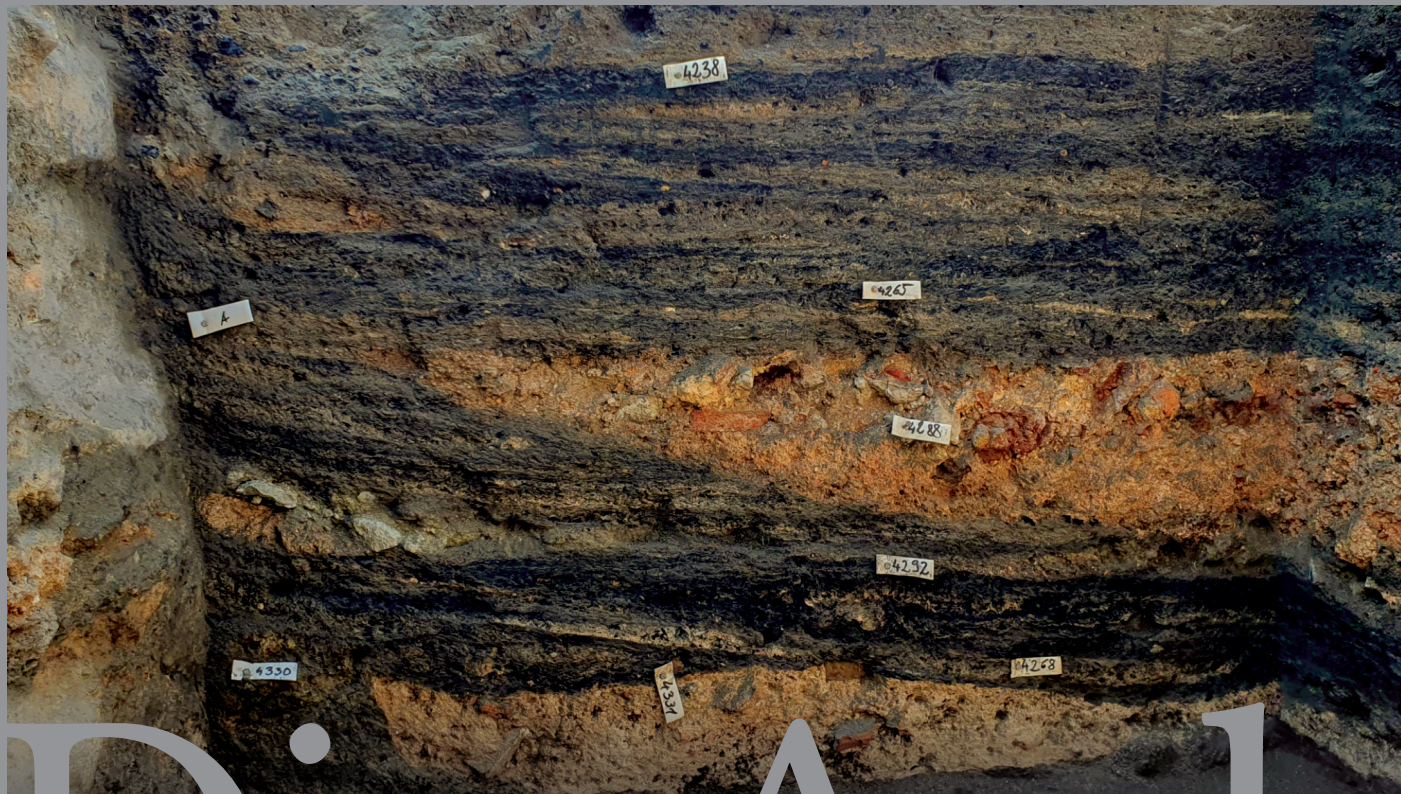


DISSERTATIONES ARCHAEOLOGICAE

ex Instituto Archaeologico

Universitatis de Rolando Eötvös nominatae



DissArch

Ser. 3. No. 12. | 2024

Dissertationes Archaeologicae
ex Instituto Archaeologico
Universitatis de Rolando Eötvös nominatae

Ser. 3. No. 12.

Editor-in-chief

Dávid BARTUS

Editorial board

László BARTOSIEWICZ (Stockholm University, Stockholm, Sweden)

Ondřej CHVOJKA (University of South Bohemia, České Budějovice, Czech Republic)

Alexandra ANDERS (ELTE Eötvös Loránd University, Budapest, Hungary)

Miroslava DAŇOVÁ (University of Trnava, Trnava, Slovakia)

Mario GAVRANOVIĆ (Austrian Archaeological Institute AAS, Vienna, Austria)

Hajnalka HEROLD (University of Exeter, Exeter, United Kingdom)

Tomáš KÖNIG (Comenius University, Bratislava, Slovakia)

Tina MILAVEC (University of Ljubljana, Ljubljana, Slovenia)

Gábor V. SZABÓ (ELTE Eötvös Loránd University, Budapest, Hungary)

Tivadar VIDA (ELTE Eötvös Loránd University, Budapest, Hungary)

Technical editor

Gábor VÁCZI

Proofreading

Katalin SEBŐK, Emilia GRANDI

Cover picture

Ákos MÜLLER

Aviable online at <http://ojs.elte.hu/dissarch>

Contact: dissarch@btk.elte.hu

Support: vaczi.gabor@btk.elte.hu

ISSN 2064-4574 (online)

Publisher

László BORHY

© Institute of Archaeological Sciences, ELTE Eötvös Loránd University

© Author(s)

Budapest 2025



PKP
PUBLIC
KNOWLEDGE
PROJECT



DOAJ

ERIH PLUS
EUROPEAN REFERENCE INDEX FOR THE
HUMANITIES AND SOCIAL SCIENCES



CONTENTS

ARTICLES

Marie SEGUEDY – Stéphane PÉAN – Marylène PATOU-MATHIS – Zsolt MESTER	5
Des vides et des pleins : Les occupations humaines dans le Bassin des Carpates entre 130 et 10 ka BP	
Attila PÉNTEK – Krisztián ZANDLER – Szilvia GUBA – Nicklas LARSSON	41
Upper Palaeolithic site complex at Csécse-Szőlős-domb (Cserhátalja, Nógrád County, Northern Hungary): Preliminary results	
Gizella Kovács	71
Interpretation possibilities of Middle Neolithic cave usage patterns: The Neolithic finds from the 2019 excavation in the Baradla Cave in Aggtelek	
Filip ONDRKÁL	149
Hrádok nad Váhom: Bronzeworking equipment from an Urnfield Culture site in the Carpathians	
János Gábor TARBAY	167
Kartal: A fragmented hoard under a broken pot	
Gábor ILON	223
New specimen of an Early Iron Age brooch type from Western Transdanubia: A stray find from Simaság	
Attila MRENKA	231
An Early Iron Age cup with unique decoration from Fertőrákos (NW Hungary)	
Umut M. DOĞAN	243
In Turkish Thrace: The Early Iron Age cultural environment of the Tundza and Maritsa valleys	
Linda DOBOSI – Tamás SZABADVÁRY	267
Roman stamped bricks from the Tussla-collection in the Hungarian National Museum	
Ingrid PETCU-LEVEI – Radu PETCU	333
An ivory statuette depicting the god Thanatos discovered near Tomis (Moesia Inferior)	
Bence GULYÁS – Péter SOMOGYI – Gergely SZENTHE	343
New data to the Avar Period chronology of the Körös–Tisza–Maros Interfluve: Some radiocarbon dates from the cemeteries of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő	

Box-shaped cloak clasps in the Late Avar Period

Some remarks on the absolute chronology of heraldic belt fittings

Connection and disconnection: Reconstructing routes through and beyond
the Rania Plain in Iraqi Kurdistan

FIELD REPORTS

Preliminary report on the excavations of the legionary bath of Brigetio in 2024

Pilisszentiván-Hárs-erdő 2024: Newly excavated remains of an Early Roman village
in the northwestern hinterland of Aquincum

THESIS REVIEW ARTICLES

The concept of the ancient homeland of the Fenno-Ugric-speaking peoples
in light of complex research

New data on the Avar Period chronology of the Körös–Tisza–Maros Interfluve

Some radiocarbon dates from the cemeteries of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő

Bence GULYÁS 

Hungarian National Museum Public Collection Centre, Budapest, Hungary
Institute of Archaeological Sciences, ELTE Eötvös Loránd University, Budapest, Hungary
gbence567@gmail.com

Péter SOMOGYI 

Independent Researcher, Feldkirch, Austria
firtoslova@gmail.com

Gergely SZENTHE 

Hungarian National Museum Public Collection Centre, Budapest, Hungary
szenthe.gergely@hnm.hu

Received 26 October 2024 | Accepted 16 December 2024 | Published 24 January 2025

Abstract: The study presents an analysis of the internal chronology of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő, two Avar cemeteries in the Trans-Tisza Region. According to a widely accepted theory, both were established only in the second half of the Avar Period. This dating could be re-evaluated based on the radiocarbon results presented here. The question of when the Middle Avar belt sets could have appeared in the region is also addressed in the study in connection with the internal chronology of the two sites.

Keywords: Trans-Tisza Region, Early Avar Period, Middle Avar belt sets, burial rites, chronology, radiocarbon dating

Introduction

Although radiocarbon dating was first implemented in the research on the Avar Period four decades ago,¹ the earliest applications aimed to complete the traditional archaeological (typochronological) dating. Works where the method was used to answer any specific archaeological questions have only been published in the last few years.² This paper focuses on the chronological questions of the 7th century AD in the Trans-Tisza Region, which have divided the scientific community for years.

As Dezső Csallány and, later, Gábor Lőrinczy reconstructed, certain communities with burial customs different from that of the ones occupying other parts of the Carpathian Basin settled in the Trans-Tisza Region in the Early Avar Period. The ritual they practised was characterised by a mainly E–W or NE–SW grave orientation and graves with longitudinal ledges, a side-wall niche, or an end-wall shaft.

1 ŽIVANOVIĆ 1978.

2 BAJKAI – KOLOZSI 2017; SZENTHE *et al.* 2023; SZÜCSI 2023.

While partial animal remains consisting of skulls and leg bones of horses, cattle, or small ruminants are common finds in these graves, remains of harnessed complete horse skeletons can only be found in the richest ones. The most popular food offering was the sheep rump containing the *sacrum* and some vertebrae. Many graves contain pottery vessels, which, just like the food offerings, were usually placed beside the head of the deceased.³ Based on the analogies of the burial practice, these groups originated from the Eastern European steppe.⁴ Gábor Lőrinczy explained the appearance of other funerary rites (characterised by a preference for N–S or W–E orientation and the addition of complete horses) with the arrival of immigrants from other regions of the Avar Khaganate.⁵

However, researchers in recent years have pointed out that the burial customs mentioned above were not unknown in the Eastern European steppe either, so their appearance does not necessarily mean ‘Avar’ influence from Transdanubia or the Danube–Tisza Interfluve.⁶ Bence Gulyás pointed out in his PhD dissertation that the burial customs in the Early Avar Period in the Trans-Tisza Region were much more diverse than previously thought, as at least nine different traditions could be separated using statistical methods.⁷ It must be noted that the groups with diverse burial customs rarely formed homogeneous communities, and the different rites appeared admixed.

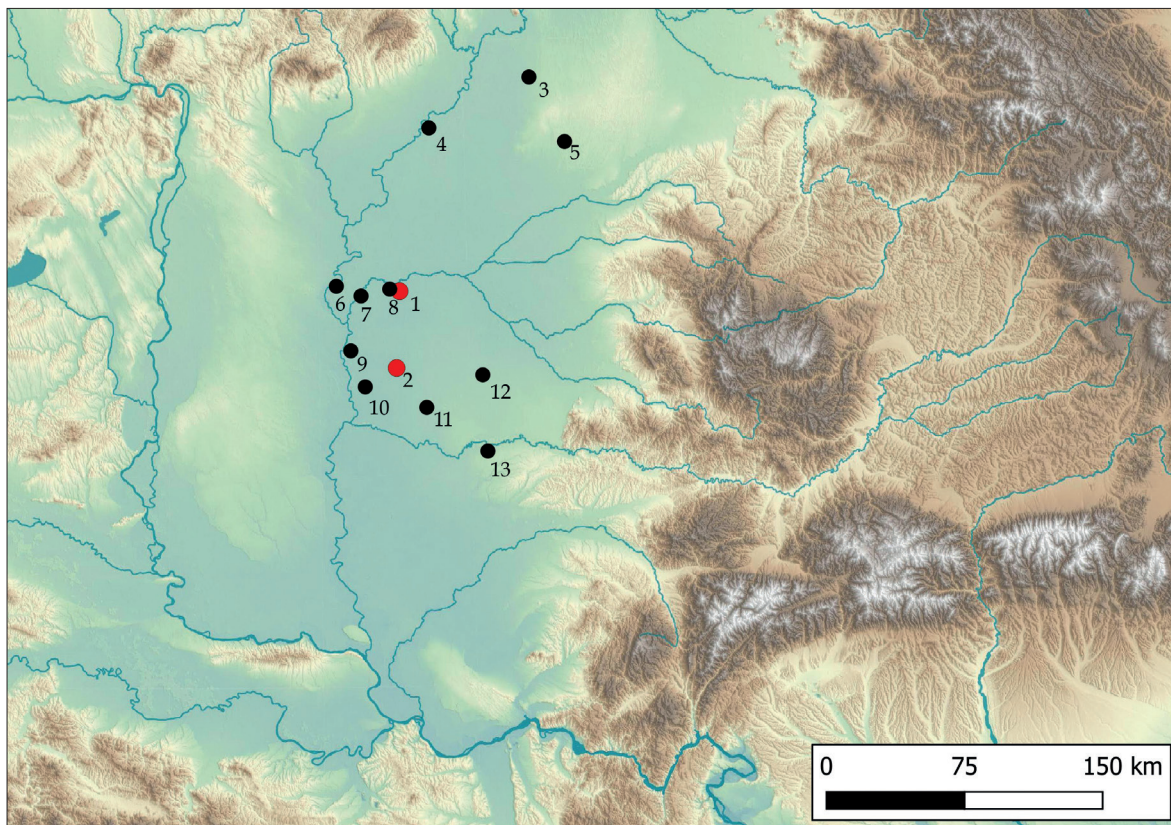


Fig. 1. Sites mentioned in the text. 1 – Szarvas-Grexa-téglagyár, 2 – Székkutas-Kápolnadűlő, 3 – Hajdúnánás-Fürjhalom-dűlő, 4 – Tiszafüred-Majoroshalom, 5 – Debrecen-Bellegelő, Bordás-tanya, 6 – Tisza-kürt-Zsilke-tanya, 7 – Kunszentmárton-Habranyi-telep, 8 – Békésszentandrás-Benda-tanya, 9 – Hódmezővásárhely-Kishomok, 10 – Szegvár-Oromdűlő, 11 – Pitvaros-Víztározó, 12 – Nagykamarás, 13 – Fönlak (Felnac, RO).

3 CSALLÁNY 1939, 132–133; LŐRINCZY 1998, 344.

4 SOMOGYI 1987, 149; GULYÁS 2015; GULYÁS 2023.

5 LŐRINCZY 1998, 352; LŐRINCZY – SOMOGYI 2018, 241.

6 GULYÁS 2023, 734, 736–737.

7 It must be noted that Gulyás did not include Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő among the Early Avar sites despite the Early Avar material found in some of the graves.

In the following, we present the radiocarbon results of five graves from the cemetery of Szarvas-Grexa-téglagyár and four from Székkutas-Kápolnadűlő (both in Southeastern Hungary; see Fig. 1). Livia Bende believed that these sites, despite the presence of Early Avar finds, can be dated to the second half of the Avar Period⁸ because of the absence of the burial rites discussed above. This study aims to clarify the absolute chronological position of the graves with Early Avar material and two more details related to the inner chronology of the two sites. The first is the time of the first appearance of Middle Avar-style object types, especially belt sets, in the graves. The second is related to the end of the period: since Grave 266 of Szarvas and Grave 89 of Székkutas are amongst the youngest burials in these cemeteries, they may help determine in the future the absolute chronological position of the object types traditionally dated to the end of the Late Avar Period (end of the 8th or early 9th century AD).

The cemeteries of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő in light of previous archaeological research

Irén Juhász excavated 422 graves in the cemetery of Szarvas-Grexa-téglagyár in 1983–1984 and 1986. The site stands out amongst the Avar cemeteries for its relatively large number of graves with an end-wall shaft (50) and horse harness deposits (15). Most graves were NW–SE oriented. Irén Juhász dedicated a whole chapter to the chronology of the site in her monograph. Although most graves were disturbed, she believed they could still be dated relatively well.⁹ She dated the earliest graves to the beginning of the 7th century AD.¹⁰ She has identified 37 grave groups, the earliest on top of the elevation, at and slightly south of the centre of the cemetery. She assumed from the find material that the cemetery was used continuously from the beginning of the 7th century AD until the end of the Avar Period.¹¹

Katalin B. Nagy excavated 534 graves at Székkutas-Kápolnadűlő in 1965–1986. Based on the find material, only a few graves (for example, Graves 8 and 51) on the southeastern fringes of the cemetery could be dated to the Early Avar Period; however, Livia Bende believed the graves with an end-wall shaft on the western outskirts of the cemetery to be contemporaneous, belonging to the first grave horizon.¹² The cemetery included three burials with horse harness deposits and relatively many graves with an end-wall shaft (59); the younger horizons were characterised by graves with post structures. The predominant orientation was WNW–ESE; W–E was also frequent.¹³ The archaeologist dated the start of the cemetery to the second half of the 7th century AD and connected it with an assumed Onogur immigration.¹⁴ According to József Szentpéteri, the site remained in use between the last quarter of the 7th and the first quarter of the 9th century AD.¹⁵ Based on his analysis of the belts from Székkutas, Csaba Szalontai also argued that the start of the cemetery can be dated to the beginning of the Middle Avar Period and that the burials containing Early Avar items, together with the graves with an end-wall shaft, may also be dated to this horizon.¹⁶ Based on the

8 BENE 2017, 10.

9 JUHÁSZ 2004, 63–75.

10 JUHÁSZ 1995, 430.

11 JUHÁSZ 2004, 96–102. It should be noted that figures 49 and 50 are switched in the monograph, so the map of the late grave groups shows actually the early ones.

12 BENE 2003, 322.

13 BENE 2003.

14 B. NAGY 1984, 237–240.

15 SZENTPÉTERI 2002, 359.

16 SZALONTAI 2003, 400. Almost every researcher defines the chronological limits of the Early and Middle Avar Period differently; however, the most common dates for the beginning of the Middle Avar Period are AD 650 and 670, respectively (cp. BREUER 2005). Csaba Szalontai did not define the term Middle Avar Period in his article, but he dated the start of the cemetery to the last quarter of the 7th century AD based on the presence of Middle Avar belt sets (SZALONTAI 2003, 400).

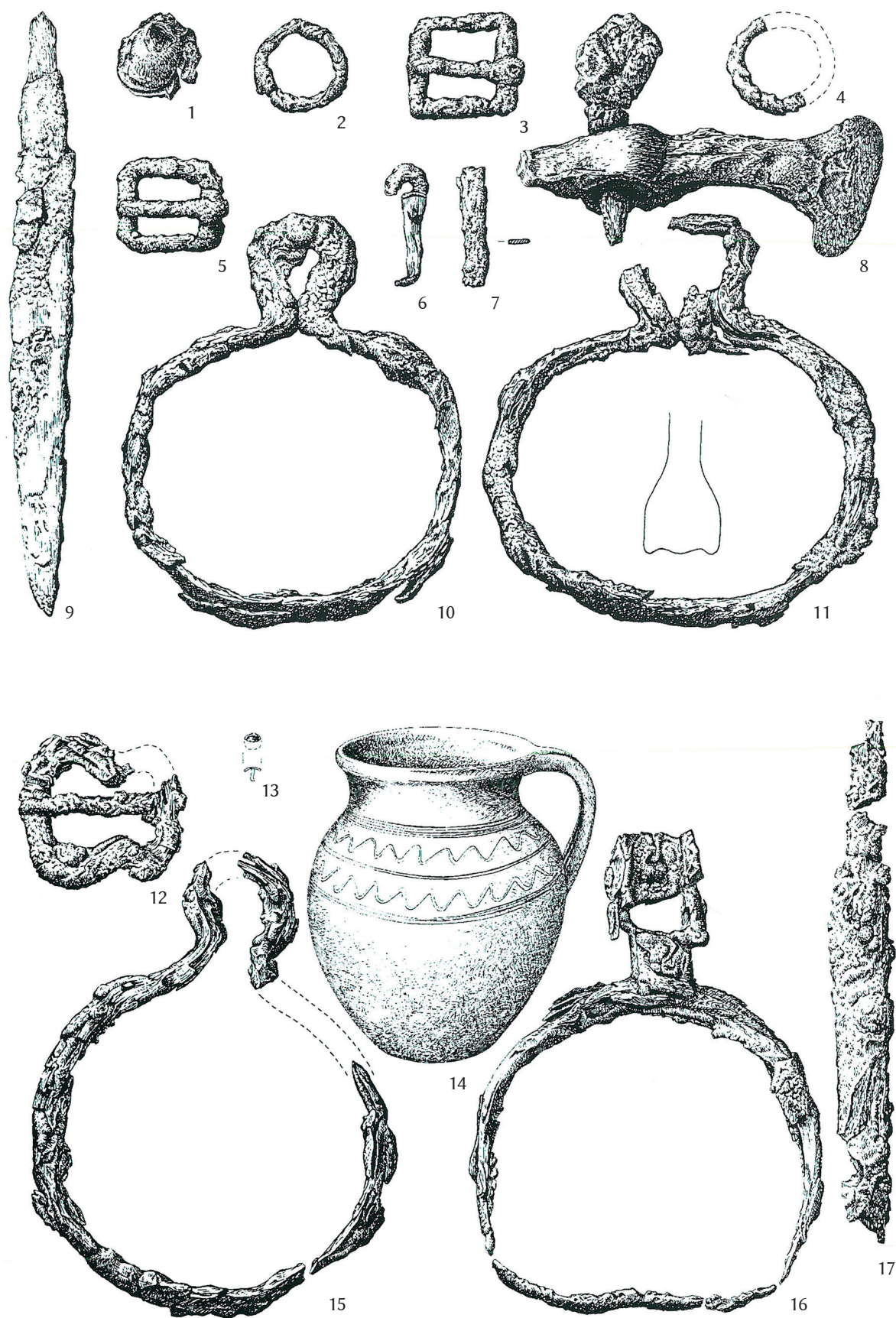


Fig. 2. Szarvas-Grexa-téglagyár. 1–11 – Grave 189, 12–17 – Grave 226 (after JUHÁSZ 2004).

beads, Adrien Pásztor concluded that the oldest graves (from the third quarter of the 7th century AD) were concentrated in several groups. According to her, the site remained in use until the beginning or the first third of the 9th century.¹⁷

Regarding the dating of the cemeteries in the Körös–Tisza–Maros Interfluve, Livia Bende suggested a new perspective. She wrote, “[...] I examined all those cemeteries and cemetery units that can be dated to the time traditionally referred to as the Middle and Late Avar periods, even though their finds may sometimes still bear Early Avar features. This explains the term ‘second half of the Avar Period’. This was also justified because there are no cemeteries in the area that can be dated to the Late Avar Period which were not in use for a long time, being present already in the Early Avar Period, or conversely, no cemeteries are known which were established at the beginning of the Early Avar Period and still used in the Late Avar Period.”¹⁸ However, her view did not become very popular. Gábor Lőrinczy consistently supported the theory, treating it as an axiom in his articles, that the cemeteries of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő started only in the second half of the Avar Period.¹⁹ Csilla Balogh also accepted Livia Bende’s dating in the case of Szarvas-Grexa-téglagyár, although she referred to the traditional chronology by Irén Juhász in her work.²⁰ Bence Gulyás accepted the chronological model of Livia Bende and Gábor Lőrinczy in his early works,²¹ and Erwin Gáll also used this framework in the evaluation of the cemeteries at Nădlac (Nagylak, Romania).²²

However, some recently published papers slightly modified this hypothesis. Two NW–SE-oriented graves with end-wall shafts and horse harness deposits have been unearthed at Békéssámson-Bendatanya. The rite of these burials is closely related to Szarvas-Grexa-téglagyár. Nevertheless, Csilla Balogh and her co-authors dated the graves to the mid-7th century AD based on the presence of some artefacts resembling Early Avar types, including a grey spouted vessel, a painted funnel-mouthed vessel, and some four-lobed horse harness mounts.²³ In the analysis of the cemetery of Tizsakürt-Zsilke-tanya Bence Gulyás and his co-authors proposed that three groups, characterised by different grave orientations, could have been present in the Trans-Tisza Region in the middle third of the 7th century AD. According to them, some cemeteries, the start of which Livia Bende dated to the second half of the Avar Period, perhaps started already in the Early Avar Period; however, only radiocarbon measurements can confirm that.²⁴

Previous radiocarbon dating of some graves from Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő

Radiocarbon data have already been published from the two cemeteries in focus. The radiocarbon dates of four graves from Székkutas-Kápolnadűlő were included in the monograph on the site. Of these, Grave 8 was dated to the Sarmatian Period, which might be the result of the bones being mixed or incorrect sampling.²⁵ In addition, Peter Stadler did not accept the dating of Graves 239 and 396, only agreeing, albeit with doubts even in that case, with the dating of Grave 51 (AD 640–681

17 PÁSZTOR 2003, 353.

18 BENDE 2017, 10.

19 See LŐRINCZY 2016.

20 BALOGH 2016, 92.

21 For example, GULYÁS 2023, 713–714.

22 See GÁLL 2017.

23 BALOGH *et al.* 2023, 237.

24 GULYÁS *et al.* 2023, 411.

25 STADLER 2003, 302.

(1σ)).²⁶ Zoltán Maróti and his co-authors carried out radiocarbon dating as part of a genetic analysis of the Huns, the Avars, and the Hungarian conquerors. The series they published also included Grave 266 of Szarvas-Grexa-téglagyár and Grave 89 of Székkutas-Kápolnadűlő,²⁷ which were traditionally dated to the second half of the 8th century AD.²⁸ New measurements from Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő, carried out within the frame of the research project behind this study, complete this small series. Five of the sampled graves could be assigned to the Early Avar Period based on their find material. Three others featured an end-wall shaft or horse harness deposits, already known from cemeteries with classical Early Avar material. The last two graves could be assigned to the Middle Avar Period based on the belt sets they contained. Next, the description of the eleven graves and their archaeological (typochronological) dating is followed by the presentation of the radiocarbon results.

Archaeological (typochronological) dating of the examined graves

Szarvas-Grexa-téglagyár

Grave 189

The grave contained the remains of an *adultus* man (Fig. 2.1–11).²⁹ All artefacts added to the grave represent types used for a long time (a pair of loop-eyed stirrups and a hammer-axe), which only allow for imprecise dating. Hammer axes are considered rare weapons in the Körös–Tisza–Maros Interfluve; no single example is known from there from an Early Avar Period context. The first examples are known from contexts assigned to the second half of the Avar Period,³⁰ of which Grave 7 of Nagykamarás is the most important, where such a weapon was found together with a horse harness deposit, like in the grave discussed. Based on the silver sheet belt set, the grave belongs to the Middle Avar Period.³¹

Grave 200

The grave contained the remains of an *adultus* man (Fig. 3).³² The most striking of its finds are the Fönlak (Felnac)-type belt mounts made of tin-plated silver sheets, discovered in a secondary position in the northwestern corner of the disturbed grave. Éva Garam was the first to analyse this artefact type; she distinguished between a higher-quality Transdanubian variant and a more modest, younger one characteristic of the southern part of the Great Hungarian Plain.³³ Csilla Balogh outlined a third variant amongst the pieces along the Maros River in the Central Tisza Region. She dated the Fönlak (Felnac)-type belt mounts to the first third of the 7th century AD, but she suggested, based on the grave of Szeged-Kundomb, that this variant remained in vogue until the middle of the century.³⁴ Gábor Lőrinczy and Péter Straub pointed out that the decoration on the mounts from Szarvas is the simplest characteristic variant³⁵ and dated the burial to the mid-7th century AD based on the horse harness deposit.³⁶

26 STADLER 2003, 302. However, he also suggested that an older dating of the latter grave is more realistic.

27 See MARÓTI *et al.* 2022, Data S3.

28 Their exact dating is discussed below.

29 JUHÁSZ 2004, 35.

30 BENDE 2017, 297.

31 BANNER 1927, 146–149.

32 JUHÁSZ 2004, 37.

33 GARAM 2001, 119.

34 BALOGH 2016, 203–204.

35 LŐRINCZY – STRAUB 2024, 86.

36 LŐRINCZY – STRAUB 2024, 100.



Fig. 3. Szarvas-Grexa-téglagyár, Grave 200 (after JUHÁSZ 2004).

Another artefact with a low dating value in the grave is a hand-formed spouted vessel. A similar vessel is known from Feature 499, a grave of Debrecen-Bellegelő, Bordás-tanya. The human remains were subjected to radiocarbon dating, based on which the grave could be dated between AD 540 and 610 with a probability of 68.3%.³⁷ The mainly blue and (like those in Debrecen) yellow, round beads found in the grave represent a common Early Avar type.³⁸

37 See BAJKAI – KOLOZSI 2017, 117, 6. ábra.

38 GULYÁS *et al.* 2023, 382.

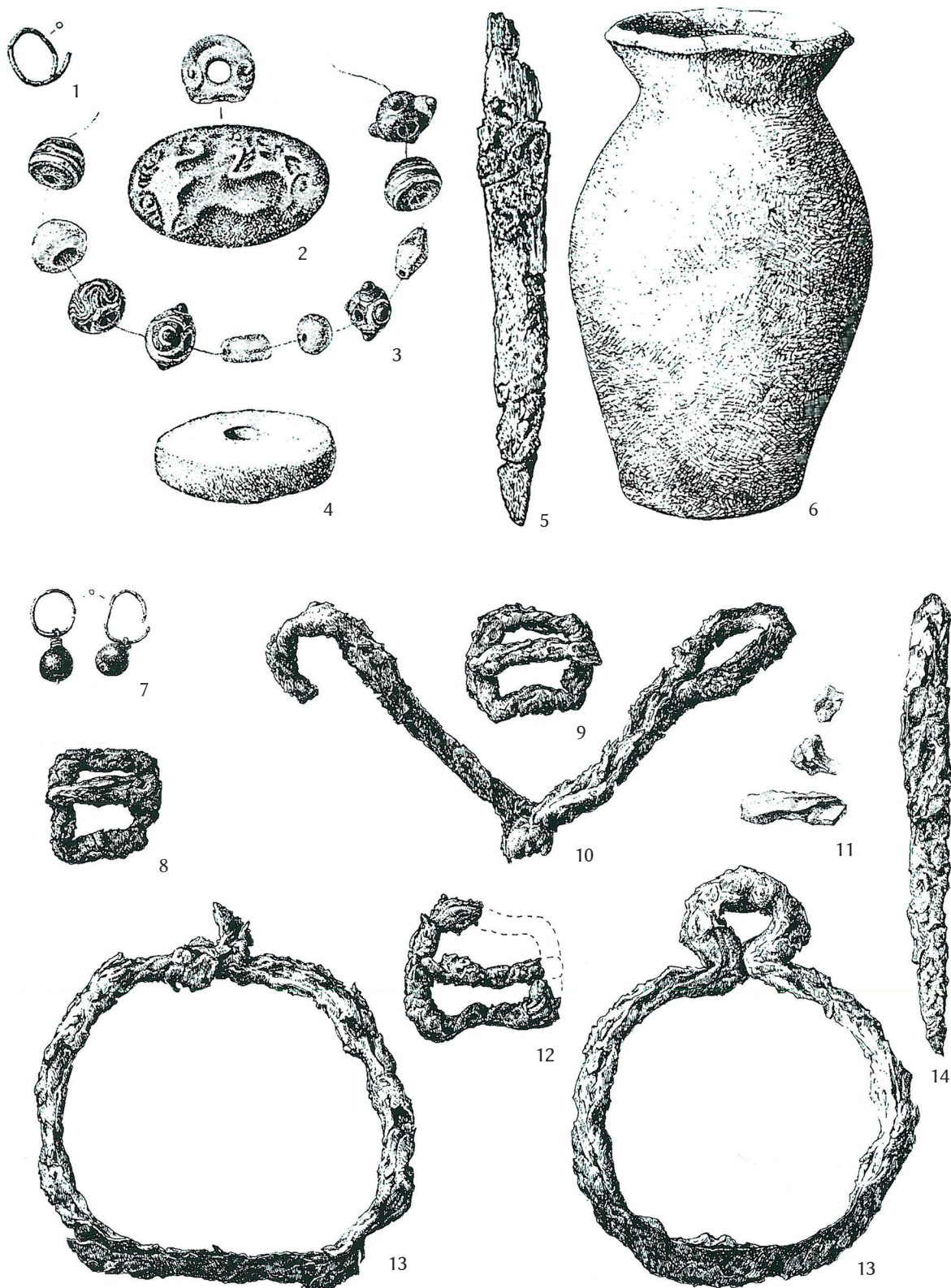


Fig. 4. Szarvas-Grexa-téglagyár. 1–6 – Grave 366, 7–14 – Grave 367 (after JUHÁSZ 2004).

Grave 226

The grave contained the remains of an *adultus* man (Fig. 2.12–17).³⁹ Of the grave finds, only a wheel-thrown, grey vessel with one handle, representing Tivadar Vida's Group IB2, could be dated with some precision.⁴⁰ The type was produced by workshops in Transdanubia, primarily in the vicinity of Szekszárd, and reached the Trans-Tisza Region through internal trade or, less likely, migration.⁴¹ Tivadar Vida dated the grey vessels with a spherical body to the second and third quarters of the 7th century AD,⁴² while Csilla Balogh and her co-authors dated these pots to the first half of the century.⁴³

Grave 266

The grave contained the remains of a *maturus* man (Fig. 5.1–11).⁴⁴ The chronological position of the feature could be specified through the belt mounts with a punched background, which Csaba Szalontai dated to the youngest grave horizon; he believed the variant remained in fashion until the end of the 8th century AD.⁴⁵ Eric Breuer classified a similar belt set to the seventh horizon, which he dated between the second half of the 8th and the beginning of the 9th centuries AD.⁴⁶

Grave 366

The grave contained the remains of a *maturus* woman (Fig. 4.1–6).⁴⁷ The dating of this feature is the most problematic of all the analysed ones, as it did not contain a single object that could be dated within a narrow time interval. The silver large spherical pendant earring did not survive, so it cannot be classified into any subtype; besides, such jewellery was used throughout the Early Avar Period.⁴⁸ Analogies to bulging and oblate spherical beads with a band decoration are known, among others, from the Szegvár-Oromdűlő cemetery.⁴⁹ The grave goods also included a flat spindle whorl, which is unsuitable for specifying the dating of the grave, albeit flat spindle whorls were more common in the first half of the Avar Period and biconical ones in the second.⁵⁰ Based on the above, the grave can definitely be assigned to the Early Avar Period, but its chronological position cannot be determined more precisely.

Grave 367

The grave contained the remains of a *maturus* man (Fig. 4.7–14).⁵¹ A pair of earrings with large beads can help with the typochronological dating of the burial. These belong to Type 3 in the framework developed by Csilla Balogh and Adrien Pásztor, representing the variant where the bead pendant is connected to the hoop with a coil of wire.⁵² They dated the first appearance of the type

39 JUHÁSZ 2004, 41.

40 VIDA 1999, 45.

41 VIDA 2022, 511.

42 VIDA 2022, 511.

43 BALOGH *et al.* 2023, 237.

44 JUHÁSZ 2004, 45–46.

45 SZALONTAI 2003, 397–399.

46 BREUER 2005, 90–95, 116–117.

47 JUHÁSZ 2004, 56.

48 BALOGH 2016, 151.

49 Cp. PÁSZTOR 2022, 442, 5. kép.

50 LŐRINCZY 2022, 192.

51 JUHÁSZ 2004, 56–57.

52 BALOGH – PÁSZTOR 2015, 587.

to the second quarter of the 7th century AD.⁵³ Earrings with large bead pendants are known from several graves in the wider region of the site (from sites around Szegvár and Hódmezővásárhely) but were only found in burials of males in Szarvas.⁵⁴ It is striking that the occurrence of the object type on several sites seems connected with an early type of large melon seed beads, dated to the middle third of the 7th century AD.⁵⁵

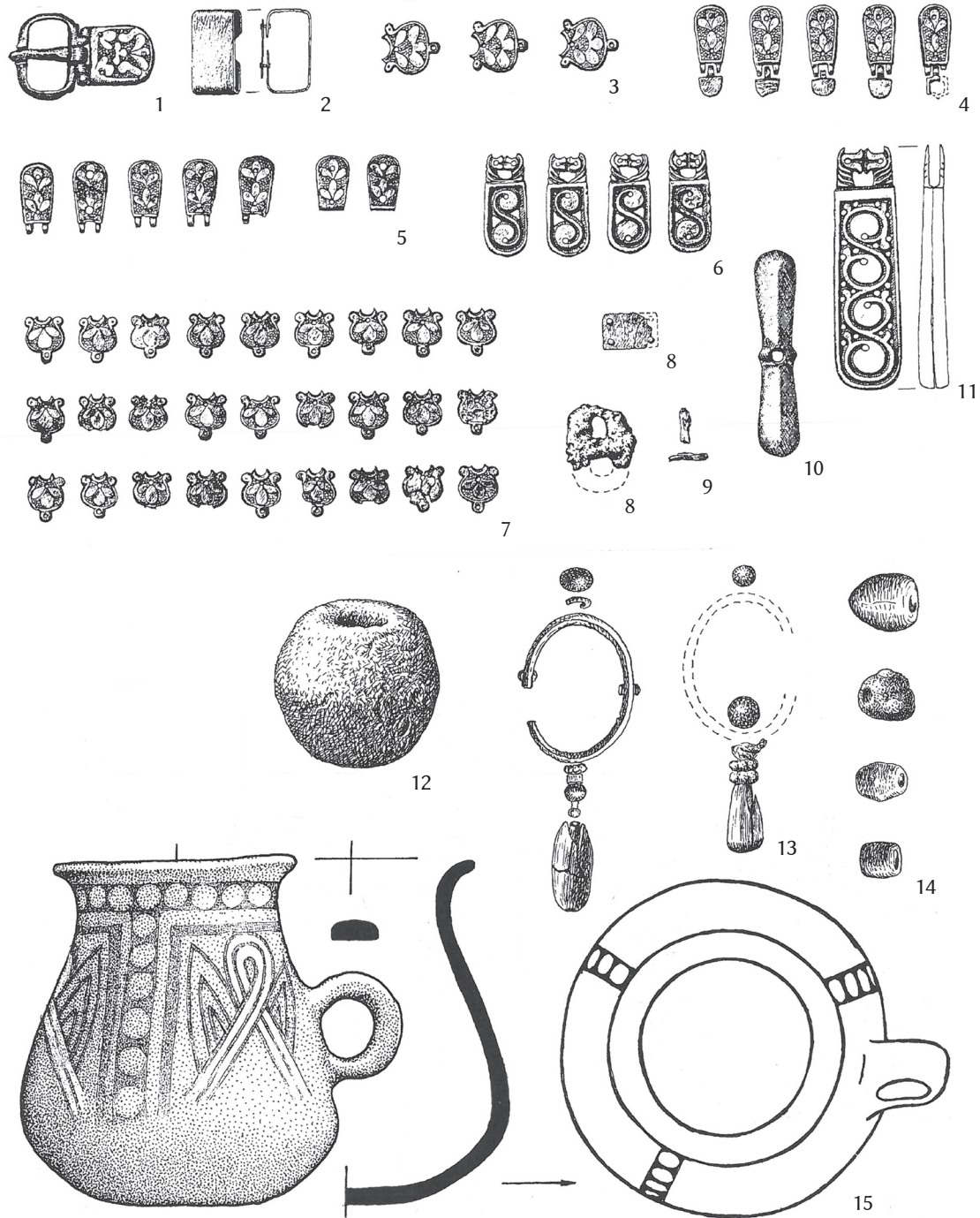


Fig. 5. 1–11 – Szarvas-Grexa-téglagyár Grave 266, 12–15 – Székkutas-Kápolnadúló Grave 89 (1–11: after JUHÁSZ 2004; 12–15: after B. NAGY 2003).

53 BALOGH – PÁSZTOR 2015, 613.

54 GULYÁS *et al.* 2023, 381.

55 GULYÁS *et al.* 2023, 408–410.

Székkutas-Kápolnadűlő

Grave 51

The grave contained the remains of a *maturus* man (Fig. 6).⁵⁶ The most important finds are the shield- and double-shield-shaped, pressblech silver belt mounts with depictions of birds. Éva Garam presumed the type to have been of Byzantine origin and dated it to the mid-7th century AD.⁵⁷ András Csuthy (questionably) classified the horse harness mounts as pressblech rosettes; however, they belong much more to hemispherical mounts,⁵⁸ a type characteristic mainly of the early Avar Period, with dies known from Kunszentmárton and Felnac.⁵⁹ Most mount-decorated horse harnesses were in use in the Early Avar Period, but more and more have been discovered in Middle Avar Period assemblages in recent years. According to András Csuthy, the horse harness from Grave 51 of Székkutas belongs to this group; he referred to the respective radiocarbon date published by Peter Stadler as proof.⁶⁰

Grave 89

The grave contained the remains of an *adultus* woman (Fig. 5.12–15).⁶¹ The most often cited find of this assemblage is a painted yellow mug. Based on the analysis of a large collection of such vessels, Katalin Bognár concluded that the exact internal chronology of this type remains to be reconstructed, as only trends can be traced in the current material. The first sporadic appearances of the type are dated to the end of the 7th and the beginning of the 8th century AD, and it is not present in the record in large numbers until the second half of the century.⁶² She believed the workshop supplying the Tisza Region was in operation between the first half of the 8th and the first half or middle third of the 9th century AD.⁶³ This relatively young dating is supported by the earrings with an oval hoop and bead pendants; in summary, this mug type is characteristic of the second half of the Late Avar Period.⁶⁴

Grave 239

The grave contained the remains of a *maturus* man (Fig. 7.1–15).⁶⁵ The belt mounts in the grave had a special design: square iron plates covered with thin silver sheets decorated with glass inlays.⁶⁶ This belt set belongs to Type 3 in the typology by Gergely Szenthe.⁶⁷ Earlier, such mounts were dated to the third quarter of the 7th century, ca. AD 650–670.⁶⁸ However, according to radiocarbon data, Middle Avar-style belt sets (at least at Tiszafüred-Majoroshalom) appeared already in the second quarter of the century.⁶⁹

56 B. NAGY 2003, 22.

57 GARAM 2001, 148–150.

58 See CSUTHY 2015, 684, 1. táblázat.

59 CSUTHY 2015, 671.

60 CSUTHY 2015, 113.

61 B. NAGY 2003, 26.

62 BOGNÁR 2022, 435.

63 BOGNÁR 2022, 436.

64 SZENTHE – GÁLL 2022, 153–155.

65 B. NAGY 2003, 39.

66 SZALONTAI 2003, 380.

67 SZENTHE 2012, 521.

68 SZENTHE 2012, 533.

69 SZENTHE *et al.* 2023, 470.

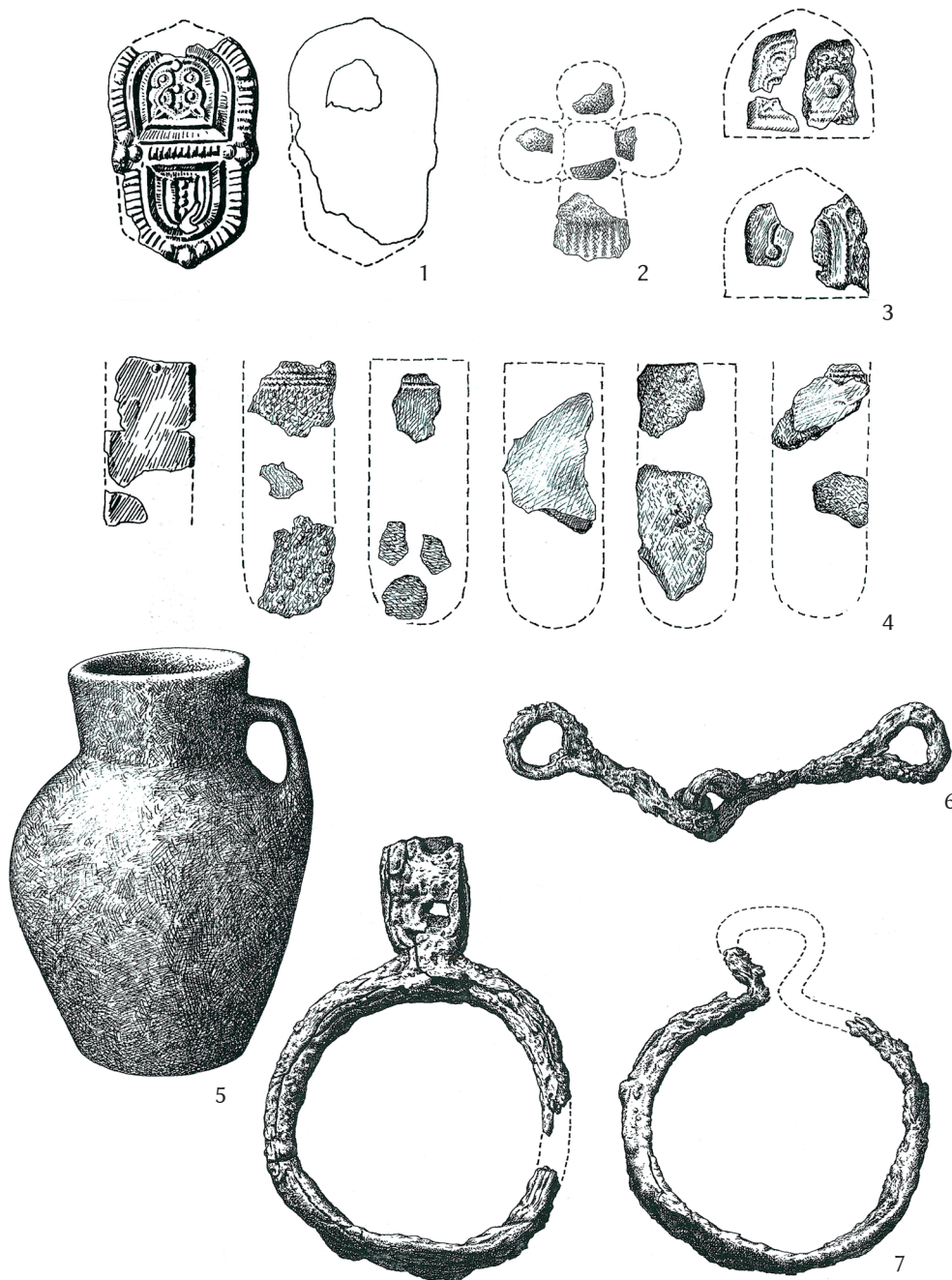


Fig. 6. Selected finds from Grave 51 of Székkutas-Kápolnadűlő (after B. NAGY 2003).

Grave 396

The grave contained the remains of a *senilis* man (Fig. 8).⁷⁰ Csaba Szalontai dated the set of pressed bronze belt mounts in the grave to the second half or end of the 7th century AD.⁷¹ Gergely Szenthe classified these into his belt set Type V, which he dated to the end of the Middle Avar Period based mainly on small strap ends.⁷² Recent radiocarbon dates from the Trans-Tisza region position such belts to around AD 670–680.⁷³

⁷⁰ B. NAGY 2003, 55–56.

⁷¹ SZALONTAI 2003, 381.

⁷² SZENTHE 2006, 191.

⁷³ See SZENTHE *et al.* 2023, 444, Fig. 1.

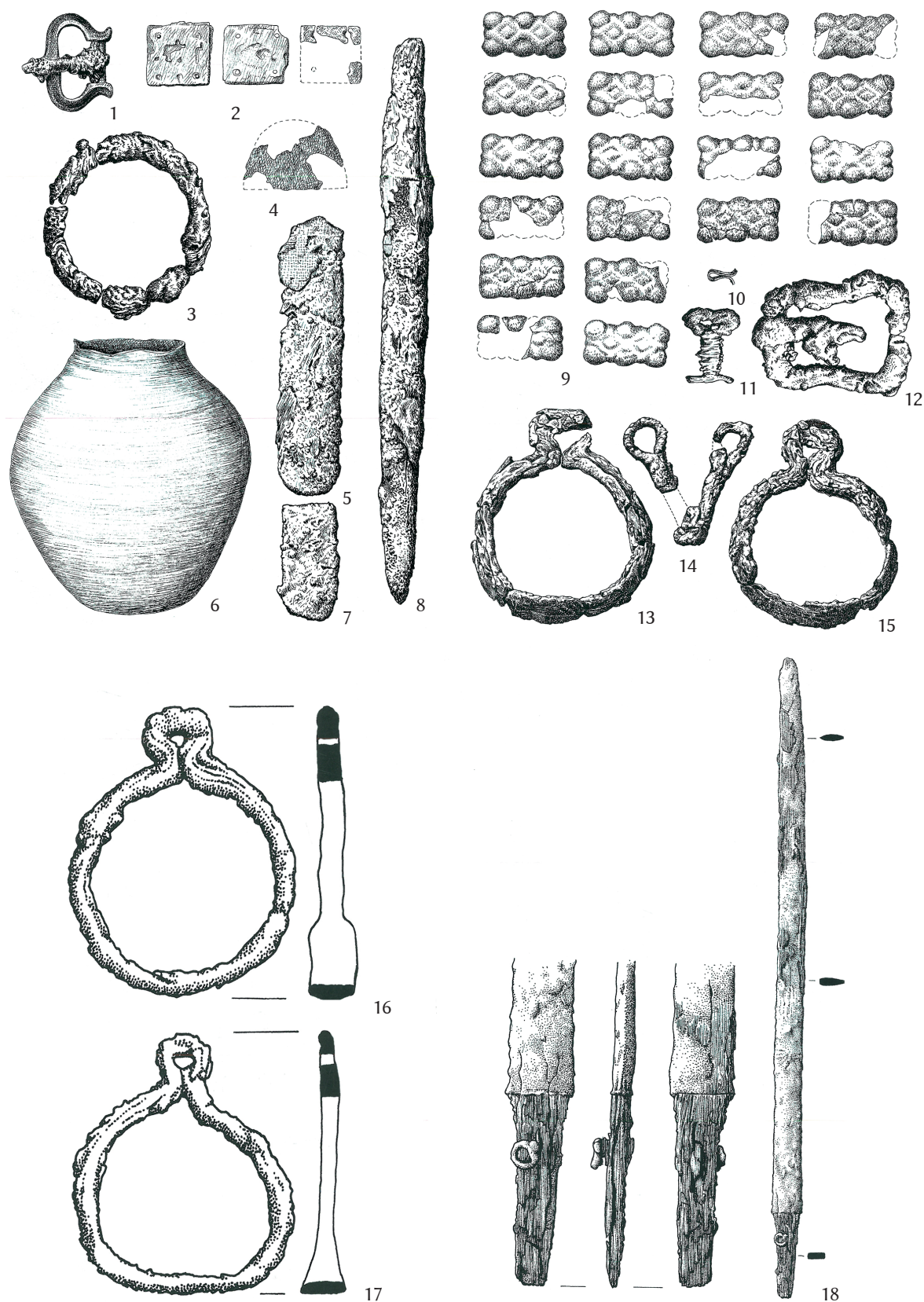


Fig. 7. Selected finds from Székkutas-Kápolnadűlő. 1–15 – Grave 239, 16–18 – Grave 541 (after B. NAGY 2003).

Grave 541

The grave contained the remains of an *adultus* man (Fig. 7.16–18).⁷⁴ The grave with an end-wall shaft is located in the western part of the cemetery. The horse harness found on the right side of the skeleton and the sabre help specify the dating. The use of loop-eyed stirrups with curved footplates can be connected primarily with the first half of the Avar Period; however, the type is unsuitable for more precise dating. Gergely Csiky interpreted the weapon from the grave as a slightly curved sabre and dated it to the Middle Avar Period, also mentioning that the type appeared already at the end of the Early Avar Period.⁷⁵ Ring pendants attached to the hilt of the weapon were especially popular in the Early Avar Period; however, there is evidence of the sporadic use of such weapons even in the Middle Avar Period.⁷⁶

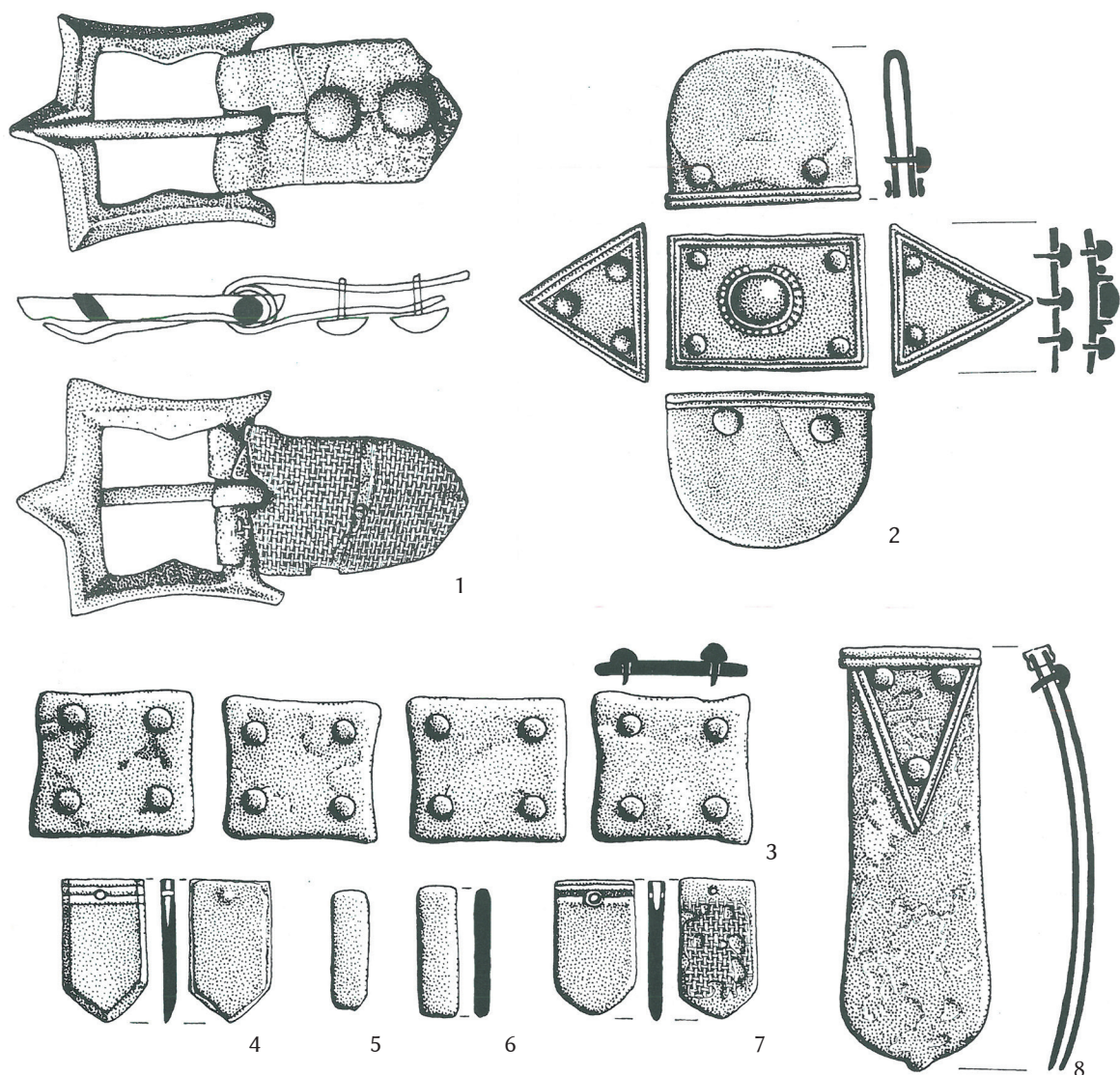


Fig. 8. Selected finds from Grave 396 of Székkutas-Kápolnadúló (after B. NAGY 2003).

⁷⁴ B. NAGY 2003, 71.

⁷⁵ See CSIKY 2015, 203, note 149, 481, Map 26.

⁷⁶ CSIKY 2015, 240–241. Gergely Csiky dated the Székkutas grave with a ring pendant to the Middle Avar Period (CSIKY 2015, 241, note 277).

Sampling strategy

The radiocarbon age of the anthropological samples from the five graves of the Avar cemetery at Szarvas-Grexa-téglagyár was determined in the laboratory of Isotoptech cPlc in Debrecen in 2022. All selected graves (189, 200, 226, 366 and 367) and all finds bearing Early Avar characteristics come from features with an end-wall shaft and/or horse harness deposits. The samples from Székku-tas-Kápolnadűlő were selected according to other criteria: in this case, the question was how reliable twenty-year-old radiocarbon dates may be. Therefore, we examined the same graves as Peter Stadler did, also adding Grave 541 (which contained a horse harness deposit) to the series. Since the sample taken from Grave 8 proved unsuitable for radiocarbon dating due to its low collagen content, verification of the measurements made in Vienna was only possible for Graves 51, 239 and 396. The recent measurements in the case of both yielded conventional dates older by fifty years than the ones made in Vienna; however, these could be combined satisfactorily using the R_Combine command of OxCal. Grave 89, investigated by Zoltán Maróti and his co-authors, was also included in the analysis.

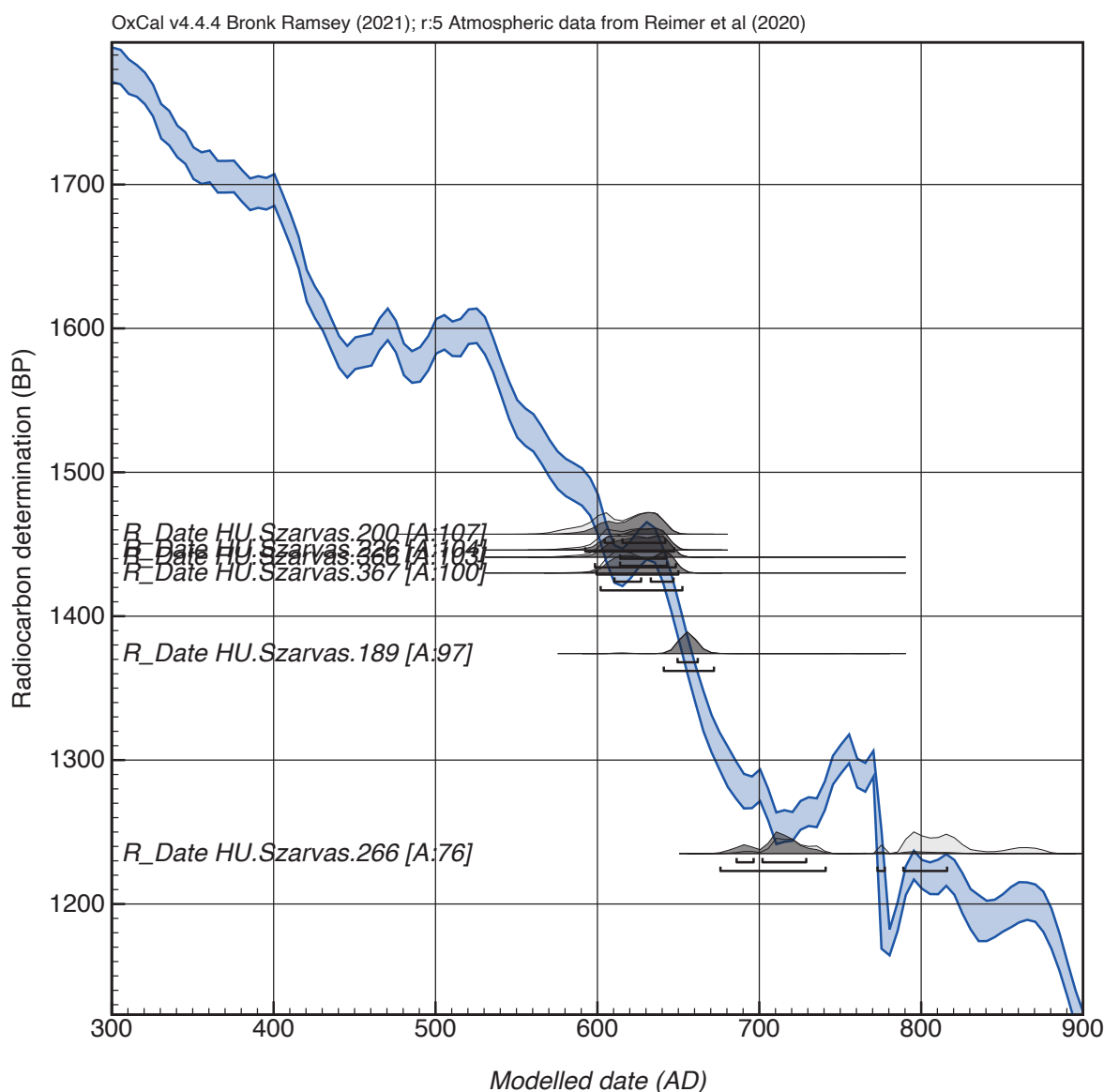


Fig. 9. Calibration plot of radiocarbon dates from Szarvas-Grexa-téglagyár.

Results

The conventional dates were calibrated and evaluated using the open-source OxCal (v4.4.4) application and the IntCal20 calibration curve.⁷⁷ The series of the two cemeteries were analysed separately; the results are presented below. Regarding Szarvas-Grexa-téglagyár, it was already clear from the distribution of uncalibrated data that Graves 200, 226, 366 and 367 belong to a single chronological phase, followed by a second (Grave 189) and a third one (Grave 266) (Fig. 9). The individual ranges of the calibrated dates could also be classified into three chronological phases, four of them marking an interval starting around AD 580–600 and ending around 645–652, and one marking the second and third phases each (AD 641–672 and 701–741, as well as AD 785–878 (2σ)) (Fig. 10).

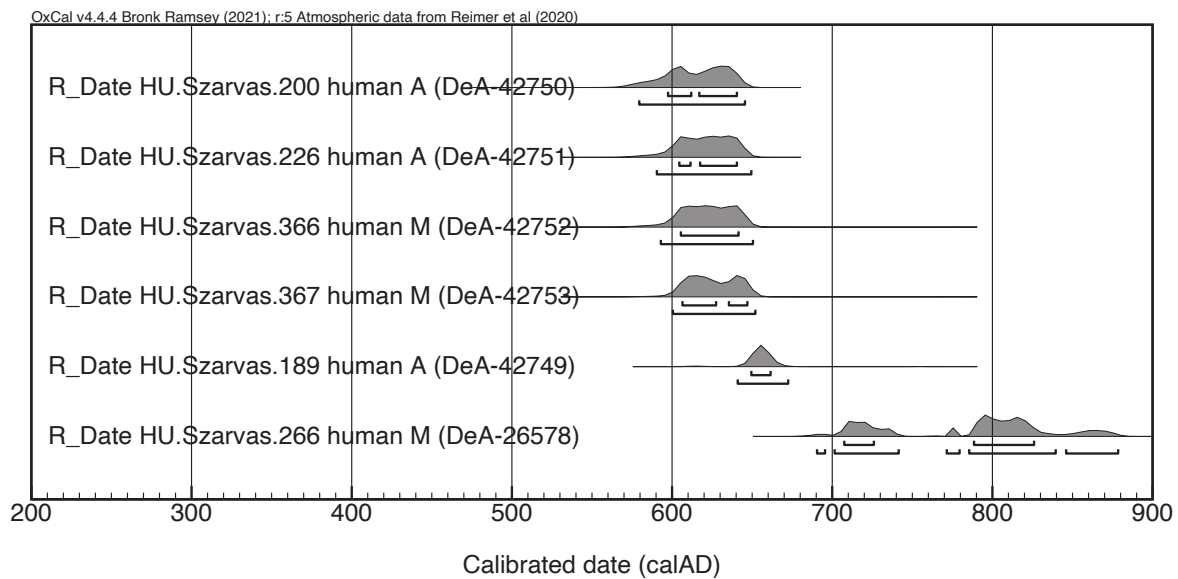


Fig. 10. Individually calibrated radiocarbon dates from Szarvas-Grexa-téglagyár.

In light of the above, little success was expected from modelling the data in a single phase, but it was done anyway. Surprisingly, the obtained result turned out to be instructive from a methodological point of view. Despite the predominance of the elements representing the first chronological phase, the single-phase model led to an unexpected result: while the dating of Grave 189, representing the second phase (AD 641–672 (2σ)), remained unchanged, that of the four graves in the first phase ‘moved’ towards it in a way that the start of the 2σ intervals shifted to around AD 600, while their ends (around AD 650) remained unchanged. The explanation for the surprising phenomenon is that the conventional (uncalibrated) result of Grave 189 falls on such a steep part of the calibration curve that even the individual calibration yielded a clear and short 2σ interval. As the OxCal algorithm using Bayesian statistics could not draw this robust (i.e. only insignificantly uncertain) dating near the predominantly early ones, it changed the longer probability distributions of those, specifying their start. The algorithm only affected the start of the respective ranges because the closing dates around AD 650, due to the course of the calibration curve, could not be shifted to be significantly younger. In contrast, the bimodal probability distribution obtained for Grave 266, suggesting only a rather long period for the feature, was affected more significantly by the five ‘old’ graves within the phase; thus, when the algorithm specified it in the model, the probable range (AD 676–741, 88.4% probability) fell in the ‘early’ interval of the original range (Figs 11–12).

77 <https://c14.arch.ox.ac.uk/oxcal.html>. For the method, see BRONK RAMSEY 1994; BRONK RAMSEY 2001; BRONK RAMSEY 2009, respectively.

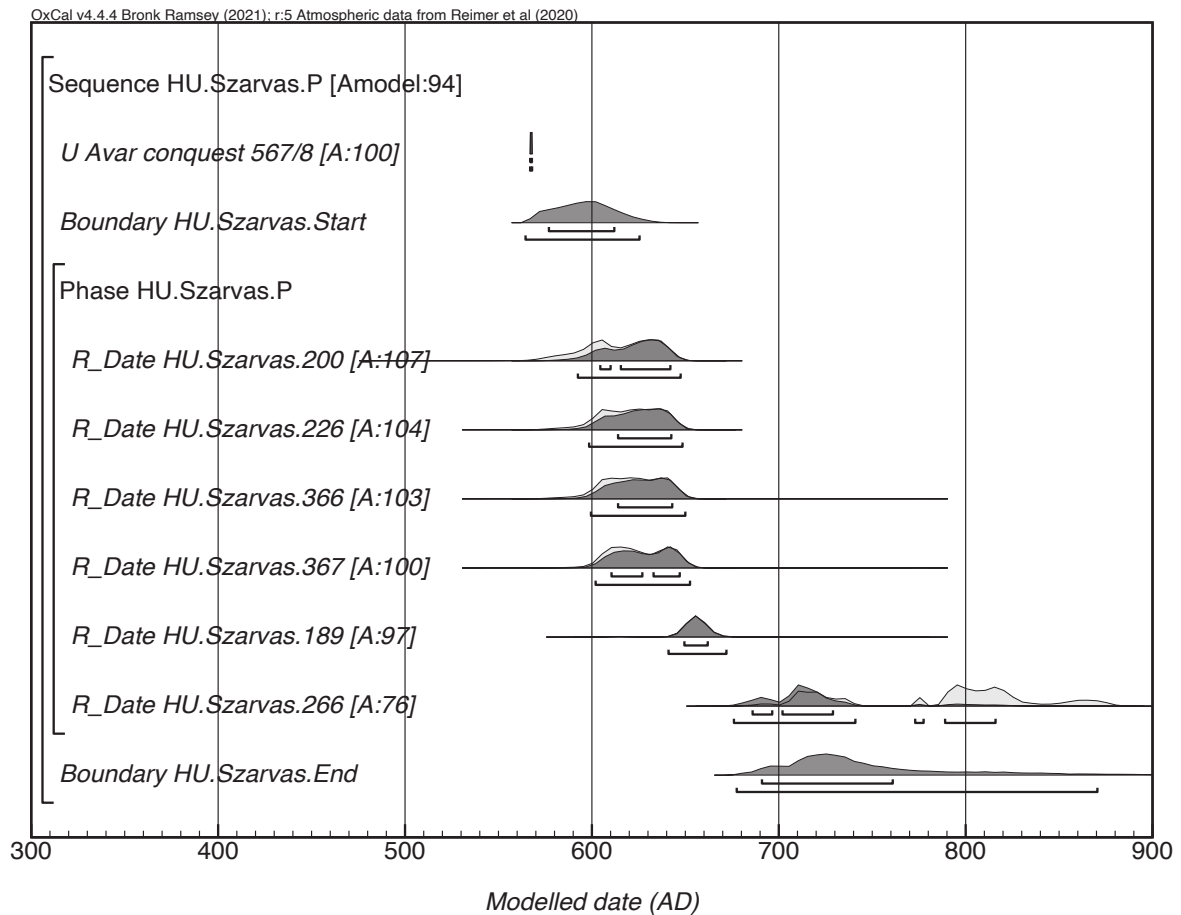


Fig. 11. Single-phase model of the radiocarbon dates from Szarvas-Grexa-téglagyár.

The burials in the three chronological phases outlined from their conventional radiocarbon dates could also be classified into three periods based on their find material. The graves of the first phase could be defined as Early Avar burials, while a grave of the second and third phases each belongs to the Middle and Late Avar periods, respectively. The two chronologies do not necessarily overlap; on the contrary, that rarely occurs. However, in this case, prior archaeological knowledge (i.e., the relative chronological positions of the graves) matched the chronological sequence outlined by radiocarbon data; thus, typochronology could not provide additional information for Bayesian statistics. Accordingly, the results of the three-phase model only differ essentially from that of the single-phase model in the case of Grave 266, where, in addition to an early dating to AD 681–743 (57.5%), another range, AD 785–833 was also determined, even if only with a probability of 31.1%. Of course, the sequential model could not change the fact that wiggle matching can only be applied to a minimal extent to the robust probability distributions of the first two phases (Figs 13–14).

Based on the modelling of the data and the analysis of the results obtained in the models, it can be clearly established that Graves 200, 226, 366, and 367, all features with an end-wall shaft and/or a horse harness deposit, were created between AD 600 and 650, and Grave 189 (with a horse harness deposit) in AD 640–670 (2σ). Since Grave 266, which contained belt mounts with a punched background, can be (intuitively) dated to the last third of the 8th or the first third of the 9th century AD based on the relative chronology of Late Avar belt sets, the younger dating of the grave to AD 785–833 suggested by the sequential model can be accepted. The older interval, AD 681–743, can be completely ruled out based on archaeological knowledge; its 57.5% probability does not reflect archaeological knowledge but only a predominance (5:1) of ‘old’ dates in the model. Since this predominance could affect the single-phase model more, the probability of younger dating there (to AD 773–816) was only 7.1%.

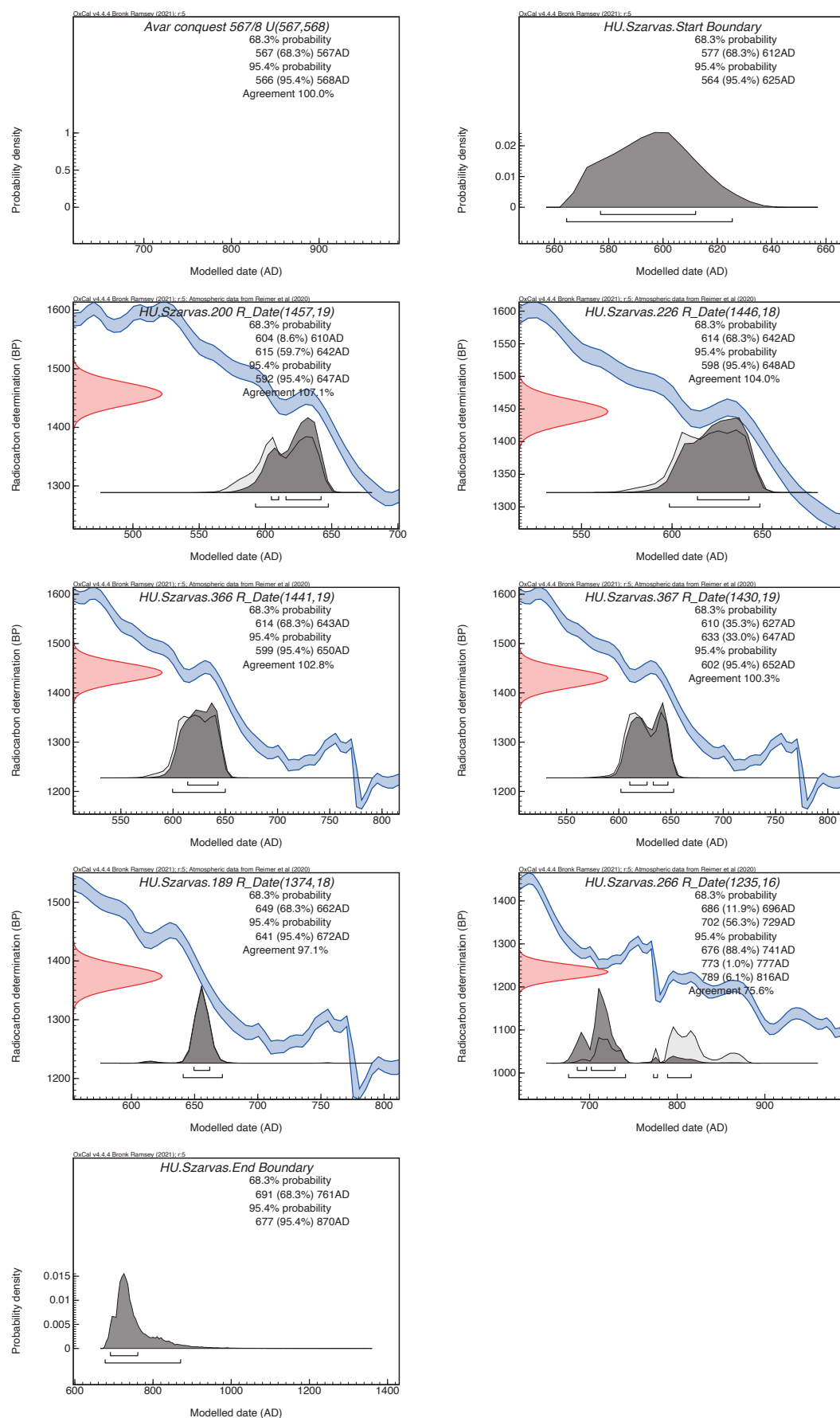


Fig. 12. Calibration plots of the single-phase model of the radiocarbon data from Szarvas-Grexa-téglagyár.

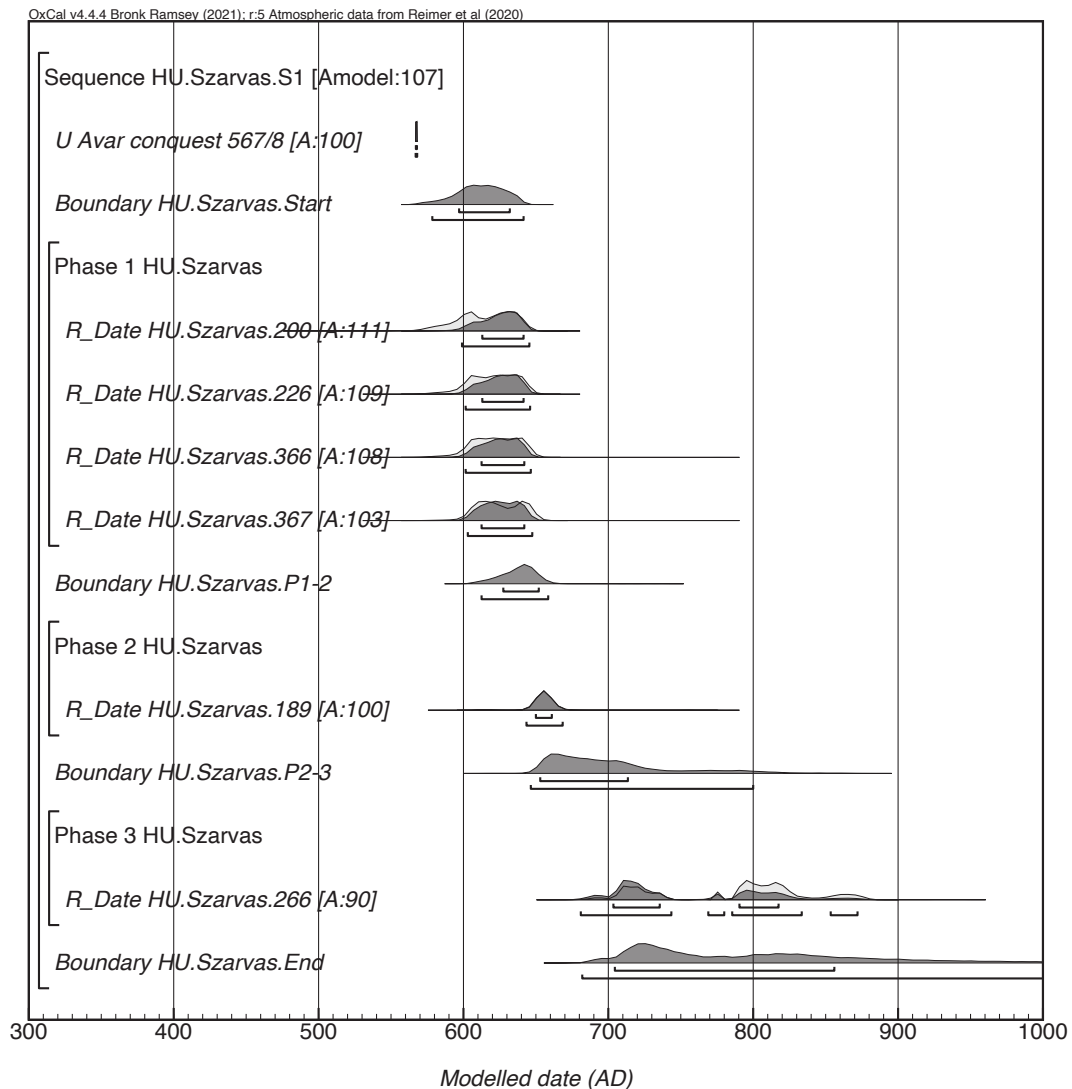


Fig. 13. Three-phase sequential model of the radiocarbon data from Szarvas-Grexa-téglagyár.

The single-phase model of the series of individually calibrated measurements from five graves of Székkutas-Kápolnadűlő yielded useful calibrated ranges covering the first half and second third of the 7th century AD; however, the 2σ confidence level only reached 95.4% probability in the cases of Graves 51 and 541 (Fig. 15). Therefore, in the next step, two sequential models were constructed, taking into account the relative chronological positions of the burials. The first sequential model consisted of three consecutive phases, with Grave 51 in the first, Graves 239, 396, and 541 in the second, and Grave 89 in the third (Fig. 16). The second sequential model has four phases, with Graves 51 and 541 in the first, Grave 239 in the second, Grave 396 in the third, and Grave 89 in the fourth (Fig. 17).

Grave 541 of Székkutas was also sampled; its uncalibrated data falls on such a steep part of the calibration curve that even its individual calibration led to a clear and short 2σ interval with 95.4% probability. Accordingly, the OxCal algorithm acted in the case of both sequential models the same way as in the model of Szarvas, ‘drawing’ the dates of Graves 51, 239, and 396 closer to that of Grave 541, which remained practically unchanged (AD 641–663 and 636–662 (2σ), respectively). In accordance with the different phasing of the two models, the start of the calibrated range of Grave 51 also shifted later (to AD 605–649 and 610–654 (2σ), respectively), and the individually calibrated 2σ ranges of Graves 239 and 396, which covered more than 200 and 100 years, when added to early

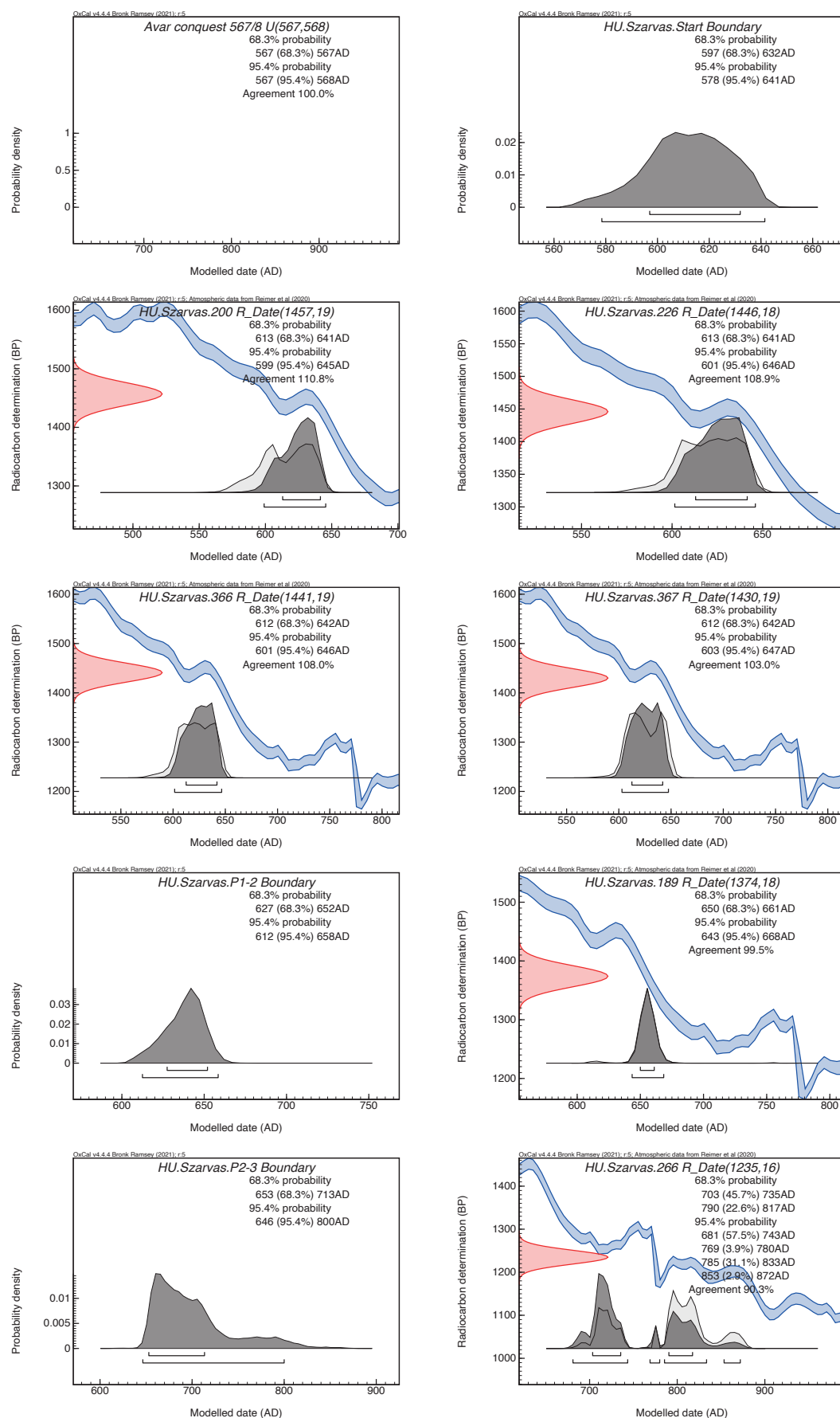


Fig. 14. Calibration plots of the three-phase model of the radiocarbon data from Szarvas-Grexa-téglagyár.

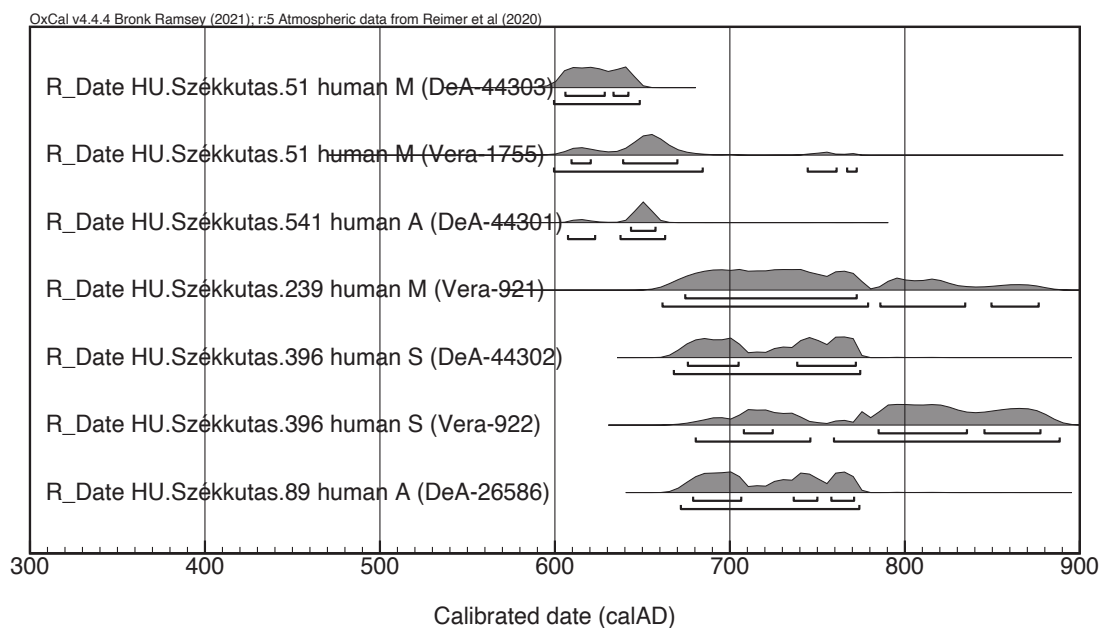


Fig. 15. Individually calibrated radiocarbon dates from Székkutas-Kápolnadűlő.

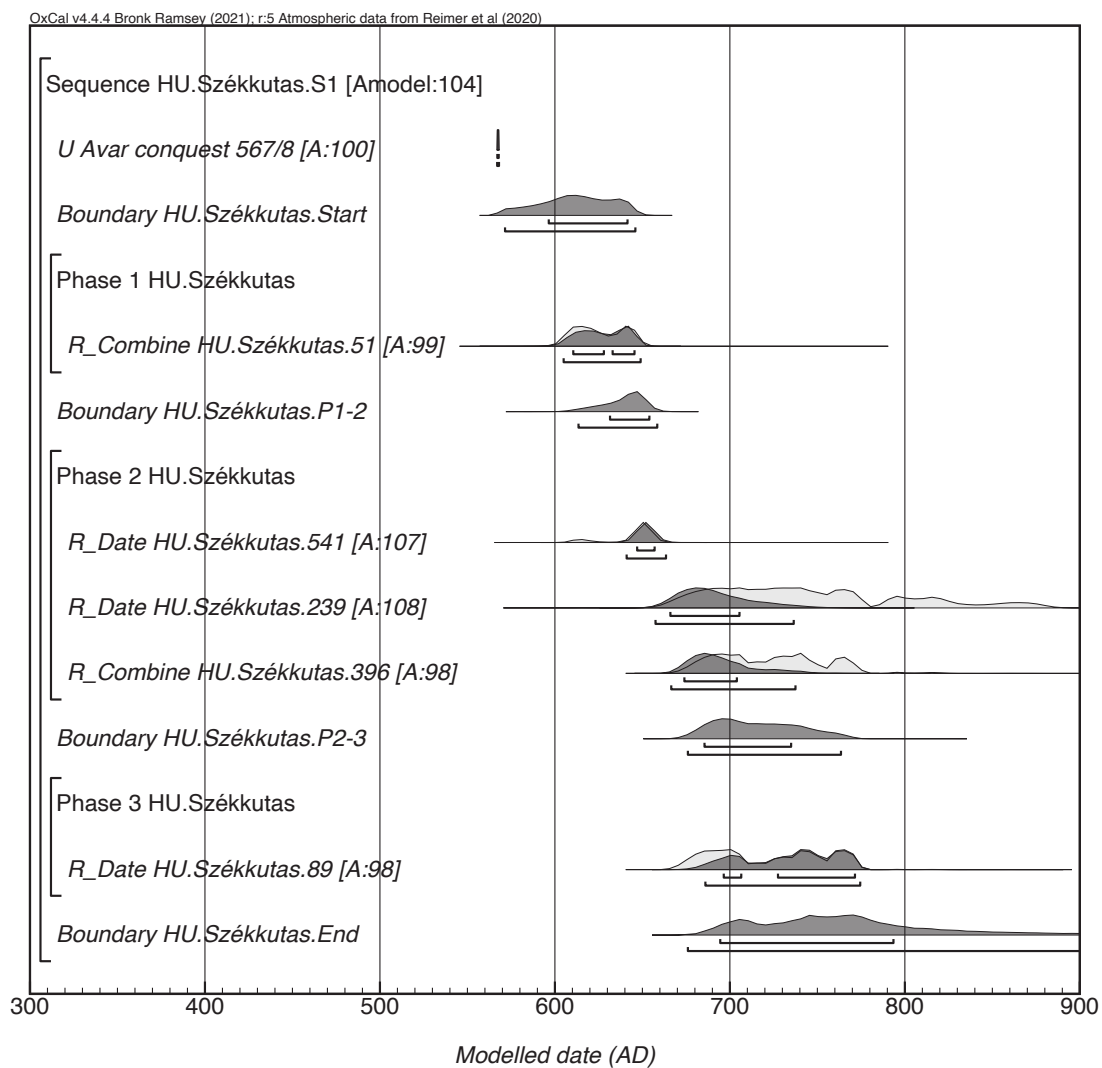


Fig. 16. Three-phase sequential model of the radiocarbon dates from Székkutas-Kápolnadűlő.

phases in these models, were shortened to 70–80 years with 95.4% probability (AD 657–736, 666–737 and AD 656–726, 673–751 (2σ), respectively). The algorithm suggested a dating between AD 686 and 774 in both models for Grave 89, representing the last phase in both sequences, with a 95.4% probability (Figs 18–19).

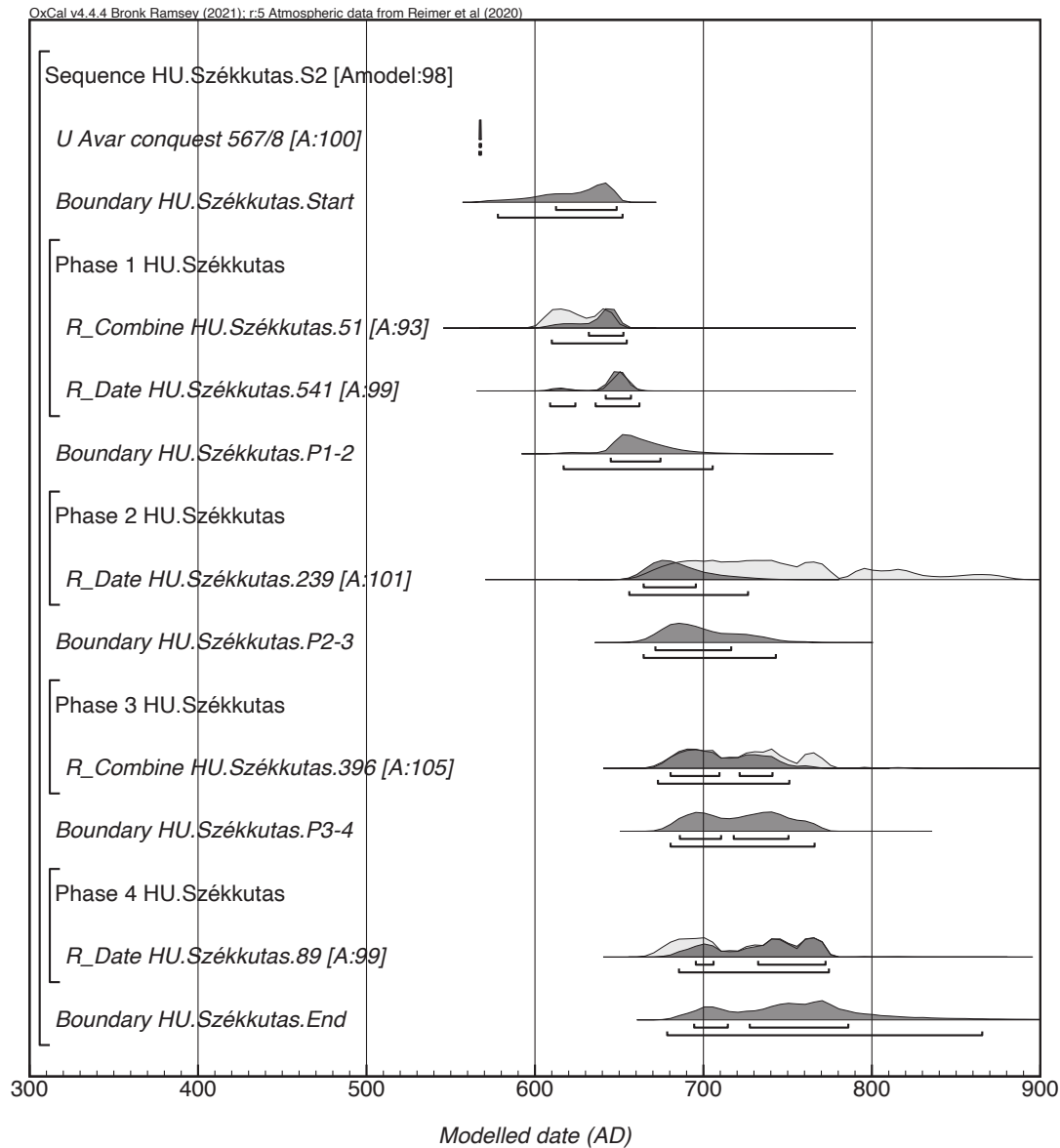


Fig. 17. Four-phase sequential model of the radiocarbon dates from Székkutas-Kápolnadűlő.

Discussion

The modelling of the radiocarbon dates has revealed that besides the population described by Dezső Csallány and Gábor Lőrinczy, one can count with at least one more relatively large group in the Trans-Tisza Region during the Early Avar Period, with burial customs characterised by NW–SE and W–E orientation and the use of simple shaft graves and graves with an end-wall shaft. In contrast to the ‘traditional’ Early Avar burials in said region, these graves do not include horse skulls or leg bones, and cattle remains are also rare, but those of small ruminants are frequent. Sheep rump bones and hand-formed vessels are also common additions. Besides Szarvas-Grexa-téglagyár Székkutas-Kápolnadűlő, cemeteries of this group include Békéssámson-Benda-tanya, the somewhat younger Szentes-Berekhát,

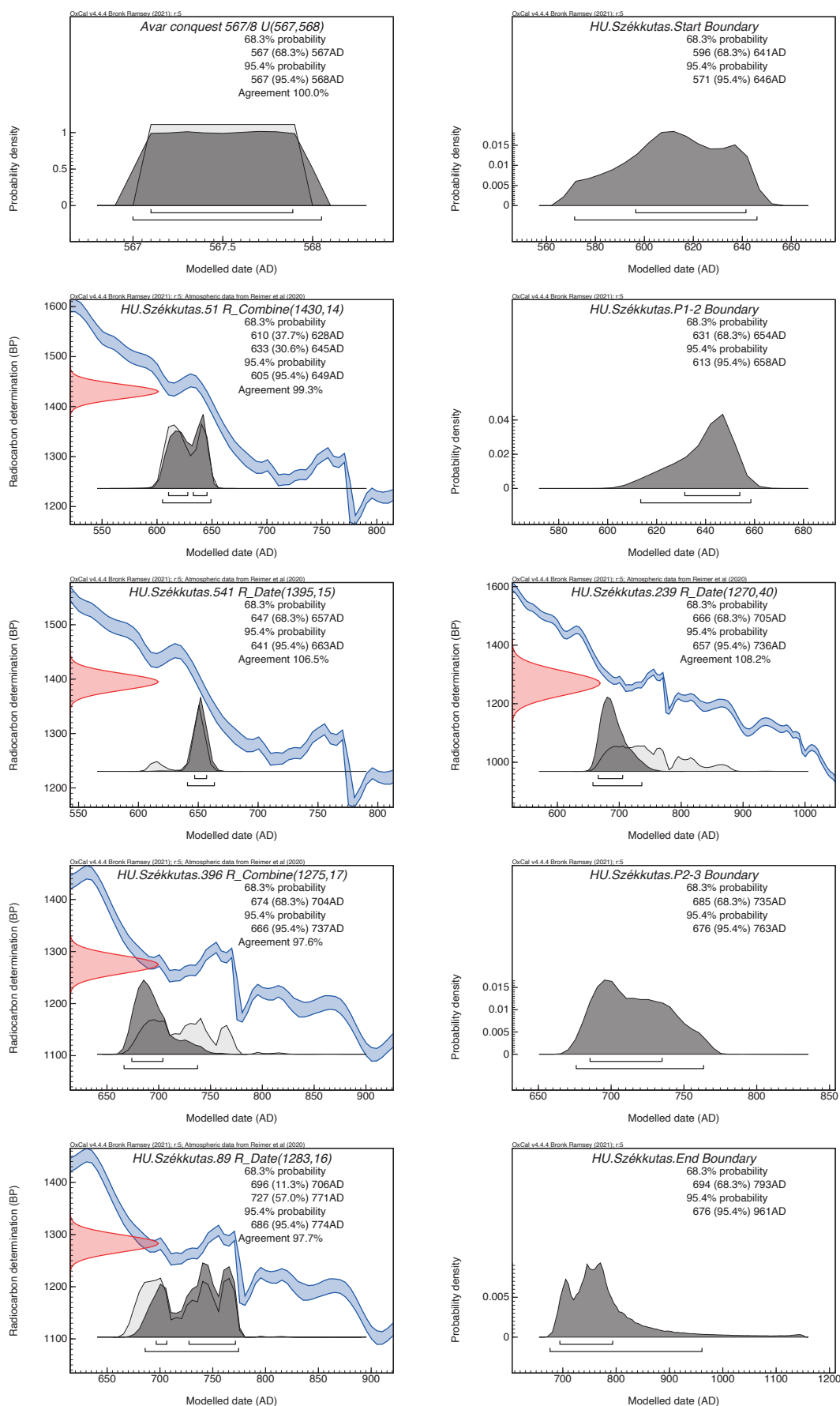


Fig. 18. Calibration plots of the three-phase model of the radiocarbon data from Székkutas-Kápolnadűlő.

Farkas-tanya I, and Pitvaros-Víztározó.⁷⁸ The chronological position of the latter has been determined from the Early Avar-style find material and radiocarbon dates as the first half of the 7th century AD.

There are several fundamental differences between the ‘Early Avar population of the Trans-Tisza region’ described by Dezső Csallány and Gábor Lőrinczy and the communities buried in Szarvas and Székkutas, the most important of which is the time of use. In contrast to the two examined cemeteries, ‘traditional’ Early Avar ones usually do not contain any Middle or Late Avar artefacts, which suggests that the two great burial traditions overlap only partially in time. In addition to burial customs, there are important differences in material culture. The graves in Szarvas and Székkutas are poor compared to the ‘classic’ Early Avar cemeteries of the region: weapons and Byzantine coins are completely missing from their find material, and gold objects are extremely rare. The cosmetic sets typical in the region are absent from the graves of females. Additionally, there is a significant difference in grave disturbance: While only a few ‘classic’ Early Avar graves have been reopened in the region, the phenomenon is extremely common in Szarvas-Grexa-téglagyár and also is present to a lesser extent in Székkutas.

In light of the above, it is a question when the Middle Avar find material appeared on the sites in focus. Scientific consensus has determined the onset of the Middle Avar Period at around AD 650.⁷⁹ It was accompanied by the appearance of a whole range of new artefact types: belts decorated with rectangular pressed mounts and complex mounts, braid plates, sabres, etc.⁸⁰ The radiocarbon ages of Grave 189 of Szarvas and Grave 541 of Székkutas cover best the first half of the Middle Avar Period, as their 2 σ intervals end around AD 660–670. These graves did not contain typical Middle Avar finds, but the importance of the deceased was clearly indicated by the weapons buried with them, which can be said to be quite rare in both cemeteries. In addition, tacks (especially stirrups) were also found in the graves. No Middle Avar belt set has been found in the Szarvas cemetery, in contrast to Székkutas, from where two burials containing such accessories (Graves 239 and 396) were radiocarbon dated; the results indicate that both are relatively young (AD 657–736, 666–737 and AD 656–726, 673–751 (2 σ), respectively).⁸¹ Similar data are known from other sites of the Trans-Tisza Region. Based on the *solidi* of Constans II and Constantine IV and radiocarbon dating, Grave 12 of Hajdúnánás-Fürj-halom-járás can be dated between AD 662 and 691 with a 95.4% probability, while Grave 19 was dug between AD 661 and 730 with a 79.1% probability.⁸² The burial customs characterising the cemetery differ from the two traditions presented above: the N–S oriented shaft graves did not contain partial animal remains but only a separate horse burial and one with a horse harness. Remains of cattle, small ruminants, horses, and domestic geese occurred as food offerings.⁸³ Grave 218 of the Pitvaros-Víztározó cemetery also contained a Middle Avar belt set. Radiocarbon dating suggested a relatively young age for this feature, too: AD 670–714 (1 σ).⁸⁴ Based on these, it is conceivable that Middle Avar belt sets appeared later in the region than in the cemeteries of ‘innovative’ communities. For example, they appeared in the second quarter of the 7th century AD in Tiszafüred.⁸⁵ In the future, it would be worth paying more attention to the

78 See BALOGH *et al.* 2023, MADARAS 1999, 33–39, 321; BENDE 2017.

79 See SZENTHE *et al.* 2023, 445.

80 BÓNA 1970.

81 The above-mentioned data have a probability of 68.3%.

82 SIKLÓSI 2014, 234.

83 RÁCZ – SZENTHE 2009, 324–325.

84 See SIKLÓSI – LŐRINCZY 2017, 495, 4. táblázat. The individual date of the grave is AD 661–868 (2 σ); see SIKLÓSI – LŐRINCZY 2017, 487, 1. táblázat.

85 SZENTHE *et al.* 2023, 470. It should be noted that they used 1 σ dates, which resulted in a ‘narrower’ chronology.

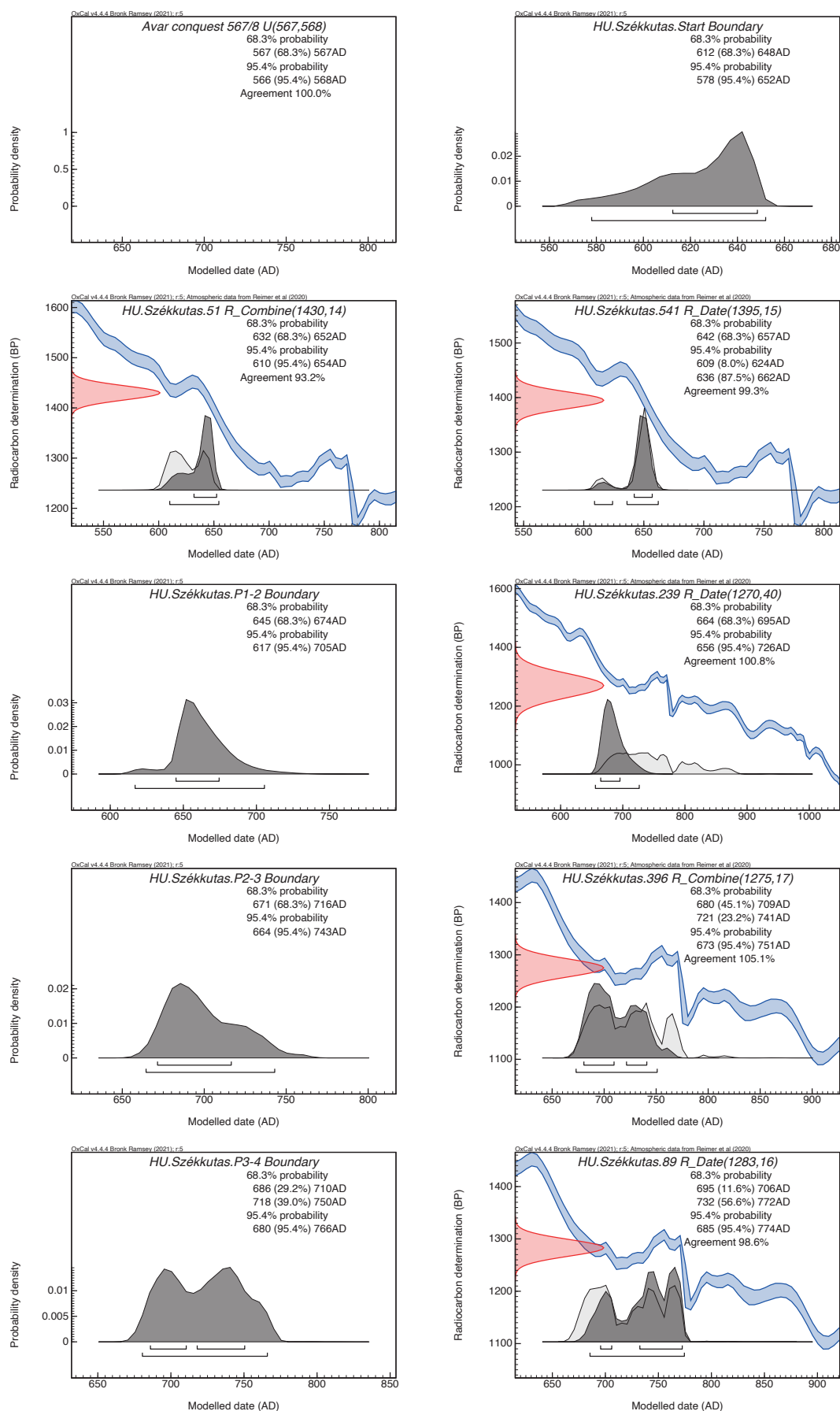


Fig. 19. Calibration plots of the four-phase model of the radiocarbon data Székkutas–Kápolnadűlő.

dynamics of the spread of Middle Avar-type belt sets, for which radiocarbon tests should be carried out on as many graves containing such accessories as possible.

The radiocarbon dates obtained for Grave 266 of Szarvas and Grave 89 of Székkutas were older than traditional archaeological dating: while their grave goods were dated typochronologically to the end of the 8th and the beginning of the 9th century AD, the calibrated intervals only included this period in the case of one of them. Several recent radiocarbon studies reached similar results. Frigyes Szücsi proposed a review of the previous dating of S-terminalled hair rings and spiral pendant earrings.⁸⁶ The record of the Pilismarót-Basaharc cemetery contained many artefacts that are traditionally assigned to the very end of the Avar Period.⁸⁷ However, the radiocarbon dating of the twenty graves indicated that the use of the cemetery ended earlier than expected.⁸⁸ The data of Grave 266 of Szarvas and Grave 89 of Székkutas fit this picture well. However, whether the appearing contradictions are caused by the relevant section of the calibration curve or whether we will have to rethink our previous knowledge about the end of the Avar Period in the future remains unanswered.⁸⁹

Conclusions

The paper presents the evaluation of the radiocarbon dates obtained from ten graves, five from Szarvas-Grexa-téglagyár and five from Székkutas-Kápolnadűlő; the sample taken from Grave 8 of Székkutas proved unsuitable for dating due to its low collagen content. The main goal of the investigation was to determine the chronological position of the graves with an end-wall shaft and/or horse harness deposits and Early Avar-style grave goods, as well as of the graves with Middle Avar-style belt sets in Székkutas. The two previously published dates for Grave 266 of Szarvas and Grave 89 of Székkutas can help determine the time when the two sites were abandoned, but more measurements are needed to build a robust chronology.

Due to the temporal distribution of the data and the shape of their probability distribution curves (depending on the course of the calibration curve, i.e. single or multi-modal), as well as the length of the intervals covered by them, the models built on the short radiocarbon series from Szarvas and Székkutas led to robust and archaeologically useful results only in the case of Early and Middle Avar burials. Based on these, the graves containing Early Avar artefacts (Graves 200, 225, 366, and 367 of Szarvas and Grave 51 in Székkutas) could clearly be dated to the Early Avar Period, more precisely between AD 600 and 650. Graves 189 in Szarvas and 541 in Székkutas contained both weapons and horse harnesses but no other objects facilitating accurate dating. Based on radiocarbon results, they could be dated to the Middle Avar Period; the end of their 2σ intervals is around AD 660–670.

This data nuances the existing picture of the Early Avar Period Trans-Tisza Region. Dezső Csallány, then Gábor Lőrinczy, described the local funerary tradition as characterised by E–W and NE–SW orientation, the presence of graves with longitudinal ledges, side-wall niches, or end-wall shafts, flayed animal remains, and a preference for sheep rump as a food offering. The cemeteries of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő, which also contain Early Avar finds, have been dated to the second half of the Avar Period based on their different rite. Although the available radiocarbon data alone are not sufficient to clearly disprove this hypothesis, the available ones suggest that the two groups—i.e. the ‘traditional’ population of the Trans-Tisza Region and the founding generation of Szarvas-Grexa-téglagyár and Székkutas-Kápolnadűlő—could coexist.

86 SZÜCSI 2023.

87 See SZŐKE 1992.

88 SZENTHE *et al.* 2023, 479.

89 Both Hortobágy-Árkus and Tiszafüred-Majoros contained burials whose calibrated dates included the beginning of the 9th century AD (SZENTHE *et al.* 2023, 475–479).

The graves with Middle Avar belt sets in the region could slightly younger than the consensual start of the Middle Avar Period (around AD 650). In connection with these, it was suggested that the new fashion did not appear at once in the entire territory of the Khaganate but perhaps even a generation earlier in the central places.⁹⁰ Accurate interpretation of situations similar to the one observed in Székkutas and Pitvaros requires more Middle Avar graves to be radiocarbon-dated in the future.

From archaeological interpretation's point of view, the radiocarbon dating of the two Late Avar burials proved unsatisfactory. However, this well-known problem for research can only be solved by sequential modelling of the radiocarbon dates of series taken from typo-chronologically significant finds and intersecting graves.⁹¹

References

- BAJKAI, R. – KOLOZSI, B. 2017: Az abszolút kormeghatározás lehetőségei, avagy a 9. századi keltezés nehézségei egy debreceni lelőhely tükrében (Possibilities of Absolute Dating or the Difficulties of 9th-century Dating in the Light of a Debrecen Site). In: Takács, M. (ed.): *Az Alföld a 9. században II. Válogatás „Az Alföld a 9. században II – Új eredmények” című konferencián 2014. május 21–23. között elhangzott előadások anyagaiból* (MTA SZAB Székház, Szeged). Monográfiák a Szegedi Tudományegyetem Régészeti Tanszékéről 4. Szeged, 103–137.
- BALOGH, Cs. 2016: *Régészeti adatok a Duna–Tisza közti avarok történetéhez* (The history of the Avars in the Danube–Tisza interfluvium as reflected in the archaeological record). *Studia ad Archaeologiam Pazmaniensia* 6. Budapest.
- BALOGH, Cs. – PÁSZTOR, A. 2015: Az avar kori nagy gyöngycsüngős fülbevalók (Large bead-pendant earrings from the Avar period). In: Türk, A. (ed.): *Hadak útján. A népvándorlaskor fiatal kutatóinak XXIV. konferenciája, Esztergom 2014. november 4–6.* *Studia ad Archaeologiam Pazmaniensia* 4. Budapest–Esztergom, 581–648. https://doi.org/10.55722/Arpad.Kiad.2015.3.1_23
- BALOGH, Cs. – GULYÁS, A. – LŐRINCZY, G. 2023: 7. századi temetkezések Békés vármegyéből – Adatok a Tiszántúli avar kori lószerszámos temetkezéseihez (7th century graves from Békés County (SE-Hungary): Data for Avar-age burials with horse harness from the Trans-Tisza region). *Archaeologiai Értesítő* 148, 223–267. <https://doi.org/10.1556/0208.2023.00041>
- BANNER, J. 1927: Népvándorlaskori sírok Nagykamaráson (Gräber aus der Völkerwanderungszeit bei Nagykamarás). *Dolgozatok* 3, 141–159.
- BENDE, L. 2003: Temetkezési szokások a Székkutas-kápolnadűlői avar kori temetőben (Bestattungssitten im awarenzeitlichen Gräberfeld von Székkutas-Kápolnadűlő). In: B. Nagy, K. A. *székkutas-kápolnadűlői avar temető*. Monographia Archaeologica 1. Szeged, 305–330.
- BENDE, L. 2017: *Temetkezési szokások a Körös–Tisza–Maros közén az avar kor második felében* (Bestattungsbräuche in der zweiten Hälfte der Awarenzeit im Gebiet zwischen Körös, Theiss und Maros). *Studia ad Archaeologiam Pazmaniensia* 8. Budapest.
- BOGNÁR, K. 2022: Yellow Pottery in the Late Avar Period. *Dissertationes Archaeologicae* 3.10, 421–439. <https://doi.org/10.17204/dissarch.2022.421>
- BÓNA, I. 1970: Avar lovassír Iváncsáról (Grave of an Avar horseman at Iváncsa). *Archaeologiai Értesítő* 97, 243–263.
- BREUER, E. 2005: *Byzanz an der Donau. Eine Einführung in Chronologie und Fundmaterial zur Archäologie im Frühmittelalter im mittleren Donauraum.* Archaeological Introductions 2. Tettngang.
- BRONK RAMSEY, C. 1994: Analysis of Chronological Information and Radiocarbon Calibration. The Program OxCal. *Archaeological Computing Newsletter* 41, 11–16.
- BRONK RAMSEY, C. 2001: Development of the Radiocarbon Program. *Radiocarbon* 43:2A, 355–363. <https://doi.org/10.1017/S0033822200038212>

90 SZENTHE *et al.* 2023, 482–483.

91 This paper was written as part of the project TKP2021-NKTA-24.

- BRONK RAMSEY, C. 2009: Bayesian analysis of radiocarbon dates. *Radiocarbon* 51:1, 337–360. <https://doi.org/10.1017/S0033822200033865>
- CSALLÁNY, D. 1939: Kora-avarkori sírleletek (Grabfunde der Frühawarenzeit). *Folia Archaeologica* 1–2, 121–155.
- CSIKY, G. 2015: *Avar-Age Polearms and Edged Weapons. Classification, Typology, Chronology and Technology. East Central and Eastern Europe in the Middle Ages 450–1450* 32. Leiden–Boston. <https://doi.org/10.1163/9789004304543>
- CSUTHY, A. 2013: Az avar kori rojtos végű lószerszámveretek kiértékeléséhez (Data for the Evaluation of Horse Harness Mounts with Fringe Pattern from the Avar Period). *Iuxta Danubium* 15, 109–119.
- CSUTHY, A. 2015: Az avar kori félgömb alakú és rozettás lószerszámveretek (Hemispherical horse harness mounts and rosettes from the Avar period). In: Türk, A. (ed.): *Hadak útján. A népvándorlaskor fiatal kutatóinak XXIV. konferenciája. Esztergom, 2014. november 4–6.* Studia ad Archaeologiam Pazmaniensia 4.1. Budapest–Esztergom, 669–699. https://doi.org/10.55722/Arpad.Kiad.2015.3.1_25
- GARAM, É. 2001: *Funde byzantinischer Herkunft in der Avarzeit vom Ende des 6. bis zum Ende des 7. Jahrhunderts.* Monumenta Avarorum Archaeologica 5. Budapest. <https://doi.org/10.62150/MAA.5.2001>
- GÁLL, E. 2017: *At the Periphery of the Avar Core Region. 6th–8th Century Burial Site near Nădlac.* (The Pecica–Nădlac Motorway Rescue Excavations). Patrimonium Archaeologicum Transylvanicum 13. Paris–Budapest.
- GULYÁS, B. 2015: Újabb adatok a kora avar kori Tiszántúl kelet-európai kapcsolataihoz (New results of research concerning the relations between Hungary and the Eastern European steppe in the Early Avar period). In: Türk, A. (ed.): *Hadak útján. A népvándorlaskor fiatal kutatóinak XXIV. konferenciája, Esztergom, 2014. november 4–6.* Studia ad Archaeologiam Pazmaniensia 4.1. Budapest–Esztergom, 499–512. https://doi.org/10.55722/Arpad.Kiad.2015.3.1_20
- GULYÁS, B. 2023: Cultural connections between the Eastern European steppe region and the Carpathian Basin in the 5th–7th centuries AD. The origin of the Early Avar Period population of the Trans-Tisza region. *Dissertationes Archaeologicae* 3.11, 701–756. <https://doi.org/10.17204/dissarch.2023.701>
- GULYÁS, B. – PÁSZTOR, E. – FEHÉR, K. – LÍBOR, Cs. – SZENICZEY, T. – ARADI, L. E. – FÜLÖP, R. – LYUBLYANOVICS, K. 2023: Tiszakürt-Zsilke tanya: An interdisciplinary analysis of an Early Avar Period cemetery. *Dissertationes Archaeologicae* 3.11, 293–411. <https://doi.org/10.17204/dissarch.2023.293>
- JUHÁSZ, I. 1995: Fülkesíros temetkezések Békés megyében (Stollengräber im Komitat Békés). *A Móra Ferenc Múzeum Évkönyve – Studia Archaeologica* 1, 417–452.
- JUHÁSZ, I. 2004: *Das awarenzeitliche Gräberfeld in Szarvas-Grexa-téglagyár, FO 68.* Monumenta Avarorum Archaeologica 7. Budapest. <https://doi.org/10.62150/MAA.7.2004>
- LŐRINCZY, G. 1998: Kelet-európai steppei népesség a 6–7. századi Kárpát-medencében. Régészeti adatok a Tiszántúl kora avar kori betelepüléséhez (Osteuropäische Steppenbevölkerung im 6. und 7. Jahrhundert im Karpatenbecken. Archäologische Beiträge zu frühawarenzeitlichen Einsiedlung des Gebietes jenseits der Theiß). *A Móra Ferenc Múzeum Évkönyve – Studia Archaeologica* 4, 343–372.
- LŐRINCZY, G. 2016: A tiszántúli VI–VII. századi sírok és temetők sajátosságai. A kora avar kori népesség továbbélése a VII–IX. században a Körös–Tisza–Maros-közén (Characteristic features of 6th–7th century burials and cemeteries east of the Tisza). *A nyíregyházi Jósza András Múzeum Évkönyve* 58, 155–176.
- LŐRINCZY, G. 2022: A Szegvár-oromdűlői kora avar kori temető (The Avar-period populations of Szegvár-Oromdűlő and the Trans-Tisza Region). In: Lőrinczy, G. – Major, B. – Türk, A. (eds): *A szegvár-oromdűlői temető és a Tiszántúl kora avar idősza.* Studia ad Archaeologiam Pazmaniensia 25 – Magyar Őstörténeti Kutatócsoport Kiadványok 5. Budapest–Szeged–Szentés, 11–404. https://doi.org/10.55722/arpad.kiad.2022.5_03
- LŐRINCZY, G. – SOMOGYI, P. 2018: Archäologische Aussagen zur Geschichte der Grossen Ungarischen Tiefebene östlich der Theiss im 6. und 7. Jahrhundert. Grab 33 des frühawarenzeitlichen Gräberfeldes von Szegvár-Oromdűlő. In: Drauschke, J. – Kislinger, E. – Kühtreiber, K. – Kühtreiber, Th. – Scharrer-Liška, G. – Vida, T. (eds): *Lebenswelten zwischen Archäologie und Geschichte. Festschrift für Falko Daim zu seinem 65. Geburtstag.* Monographien des Römisch-Germanischen Zentralmuseums 150. Mainz, 231–249.
- LŐRINCZY, G. – STRAUB, P. 2024: A Fönlak-típusú övveretes síregyüttesekről (About graves with Fönlak-type belt sets). *A Tornyai János Múzeum Évkönyve* 5, 71–107.

- MADARAS, L. 1999: Újabb avar kori temetők Szentes határában (Neue awarenzeitliche Gräberfelder in der Gemarkung von Szentes). *A Móra Ferenc Múzeum Évkönyve – Studia Archaeologica* 5, 317–355.
- MARÓTI, Z. – NEPARÁCZKI, E. – SCHÜTZ, O. – MAÁR, K. – VARGA, I. B. G. – KOVÁCS, B. – KALMÁR, T. – NYERKI, E. – NAGY, I. – LATINOVICS, D. – TIHANYI, B. – MARCSIK, A. – PÁLFI, Gy. – BERNERT, Zs. – GALLINA, Zs. – HORVÁTH, C. – VARGA, S. – KÖLTŐ, L. – RASKÓ, I. – L. NAGY, P. – BALOGH, Cs. – ZINK, A. – MAIXNER, F. – GÖTHERSTRÖM, A. – GEORGE, R. – SZALONTAI, Cs. – SZENTHE, G. – GÁLL, E. – P. KISS, A. – GULYÁS, B. – NY. KOVACSÓCZY, B. – GÁL, Sz. S. – TOMKA, P. – TÖRÖK, T. 2022: The genetic origin of Huns, Avars, and conquering Hungarians. *Current Biology* 32/13, 2858–2870. <https://doi.org/10.1016/j.cub.2022.04.093>
- B. NAGY, K. 1984: Az Avar Kaganátus [The Avar Khaganate]. In: Nagy, I. (ed.): *Hódmezővásárhely története a legrégibb időktől a polgári forradalomig I*. Hódmezővásárhely, 229–256.
- B. NAGY, K. 2003: A székkutas-kápolnadülői avar temető [The Avar cemetery of Székkutas-Kápolnadülő]. In: B. Nagy, K.: *A székkutas-kápolnadülői avar temető*. Monographia Archaeologica 1. Szeged, 11–304.
- PÁSZTOR, A. 2003: A székkutas-kápolnadülői avar temető gyöngylelei (Die Perlen des awarenzeitlichen Gräberfeldes von Székkutas-Kápolnadülő). In: B. Nagy, K.: *A székkutas-kápolnadülői avar temető*. A Móra Ferenc Múzeum Évkönyve – Monographia Archaeologica 1. Szeged, 331–370.
- PÁSZTOR, A. 2022: A szegvár-oromdülői temető gyöngylelei (Bead finds from the cemetery of Szegvár-Oromdülő). In: Lőrinczy, G. – Major, B. – Türk, A. (eds): *A szegvár-oromdülői temető és a Tiszántúl kora avar idősza*. *Studia ad Archaeologiam Pazmaniensia* 25 – Magyar Őstörténeti Kiadványok 5. Budapest–Szeged–Szentes, 405–508. https://doi.org/10.55722/arpad.kiad.2022.5_04
- RÁCZ, Zs. – SZENTHE, G. 2009: Avar temető Hajdúnánás határában (Awarisches Gräberfeld in der Gemarkung von Hajdúnánás). *Communicationes Archaeologicae Hungariae*, 309–335. <https://doi.org/10.54640/CAH.2009.309>
- SIKLÓSI, Zs. 2014: A Tiszavasvári–Kashalom-dűlőben és Hajdúnánás–Fürj-halom-járáson feltárt avar sírok radiokarbon keltezése (Radiocarbon dating of Avar graves excavated in Tiszavasvári–Kashalom-dűlő and Hajdúnánás–Fürj-halom-járás). *A nyíregyházi Jósza András Múzeum Évkönyve* 56, 229–236.
- SIKLÓSI, Zs. – LŐRINCZY, G. 2017: A pitvaros-víztározói késő avar kori temető radiokarbon keltezése, Bayes-analízise és régészeti értékelése (The radiocarbon dating, the Bayesian and archaeological analysis of the late Avar period cemetery at Pitvaros-Víztározó). In: Bende, L.: *Temetkezési szokások a Körös–Tisza–Maros közén az avar kor második felében* (Bestattungsbräuche in der zweiten Hälfte der Awarenzeit im Gebiet zwischen Körös, Theiss und Maros). *Studia ad Archaeologiam Pazmaniensia* 8. Budapest, 483–504.
- SOMOGYI, P. 1987: Typologie, Chronologie und Herkunft der Maskenbeschläge zu den archäologischen Hinterlassenschaften osteuropäischer Reiterhirten aus der pontischen Steppe im 6. Jahrhundert. *Archaeologia Austriaca* 71, 121–154.
- STADLER, P. 2003: A székkutas-kápolnadülői minták datálása (Datierung der Proben von Székkutas-Kápolnadülő). In: B. Nagy, K.: *A székkutas-kápolnadülői avar temető*. A Móra Ferenc Múzeum Évkönyve – Monographia Archaeologica 1. Szeged, 302–304.
- SZALONTAI, Cs. 2003: A székkutas-kápolnadülői avar kori temető öveinek elemzése (Die Analyse der Gürtel des awarenzeitlichen Gräberfeldes von Székkutas-Kápolnadülő). In: B. Nagy, K.: *A székkutas-kápolnadülői avar temető*. A Móra Ferenc Múzeum Évkönyve – Monographia Archaeologica 1. Szeged, 371–412.
- SZENTHE, G. 2006: Középpavar kori összetett hátveretek. Egy középpavar övtípusról (Mittelawarenzeitliche zusammengesetzte Rückenbeschläge. Über einen mittelawarischen Gürteltyp. *Communicationes Archaeologicae Hungariae*, 179–212.
- SZENTHE, G. 2012: 7. századi ezüstlemezes övgarnitúrák. Adatok az ezüstlemezből készült, sima felületű övveretek elterjedéséhez (Gürtelgarnituren des 7. Jahrhunderts aus Silberblech. Angaben zur Verbreitung der Gürtelbeschläge aus flachem Silberblech). In: Vida, T. (ed.): *Thesaurus Avarorum. Régészeti tanulmányok Garam Éva tiszteletére – Archaeological Studies in Honour of Éva Garam*. Budapest, 521–550.
- SZENTHE, G. – FARAGÓ, N. – GÁLL, E. 2023: Chronological problems of the 7th–10th-century AD Carpathian Basin in light of radiocarbon data. *Dissertationes Archaeologicae* 3.11, 443–492. <https://doi.org/10.17204/dissarch.2023.443>
- SZENTHE, G. – GÁLL, E. 2022: Hortobágy–Árkus kora középkori temetője. Egy elit csoport hagyatéka a 8–10. századi Észak-Tiszántúlról (The Early Medieval Cemetery at Hortobágy–Árkus. The Heritage of an Elite Group from the 8th–10th Century Northern Transtisza Region). *Archaeologia Hungarica* 52. Budapest.

- SZENTPÉTERI, J. 2002: Székkutas-Kápolna-dűlő, homokbánya (Sandgrube). In: Szentpéteri, J. (ed.): *Archäologische Denkmäler der Awarenzeit in Mitteleuropa*. Varia Archaeologica Hungarica 13. Budapest, 359.
- SZŐKE, B. M. 1992: Die Beziehungen zwischen dem oberen Donautal und Westungarn in der ersten Hälfte des 9. Jahrhunderts (Frauentrachtzubehör und Schmuck). In: Daim, F. (ed.): *Awarenforschungen II*. Archaeologia Austriaca Monographien 2 – Studien zur Archäologie der Awaren 4. Wien, 841–968.
- SZÜCSI, F. 2023: The 9th Century Chronology under Fire? Remarks on the Chronology of the Spiral and Multiple S-Ended Pendants. In: Mărginean, F. – Romat, S. – Băcuet-Crișan, D. – László, K. – Stanciu, I. (eds): *The Power of Fire in the Middle Ages (7th–14th Centuries). Proceedings of the International Conference “The Power of Fire in the Middle Ages (7th–14th Centuries)”*, Székesfehérvár 14th–16th October 2022. Orbis Mediaevalis 4. Cluj-Napoca–Budapest, 207–226.
- VIDA, T. 1999: *Die awarenzeitliche Keramik I*. Varia Archaeologica Hungarica 8. Budapest.
- VIDA, T. 2022: Sírkerámia a szegvár-oromdűlői avar kori temetőben (Grave pottery in the Avar Age cemetery of Szegvár-Oromdűlő). In: Lőrinczy, G. – Major, B. – Türk, A. (eds): *A szegvár-oromdűlői temető és a Tiszántúl kora avar idősza*. Studia ad Archaeologiam Pazmaniensia 25 – Magyar Őstörténeti Kutatócsoport Kiadványok 5. Budapest–Szeged–Szentés, 509–554. https://doi.org/10.55722/arpad.kiad.2022.5_05
- ŽIVANOVIĆ S. 1978: Apsolutno datovanje skeletnih ostataka iz nekropole Čelarevu (Radiocarbon datings on human skeleton from Čelarevo). *Rad Vojvodanskih muzeja* 23–24, 19–20. <https://doi.org/10.1017/S003382220000388X>

