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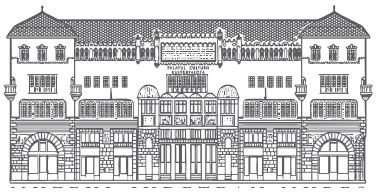

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CONTENTS

THE INTERVAL TOWERS OF ROMAN MILITARY FORTS IN THE PROVINCE OF DACIA POROLISSENSIS

Péter SIMON*

This study examines the interval towers of Roman auxiliary forts in the province of Dacia Porolissensis, focusing on their typology, distribution, and role within fortification systems. The analysis is based on archaeological data, published excavation reports, and standardized digital plans that enable comparative assessment across multiple sites. The results indicate that, although interval towers are a common feature of stone-built forts, their presence and design are not fully standardized. Three main types can be distinguished: rectangular towers without projection, which are predominant, rectangular towers with projection, attested in limited cases, and horseshoe-shaped towers, which are rare. Variations in form and construction suggest adaptation to local conditions and defensive needs, while the uneven state of research highlights the need for further investigation.

Keywords: Roman military architecture, auxiliary forts, interval towers, Dacia Porolissensis, Roman fortification systems.
Cuvinte-Cheie: arhitectură militară romană, castre auxiliare, turnuri de curtină, Dacia Porolissensis, sisteme de fortific

THE STANDARDIZED ROMAN AUXILIARY CAMP AND THE PLACEMENT OF INTERVAL TOWERS

The general structure of Roman auxiliary forts can be reconstructed on the basis of several types of evidence. Written sources provide general information on the layout of these camps, while archaeological research, including excavations, geophysical surveys, and aerial investigations, offers essential complementary data. A comprehensive synthesis is provided by the work of D. B. Campbell,[1] which presents concise and easily accessible information on auxiliary forts of the Principate period. One of the most important written sources is the *Liber de munitionibus castrorum*,[2] attributed to Hyginus Gromaticus. The work was composed at the end of the 1st century AD or the beginning of the 2nd century, during the reign of

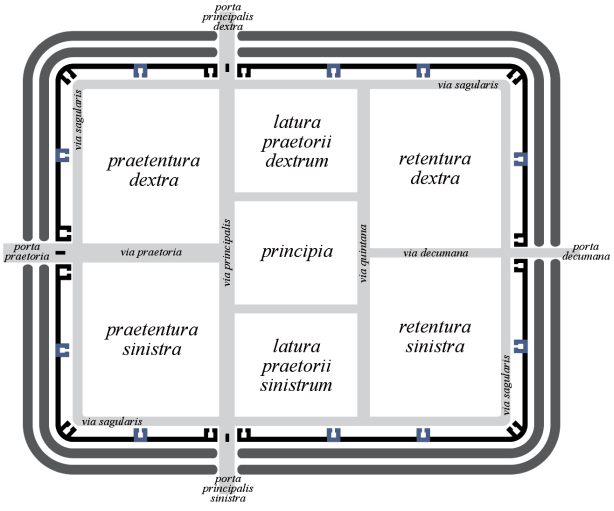

Fig. 1. Location of interval towers in a standardized auxiliary fortification.

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[1] Campbell 2009.

[2] Campbell 2018, 15–80.

Emperor Trajan. The author presents the structure of the ideal Roman *castrum*, emphasizing its fundamental principles and main components. He describes the *tertiata*[3] layout, according to which the camp is divided into three principal parts: *praetentura*, *latura praetorii*, and *retentura*. These are further subdivided into *dextra* (right wing) and *sinistra* (left wing). At the center of the camp stood the *principia*, the administrative headquarters. The different units of the camp were separated from one another by the internal road network.

The defensive system of auxiliary forts was generally constructed by digging ditches, with the excavated soil used to form the *agger*, upon which a defensive palisade was erected. The space between the first ditch and the *agger* was known as the *berma*. After the frontiers in the provinces of Dacia became stabilized, most forts were rebuilt in stone, with stone walls erected either in place of the palisade or in front of the *agger*. The forts were almost invariably rectangular in plan and featured four gates: the *porta praetoria*, the *porta principalis sinistra*, the *porta principalis dextra*, and the *porta decumana*. The gates were often flanked by two towers, and the defensive walls were equipped with towers at the corners. Interval towers were positioned along the curtain walls between the corner towers and the gates, and are highlighted in blue in the illustration (Fig. 1).

NOTATIONAL SYSTEMS OF DIGITAL DRAWINGS

In the case of the fort plans, these are consistently oriented so that the *porta praetoria* is always positioned on the left-hand side. The notational system employed (Fig. 2) highlights the preserved portions of the ruins, allowing for a clearer distinction between extant and reconstructed elements. For the interval towers, two distinct notational approaches can be identified. The first consists of simplified plans (Fig. 3), which trace only the line of the walls

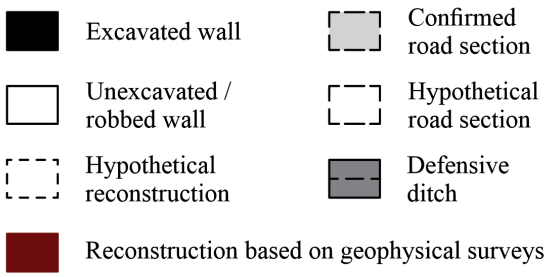

Fig. 2. Notational system used in the redrawn fort plans.

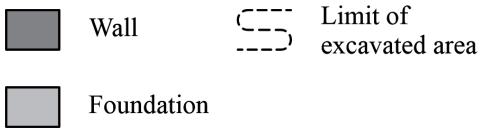

Fig. 3. Notational system used in the simplified plans.

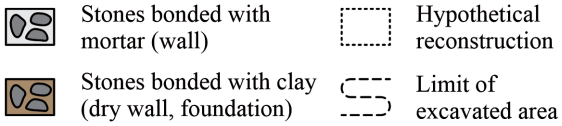

Fig. 4. Notational system used in the detailed plans.

and emphasize overall layout and positioning. The second comprises detailed plans (Fig. 4), in which construction elements such as stone, mortar, and other materials are also represented, providing insight into building techniques and structural composition. Each interval tower is also accompanied by its location within the overall plan of the respective fort.

CAMPS WITH STONE ENCLOSURES AND INTERVAL TOWERS: EVIDENCE FROM DACIA POROLISSENSIS

If we examine the map of the Roman provinces of Dacia (Fig. 5), it becomes apparent that a considerable number of permanent military camps were equipped with stone-built enclosures. However, not all of these featured interval towers, for example, the defensive system of the fort at Bologa, one of the best-researched sites, did not include such towers.

Nevertheless, a significant number of these camps were equipped with interval towers,

[3] The *castrum* was characterized by a 3:2 proportional layout, with a rectangular plan and rounded corners, often referred to by scholars as a *card-shaped* form.

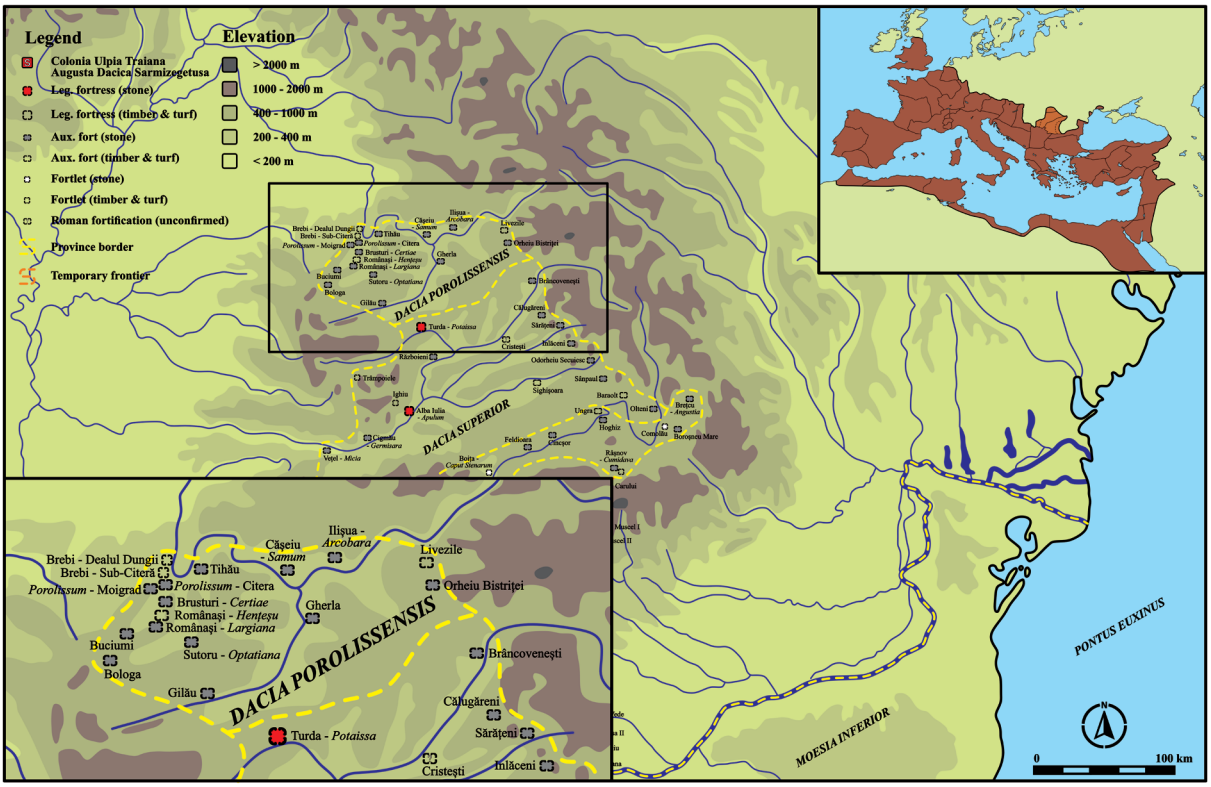

Fig. 5. Map of the Roman provinces of Dacia, highlighting Dacia Porolissensis.

as evidenced at Gilău (Gyalu, Cluj County, RO), Buciumi (Vármező, Sălaj County, RO), Românaşi – *Largiana*, (Alsóegregy, Sălaj County, RO), Brusturi – *Certiae* (Somróújfalu, Sălaj County, RO), Porolissum – *Pomăt* (Sălaj County, RO), Tihău (Tihó, Sălaj County, RO), Căşeiu – *Samum* (Alsókosály, Cluj County, RO), Ilişua – *Arcobara* (Alsóilosva, Bistriţa-Năsăud County, RO), and Gherla (Szamosújvár, Cluj County, RO). In most cases, these elements are associated with the stone rebuilding phase of the forts, generally dated to the 2nd century AD, although the variability in their presence suggests that their adoption was not governed by a single standardized model.

The uneven attestation and differing states of preservation of these features have also influenced their documentation and interpretation in the archaeological record, an issue that will be addressed in the following section.

RESEARCH HISTORY OF INTERVAL TOWERS

The research history of interval towers within the forts of Dacia Porolissensis is uneven, both in terms of excavation chronology and the degree of publication. In many cases, these features were identified during broader investigations of fortifications, while in others they have only been partially explored or documented through non-invasive methods.

At Gilău, four interval towers are known, of which three have been published. Tower S2 was excavated in 1951,[4] while the towers designated S1 and N2 were investigated between 1976 and 1985, although the precise years of their uncovering were not recorded.[5] A similar lack of precision characterizes the research at Buciumi, where the interval towers were uncovered during a series of archaeological campaigns conducted between 1963 and 1972.[6] The exact

[4] Rusu 1956, 687.

[5] Isac 1997, 59–60.

[6] Although the series of archaeological excavations continued until 1976, all these elements of the defensive

years of excavation remain uncertain,[7] however, renewed investigations in 2015, under the direction of I. Bejinariu, included the re-excavation of the *porta praetoria* and several interval towers.[8]

At Românași/*Largiana*, two interval towers were identified during excavations carried out in 1959. Although these findings were not published at the time, they were later incorporated into the site monograph issued in 1997.[9] In contrast, at Brusturi/*Certiae*, the presence of interval towers has been suggested primarily on the basis of geomagnetic surveys conducted at the beginning of the 21st century, indicating multiple such structures within the fort's defensive system.[10]

The fort at Porolissum–*Pomăt* presents a more complex research history. With the exception of the *porta principalis dextra*, the elements of the enclosure wall had already been uncovered by 1943.[11] Subsequent excavations carried out between 1979 and 1989 re-investigated the gates, including the *porta principalis dextra*, and led to the exposure of both interval and corner towers.

At Tihău, geomagnetic surveys conducted in 1998 and published the following year provided important data regarding the layout of the fortification.[12] These results were later reinterpreted by J. Bennett in 2006.[13] While several components of the defensive system, including interval towers, have been identified through non-invasive methods, their dimensions remain largely hypothetical.[14]

In the case of Cășeiu/*Samum*, most elements of the enclosure wall were uncovered during the interwar period, although the results were not published at the time. A significant contribution was made by D. Isac, who in 2003 published the results of his excavation of an interval tower uncovered in 1988.[15]

In the case of Ilișua/*Arcobara*, several interval towers were excavated during campaigns conducted in 1989,[16] 1990,[17] and 1993,[18] contributing to a better understanding of the fort's defensive layout. Finally, at Gherla, relevant data concerning the interval towers were published in the site monograph of 2008.[19]

Overall, the available evidence reflects a fragmented research history, marked by inconsistencies in documentation and publication, as well as by varying methodological approaches. This situation has had a direct impact on the interpretation of interval towers and their role within the defensive systems of Roman forts in Dacia Porolissensis.

INTERVAL TOWERS IN DACIA POROLISSENSIS: TYPOLOGY AND DISTRIBUTION

Interval towers represent essential architectural elements of Roman fortifications, strategically positioned along the enclosure walls of a *castrum*. In the case of auxiliary forts, these towers are typically placed at regular intervals between the corner towers and the gates of the fortification. In the forts of the province of Dacia Porolissensis, this feature can be observed in the majority of sites, with the notable exception of the large fort at Porolissum, where multiple interval towers were constructed along certain sections between the corners and the gates.

Three main types of interval towers can be identified within the province. The first type is represented by rectangular towers without projection (Fig. 6). These are solid constructions, usually attached to the enclosure wall, providing an additional defensive platform and a wide field of view over the surrounding area. This type is the most widespread in the forts of the province, being attested at numerous sites such as Gilău, Buciumi, Românași/*Largiana,* and Porolissum–*Pomăt*, suggesting that it constitutes a characteristic feature of the western and north-western

system are presented in the 1972 monograph.

[7] Gudea 1997, 13–15.

[8] Bejinariu et al. 2016, 124–125.

[9] Tamba 1997, 23–24.

[10] Franzen et al. 2007, 163–164, 176.

[11] Tóth 1978, 6–7, 72.

[12] Haalebos 1999.

[13] Bennett 2006, 279–299.

[14] Bennett 2006, 287, 289.

[15] Isac 2003, 104, 108.

[16] Protase et al. 1997, 31–32.

[17] Protase et al. 1997, 33–35.

[18] Protase et al. 1997, 39.

[19] Protase et al. 2008, 36–37.

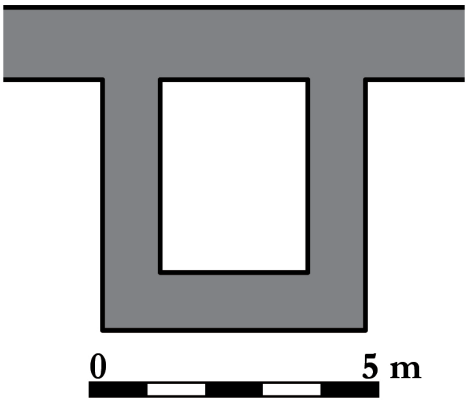

Fig. 6. Rectangular interval tower without projection.

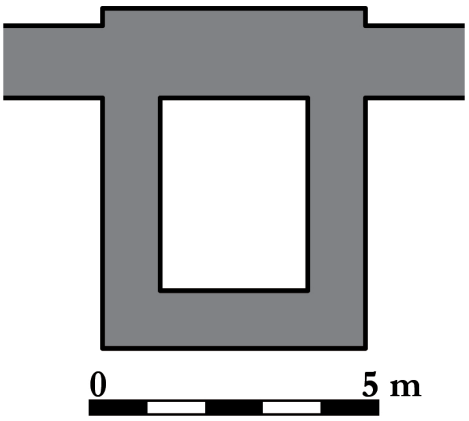

Fig. 7. Rectangular interval tower with small projection.

frontier of the province. An important observation is that these towers display a relative uniformity in both size and configuration. The surface area they occupy, measured externally from the enclosure walls, generally falls within an approximate range of 15 to 30 m². In some cases, it is noted that the walls of the towers are structurally bonded with those of the enclosure, suggesting that they were constructed during the same building phase.

The second type is represented by rectangular towers with small projections (Fig. 7). These were designed to extend outward from the line of the enclosure wall, allowing defenders a better angle of fire and more effective control over the adjacent area. This type can be securely attested only at the fort of Ilișua/*Arcobara*. Its presence at Gherla remains a matter of debate, as some of the available information appears to be exaggerated or insufficiently documented. Although this issue has not been explicitly addressed in the literature, observations based on the only published plan suggest that the tower walls are structurally bonded with those of the enclosure, indicating that they were constructed within the same building phase. In general, these towers covered a larger surface area than those without projections, ranging between 25 and 33.3 m².

The third type of interval tower is the horseshoe-shaped variety, featuring a semicircular projection (Fig. 8). These towers are characterized by a more complex plan, allowing for improved visibility and more effective defense of the area in front of them. In Dacia Porolissensis, they have been identified only at the fort of Cășeiu/*Samum*. Although many of these were excavated during the interwar period by E. Panaitescu, the data and results remained unpublished. The only example to have been published is that investigated by D. Isac, who notes that the tower walls were organically integrated with those of the enclosure and argues that the tower was originally designed with an apse.[20] Nevertheless, it cannot be excluded that both the tower and the adjacent enclosure wall were rebuilt in a later phase, given their placement over the fill of an earlier defensive ditch belonging to a previous phase of the fort.

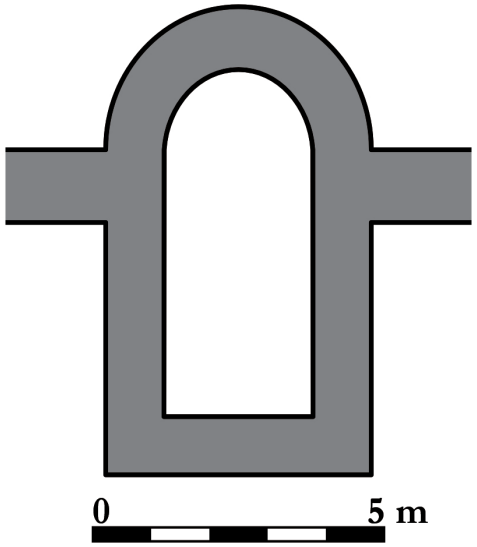

Fig. 8. Horseshoe-shaped interval tower.

[20] Isac 2003, 111–112.

In general, geophysical surveys represent a useful method for identifying and locating elements of the defensive system of an archaeological site, including interval towers. These techniques allow for the acquisition of detailed information about subsurface structures without the need for excavation. However, it is important to emphasize that geophysical investigations are limited in terms of the precise characterization and interpretation of such features. While they can provide data regarding approximate dimensions, positioning, and, in some cases, general composition, they cannot offer precise architectural details or insights into function. Nevertheless, geophysical surveys conducted at the forts of Brusturi/*Certiae* and Tihău have provided relevant evidence for the presence of multiple interval towers. Although the available results do not allow for precise typological classification, it can be observed that these features display rectangular plans, while the presence or absence of projections remains indeterminable.

Interval towers thus constitute essential components of Roman fortifications, strategically positioned to enhance the defense of military installations. The variation in their forms and structural characteristics reflects both the specific requirements of individual forts and broader developments in Roman military architecture. At the same time, the diversity observed in Dacia Porolissensis suggests that, despite recurring patterns, the design and implementation of these elements were not fully standardized, but rather adapted to local conditions, building phases, and defensive needs.

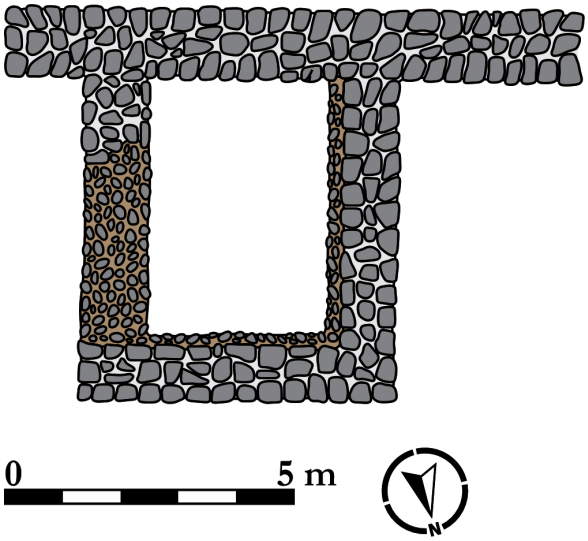

Fig. 9. Gilău, interval tower S1 (redrawn after Isac 1997, 101, Pl. XX/1).

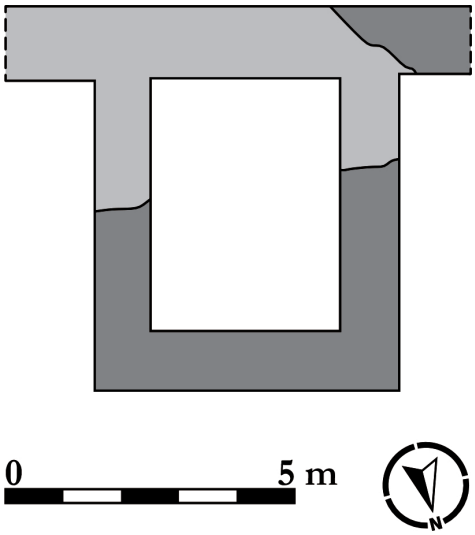

Fig. 10. Gilău, interval tower S2 (redrawn after Rusu 1956, 689, Fig. 2).

CATALOGUE

1. Gilău

In 1956, following archaeological excavations carried out at the fort of Gilău, M. Rusu published an article providing information on an interval tower located on the southern side.[21] In his 1997 monograph, D. Isac notes that four interval towers were identified along the fort's enclosure. All of these were investigated through archaeological excavations.[22] However, he provides data only on the so-called bastions S1 and N2. No data concerning bastion N1 could be identified, and it is likely that this was never published.

[21] Following the convention used by D. Isac, I have designated it as tower S2.

[22] Isac 1997, 59.

1.1. Gilău, interval tower S1
The bastion has an approximately square plan (Fig. 9), measuring 5.3 × 5.4 m. The walls, 1 m thick, are built using the *opus incertum* technique and are structurally bonded with the curtain wall.[23] This indicates that the tower was constructed simultaneously with the enclosure wall.
1.2. Gilău, interval tower S2
The tower had a rectangular plan (Fig. 10), measuring 5.45 × 4.4 m. With the exception of the curtain wall, which measures 1.3 m in thickness, the walls are uniformly 1 m thick. Their foundation was set into the *agger* and consisted of river cobbles not bonded with mortar.[24]
1.3. Gilău, interval tower N2

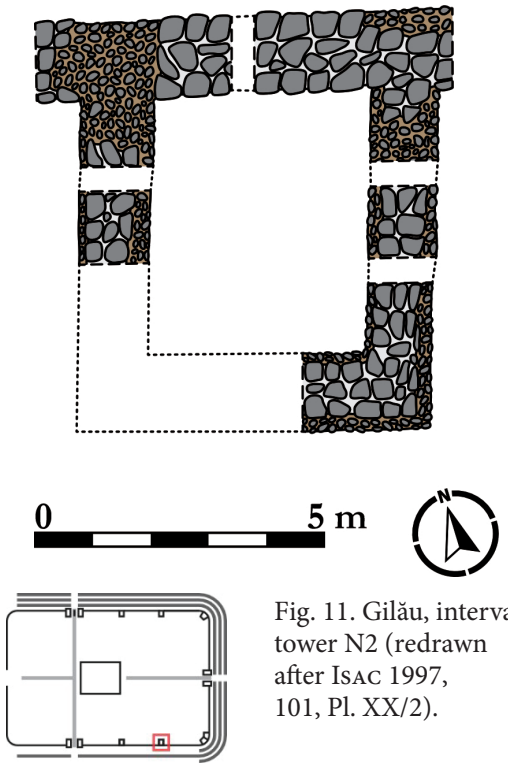

Fig. 11. Gilău, interval tower N2 (redrawn after Isac 1997, 101, Pl. XX/2).

The tower has a square plan (Fig. 11), measuring 5.5 × 5.5 m. The walls are 0.75–0.9 m thick and are built on a wider foundation of river cobbles. Compared to bastion S1, its state of preservation is poorer.[25] However, it was most likely constructed simultaneously with the curtain wall.

2. Buciumi
At the fort of Buciumi, two interval towers have been identified and investigated, both located on the south-eastern side of the fortification, that is, on the side of the *porta praetoria*. They are numbered accordingly, the first being situated to the south-west and the second to the north-east of the *porta praetoria*.
2.1. Buciumi, interval tower 1
The tower had a rectangular plan (Fig. 12) measuring 4.6 × 4.3 m. The walls are 1 m thick. Although its foundation does not descend to the level of the foundation of the curtain wall, it was set into the agger, and the interior of the tower was levelled. The archaeological material recovered during the excavation suggests that

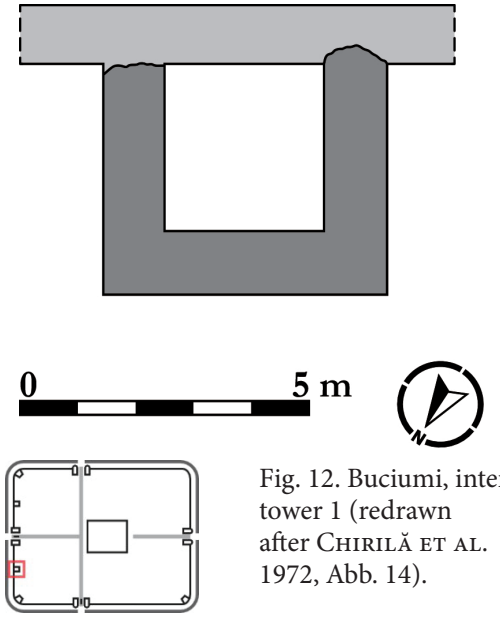

Fig. 12. Buciumi, interval tower 1 (redrawn after Chirilă et al. 1972, Abb. 14).

the tower was inhabited. The presence of *tegulae* and *imbrices* indicates that it was roofed.[26]
2.2. Buciumi, interval tower 2
The tower has a rectangular plan (Fig. 13) measuring 4.9 × 4 m. The walls are 1 m thick. Although its foundation does not descend to the level of the foundation of the curtain wall, it was set into the agger, and the interior of the tower was levelled. The archaeological material recovered during the excavations suggests that

[23] Isac 1997, 59–60.
[24] Rusu 1956, 688–690.
[25] Isac 1997, 60.
[26] Chirilă et al. 1972, 16.

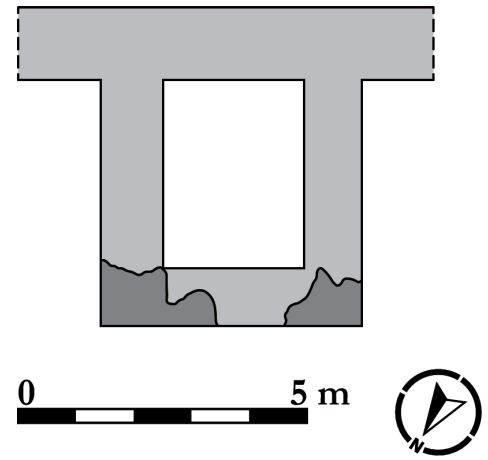

Fig. 13. Buciumi, interval tower 2 (redrawn after Chirilă et al. 1972, Abb. 13).

the tower was inhabited. The presence of *tegulae* and *imbrices* indicates that it was roofed.

3. Românași/*Largiana*

In 1959, two interval towers were identified on the western side, that is, on the side of the *porta decumana* (Fig. 14). The data were published by

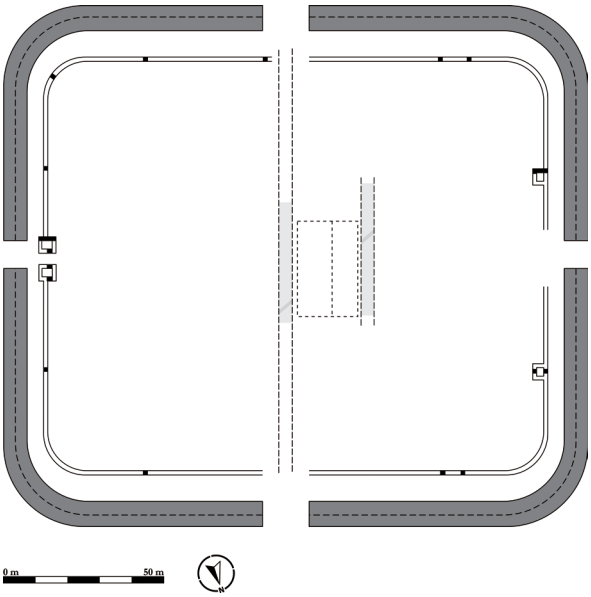

Fig. 14. Românași/*Largiana*, stone phase (redrawn after Tamba 1997, 49, Fig 14).

D. Tamba at the end of the millennium. The towers are designated E and F, following the names of the excavation sections that intersected them.

3.1. Românași/*Largiana*, interval tower E

In section E, the interior of the tower (not illustrated) was measured at 3.5 m. Its length, measured from the outer face of the curtain wall, is 5.65 m. The wall was constructed with a thickness of 1 m.[27] D. Tamba estimates the tower's dimensions at 4.25 × 4.25 m and notes that no habitation layer was observed within it.[28]

3.2. Românași/*Largiana*, interval tower F

In the case of interval tower F (not illustrated), D. Tamba mentions only that its length, measured from the outer face of the curtain wall, is 5.65 m.[29]

4. Brusturi/*Certiae*

Geophysical surveys (Fig. 15) carried out within the fort have allowed the identification

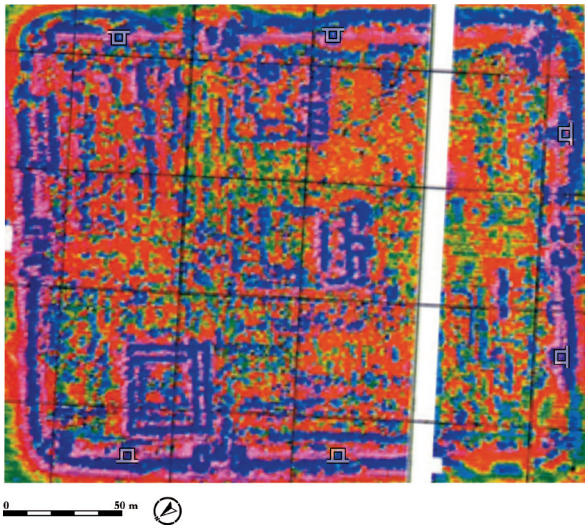

Fig. 15. Brusturi/*Certiae*, geophysical measurements (Franzen et al. 2007, 176, 1).

of numerous interval towers,[30] especially along the sides of the *portae principales* and the *porta decumana*. Their plan appears to be quadrangular, without external projection.

5. Porolissum-*Pomăt*

A total of six interval towers were identified at the fortification: two on the north-eastern side, two on the north-western side, one on the south-eastern side, and one on the south-western side. Of these, three were fully excavated, namely those on the side of the *porta praetoria* and one on the side of the *porta principalis sinistra*.

[27] Tamba 1997, 23–24.
[28] Tamba 1997, 24.
[29] Tamba 1997, 23.
[30] Franzen et al. 2007, 163.

5.1. Porolissum–*Pomăt*, interval tower (north-east) 1

The tower[31] had a quadrangular plan (not illustrated), with dimensions of 5.3 × 4 × 5 × 4.3 m. The walls are 0.8–0.9 m thick. A habitation layer was identified within the bastion. Fragments of *tegulae* and *imbrices* suggest that the bastion was roofed, the roof being supported by a wooden framework.[32]

5.2. Porolissum–*Pomăt*, interval tower (north-east) 2

The tower[33] had a square plan (not illustrated), measuring 5.1 × 5.1 m. The walls are 0.95–1 m thick. The interior of the bastion was inhabited. In a later phase, a wall parallel to the curtain wall was constructed within it. Its purpose was structural reinforcement and to support the tower in the event of slippage. Fragments of *tegulae* and *imbrices* suggest that the bastion was roofed, the roof being supported by a wooden framework.[34]

5.3. Porolissum–*Pomăt*, interval tower (north-west) 3

The tower[35] had an irregular quadrangular plan (Fig. 16),[36] with dimensions of 5 × 4.7 × 5.1 × 4 m. The walls are 0.8–0.85 m thick. The presence of large volcanic boulders is noted on the rear sides at the corners of the tower,[37] likely reflecting an intentional reinforcement of structurally vulnerable points and contributing to improved stability, possibly in response to local ground conditions.

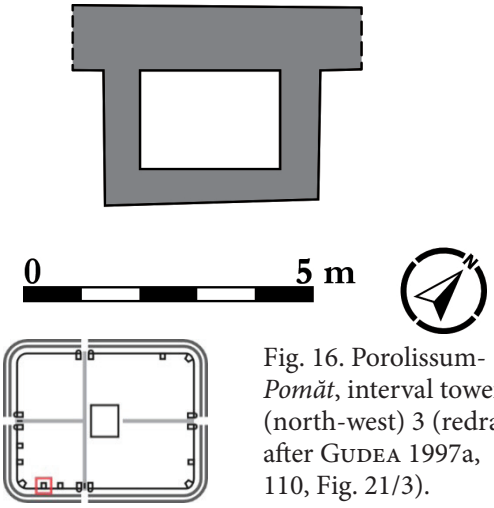

Fig. 16. Porolissum-*Pomăt*, interval tower (north-west) 3 (redrawn after Gudea 1997a, 110, Fig. 21/3).

6. Tihău

The results of geomagnetic surveys (Fig. 17) suggest that the sides of the principal gates in the *retentura dextra* were each equipped with an interval tower. These were positioned approximately halfway between the gates and the corners of the fort. They occupied an area of approximately 6 × 6 m.[38]

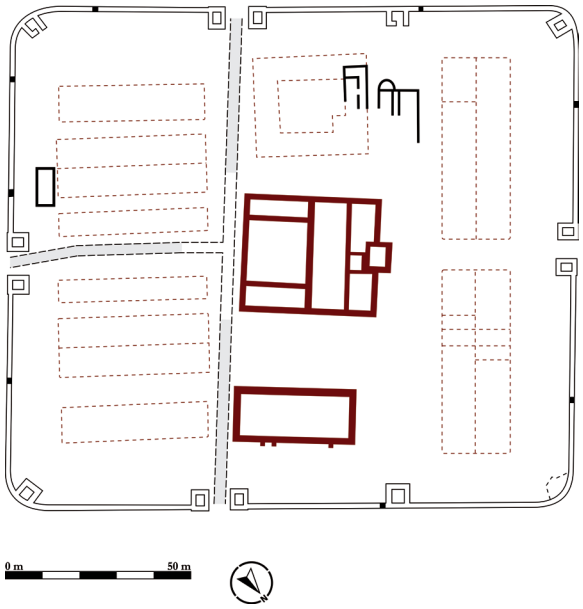

Fig. 17. Tihău, stone phase (redrawn after Opreanu–Lăzărescu 2016, 96, Fig. 55).

7. Cășeiu/*Samum*

During the interwar period, E. Panaitescu excavated the interval towers in the *retentura*, namely two on the side of the *porta decumana* and one on each of the sides of the *portae principales*, for a total of four. Unfortunately, he did not publish detailed information regarding these towers, only noting that their semicircular shapes have chronological significance, indicating a date in the early 3rd century.[39] In order to provide and clarify certain data related to these

[31] It is located on the side of the *porta praetoria* and is the closer of the two.

[32] Gudea et al. 1983, 121.

[33] It is located on the side of the *porta praetoria* and is the one situated closer to the northern corner.

[34] Gudea et al. 1983, 121–122.

[35] It is located on the side of the *porta principalis sinistra* and is the one situated closer to the northern corner.

[36] The dimensions of the tower on the original plan do not correspond to those mentioned in the text. The plan was evidently published at an incorrect scale.

[37] Chirilă et al. 1980, 88.

[38] Bennett 2006, 289.

[39] Panaitescu 1929, 326–327.

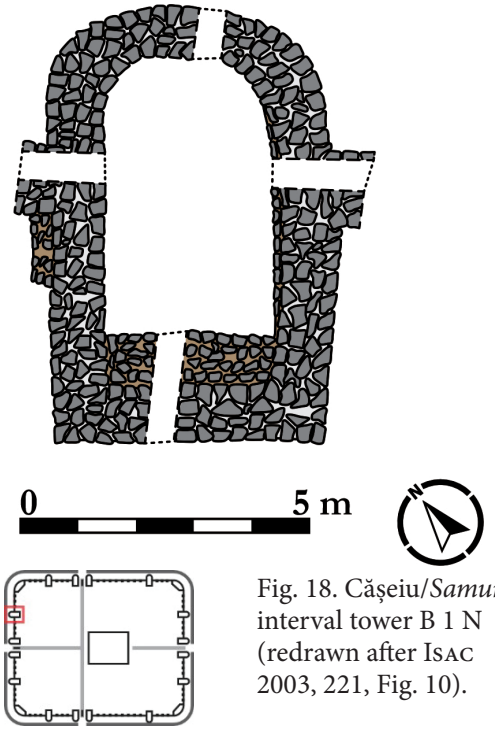

Fig. 18. Căşeiu/*Samum*, interval tower B 1 N (redrawn after Isac 2003, 221, Fig. 10).

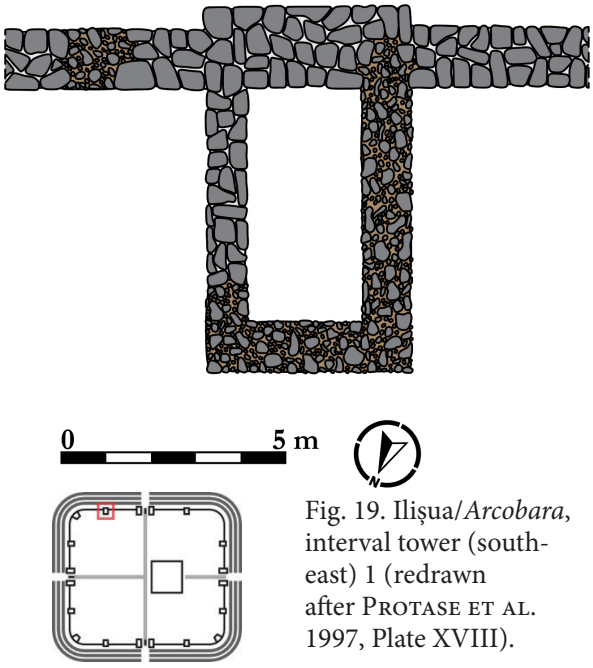

Fig. 19. Ilişua/*Arcobara*, interval tower (south-east) 1 (redrawn after Protase et al. 1997, Plate XVIII).

towers, D. Isac excavated one located on the side of the *porta praetoria*, more precisely in the area of the *praetentura dextra*.[40] This tower is designated as interval tower "B 1 N".

7.1. Căşeiu/*Samum*, interval tower B 1 N

The tower has a horseshoe-shaped plan (Fig. 18), with a semicircular projection of 2.5 m. It measures 7.5 × 5 m. The walls are 1 m thick and are built of river cobbles. Two construction phases with multiple habitation levels have been identified during its period of use.[41]

Already in the first phase, the bastion was built with an apse, although of more modest dimensions. This is indicated by the foundation identified on the outer left side and by that located within the bastion. In the second phase, the wall on the side facing the interior of the fort was rebuilt, enlarging the interior of the tower by 1 m. Works were also carried out to reinforce the external structure, especially at the apse of the tower, as the structure was slipping towards the ditch of the stone phase.[42]

8. Ilişua/*Arcobara*

In the 1997 monograph, the researchers note that a total of eight interval towers were identified at the fort, four in the *praetentura* and four in the *retentura*. These are arranged symmetrically; all being positioned midway between the gates and the corner towers of the fortification. Unfortunately, data have been published only for the towers in the *praetentura* and for one tower in the *retentura* dextra, on the south-western side.

8.1. Ilişua/*Arcobara*, interval tower (south-east) 1

The tower has a rectangular plan (Fig. 19),[43] measuring 4.25 × 6.7 m. Its walls are bonded with those of the curtain wall and were constructed of quarried stone. The foundations were set into the *agger* and consist of river cobbles.

In relation to the outer face of the curtain wall, the bastion has a rectangular projection of 0.3 m, created by thickening the defensive wall. Among the archaeological material, the researchers highlight a single find, a bronze coin of Faustina the Elder.[44]

8.2. Ilişua/*Arcobara*, interval tower (north-west) 2

The tower has a rectangular plan (not illustrated), measuring 5 × 6.5 m. Its walls are

[40] Isac 2003, 108.

[41] Isac 2003, 109–111.

[42] Isac 2003, 111–114.

[43] The original plan did not include a scale. In the redrawn version, the scale has been introduced based on the dimensions of the tower provided in the text.

[44] Protase et al. 1997, 32.

structurally bonded with those of the curtain wall and were constructed of quarried stone. The foundations were set into the agger and consist of river cobbles.

In relation to the outer face of the curtain wall, the bastion has a rectangular projection of 0.3 m, created by thickening the defensive wall.[45]

8.3. Ilișua/*Arcobara*, interval tower (north-east) 3

The tower, with a rectangular plan (not illustrated), measures 4.85 × 5.2 m. Its walls are structurally bonded with those of the curtain wall, which was thickened towards the exterior, resulting in a projection of 0.2–0.25 m. The foundations were set into the *agger* and consist of large stone blocks bonded with clay.

The walls of the bastion are 0.85–0.9 m thick, while the outer wall, that is, the curtain wall, measures 1.4–1.45 m in thickness.[46]

8.4. Ilișua/*Arcobara*, interval tower (north-east) 4

The tower, with a rectangular plan (not illustrated), measures 5 × 5.4 m. Its walls are integrated with those of the curtain wall, which is thickened towards the exterior, creating a projection of 0.2–0.25 m. The foundations were embedded in the *agger* and are composed of large stone blocks bonded with clay.

The bastion walls have a thickness of 0.85–0.9 m, while the exterior wall, namely the curtain wall, reaches 1.4–1.45 m in thickness.[47]

8.5. Ilișua/*Arcobara*, interval tower (south-west) 5

The tower was most likely constructed with a rectangular plan (not illustrated), although the state of preservation did not allow for the precise determination of its dimensions. The side facing the interior of the fort was almost completely destroyed, likely due to stone robbing. It has, however, been established that the tower projected 0.2 m from the line of the curtain wall, with a width of 3.2 m.

Towards the interior of the fort, the lateral walls could be traced over a distance of 1.5 m. These walls are 1.15 m thick and were set into the *agger*. The excavations in this area did not reveal any habitation layer or significant archaeological material.[48]

9. Gherla

Two interval towers were identified, both on the eastern side of the fort (Fig. 20). They were positioned midway between the *porta principalis dextra* and the north-eastern and south-eastern corners, respectively.

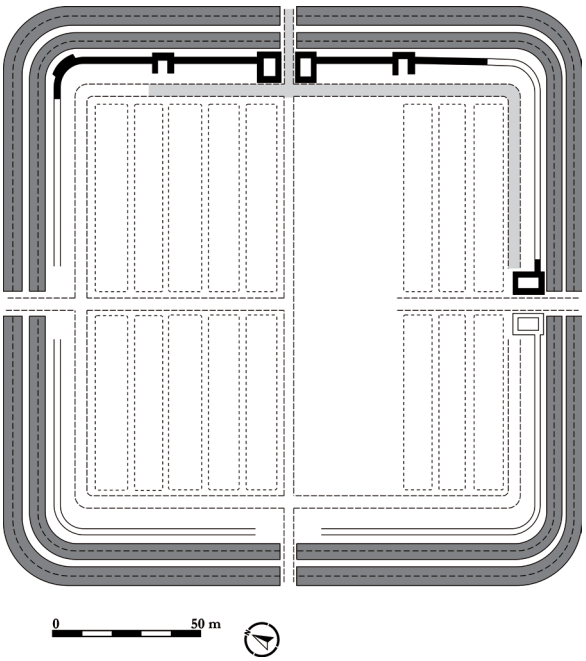

Fig. 20. Gherla, stone phase (redrawn after Protase et al. 2008, 406, Fig. 33a).

The towers had a quadrangular plan, with a projection of 4 m.[49] This type of tower is dated to the reign of Emperor Hadrian.[50]

CONCLUSIONS

The analysis of interval towers in Dacia Porolissensis demonstrates that, although these elements represent a common feature of auxiliary forts, their design and implementation were not fully standardized. Three principal types can be distinguished: rectangular towers without projection, which constitute the dominant form, rectangular towers with projection, attested in limited and sometimes uncertain contexts, and horseshoe-shaped towers, which appear to be exceptional within the province.

[45] Protase et al. 1997, 32.

[46] Protase et al. 1997, 34–35.

[47] Protase et al. 1997, 34–35.

[48] Protase et al. 1997, 39.

[49] The researchers rightly consider this dimension to be exaggerated.

[50] Protase et al. 2008, 36–37.

The predominance and relative uniformity of the rectangular type suggest the existence of shared construction practices, particularly during the stone rebuilding phases of the forts, generally dated to the 2nd century AD. At the same time, the observed variations in form, size, and layout indicate that local conditions and specific defensive requirements played a significant role in shaping these structures.

The current state of research remains uneven, with important differences in documentation and publication, and with some sites known primarily through geophysical surveys. As a result, certain aspects, such as precise typological classification and construction phases, remain difficult to establish. Future investigations, particularly those involving systematic excavation and comprehensive publication, are essential for a more complete understanding of the role and development of interval towers within the defensive systems of Roman Dacia.

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LIST OF FIGURES

Fig. 14. Românași/*Largiana*, stone phase (redrawn after Tamba 1997, 49, Fig 14).
Fig. 15. Brusturi/*Certiae*, geophysical measurements (Franzen et al. 2007, 176, 1).
Fig. 16. Porolissum-*Pomăt*, interval tower (north-west) 3 (redrawn after Gudea 1997a, 110, Fig. 21/3).
Fig. 17. Tihău, stone phase (redrawn after Opreanu–Lăzărescu 2016, 96, Fig. 55).
Fig. 18. Cășeiu/*Samum*, interval tower B 1 N (redrawn after Isac 2003, 221, Fig. 10).
Fig. 19. Ilișua/*Arcobara*, interval tower (south-east) 1 (redrawn after Protase et al. 1997, pl. XVIII).
Fig. 20. Gherla, stone phase (redrawn after Protase et al. 2008, 406, Fig. 33a).

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.