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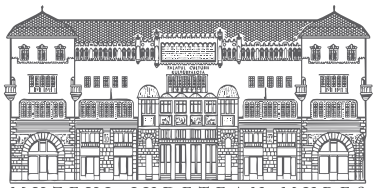

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THE RESULTS OF THE GEOPHYSICAL SURVEY OF THE BETHLEN CASTLE IN CRIȘ (MUREȘ COUNTY)

Ünige BENCZE[*] – László LENKEY[**] – Noémi KÓSA[***] – Kolos NÉMETH[****] – Levente László ZÓLYA[*****]

The article presents the results of the geophysical survey undertaken at the Bethlen castle in Criș (Keresd, de. Kreisch, Mureș County, RO), in 2022. The measurements concentrated on two areas located outside of today's fortification walls, on the western and southern side, since these were relatively open spaces. The survey revealed a number of unexpected features located all underground, such as several walls, possible buildings and at least one corner tower, all parts of an earlier fortification system that had existed before the one visible today. Most probably this earlier fortification functioned in the 15th or 16th centuries. Hopefully we will have a more exact dating, when the analysis of the finds is over. Furthermore, we discuss the possible interpretations and the older and newer archaeological results with the incorporation of the written sources. The excavations from the 1970s and the 1990s already revealed several segments of this earlier fortification, especially smaller fragments of walls or wall negatives. Also, an important chronological framework for the various construction phases of the castle ensemble was elaborated by M. Dumitrache, which is presented here in detail as well. During the excavations undertaken by the Mureș County Museum, between 2020–2022 we have also identified part of this ensemble, namely a southeastern corner tower with its adjoining eastern and southern walls. Above this fortification corner several other later establishments and archaeological features were revealed especially from the 18th and 19th centuries. This fortification does not appear mentioned in any of the known written sources so for now it cannot be clearly linked to any of the family members. What we know is that this fortification was dismantled latest by the seventeenth century, when the construction of the new fortification system began.

Keywords: noble residence, Bethlen family, geophysical survey, archaeology, estate
Cuvinte cheie: reședință nobiliară, familia Bethlen, măsurători geofizice, arheologie, proprietate

INTRODUCTION

The Bethlen castle located in the village Criș, Mureș County, was subject to several specialized studies along the ages, starting from the 20th century.[1] These studies were mainly aimed at the art historical and architectural analysis of the still-standing buildings, merely two articles presented briefly the results of archaeological excavations.[2] New archaeological and historical research began after 2020, when the Mureș County Museum resumed archaeological investigations in the framework of a larger, still-ongoing restoration project.[3] Since then,

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[1] See: B. Nagy 1970; Bicsók–Orbán 2012, 163–169; Cosnean Nistor 2021a, 78–97; Kovács 2003; 2009; 2017, Kovács et al. 2023.
[2] Dumitrache 1996, 283–292; Iosipescu–Iosipescu 1999, 68–79.
[3] Bencze–Zólya 2022a, 121–130; Bencze–Zólya 2022b, 26–34.

Fig. 1. The survey area outside the southern and western castle walls. Green dots: locations of magnetic measurements, black crosses: locations of electric measurements.

several new inquiries were undertaken at the request of the St. Francis Foundation, which manages the castle, such as geophysical and dendrochronological survey as well as a reinterpretation of the older art historic and archaeological studies.

In this paper we focus on the results of the geophysical survey and their possible interpretation by incorporating the results of the older archaeological excavations, which greatly impacted our understanding of the structures that had once existed around the castle grounds but now are invisible. The geophysical survey was undertaken by the Department of Geophysics and Space Science of the Eötvös Lóránd University in Budapest between the 26th and 27th of March 2022. The surveyed area was located outside the castle walls (Fig. 1), to the south and

to the west, in order to locate possible unknown buildings. As outlined in several studies, based on the documentary information preserved in few charters it is known that in the late 15th and early 16th centuries at least three manor houses stood on the grounds of today's castle but their exact location in still unknown.[4] Additionally, the excavations from 2020–2022 also revealed a part of an earlier fortification with a corner tower, which was unexplored. Thus, in order to get an extended perspective on the area two types of surveys were commissioned, a magnetic and an electric measurement.

DESCRIPTION OF THE MEASUREMENTS

During the magnetic survey the amplitude of the magnetic intensity and its vertical gradient were measured with a GEM–19 type Overhauser magnetometer. The measurements were taken along sections, which were located parallel to each other at a 0.5 m distance. The measuring points were situated at 0.2–0.25 m along the sections (green dots on Fig. 1). This type of measurement is generally suitable for magnetized materials, such as building materials like bricks and tiles. It is sensitive also to the iron and steel objects.

The electrical measurements allow the determination of the subsurface electrical resistivity, also called Earth Resistivity Tomography (ERT). The specific resistivity depends on the type of material. The resistivity of walls and foundations built of stone and brick is greater than the resistivity of the surrounding soil. During the measurements, via two electrodes, inserted into the ground, current is passed through the soil and the voltage is measured. From the measured voltage and the injected current, the specific resistivity is calculated. The further apart the electrodes are, the greater the depth the current penetrates, thus, the resistivity of greater depth can be measured. The survey was conducted with an ARES type of instrument along sections, where the electrodes were positioned in a Wenner-Schlumberger array with electrode spacing of 1 m. A total of 40 sections were measured with a largely north-south direction situated at 2 m distance from each other. For verification, several east-west oriented sections were also surveyed. The location of the electrodes can be seen on Fig. 1, highlighted with crosses.

DATA PROCESSING

During the processing of magnetic data, the high amplitude values (< 200 nT/m) were removed. Anomalies with wavelengths greater than 5 m were attenuated by filtering. The magnetic gradient values are presented on map (Fig. 2).

The specific resistivity along the sections was determined using the Res2Dinv program, while the resistivity in 3D was determined with the Res3Dinv program.[5] The specific resistivity processed in 3D was presented on maps at various depths.

RESULTS AND INTERPRETATION

The vertical gradient of magnetic intensity can be seen on Fig. 2. The magnetic picture is very noisy with many magnetic anomalies. Most of these are not related to archaeological objects, but many of the small-scale anomalies are caused by contemporary iron or steel objects, such as wires, nails, screws etc. Only a small part of these can be archaeological artifacts made from iron. The walls of the castle were built from sandstone and limestone, which are generally non-magnetic materials. Otherwise, there should be a strong magnetic anomaly close to the walls, which was not the case here. The foundation of a kitchen building excavated outside the southern wall of the castle is shown by faint grey lineaments on Fig. 2. This supports the observation that the walls were not built from magnetic rock. The walls of the kitchen were highlighted with magenta color on Fig. 3 for easier identification. It is interesting that

[4] MNL DL 62986, https://archives.hungaricana.hu/hu/charters/view/265967/?pg=0&bbox=–2503%2C–5667%2C7734%2C–118. Detailed discussion on the sources in: Bencze–Zólya 2022a, 121–130.

[5] Loke et al. 2013; Loke, 2014.

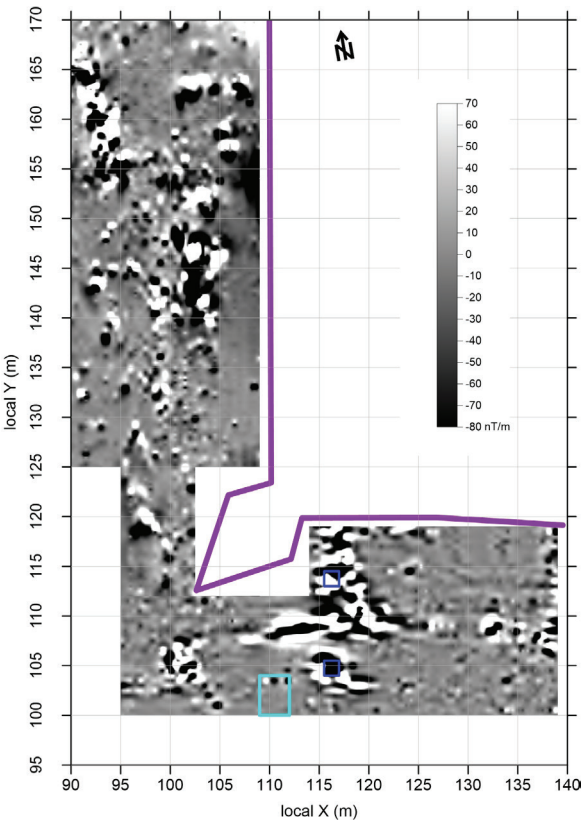

Fig. 2. Vertical gradient of magnetic intensity. Purple line: castle walls, blue square: drain outcrop, light blue: archaeological trench.

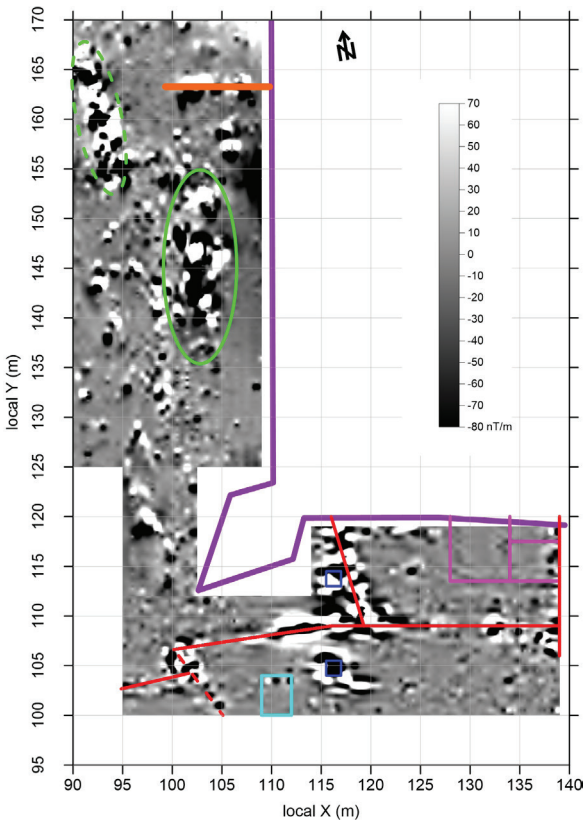

Fig. 3. The interpretation of the magnetic survey. Red line: iron pipe, dashed red line: presumed iron pipe, green line: larger iron objects, dashed green line: possible iron pipe, orange line: wall section, magenta line: excavated kitchen walls, other colors: same as on Fig. 2.

also on the south side, around the area given by coordinates x=110 and y=100 a brick floor of a building was found at the depth of 0.5 m (light blue square on Figs. 2 and 3), and this floor does not appear on the magnetic map. This indicates that the magnetization of the bricks used for this floor is low. On the southern side of the study area two canal outlets are located marked by blue squares on Figs. 2 and 3.

Their iron cover and steel–concrete sides cause strong magnetic anomalies. Also on the southern side, a characteristic banded black–and–white strong anomaly begins from the eastern side of the corner bastion and continues towards the south until the center of the territory, where it turns towards east–west. This is most probably an iron pipe or a steel cable, which branches out. A similar iron pipe or steel cable runs along the eastern edge of the measurement area in north–south direction. These utilities were marked with a red line on Fig. 3. In the southwestern corner of the study area the magnetic anomaly of the utility is not as strong as in the other areas, so it is marked only with a dashed red line.

On the western side of the study area two large magnetic anomalies can be seen, which were encircled with green lines on Fig. 3. The anomaly marked with continuous line is irregular, which indicates that it is caused by several smaller-larger iron and steel objects. The shape of the northwestern anomaly is linear and banded, like the utilities in the southern area, so it might be also caused by a buried iron pipe (marked with dashed line in Fig. 3). In the location, where earlier research found a section of a wall foundation, which starts from the western castle wall, and heads towards southwest at coordinate y=163, the magnetic map indicates an anomaly-oriented east–west. This anomaly

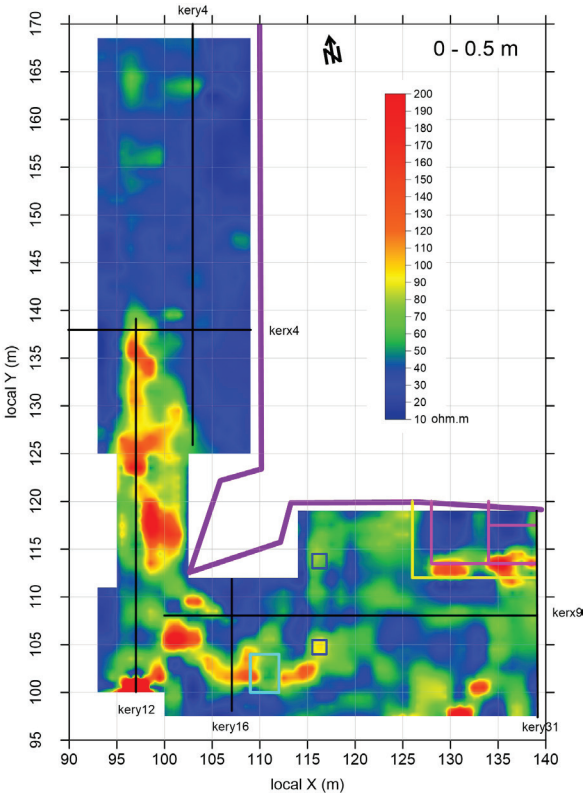

Fig. 4. Specific electrical resistivity up to 0.5 m depth. Black line: resistivity profiles shown in Fig. 9, yellow line: steep slopes due to excavation, other colors: same as on Fig. 2.

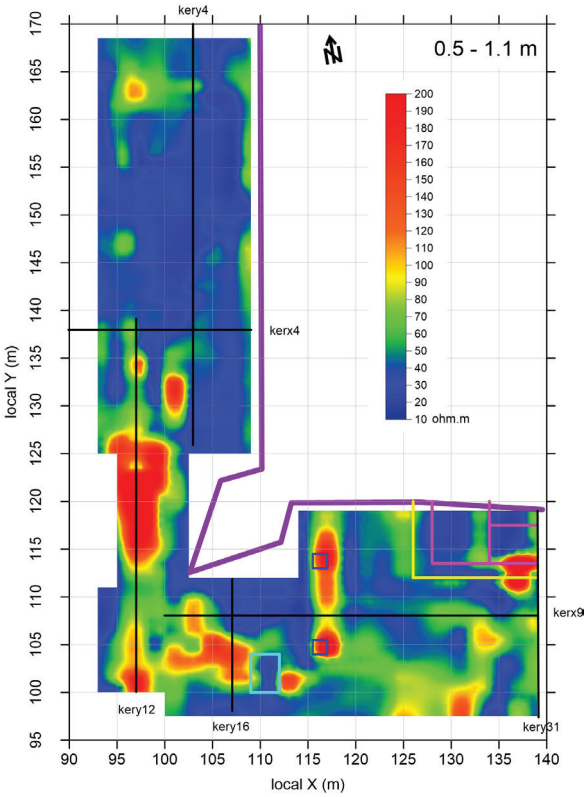

Fig. 5. Specific electrical resistivity in depth interval 0.5–1.1 m. See color code on Figs. 2 and 4.

can be attributed to a wall foundation, since it can also be seen on the resistivity maps (see later). Even though earlier we stated that the castle walls were erected from non-magnetic rocks, still, it may happen that possible earlier castle walls were built from magnetic rock. This wall section is marked with an orange line on Fig. 3. A possible resolution of the contradiction according to which the building stones are non-magnetic is that a pipe or a steel cable is also present at the wall: the magnetic anomaly due to these iron objects is visible on the magnetic map, and the high resistivity caused by the stones is visible on the resistivity maps.

Apart from this wall section, the magnetic map shows no similarity with the resistivity maps. Thus, it might be presumed that most of the magnetic anomalies are caused by iron objects and cannot be linked to archaeological features.

The resistivity profiles were first processed individually in 2D. By placing the profiles next to each other, one can imagine the resistivity in 3D, but visually it is more satisfying to generate maps. 3D processing makes it possible to determine the resistivity in given depth intervals and to create maps. The resistivity in the depth intervals of 0–0.5 m, 0.5–1.1 m, 1.1–1.7 m and 1.7–2.5 m is shown in Figures 4, 5, 6, and 7, respectively.

Usually, the upper 0.5 m is inhomogeneous because of the rearrangements of the near surface ground layer by former construction phases. Therefore, the resistivity is generally interpreted at greater depths. On the other hand, below 2 m depth the resistivity gets smoother due to the measurement technique: deep penetration occurs at a larger electrode distance, thus the resistivity gets averaged out. Therefore, at greater depths the resolution of the method decreases. In the study area structures with high resistivity are not observed below 1.7 m depth (Fig. 7) except a high resistivity “patch” at the very eastern side of the area. It belongs to a wall

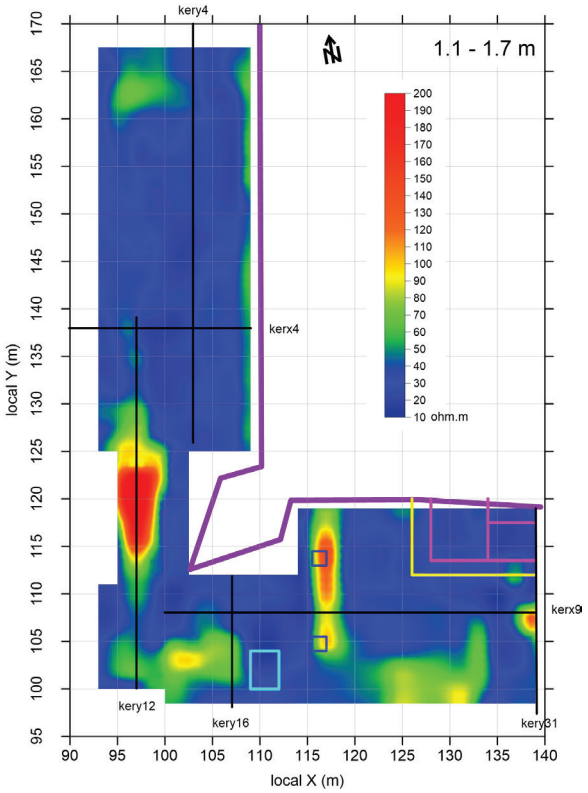

Fig. 6. Specific electrical resistivity in depth interval 1.1–1.7 m. See color code on Figs. 2 and 4.

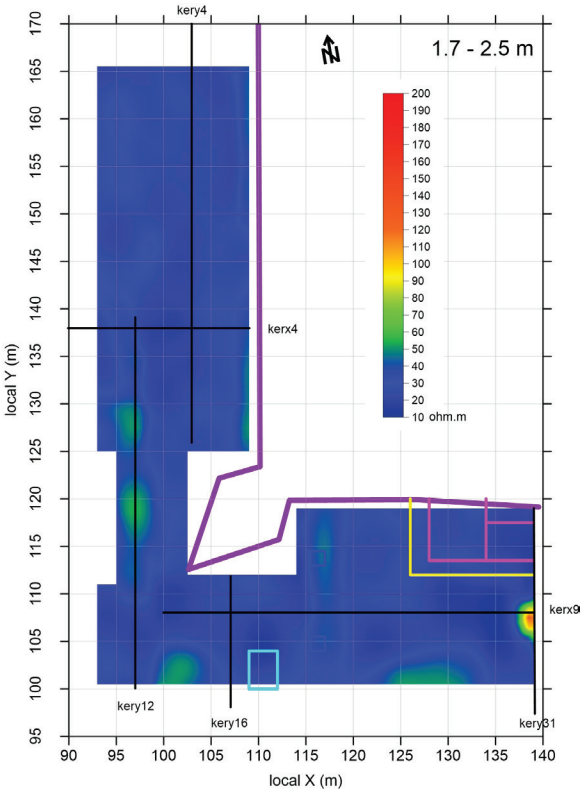

Fig. 7. Specific electrical resistivity in depth interval 1.7–2.5 m. See color code on Figs. 2 and 4.

excavated further to the east. The high resistivity of this wall section does not extend to the study area; thus, we assume that foundations and/or walls below 1.7–2 m depth are not present or were quarried out. In the depth interval 1.1 m–1.7 m (Fig. 6) the same high resistivity structures can be seen than in the depth interval 0.5–1.1 m (Fig. 5), but the later picture is more detailed. Thus, we interpreted the resistivity structure in the depth interval between 0.5–1.1 m (Fig. 8). The interpretation is cross-checked by sections, which show the resistivity in vertical direction (Fig. 9). On the western side of the study area, parallel with today's castle wall at approximately 12–13 m distance an "outer" or earlier wall or a fence was spotted. It seems to be discontinuous on Figs. 5 and 8, because there are only a few east–west sections crossing the wall, but it can be identified in all of them. As an example, section *krx4* shall be presented, where the high resistivity wall is clearly visible at 12 m

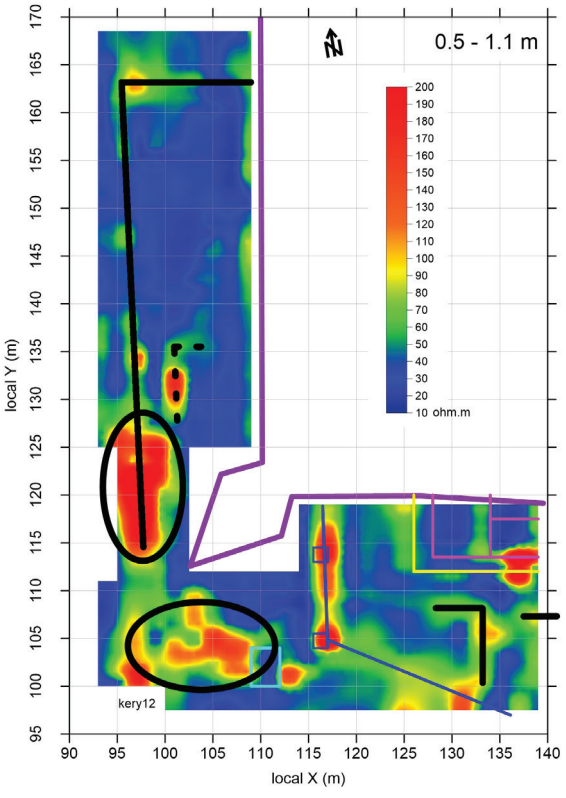

Fig. 8. Interpretation of specific resistivity at 0.5–1.1 m depth. Thick black line: walls, building foundations, dashed black line: presumed walls, blue line: drain, magenta line: excavated kitchen wall, yellow line: steep slope.

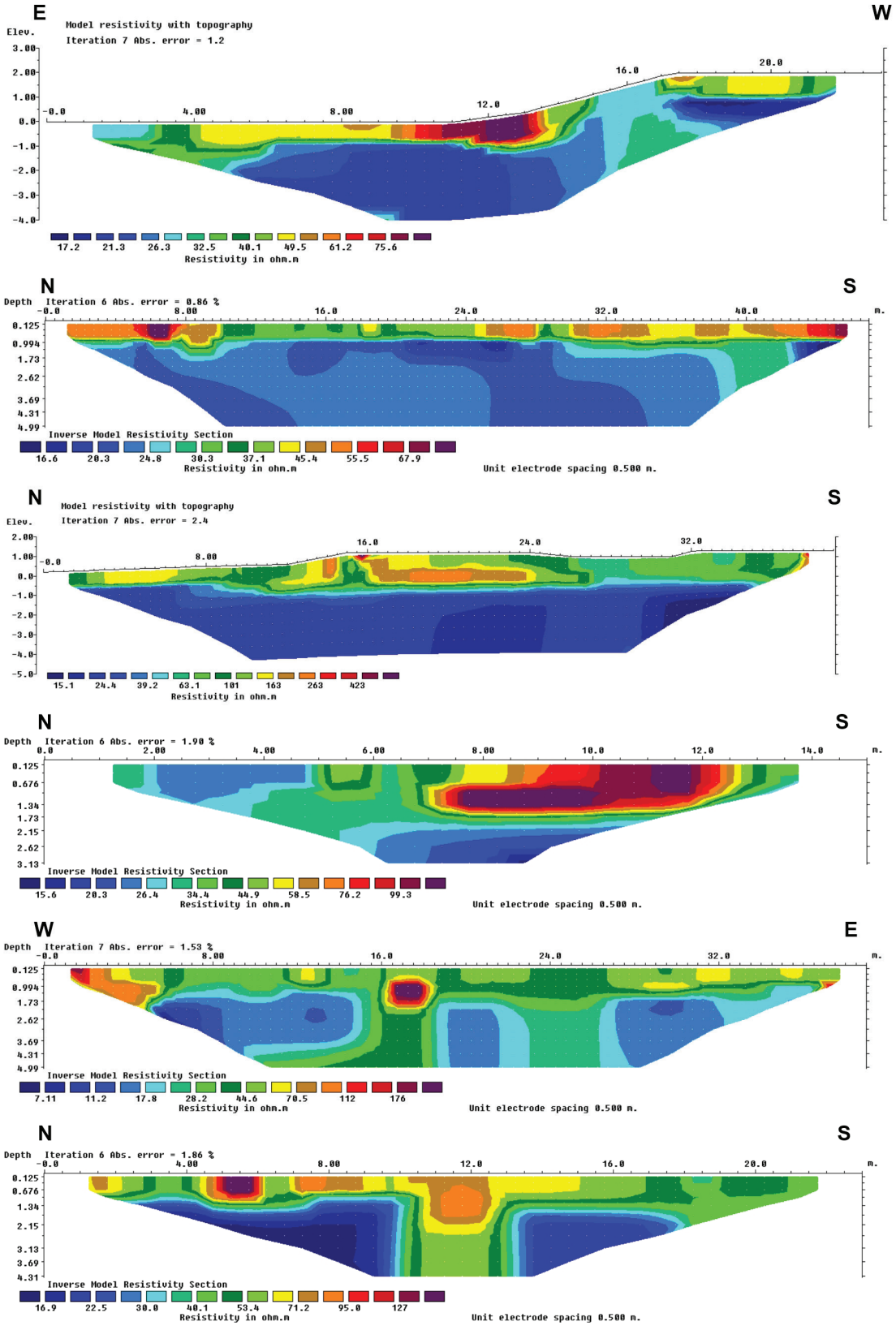

Fig. 9. 1. Section kerx4, specific electrical resistivity, wall at 12 m; 2. Section kery4, specific electrical resistivity, wall at 7 m; 3. Section kery12, specific electrical resistivity, former SW bastion at 16–24 m; 4. Section kery16, specific electric resistivity, building foundation between 7–10 m, in 0.5–1.3 m depth; 5. Section kerx9, specific electric resistivity, drain at 16–18 m, in 1–1.7 m depth; 6. Section kery31, specific electric resistivity, wall between 11–12 m, to a depth of 0.5–2 m.

(Fig. 9/1). The northern section of the wall is located at coordinate y=163 m. This wall section is clearly visible between 6–7 m on section *kery4* (Fig. 9/2). At the point, where the northern wall joins the castle wall, at its base a wall fragment can still be seen. On the northwestern corner of the wall an earlier bastion or tower may have existed, which is indicated by a higher resistivity patch on Figs. 5, 6 and 8. The bastion was probably demolished because the high resistivity area is small. On the southern side another bastion must have stood, to the west from today's bastion, encircled with thick black line on Fig. 8. It seems that a larger concentration of building material remained in this place, fact that is indicated by the high resistivity part, which could be seen in several sections to a relatively great depth (e.g. section *kery12* on Fig. 9/3).

At the place of the presumed old tower a small hill with a large tree exists today. Another high resistivity area with irregular shape is located to the south from today's southwestern bastion (Fig. 8). This might indicate the remains of a building, which was also revealed in the archaeological excavations. The *kery16* control section crossing the anomaly shows high resistivity at a depth of 0.5–1.3 m (Fig. 9/4). In the middle of the southern area a canal continues outside the southern castle walls, which comes from the small courtyard of the castle, and it connects two outlets, turns to a southeastern direction and leaves the area. The path of the canal can be tracked by the high resistivity band on Fig. 8. On the cross-section *kerx9* the canal is indicated by a high resistivity anomaly between 16–18 m at a depth of 1–1.7 m (Fig. 9/5).

At the western end of the section the remains of a building found south to the southwestern bastion can be seen. A wall was identified in the archaeological excavations located to the east in the southern surveyed area. The wall is still visible in section *kery31* (Fig. 9/6) but towards the west this wall disappears from the sections.

There are other linear features on the resistivity maps. On the eastern part of the southern area a medium-high resistivity anomaly with upside-down L shape is present (Figs. 4 and 5). It might belong to a corner of a building (Fig. 8). An L shape anomaly exists also in the western area close to the former tower (Fig. 5). However, its shape is less developed, which may suggest that it is not a ruined building, but the anomaly might have been caused by demolished material from the nearby older tower. Therefore, it is indicated as a hypothetical building on the interpretation map (Fig. 8).

CONCLUSIONS AND INTERPRETATIONS

To summarize the results, the electrical resistivity measurements have identified an earlier wall to the west from the present-day castle wall at a distance of approximately 12 m. This wall may have been closed on the north by a perpendicular wall section. The debris found at the junction of these two walls indicates the possible existence of a northwestern corner tower, which was destroyed or demolished at a certain point in time. Another building or perhaps even a corner tower may have existed on the southwest from which significant amount of building materials remained under the ground. Further to the south, from today's southwestern corner tower at the distance of 10 m additional ruins were again identified at the depth of 0.5–1.3 m. Since this resistivity anomaly has an irregular structure, it may represent the remains of a building. In the eastern part of the southern area, located to the south from the ruins of the kitchen, the northern and eastern walls and the northeastern corner of a building were revealed. Possible walls of a building or debris material from a former southwestern tower may have also existed in the western area in a northeastern direction from the former tower. Additionally, the magnetic measurements revealed modern utilities such as pipes and/or cables and most likely contemporary iron objects, many of which are possibly the remains of the restoration works from the 1990s or the 1970s.

Concerning the correlation of the geophysical measurements with the results of archaeological excavations several hypotheses can be put forward; however, the precise dating and function of these architectural features still remains unknown. Although the interpretation map seems impressive and filled with possibilities, archaeology remains the only way to date and identify these underground architectural

features. Next, we shall briefly look into the results of earlier excavations and their interpretation elaborated and published by M. Dumitrache, since they supply the first general chronological framework based on archaeological research, from where one can start the interpretation.[6] Where it was possible the archaeological interpretation of M. Dumitrache[7] was supplemented by data extracted from the written records. It needs to be highlighted that the reinterpretation works and analysis of the materials are still underway and shall be discussed in a separate study in more detail. Here we try to provide an insight into the entangled variations that we try to navigate.

Looking more closely at the western surveyed area, outside the western castle walls, at least five newly identified architectural features emerge on the geophysical maps: two walls and three buildings or parts of buildings (see interpretation map Fig. 8). Earlier excavations in the 1970s (S10)[8] but also in 1998 (C III)[9] revealed a small part of a wall (Fig. 3), which was slightly oriented to the south-southwest and did not connect to today's western wall perpendicularly. Most part of the wall was quarried out at some point so its extent, exact direction and function remains unknown. Other elements were never researched archaeologically in this area (since reconstruction works on the castle did not reach the areas located outside the castle walls), thus it remains open whether the buildings or parts of buildings were corner towers as parts of a larger enclosed fortification or not. One can argue that the geophysical results as well as the archaeological data complements the presumptions of M. Dumitrache, who based on her excavations argued for the existence of at least one earlier fortification system (if not two).[10]

However, for a better understanding of the history and evolution of this noble residence, one must also tackle in detail the earliest physical remains and the archaeological material found on this territory, which means several features that were already identified by M. Dumitrache as well as also by the latest investigations in 2020–2024. In the following, the results of the archaeological investigations and the dating of the various constructions phases identified by M. Dumitrache shall be presented, for now using the dating elaborated by M. Dumitrache. Additionally, relevant data known from written sources will also be presented, when it is important for the discussion or for a better understanding of the events. This detailed overview is essential firstly, because in the light of the newest excavations these results need to be reconsidered or at least correlated, secondly because in the scholarship the dating of the construction phases varies from author to author (e.g. art historians date the whole castle complex differently than archaeologists[11] etc.). The earliest archaeological features excavated by M. Dumitrache comprise various pits, located inside and outside the castle precinct, which contained pottery and daub fragments.[12] The pottery fragments came from cooking vessels made from a coarse paste, with flared and rounded rims, decorated with a simple embossed rib on the outer surface.[13] M. Dumitrache dated these pits to the 13th and 14th centuries.[14] She also connected another pit to this earliest phase, which was identified in S4, a section located perpendicular to the round tower (east-west orientation). In this pit the archeological material was mixed but could be dated to the 12th and 15th centuries, with a coin found in secondary position, issued by King Béla III (1172–1196). Interestingly, the pit contained a high number of pottery fragments none of which was enameled (cooking jars, jugs,

[6] Dumitrache 1996, 283–291.

[7] The documentation, more exactly part of the documentation of the excavations lead by M. Dumitrache are held at the National Heritage Institute in Bucharest. A detailed study on these preserved documents, from an architectural perspective, can also be read in: Cosnean Nistor 2021b, 109–136 (Institutul Național de Patrimoniu).

[8] Excavated in 1974, details extracted from the documentation preserved at the archives of the National Heritage Institute, file nr. 4125: "Raport preliminar de cercetare arheologică: 1974, 1976, 1977".

[9] See Iosipescu–Iosipescu 1999, figs. 24, 25, 26.

[10] Dumitrache 1996, fig. 4.

[11] For differences see the works of András Kovács, Liana Tugearu or Letiția Cosnean Nistor.

[12] Dumitrache 1996, 285.

[13] Dumitrache 1996, 286.

[14] Dumitrache 1996, 286.

small mugs, lids) and stove tiles, which enabled the presumption of the existence of an earlier building, which was demolished before the erection of the round tower. This construction could have been located on the western part or south–northwestern part of the castle precinct, also conditioned by the configuration of the terrain.[15] Also, a ditch was revealed, to the west from the round tower and central palace building, in the small courtyard (in S13 and S24).[16] However, the level from which it was dug could not be identified due to later landscaping works, which destroyed the upper layers. The preserved maximum depth of the funnel-shaped ditch was –2,20 m with a 2,60 m upper part and a 0,50 m lower part, in the bottom lined with carbonized wooden planks.[17] The fill of the ditch did not contain any traces of construction materials (such as stone or bricks) or mortar, the lack of which suggested its use before the erection of the rectangular central palace or any other building constructed from these materials, M. Dumitrache dated the ditch to the 12th century.[18] During the archaeological works conducted in 2020–2021 another larger pit was excavated (overlapped by walls of the newly identified corner tower), which yielded pottery dated to the 11th and 13th centuries with characteristic shapes and decorations (decorations of incised waves, simple lines, cauldrons etc.). All these scattered features suggest the existence of a rural settlement in this area, which most probably functioned before the Bethlen family raised their residences and enclosed them. Thus, based on all these features a large chronological spam can be highlighted, where the first traces of habitation of the area appeared, which falls largely between the eleventh and fourteenth centuries. Now, if one confronts these archaeological results with the scarce written sources that are available until the 14th century not much is revealed. The very first mentioning of the settlement Criș comes only from 1305 from a division of an inheritance, where Apa's (1285–1270) three sons divided their fathers' possessions.[19] According to this division Gregorius (1282–1325) received Criș but soon, after his death in 1325, the estate passed on to his brother Jacobus (1282–1329).

Parts of probably the earliest noble residence on this hill were identified already in the 1970s, concentrated especially on the northern and western parts of today's castle grounds. Inside the castle chapel M. Dumitrache revealed the remains of a house pit (possibly a semi-sunken daub-and-wattle house) from the 13th–15th centuries over which the foundation of a wall was built.[20] In the area of the gate, also two earlier structures (possibly two gate towers) were excavated just as a further wall foundation in the octagonal tower.[21] Yet, these small, uncovered parts do not offer a clear, reconstructable picture of the first structures that had existed here. M. Dumitrache dated these constructions to the second half of the 14th until the middle of the 15th century but it is not clear whether these were all constructed and used in the same time or not.[22] The first written information of an existing manor house comes only from 1435.[23] On this occasion a division of properties took place between the three sons (Nicolaus, Gregorius and Antal) of Johannes Bethlen (1397–1427),[24] when Antal (1414–1472) received his own manor house with the fishponds in Criș. Actually, this information could correlate with the archaeological traces identified by M. Dumitrache however, the identification and association of the written data and the archaeological remains is not that easy.

A second phase of constructions was linked to the erection of the central palace and the round tower, which was generally attributed to Marc Bethlen (1443–1473), yet now we know that the round tower (also known as old tower) was actually built later.[25] Based on the archaeological stratigraphy of the area M. Dumitrache

[15] Dumitrache 1996, 286.
[16] Dumitrache 1996, 285 and fig. 4.
[17] Dumitrache 1996, 285.
[18] Dumitrache 1996, 285.
[19] Bencze–Zólya 2022, 121.
[20] Dumitrache 1996, 286.
[21] Dumitrache 1996, 286.
[22] Dumitrache 1996, 286.
[23] MNL DL 36554.
[24] Descendent of Jacobus, mentioned earlier.
[25] Dumitrache 1996, 287.

pointed out that the foundations of the round tower cut through layers dated to the 12th and 15th centuries.[26] She observed that before the construction of the tower the terrain was leveled and in this leveling layer a high number of pot tiles and decorative discs were found, which probably came from an earlier building that was demolished. Initially, the tower had only three floors, and its basement or ground floor was equipped with loopholes, the traces of which, due to the numerous later interventions, cannot be seen anymore. Also, the basement walls of the rectangular central palace were subjected to analysis,[27] which revealed that on the ground floor, on the eastern wall two loopholes existed.[28] M. Dumitrache argued that the now-visible ventilation windows on the northern and western walls of the basement could have also been loopholes. Besides these, several traces of wooden beams (0.30–0.35 m) were found, when the fill of the vaults now covering the basement were removed in order to consolidate these. The hand-carved ends of the beams were well-preserved indicating that the beams and the wooden floor they sustained did not perish in a fire or were damaged by time but were dismantled, when the basement was vaulted.[29] M. Dumitrache hypothesized that maybe in this phase the residence was already enclosed and perhaps the two uncovered gate towers were part of this walled precinct.[30] Later, around the year 1500 or in the first half of the 16th century (before the works of Georgius Bethlen) an irregular-shaped walled precinct was erected, to which the octagonal tower and parts of the northern end of the castle linked.[31] Additional foundations that belonged to this enclosure wall were identified on the outside of the eastern fortification wall and in the south-eastern corner of the building complex. M. Dumitrache dated these constructions to the time of Alexius Bethlen (1474–1549).[32] From this period, a charter from 1482[33] recorded an agreement between the sons of the late Marc Bethlen, Nicholaus (1465–1528) and Eustachius (1454–1472) concerning the houses they inherited from their father in Beclean and Criș. According to this agreement, Nicholaus gave half of his house and noble manor to his brother Eustachius, who in exchange gave to his brother half of his house in Beclean. Thus, we know for sure that the manor house of Marc already existed in Criș and had two owners. Additional information about fortifications were not mentioned.[34] After the death of Eustachius, his brother Bernat (1463–1494) inherited the old house in Criș. The accounts of Cluj-Mănăștur from 1493 recorded that Bernat sold the majority of his possessions or parts of possessions to his brother Nicholaus.[35] Few years later, an unpublished source from 1509,[36] a witness account, offers a momentary glimpse into a possibly larger issue, about which not much is known but gives valuable insight into the family's life in Criș. According to the document, a trial was between Nicholaus Bethlen and the sons of Gregorius Bethlen, Blasius and Johannes. The witnesses were meant to describe the situation of the existing manor houses in Criș. Gaspar de Hossywthelke said that when he was court judge (judge servant), 25 years earlier (around 1484?), he knew only two noble residences in Criș, one belonged to Marc and the other to Gregorius, situated opposite the parish church. Michael de Almad testified that when Nicholaus Bethlen divided the inheritance with his brothers the old house was given to Bernat

[26] Dumitrache 1996, 287.

[27] Dumitrache 1996, 287.

[28] However, the study was not published nor could it be consulted for further details, only Dumitrache mentions it.

[29] Dumitrache 1996, 287.

[30] Dumitrache 1996, 288.

[31] Dumitrache 1996, 286. It must be mentioned that the dating of the octagonal tower is not uniform, art historians date the tower to a much later date, see: Kovács et al. 2023, 103–104.

[32] Dumitrache 1996, 286. Yet, we know that he mostly lived in Beclean – see Lukinich 1927, 56–62. Alexius Bethlen was the son of Gregorius Bethlen (1448–1500) first cousin of Marc Bethlen.

[33] MNL DL 32507, MNL DL 26433.

[34] The name of Alexius does not appear.

[35] Nicholaus additionally acquired a large number of possessions through donations from the king for his services or as pledge estates, and on many occasions quarreled also with his own family, namely with the descendants of Antal (1414–1472), the sons of Gregorius (1448–1500): Blasius, Johannes, and Alexius.

[36] MNL DL 62986.

(which earlier belonged to Eustachius) and Nicholaus had built a new house for himself. Theoretically, if the two sons of Marc had two manor houses in Criș and also Gregorius (son of late Antal) had another, then at this point three noble residences existed. Unfortunately, the building remains unearthed by the archaeological excavations and the still-standing buildings cannot be clearly associated with the noble residences mentioned in the above presented documents. Thus, even though the written sources offer important details, the identification of these buildings still remains an open issue.

One of the significant construction phases was connected to the name of Georgius Bethlen (1515–1577?), son of Alexius. According to an inscription from 1559, which disappeared during the last decades, he and his wife, Clara of Nagykároly had renovated the castle, meaning the central palace. They vaulted the basement, the upper floor was redistributed in various rooms, smaller rooms were attached on the eastern side to the basement, above which later the loggia was built.[37] In 1977 M. Dumitrache uncovered foundations that suggested this construction phase was quite extensive, meaning that another building was attached to the northern fortification wall. This building comprised three vaulted rooms on the ground floor with hexagonal floor tiles. In one of the rooms a high number of stove tiles were found with plant motifs, characteristic to the 16th and 17th centuries. In front of these rooms four pillar bases were uncovered that sustained an open gallery towards the inner courtyard.[38] Near the northern room, under the loggia, a foundation was also identified, which sustained a stair case that lead to the first floor of the building. The first floor probably comprised one single large space and had three windows, which at the time of the excavation, were still preserved on the northern fortification wall. Additionally, most probably the loggia continued until this northwestern building so that this part could also be accessed.[39] M. Dumitrache presumed that the north-eastern building was also erected in this period and that the old gate tower was demolished giving space to a new one, built in Renaissance style.[40] The written sources from this period are still unstudied and unpublished so perhaps in the near future we can also look into the data hidden in these sources to complement our knowledge.

The entire castle precinct was rebuilt in the second half of the seventeenth century, initiated and undertaken by Alexius Bethlen (1643–1696). A new fortification precinct was built as a court of an irregular rectangle with four corner towers, and only a small part of the older precinct was preserved, such as the octagonal tower, part of the walls and buildings on the northern side. All these constructions were marked by inscribed dates on the towers as well as on the eastern castle wing, constructed between 1683–1684.[41] Today's castle preserved mostly this last mayor construction phase. According to M. Dumitrache, between the 18th and 19th centuries, only few smaller scale interventions or changes occurred. At some point in the 18th century a landslide destroyed the northwestern tower and the building on the northwestern part of the castle precinct together with the entrance gate.[42] The gate was extended and rebuilt in 1804 but due to its precarious state it was demolished during the reconstruction works undertaken in 1976.[43]

As outlined above, the constructions and evolution of the castle was a complex process, where generally it is impossible to clearly identify the one, who commissioned the works. For the later periods, where written sources are more abundant or inscriptions had been preserved it is perhaps a bit easier, yet it must be highlighted that a systematic study of all the preserved written sources had not been undertaken, so this should be kept in mind, when dealing with the history of the castle. Furthermore, a cross-disciplinary analysis of the whole castle, confronting

[37] Dumitrache 1996, 286.
[38] Dumitrache 1996, 286.
[39] Dumitrache 1996, 289.
[40] Dumitrache 1996, 289.
[41] Dumitrache 1996, 290.
[42] Observed also in the archaeological excavations, represented by cracks in the foundations of the northern castle wall and the walls of the northern building, see Dumitrache 1996, 290, note 23.
[43] Dumitrache 1996, 291, note 25.

the written, art historical, archaeological, architectural, environmental and other available sources was never attempted, even though perhaps such a holistic approach might prove efficient in settling several issues connected to the dating of various construction phases. Thus, our present study has its limits, since the archaeological materials from the old excavations[44] were not yet located and the finds from the new excavations are still under processing, so we could not use the information they provide for this study.[45] Several new questions also arise but most of them can be connected to the dating of these newly identified structures. At this point one can only say that each castle or noble residence is unique in its way and reflects the activity and vision of the generations of family members that lived in them.

REFERENCES

B. Nagy 1970

B. Nagy Margit, *Reneszánsz és barokk Erdélyben. Művészettörténeti tanulmányok* (Bukarest 1970).

Bencze – Zólya 2022a

Ü. Bencze – L. L. Zólya, The Bethlen Castle in Criș (Mureș County): overview of the archaeological excavations and a short revisited early history of the estate, *Caiete ARA* 13, 2022, 121–130.

Bencze – Zólya 2022b

Ü. Bencze – L. L. Zólya, The Bethlen castle in the light of written sources and the latest excavations, *Hung. Archaeol.* 11/3, 2022, 26–34. https://doi.org/10.36338/ha.2022.3.1

Bicsok – Orbán 2011

Z. Bicsók – Zs. Orbán, *„Isten segedelmével udvaromat megépítettem". Történelmi családok kastélyai Erdélyben* (Csíkszereda: Gutenberg, 2012).

Cosnean Nistor 2021a

L. Cosnean Nistor, Loggias in the Renaissance courtly Architecture. Hunedoara and Criș, in: L. Cosnean Nistor – V. Apostol – M. C. Popescu – Șt. Bâlici – N. Toma (eds.), *Arhitectură. Restaurare. Arheologie. In honorem Monica Mărgineanu Cârstoiu* (Bucureşti 2021), 78–97.

Cosnean Nistor 2021b

L. Cosnean Nistor, Castelul Bethlen din Criș (jud. Mureș) în arhiva Direcției Monumentelor Istorice, *SCIVA* 72, 1–4, 2021, 109–136.

Dumitrache 1996

M. Dumitrache, Castelul Bethlen din Criș (jud. Mureș), *ActaMN* 33/II, 1996, 283–292.

Iosipescu – Iosipescu 1999

R. Iosipescu – S. Iosipescu, Castelul Bethlem – Criș, jud. Mureș. Raport de cercetare arheologică, *Buletinul Comisiei Monumentelor Istorice* 10/1–4, 1999, 68–73. http://temp–18–250.cimec.ro/images/BCMI/BCMI_1999_nr.1–4.pdf

Kovács 2003

A. Kovács, *Késő reneszánsz építészet Erdélyben 1541–1720* (Budapest–Kolozsvár 2003).

[44] The archaeological finds from the excavations of Mariana Dumitrache (1974–1977) have been deposited in the National History Museum in Bucharest but since then the materials have not been identified, see: Dumitrache 1996, 284, note 6. The finds were never published.

[45] The publication of the archaeological finds from the 2020–2024 excavations is still a work in progress just as the collection and investigation of the old materials and documentation.

Kovács 2009
A. Kovács, Az erdélyi késő reneszánsz, in: Z. Deák (ed.), *Pannon Enciklopédia. A magyar építészet története* (Budapest 2009).

Kovács 2017
Zs. Kovács, Political emblems in the decoration of the Transylvanian noble residences (17th and 18th centuries). The mural paintings of the Bethlen Castle in Criș and the Rákóczy – Bornemissza country house in Gurghiu, *AUASH* 21/II, 2017, 31–73.

Kovács et al. 2023
A. Kovács – Zs. Kovács – K. Pakó – A. Weisz, *A keresdi „felső" Bethlen-kastély. Művészettörténeti tanulmány és értékleltár,* manuscript (Kolozsvár 2023).

Loke et Al. 2013
M. H. Loke – J. E. Chambers – D. F. Rucker – O. Kuras – P. B. Wilkinson, Recent developments in the direct-current geoelectrical imaging method. *Journal of Applied Geophysics* 95, 135–156.

Loke 2014
M. H. Loke, Tutorial: 2-D and 3-D electrical imaging surveys. Geotomo Software, Malaysia.

Lukinich 1927
I. Lukinich, *A Bethleni gróf Bethlen-család története* (Budapest 1927).

Tugearu 1980
L. Tugearu, Profilatura și sculptura decorativă de renaștere de la castelul din Criș, *RMM–MIA* 49, 2, 1980, 81–86.

LIST OF ILLUSTRATIONS

Fig. 1. The survey area outside the southern and western castle walls. Green dots: locations of magnetic measurements, black crosses: locations of electric measurements.

Fig. 2. Vertical gradient of magnetic intensity. Purple line: castle walls, blue square: drain outcrop, light blue: archaeological trench.

Fig. 3. The interpretation of the magnetic survey. Red line: iron pipe, dashed red line: presumed iron pipe, green line: larger iron objects, dashed green line: possible iron pipe, orange line: wall section, magenta line: excavated kitchen walls, other colors: same as on Fig. 2.

Fig. 4. Specific electrical resistivity up to 0.5 m depth. Black line: resistivity profiles shown in Fig. 9, yellow line: steep slopes due to excavation, other colors: same as on Fig. 2.

Fig. 5. Specific electrical resistivity in depth interval 0.5–1.1 m. See color code on Figs. 2 and 4.

Fig. 6. Specific electrical resistivity in depth interval 1.1–1.7 m. See color code on Figs. 2 and 4.

Fig. 7. Specific electrical resistivity in depth interval 1.7–2.5 m. See color code on Figs. 2 and 4.

Fig. 8. Interpretation of specific resistivity at 0.5–1.1 m depth. Thick black line: walls, building foundations, dashed black line: presumed walls, blue line: drain, magenta line: excavated kitchen wall, yellow line: steep slope.

Fig. 9. 1. Section kerx4, specific electrical resistivity, wall at 12 m.
2. Section kery4, specific electrical resistivity, wall at 7 m.
3. Section kery12, specific electrical resistivity, former SW bastion at 16–24 m.
4. Section kery16, specific electric resistivity, building foundation between 7–10 m, in 0.5–1.3 m depth.
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ABBREVIATION

ACMI	Anuarul Comisiunii Monumentelor Istorice, București
Acta Antiqua	Acta Antiqua Academiae Scientiarum Hungaricae, Budapest
Acta Siculica	Acta Siculica. A Székely Nemzeti Múzeum Évkönyve, Sfântu Gheorghe
ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae, Budapest
ActaMN	Acta Musei Napocensis, Cluj-Napoca
ActaMP	Acta Muzei Porolissensis, Zalău
AEM	Archaeologisch–Epigrapische Mitteilungen aus Oesterreich–Ungarn, Wien
American Antiquity	American Antiquity, Society for American Archaeology
Analele Banatului (S.N.)	Analele Banatului S.N., Arheologie – Istorie, Muzeul Național al Banatului, Timișoara
Angustia	Angustia, Muzeul Carpaților Răsăriteni, Sfântu Gheorghe
ANRC	Arhivele Naționale ale României, Cluj
Apulum	Apulum. Acta Musei Apulensis, Alba Iulia
Aquincumi Füzetek	Aquincumi Füzetek, Budapesti Történeti Múzeum, Budapest
Archaeolingua	Archaeolingua, Budapest
ArchÉrt	Archaeologiai Értesítő, Budapest
ArchKorr	Archäologisches Korrespondenzblatt: Urgeschichte, Römerzeit, Frühmittelalter, Mainz
ArchKözl	Archaeologiai Közlemények, (1859–1899), Magyar Tudományos Akadémia Archaeológiai Bizottsága, Budapest
ArhMold	Arheologia Moldovei, Institutul de arheologie Iași, Iași
ATF	Acta Terrae Fogarasiensis, Muzeul Țării Făgărașului, Făgăraș
AUA (SH)	Anuarul Universității 1 Decembrie 1918, Alba Iulia
AUASH	Annales Universitatis Apulensis. Series Historica, Universitatea 1 Decembrie 1918", Alba Iulia
BiblEphNap	Bibliotheca Ephemeris Napocensis, Institutul de Arheologie și Istoria Artei, Cluj-Napoca
Bibliotheca Marmatia	Bibliotheca Marmatia, Muzeul Județean de Istorie și Arheologie Maramureș
BiblThrac	Bibliotheca Thracologica, București
BMM	Bibliotheca Musei Marisiensis, Seria(es) Archaeologica, Târgu Mureș
BMN	Bibliotheca Musei Napocensis, Cluj-Napoca
Buridava	Buridava. Studii și materiale, Muzeul Județean „Aurelian Sacerdoțeanu" Vâlcea
Caiete ARA	Caiete ARA (Arhitectură. Restaurare. Arheologie), Asociația ARA, București
CAN	Cercetări arheologice în aria nord-tracă, Institutul de Thracologie, București
CCA	Cronica Cercetărilor Arheologice din România, București
CIL	Corpus Inscriptionum Latinarum, Berlin-Brandenburg Academy of Sciences and Humanities, Berlin
Coll. Med.	Collegium Mediense. Comunicări Științifice, Muzeul Municipal Mediaș, Mediaș
ComArchHung	Communicationes Archaeologicae Hungariae, Budapest
Complutum	Universidad Complutense de Madrid, Madrid
Crisia	Crisia, Muzeul Țării Crișurilor, Oradea

Dacia (N. S.)	Dacia. Recherches et décuvertes archéologiques en Roumanie, I–XII (1924–1948), Nouvelle série (N. S.): Dacia. Revue d'archéologie et d'histoire anciene
DissPan	Dissertationes Pannonicae, Budapest
EDR	Ephemeris Dacoromana. Annuario della Scuola Romena di Roma, Roma
EphNap	Ephemeris Napocensis, Cluj-Napoca
ErdÉvsz	Erdélyi Évszázadok, a Kolozsvári Magyar Történeti Intézet évkönyve, Kolozsvár
ErdMúz	Erdélyi Múzeum. Az Erdélyi Múzeum Egylet Történelmi Szakosztályának Közlönye, Kolozsvár
ETF	Erdélyi Tudományos Füzetek, Kolozsvár
FileIst	File de Istorie, Complexul Muzeal Bistrița-Năsăud, Bistrița-Năsăud
HTRTÉ	A Hunyadmegyei Történelmi és Régészeti Társulat Évkönyve (1880–1912), Déva
Hung. Archaeol.	Hungarian Archaeology, Archaeolingua, Budapest
Hungarian Archaeology	Hungarian Archaeology, Archeolingua, Budapest, e-Journal
IDR	Inscriptiones Daciae Romanae, Academia Română
Istros	I stros. Revue d'archéologie et d'histoire ancienne, Muzeul Brăilei, Brăila
JAHA	Journal of Ancient History and Archaeology, Institute of Archaeology and Art History of Romanian Academy Cluj-Napoca & Technical University of Cluj-Napoca, Cluj-Napoca
JAMÉ	A Nyíregyházi Jósa András Múzeum Évkönyve
JAMT	Journal of Archaeological Method and Theory, Springer Nature
JAS	Journal of Archaeological Science, Elsevier, e-Journal
JdI	Jahrbuch des Deutschen Archäologischen Instituts, Deutsches Archäologisches Institut, Berlin
JMS	Journal of Mithraic Studies
Journal of Applied Geophysics	Journal of Applied Geophysics, Amsterdam
JRA	Journal of Roman Archaeology, Cambridge University Press, https://journalofromanarchaeology.com/
JRMS	Journal of Roman Military Equipment Studies, Association for Roman Military Equipment Studies
LUPA	
Lustra	Lustra, Internationale Halbjahresschrift für Fragen des Klassischen Altertums, Göttingen
MAGW	Mitteilungen der Anthropologischen Gesellschaft in Wien, Wien
Marisia	Marisia (V–XXXV): Studii și Materiale, Târgu Mureș
Marisia-AHP	Marisia: Archaeologia, Historia, Patrimonium (2019–), Târgu Mureș
MBV	Münchner Beiträge zur Vor- und Frühgeschichte, München
MCA	Materiale și Cercetări Arheologice, Institutul de Arheologie „Vasile Pârvan", București
MIMK	Molnár István Múzeum Kiadványai, Székelykeresztúr
MNL DL	Magyar Nemzeti Levéltár, Diplomatikai Levéltár
NIMB	Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Elsevier, e-Journal
OJA	Oxford Journal of Archaeology, Oxford
Opitz Archaeologica	Opitz Archaeologica, Martin Opitz Kiadó, Budapest
Pásztortűz	Pásztortűz (1921–1944), Kolozsvár
PAT	Patrimonium Archaeologicum Transylvanicum, Cluj-Napoca

PBF	Prähistorische Bronzefunde, München, Stuttgart
Peabody Museum Bulletins	Peabody Museum Bulletins, Harvard University Series
PPS	Proceedings of the Prehistoric Society, London
Pril. Inst. arheol. Zagrebu	Prilozi Instituta za arheologiju u Zagrebu, Zagreb
PZ	Prähistorische Zeitschrift, Berlin
Quat.Int.	Quaternary International, International Union for Quaternary Research, Elsevier, e-Journal
Radiocarbon	Radiocarbon, Cambridge University Press
ReiCretActa	Rei Cretariae Romanae Fautorum Acta, Tongeren
Religion	Religion, e-Journal
RevBis	Revista Bistriței, Complexului Muzeal Bistrița-Năsăud, Bistrița
RevMuz	Revista Muzeelor Institutul Național pentru Cercetare și Formare Culturală, București
RMM – MIA	Revista Muzeelor și Monumentelor. Monumente istorice și de artă, Institutul Național al Patrimoniului, București
SaalbJb	Saalburg-Jahrbuch. Bericht des Saalburg-Museums
SAO	Studien zur Archäologie in Ostmitteleuropa, Berlin
Sargetia (N. S.)	Sargetia. Acta Musei Devensis, deva
Sbor. FFUK Historica	Sborník Filozofickej fakulty Univerzity Komenského, Historica, Bratislava
SCIV(A)	Studii și Cercetări de Istorie Veche (și Arheologie 1974–), București
SlovArch	Slovenská Archeológia, Nitra
StCom Satu Mare	Studii și comunicări Satu Mare, Muzeul Județean Satu Mare
StudPreist	Studii de preistorie, Asociația Română de Arheologie (ARA), București
Székelyföld	Székelyföld, Kultúrális folyóirat, Csikszereda
Terra Sebus	Terra Sebus, Acta Musei Sabesiensis, Muzeul Municipal „Ioan Raica", Sebeș
Thraco-Dacica	Thraco-Dacica, Institutul de Tracologie, București
Tisicum	Tisicum – A Jász-Nagykun-Szolnok Megyei Múzeumok Évkönyve, Szolnok
UPA	Universitätsforschungen zur Prähistorischen Archäologie, Bonn
VAH	Varia Archaeologica Hungarica, Budapest
VMMK	A Veszprém Megyei Múzeumok Közleményei, Veszprém
V PU	Vydavateľstvo Prešovskej univerzity, Prešov
WorldArch	World Archaeology, Taylor & Fracis, e-Journal
Xantener Berichte	Xantener Berichte. Grabung–Forschung–Präsentation, Meinz

MARISIA. ARCHAEOLOGIA, HISTORIA, PATRIMONIUM

With a publishing tradition since 1965, in 2019 the annual of the Mureș County Museum initiated a new series entitled: *Marisia. Archaeologia, Historia, Patrimonium*. The publication provides a panel for new research results in archeology, architecture and material heritage of the history of arts and culture. The studies mainly focus on the inner Transylvanian region that encompasses also Mureș County. Beyond local valuable contributions, the annual aims at a regional and global concern that is relevant for the whole of Transylvania. Among the annual's missions is to provide mutual interpretation of the research results produced by the Romanian and Hungarian scientific workshops. Therefore, the annual articles are mainly in English but based on the field of research and the approached topic studies in German, Romanian or Hungarian are also accepted.

Cu o tradiție din anul 1965, anuarul Muzeului Județean Mureș s-a relansat în 2019 sub titlul *Marisia. Archaeologia, Historia, Patrimonium*. Această publicație se descrie ca o platformă științifică care cuprinde rezultatele cercetărilor în domenii precum: arheologia, arhitectura și patrimoniul material din zona istoriei artelor și a culturii, studii localizate în regiunea centrală a Transilvaniei, din care face parte județul Mureș. In extenso, anuarul își propune să ofere un spațiu unitar contribuțiilor științifice valoroase, relevante din perspectiva geografică a ceea ce înseamnă întreaga regiune a Transilvaniei. Una dintre misiunile publicației este aceea de a oferi tuturor celor interesați spațiul de schimb pentru cele mai noi rezultate din atelierele științifice românești și maghiare. Articolele anuarului sunt scrise în general în limba engleză, existând totodată articole scrise în germană, română și maghiară, în funcție de specificul domeniului și a temei abordate.

A Maros Megyei Múzeum 1965 óta megjelenő évkönyvének 2019-ben útjára bocsátott új sorozata, a *Marisia. Archaeologia, Historia, Patrimonium* elsősorban a mai Maros megyét is magába foglaló belső-erdélyi régió régészeti, épített és tárgyi örökségére, nemkülönben az ezekhez kapcsolódó művészettörténeti, művelődéstörténeti kérdésekre vonatkozó újabb kutatások tudományos fóruma. A lokális perspektíván túl igyekszik kitekinteni a regionális és univerzális összefüggésekre, így a tágan értelmezett Erdély területére nézve is közöl kiemelkedő értékkel bíró tanulmányokat. Küldetésének tekinti a hazai román és magyar tudományos műhelyekben született eredmények kölcsönös tolmácsolását. A dolgozatok nyelve főként az angol, de szakterülettől és témától függően német, román vagy magyar nyelven is közöl írásokat.