Estonian Journal of Archaeology, 2022, **26**, 2, 157–183
https://doi.org/10.3176/arch.2022.2.03

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FIRST AMS ^{14}C DATING OF BRONZE AND PRE-ROMAN IRON AGE CREMATED BONES FROM BARROWS IN WESTERN LITHUANIA: RESULTS AND INTERPRETATION

Received 31 March 2022, accepted 10 June 2022, available online 4 November 2022

Whilst the practice of cremation first emerged and spread in the East Baltic region during the 2nd–1st millennium BC, non-cremation burials in both barrows and flat cemeteries continued to exist in parallel or the inhumation custom was first replaced by cremations until, at the end of the Pre-Roman Iron Age, inhumation became the dominant burial custom. Barrows were the main type of burial monument in western Lithuania through the Late Bronze Age and Pre-Roman Iron Age, even during the transition from cremation to inhumation. The emergence of cremation led to a decrease in grave goods, which, combined with variations in the structure of the mounds and stone arrangements associated with cremation burials and the placement of graves inside or outside the barrow, left the typological method alone incapable of determining the beginning and duration of the cremation custom. Therefore, the AMS ^{14}C method was applied for the first time to date cremated bones from barrows in western Lithuania. This article presents twelve AMS ^{14}C dates yielded from a range of different barrows and graves in the following barrow cemeteries: Ėgliškiai, Kurmaičiai, Kveciai, Sūdėnai, Šlikiai, and Gintarai. The data was used to determine the duration of the cremation custom practiced in these barrows, and to identify chronological variations between different types of graves found within. The results indicate that cremation was practiced from the 9th–6th century BC to the 4th–2nd century BC. Comparison of AMS ^{14}C data from differently arranged cremation graves suggests that collective burials in barrows, burials outside the external stone circle of the barrow, and individual barrows for a single deceased could have co-existed.

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Introduction

The Bronze Age and Pre-Roman Iron Age were marked by changes in the pattern of settlements, economic strategies, and funerary practices (Grigalavičienė 1995, 56–97, 100–101; Grikpėdis & Motuzaitė-Matuzevičiūtė 2018, 264–279; Podėnas 2019, 1–17; Minkevičius et al. 2020, 327–338). The custom of cremation of the deceased first emerged and spread at this time, alongside the limited appearance of barrows in some parts of Lithuania (Merkevičius 2014). Whilst burial customs and other changes in the material culture could represent social and ideological shifts within Bronze Age and Pre-Roman Iron Age communities, some researchers believe that the emergence of cremation may be related to a new approach to death, where fire was invoked to separate an immortal soul or spirit from the body (Vasks 2009, 94–97).

The emergence of cremation led to a decrease in the number of grave goods. In fact, the vast majority of Bronze Age and Pre-Roman Iron Age cremated burials in Lithuania contain no grave goods. Consequently, establishing a relatively precise chronology of cremated burials found in barrows or flat cemeteries remains challenging. Comparison of the number of grave goods found in inhumations and cremation burials provides further confirmation of the apparent decrease in grave goods. For instance, the inhumations in the Šlažiai barrow cemetery contained a total of 24 grave goods dating to the Early Bronze Age (Merkevičius 2011, 124–128), which exceeds the combined number of grave goods from all previously excavated cremation burials in the same region (north-western Lithuania, where grave goods were found in 14 out of 169 cremation burials, resulting in a grave good ratio of 8%; Muradian 2017, 62–63, 66–67). Most tools and artefacts attributed to the Early Metal Period were not actually metal, but made from bone, wood, or stone instead (Grigalavičienė 1995, 144, 163–173), and organic-material grave goods rarely leave a trace in the archaeological record. It is also possible that grave goods were incinerated alongside the deceased, as evidenced by melted metal objects present in some cremation burials (Michelbertas 1963, 55–72; Kulikauskas 1968, 26; Grigalavičienė 1979, 17, 26; Merkevičius 2011, 77–79). Furthermore, recent excavations in the Kvietiniai flat cemetery have demonstrated that some grave goods predate the associated cremation burials. For example, some urns featuring a fine-rusticated surface contained multiple Corded Ware sherds inside, along with burnt bones. These cremation burials date to the first millennium BC, whilst the associated grave goods – i.e., the Corded Ware sherds – belong to an earlier period. This may signify certain religious rituals of the funerary process (Vengalis et al. 2020, 40–45). The low number of grave goods and the inclusion of items from earlier periods in mortuary rituals severely impacts our ability to establish a reliable chronology using traditional methods, and an opportunity to analyse the emergence, spread, and disappearance of the cremation custom.

The most recent radiocarbon dates obtained from cremation burials in Latvia indicate that the spread of the cremation custom in the East Baltic region could have started between the 17th (16th) and 15th century BC, as evidenced by dates from

the Pukuļi barrow cemetery in southern Latvia (Legzdiņa et al. 2020, 1845–1868). Until recently, only six samples from cremation burials in flat cemeteries had been dated in Lithuania (Tamulynas 2004, 18; Piličiauskas 2012, 13, 16; Vengalis et al. 2020, 37–38), and no radiocarbon dates had been obtained from barrows. Notably, cremation burials and barrows represent the main transformation in mortuary practices in Lithuania in that period. Until then, non-cremation burials had previously been placed in non-barrow settings (Žukauskaitė 2007, 71–90; Piličiauskas 2018, 114–119). Significant shifts in the mortuary tradition can be triggered by both external influences and internal societal transformations which encompass a broad range of aspects of daily life.

Barrows may have had a range of symbolic meanings in contemporary societies. The majority of studies concur that a barrow is a symbol of social expression common among socially differentiated communities (Brazaitis 2005, 291, 299; Merkevičius 2007, 102–103; Girininkas 2013, 108; Vasks 2021, 142–144). Another interpretation considers barrows as territorial markers, as the mounds would have been visible in the landscape, and their longevity and memorial aspects shape a powerful image of long-inhabited territory, potentially associated with social memory (Wright 2013, 406).

A barrow is a collective burial place, normally containing multiple graves. Radiocarbon dates from the Reznes barrow cemetery along the Dauguva River in Latvia place the site approximately between the 14th and 7th century BC. It was determined that various burial methods (inhumation, cremation, cist graves) observed in the barrows were practiced concurrently, rather than consecutively. Researchers believe that the reason for variation in the burial method could have been the social status of the deceased within the community (Vasks et al. 2021, 13). In Lithuania, variations in cremation burials can be observed within a single barrow, perhaps owing to changes in mortuary practice over time. A single barrow may be in use for centuries, and although changes in grave settings within a barrow generally follow shifts in mortuary traditions, other explanations must be considered.

Overall, the chronology of cremation burials in barrows in Lithuania is relative and ambiguous, which imposes limitations on determining the timeline of changes in mortuary traditions and interpreting the reasons behind them. Therefore, burnt bone fragments from barrows in western Lithuania (Ėgliškiai, Kurmaičiai, Kveciai, Sūdėnai, Šlikiai, and Gintarai cemeteries; Fig. 1) were selected for AMS ^{14}C dating in order to establish a more accurate timeline for the practice of cremation and assess the chronological aspects of structural variability in barrows and the cremation burials within. The aim of this article is to assess the AMS ^{14}C dates and provide an interpretation of mortuary practices in the Late Bronze and Pre-Roman Iron Age in western Lithuania.

The dates presented in this article are the first AMS ^{14}C dates ever yielded from cremation burials from Bronze and Pre-Roman Iron Age barrows in Lithuania. Additional dating in the future would entail a reassessment of the current timeline for the emergence of cremation and its regional evolution in Lithuania.

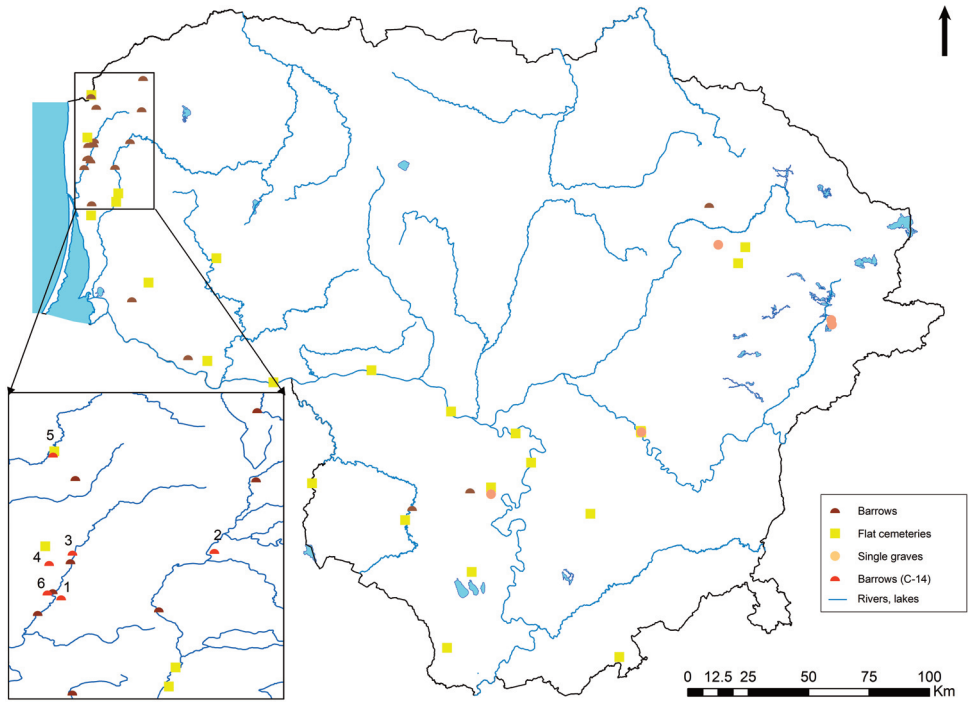

Fig. 1. Early Metal Period burial sites in Lithuania. ^{14}C-dated graves from: 1 – Ėgliškiai barrow cemetery; 2 – Gintarai barrow cemetery; 3 – Kurmaičiai barrow cemetery; 4 – Kveciai barrow cemetery; 5 – Sūdėnai barrow cemetery; 6 – Šlikiai barrow cemetery. *Compiled by L. Muradian*.

Material and methods

Methods

AMS ^{14}C dating was performed at the Vilnius Radiocarbon Laboratory at the Centre for Physical Sciences and Technology. Absolute dates for conventional AMS ^{14}C dates were calculated using OxCal 4.4.4 software and the IntCal13 curve (Reimer et al. 2020). Calibrated dates were interpreted at a 95.4% confidence interval. Statistical comparison was performed using the Combine function in OxCal 4.4.4, whilst the duration of the cremation custom was calculated using the Sequence function.

Sample selection took into consideration the placement of graves within the barrow, and the structural aspects of both. Sampling prioritised graves from the base of the mound, as they would provide a date for initial barrow formation. In some instances, the surviving material was insufficient for AMS ^{14}C dating. Several previous studies have established that the level of contamination in a cremated bone fragment and, consequently, the reliability of the results, depends on the temperature reached at the time of cremation. Bones incinerated at temperatures above 600 °C

Fig. 2. Cremated bones found in a grave pit outside the external stone circle of the barrow in Gintarai. *Photo by L. Muradian*.

are most suited for ^{14}C dating, and they are normally white in colour (Van Strydonck et al. 2009, 553–568; Zazzo et al. 2012, 855–866; Minami et al. 2019, 1823–1834). Samples selected for dating in this study were skull or diaphysis fragments burnt at high temperature, displaying white colour on the interior and exterior (Fig. 2).

Archaeological sites and samples

In total, Lithuania has around 50 burial sites dating to the Bronze and Pre-Roman Iron Age (Merkevičius 2014), and their distribution is uneven – the majority (24 sites) are concentrated in the west of the country. Generally, the most common types of mortuary monuments are region-specific. Barrow cemeteries dominate the mortuary landscape in western Lithuania, whereas only two similar sites are known in the rest of the country: the Pažarstis barrow cemetery (Prienai district) in the south (Merkevičius 2014, 123–125), and the Visėtiškės barrow cemetery (Anykščiai district) in the east (Brazaitis 2000, 101–114). These two sites contained few artefacts and graves possibly dating to the Early Metal Period, and evidence of earlier settlements has been found below the barrows. Most burials in these sites belong to later times, with most graves dating to the 2nd–4th century in Pažarstis and the 3rd–12th century in Visėtiškės (Kazakevičius 2000, 81). Another possible barrow cemetery might have existed in Pietariai Village (Marijampolė district),

where the Nortycken-type battle axe was discovered, and a local resident mentioned having seen "little mounds", pottery, and ashes in the area (Merkevičius 2014, 123–125). However, this area has never been investigated and its destruction during earthworks only leaves us guessing as to what might have been there.

Barrows are clustered predominantly in western Lithuania, with this key region containing 17 sites dating to the Bronze and Pre-Roman Iron Age. Barrows have existed since the Early Bronze Age, and the Šlažiai barrow cemetery belongs to that period (Grigalavičienė 1995, 64–65). The rest of the barrow sites fall into the Late Bronze Age and Pre-Roman Iron Age period. Initially, cremation was not part of the mortuary tradition, but it became widespread around the end of the 2nd millennium BC. This can be observed in the Šlažiai cemetery, where one barrow contained both skeletal inhumations and cremated remains. The cremation custom thrived for over a thousand years, until non-cremated inhumations resumed at the end of the Pre-Roman Iron Age, as suggested by evidence from graves found in Ėgliškiai and Kurmaičiai (Kulikauskas 1968; Grigalavičienė 1979). Barrows in western Lithuania exhibit a range of structural variations: they contain 1–3 oval or round stone circles, consisting of medium- and large-size boulders arranged in multiple rows and up to five stacks. Cavities were sometimes filled with smaller pebbles. The mounds were built using boulders and earth, with some containing larger quantities of stone and multiple stone-paved floors (for example, in the Kveciai and Žvainiai barrows, and in Kurmaičiai Barrow 8 (3); Kulikauskas 1968, 12–56; Merkevičius & Šimėnas 1998, 143–145; Merkevičius 2000, 194–195). Cremation burials were equally diverse: a stone arrangement housing the remains would sometimes be placed in the central part of the barrow, alternatively the bones would be placed in a small pit with a stone-paved floor. Other graves within barrows featured various stone arrangements, stone-paved floors, stone circles or semi-circles, and stone boxes (i.e., the urn would be enclosed by flat stones on all sides). A single barrow contained anywhere between two and 23 individuals, whilst some mounds were dedicated to a single burial. Cremation burials were also noted outside the boundary of the mound, i.e., beyond the outermost stone circle.

Barrow cemeteries in western Lithuania can be split into three categories: 1) unexcavated barrow cemeteries; 2) barrow cemeteries investigated between the end of the 19th and start of the 20th century; 3) barrow cemeteries investigated from the mid-20th century onwards. Three sites fall into the first category (Merkevičius 2014, 21–23, 89–85, 115). The second category contains five sites that were excavated by German archaeologists prior to the outbreak of World War I (Bezzenberger 1893a, 80–82; 1893b, 82–85; 1900a, 86–87; 1900b, 81–85; 1909, 39–41; Götze 1914, 85–87). All related archaeological materials were stored in the Prussian Museum until 1945, but went missing after World War II. At the end of the 20th century, portions of the Prussian Museum's collection were discovered at the Museum of Prehistory and Early History in Berlin and the Kaliningrad Museum. Some archives still possess negatives of items stored in the Prussian Museum, including the archaeological finds. Negatives of finds from the Šlažiai barrow cemetery are currently stored in the Museum of Prehistory and Early History in

Berlin, and in the Jonas Puzinas' Archive in the Martynas Mažvydas National Library in Lithuania (Tamulynas 2006, 179). The location of the finds themselves – human remains and grave goods – remains unknown. A total of ten barrow cemeteries were excavated after WWI, and the excavation of one site started at the end of the 19th century (Merkevičius 1963; Kulikauskas 1968, 12–56; Jablonskis 1974, 32–35; 1977a; 1977b; Grigalavičienė 1979, 5–43; Jablonskis 1980, 46–48; 1984, 53–55; 1986, 47–49; 1988, 49, 50; Merkevičius & Šimėnas 1998, 143–145; Merkevičius 2000, 194, 195). The majority of these barrow cemeteries were concentrated between the Akmena–Danė and Minija rivers, and exhibited a range of grave types dating to the period in question (Fig. 1). This material is the subject of further investigation and analyses.

The samples for radiocarbon dating were selected from sites which had been excavated in greater detail, and had their burnt bone material stored in the Department of Anatomy, Histology and Anthropology at the Faculty of Medicine at Vilnius University, in addition to the collections of the National Museum of Lithuania and the Kretinga Museum. The sample selection process aimed to be representative of a range of grave settings and barrows, and the results obtained were cross-compared. A total of twelve samples were dated from six barrow cemeteries: *Ėgliškiai*, *Gintarai*, *Kurmaičiai*, *Kveciai*, *Sūdėnai*, and *Šlikiai*.

The following section describes the graves and barrows dated for the purposes of this article, along with tables displaying a list of structural elements in graves and mounds (see Table 1 for summarised results).

Ėgliškiai (Kretinga district municipality) barrow cemetery is one of the best-explored and most data-rich burial sites. The barrows were situated on the left bank of the Danė River, not far from its confluence with the Šaltupis River. The site contained the largest number of burials from the relevant period in Lithuania: eight barrows comprised 37 cremation burials, and 11 skeletal inhumations in total. More barrows may have existed originally, but the site's proximity to a sand quarry and an adjacent gravel pit indicate that they were most likely destroyed. The barrow cemetery was first discovered and excavated at the end of the 19th century. A section of one barrow was excavated by Alfred Götze in 1895 (Götze 1914, 85–87), and another barrow was later excavated by Adalbert Bezzenberger (Bezzenberger 1900a, 86–87). Large-scale excavations in 1969 and 1974–1975 were headed by Elena Grigalavičienė, who finished investigating the mound partially excavated by Götze, along with four new mounds (Grigalavičienė 1979, 5–43). Two more mounds were identified and excavated in 1980–1981 by Ignas Jablonskis (Jablonskis 1982, 35–37). The surrounding areas were investigated by Julius Kanarskas in 2005 (Kanarskas 2006, 113–116).

Samples for radiocarbon dating were collected from Barrows 2, 3, 5, and 7 (6). *Barrow 2*, measuring 11.5 metres in diameter and 1.2 metres in height, was located between Barrows 1 and 3. The mound had a single stone circle, consisting of three rows and multiple stacks of boulders, and contained a total of eight cremation burials and two skeletal graves. The centre featured an oval stone structure measuring 2.9 × 2.3 metres. Graves 7 and 8 associated with this structure were

Table 1. Features of the barrows and cremation graves

Site	Barrow (B), grave (G)	Number of stone circles around the barrow	Stone-paved floor	Stone structure/building in the centre of the barrow	Features of the cremated graves				
					"Stone boxes"	Stone structure/ arrangement	Pit without stones	Stone-paved floor	Stone circle/ half-circle
ĖGLIŠKIAI	B 2, G 7	1	–	+	–	+	–	–	–
	B 3, G 5	1	–	+	–	–	+	–	–
	B 5, G 3	1	–	–	+	–	–	–	–
	B 7 (6), G 1	3	+	–	–	–	–	+	–
GINTARAI	Burial outside the external stone circle of the barrow	1	–	–	–	–	+	–	–
KURMAIČIAI	B 5 (4), G 1	3	+	–	–	–	–	–	–
	B 8 (3)	–	+	–	–	–	–	–	–
KVECIAI	B 1, G 11	2	+	–	–	–	–	+	–
	B 2, G 1	2	+	–	–	–	–	+	–
SŪDĖNAI	B 1, G 4	3	–	–	–	–	–	–	+
	B 5, G 1	2	–	–	–	–	–	–	+
ŠLIKIAI	B 1, G 2	3	–	–	–	–	–	–	+

found underneath its base, and consisted of two small pits with burnt bones inside. One sample was collected from *Grave 7*, and the burial contained no grave goods.

Barrow 3 was situated to the south-west of Barrow 2, and both had adjoining mounds. The diameter of the mound of Barrow 3 measured 24–26 m, with a height of 2 m. A stone-paved floor was built along the perimeter to reinforce the mound, and a single stone circle measuring 17–18 m in diameter was found, which was comprised of multiple rows and stacks of boulders. The barrow contained 23 graves: 14 cremated and nine skeletal. The centre of the mound featured a rectangular stone structure measuring 5.2 × 3.3 m in size and 0.6 m in height, and it contained three cremation burials. The surface of this structure was covered with a layer of clay, and another, oval stone structure containing another cremation burial was found on top. Other cremation burials were found within the mound. *Cremation Grave 5*, located within the mound at a depth of 30 cm, was sampled for dating purposes. The burnt bones were found in a pit, along with a few pottery sherds – potentially remnants of an urn. No grave goods were found. Notably, nine skeletal graves were found within the mound at the same depth, and the associated grave goods indicate an origin in the Pre-Roman Iron Age.

Barrow 5 was situated next to a gravel pit, approximately 100 metres south-east of Barrows 1–3. The barrow featured a 14–15 m wide stone circle, comprised of multiple stacks of boulders. The central grave was destroyed by a later pit. In total, the mound contained six cremation burials. The sample for dating was collected from *cremation Grave 3*, which had been arranged in a so-called stone box. No grave goods were found.

Barrow 7 (*6*)[1] was located 600–700 m to the south-east of Barrows 1–3, 5, and 6. Barrow 7, along with Barrow 8 (7), is structurally dissimilar to the other barrows in Ėgliškiai. This particular barrow featured three stone circles, each consisting of a single layer of boulders arranged in a single row. A small stone-paved base at the centre of the mound concealed a pit containing a cremation burial underneath. This was the only burial discovered in the mound. A neighbouring barrow also contained only a single deceased person.

Gintarai (Kretinga district municipality) barrow was situated on a hill in the vicinity of the Minija River, approximately 800 m eastward from its left bank. Initially discovered by Jablonskis in 1967, a multi-season excavation of the site began a decade later. Jablonskis conducted the excavations in 1977 and 1987 (Jablonskis 1977b), and Mykolas Michelbertas followed in 1978, 1980 and 1981 (Michelbertas 1980, 66–68; 1982, 37–39). The Gintarai area is home to several burial monuments from multiple periods. One barrow dating to the Early Metal Period was severely damaged by ploughing, but its single stone circle consisted of multiple stacks of boulders. Individual burnt bone fragments were scattered across the barrow. One reasonably well-preserved burial was found next to the barrow, outside its stone circle. The burnt bones were placed in a smooth-surface urn.

[1] This article uses a continuous numbering system for the Ėgliškiai barrows, as introduced by Grigalavičienė (Grigalavičienė 1995, 66–76).

Kurmaičiai (Kretinga district municipality) burial site was located on the right bank of the Akmena River (Padvariai Reservoir). Fifteen barrows have been identified in the area, containing a total of 28 cremation burials and one skeletal grave. A total of 14 barrows were excavated in Kurmaičiai in 1940, 1948, 1950, 1951, and 2010 by Pranas Baleniūnas, Pranas Kulikauskas, and Algimantas Merkevičius (Kulikauskas 1968, 12–56; Merkevičius et al. 2011, 139–144).

The samples were collected from Barrows 8 (3) and 5 (4)[2]. *Barrow 5 (4)* was situated in the centre of the group of barrows, and was the largest of all excavated barrows in Kurmaičiai. The surviving mound was 1 m high, and its diameter was approximately 20 m. The mound featured three stone circles, and individual boulders and fragments of stone-paved floors were present throughout the mound. All the circles contained multiple stacks and rows of boulders, and cobblestone bases and piles of stone were present within the circle. The central area delineated by the interior circle was paved with stone, and contained a cremation burial underneath. In total, six cremation burials were identified within the mound, and one burial beyond the external stone circle (Kulikauskas 1968, 25–26). The sample for dating was collected from a cremation burial designated as *Grave 1*, which was located within the mound. The burnt bones were placed inside an urn which featured some surface brushing.

Barrow 8 (*3*) was situated on the western edge of the cemetery. Unlike Barrow 5 (4), its structure bears closer resemblance to Barrows 9 and 10. The mound contained a large quantity of stone, and although definitive stone circles were absent, many paved sections were recorded. Burnt bone fragments were scattered in multiple parts of the barrow, alongside some non-burnt horse teeth.

Kveciai (Kretinga district municipality) barrow was situated on a hill to the east/south-east of the confluence of the Tenžė and Kiaulupis rivers, where two barrows and a 9th–12th century cemetery were found. The barrows were excavated by Merkevičius in 1963 (Merkevičius 1963, 1–4).

Samples for dating were collected from both barrows. *Barrow 1* was 1.65 m high, measured 13 m in diameter, and featured two stone circles with individual groups of stone stacks and small-scale string-like arrangements situated in the gaps. Both stone circles were comprised of multiple rows and stacks of boulders, and the interior of the central circle was paved with stone. In total, 12 cremation burials and one skeletal grave of a horse were found next to and in the mound itself. *Grave 11*, containing a set of cremated remains, was chosen for dating, as it was situated in the central area of the mound, underneath the stone floor.

Barrow 2 was situated 1 m to the north-west of Barrow 1. The mound had a diameter of 6 m and a height of approximately 1 m. Two stone circles were present, comprised of two rows of double-stacked stones. Individual boulders and small, stone-paved areas were recorded in the space between the circles. The barrow contained a total of three cremation burials. The centrally-situated *cremation Grave 1* was selected for radiocarbon dating. The grave featured three stacked layers of

[2] Excavation reports and scientific literature use different numbering systems for the barrows. This article uses the system presented in the article by Kulikauskas (Kulikauskas 1968, 12–56).

stone-paved floor. The upper layer was 2 m in diameter, and its border was lined with larger boulders whilst smaller ones formed the interior pavement. Below, a 10 cm deposit of darker soil with a small amount of burnt bones was recorded. The second stone floor was located beneath, followed by another 6 cm deposit of dark soil, and, finally, a third layer of stone. The bottom floor featured flat stones gently sloping inward, forming a shallow pit which contained the burnt bones. No grave goods were found (Merkevičius 1963, 19–28).

Sūdėnai (Kretinga district municipality) barrow cemetery was situated in the Šventoji River valley, around 300 m east of its left bank. A total of five barrows have been identified in the area, arranged in a row in a north–south direction. The site contained a total of 26 cremation burials. All barrows were excavated in 1982, 1984, and 1985 (Jablonskis 1984, 53–55; 1986, 47–49).

Barrows 1 and 5 were sampled for radiocarbon dating. *Barrow 1* was situated at the southern end of the cemetery, measuring 10–12 m in diameter, and the surviving mound peaked at 30 cm above ground. The mound was enclosed by three stone circles containing multiple stacks of boulders. The mound contained a total of five cremation burials, and *Grave 4* was selected for sampling. The grave was set in a 25 cm wide pit at the base of the mound, at the centre of the innermost stone circle, 56 cm below the surface. Five boulders were placed on top of the grave.

Barrow 5 was on the northern side of the site. The mound featured two stone circles with a single cremation burial in the centre. The bones were placed in an urn alongside three boulders arranged in a semi-circle. The top of the grave was covered with a flat stone.

Šlikiai (Klaipėda district municipality) barrow cemetery consisted of four barrows situated approximately 30 m west of the right bank of the Tenžė River. Two of the barrows were excavated in 1986 (Jablonskis 1988, 49–50), and the other two remain untouched to the present day. The first barrow contained four cremation burials, whilst the second had been disturbed in the past and had no well-preserved burials left, aside from a few burnt bone fragments and pottery sherds. *Grave 2* in *Barrow 1* was selected for dating. This particular mound was fairly low, only 40 cm high, and had three stone circles. Grave 2 was recorded at a depth of 75 cm, and contained the remains of a non-adult individual, enclosed by a double-stacked stone circle measuring 1.2 m in diameter. The burnt bones were placed in an urn.

Typological chronology of barrows

There were few grave goods recorded in association with the Bronze Age and Pre-Roman Iron Age cremation burials in barrow cemeteries analysed in this article. Cremation burials in Ėgliškiai contained several bronze ribbon bracelets, two crossbow brooches, and a pin. Some pyre-melted metal artefact fragments were noted in Kurmaičiai and Kveciai. No grave goods were found in the burials submitted for further research in this article. Urns containing cremated bones ranged from smooth to fine-rusticated or faintly brushed (Fig. 3). Grave 1 in Barrow 5 (4)

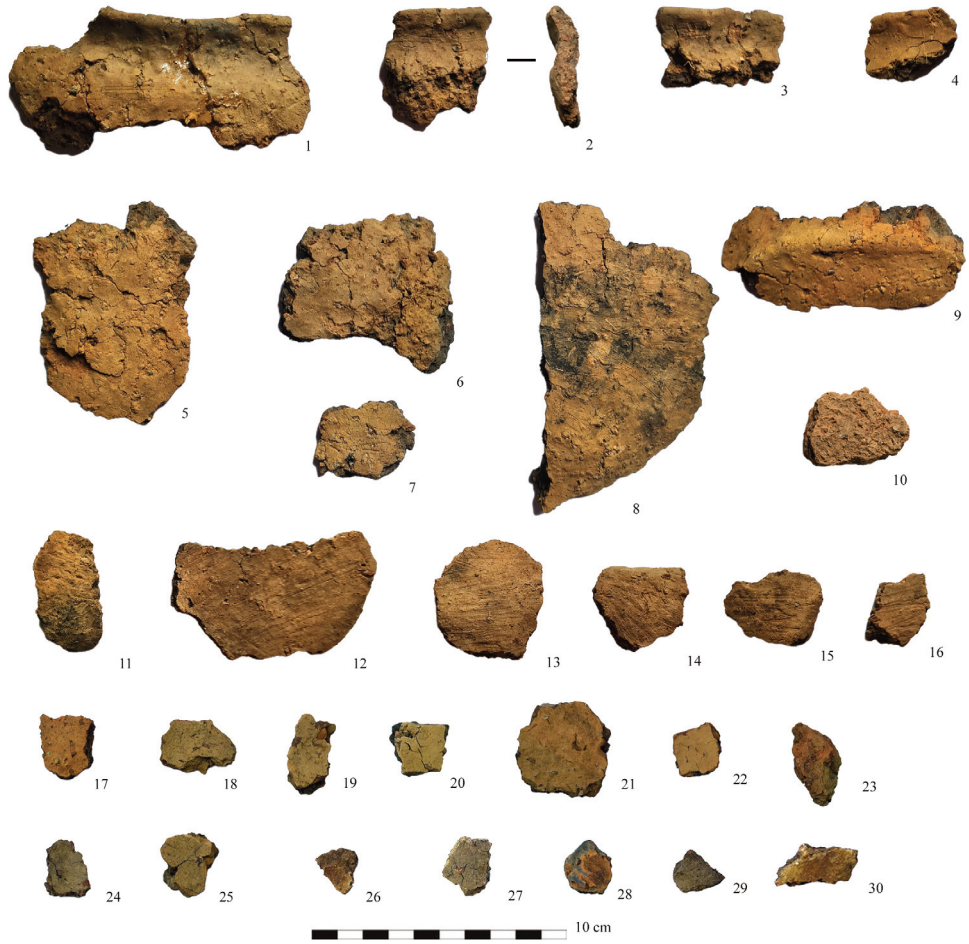

Fig. 3. Sherds of urns from cremation graves: 1–9 – Ėgliškiai (Grave 3 in Barrow 5); 10 – Kurmaičiai (Barrow 8 (3)); 11–16 – Kurmaičiai (Grave 1 in Barrow 5 (4)); 17–30 – Gintarai barrow. *Photo by L. Muradian*.

in Kurmaičiai contained a faintly brushed urn, and Grave 3 in Barrow 5 in Ėgliškiai contained a largely smooth-surface urn with some brushed (?) sections, although crushed stone temper was noted in the clay matrix of both urns. Fragments of smooth urns were found in a cremation burial adjacent to the Gintarai barrow and in Grave 1 in Barrow 5 in Sūdėnai. A fine-rusticated ware sherd was found in Barrow 8 (3) in Kurmaičiai, and Grave 2 in Barrow 1 in Šlikiai contained a fine-rusticated ware urn. Fine-rusticated ware dates from the 1st millennium BC, and is present in the assemblages of other Bronze Age and Pre-Roman Iron Age burial sites in western Lithuania. Charcoal pieces found in a fine-rusticated urn in the Kvietiniai cemetery were dated to 728–388 cal BC (95.4%) (Vengalis et al. 2020, 37).

The lack of a systematic analysis of pottery assemblages from this period limits researchers to broad typological periodisation, and makes accurate dating of cremation burials based exclusively on the urn typology problematic.

Barrows and associated burials are typically dated through structural features and stratigraphy. Carl Engel's "Die Vorgeschichte der Altpreussischen Stämme", published in 1935, represented the first attempt to establish a comprehensive chronology of barrows in the south-eastern Baltic region (formerly East Prussia, encompassing present-day Kaliningrad Oblast, north-eastern Poland, and parts of western Lithuania). The study identified nine distinct chronological types of barrows based on their structural features: central grave(s), the shape of stone circles, and other distinguishing stone arrangements within the mound (Engel 1935, 82–98). Five barrow cemeteries were known in western Lithuania at the time: Ėgliškiai, Kretingalė, Mišeikiai, Šlažiai, and Armalėnai. The Ėgliškiai and Kretingalė cemeteries were designated type III (featuring stone circles and a central stone structure containing cremated remains) and ascribed to Montelius's IV–VI period (Engel 1935, 83, 333). The Šlažiai cemetery was designated type I (the central grave contained one or more non-cremated burials and featured a stone structure with a stone circle) and ascribed to Montelius's III period. The Mišeikiai barrows were designated type V (the mound featured irregular stone circles, and cremation burials were set in "stone boxes") and ascribed to the Pre-Roman Iron Age (Engel 1935, 83–84, 331–332, 336). The barrow of Armalėnai was extremely badly preserved/destroyed, and thus was not designated a specific type.

Excavations of other barrows from this period utilised Engel's typological scheme as a basis. The Ėgliškiai barrow cemetery was dated to the end of the Late Bronze Age–Pre-Roman Iron Age (Grigalavičienė 1979, 29). Some of the earliest burials – Graves 7 and 8 in Barrow 2 and Graves 11 and 12 in Barrow 3 – were situated in the central part of their respective barrows, contained no urns, and were placed under oval- and square-shaped stone arrangements. These barrows were designated type II and III. Other graves which were located within the mound, along with Barrows 1, 4–6, were ascribed to a later period. Barrow 5 and "stone box" graves in Barrow 3 were dated to 300–200 BC (Grigalavičienė 1979, 31). Graves set between stone-paved floors (Grave 3 in Barrow 1; Grave 8 in Barrow 3) were dated to 200–150 BC based on a bronze pin with a swan-neck-shaped head found in one of the graves (Grigalavičienė 1979, 31–32). Graves set within mounds and free of associated stone structures (Grave 2 in Barrow 1; Graves 4 and 5 in Barrow 2; Graves 1–7 in Barrow 3) were dated to 150 BC (Grigalavičienė 1979, 32). These may be contemporary with skeletal graves within the mounds of the Ėgliškiai barrows, which can be sequenced through their more common grave goods.

No significant chronological differences were observed between different cremation burials in the Kurmaičiai barrow cemetery. The researcher divided these barrows into three groups: I – barrows with 2–3 stone circles (Barrows 1 (A), 4 (5), and 5 (4)); II – barrows with mounds containing high quantities of boulders and stone floors (Barrows 8 (3), 9, and 10); and III – barrows with a single stone circle. Kulikauskas determined that barrows in group I correspond to type I and type VII,

and date to the Late Bronze Age, whereas barrows in group II date to the Pre-Roman Iron Age (Kulikauskas 1968, 20–21).

Jablonskis excavated some minor barrow cemeteries, but did not establish specific groups. A cremation burial found next to the barrow in Gintarai was dated to the first half of the 1st century BC (Jablonskis 1977b, 7–8), the Šlikiai barrows were dated to the 3rd–2nd century BC (Jablonskis 1988, 49–50), and the cremation burials in the Sūdėnai barrows were dated to the 3rd–1st century BC (Jablonskis 1984, 53–55). Barrows 7 (6) and 8 (7) in Ėgliškiai were dated to the 5th–3rd century BC (Jablonskis 1982, 35–37). None of these burials contained any grave goods and only a few urns were present, so despite spanning a relatively short period, these dates lack the precision commonly drawn from parallels with contemporary burials elsewhere in Lithuania or nearby territories, namely Kaliningrad Oblast or Latvia.

Burials in the Kveciai barrow cemetery were dated to the Pre-Roman Iron Age (Merkevičius 1963, 33). Grave 1 in Barrow 2 featured a unique stone structure: burnt bones were placed between three layers of stone-paved floors with no associated grave goods. The consensus in scientific literature ascribed this grave to the Pre-Roman Iron Age, based on its placement on top of the mound and the absence of grave goods (Grigalavičienė 1995, 79–80; Merkevičius 2014, 76, fig. 5; Muradian 2017, 59). However, radiocarbon dating revealed its true age to be in the range of 1047–1260 cal AD (see Table 2), which fits with the chronology of another cremation burial situated some distance away from the mound that contained grave goods from the 10th–11th century. These findings demonstrate that the same location and even existing barrows were chosen for cremation burials millennia later. Perhaps the barrow represented a link between the living and their ancestors, acting as a symbol of communal identity. Graves from later periods were also found within the boundaries of the Kurmaičiai, Padvariai, and Sūdėnai barrow cemeteries (Kulikauskas 1968, 34–53; Jablonskis 1980, 46–48; 1984, 53–55; 1986, 47–49).

A review of the dating of barrow burials showed that different types of graves within a single barrow tend to be interpreted in light of chronological changes. Notably, some researchers based their periodisation on the structural features of the *barrow*, whilst others emphasised *individual graves* and attempted to date them as such. Conversely, the case of Barrow 2 in Kveciai demonstrated that cremation burials without grave goods can belong to a completely different period than previously thought. Therefore, this article focuses on: 1) the assessment of individual graves in an attempt to determine whether differences in individual grave structure were the result of chronological changes; and 2) the identification of the period of use of each barrow cemetery. There are many burial sites situated within the area in question, less than 500 metres apart in some instances; therefore, a key issue to address is the relationship between these sites. All barrows in the area largely span the first millennium BC, and the traditional model dictates that barrows with intricate stone structures predate their more modest equivalents, and that towards the end of the period embellishment was limited to a single stone circle (Grigalavičienė 1995, 88–95).

Table 2. Radiocarbon dates of cremated bones from the barrow cemeteries. Calibration produced in OxCal 4.4.4 (Reimer et al. 2020; Bronk Ramsey 2021)

No.	Site	Barrow (B), grave (G)	Material	Context	Laboratory code	Date BP	Cal (95.4%)
1.	ĖGLIŠKIAI	B 2, G 7	Cremated bone 3.13 g	Pit under a stone structure at the base of the mound, depth 90 cm	FTMC-CZ24-3	2469 ± 31	765–421 cal BC
2.	ĖGLIŠKIAI	B 3, G 5	Cremated bone 4.04 g	Pit with an urn, depth 30 cm	FTMC-CZ24-2	2414 ± 32	746–400 cal BC
3.	ĖGLIŠKIAI	B 5, G 3	Cremated bone 2.28 g	Urn with cremated bones in a "stone box", depth 30 cm	FTMC-CZ24-1	2515 ± 32	790–541 cal BC
4.	ĖGLIŠKIAI	B 7 (6), G 1	Cremated bone 2.75 g	Pit with a stone circle at the base of the mound, depth 45–97 cm	FTMC-CZ24-6	2495 ± 31	777–491 cal BC
5.	GINTARAI	Burial outside the external stone circle of the barrow	Cremated bone 4.25 g	Pit with an urn, depth 35 cm	FTMC-CZ24-7	2476 ± 31	771–423 cal BC
6.	KURMAIČIAI	B 5 (4), G 1	Cremated bone 1.57 g	Pit with an urn, depth 8 cm	FTMC-UF73-1	2437 ± 26	750–408 cal BC
7.	KURMAIČIAI	B 8 (3)	Cremated bone 2.69 g	Deposit of calcined bones	FTMC-UF73-2	2471 ± 26	766–425 cal BC
8.	KVECIAI	B 1, G 11	Cremated bone 6.41 g	Pit under a stone-paved floor at the base of the mound	FTMC-CZ24-4	2477 ± 32	771–423 cal BC
9.	KVECIAI	B 2, G 1	Cremated bone 5.65 g	Deposit on a stone-paved floor at the top-centre of the mound	FTMC-CZ24-5	872 ± 30	1047–1260 cal AD
10.	SŪDĖNAI	B 1, G 4	Cremated bone 2.20 g	Pit at the base of the mound, depth 56 cm	FTMC-CZ24-8	2397 ± 31	734–397 cal BC
11.	SŪDĖNAI	B 5, G 1	Cremated bone 2.88 g	Pit with an urn under a stone floor at the base of the mound, depth 45 cm	FTMC-CZ24-9	2226 ± 31	387–198 cal BC
12.	ŠLIKIAI	B 1, G 2	Cremated bone 1.37 g	Urn with a stone circle at the base of the mound, depth 75 cm	FTMC-CZ24-10	2263 ± 32	396–206 cal BC

Results of radiocarbon dating

Calibration of the radiocarbon dates placed the majority within the Hallstatt plateau of 800–400 BC (see Table 2; Fig. 4). The only dates outside this range were obtained from Grave 1 in Barrow 5 in Sūdėnai (387–198 cal BC), Grave 2 in Barrow 1 in Šlikiai (396–206 cal BC), and the previously discussed Grave 1 in Barrow 2 in Kveciai (1047–1260 cal AD).

The comparison of dates in OxCal 4.4.4 and the evaluation of the statistical reliability of their overlap using the Combine function revealed a statistically reliable non-overlap of dates yielded by Grave 5 in Barrow 3 and Grave 3 in Barrow 5 in Ėgliškiai (Acomb = 41.1% (An = 50.0%)). Other dates yielded by the Ėgliškiai barrows demonstrated a statistically reliable overlap. Archaeological data confirmed that Barrows 1–3 were likely constructed around the same time, as evidenced by their interconnected mounds and stone circles. However, the presence of a large number of different burials in the barrows posed a question as to whether the dead were buried around the same time or whether the barrows saw long periods of use and certain remains were deposited at a later time. Notably, Barrow 7 (6), which

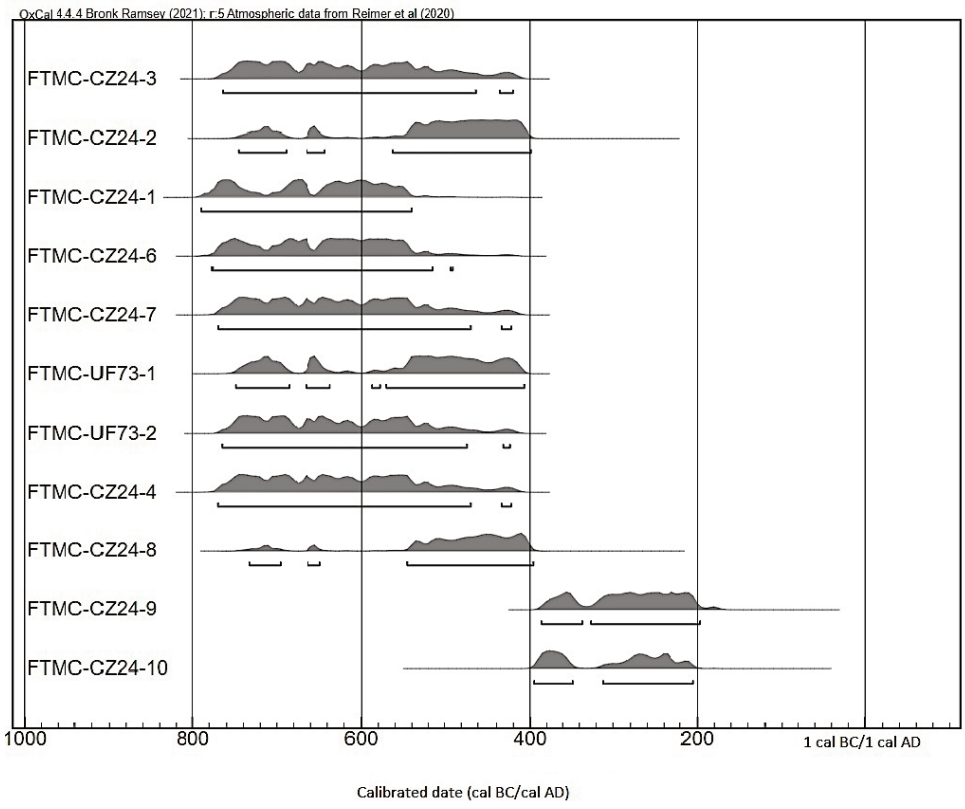

Fig. 4. ^{14}C calibrated dates, produced in OxCal 4.4.4 (Reimer et al. 2020; Bronk Ramsey 2021).

was sequestered from the other barrows, yielded a date that statistically reliably overlapped with dates from Barrows 2 and 3, despite significant differences in features (stone circles and types of burials present). The centre of Barrow 7 (6) contained a single grave, whereas Barrows 2 and 3 contained ten and 23 individuals, respectively. If these barrows were indeed contemporary, the question of why the individual in Barrow 7 (6) was buried separately rather than in the communal barrow must be addressed. Perhaps social or ideological factors apply in this instance. Equally, the deceased may have been members of different communities altogether because the probability interval of the dates from the Ėgliškiai barrows spans nearly 300 years, and individual barrows could in fact be centuries apart.

When considering the funerary segregation of certain individuals, graves situated beyond the outermost stone circle merit closer examination. Such examples were present across multiple burial sites in western Lithuania, in particular in Ėgliškiai, Kurmaičiai, Kveciai, Sūdėnai, Žvainiai, and one in Gintarai. The latter yielded a radiocarbon date of 771–423 cal BC, which overlaps with cremation burials within the barrows. This date statistically reliably overlaps with radiocarbon dates yielded from the Ėgliškiai, Kveciai, and Kurmaičiai barrows, along with Barrow 1 in Sūdėnai. Overall, fewer cremation burials were recorded outside the boundaries of barrows than within, but examples of this were encountered across multiple burial sites in western Lithuania. Therefore, this particular grave placement may have existed in parallel with barrow interment.

Two structurally different barrows in Kurmaičiai yielded similar dates: 750–408 cal BC (Grave 1 in Barrow 5 (4)) and 766–425 cal BC (Barrow 8 (3)), although the excavators had originally dated each to different periods. The overlap of radiocarbon dates was statistically reliable, and the results are indicative of the barrows being used around 751–418 cal BC (Combine function). A noteworthy find in Barrow 8 (3) was a set of horse teeth. An individual inhumation of a horse was discovered in Barrow 1 in Kveciai, and radiocarbon dating of a cremation burial at the base of Barrow 1 yielded a date of 771–423 cal BC. Evidently, horse burials may have spread around 8th–5th century BC, when the cremation custom was still commonplace. Horse remains have been identified in other Early Metal Period burial sites in the East Baltic region (Merkevičius & Muradian 2015, 32–34).

The Sūdėnai barrows were structurally similar, and featured a linear arrangement on a north–south axis. Barrow 5 in the north and Barrow 1 in the south were sampled to determine the period of use of the barrow cemetery. The dates yielded were 734–397 cal BC and 387–198 cal BC, and the absence of overlap was statistically reliable in this instance (Acomb = 7.3% (An = 50.0%)). Both samples were collected from cremation burials at the base of the mound, i.e., representing the earliest stratigraphic events in the formation of the barrow. It is possible that the cemetery was in use longer than presumed, and the barrows were not necessarily contemporary despite similarities in appearance. Each barrow featured two or three stone circles and pit burials, occasionally surrounded by individual stone circles or semi-circles. Some burnt bones had been placed in urns exhibiting fine-rusticated surfaces and ground stone temper in the clay matrix.

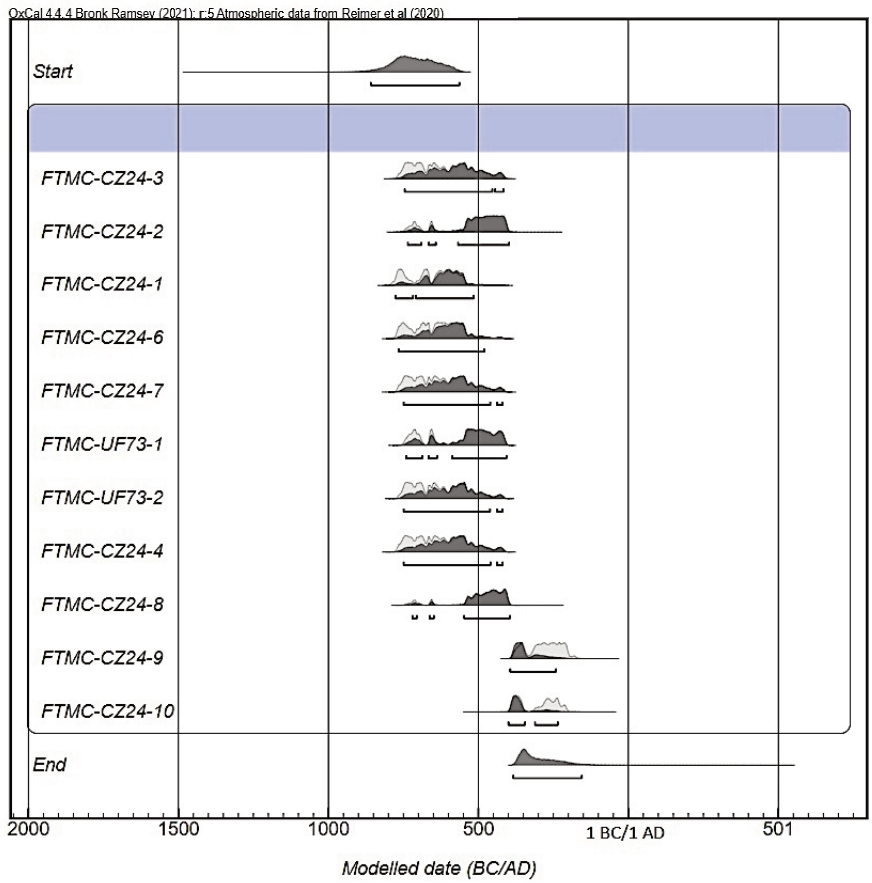

Fig. 5. Duration of the cremation custom, produced via the Sequence function in OxCal 4.4.4.

The Sequence function in OxCal 4.4.4 was used to determine the timeframe for the cremation custom in the barrows investigated, assuming that the obtained samples included the earliest and the latest dates. The results demonstrated that cremation was practised in these specific barrow cemeteries between 859–564 cal BC and 385–156 cal BC (Fig. 5). Cremation and deposition of remains within the investigated barrows could have lasted from 196 to 509 years.

Discussion

Until recently, cremated bones have not been used for radiocarbon dating due to the changes that occur within the bone structure during cremation. The majority of Bronze Age and Pre-Roman Iron Age material from burial sites consists primarily of cremated osteological materials, and in the absence of grave goods these bones

may provide the only means of establishing a more precise chronology for burial sites. As recent decades have shown, radiocarbon dating of burnt bones can deliver reliable results, with a few considerations in mind. Non-cremated and cremated bones possess different limiting factors in regard to radiocarbon dating and its results. The high-temperature (> 600 °C) cremation process causes changes in bone structure, and a range of studies have found that the greatest possible influence on the accuracy and interpretation of radiocarbon dates is attributable to the *old wood effect* (Van Strydonck et al. 2005, 3–10; Zazzo et al. 2009, 601–611; Snoeck et al. 2014, 591–602). Meanwhile, diet (if a person consumed primarily fish or shellfish) and the pertained *reservoir effect* are of lesser concern. Firstly, the reservoir effect is difficult to quantify, as bone cremation changes stable isotope ($\delta^{13}C$ and $\delta^{15}N$) values that are normally used to examine a person's diet and thus to assess its potential impact on radiocarbon dating. Evidently, the values of $\delta^{13}C$ depend on the temperature and duration of cremation (Van Strydonck et al. 2009, 553–568). Accurate stable isotope analysis is only possible in low-temperature cremations (up to 300 °C) (Harbeck et al. 2011, 191–200). However, the exchange of carbon between fuel/wood and bone that occurs during high-temperature cremations (> 600 °C) may help circumvent the reservoir effect since the date would pertain to the fuel used in the pyre, and the diet of the deceased would have no impact on the result (Zazzo et al. 2012, 863).

If aged wood (for example, an old tree) was used as fuel for the cremation pyre, the burnt bones may yield an earlier date (Zazzo et al. 2012, 855–866; Olsen et al. 2013, 30–34; Snoeck et al. 2014, 591–602). The old wood effect can age a date by a few hundred years or more (Snoeck et al. 2014), and the date would only reflect the true age of a bone if the tree used for fuel and the deceased were contemporary. Presumably only a few graves within a single burial site could potentially be affected by this, as it is highly unlikely that aged wood would be used for every single cremation pyre. Radiocarbon dates obtained from cremated bones in western Lithuanian barrows were largely consistent with other archaeological data, and most dates were statistically reliably overlapping. However, dates from the Sūdėnai barrow cemetery merit a separate mention: a comparison of date intervals from one of the barrows exposed a lack of statistically reliable overlaps. It is unclear whether the old wood effect was in play in this instance, or whether the barrows had simply been in use longer than anticipated. Future research would benefit from dating a broader range of organic material from the same burial site and using statistical methods to compare the calibrated intervals.

Most radiocarbon dates obtained in the course of this study demonstrated that despite structural differences, barrows and cremation burials within may be contemporary with graves beyond the boundary of a barrow, as well as with individual barrow burials. Equally, such interpretations are subject to the Hallstatt plateau which produces broad intervals. Internal periodisation is one of the key issues pertaining to the plateaued calibration curve. Although individual variances were observed in the structure of barrows, cremation burials, and pottery (urn) types, a level calibration curve creates ambiguous periodisation and wide-ranging date

intervals. For example, calibration of the AMS ^{14}C date (2414 ± 32 BP) from cremation Grave 5 in Ėgliškiai Barrow 3 resulted in a date of 746–400 cal BC, i.e., the interval for the construction of the grave is 346 years. The same is true of other cremation burials in Ėgliškiai, Kurmaičiai, Kveciai, Gintarai, and Sūdėnai. Further dating-related information would help to improve the accuracy of the calibration curve, which is currently plagued by typological dating issues addressed in the previous section, i.e., the scarcity of grave goods in cremation burials and inconsistent dating based on structural features in the literature. Therefore, introducing other dating methods or expanding the burial-related types of organic material used in AMS ^{14}C dating should be considered, with certain reservations. Unlike with burnt bones, the context of charcoal pieces and their association with the grave must be confirmed. Some charcoal pieces present in the burnt bone assemblages stored in museum collections and at the Department of Anatomy, Histology and Anthropology at the Faculty of Medicine at Vilnius University could potentially be dated using the AMS ^{14}C method, thus allowing researchers to assess and compare the reliability of the dates yielded. Thermoluminescence is a popular method for dating pottery (urns), but its considerable margin for error of around 10% (Kusiak et al. 2011, 359–368) is unlikely to lend accuracy to the AMS ^{14}C intervals. A new dating method for fired-clay ceramics – rehydroxylation (RHX) – has been in development since 2009 (Clelland et al. 2015, 392–404), and could one day be used to date archaeological material from Lithuania.

The dates obtained in the course of this study indicate that the cremation custom in the barrows in question was practised from the 9th–6th century BC to the 4th–2nd century BC. However, only a fraction of the existing osteoarchaeological material has been dated so far, the level of detail recorded in each excavation varies from site to site, and some burial sites have not survived to the present day. Furthermore, no material from a multitude of barrows excavated by German archaeologists before the mid-20th century has survived to the present day, making further examination impossible. That is certainly the case with the Šlažiai barrow cemetery, located approximately 500 m from Ėgliškiai. The Šlažiai barrows were first excavated at the end of the 19th century, and revealed both skeletal and cremation burials (Bezzenberger 1900b, 81–85). Items discovered within the skeletal graves (a coiled pin, tag pins, a double button, and others) indicate that the barrows were first formed and used in the Early Bronze Age (Montelius's period III) (Grigalavičienė 1995, 64–65). Therefore, the obtained radiocarbon dates reflect the timeline of the cremation custom based on data from these specific barrows, but cremation is likely to have emerged earlier across the region.

Six radiocarbon dates have so far been obtained from flat cremation cemeteries elsewhere in Lithuania. A piece of charcoal found in Grave 9 in the Kvietiniai cemetery (Klaipėda district municipality) was dated to 728–388 cal BC (Vengalis et al. 2020, 37–38); burnt human bones from Grave 12 in the Paveisininkai cemetery (Lazdijai district municipality) were dated to 800–540 cal BC; burnt bones from Grave 5 in the Kernavė cemetery (Širvintos district municipality) were dated to 790–540 cal BC; and burnt bones from Grave 1 in the Naudvaris cemetery

(Jurbarkas district municipality) were dated to 410–230 cal BC, whilst bones in the urn from Grave 2 were dated to 970–830 cal BC (Piličiauskas 2012, 13, 16). Radiocarbon dating of charcoal pieces found on the exterior of the urn in Grave 1 in Strazdai-Ječiškės yielded a date of 1125–803 cal BC (Tamulynas 2004, 18). Therefore, the earliest radiocarbon date demonstrates that cremation was practiced in the 12th–9th century BC. Dating a large quantity of samples from cremation burials in both barrows and flat cemeteries would contribute towards establishing a more precise timeline for the initial emergence of cremation. It is worth noting that radiocarbon dates were obtained for three inhumations at the Turlojiškė (Kalvarijos district municipality) sacrificial site. Two individuals were dated: 1230–920 cal BC and 1190–840 cal BC. The radiocarbon date obtained for Grave 3 was earlier: 2300–1560 cal BC (Antanaitis-Jacobs et al. 2009, 12–30). After a later radiocarbon dating of Grave 3, it was revealed that this grave also belongs to the Late Bronze Age: 930–810 cal BC (Piličiauskas et al. 2017, 530–542). Forty-eight radiocarbon dates obtained from burial sites (barrow cemeteries, flat cemeteries, and stone grave cemeteries) in Latvia include both cremated and non-cremated burials and a wide range of materials (burnt bones, charcoal, and horse teeth). The data indicate that cremation could have spread from the 17th (16th) century BC to the 15th century BC (based on data from the Pukuļi barrow cemetery). The cremation custom remained in use alongside inhumation throughout the region until the end of this period. Furthermore, one date yielded by a cremation burial in the Lazdiņi stone grave cemetery demonstrated that the cremation custom continued into the 3rd–1st century BC (201–46 cal BC) (Legzdiņa et. al 2020, 1851, 1852, 1860).

In Estonia, inhumations and cremations were found in various Late Bronze and Pre-Roman Irone Age burials: stone-cist graves, ship graves, cairn graves, and *tarand* graves (Lang 2007, 147–218). The stone-cist graves in Rebala predominantly contained inhumations, but cremations were also found. The radiocarbon dating of bones from five stone-cist graves in Rebala demonstrated that the cemetery was likely founded between 850 and 600 BC, and was used thereafter until ca 350/300 BC. One radiocarbon date of a cremated burial in Grave II was earlier (970–810 cal BC), but this could be the result of the old wood effect (Laneman 2021, 113–139).

Conclusions

The AMS ^{14}C dates obtained from twelve samples of burnt bones from six barrow cemeteries (Ėgliškiai, Kurmaičiai, Kveciai, Gintarai, Sūdėnai, and Šlikiai) in western Lithuania demonstrated that the cremation custom in these barrow cemeteries was practiced around 859–564 cal BC, and lasted until 385–156 cal BC. The absence of dates from the 2nd millennium BC could be due to several reasons: 1) no surviving material from early barrows is suitable for AMS ^{14}C dating; 2) earlier barrow sites have yet to be excavated; and 3) some burial sites were

destroyed by earthworks over the years. Therefore, it is possible that the practice of cremation commenced earlier than the initial dates suggest. An array of archaeological data indicates that cremation emerged in the East Baltic in the 2nd millennium BC. Additional radiocarbon dating of cremated remains from other regions in Lithuania is necessary to draw a more precise conclusion on the emergence, duration, and spread of cremation, and on the reasons behind it.

The majority of dates obtained in this study fall within the range of 800–400 BC, i.e., the Hallstatt plateau, which makes it impossible to determine the internal evolution of barrows. Multiple forms of evidence indicate that different grave structures, burials outside the boundaries of mounds, and individual graves in barrows that contained no subsequent burials could have co-existed. Therefore, these variations could represent social, ideological, or religious influences, rather than purely chronological shifts in the mortuary tradition. It is worth noting that the dates obtained in this study span around 300 years, and a minor chronological delay between some types of burial customs is not unlikely.

Acknowledgements

This research was supported by PhD funding from the Faculty of History at Vilnius University and the Lithuanian Institute of History, and by the joint initiative of "Modern Technologies for Lithuanian Archaeology" of the Lithuanian Archaeology Society and Vilnius Radiocarbon Laboratory at the Centre for Physical Sciences and Technology. The text was translated by Kristina Vaičiūnaitė and Jamie Redfern. The publication costs of this article were covered by the Estonian Academy of Sciences.

I am grateful to Dr Justina Kozakaitė (Department of Anatomy, Histology and Anthropology at the Faculty of Medicine at Vilnius University), Dr Eglė Rimkienė (Kretinga Museum), Dr Povilas Blaževičius, Gytis Grižas and Aušra Šmaižytė (National Museum of Lithuania) for their assistance with sampling procedures, to Dr Laurynas Vytis Kurila for consultations and useful insights in the preparation of this article, and to the two reviewers of the manuscript for their valuable comments.

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LÄÄNE-LEEDU PRONKSI- JA EELROOMA RAUAAJA KÄÄBASTE PÕLETATUD LUUDE ESIMENE DATEERIMINE AMS ^{14}C-MEETODIL: TULEMUSED JA TÕLGENDUS

Resümee

Uuringus esitatakse kaksteist AMS radiosüsinikdateeringut erinevatest kääbaskalmistutest Lääne-Leedus: Ėgliškiai, Kurmaičiai, Kveciai, Sūdėnai, Šlikiai ja Gintarai. Need on esimesed AMS radiosüsinikdateeringud, mis on saadud Leedu pronksiaja ja eelrooma rauaaja kääbaste põletusmatustest. Tulemusi kasutati selleks, et määrata kindlaks põletatult matmise kombe kestus nendes kalmetes ning selgitada välja, kas esineb kronoloogilisi erinevusi eri liiki matuste vahel. Dateeringud tehti Vilniuse Ülikooli Füüsikateaduste ja Tehnoloogia Keskuse radiosüsiniku laboratooriumis ning tulemuste kalibreerimisel kasutati OxCal 4.4.4 tarkvara

(tõenäosusega 95,4%) ja IntCal13 graafikat (Reimer et al. 2020). Statistiliste võrdluste tegemiseks kasutati OxCal 4.4.4 *Combine*-funktsiooni ning põletusmatuste traditsiooni kestuse arvutamisel sama programmi *Sequence*-funktsiooni. Dateerimiseks võeti proovid tugevasti (üle 600 °C) põletatud kolju- või diafüüsitükkidest, mis olid nii sise- kui ka välispinnal põlenud valgeks (joonis 2).

Kokku teatakse Leedus u 50 pronksiaega ja eelrooma rauaaega dateeritud matmispaika (Merkevičius 2014), kuid nende levik on ebaühtlane: enamik kalmetest paikneb maa lääneosas (joonis 1). Tolleaegsed põletusmatustega kääpad koonduvadki peamiselt vaid Lääne-Leedusse (17 rühma) ning kujutavad endast olulist muutust võrreldes neoliitikumis levinud laibamatustega maahaudades (Žukauskaitė 2007; Piličiauskas 2018). Lääne-Leedu kääpad võivad üksteisest erineda oma ehituse ning matuste paiknemise poolest (tabel 1): esineb nii kollektiivmatustega kui ka üksikmatustega kääpaid ning ka selliseid kohti, kus surnud on maetud kääpa kiviringist väljapoole.

Põletusmatmise traditsiooni levikuga kaasnes hauapanuste arvu vähenemine. Tegelikult ei sisalda valdav enamik Leedu pronksi- ja eelrooma rauaaja põletusmatustest üldse mingeid leide. Hauapanuste väike arv ning vanemate esemete kasutamine matmisrituaalides on seni tõsiselt raskendanud kalmete usutava kronoloogia väljaselgitamist.

Osa põletusmatuseid paigutati urnidesse. Põletatud luid sisaldavad urnid olid kas tasandatud pindadega, varbitud või riibitud pindadega (joonis 3). Kurmaičiai 5. (4.) kääpa 1. matuse urn oli varbitud pindadega, Ėgliškėsi 5. kääpa 3. matuse urni pinnad olid aga enamjaolt tasandatud, kuigi mõnes osas riibitud. Samas oli mõlema urni savikoostis ühesugune ja sisaldas kivipurdu. Tasandatud pindadega urni katked avastati ka Gintarai kääpa kõrval ning Sūdėnai 5. kääpa 1. matuses. Varbitud pinnaga urne täheldati Kurmaičiai 8. (3.) kääpas ning Šlikiai 1. kääpa 2. matuses.

Radiosüsinikdateeringud on esitatud tabelis 2 ja joonisel 4. Enamik dateeringuid langeb ajavahemikku 800–400 eKr, s.o nn Hallstati kalibreerimisplatoole, mis ei võimalda jälgida kääpamatuste traditsiooni evolutsiooni selle perioodi sees. Hulk tõendeid osutab siiski sellele, et erinevad kalmekonstruktsioonid ja matmisviisid (individuaalsed, kollektiivsed ja kääpavälised matused) võisid esineda samaaegselt. Seetõttu võivad seesugused variatsioonid peegeldada pigem sotsiaalseid, ideoloogilisi või usundilisi erinevusi ja mitte niivõrd kronoloogilisi.

Põletatud luude radiosüsinikdateeringud Lääne-Leedu kääbastes sobivad hästi kokku teiste arheoloogiliste andmetega. Kui muuhulgas selgus, et Kveciai 2. kääpa 1. matus kuulub radiosüsinkdateeringu alusel perioodi 1047–1260 pKr, siis sobis see kokku teise matusega, mille võis hauapanuste põhjal dateerida 10.–11. sajandisse. Need leiud näitavad, et vanu matmiskohti ja kääpaid võidi matmiseks kasutada ka aastatuhandeid hiljem. Nähtavasti kujutati kääbast lülina elavate inimeste ja nende kaugete esivanemate vahel, mis sümboliseeris selliselt kogukondlikku identiteeti. Hilisemaid haudu on avastatud ka Kurmaičiai, Padvariai ja Sūdėnai kääbaskalmistutes.

OxCal 4.4.4 programmi *Sequence*-funktsiooni kasutati põletusmatuste ajalise raamistuse määramiseks kääbastes, oletades, et saadud daatumite hulgas oli nii

kõige varasem kui ka kõige hilisem ajamäärang. Tulemused näitasid, et surnute põletamine algas Ėgliškiai, Kurmaičiai, Kveciai, Sūdėnai, Šlikiai ja Gintarai kalmistuil ajavahemikus 860–565 eKr ning jätkus kuni ajavahemikuni 383–151 eKr (joonis 5). Mujalt Leedus on saadud kuus radiosüsinikdateeringut põletusmatustest maahaudadega kalmistutelt (Tamulynas 2004; Piličiauskas 2012; Vengalis et al. 2020). Nende põhjal võib öelda, et põletatult matmise traditsioon levis Leedus tegelikult juba varem, so 12.–9. sajandil eKr. Seda ajajoont võib tulevikus täpsustada uute radiosüsinkdateeringutega nii kääbastest kui ka maahaudadega kalmistutelt.