves or between the burying and the buried without an exact chronology of the place (cemetery and the related settlement). Previous sequences of ceramic decoration are insufficient for revealing chronological developments, and thus more radiocarbon and genetic studies are suggested.

Superpositions were recorded only in two cases in Kralice na Hané. The reuse of old funerary spots maintains community ties and may represent a link between generations. The use of the same location for cremation remains (grave 30/05) and inhumation (grave 33/05) in Kralice na Hané (Šmid 2008.251) and traces of fire detected on the vessel deposited next to the skeleton might indicate the traditional use of fire at the funerary rite. More information in relation to this hypothesis could be brought by detailed DNA analyses of both dead people, which has so far not been possible.

With regard to burial practices, there are no distinct differences between burials of adult women or men and children. The presented burial grounds reflect the demography of the population. The right and
possibility of being buried at the burial ground were not denied to neither sex nor any age category. Nevertheless, there are also some exceptions. In some cases, whole groups of graves are excluded from the burial ground, and sometimes there are no female, male, or child graves within a given site (Chapman 2000; Wann 2001). Such localization of graves can be observed in the Vedrovice – Široká u lesa LPC cemetery (Podborský 2002). Selected clusters can also be divided by sex, with one group of graves being populated exclusively by females and the other one by men, children, and anthropologically undefined individuals (Podborský 2002:301, Fig. 2).

Grave goods in cremations do not show any significant differences at both analysed sites. They were placed in graves of adult men, women, and children. Grave goods specific for sex (e.g., occurrence of adzes and hoes with men) are an exception. Numerous experts have pointed out that LPC adzes appear to have conveyed social, or even status, differences also in relation to the LPC inhumation burials (Jevněse 1997; Nieszery 1995; John 2005; Mandák Niklová, Mandák 2020). For example, in Vedrovice wealthy burials including prestige items such as adzes were only associated with men (the only exception was a child grave 39) (Květina 2004:385). Regarding social hierarchy exceptionally wealthy male burials, comprising older individuals (matures, seniles) were therefore attributed to chieftains, big men or elders (Květina 2004:387). The increased frequency of polished stones in cremations at Aiterhofen-Odmühle also indicate a predominating presence of men, with half of the provided ones confined to adzes as the only gift (Hahnekamp 2021:979, 982). The difference in grave goods equipment between inhumations and cremations is thus seen here as potentially signifying gender distribution inequalities. Moreover, adult men buried with polished adzes in certain sites (Aiterhofen-Odmühle, Vedrovice, and Nitra) have a higher protein intake of animal origin ($^{15}$N) so it seems that this social group has certain privileges such as a richer nutrition and a stable residence (Augerau 2021:959).

Pottery was represented by the highest number of artefacts (as for fragments) which occurred in cremation burials. It was preserved mainly in fragments or as damaged vessels. The shape in which they were deposited in the graves, however, can reflect a different form of burial traditions. From the aspect of the rite of passage, for instance, intentional damaging of things (e.g., breaking a vessel) might symbolize the dying of things so that they can further be used by the dead person (Lutovský 1998:256).

Unlike Modlniczka, Site 2, three graves in Kralice na Hané contained complete vessels. It could suggest a different function of pots and fragments deposited in graves. All this pottery is probably for the serving and to a lesser extent storing food and drink. Whether they were part of a funerary ritual involving the mourners eating and drinking at the grave, or whether they were placed in the grave for the deceased’s use in the afterlife is open to debate. In this context, the fact that the presence of animal bones in cremation graves was minimum is very important. Unique burned bones (rabbit and sheep/goat) that might indicate adding meat to graves were identified only in two cremations in Kralice na Haně.

We must not overlook the significant fact that there is generally no indication of urn burials in the LPC (as well as in the studied sites). Vessels are placed deposits (grave goods) to the burial or used to cover cremated remains. In this context, it would be appropriate to regard the vessel as an upside-down urn?

A funeral pyre has not been recorded at any of the burial grounds. They were possibly at some distance from the burial ground. Transporting pyre remains into graves probably followed specific rules. In Modlniczka, Site 2, was observed that human bones, often with flint artefacts, were placed first, then – on
the same level or slightly above – adzes and pottery. Many stone and flint artefacts are burnt, but no traces of fire have been documented on potsherds. It suggests that broken vessels might have been placed directly into the pit (Czekaj-Zastawny, Przybyła 2012,38–42).

Certain differences and variations occurring among graves are a result of other factors – hidden in archaeological records – which could point to the status of an individual and/or a family (?), to wealth, and they could have been inherited, as children’s graves rank among the richest ones from the aspect of typological diversity of grave goods. They include e.g., grave 15/05 and 1/06 HOPI in Kralice na Hané and grave 1249 in Modlniczka, Site 2.

A certain change in the number of grave goods can be noticed when comparing older and newer graves. The youngest grave 9/06 (LPC phase IIc/III) belonged to the richest graves in the cemetery in Kralice na Hané. In the grave, three vessels, chipped lithic industry and a sandstone grinding stone were found. The youngest grave 1109 (Želiezovce phase) in Modlniczka, Site 2 also ranks among the richest ones discovered at the site with its inventory.

It was noticed in the past that cremation played various roles in various territories. In some regions, it was almost as common as inhumations, regardless of a chronological phase, in others much less frequent (Czekaj-Zastawny, Przybyła 2012,49, Fig. 31). We can also add – based on the above-presented facts – that it depends mainly on the state of research, not the regional tradition.

Conclusion

When considered alongside the small sample size, the potential of CA did not seem promising. Nevertheless, the use of CA in this contribution was intended to be exploratory and, in this case, it served its purpose. As we see the CA results brought not hidden, previously unrecognized data, but rather highlighted certain facts. We intended to find out what cremation says about the buried individual and if the burial method reflects the deceased person’s social identity.

In the first place, we can confirm that any attempt to extrapolate a relationship between age and the type of burial used. Naturally, as the bodies were burnt, age and sex determinations are missing for the most part. There are also several aspects of burial practice that seem to have been ‘cross-regional’. For example, the grave goods in cremation did not differ significantly from grave goods in inhumation burials, including exceptionally furnished burials of wealthy adult men or the presence of ochre in burials of adult individuals. These are LPC practices that occur across Europe and may point to shared understandings or values. It is especially relevant in addressing the mainstream ideology in the LPC society (Augereau 2021). However, this pattern does not characterise the whole LPC burial practice. Indeed, in the case of placing commodities at the funeral pyre together with the dead, unification does not apply, thus the ideology of cremation in the LPC culture was probably different or expressed in a different way, not perceptible in the funerary data.

Thirdly, a key issue in understanding the LPC sites is time. Unfortunately, all the sites with cremations in Central Europe are lacking a refined chronology, and the burials at the cemeteries have not been radiocarbon dated. Chronologies of the cemeteries discussed above were only broad phases based on typologies. And as the analysis of František Trampota and Petr Května (2020) showed changes in the original material culture do not necessarily occur on a time axis. Hence more refined chronologies, such as whether a burial group/row was added to in a particular direction, or whether one area was finished before another came into use, do not yet exist. It is therefore impossible to follow the burial practice, in our case cremation, more closely in time. However, summarizing the current facts on cremation burials in Central Europe, their beginnings and gradual establishment in the Neolithic, we can state that their origin no longer needs to be sought in distant and more developed regions. In the LPC, cremation funerary rite becomes ‘domesticated’. The rite itself cannot be associated with ethnicity and probably not with the social status of individuals either. However, cremation can be considered a common burial custom spreading simultaneously with inhumation since the Neolithic. This fact is documented also by recent excavations at biritual cemeteries in Central Europe. They gradually open the way to a better understanding of this funeral tradition and objective evaluation of the situation in a wider territory.

At the beginning of the millennium, we learned about cremation in LPC based on data from west-
ern Europe. New excavations and published data in the studied territory point to the fact that cremation was represented at cemeteries to a much greater extent as assumed. Therefore, we can state that cremation in the LPC was not limited territorially, chronologically, or demographically and it was used parallelly with inhumation also in Central Europe. Although cremations are still far less numerous than inhumations, they occurred in significant numbers depending on region and site, and thus must have played an important role in Linear Pottery funerary rites and might have reflected changes in notions of the afterlife. For example, at Vedrovice, Kleinhadersdorf and Nitra, cremations are scarce to absent, while they predominated in sites such as Kralice na Hané and Modlniczka, Site 2. All of these features point to dynamic and adaptable funeral practices and norms rather than fixed systems. The mode of body disposal could be affected by social organization, hierarchies, family, economic factors, religious beliefs, and by the individual preferences of the deceased or their survivors, and other factors not apparent in today’s ideology.

The act of cremation can be associated with the purifying power of fire. The ritual aspect of the cremation process was a strong spiritual experience for the people attending a funeral (Schlentner 1960; Ucko 1969). The practical aspect of cremation is presented by the effort of the survivors at the creation of a funeral pyre, as well as reduced requirements for the deposition space. All these facts might have played equally important roles in deciding on the funerary rite. We also agree with the idea that the funerary treatment represents a chronological act expressing idealized social identities (more details in Fowler 2013), i.e. the archaeological remains are not an a priori reflection of a current social organization – they present a deeper view of the world of the contemporary community (family of the deceased person).

Since only a fraction of the living population was being buried in cemeteries, there will always be doubts about what could be considered a mortuary norm and exception (cf. Boyadziev 2009; Perlès 2001.274). Nevertheless, the known data provide information on the religious, ritual, and social tradition, but these aspects can constantly change and vary in everyday practice. The presented examples confirm that the burial customs of individual communities primarily reflect domestic traditions and rules. A good example in cremation can be seen in the various compositions and ways of depositing grave goods – either on a pyre or in a grave intermingled with the burnt remains on variable sites.

As for the future of excavations of cremations and cremation cemeteries of the LPC, there are several determining factors, including localization of cemeteries in inundation areas or floodplains where settlement and associated activities are not expected or have not been searched by survey activities so far. The second determinant is the high proportion of destroyed graves which is associated with their smaller and shallower grave pits being disturbed or completely damaged by (not only) recent activities. Bearing this fact in mind, we must pay more attention to targeted searches and exact documentation of find contexts, which are unique testimonies of the LPC funerary rite.

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