

TWO ROMAN BELLS (*TINTINNABULA*) FROM BRATISLAVA CASTLE

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Abstract: The paper presents two bronze Roman bells from the interior of the so-called Roman building II from the late La Tène period at Bratislava Castle. A large cylindrical bell with an oval base and an angular handle with five edges was discovered in the southwest corner of the building, and a small hemispherical bell with a massive loop handle was found near the entrance to the building. We analysed the bells based on typology, dimensions, chronology, finding context, material composition, and their possible function. Interdisciplinary research included the use of X-ray and XRF analysis. Presented are analogies from outside the Mediterranean region, dating from the 1st century BC to the 4th century AD. The earliest analogical cylindrical and hemispherical bells come from the Augustan military camps. The bells from Bratislava, dating to the second half of the 1st century BC, represent Roman imports on the acropolis of the oppidum and are among the oldest existing in the region north of the Alps. Their purpose was probably utilitarian (signalling).

INTRODUCTION

Two bells were discovered during archaeological excavations in the Bratislava Castle's North Terrace (Fig. 1).¹ The two finds, which are the subject of this paper, are from the interior of the so-called Roman building II (Fig. 2).² In 2009, a large bell (No. 1) was discovered in the southwest corner of the building; in 2014, a fragment of a small bell (No. 2) was found in the same building, near the entrance. The items are classified as Roman imports. Metal bells are known from various sites in our territory, dating back to Roman times.³ The archaeological context of the Roman Building II (Resutík 2014, 153–166) dates the two presented bells to the time before the Roman period, specifically to the late La Tène period, the end of the existence of the Bratislava oppidum.

DESCRIPTION OF THE BELLS

Bell No. 1 (BH 00041), Bratislava Castle, North Terrace, area III/Sector 7, Roman Building II, trench P4/2009, SJ 5591⁴, 22. 9. 2009.

Dimensions: height 20.3 cm, base diameter 11.4 × 6.7 cm, casing thickness 0.1–0.2 cm, handle width 6 cm, handle height 4.6 cm, handle base diameter 3.8 cm, handle thickness 0.6 cm, weight 756.58 g.

The large bronze bell has a cylindrical body, is slightly compressed in the waist, has an oval base, and has an angular handle with five edges (Fig. 3). There is a circular depression on the upper, shortest edge of the handle. The bell is cast, with the walls moulded after casting. The surface of the handle bears traces of file work (Fig. 3: 4). The bronze handle is massive, attached to the casing of the bell with a circular base (Fig. 3: 5). It is likely the inside featured a clapper (missing here), attached on an iron eyelet (Fig. 3: 3). The bell has plain undecorated walls, with one side of the casing cracked (Fig. 3: 6).

¹ The bells are deposited at the Slovak National Museum – Museum of History.

² The archaeological research at the Roman building II was led by B. Resutík of the Bratislava Municipal Monument Preservation Institute (MÚOP).

³ For example, Bratislava-Rusovce; Bratislava-Jarovce; Bratislava-Židovská street; Vištuk; Komárno; Streda nad Bodrogom (summarised by Pomberger/Mühlhans/Saunderson 2022c); Iža (Rajtár 2020, 272, cat. 171), Veľký Cetín-Jakubské A (Cheben/Ruttkayová/Ruttkay 1994, 196; Kvetánová 2008, 33); Šamudovce (Gačková 1991, 159); Lazisko-Zvon, Mošovce and others (Credits to K. Pieta, Institute of Archeology of the Slovak Academy of Sciences).

⁴ The bell was discovered just above the surface of the floor of the Roman building II, where there was a sandy-clay layer with an admixture of ash and charcoal, representing the destruction of the Roman building II. The layer contained late La Tène pottery and fragments of amphorae (Resutík/Teslíková 2012, 76).



Fig. 1. Bratislava Castle. Bells from the Roman building II. 1 – Bell No. 1; 2 – Bell No. 2 (photo S. Okkel, drawings L. Kováčik).



Fig. 2. Bratislava Castle. Situation of the Roman Building II and bell finds (graphic by S. Gabura, modified after *Haberland/Horanský 2014*; data source OpenStreetMap).

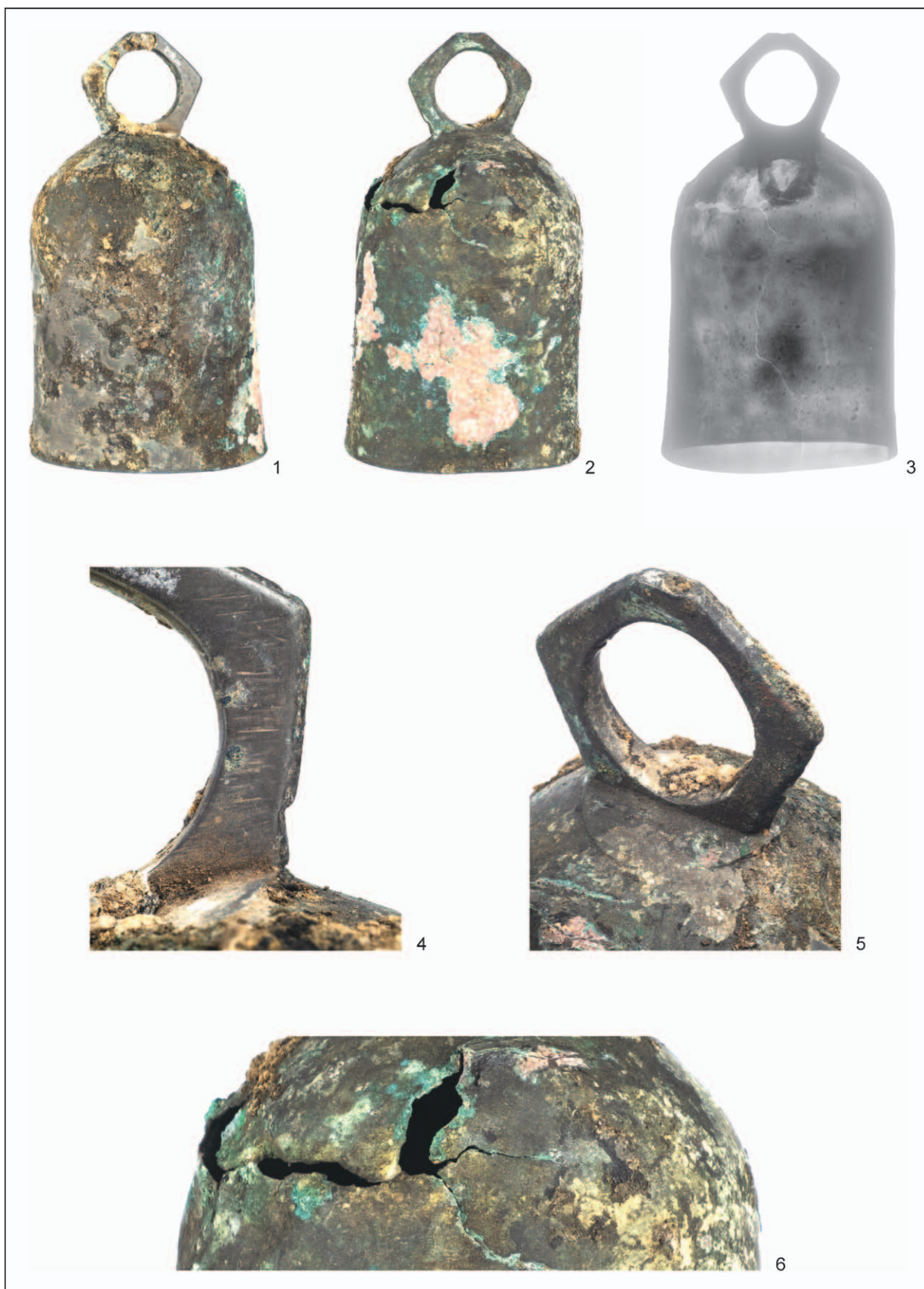


Fig. 3. Bell No. 1. 1 – front side; 2 – back side; 3 – bell X-ray; 4 – traces of file work; 5 – detail of the handle circular base; 6 – bell crack. Not to scale.

Bell No. 2 (BH 00187), fragment, Bratislava Castle, North Terrace, area III/Sector 7, Roman building II, trench R5/2009, SJ 5591⁵, 22. 5. 2014.

Dimensions: preserved height 4.2 cm, preserved width 4.3 cm, handle diameter 2 cm, handle aperture diameter 1 cm, casing thickness 0.5–0.7 cm, weight 70.82 g.

The fragment of the upper casing of the hemispherical bronze bell has a massive loop handle, while the clapper is missing (Fig. 1: 2). The bronze bell and the handle are cast. The casing of the bell has no decoration.

TYPOLOGY

Several scholars have researched the subject matter of bells in the Roman period. The fundamental typological works include the study by *L. Ohlenroth* (1925), which was based on findings from Swabia and Bavaria, and the typology of bells from “European Barbaric” by *W. Nowakowski* (1988). Nowakowski’s typology was expanded and supplemented by *Ch. Flügel* (1993, 99, 100) and *D. Božič* (2005, 315–317). Their works were subsequently built upon by *J. Jilek* (2008).

L. Ohlenroth divided bells into five groups: A – High, in the middle slight diminished shape, round-oval base; B – Four-sided bell with rectangular or quadrangular base; C – Hemispherical shape with circular base and hexagonal loop; D – Hemispherical shape, circular base and round loop; E – Shape of church bells and circular base.

W. Nowakowski divides bells according to the body shape into four types: A – Cylindrical; B – Pyramidal with rectangular base; C – Conical; D – Hemispherical. Based on the findings from Central Europe, the latest typology of bells has been elaborated by *B. M. Pomberger* (2016, 2018). She distinguished between eight types of bronze bells and two types of iron bells, with four groups of bases, nine types of handles, and four types of clappers. Other works on bells, in which the authors attempted classifications, were based on findings at specific archaeological sites, such as Enns-Lauriacum (*Kneifel* 1988), Kempten-Cambodunum (*Flügel* 1993), etc.

The cylindrical bell (No. 1) from Bratislava Castle can be classified as type A (according to *Nowakowski* 1988; *Ohlenroth* 1925), which includes tall cylindrical shapes, slightly compressed in the waist, with a circular-oval base and a massive angular handle. According to *B. M. Pomberger* (2016, 2018), the bell belongs to type 2, to which she assigns tulip-shaped forms with domed top and oval bases. The bell had an angular handle (type 4) and plain walls void of decoration (*Pomberger* 2018, 12).

The second bell from Bratislava (No. 2) has only been preserved in a fragment, so we state its typology assignment as probable. The small bell can be classified as type D (*Nowakowski* 1988, 80; *Ohlenroth* 1925, 153), hemispherical shape⁶ with a circular base and a loop handle, or according to *B. M. Pomberger*, as type 5, variant A (*Pomberger* 2016, 153), where she assigns hemispherical-shaped bells with a circular base and a loop handle with a wide aperture.

Cylindrical Bell Sizes

(Fig. 4)

W. Nowakowski states the sizes of Roman cylindrical bells (type A) from 7 to 10 cm (1988, 75). *B. M. Pomberger* gives the general sizes of Roman bells from 1.5 cm to 30 cm (2018, 1). The cylindrical bells from the Haltern camp (10 pieces) were between 6 and 9.3 cm tall, with the most common height being around 6.5 cm (*Müller* 2002, 194, 195). Four cylindrical bells from the Augsburg-Oberhausen camp were 5.8 to 9.1 cm tall (*Hübener* 1973, 41, Taf. 9). A cylindrical bell 9 cm tall was also found at another early Roman camp at Aislingen on the Danube, Germany (*Ulbert* 1959, Taf. 21). Identical bells (9 pcs) from Kempten-Cambodunum were from 6.6 cm to 10.2 cm tall (*Flügel* 1993, 101, Taf. 33). A cylindrical bell 6.9 cm tall from Magdalensberg also dates back to the time between the 1st century BC and the 1st century AD (*Deimel* 1987, 325, Taf. 86:6). A 17.4 cm tall cylindrical bell, very similar to the Bratislava specimen, is exhibited in the Antiquarium di Boscoreale Museum, Italy.⁷ Two cylindrical bells with heights of 13.8 and 14.4 cm were found at a younger depot in Havor,

⁵ Layer 5591 was dark brown with significant content of charcoal (*Horňák et al.* 2014).

⁶ Given the fragmentary nature of the find, the originally cone shaped body of the bell cannot be ruled out either (cf. *Nowakowski* 1988, 79, Abb. 6: 7).

⁷ Credits for valued consultation to M. L. Vitale, Pompeii Archaeological Park.

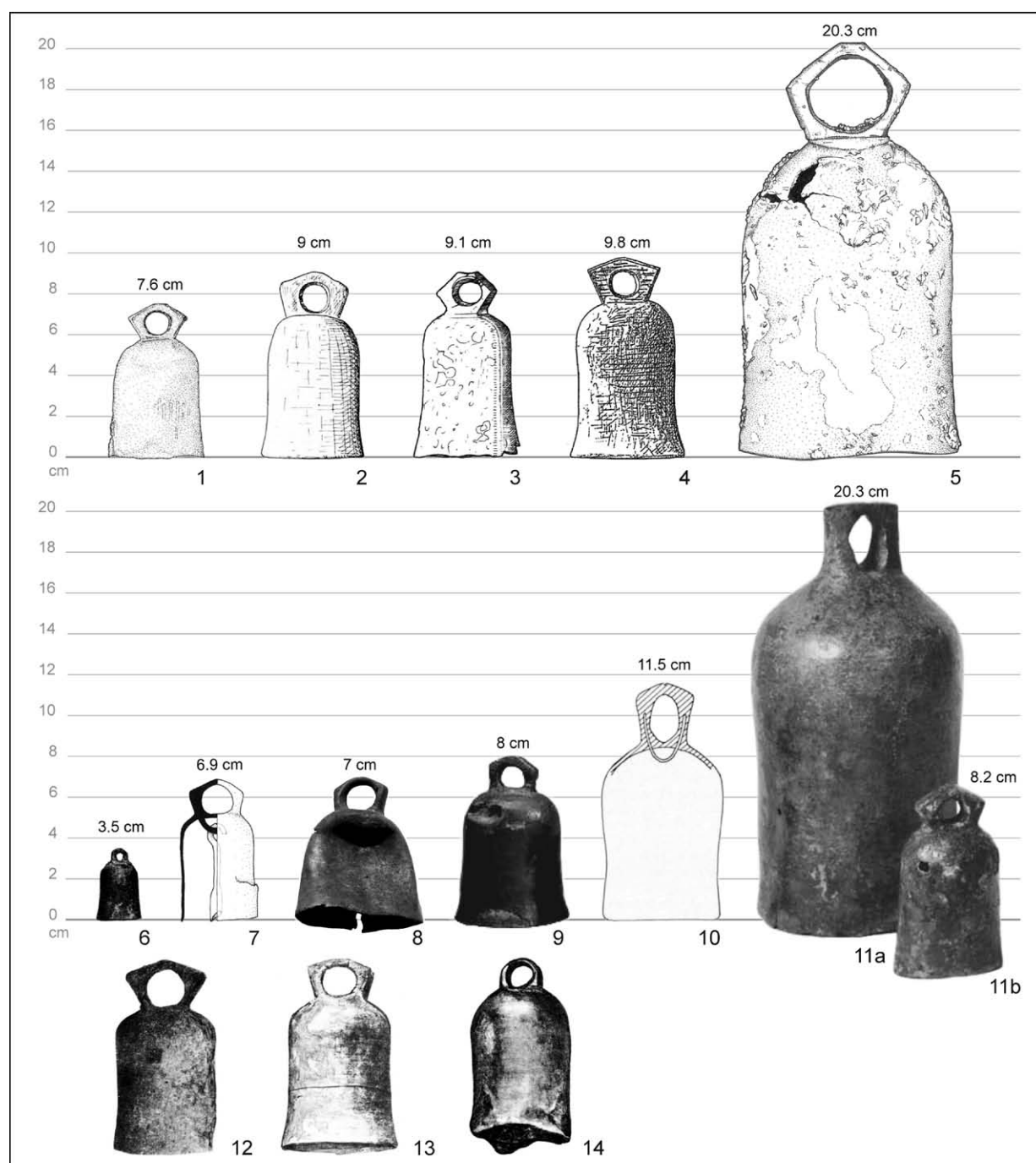


Fig. 4. Cylindrical bronze Roman bells (selection). 1 – Haltern (Müller 2002); 2 – Aislingen (Ulbert 1959); 3 – Augsburg-Oberhausen (Hübener 1973); 4 – Kempten (Flügel 1993); 5 – Bratislava; 6 – Mt. Beuvray (De Fontenay 1880); 7 – Magdalensberg (Deimel 1987); 8 – Uherský Brod (Jílek 2008); 9 – Brigetio (Ratimorská/Minaroviech 2009); 10 – Havor (Nowakowski 1994); 11 – Augst (Furger/Schneider 1993); 12 – Matételke; 13 – Mojtyny, 14 – Starzykowo Małe (12–14 Nowakowski 1988, not to scale). Graphic by S. Gabura.

Sweden (Nowakowski 1994, 138, 139). Roman cylindrical bells deposited in the British Museum are 13.5 to 17.7 cm tall.⁸

Exceptionally large, though pyramid-shaped (!) bells were found in Slovenia's Gora – 18 and 20.5 cm tall, and Ulake – 22.3 cm tall (Božič 2005, 315, 318). A 20.3 cm tall bell with a rectangular base was found in Kalkriese, Germany (Rost/Wilbers-Rost 2010, 122, fig. 5). An 18 cm tall bell of type A comes from the site

⁸ https://www.britishmuseum.org/collection/search?keyword=Roman&keyword=bell&object=bell&view=grid&sort=object_name__asc&page=1#page-top [26. 2. 2024]

of Labin-Albona, Istria, Croatia (Božić 2005, 319). A cylindrical bell of up to 20.3 cm in height, though with a rectangular handle, was found at the site of Augst-Augusta Rauricorum, while a smaller cylindrical bell with a angular handle from the same site was only 8.2 cm tall (Furger/Schneider 1993, 164, 165, Abb. 8). With its height of 20.3 cm, the bronze cylindrical bell with an oval base and an angular handle from Bratislava Castle is one of the tallest of its type outside the Mediterranean region.

Materials

Bells are struck by idiophones, which are resounded by striking the clapper against the inner side of the bell's casing. Metal bells in the Roman period were cast from copper alloys or wrought from iron sheets. B. M. Pomberger (2018, 1) gives a ratio of bronze to iron bells of up to 83% : 17% in the finds from Central Europe. Bronze bells produce more of a melodic sound than iron bells, which have a tinny sound. Bells with an oval base give two notes, which are distinct, unlike circular bells that only sound with one tone (Pomberger 2018, 16). The sound of the bell is determined by the physical properties of the metals or their alloys (and also by the bell's shape and size). Loudness is more correlated to the shape than the alloy (Mühlhans/Pomberger 2023, 164).

We analysed the Bratislava bells by the XRF method using a Niton XL3 device with a beam diameter of 3 mm.⁹ They were made of (No. 1) lead bronze and (No. 2) tin bronze with lead admixture (Table 1). An X-ray¹⁰ of the cylindrical bell No. 1 proved an oval iron loop from which the clapper was suspended (Fig. 3: 3). No decoration, writing, or markings were confirmed on the bells.

The analysis of 12 bronze bells from the Haltern camp showed a content of 18.59 to 23.35% tin and 1.47 to 10.2% lead in the hemispherical bells and a content of 5.47 to 9.31% tin and 3.45 to 22.15% lead in the cylindrical bells.¹¹ Two later-Roman bells from Havor showed the following content: 86.7% Cu; 9% Sn; 2.5% Pb and 80.2% Cu; 9.3% Sn and 10.2% Pb (Emsheimer 1988 according to Pomberger et al. 2022a, 134). The analysed cylindrical and hemispherical bells from the Szombathely Museum, Hungary, dated approximately from the 2nd to the 4th centuries, were 4.6 to 16% Sn and 0.3 to 14.2% Pb (Pomberger et al. 2021, tab. 3). The collections of

Table 1. XRF data of metal measurements.

Bell	Nature of Sample	Cu	Sn	Pb	Ag	Fe
1a (handle)	Surface measurement after corrosion removal	83.601	7.88	8.048	–	0.112
1b (casing)	Mechanically chipped from the body	84.259	5.917	9.822	–	–
2	Drilled from the body	81.912	10.959	6.655	0.284	0.072

the Slovak National Museum – Museum of Archaeology preserve one cylindrical bell (7.45 cm tall) from the vicinity of Komárno;¹² its material analysis showed a content of 73.45% Cu, 4.59% Sn, and a high percentage of Pb of 19.42% (Pomberger/Mühlhans/Saunderson 2022c, 362, tab. 1).

Tin gives the bell good sound properties. In the Middle Ages, the recommended ratio of copper to tin was 4 : 1, or 78% : 22%. To save on tin, the bellfounders usually added lead or zinc to the alloy (Flodr 1983, 61–63). It was the ratio of metals in the alloy that could potentially be one of the indicators of how a given bell was used.

As the bells from Bratislava Castle are damaged or in fragments. The large bell No. 1 has a cracked casing and a missing clapper. From the remains of corrosion on the inside of the loop and analogies, we believe that the bell had an iron clapper. When attempted with an iron rod, it gave a tinny sound; this, however, was primarily due to the cracked casing.

FUNCTION

It is questionable whether the bells found on the acropolis of the Bratislava oppidum can be automatically attributed the same meaning and function as they had back in the Roman environment. It is also questionable whether

⁹ Credits to B. Ritterová and R. Čambal, Slovak National Museum – Museum of Archaeology for cooperation.

¹⁰ The X-ray images were taken at the Monuments Board of the Slovak Republic, Bratislava. Credits to the staff of the Department of Conservation Science, L. Drotovánová, L. Vrbíková and P. Farkaš.

¹¹ M. Müller pointed out the higher occurrence of silver (0.2–0.3%) in bells with a higher tin content (Müller 2002, 124).

¹² The more detailed finding context of the bell (AP 13 772) is unknown (Kraskovská 1986, 114, fig. 1: 4).

they had also been used in the places where they were found or whether they were a source of raw materials, etc. In Roman times, bells had a variety of uses. They were found in military and civilian environments, secular and sacral spaces, houses, streets, roadsides, temples, workshops, waste pits, ditches, depots, graves, etc.

Cylindrical bells were also referred to as “horse bells”, especially according to the findings from the Augustan military camps (Nowakowski 1994, 138). They are considered part of the military horse harness in the Haltern camp, where, together with the phallic and crescent-shaped pendants, they had decorative and apotropaic functions (Müller 2002, 53).

This connection could also be proved by the later finds of graves with horses in Mátételke, Hungary, and Mojtyny, Poland (Fig. 4: 12, 13), or a warrior's grave at the burial site of Hortobagy, Hungary, from the second half of the 3rd century (Nowakowski 1988, 115; 1994, 138), where a hemispherical bell (Fig. 5: 1), analogical to the one in Bratislava, was possibly used as a bridle decoration.

In addition to horses, bells are associated with draft animals (oxen, mules, donkeys, etc.), sheep, goats, and even pigs and dogs. They were used to identify the movement of animals or entire herds and to safeguard them from predators. This was why bells are also found in fields, pastures, and roadsides as lost, therefore unstratified finds. Some researchers believe cattle bells were made predominantly of iron (Nowakowski 1988, 83). In addition to archaeological findings, several written sources confirm the wearing of bells on animals (summarised by Pomberger *et al.* 2022a, 177). Regarding the sizes of bells, what must be considered is also the significantly lower height of the cattle in the La Tène and Roman periods compared to today. For example, an archaeozoological analysis of skeletal remains from Liptovská Mara showed that cattle grew to a height of only 102–113 cm at the withers in this period (Chrószcz/Janeczek/Miklíková 2010, 225). On the other hand, a 20.3 cm tall bronze bell from the Kalkriese site was found next to a mule skeleton, which testifies to the use of large bells for this purpose as well (Rost/Wilbers-Rost 2010, 122, fig. 5).

Findings of bells in houses, workshops, warehouses, temples, and gardens may also be related to watchdogs that wore them around their necks, as evidenced by written sources and depictions on stone monuments (Pomberger *et al.* 2022a, 149, 158). At the Quedlinburg-Bokshornschanze burial site in Germany, a bell was found on the skeleton of a dog in Grave 40 (Nowakowski 1988, 94).¹³ In 2021, a lavish child's grave was discovered in central France with a puppy wearing a little bell hanging on its collar. The grave is dated back to the first half of the 1st century.¹⁴

Small bells were also used as part of costumes, decoration (Nowakowski 1988, 100, 101), or jewellery – in necklaces, bracelets, earrings, pendants/amulets, etc. (Pomberger *et al.* 2022a, 153).

Bells also served practical purposes, such as announcing events (timetables for specific duties, e.g. in military camps), alarms, wars, and fires. They were also used by guards of city walls and camps who carried them along (Furger/Schneider 1993, 169; Pomberger *et al.* 2022a, 157).

Bells were widely used in civilian life. They were used to announce the opening and closing of public baths, markets, and the like (Furger/Schneider 1993, 169). Also, bells used to be placed in the narrow gaps of street intersections to warn of opaque spaces (Kybalová/Lunga/Vácha 2005, 13). Bells' findings in the sea point to their signalling and warning function. The bells from the site of Labin in Istria, Croatia, and the sea off Agde in southwestern France likely served as signal bells on ships (Božič 2005, 319).

Larger bells could have been used for these “public” purposes (Božič 2005, 315; Furger/Schneider 1993, 169). The reason for the less frequent occurrence of large “signal” bells may have been their costly production or replacement by gongs, cymbals, or horns in military settings (Furger/Schneider 1993, 170). According to some scholars, the low number of tall bells can also be explained by the fact that those were easier to find and use secondarily (Furger/Schneider 1993, 167). In general, the problem of defining the function of large bells persists (Pomberger/Mühlhans/Mehofer 2022b, 380).

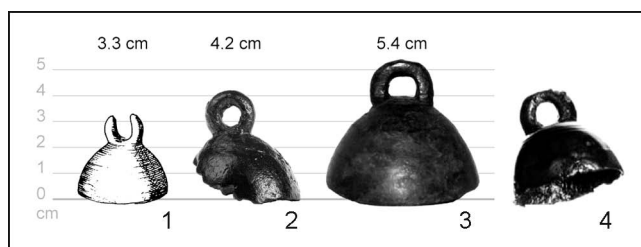


Fig. 5. Hemispherical bronze Roman bells. 1 – Hortobagy (Nowakowski 1988); 2 – Bratislava; 3 – Savaria (Pomberger *et al.* 2021); 4 – Fréjus (Lattard/Schmitt 2023, not to scale). Graphic by S. Gabura.

¹³ The burial site was used from Roman times until the Middle Ages, but the grave is dated to the Roman period without more precise dating (Nowakowski 1988, 94).

¹⁴ <https://archivio.greenreport.it/news/scienze-e-ricerca/il-bambino-e-il-cucciolo-di-cane-col-campanellino-che-dormono-in-sieme-da-2000-anni/> [20. 1. 2021]

Smaller bells were placed at entrances to buildings, on doors and windows, in courtyards, corridors, etc. Due to their sizes and structure, they could be easily moved. The bell was activated by opening the door, sliding a curtain, etc. Thus, the bell/wind chime placed like this does not make a sound randomly (by wind) but purposefully. In this case, its function can also be explained in utilitarian terms – safeguarding a space by signalling the presence of a person entering the space (*Dierichs 1999, 145; Parker 2018, 62–66; Pomberger et al. 2022a, 148*).

A specific kind of signalling function of bells was their use in fishing. Placed on fishing nets, they signalled that fish were caught (*Pomberger et al. 2022a, 156*).

The individual functions of bells, such as protective (apotropaic), cult, or decorative functions, cannot always be separated. As long as the chimes (*tintinnabula*) were hanged in the wind, their sound was produced randomly. Such a sound could serve to ward off evil forces and prevent them from acting against the bell's owner or the building in which it rang. The bells could thus protect houses, shops, kitchens, etc. (*Pomberger et al. 2022a, 151*). *Tintinnabulum*, or set of smaller bells hanging on a chain, produced various tones when ringing. Theoretically, the bell alone could also be used as a wind chime (*Pomberger et al. 2022a, 148*).

In addition, smaller hemispherical bells (*tintinnabula*) could be used as amulets and are also found in graves, often children's graves (*Eckardt/Williams 2018, 193; Simpson 2007, 114–119; Wardle 1981, 354–356*). They were used during cult ceremonies, e.g. in worshipping oriental deities (*Božič 2005, 315; Fugner/Schneider 1993, 168*), ceremonies, feasts, festivities, and also as musical instruments (*Pomberger et al. 2022a, 177*). Bells served as decoration for sacrificial animals but also as offerings to various deities (*Furger/Schneider 1993, 168*).

A cylindrical bell was discovered in the northeast corner of the temple at Magdalensberg, Austria (*Deimel 1987, 325*). From the Roman sanctuary of Jupiter Dolichenus in Brigetio, Hungary, there are known six pieces of “cult” cylindrical bells (Fig. 4: 9), no more than 7 and 8 cm tall, dating back to the beginning of the 3rd century (*Jenő 1998, 99; Ratimorská/Minaroviech 2009, 13, fig. 20*). This type of bells possibly had a magical role even outside Italy, where these too were found in graves – such as in the children's grave No. 17 in Velký Cetín, Slovakia (*Cheben/Ruttkayová/Ruttkay 1994, 224, fig. 23: 6; Kvetánová 2008, 23*), at the site of Fréjus, Saint-Lambert, France (Fig. 5: 4; *Lattard/Schmitt 2023, 235*), in the marshes of the site of Starzykowo Małe, Poland, and the depot from Havor, Sweden (Fig. 4: 10, 14; *Nowakowski 1994, 138, 139*). Also, a cylindrical bell with an angular handle was part of a religious depot from the area of Mont Beuvray, France (Fig. 4: 6; *Barral/Luginbühl/Nouvel 2012, 175; De Fontenay 1880, 7*).

DATING OF BELLS

Most bells analogical to the Bratislava finds are tentatively dated to the Roman Imperial Period. These are often the finds without the finding context.¹⁵ Although W. Nowakowski tried to classify the individual types chronologically, he only arrived at a broader dating or conclusion that the individual types of bells were used throughout the period of the Roman Imperial Period or as back as the final stage of the Roman Republic (*Nowakowski 1988, 75; 1994, 134*). A narrower chronological delimitation was attempted by D. Božič, who considers pyramidal bells with a polygonal or square base to be of later origin. On the other hand, he classified bells with cylindrical or hemispherical bodies and oval or circular bases as earlier forms (*Božič 2005, 316, 317*). Nevertheless, cylindrical bells with angular handles were among the most typical Roman bells, as they were found throughout the Roman Imperial Period, as evidenced by numerous finds (*Nowakowski 1994, 138*). The earliest analogical cylindrical and hemispherical bells north of the Alps come from the Augustan military camps at Augsburg-Oberhausen (*Hübener 1973, 40, 41, Taf. 9*), Haltern (*Müller 2002, 53, Taf. 56–62*), Oberaden, and Kops Plateau (Nijmegen) dating to before the turn of the centuries, and also from the somewhat later castle in Aislingen (*Ulbert 1959, Taf. 21: 16*). In a broader context, the Magdalensberg bell is dated from the 1st century BC to the 1st century AD (*Deimel 1987, 325, Taf. 86: 6*).

A cylindrical bell with an angular handle also comes from a depot, probably dating back to the last quarter of the 2nd century¹⁶, from the location of Grandes-Tailles à La Comelle, France (*De Fontenay 1880, 7, pl. IV: 13*).

¹⁵ E.g.: <https://www.uibk.ac.at/archaeologien/forschung/arbeitsgemeinschaften/musikarchaeologie/glocken/buntmetall/roemisch/gegossene-glocken-roemisch-14.html> [26. 2. 2024]; https://www.britishmuseum.org/collection/search?keyword=Roman&keyword=bell&object=bell&view=grid&sort=object_name__asc&page=1#page-top [26. 2. 2024]

¹⁶ The bell was found along with bronze sculptures of deities and other religious objects. However, this is an older find with no further context. The depot was unearthed by a worker while quarrying stone in 1878, and two years later, the set was published by

A small, 7cm tall cylindrical bell from Uherský Brod, the Czech Republic, also comes from the second half of the 2nd century (Fig. 4: 8; *Jílek 2008*, 145). Another fragment of a cylindrical bell comes from Blatnice pod Svatým Antonínkem I. The bell is without further chronological classification (*Zeman 2017*, 154). More numerous and significantly younger analogies of cylindrical bells from the late Roman Period are known from sites such as Kladovo (Serbia), the burial site of Mátételke (Hungary), the Tazovo settlement (Ukraine), a grave with a horse from Mojtyny and the marshes in Starzykowo Małe (Poland), as well as from the depot in Havor, Sweden (*Nowakowski 1988*, 75, 98, 100, 103, 106; *1994*, 138, 139).

An analogous smaller hemispherical bell, very similar to the Bratislava find (No. 2), comes from Galia, from a child's grave at the site of Fréjus (Fig. 5: 4). However, the local burials are dated quite broadly, from the end of the 1st century BC to the beginning of the 2nd century AD (*Lattard/Schmitt 2023*, 222–235, fig. 7: D). Hemispherical bells were generally less abundant than pyramidal and cone-shaped *tintinnabula* (*Nowakowski 1988*, 80).

The bells from Bratislava Castle were found above the floor of Roman Building II, in the layer that represents the destruction of Roman Building II. The layer contained late La Tène pottery, fragments of amphorae and a lot of charcoal. Based on the unambiguous finding context, both bells can be dated to the second half of the 1st century BC or the final stage of the settlement of the Bratislava oppidum.

CONCLUSION

Considering the finding context of the two bronze bells at Bratislava Castle (interior of the house, storage area), their utility function can be assumed. The signalling function of the smaller hemispherical bell is indicated by its location near the entrance to the building (from the interior side) and by the proportion of tin in the alloy, providing a more distinctive sound. Even though no more components of a possible wind chime have been found (a chain, suspension mechanism, other bells, etc.), it can be characterised by the established term *tintinnabulum*. Whether the house owner attributed an apotropaic function to the bell cannot be judged.

The interpretation of the function of the large bell is more problematic. Considering the diverse and abundant inventory of the Roman building II with numerous Roman imports not yet comprehensively processed, it cannot be positively said whether the bell was part of the household or a stored piece of goods meant as a trade commodity. Even though various raw materials have been found in the construction of Roman building II, such as brass ingot, lead ingot, gold foils, amber, the so-called Egyptian blue, etc. (*Resutík 2014*), we do not assume the damaged bell was raw material intended for further processing. Moreover, given the size of bell No. 1, we assume notification or signalling purposes. The large cylindrical bell is unparalleled in the (Central) European late La Tène environment; it is even one of the largest of its kind in the area north of the Alps when it comes to the Roman period alone. Due to the finding context, the presented bells can be considered the oldest metal bells in nowadays Slovakia and its wider surroundings. At the same time, they represent other notable imports in Bratislava oppidum.

Translated by Cronica, s. r. o.

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Dva rímske zvony (*tintinnabula*) z Bratislavského hradu

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Súhrn

Predmetom príspevku sú dva kovové zvony z výskumu v priestore severnej terasy na Bratislavskom hrade. Nachádzali sa na podlahe v interiéri tzv. stavby Rím II. V kontexte nálezov z Bratislavy sa v príspevku zaoberáme typológiou, materiálom, zložením, funkciou a chronológiou rímskych zvonov, pochádzajúcich z oblasti mimo Stredomoria. Väčší bratislavský zvon (č. 1) klasifikujeme ako cylindrický zvon s kruhovo-oválnou základňou a masívnym päťuholníkovým uchom. Fragment menšieho zvončeka (č. 2) patrí k zvonom polguľovitého tvaru s okrúhľou základňou a okrúhlym uškom. Analýza XRF ukázala, že boli zhotovené (č. 1) z olovnateho bronzu a (č. 2) z cínového bronzu s prímiesou olova (tabela 1).

Je otázne, či môžeme zvonom nájdeným na akropole bratislavského oppida pripisovať rovnaký význam a funkciu, akú plnili v rímskom prostredí. Všeobecne sa zvony nachádzajú vo vojenskom i civilnom prostredí, v svetských i sakrálnych priestoroch, v domoch, na uliciach, pri cestách, v chrámoch, dielnach, odpadových jamách, priekopách, depotoch, hroboch a pod. Cylindrické zvony možno označiť aj ako tzv. „konské zvony“, najmä podľa nálezov z augustovských vojenských táborov severne od Álp. V tábore v Haltern sa považujú jednoznačne za súčasť vojenského konského postroja, kde spolu s falickými a lunicovými záveskami plnili dekoratívnu a apotropajnú funkciu. Okrem koní sa zvony a zvončeky dávajú do súvislosti s ťažnými zvieratami, ovcami, kozami, dokonca ošpanými a psami. Slúžili na identifikáciu pohybu zvierat a ich ochranu pred predátormi.

Zvony mali tiež signalizačnú funkciu, oznamovalo sa nimi otváranie a zatváranie verejných kúpeľov, trhov a pod. Menšie polguľovité zvončeky (*tintinnabula*) mohli slúžiť aj ako amulety a vyskytujú sa taktiež v hroboch, často detských. Využívali sa počas kultových obradov, napr. pri uctievaní orientálnych božstiev, pri ceremóniách, hostinách, slávnostiach a tiež ako hudobné nástroje. Vzhľadom na nálezové okolnosti zvonov na Bratislavskom hrade (interiér domu, skladový priestor), možno predpokladať skôr ich utilitárnu funkciu. Či boli zvony súčasťou domácnosti, alebo išlo o uskladnený obchodný tovar nemožno posúdiť. Veľký (20,3 cm) cylindrický zvon nemá zatiaľ v (stredo)európskom neskorolátenskom prostredí obdobu a aj v rámci rímskeho obdobia patrí k najväčším zvonom svojho druhu v oblasti severne od Álp. Na signalizačnú funkciu menšieho polguľovitého zvončeka poukazuje miesto jeho nález v blízkosti vstupu do stavby (z interiérovej strany), ako aj podiel cínu v zliatine, zabezpečujúci výraznejší zvuk. Aj keď sa nenašli ďalšie súčasti prípadnej zvonkohry, môžeme ho charakterizovať zaužívaným termínom *tintinnabulum*.

Väčšina analogických zvonov k bratislavským nálezom je datovaná iba rámcovo do doby rímskeho cisárstva. Často ide o nálezy bez nálezového kontextu. Najstaršie analogické cylindrické a polguľovité zvony severne od Álp pochádzajú z augustovských vojenských táborov v Augsburg-Oberhausen, v Haltern, Oberaden a Kops Plateau (Nijmegen) z obdobia pred prelomom letopočtov. Do širšieho rámca sú datované zvony napr. z Magdalensbergu, Fréjus a i. Zvony z Bratislavského hradu sa našli nad podlahou stavby Rím II, v deštručnej vrstve, ktorá obsahovala tiež neskorolátensku keramiku a fragmenty amfor. Obidva bratislavské zvony môžeme na základe jednoznačnej nálezovej situácie datovať do druhej polovice 1. storočia pred. Kr., resp. do záverečnej fázy osídlenia bratislavského oppida. Nálezy považujeme za najstaršie kovové rímske zvony na území Slovenska, ale aj v širšom okolí.

Obr. 1. Bratislavský hrad. Zvony zo stavby Rím II. 1 – zvon č. 1; 2 – zvon č. 2 (foto S. Okkel, kresba L. Kováčik).

Obr. 2. Bratislavský hrad. Poloha stavby Rím II a nálezov zvonov (grafika S. Gabura, upravené podľa *Haberland/Horanský 2014*; zdroj OpenStreetMap).

Obr. 3. Zvon č. 1. 1 – predná strana; 2 – zadná strana; 3 – RTG snímka zvonu; 4 – stopy opracovania pilníkom; 5 – detail kruhovej základne uška; 5 – prasklina zvona. Bez mierky.

Obr. 4. Cylindrické bronzové rímske zvony (výber). 1 – Haltern (*Müller 2002*); 2 – Aislingen (*Ulbert 1959*); 3 – Augsburg-Oberhausen (*Hübener 1973*); 4 – Kempten (*Flügel 1993*); 5 – Bratislava; 6 – Mt. Beuvray (*De Fontenay 1880*); 7 – Magdalensberg (*Deimel 1987*); 8 – Uherský Brod (*Jílek 2008*); 9 – Brigetio (*Ratimorská/Minaroviech 2009*); 10 – Havor (*Nowakowski 1994*); 11 – Augst (*Furger/Schneider 1993*); 12 – Matételke; 13 – Mojtyny, 14 – Starzykowo Małe (12–14 *Nowakowski 1988*, bez mierky). Grafika S. Gabura.

Obr. 5. Polguľovité bronzové rímske zvony. 1 – Hortobagy (*Nowakowski 1988*); 2 – Bratislava; 3 – Savaria (*Pomberger et al. 2021*); 4 – Fréjus (*Lattard/Schmitt 2023*, bez mierky). Grafika S. Gabura.

Tabela 1. Výsledky merania XRF.

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