

THE ÁRPÁDIAN AGE FORTIFICATION OF FEHÉRVÁR CASTLE

An overview of architectural history

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The fortification of medieval Fehérvár (Alba Civitas), located in the present-day city of Székesfehérvár, has been the focus of research for a hundred years now. Its construction date was clarified thanks to Gyula Siklósi's work in the past three decades. He argues that the town was fortified with a stone wall in the 13th century AD, after the Mongol Invasion. However, novel scientific methods, as well as recent archaeological excavations, yielded new results concerning the architectural history of the fortification. Most notably, dendrochronology, radiocarbon dating, and stratigraphic observations confirmed that parts of the stone wall and the earth-and-timber rampart inside it had already been built by the mid-11th century AD.

Keywords: 11th century AD, castle architecture, stone wall, rampart, dendrochronology, radiocarbon

INTRODUCTION

The fortification's research history has already been discussed by the present authors in several papers (HORVÁTH *et al.* 2018, 169–170; SZÜCSI, MORGÓS & HORVÁTH 2019, 10; SZÖLLŐSY 2020, 371–373) and, therefore, it is only briefly summarised here. Gyula Siklósi's work is pivotal, as it was his comprehensive interpretation of the medieval and Ottoman Period fortifications of Fehérvár that paved the way for our research project and served as its starting point (SIKLÓSI 1999).

In the early Árpáadian Age, no cities existed in the late medieval or modern sense of the word. Settlements around castles could potentially develop into urban ones later (for the most recent summary of and literature on this topic, see SZENDE 2022, 357–371). Taking into consideration that the line of the late medieval town wall of Fehérvár follows that of the 11th-century AD castle wall in all locations under study (Fig. 1), one may hypothesise that this was also the case with other parts of the wall, the chronology of which is poorly known. The 11th-century AD stone wall surrounded 17 hectares, an area significantly larger than the castles of the *comes* (*ispán*) (ZSOLDOS 2010, 10; ZSOLDOS, THOROCZKAY &

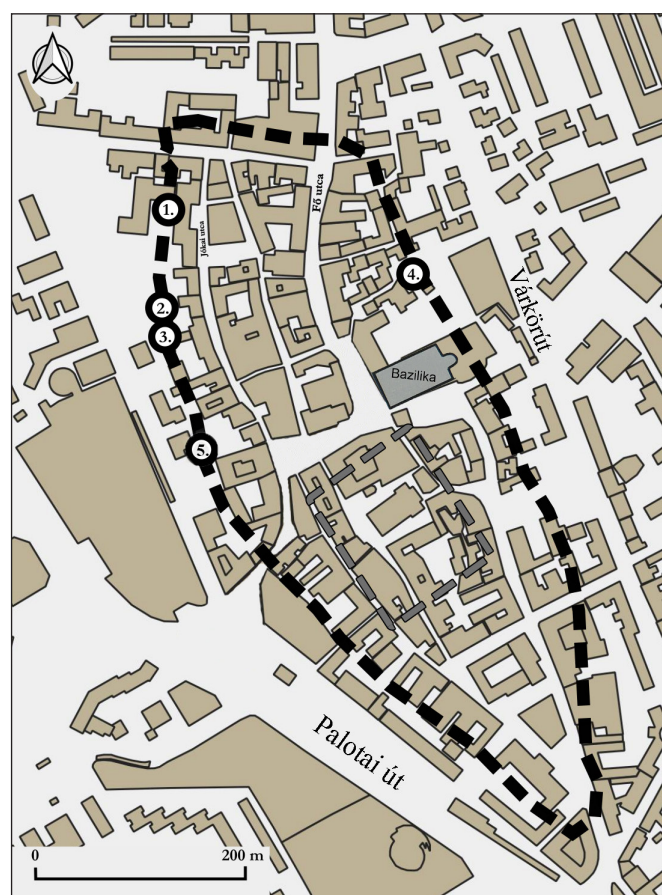


Fig. 1. Downtown of present-day Székesfehérvár. The castle wall is indicated with a black dashed line. Provenance of the samples used for dendrochronological and radiocarbon dating: 1: 20 Jókai Street, 2: 14 Jókai Street, 3: 12 Jókai Street, 4: 7 Lakatos Street, 5: 3 Mátyás Király Boulevard (Music School)

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KISS 2016, 214; SZÜCSI, SZÖLLÖSY & ROMÁT 2020, 67, 69; SZÜCSI, SZÖLLÖSY & ROMÁT 2021, 226, 229). As in Fehérvár, the early Árpadian Age settlement was established within the sizeable castle, that is, within the castle walls, which, thus, became town walls later.

In this paper, the architectural history of the partially excavated ‘inner castle’ (‘early royal castle’), located on a small hill in the town centre, and the citadel (‘late royal castle’) that once stood in the north-eastern corner of the present-day downtown, will not be discussed.

The AMS measurements of the samples mentioned in the study were analysed in the Hertelendi Ede Laboratory of Environmental Studies of the Nuclear Research Institute (MOLNÁR *et al.* 2013, 338–344). Radiocarbon dates were calibrated with OxCal v4.4.4, using the IntCal20 atmospheric curve (BRONK RAMSAY 2021; REIMER *et al.* 2020). The analysis of the samples DeA-38182 (pig bone) and DeA-38383 (tree bark) was funded by The House of Árpád Programme in the framework of a research project carried out at the Research Centre for the Humanities of the ELRN in Budapest. The authors are grateful to Prof. Elek Benkő for his permission to publish the results. The Szent István Király Museum of Székesfehérvár commissioned the AMS analysis of the rest of the radiocarbon samples.

THE FOUNDATION STRUCTURE OF THE CASTLE WALL AND THE INTERNAL RAMPART

The foundation structure of the stone castle wall and the structure of the earth-and-timber rampart within the walls have already been discussed in detail (SZÖLLÖSY 2020, 371–373; SZÜCSI & SZÖLLÖSY 2020, 165–177; SZÜCSI, SZÖLLÖSY & ROMÁT 2020, 55–58; SZÜCSI, SZÖLLÖSY & ROMÁT 2021, 211–214). Only a short summary is provided here to make the argument clear. The lowermost layer of the foundation structure was packed with discarded pieces of wood (small pieces of inner and outer bark and timber, *Fig. 2 A/1*), which could be interpreted as the construction waste of the beam grillage on its top. This structure was covered with wooden boards, the gaps of which were filled with black clay loam (*Fig. 2 A/2*). On top of it was a layer of crushed stones in clay loam (*Fig. 2 A/3*) and another layer of evenly spread black clay loam (*Fig. 2 A/4*). The mortared castle wall was built on top of the latter, using large ashlars on both sides and smaller ones between them for fill (*Fig. 2 A/5*). A 6-metre-wide earth rampart with ‘fibrous’ box skeleton structure was erected at the inner side of the foundation (*Fig. 2 B*): the foundation of the inner wooden supporting structure of the rampart consisted of box-like units or coffers closed on four sides. Boards were placed on top of the timber ‘boxes’ perpendicular to the axis of the rampart, thus creating a ‘fibrous’ supporting structure (*Fig. 2 B/6*) (MORDOVIN 2016, 151, Type 3. a).

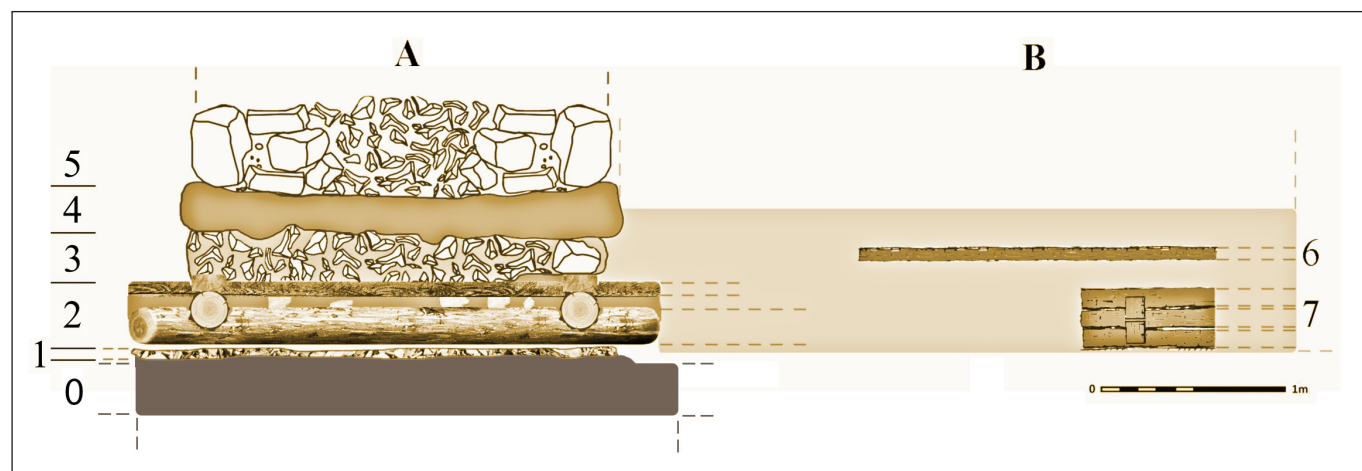


Fig. 2. The castle wall of Fehérvár and its foundation structure (A) and the earth rampart within the walls (B)

In the next section of the paper, the recent results concerning the architectural history of the Árpadian Age fortification of Fehérvár are outlined.

THE AD 1010S – THE EARLIEST DATA ON FORTIFICATION

Dendrochronological data on the earliest period (apart from wood that seems to have been secondarily used, see GRYNÆUS 2020, 114, 116–117) were obtained from three beam fragments recovered during a development project at 7 Lakatos Street in 2019 (Table 1 and Fig. 1/4). These beams were originally in a horizontal position and were found at the level of the castle wall's foundation, identical to the lowermost part of the rampart (ROMÁT & POKROVENSZKI 2019, 72).⁵ Although it is uncertain whether these pieces were part of the wall's foundation or the rampart's inner structure, their position leaves little doubt that they belonged to the fortification. The samples came from pedunculate oak; the method of their dendrochronological analysis has already been discussed in detail in earlier papers (MORGÓS 2007, 31–88; MORGÓS, KERN & HORVÁTH 2020, 85–109; MORGÓS, KERN & KÖRÖSFŐI 2021, 75–106). The Medieval Oak Alba Regia (MOAR1) chronology and the dendrochronological, radiocarbon and calendar dates are available in MORGÓS, KERN & HORVÁTH (2020).



Fig. 3. Dendrochronological sample Szfv138, a piece of timber (1) and its cross-section prepared for dendrochronological analysis (2)

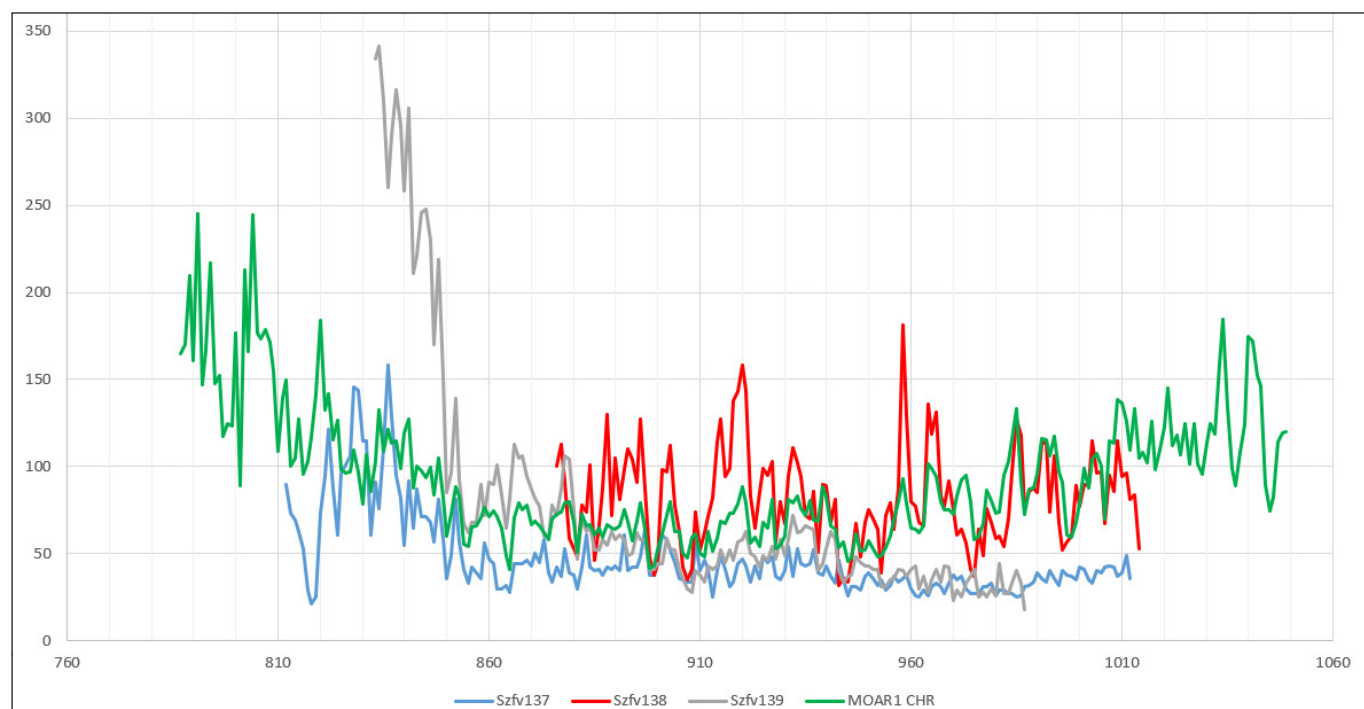


Fig. 4. Time series of the MOAR1 chronology (absolute calendar years, based on TRW of annular rings of oak) and samples Szfv137, Szfv138, and Szfv139

⁵ The EOVS coordinates of the timbers' provenance are X 601728 Y 205586 (EOVS, *Egységes Országos Vetületi rendszer*, Uniform National Projection system, a plane projection system used uniformly for the Hungarian civilian base maps and spatial informatics in general). The authors are grateful to Sándor Romát, who led the archaeological supervision of the development project at Lakatos Street, for allowing the publication of the finds. He also confirmed in oral communication the authors' hypothesis, which they formulated drawing on *in situ* photos, that the timbers were placed horizontally in the original structure.

| | Series length | Coverage | Glk% | GSL | TVBP | CDI | Dating | Note |
|----------------|---------------|----------|------|-----|------------|-----|---------------------------------|-------------------------------|
| Szfv137 | 201 yrs | 201 yrs | 64% | *** | 6.2 | 37 | 812-1012 +2nm = 1014 | 2nm+ SIB (bark!) |
| Szfv138 | 139 yrs | 139 yrs | 71% | *** | 8.1 | 59 | 876-1014 | Bark |
| Szfv139 | 155 yrs | 155 yrs | 64% | *** | 6,5 | 38 | 833-987 | The end cannot be measured |

Table 1. Absolute dating of the three wood samples by using the MOAR1 chronology (GLK = Gleichläufigkeit (sum of equal slope intervals in %); GSL = Signature Glk; TVBP = T-value Baillie-Pilcher; CDI = cross-date index; nm = non-measurable growth ring, i.e. distorted or damaged; SIB = surface indicating bark)

One of the three samples (Szfv138) had a piece of bark on top of the outer growth ring, proving that the last ring of the tree grew in AD 1014 (Fig. 3). The felling of the tree must have taken place between autumn AD 1014 and spring AD 1015.

The last measurable growth ring of sample Szfv137 grew in AD 1012; two further rings above it were damaged and could not be measured. It contained no bark remains but only a surface indicating its one-time presence. Therefore, adding two years (two rings) to the year AD 1012 provides the same felling date, AD 1014. Sample Szfv139 came from a worked piece of wood from which several rings were removed. Therefore, this piece was dated earlier, to AD 987 (Fig. 4).

In the Middle Ages, wood to be used in underground structures or buildings was not set aside to dry but was used up shortly after felling (within a year, between spring and late autumn) because freshly felled trees were more flexible and easier to work with and wet wood stored in the open air could be damaged by microorganisms (fungi). In some cases, especially when huge buildings (e.g., cathedrals) were constructed, which required large quantities of timber it took a long time to gather the necessary quantity, and the wood had to be stored for a while. Thus, more than a year may have passed between the felling and the actual using of the wood; however, even in such cases, the constructors aimed at using the building material as soon as possible (SCHMIDT, KÖHREN-JANSEN & FRECKMANN 1990, 36; SIMPSON 1996, 10–20).

EARLY 11TH CENTURY AD: THE EARTH-AND-TIMBER RAMPART WITH THE 'FIBROUS' SKELETON STRUCTURE

Present authors hypothesised in earlier publications that the earth-and-timber rampart within the castle walls, brought to light at 14 Jókai Street, was roughly contemporaneous with the castle wall. Thus, the rampart was interpreted as an embankment supporting the wall (SZÜCSI & SZÖLLÖSY 2020, 173–176; SZÜCSI, SZÖLLÖSY & ROMÁT 2020, 60). However, recent results suggest an earlier dating for the rampart and raise the possibility that originally, it functioned as a separate line of defence. This is supported, among other things, by a 50–200-cm-wide zone where almost no wooden remains were found, except for a few boards (SNR 29, SNR 2017/51). Judging from their joints, the latter seems to have had no function whatsoever. These board remains give the impression that the western side of the rampart was dismantled at some point to facilitate the building of the castle wall. There was a few centimetre thick



Fig. 5. The soil layer between board SNR 2017/51 and beam SNR 2017/19 on a field photo image

soil layer between a piece of board, no. 2017/51, and beam, no. 2017/19, which belonged to the lowermost layer of the castle wall's foundation, meaning that the board and the beam must have been part of two different structures (Fig. 5). Board no. 2017/51 was probably part of a rampart section which became dismantled.

Other stratigraphic observations also confirm the earlier dating of the rampart. The box skeleton structure of the rampart was in layer SNR 19, while beam grid SNR 13 (the lowermost layer of the castle wall's foundation) was built *on top* of that layer. The foundation structure of the castle wall was dug into SNR 34, and its lower part, up to the top of the clay loam layer SNR 64, was undoubtedly underground. Layer SNR 34 was situated on top of SNR 19 (which contained the box skeleton structure of the rampart), which means that the foundation of the castle wall was dug into a layer that was younger than the one that contained the rampart's box skeleton structure (Fig. 6).⁶

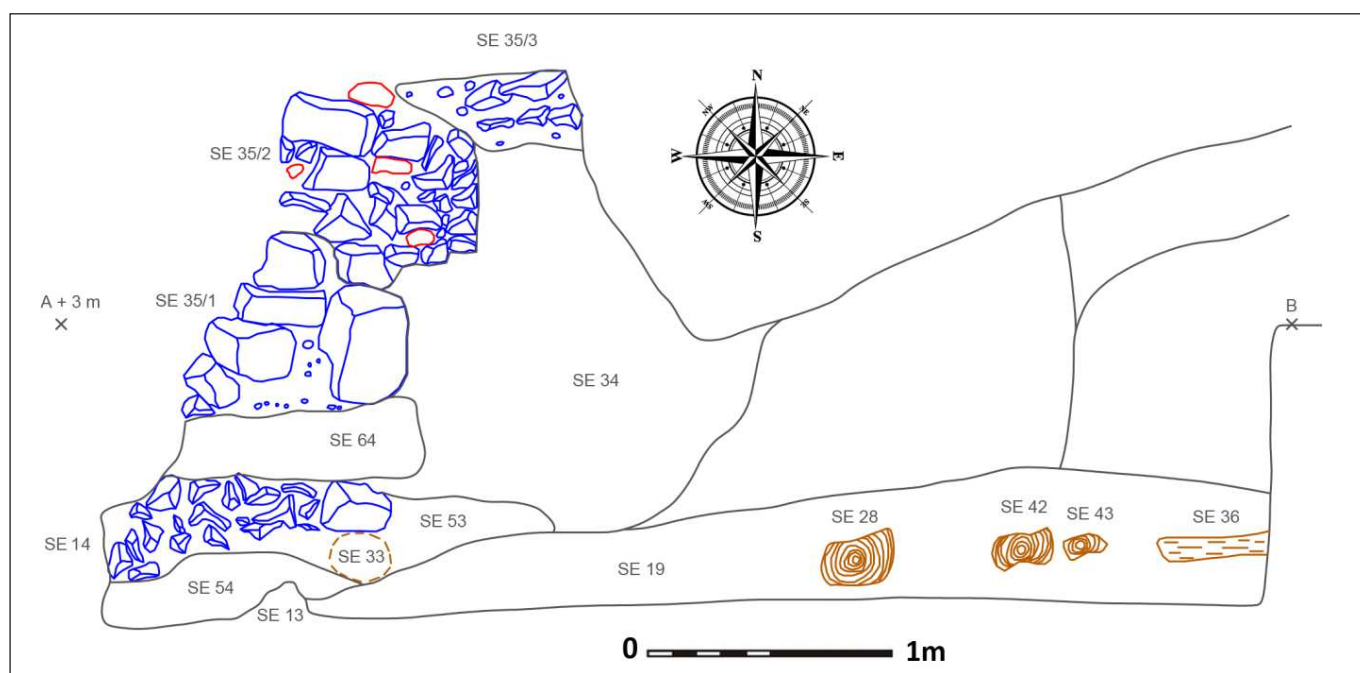


Fig. 6. The northern section wall of the 2019 excavation at 14 Jókai Street, showing the stone wall's stub (SNR 35/1), the foundation structure (SNR 64, 14, 54, 13), the earth crumbled from the rampart (SNR 19), and remains of the rampart's wooden supporting structure (SNR 28, 36, 42, 43)

Beam SNR 2017/70 (Fig. 7/1) was part of the rampart at 14 Jókai Street. It was deformed and poorly preserved, and its rings were unsuitable for dendrochronological analysis (GRYNAEUS 2020, Fig. 2b). The sample taken from its outer rings, DeA-20503, was AMS measured, yielding a calibrated date AD 886–1017 (95.4%) (Fig. 8) or AD 886–997 (92.8%). As no sapwood rings were preserved, the smallest possible number of sapwood rings was added to the calculation (GRYNAEUS 2002, 265–272). According to this, the earliest time when the tree could have been felled was between AD 898 (886+12) and 1029 (1017+12) AD (95.4% probability) or AD 898 (886+12) and 1009 (997+12) (92.8% probability).

Beam SNR 2019/28 (Szf163) was suitable for dendrochronological dating and must have belonged to the rampart. However, there are uncertainties concerning its interpretation within the structure because it was unearthed at the edge of the excavation trench at 14 Jókai Street (Fig. 7/2). The youngest of its 117 measurable growth rings dates to AD 975. As no sapwood was preserved of it, its earliest felling date is AD 987 (975+12) (MORGÓS, KERN & HORVÁTH 2020, 95, Table 1, Pt 2).

Only one sample that could be undoubtedly linked to the rampart was suitable for dendrochronological analysis: a board from stratigraphic unit SNR 2019/29 (sample Szfv166) (Fig. 7/3). Altogether 69 of its growth rings were measurable, the youngest of which dates to AD 901. As the sample contained

⁶ The authors are grateful to Gergely Buzás for drawing their attention to this detail.

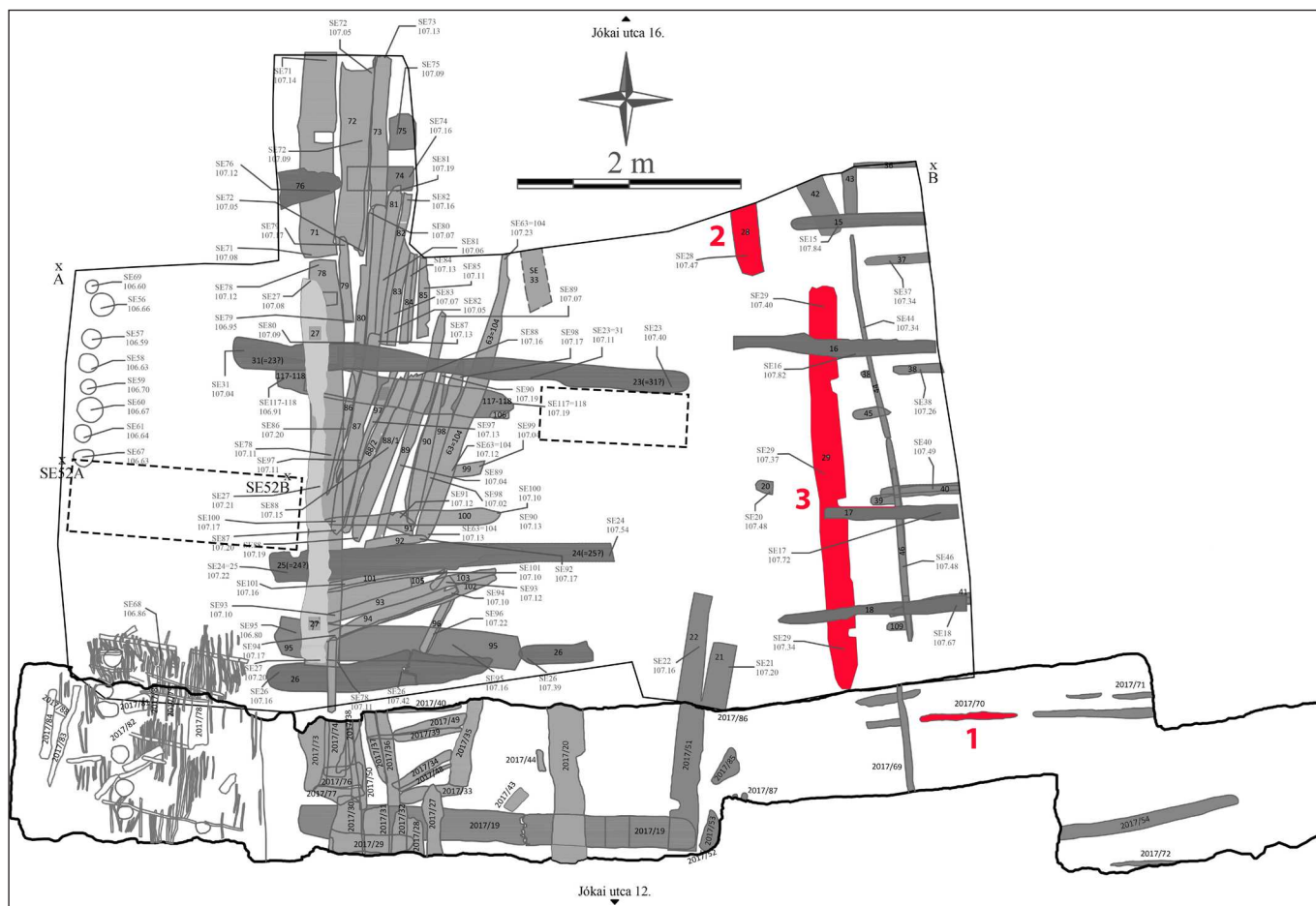


Fig. 7. Survey map of the wooden structures in the castle wall's foundation, the rampart sections brought to light at 14 Jókai Street in a trial trench (2017), and the area of the planned excavation (2019). 1: SNR 2017/70; 2: SNR 2019/28; 3: SNR 2019/29

no sapwood, the earliest possible felling date is AD 913 (901+12) (MORGÓS, KERN & HORVÁTH 2020, 95, Table 1, Pt 2).

Thus, based on dendrochronological evidence, if the interpretation of beam SNR 2019/28 (sample Szfv 163) is correct, it was indeed part of the rampart. The earliest possible date for the construction of the rampart is AD 987, while the latest date was determined by the castle wall's construction in AD 1050. Potsherds brought to light from the rampart confirmed this dating. In addition to ceramics dated to the 8th–10th (seven pieces, 29%) and 10th–11th centuries AD (nine pieces, 38%), respectively, the record also contained 11–12th-century AD pottery (eight pieces, 33%) (SZÜCSI, SZÖLLÖSY & ROMÁT 2020, 62, Fig. 18).⁷ In summary, pottery finds enable specifying the dating of the structure to the early 11th century AD.

In all probability, the rampart was constructed during the reign of (Holy) Stephen I, as it was the Provostry of the Holy Virgin, constructed at that time, and the royal basilica that made a protective

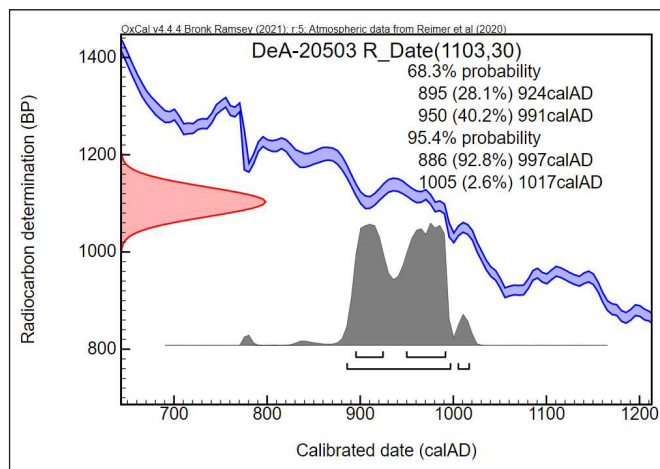


Fig. 8. Calibrated date of beam SNR 2017/70, collected from the rampart at 14 Jókai Street

⁷ Potsherds dated to the 11th–12th c. came to light from the higher, 'fibrous' part of the rampart's structure (SNR 15, 17–18), while the lower layers with the timber boxes of the rampart (SNR 19) yielded only 8th–10th and 10th–11th-century ceramics.

fortification necessary. The samples from Lakatos Street, dated between autumn AD 1014 and spring 1015, may indicate the time of the construction of the rampart.

MID-11TH CENTURY AD: THE STONE CASTLE WALL

The lowermost cultural layer excavated below the foundation structure of the castle wall at 14 Jókai Street is identical to stratigraphic unit SNR 66 of the 2019 excavation, a layer sequence discovered at about 106.7 metres a.B.s.l. (Fig. 2 A/0). The AMS dated pig bone (DeA-38182) was collected from this layer along with other animal bones and was dated to AD 993–1030 (95.4% probability, Fig. 9). The pig must have died in this period, which more-or-less corresponds to the reign of King (Holy) Stephen I. The bone must have been deposited in the lowermost, silty soil layer shortly after the meat had been consumed. This layer yielded large quantities of animal bones and, according to archaeobotanical results, was located at the fringes of a swampy area (PETŐ, GYULAI & BRAUN 2020, 132). The radiocarbon dating of the stratum was also confirmed by potsherds recovered from SNR 66, which included 8–10th- (27 pieces, 69%) and 10–11th-century AD ceramic fragments (12 pieces, 31%) (SZÜCSI, SZÖLLÖSY & ROMÁT 2020, 62, Fig. 18).

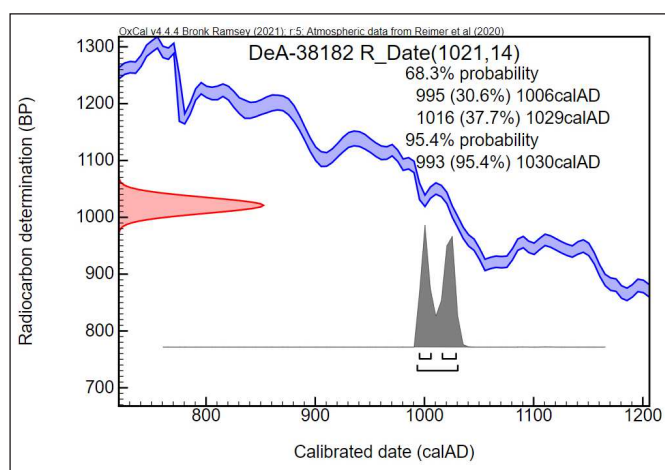


Fig. 9. Calibrated date of a pig bone from the layer under the foundation structure of the castle wall at 14 Jókai Street (SNR 66, excavated in 2019)

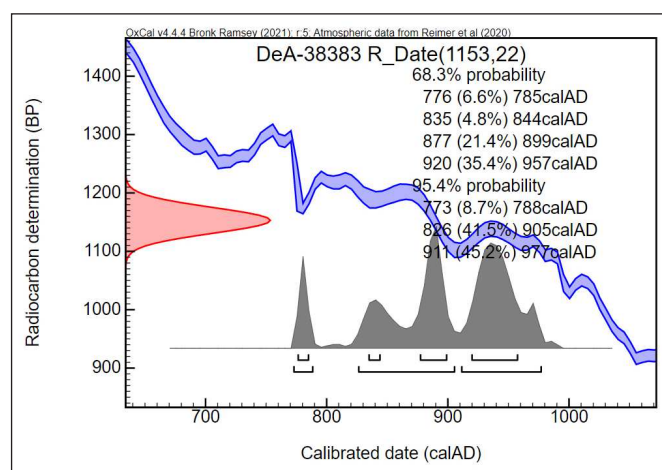


Fig. 10. Calibrated date of sample DeA-38383, obtained from the construction waste of the foundation structure of the castle wall at 14 Jókai Street

The part of the castle wall foundation excavated at 14 Jókai Street was built on top of the cultural layer mentioned above, yielding an animal bone that was dated between AD 993 and 1030. Sample DeA-38383, collected from the lowermost layer packed with discarded chips of wood and small pieces of timber and bark, interpreted as a woodworking layer linked to the foundation structure (Fig. 2 A/I), was AMS dated to AD 773–977 (95.4% probability) (Fig. 10). As it is uncertain from which part of the tree's ring sequence the sample came from, the dating can only be considered *terminus post quem*. Luckily, the construction waste layer⁸ yielded a piece of wood cut almost perpendicularly to the tree's axis and exhibiting bark traces, which enabled the identifying of the outermost growth ring and date it to between autumn AD 1049 and fall 1050 (MORGÓS, KERN & HORVÁTH 2020, 91, Fig. 7, 95, Table 1, Pt. 2).

Zoltán Kern wiggle-matched the data obtained from five dendrochronologically synchronised wood samples⁹ from the slab waffle foundation of the castle wall at 14 and 20 Jókai Street (Fig. 1/I–2) (MORGÓS, KERN & HORVÁTH 2020, 99). At 95% probability, the calibrated dates indicated two time intervals, AD 998–1057 and AD 1068–1074, for the outermost growth ring of sample Szfv105; the former, however, is more

⁸ Stratigraphic unit SNR 52.

⁹ 20 Jókai Street (excavation in 1981): 81.489.6. (inv. no.) / Szfv8/1 (dendrochronology sample no.) / DeA-4834 81.489.6. (inv. no.) / Szfv8/2 / DeA-4835; 14 Jókai Street (test excavation in 2017): SNR 19 / Szfv105 / DeA-20887, SNR 28 / Szfv100 / DeA-20888, SNR 30 / Szfv85 / DeA-20889.

probable (MORGÓS, KERN & HORVÁTH 2020, 101). All this evidence points to the early 11th century AD as the most probable date of the felling of the trees built in the castle wall's foundation (*Fig. 11*).

Wood samples recovered from the castle wall's foundation at 14 Jókai Street were analysed in two different dendrochronology labs. One of them, based on a comparison with relative (floating) tree ring sequences suggested AD 1045 (Grynaeus 2020, 119), while using absolute chronology (calendar dates) a period between late autumn AD 1049 and spring 1050 as the latest possible felling date (MORGÓS, KERN & HORVÁTH 2020, 94–95, Table 1). It is important to stress that while the two independent analyses used different references, they still suggested similar dates. The youngest pieces of wood, with their last growth rings dated to AD 1049, also contain bark or the remains thereof,¹⁰ which indicates that the material must have been used soon after felling (to keep non-debarked wood from rotting).

Potsherds from the foundation layers¹¹ were dated to the 8–10th (six pieces, 32%) and 10–11th centuries AD (13 pieces, 68%), respectively. These also support the foundation's dating to the 11th century AD (SZÜCSI, SZÖLLÖSY & ROMÁT 2020, 61–63).

In the early years of Andrew I's reign, preparations to ward off a possible German attack to avenge the death of King Peter (Orseolo) and restitute vassalage made it necessary and reasonable to fortify the castle of Fehérvár with stone walls. The attack indeed came in AD 1051. Master Simon of Kéza, drawing on earlier Hungarian chronicles, claims that in that year, the troops of Roman Emperor Henry III marched as far as Fehérvár and besieged the castle, although without success (ZSOLDOS, THOROCZKAY & KISS 2016, 49).¹²

LATE 11TH – END(?) OF THE 13TH CENTURY AD: THE CONSTRUCTION OF THE HORSESHOE- OR U-SHAPED TOWERS

In 1991, Gyula Siklósi excavated the foundation of one of the U-shaped towers in the backyard of the Music School (earlier sites names: 8 Városháza Square, 2 Szabadságharcos Road; today: 3 Mátyás király Boulevard). Three beams were unearthed there at 107.3 metres a.B.s.l. (*Fig. 12*). Several years later, conservator József Lángi handed over the wood samples to dendrochronologist Emil Horváth. No statistically significant connection could be observed between the tree-ring sequences of samples Szfv3, Szfv4, and the MOAR1 chronology. There were similarities with Szfv5, a sample that comprised only 40 growth rings; however, this data was still insufficient for dendrochronological dating (SZÜCSI, MORGÓS & HORVÁTH 2019, 24–25). The calibrated AMS date based on the four youngest growth rings of Szfv5 (DeA-20886) was AD 1041–1213 (95.4% probability) (*Fig. 13*). However, that sample only contained hardwood rings; thus, the smallest possible number of sapwood rings (12; GRYNÆUS 2002, 265–272) were added, establishing the earliest possible felling date to between AD 1053 (1041+12) and 1225 (1213+12). While in the absence of dating artefacts or stratigraphic observations, the hypothesis accepted by research has been that the

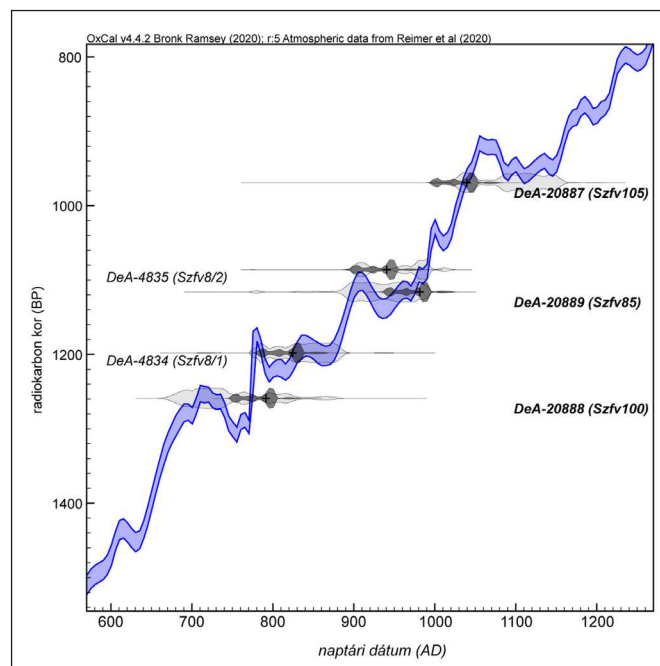


Fig. 11. Calibration curve plot of individual wood samples from 14 and 20 Jókai Street (light grey shade: individual probability distribution, dark grey shade: specified 'wigggle match' probability distribution of the individual samples in the series (after MORGÓS, KERN & HORVÁTH 2020, Fig. 12)

¹⁰ Six timbers showed traces of bark: SNR 2017/19 (Szfv105), SNR 2017/30 (Szfv85), SNR 2019/52 (Szfv168), SNR 2019/71 (Szfv159), SNR 2019/74 (Szfv161), SNR 2019/95 (Szfv145).

¹¹ Stratigraphic units SNR 27, 31, 48, 52, 54.

¹² The authors are grateful to Gergely Buzás for highlighting this important historical detail.

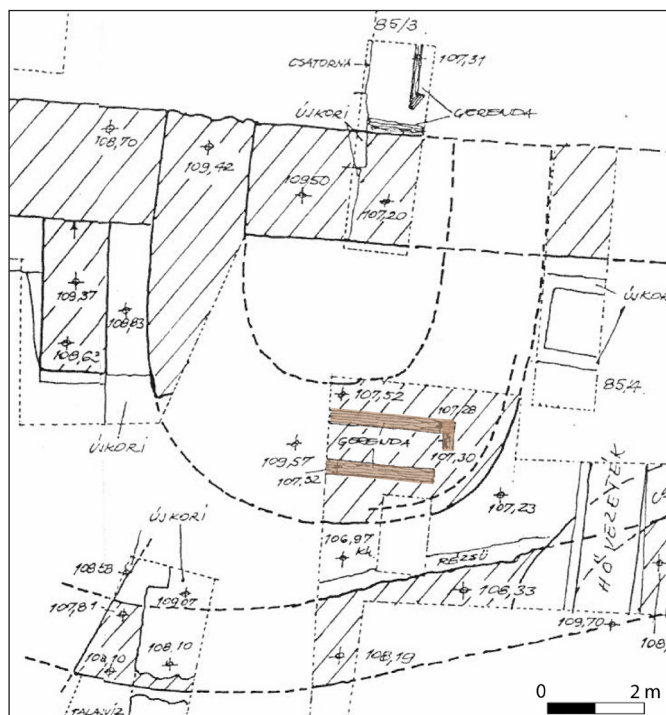


Fig. 12. Survey map of the horseshoe-shaped tower in the courtyard of the Music School (3 Mátyás Király Boulevard). The beams of samples Szfv3–5 in the foundation are highlighted in brown.

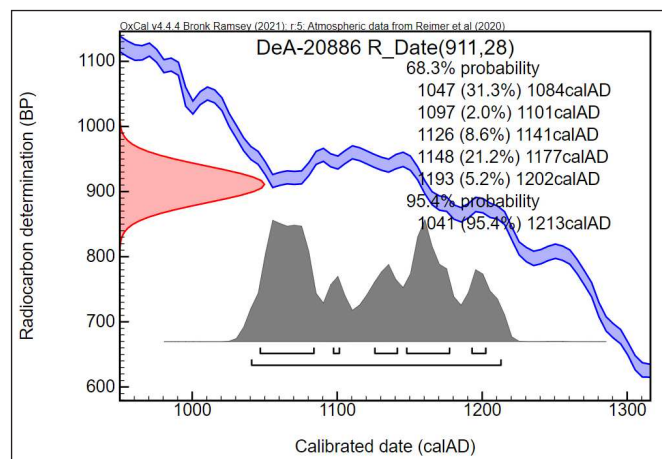


Fig. 13. Calibration curve plot of the four outermost growth rings of sample Szfv5, brought to light in 1991 from the timber foundation of the horseshoe-shaped tower in the yard of the Music School (3 Mátyás Király Boulevard)

horseshoe-shaped tower in the yard of the Music School was built at the turn of the 13th and 14th centuries AD (Siklósi 1999, 39, 59), actually, it was constructed probably earlier. Gyula Siklósi's excavations suggest that the horseshoe-shaped tower brought to light in the yard of the Music School was not contemporaneous with the castle wall but,

in fact, constructed only after parts of the castle wall had been dismantled (Siklósi 1999, 39). This is also supported by the radiocarbon dates obtained from the samples from the timber structure of the tower's foundation. In all probability, the remaining horseshoe-shaped towers, which have not yet been excavated but their presence has been hypothesised from 17th-century ground plans of the town, can also be dated to between the late 11th century and the end of the 13th century AD. However, their more precise dating is not possible at this point (Siklósi 1999, Abb. 2, 5, 10, 65).

13TH CENTURY (OR LATER): CONSTRUCTION OF THE RECTANGULAR TOWERS

In 1981, Gyula Siklósi unearthed the remains of the 220-centimetre-thick walls of a rectangular tower in a trial trench at 20 Jókai Street (József Attila High School, today Szent István High School of the Cistercian Order). His observations suggested that the town wall was dismantled in a section of ca. 8 metres, and the beam grillage was exposed in order to build a tower upon it (Horváth et al. 2018, Fig. 2; Szűcsi, Morgós & Horváth 2019, Fig. 2). Based on a 13th-century AD pot recovered from the tower's foundation level, he hypothesised that the tower was erected at the end of that century (Siklósi 1999, 36–37, Abb. 162). However, this is only a *terminus post quem* date, which means that the rectangular tower excavated at 20 Jókai Street was built in the 13th century AD at the earliest. This is probably true for the other rectangular towers, which have not yet been explored by archaeological means but are only known from 17th-century survey maps of the town (Siklósi 1999, Abb. 2, 5, 10, 65).

SUMMARY

The independent results of separate analyses utilising the methods of different fields suggested similar dating for the studied structures. The stratigraphic observations at 14 Jókai Street (western castle wall), the radiocarbon dating of the castle wall's foundation and the rampart within the walls, as well as the dendro-chronological dating carried out by two different laboratories using different references all pointed to the 11th century AD as the date of construction for the castle wall's foundation and the rampart within its line.

Potsherds brought to light from the spaces of the rampart's box skeleton structure and the dendrochronological and radiocarbon dating of the wood it was constructed from suggest that the rampart was built sometime in the early 11th century AD. Previously, we believed it to be 'more-or-less contemporaneous' with the castle wall, but recent results suggest that the rampart was built a few decades earlier and should be identified as a separate line of defence rather than a simple embankment supporting the walls. AD 1014–1015, the dendrochronological dating of the samples from the rescue excavation at Lakatos Street, may indicate the closing date for the rampart's construction. If these samples came from the foundation of the castle wall, then it cannot be excluded that that was also started to be built during the reign of (Holy) Stephen I. Recent results, however, point to the former: in all probability, the earth-and-timber rampart can be dated to the reign of Stephen I (AD 997–1038), and the construction of the stone wall started few decades later.

Dendrochronology allowed a more precise dating of the castle wall's foundation, excavated at 14 Jókai Street, to the mid-11th century AD. The felling of the trees must have taken place between late autumn AD 1049 and spring 1050. During the reign of I Andrew, the stone wall of the castle of Fehérvár was built by dismantling a part of the rampart first; later, the medieval town was formed within this new line of defence. The construction of the castle walls coincides with the war preparations known from historical sources to ward off an expected German attack, an event finally taking place in AD 1051. The German armies besieged Fehérvár unsuccessfully; perhaps the stone castle walls already played a significant role in their defeat.

By our present knowledge, the castle wall was only reinforced with towers later. The horseshoe-shaped tower were erected sometime between the late 11th and the end of the 13th century AD, while the earliest date for the construction of the rectangular towers is the 13th century AD.

RECOMMENDED LITERATURE

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