

FINDS OF ARTILLERY MISSILES FROM THE SOUTH-EASTERN PART OF THE VICUS OF THE ROMAN AUXILIARY FORT AT GERULATA¹

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DOI: <https://doi.org/10.31577/szausav.2025.suppl.3.26>

Keywords: Roman Period, Gerulata, Bratislava-Rusovce, artillery missiles

Abstract: The subject of the paper is the finds of Roman sling projectiles and a throwing machine – ballista, which was discovered in the area of the south-eastern part of the civil settlement (vicus) in ancient Gerulata (the territory of modern Bratislava-Rusovce). The finds were discovered during a rescue archaeological research by the Department of Classical Archaeology, University of Trnava in Trnava, conducted in the Rusovce Manor House and its park in the summer of 2018. In the fills of two partially excavated sunken settlement features, two stone projectiles of oval, almost circular cross-section (diameter approx. 8.8×10.2 cm) made of sandstone and one smaller round clay ball were found among the common settlement material (pottery, clay lamp). Based on analogues, we assume the two stone balls were projectiles for a throwing weapon called a *ballista*. In contrast, the smaller clay ball (diameter 3.5×3.9 cm) was intended as a slingshot (*funda*) projectile. The accompanying finds permit their framework dating to the 2nd to 3rd century AD.

INTRODUCTION

From the archaeological point of view, the city district of Bratislava-Rusovce represents one of the most important archaeological sites of the Roman Period in present-day Slovakia. Unfortunately, most former ancient settlements are currently located under medieval and modern buildings. Nevertheless, numerous archaeological excavations realised in the second half of the 20th century and the first decades of the 21st century have provided many important clues (for a summary, see Kolník/Krekovič/Snopko *et al.* 1993; Polla/Vallašek 1991; Schmidtová 2008; 2012; Schmidtová/Mathédesz 2018; 2020; Snopko/Geržová/Ferus 1982; 1986; Varsík 1996a; 1996b; most recently Dragun 2022, 22–30, also with additional references). The building of a military auxiliary fort in the late 1st century AD has an immediate effect on the development of the settlement in its vicinity and the wider hinterland. The *Castellum* of Gerulata was the first of the fortified points of the Roman frontier on the Carnuntum – Ad Flexum line. The auxiliary fort (*Castellum*) was built near the Danube's side branch (today the Rusovce Canal), its strategic position being to protect the northern part of the relatively large area of the widely branching Danube with its many branches and riverside islands with alluvial forests (Schmidtová/Mathédesz 2019, 6, 15; 2020, 87, 88). The military fort was surrounded on three sides by a civilian settlement, the vicus, which gradually grew. The presumed extent of the settlement is indicated by the directly excavated settlement features and the burial areas located on its periphery and along the roads leading out of the former settlement. So far, the most prolific civil features have been excavated in front of the north-western gate of the *castellum* (present-day Maďarská and Irkutská Streets). A settlement pattern of a similar character has long been assumed in the area to the south and southeast of the fort, but so far, there has been only negligible information about it. One of the main entrance gates to the fort (the southern one) faced directly onto the area of the present-day castle site, which is approximately 215–220 m away from it as the crow flies (Fig. 1). The unsatisfactory state of research is aptly illustrated by virtually all published maps, where the area of the present Manor House and the adjacent park is drawn as a *de facto* empty area – ‘*terra incognita*’ (cf., e.g. Dragun 2022, fig. 2; Schmidtová 2008, fig. 78; Schmidtová/Mathédesz 2018, 57; Snopko/Geržová/Ferus 1986, fig. 1; Varsík 1996a, Abb. 1; 1997, fig. 1.34: 1). In other words, it represented an area without any evidence of settlement in a given location. There is even a sceptical opinion in the professional literature that the presumed numerous younger building activities from the medieval and modern periods in this part of Bratislava-Rusovce seem

¹ This work was supported by the Slovak Research and Development Agency under the Contract No. APVV-21-0257 and by the grant project VEGA 1/0425/24.

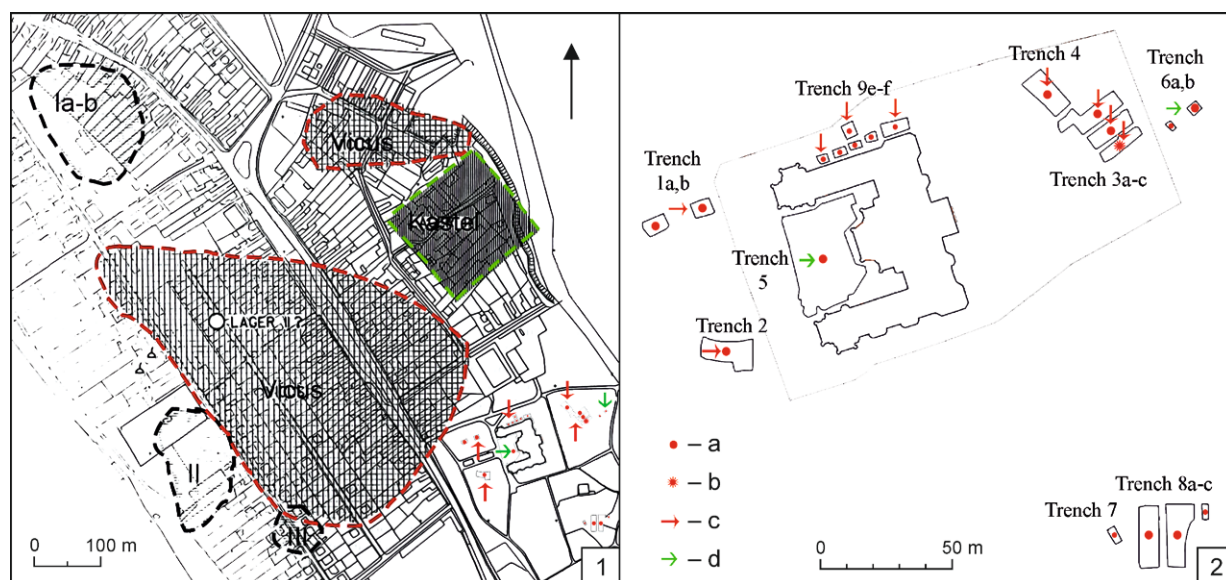


Fig. 1. Bratislava-Rusovce. Site on the map (after Dragun 2022, fig. 2; Varsik 1996a, 31, Abb. 8). Legend: a – sectors/trenches; b – sector/trench 3c; c – sectors with attested settlement from the Roman Period; d – sectors with likely occupation from the Roman Period.

to have destroyed the older settlement layers and features from the Roman Period (cf. Schmidtová 2012, 265). One of the few published exceptions is the mention of Roman *spolia* secondarily used in the construction of the church of St. Vitus (Polla/Vallašek 1991, 144; Schmidtová/Mathédesz 2019, 32; Schmidtová/Jezná/Kozubová 2005, 40, 62), in the vicinity of which five late Roman skeletal graves and one horse skeleton were simultaneously investigated (the so-called cemetery number IV). It is assumed that this burial site continued towards Balkánska Street, where an empty brick tomb was uncovered (Schmidtová/Štolcová 2017, 4, 5). This location is topographically only at the southern edge of the Manor House Park. This burial suggests the possible extent of a civilian settlement in the area to the south and southeast of the auxiliary fort. The results of the exploratory research in the area of the present-day Manor House and its adjacent park in Bratislava-Rusovce, the original assumptions about the destruction of evidence of Roman Period settlement in this location are significantly corrected or directly refuted. The present paper aims to briefly introduce the main results of the archaeological research and then discuss in more detail two settlement contexts in which several pieces of Roman artillery missiles were found.

BRIEF RESEARCH DESCRIPTION

Field archaeological research in 2018 under the direction of the Department of Classical Archaeology of the University of Trnava in Trnava was undertaken on the recommendation of the Monuments Board of the Slovak Republic. It was a rescue archaeological research significantly limited by space and time possibilities. It was to immediately precede a more extensive rescue research, which has still not been carried out so far, even with the gap of several years. The research aimed to identify the stratigraphic situation in the locality and the state of preservation of the archaeological features and to verify the results of the previous geophysical survey. The information obtained was subsequently incorporated into the project documentation for the long-term planned reconstruction of the site.² A total of 10 sectors were delineated, located in the areas potentially most threatened by the planned construction activity (Fig. 1). The archaeological survey revealed the presence of archaeological components from several periods. Reliably documented settlement features belong to the late

² Following the manuscript of this study's submission to the editors of the proceeding, the second phase of field archaeological research near the Manor House in Bratislava-Rusovce was initiated in August 2024. Its first phase focused on the area east of the Manor House and the periphery of Sector 3a–c, where an intensive settlement dating from the Early and Middle Roman Period was also identified.

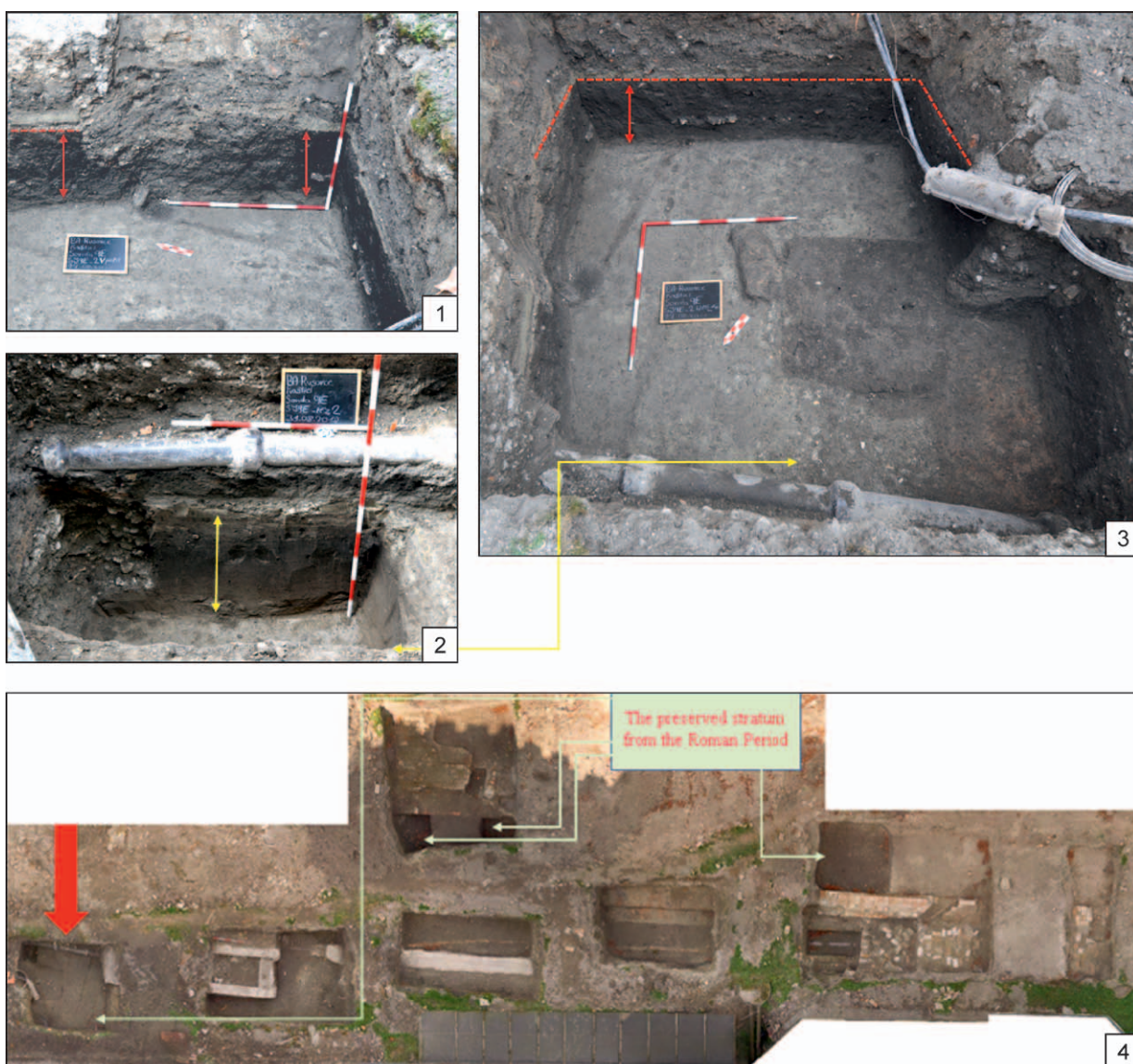


Fig. 2. Photos of the area of research Sector/Trench 9. 1–3 – parts of the examined area (Sector 9e) with preserved settlement strata and floor from the Roman Period (author T. Kolon, E. Hrnčiarik).

Hallstatt Culture (the area of Sectors 3 and 4) and the 17th to 19th century (concentrated mainly in the area of the Manor House courtyard – Sector 5 and in the area of Sectors 1, 2 and 9). To a lesser extent, the La Tène Culture is also attested amongst the moveable finds (the area of Sector 3a, sporadically within Sector 3c and Sector 4).

A partly surprising finding was the identification of preserved traces of intensive Roman era settlement of the site (Sector 1b, Sector 2, Sector 3, Sector 4, Sector 9 and, at least in part, the area of the entrance courtyard beneath the under the unbasemented parts of the older ruined Manor House – the so-called Sector 5). Although the construction of the Neo-Gothic Manor House in the areas with basements appears to have destroyed most of the earlier features, the immediate vicinity of the Manor House has been artificially raised in the modern period to the level of the pedestrian walkway. As a result, the older stratigraphic situations have remained relatively well preserved in some positions despite some 19th and 20th century trenches and incursions (Fig. 2). For example, within the minor archaeological survey of Sector 9 situated along the northern wall of the Manor House, a compact homogeneous cultural layer with dark brown to black filling was even identified in several positions, which was characterised by the concentration of a large number of artefacts dated to the second half of the 2nd to the first half of the 3rd century (Fig. 2: 1–3). The upper level of



Fig. 3. Photos of the area of research Sector/Trench 3c. 1 – photo of Trench 3c; 2, 3 – photos of the feature S.J. 3c_4/8; 4–6 – photos of the feature S.J. 3c_7a (author E. Hrnčiarik).

this layer started approximately 0.94 m from the present ground level. It continued to a depth of 1.44 (1.50) m, where the level of the earthen floor of a feature of unknown dimensions dating to the early Roman Period was located (Fig. 2: 1, 3). This cultural layer of approximately 0.5 m thickness, dating to the Early Roman Period, thus represents the *terminus ante quem* for dating the excavated part of the smothered clay floor (Fig. 2: 3). Subsequently, using a smaller reconnaissance section, we found another cultural layer as thick as 1.00 to 1.06 m under this floor (Fig. 2: 4). It cannot be ruled out that the total thickness of the preserved cultural layers from the Roman Period in the area north of the Manor House may reach from 0.5 m to 1.45–1.56 m in places. A similar layer was also present in places a few dozen metres further away in the main entrance courtyard (Sector 5), but this was only investigated at its upper level of interception. So, the extent of the preserved Roman era features in that area of the Manor House site cannot be determined. At the same time, a partially preserved cultural layer from the Early Roman Period is also presumed to be present near Sector 1b. The findings certainly cannot be applied universally to other locations within the Manor House grounds. For example, a different situation was found in the nearby areas of Sectors 3 and 4. Compared to the immediate vicinity of the Manor House building, the relief in this area is characterised by a significantly

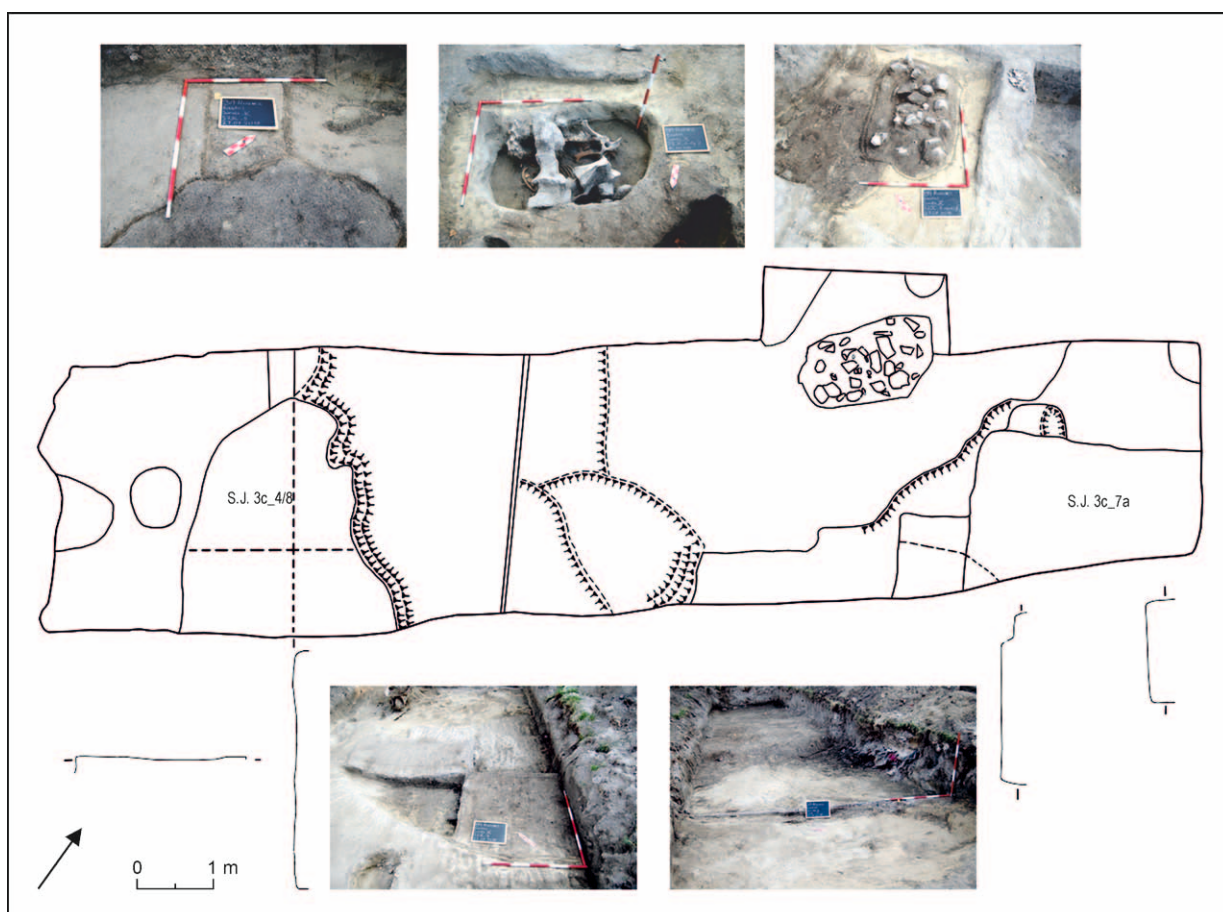


Fig. 4. Plan of the area of research Sector/Trench 3c (author T. Kolon, E. Hrnčiarik).

lower level, which is probably related to the gradual slope of the terrain towards the Danube and also to the landscaping of the garden carried out in the modern period (levelling of the terrain). This fact was immediately reflected in the state of preservation of the documented archaeological features. The cultural layer has been preserved only in a torso-like condition in the given location, especially in the places of natural depressions. The original surface has not been preserved in this part of the study area, and a significant part of the settlement features has thus been preserved only when they are sunk into the sands of the subsoil (Fig. 3: 1). A number of these have also been secondarily disturbed by various interventions and trenches dating to the modern period. Nevertheless, even in this location, intensive settlement from the Roman Period has been documented.³ By agreement with the situation with Sector 9 mentioned above, in this section, most of the artefacts were mainly from the 2nd century to the first half of the 3rd century. Only isolated finds (e.g. a few fragments of glazed *mortaria*) indicate the continuation of the settlement in the Middle and Late Roman Period.

FINDSPOTS WITH THE PRESENCE OF ROMAN MILITARIA

The Roman Period military equipment, which is the subject of this study, was found in the sunken parts of the two settlement features investigated in Sector/Trench 3c (Fig. 3; 4). This trench was one of three line trenches excavated in the enclosure area behind the east wing of the Neo Gothic Manor House. The trench was slightly trapezoidal in plan (length: 17.25 m; width: 2.45–3.9 m) and had a longer axis orientated approximately

³ During the current archaeological research, part of a masonry aqueduct was identified in the area east of the present Manor House. This aqueduct most probably supplied water from an adjacent branch of the Danube River to an unknown structure, probably originally located under the south wing or southwest or west of the south wing of the Manor House, respectively.

east-west. The purpose of this trench was to verify the presence of extant archaeological remains and to establish the essential characteristics of the relief. The upper layer of the brown earth was to be excavated using an earth machine with a flat spoon approximately 0.5 to 0.6 m in thickness. However, immediately after the extraction of part of the brown humus surface, the remains of the bulk of an unrecorded modern dump of construction and communal waste from the 1990s were recovered in the central part of the excavated trench, significantly disturbing the earlier find situations. The archaeological remains were also damaged by the digging for a water pipe that cut north–south across the entire trench. Nevertheless, several interesting archaeological situations could be archaeologically documented.

The first is a relatively shallowly sunken, flat-bottomed settlement feature (Fig. 3: 2, 3), the filling of which consisted of brown compact earth with an admixture of a large number of pottery sherds, animal bones, and, more rarely, other finds (labelled S.J. 3c_4/8). The floor of the feature consisted of a beaten, hard grey earthen floor (Fig. 3: 3). The original exact dimensions of the feature could not be determined as the waste dump and the trench for the water pipe had destroyed its eastern side. At the same time, its southern part lay outside the excavation area. No remains of the column structure were recovered directly in the floor area. Several pits were investigated near the feature, but their relationship to the feature is unclear. The preserved dimensions of 3.52 m (surviving width) $\times$ 4.5 m (surviving length) $\times$ 0.15–0.23 m (depth) suggest that this was a typical partially sunken hut with rounded wall. Several analogues to this feature are recorded directly from the hinterland of the auxiliary fort at Bratislava-Rusovce (*Varsik* 2012, 229, 230, fig. 378, 380). The fragments of pottery – Red-coloured (oxidized) ware (both undecorated and Pannonian striped ware with painted horizontal bands), the so called grey (reduced) coarse ware and samian ware (*terra sigillata*) – were numerous in the fill of the sunken hut (Pl. III: 10–18; IV). The small finds (Pl. III: 10, 13) include fragments of iron building fitting (Pl. II: 6) and fragments of another building fitting or corroded iron key? (Pl. II: 2), smaller fragments of ceramic building material (*tegulae*) and one specimen of an almost round terracotta ball (dimensions: 3.9 $\times$ 3.5 $\times$ 3.7 cm, weight: 48.9 g). The ball was made of well-baked fine-grained clay of reddish-brown colour (7.5YR 5.5–6/3).

Unfortunately, the other sunken settlement feature recorded in the area of Trench 3c could also be investigated only partially. At the time immediately after the removal of the humus layer, it was not possible to determine its exact dimensions, as after clearance, the entire eastern quarter of the area of Trench 3c was characterised by a continuous brown with no distinct borders, with a few accumulations of moveable artefacts (Fig. 3: 1; 4). From a methodological point of view, the feature was therefore designated collectively as S.J. 3c_7 and investigated through several reconnaissance cuts (Cut 1, Cut 2, Cut 3 and partially Cut 4) oriented transversely to the longer axis of Trench 3c (Fig. 3: 4). After documenting the findspot situation, the control blocks were removed, and the features were separately marked. Part of the material thus recovered also came from the clearance of the cultural layer above its level of interception in the sandy subsoil, from the excavation of the test cuts and the removal of the control blocks. Except for one stone artefact found directly on the floor, all other artefacts came from its fill and so cannot be directly linked to the original function of the feature.

The part of the feature examined was rectangular in plan with vertical upright walls and a flat bottom. On both partially captured sides, a shallowly sunken and outward protruding ‘stepped niche’ measuring 0.91 $\times$ 0.43 m. On the flat bottom, the remains of a beaten floor were preserved in places – grey hard earthen floor (Fig. 3: 5, 6). Below the floor, there was a thin sand layer with distinctive yellow mottles and streaks, just below a layer of geological subsoil gravel. The filling of the feature was grey-brown clay with an admixture of river pebbles, which produced marbled dark yellow veining in places. The feature in the southern part near the edge of the trench was disturbed by another feature, S.J. 3c_7c (?), but the more significant part was located south of the survey area. A horse grave (S.J. 3c_6a) and part of a hearth/oven were examined near it (S.J. 3c_7b). Two pieces of stone artefacts made of yellow–grey sandstone (2.5Y 7/2–2.5) were found directly in the fill of the sunken hut and from the layer above it (Pl. I). Both artefacts were oval, almost spherical with one flatter side and approximately the same size and weight (1. stone ball: diameter 8.8 cm $\times$ 10.0 cm, weight: 1.0198 kg; 2. stone ball: diameter 8.9 cm $\times$ 10.2 cm, weight: 0.9971 kg). One stone ball was found during the clearance of the area of Trench 3c after the removal of the humus layer in the area above the level of feature 3c_7. A second stone artefact was found during the removal of control Block 3, located in the fill space of the sunken portion of the same feature. At the same time, another larger stone in the “shape of a loaf” (dimensions: 20.1 $\times$ 17.2 $\times$ 9.5 cm; weight: 3.0956 kg) with one flat side with traces of working (semi-working/raw material) was found

on the floor of the feature, and it was made of the same type of sandstone, too. A smaller fragment of another artefact made of a different (harder and finer-grained) type of stone was also found during the excavation of Cut 4. The preserved worked part is oval rounded with a presumed diameter of ca. 7–9 cm (preserved dimensions: 8.0 × 3.9 × 5.0 cm).

THE ANALYSIS OF ARTEFACTS

The recovered movable finds based on analogues served as projectiles for Roman long range weapons. Two more giant sandstone stone balls (Pl. I: 1, 2) may have been used as munitions for a Roman military stone throwing machine called a ballista.⁴ In the case of the larger limestone, which is in the shape of a loaf, its interpretation is uncertain (Pl. I: 4). It may be, for example, a semi-finished stone or part of a raw material. Similarly, in the case of a smaller fragment made from a different type of stone, its exact functional assignment is questionable (Pl. I: 3). It may also be a projectile for a ballista or part of a stone weight.

Studies of ancient artillery rely heavily on literary evidence – for example, Heron (*On the Construction of Artillery*), Vitruvius (*On Architecture*), Vegetius, Ammianus Marcellinus, the anonymous author of the *De Rebus Bellicis* (*On Military Matter*), and Procopius – all include detailed descriptions of artillery pieces (Sarantis 2013, 170; detailed by Campbell 2004 also with relevant commentary). The terminology used is inconsistent and, in some cases, quite confusing. Ancient writers often used different names for the same weapons. This fact may theoretically indicate a change in terminology over time (cf. Chapman 2005, 53). The two main types of artillery used by the Roman army in the first century AD were the stone-thrower (*ballista*) and the bolt-shooter (*catapulta*). By the time of Trajan's reign, these static field pieces were supplemented by versions mounted on carriages (*carroballistae*), designed to provide mobile artillery that was employable in open battle. In the 3rd century, the onager, also called the *Scorpio*, was added, apparently becoming the main stone throwing engine by the time of Vegetius and Ammianus Marcellinus. By the fourth century, the term ballista had come to mean a bolt-shooter (Chapman 2005, 53). This new vocabulary for artillery is also found in Vegetius (detailed in Campbell 2011, 690).

Stone projectiles are attested in various parts of the Roman Empire but relatively rarely published. It is generally assumed that stones weighing less than 500 g are unsuitable for use as ballista missiles, and they were probably thrown by hand or shot with a slingshot (Arbiv 2023, 110). From the area of ancient Gerulata, only one such find has so far been recorded, but without known detailed finding context. It is identical in terms of the material used (sandstone) and dimensions – diameter ca. 9.5 cm (Krekovič 1994, 212). A fragment of a smaller artefact of round shape, made of limestone (diameter: 8.6 cm; weight: 605 g), was also found during archaeological research on Gerulatská Street in Bratislava-Rusovce. However, unlike the finds from the Manor House area, it has a hole dug in one of its sides, where a metal handle could have been fixed originally. From a functional point of view, it probably represents a weight (Varsik/Kuzmová/Schmidtová 1996, Taf. 5: 50). Weights with a hollowed-out cavity and with a preserved metal handle are known from some localities. At this point, however, it should be pointed out that several sandstone balls interpreted as ballista projectiles also had a partially excavated hole on one side (e.g. Beutler et al. 2017, 294, Cat. No. 500; Chirilă et al. 1972, Taf. LXIII: 2). Several projectiles made of stone and clay with a diameter of 7.4–12.5 cm have also been found in the auxiliary fort of the Carnuntum (Beutler et al. 2017, 294, Cat. No. 498–500; Tragau 1897, 203, Abb. 15). One find of a stone ball interpreted as a projectile is now exhibited in the Komáromi Klapka György Museum. The location of the discovery is mentioned as Komárom-Szőny Stadion, and it is roughly dated to the 1st to 4th century AD. A single limestone ball (diameter: 12.4 cm, weight: 1658 g) was found together with another Roman military equipment in the town centre of Poetovio (Janežic/Lazar 2015, 265, fig. 11). Several crudely worked stone balls were also found in the Ellingen Castellum (Zanier 1992, 285, Taf. 105). Rather sporadic finds of missiles (in stone or terracotta) are also known from the western provinces of the Roman Empire (e.g. Maldegem-Vake in the territory of present-day Belgium, Neiderberg in the territory of present-day Germany) or the territory of Britain – e.g. from Burnswark and High Rochester (Bishop/Coulston 2006, 135, 170, fig. 82; Campbell 2008, 38; Lemke 2013, 360; Reid 2016, 22; Streinu 2017, 264).

⁴ During the current excavation, another stone artefact was found a few metres away from Sector 3c, which resembles a ballista projectile in its form and dimensions.

There are several published finds of stone ballista projectiles from the province of Dacia – e.g. from Romita-Certiae (*Matei/Bajusz* 1997, 131, Taf. LXXXIV: 2), Moigrad-Pomet (Porolissum 1), Cășei (Samum) and from Buciumi, Babadag – Topraichioi (*Gudea* 2009, 232–235; *Streinu* 2017, 263). More detailed finds are also known from the area of the military fort in Buciumi, where a more significant number of missiles have been discovered directly in barracks 2, 4, and 5, dated to the 2nd–3rd centuries (*Chirilă et al.* 1972, 66). This type of militaria is also known as Capidava, one of the most important Roman forts erected during the massive effort to strengthen the Dobrogea limes at the beginning of the 2nd century AD (*Rațiu/Stoian* 2014, 319–335). At the same time, they are also known from other sites on the Lower Danube, e.g., at Abrittus, Sucidava, Hinova, Răcari, Pleșa, Drobeta, Arutela, Feldioara, Inlăceni, Brețcu, Arcobadara, Porolissum, Gherla, Mehadia, Celei, Bumbesti, Vărădia – Chilii and Bistret (*Lemke* 2013, 360; *Streinu* 2017, 264). An extensive assemblage of stone projectiles from the legionary fortress Novae was published a few years ago. Projectiles from Novae are not entirely spherical. Some were well rounded and fabricated, suitable for a ballista or onager. Others were made with much less care, sometimes “recycling” architectural elements or artefacts, such as a mortarium (*Lemke* 2013, 360). The study’s author does not rule out their possible application in defence of the city during the Middle and Late Roman Period when an increased number of barbarian attacks in the region were recorded. The mixed military and civilian inhabitants of Novae could have effectively used these stone projectiles together to defend the city against enemies if necessary. They thus could have at least partially recompensed for the smaller number of defenders, for example (*Lemke* 2013, 360). Stone missiles thrown by hand were a crucial defensive weapon in siege warfare. Stones could be thrown with one hand or dropped over the side of the wall with both hands. For example, the ancient writer Vegetius describes how legionaries used to practice throwing stones weighing up to one pound (0.3275 kg) by hand. These were presumably thrown with one hand and may indicate the possible weight of smaller hand-thrown projectiles (*Holley* 2014b, 49).

Several stone projectiles were also discovered in locations around the Black Sea area. However, it is difficult to unequivocally prove any link with the Roman army’s presence. Examples of such sites include Apsaros, Panicapaeum, Phanagoria, Iluration, Tauric Chersonese, Tasunovo, Artesian, Uzunlarskoe Gorodiše, Kepoi, and other smaller sites on the Taman Peninsula (*Kubrak/Aslanishvili* 2018, 109–112). The 128 stone projectiles from Apsaros can be divided into five groups in terms of their diameter, whereby the most numerous represented have diameters amounting to between 5.5 and 8 cm and a weight from 0.24 to 0.75 kg. (*Kubrak/Aslanishvili* 2018, 124–126). Some dozens of stone projectiles are also known from the Roman fortress on Ai-Todor Cape in Crimea. One hundred similar artefacts were also found in Artaxata, one of the ancient capitals of Armenia (*Kubrak/Aslanishvili* 2018, 111).

Stone projectiles are particularly abundant at well-fortified sites in the Mediterranean, the Near East, and Egypt, where the use of artillery in the conquest of fortified settlements was known in earlier periods (see e.g. *Campbell* 2003, 20). There is evidence from the Roman Period, for example, at the site of Qasr Ibrim. There are 652 stone ballista projectiles published to date, with the original total estimated at over 780 pieces, but some have been lost over time due to disturbance to the site (*Wilkins/Barnard/Rose* 2006, 76). As no siege ramp is attested at this site, it seems likely that the Roman military commander Petronius employed the tactic of heavy artillery fire before the actual assault when taking the fortified city (*Wilkins/Barnard/Rose* 2006, 66).

According to eyewitness testimony of Josephus Flavius, Vespasian, for example, reportedly followed a similar approach during the siege of Jotapata (Palestine) in 69 AD. Paradoxically, only a few dozen finds of stone projectiles are known directly from archaeological excavations of this site, most of which were no heavier than 2 kg. A considerable groups of stone ammunition have been found at the other sites besieged by the Romans during the Jewish War – Jerusalem, Gamala and Masada. However, the details of only 50 of the many hundreds found at Masada have been published (*Campbell* 2003, 36, 37). A. Holley, who published the *ballista* shot from Yadin’s excavations at Masada, notes that they were all found in loci on the northwest side of the mountain, that is, on the side facing the assault ramp. He concludes that the majority of the *ballistae* at Masada were small-calibre engines (scorpions or light artillery) used to provide cover fire rather than make a breach in the wall, confirming Josephus’ description (*Davies/Magness* 2017, 61; *Holley* 1994a, 347–365). The use of *ballistae* is also well documented archaeologically well documented in the city of Jerusalem. Stone projectiles were most recently recovered as a part of research on the part of the city’s fortifications (*Arbiv* 2023, 103–116) and also in the form of a selection from the site of Herod’s Palace in Jerusalem. The findings corresponded to 8 weight categories weighing from 0.5 kg to 26 kg. Gamalla, besieged by the Romans in 67 AD,

produced over 2000 ballista balls (Campbell 2003, 36, 37). A total of 1310 stones were recorded at Gamla. Most were found along the defensive wall and were then grouped by the excavators. The stone balls likely represent more or less the complete inventory of stone projectiles used at the siege (Holley 2014b, 37, 38). Three hundred rounded stone balls came to light in the Khirbet el-Maqatir excavations, distributed throughout the Bronze Age, Iron Age, Late Hellenistic, and Early Roman strata. While the largest was 1.96 kg, most balls weighed 250–350 g. Stones weighing over 655 grams could have been Early Roman ballista balls (Strecker/SeEVERS 2023, 303). Significant numbers of stone balls of different diameters were also recovered at Dura Europos (Bishop/Coulston 2006, 169, 170, fig. 108; James 1990, 101, 102).

The smaller terracotta, almost globular ball (Pl. III: 10), represents the projectile for the sling, according to the classification of Th. Völling belongs to its Type I (Völling 1990, 38, Abb. 22: I). Directly in Bratislava-Rusovce, a few finds of slingshot projectiles from the Roman Period have been obtained so far through several archaeological excavations (Kraskovská 1988, 134; Krekovič 1994, 211, 212, fig. 4: 8; Pichlerová 1990, 82; Schmidtová/Mathédesz 2019, 39, 68; Varsik 1996b, 555, Abb. 13: 6).⁵ The author mentioned above also collected most of the previously known published Type I clay projectiles, including well-dated pieces from the sites of Tharros, Haltern, Alphen, Pförring, Buciumi, Balmuidy, Bar Hill, Brough-on-Humber, Old Kilpatrick, Watercrock and Telița (Völling 1990, List 6). Pannonia also documented their occurrence in nearby Carnuntum (Beutler et al. 2017, 291, Cat. No. 493, 494). Soldiers were taught slinging as a matter of course during their training, presumably as a helpful skill to keep a reserve. However, specialists in this weapon seem to have been spread amongst the army in the garrison rather than kept together in one place (Bishop/Coulston 2006, 88).

In the ancient Mediterranean, the slingers (*funditores*) of the Balearic Islands are frequently mentioned in contemporary sources. According to experiments, optimal throwing accuracy is achieved at an angle of approximately 40°. The maximum range of a clay ball is 200 m, and that of a stone ball is up to 230 m. However, shooting is only effective up to a distance of 65 m, respectively 85 m (Pieta 2005, 48; Schmidtová/Mathédesz 2019, 22). Vegetius advocated using the sling and staff-sling on the end of wooden staves measuring 4 Roman foot (1.18 m) within legionary formations (Bishop/Coulston 2006, 88). Paradoxically, e.g. in the column of Marcus Aurelius, the sling is depicted in only one scene, and that too in the hands of two barbarians (Hrnčiarik/Ulický 2014, 63). In present-day Slovakia, we have evidence of using clay or stone projectiles from other periods and cultural environments. They are, for example, among the relatively common finds in hillforts and settlements of the so called Púchov culture (in detail Pieta 2005, 48, 49, Taf. 6).

DATING OF FINDS

In order to date the *ballista* and sling projectiles from the vicus research at Bratislava-Rusovce, we can rely solely on the context dating's of the accompanying artefacts (Pl. I–IV). Both settlements find assemblages belong to a waste area with high proportions of secondary to tertiary rubbish. The presumed significant proportion of unintentional cultural and natural transformations does not allow us to speak of a “sealed deposit” in the strict sense of the term. Find of the lower part of the cup (Pl. III: 4) with a so-called “sandblasted surface” (“*Becher mit Griefsbewurf*”) belongs to the group of wares referred to as “fine red-slipped ware with a gritty surface” (“*Keramik mit Griefsbewurf*”). The technique of sandblasting the exterior of pottery first appeared in the Rhineland under the Flavians. It lasted until the end of the Roman Period, while in Pannonia only until the beginning of the 3rd century, with the latest wares considered local imitations of Western shapes (Krekovič 1981, 358, 359). In the Carnuntum, this pottery form is attested in Period II (Gassner 1991, 275). Several cups have been found as part of grave goods in the cemeteries of Bratislava-Rusovce. This shape usually dates from the second third of the 2nd century to the end of the 2nd century AD (Gassner 1991, 275; Krekovič 1998, 9, Taf. 1: 12–15). Sherds of red-coloured (oxidised) ware (Pl. II: 11; III: 2, 3, 7, 15, 18; IV: 13) can only be tentatively dated to the 2nd to 3rd centuries AD. A few thin-walled fragments from the bodies of vessels, decorated on the surface with painted horizontal bands and thin engraved horizontal grooves or rows of short incisions made with a point chisel, belong to the group of so-called Pannonian striped ware (Pl. II: 14; III: 12; IV: 7). These are characteristic products of the potters in Pannonia in the Period from late 1st century to the second half of the 4th century. Most often, this technique was used to decorate a variety of jar or pot shapes. The red or

5 Another terracotta sling projectile was found within a few metres of Sector 3c during the current archaeological research.

brown paint is identical in composition to the coating on other pottery types, except that it was applied with a brush (Krekovič 1981, 353). The fragmentary character of the sherds only allows their tentative dating to the 2nd century to the first half of the 3rd century.

The relatively numerous fragments of rim sherds from the so-called grey coarse ware represent a chronologically less sensitive type of artefacts (Pl. II: 12, 13; III: 5, 6, 8, 9; IV: 1–6, 8–12, 14, 15). From the shape spectrum, lids, pot-shaped vessels and huge deep bowls with a horizontally or outward-sloping rim (the so-called “*Schüsseln mit Horizontalrand und Wandknick*”) are represented (Pl. IV: 1–3). Analogues to several of the finds can be found directly in Bratislava-Rusovce (Krekovič 1998, Taf. 9–15), but also e.g. in Carnuntum. This pottery type was produced with minor modifications throughout the Roman Period (cf. Krekovič 1981, 366). According to the classification of B. Petznek, two sherds of lids (Pl. II: 12; IV: 10) belong to Type 28 (the so-called “*Deckel mit rundem Rand und Innenabsatz*”), and they are among the oldest variants of this shape (Petznek 1998, 268, 269; 1999, Taf. 55). The rim of a pot-shaped vessel with a slanting outwardly flared rim (Pl. II: 13) has its closest analogy in Type 5.4 (Petznek 1999, Taf. 6:73), while a vessel with a triangularly flared rim (the so-called “*Töpfe mit Dreieckrand*”; Pl. IV: 4) in Type 6.1 (Petznek 1999, Taf. 7; 8; Krekovič 1998, 32). The upper part of another pot (the so-called “*Große Töpfe mit ausgebogenem Kolbenrand*”, Pl. IV: 5) belongs to Type 2 (Krekovič 1998, 33, Taf. 21; Petznek 1999, Taf. 1).

The more chronologically sensitive associated finds include, in particular, the tiny fragment of Samian ware (*terra sigillata*) found in fill feature S.J. 3c_4/8. Part of the rim of the conical cup of Drag. 33 (not illustrated) has a provenance in the Central Gaulish workshop and its presumed period of origin within the Antonine dynasty. The rim of a deeper bowl imitates the shape of Drag. 37 decorated on the outside and inside with delicate red-coloured marbling like ‘flames’ (Pl. III: 14) belongs to so-called marbled ware (“*Marmorierte Keramik*”), which was characterised by a specific surface treatment, which involved the application of red or brown slip with brush or sponge to imitate the appearance of marble. In finds assemblages, marbling is attested in the western provinces in the pre-Flavian Period, with Gaulish sigillata producers wanting to imitate glass vessels. In Pannonia, marbled wares first appeared at Emona during the middle of the first century AD, apparently connected to local pottery production (Krekovič 1981, 348; 1998, 14, 15; Vrba 2008, 268). By the traditional classification, the fragment from Bratislava-Rusovce belongs to an older (earlier) group of finds produced from the end of the 1st century to the end of the 2nd century, which were characterised by a higher quality surface finish (cf. Krekovič 1981, 348; 1998, 15).

One rim of a sherd belongs to a vessel referred to in the literature as a *turibulum* (Pl. III: 17). This form of pottery is however known under the names of *fruit dish*, *tazza*, *incense cup* or *censer* in English, *Räucherkelch* or *Räucherschale* in German and *calice à encens* in French (Mihailescu-Bîrliba 1996, 97). This pottery dates to the 1st to 4th century AD. Certainly, there are both early and late examples, but it appears most frequently in well-dated complexes between the middle of the 1st and the middle of the 3rd century AD (Mihailescu-Bîrliba 1996, 98). This type of vessel is also well attested at nearby Carnuntum, where it occurs regularly from the so-called Period 1 to Period 4 – i.e., from 50 to 300 AD. The find from feature S.J. 3c_4/8 has quite unusual profiling. The closest analogues in shape are dated to the Period 120 to 170/180 AD (Gassner 1990, Taf. 4: 19). A few fragments of *turibula* have so far also been found during other archaeological excavations in Bratislava-Rusovce (Krekovič 1998, Taf. 7: 5, 6; Varsik 1996a, Abb. 17: 8; Varsik/Kuzmová/Schmidtová 1996, Taf. 3: 22). The clay lamp belongs to the Loeschcke X type, while the open-channel lamps represent a younger variant of the firm lamps (Pl. II: 1). Throughout the long-term copying process, there were gradual changes in shape. The contours of the lamps gradually became more and more coarse, less pronounced and partly degenerated (Žundálek/Žundáleková 2012, 32). The absence of a sharp boundary between the body and the burner characterises the find from feature 3c_7. Morphologically, the lamp corresponds to shape B according to the classification of E. Alram-Stern (Alram-Stern 1989, 41). The maker’s mark is illegible. The letters are fused and form a continuous protruding band. Several such ‘marks’ can be found, for example, in the collection of the Danube Museum in Komárno (Žundálek/Žundáleková 2012, Cat. No. 72, 73, 76, 90, 92 108).

One fragment of a stamped tegula was also found in each of the two analysed settlement features. The tegula from feature 3c_7 has a preserved part of the inscription “[...] PIAF” placed in the inscriptional recessed field as a *tabula ansata* (Pl. II: 5). The interpretation of this mark is still unclear, as no precise analogues are found in the published literature known to our knowledge. Hypothetically, it could be an “atypical alternative variant” of the abbreviation of the honorary designation “*Pia Fidelis*” of the Xth Legion

of Vindobona, granted to it by Emperor Domitian in 89. The *Legio X Gemina* arrived in the Pannonian territory in 62, replacing the *Legio XV Apollinaris* in Carnuntum. It was transferred to Italy in 68 and returned to Pannonia around 101–102 again. Initially, its seat was Aquincum, but around 118 AD, it was transferred to Vindobona, where it remained until the end of the Roman administration of Pannonia (Dragun 2022, 70; Kraskovská 1991, 50). However, we do not have sufficient arguments to reliably identify the partially preserved stamped tegula with the military unit in question. In the fill of the second settlement feature, S.J. 3c_4/8, a tegula with the mark “LEG XV[....]” was found in a simple rectangular cartouche (Pl. III: 13). It represents a product of the XVth Auxiliary (*Apollinaris*) Legion, which was active in Carnuntum between 14 and 62. Subsequently, this unit was temporarily transferred to the east. After its return to Pannonia in 71, it operated again in Carnuntum until it was finally withdrawn from the Danubian area sometime between 117/118 (Neumann 1973, 11, 12; Turčan 2011, 27). Finds of stamped bricks of the XVth Auxiliary Legion are known not only from Bratislava-Rusovce (Kraskovská 1991, 51, fig. 8: 8, 9; Schmidtová/Mathédesz 2019, 47, 86) but also from the area of barbarian residences of Germanic elites built in the Roman manner – e.g. Stupava, Milanovce/Velký Kýr (Turčan 2011, 27; detailed in Brandl 1999, 204–206, Map 22). The occurrence of bricks with military troop markers does not automatically imply a direct link to the army environment. In the provinces, their occurrence in civilian buildings is also documented in several localities. The appearance of brick and tile with stamps of troops outside military forts was already noticed during the 19th century (Schmidts 2018, 169). The diversity of the conditions in the provinces makes it clear that it is nearly impossible to create one single explanatory model. For building ceramics, their later reuse cannot be ruled out. The secondary use of military bricks and tiles in civil contexts seems comprehensible, especially for regions with abandoned legionary forts (Schmidts 2018, 170). However, the dating of most of the remaining movable finds from the fills of both features is also consistent with the period of greatest settlement intensity at the site, which falls in the 2nd to 3rd (first half?) century AD.

DISCUSSION

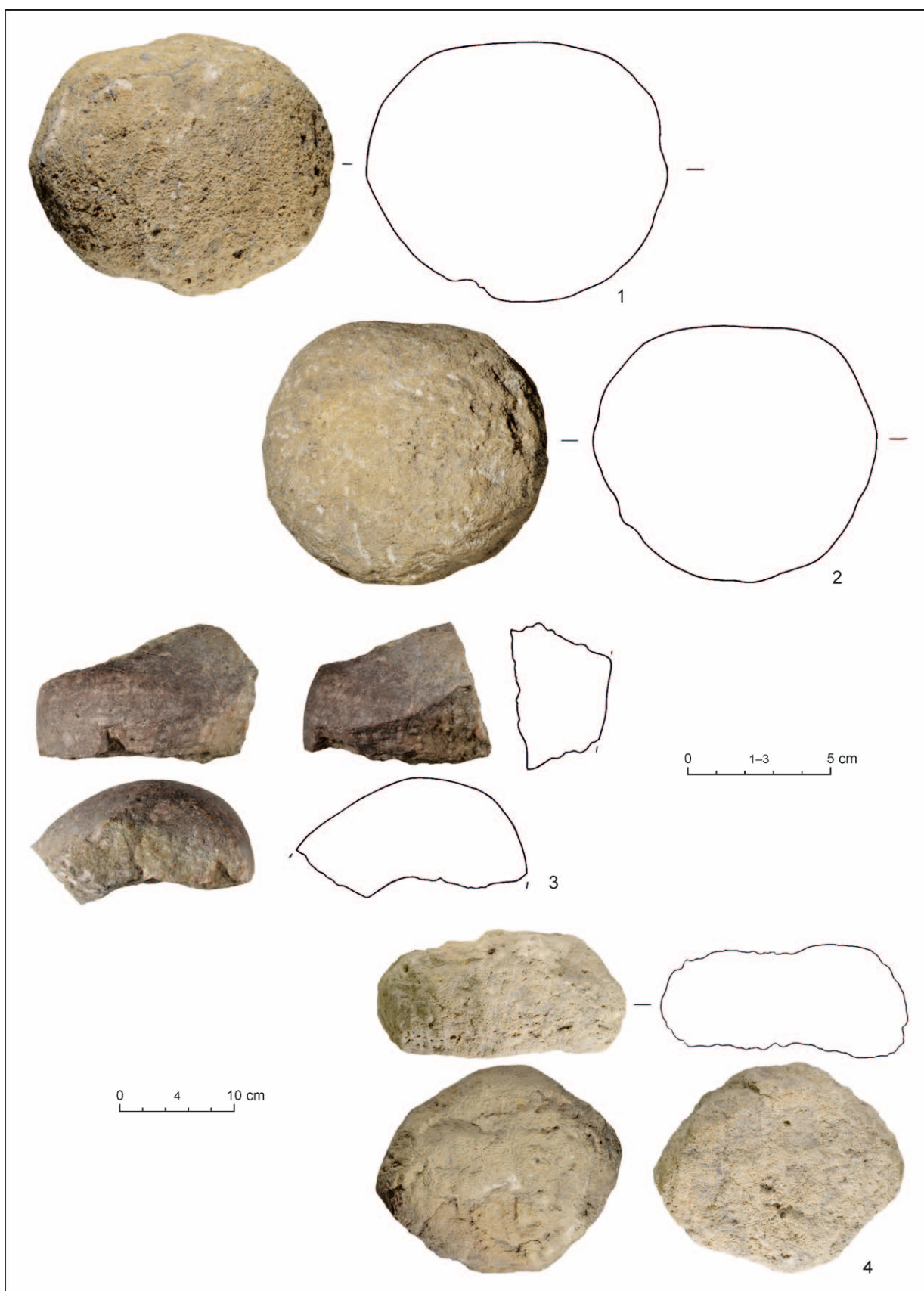
Several factors must be considered when interpreting the discoveries of military equipment recovered during the archaeological research of the Bratislava-Rusovce Manor House area. First and foremost, the exact finding context must be taken into consideration. Two stone ballista projectiles and one ceramic slingshot bullet were found in the fill of two sunken parts of the settlement features, where they had been deposited as secondary to tertiary waste. The associated findings allow the two stone ballista projectiles and one clay sling cartridge to be dated tentatively to the second half of the 2nd century to the first half of the 3rd century AD. The excavated contexts indicate that a previously unexamined archaeological part of the civilian settlement, the vicus, was located in this position, which also surrounded the military *castellum* on the south and southeast sides. From the area of Bratislava-Rusovce, we have so far published findings of military equipment from several positions (Dragun 2022, 78–80; Kraskovská 1988, 133–140; Krekovič 1994; Schmidtová/Mathédesz 2019, 36–52; Varsik 1996b, 550–558). Unsurprisingly, the largest concentration is recorded directly from the area of the soldier's fort. However, smaller numbers are also represented in other contexts, and exceptionally, they have even been deposited in graves as grave goods – e.g., one iron spear from cemetery II (Kraskovská 1988, 136; Krekovič 1994, 211). The investigated area within the Manor House is located relatively close to approximately 215–220 m as the crow flies from the southern gate of the fort. Projectiles for the *ballista* and one clay slingshot may have entered this part of the civilian settlement in several ways. The possibility that the artefacts were used by the Romans during the defence of the military base fort in an attempt to ward off an enemy attack is a possibility. Roman troops used *ballista missiles* in the siege and conquest of enemy-fortified settlements and the defence of military forts. The previously mentioned finds from Novae or Buciumi are interpreted this way (cf. Holley 2014b, 49; Lemke 2013, 360; Streinu 2017, 263).

According to the authors of the research at the second mentioned site (Buciumi), the presence of stone projectiles is probably related to the equipment of the fort garrison with several *ballistae*, which were placed on the platforms of some towers of the fortification (Gudea 2009, 227, 228, Taf. 5; Chirilă et al. 1972, 66, 67). With their precision, range, penetrative power, and rate of fire due to the use of the torsion principle, Roman artillery far exceeded the effectiveness of the archer's bow or sling (Beutler et al. 2017, 293). Other alternative interpretations must be considered at this point. They may have come to this position accidentally

and unintentionally, e.g. as part of waste disposal material. A larger stone artefact in the shape of a loaf was found on the floor of the sunken feature and, thus, theoretically, could represent part of its original inventory (?). If it is a semi-finished or uncompleted product, it could indicate the existence of a stone workshop in the vicinity. From Bratislava-Rusovce, we know of many stoneworks. Commonly, limestone was mainly used for their production, but also sandstone to a minor extent (see e.g. *Pichlerová 1990*, 69; *Schmidtová/Jezná/Kozubová 2005*, 36–44, 46–48, 50, 51, 55–61). In this respect, it should be mentioned that an undated horse grave (3c_6) was investigated near sunken feature 3c_7a, which was covered with a quarried stone of varying size with no trace of mortar. The remains or waste stone from the then non-existent stonemason's workshop, which had gradually accumulated in the vicinity, may (?) have been used to backfill the horse grave. The stone projectiles found from Bratislava-Rusovce show similarities with several published examples of this type of artefact. The preference for an easily workable and soft sandstone rock is consistent. There are also similarities in the preferred diameter of the stone spheres and their weight, corresponding to approximately three Roman pounds. The closest analogues of the stone projectiles are known directly from Bratislava-Rusovce and Carnuntum. At both sites, analogues to the ceramic slingshot are also attested (*Beutler et al. 2017*, 291, Cat. No. 493, 494; *Krekovič 1994*, 211, 212, fig. 4: 8; *Varsik 1996b*, 555, Abb. 13: 6).

CONCLUSION

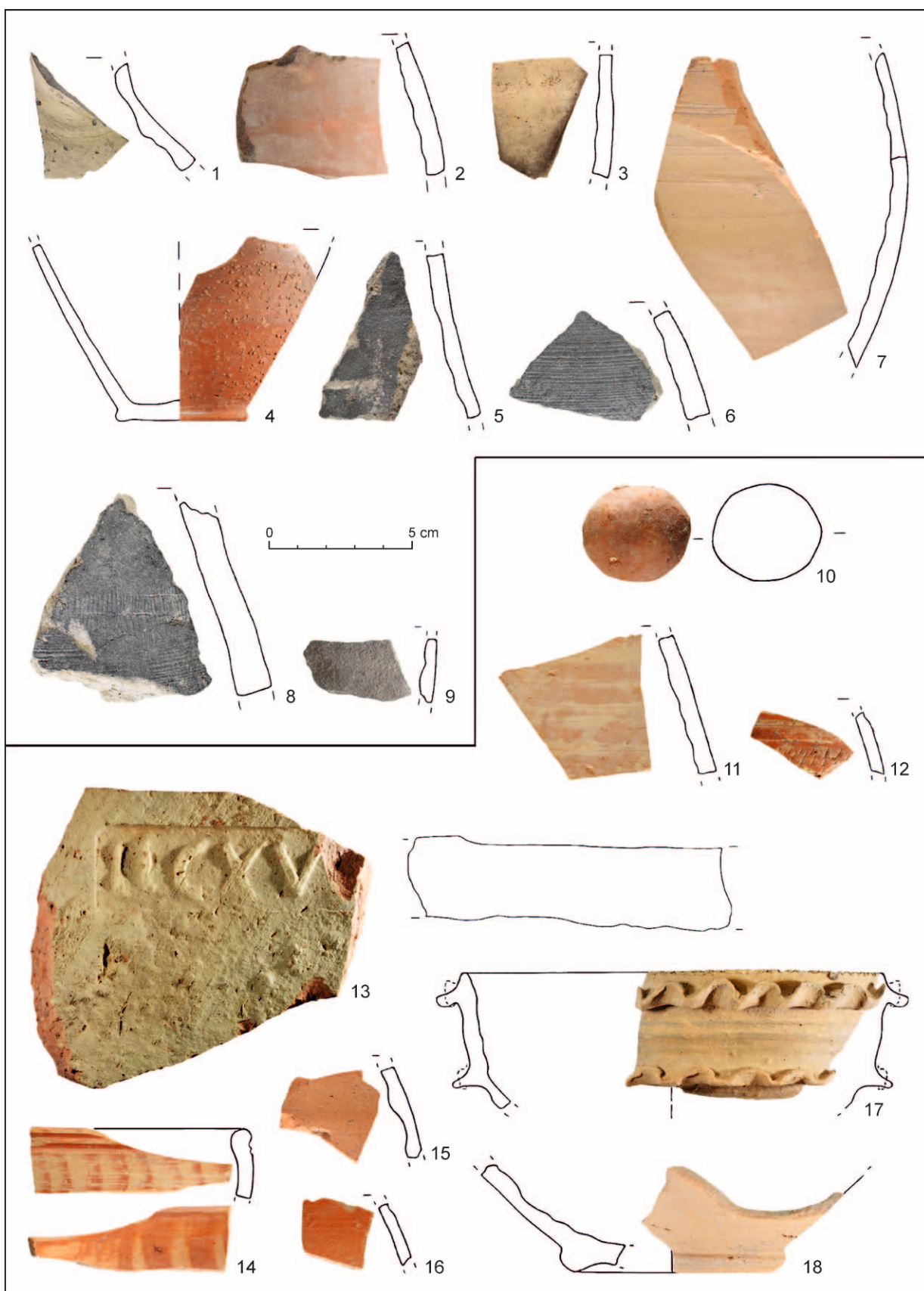
The study aimed to examine the finds of the slingshot and throwing machine projectiles (*ballista*) from the Roman Period, which were found in the area of the south-eastern part of the Bratislava-Rusovce civil settlement (ancient Gerulata), hitherto unknown in the published literature. The military equipment was found during a rescue archaeological research by the Department of Classical Archaeology of the Trnava University in 2018. The results of the field investigation in today's Manor House complex and its adjacent park in Bratislava-Rusovce, the original assumptions about the destruction of evidence of the Roman era settlement in this location are significantly corrected or directly refuted. Intensive Roman settlement occupation has been demonstrated in several locations. Although the construction of the Neo Gothic Manor House in areas with basements has largely destroyed most of the earlier features, there has been an artificial raising of the walking level in the immediate vicinity in the modern period. As a result, the older stratigraphic situations remained relatively well preserved despite several excavations and interventions in the 19th and 20th centuries. In the fills of the two partially excavated buried settlement features in Sector 3c, two larger stone projectiles of oval or almost circular cross-section made of sandstone and one smaller round terracotta ball were found amongst the usual settlement material (pottery fragments, clay lamp). Based on analogues, we assume that the two more giant stone balls served as projectiles for a throwing weapon called a *ballista*, while the smaller clay ball was intended as a projectile for a slingshot (*funda*). The accompanying finds tentatively date the military equipment to the 2nd or first half of the 3rd century AD.



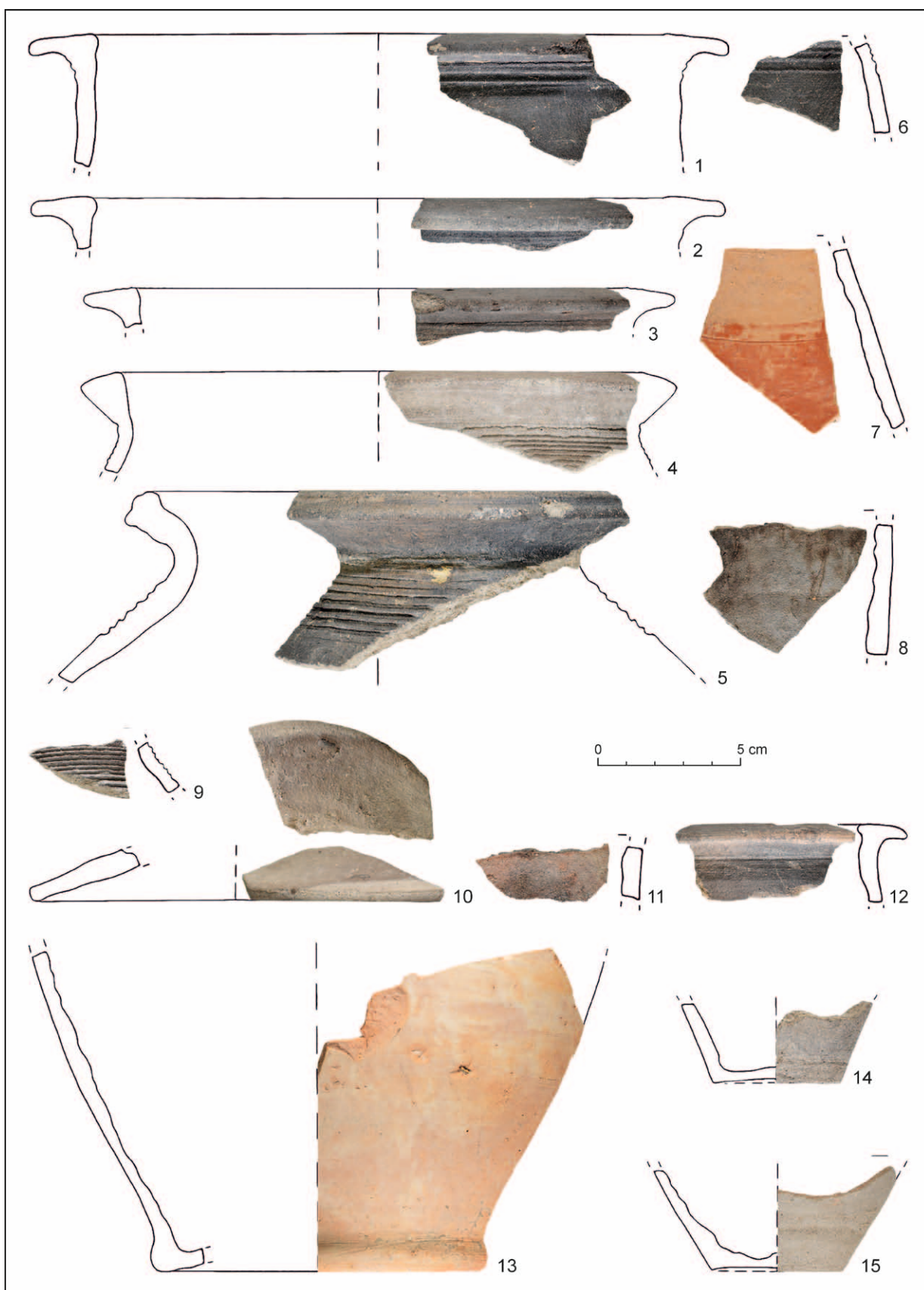
Pl. I. Bratislava-Rusovce. Selection of finds from the feature S.J. 3c_7a. 1, 2 – sandstone stone balls; 3 – a fragment of stone oval rounded artefact; 4 – larger a stone in the “shape of a loaf” (author T. Kolon).



Pl. II. Bratislava-Rusovce. Selection of finds from the feature S.J. 3c_7a. 1 – clay lamp; 2, 6 – iron construction fittings/a corroded iron key (?); 3 – glass; 4, 5, 7, 10 – ceramic building material (*tegulae*); 8, 9 – clay daub; 11–14 – pottery (author T. Kolon).



Pl. III. Bratislava-Rusovce. Selection of finds from the feature S.J. 3c_7a (1–9) and feature S.J. 3c_4/8 (10–18). 1–9, 11, 12, 14–18 – pottery; 10 – terracotta projectile for the sling; 13 – tegula (author T. Kolon).



Pl. IV. Bratislava-Rusovce. Selection of finds from the feature S.J. 3c_4/8. Pottery (author T. Kolon).

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Nálezy projektilov z juhovýchodnej časti vikusu rímskej pomocnej pevnosti v Gerulate

Tomáš Kolon – Erik Hrnčiarik

Súhrn

Predmetom štúdie bolo vyhodnotenie nálezov projektilov do praku a vrhacieho stroja z doby rímskej, ktoré sa našli v priestore dosiaľ prakticky neznámej polohy vo východnej a juhovýchodnej časti civilnej osady Gerulata. Militária sa našli počas zisťovacieho archeologického výskumu realizovaného Katedrou klasickej archeológie Trnavskej univerzity v Trnave v roku 2018. Výsledky terénneho výskumu v priestore dnešného areálu Rusoveckého kaštieľa a jeho prilahlého parku, pôvodné predpoklady o zničení starších dokladov osídlenia v tejto polohe výrazne korigujú, resp. priamo vyvracajú. Preukázané bolo intenzívne osídlenie z doby rímskej vo viacerých častiach (Sonda 1b, Sonda 2, Sonda 3, Sonda 4, Sonda 9 a minimálne z časti aj priestor vstupného nádvorja pod nepodpivničenými časťami staršieho zaniknutého kaštieľa – tzv. Sonda 5). Výstavba neogotického kaštieľa v miestach s podpivničenými priestormi síce z veľkej časti zničila väčšinu starších štruktúr, avšak v jeho bezprostrednom okolí došlo v novoveku k umelému navýšeniu nivelety pochádzajúcej úrovne. Vo výplniach dvoch čiastočne preskúmaných zahĺbených sídliskových objektov v priestore Sondy 3c sa medzi bežným sídliskovým materiálom (úlomky

keramiky, hlinená lampa) našli aj dva väčšie kamenné projektily oválneho, resp. takmer kruhového prierezu vyhotovené z pieskovca (diameter cca 8,8 cm × 10,2 cm) a jedna menšia okrúhla hlinená guľička (diameter 3,5 × 3,9 cm). Na základe analógií predpokladáme, že dve väčšie kamenné gule slúžili ako projektily do vrhacej zbrane zvanej *ballista*, kým menšia hlinená guľička bola určená ako náboj pre prak (*funda*). Sprievodné nálezy umožňujú ich rámcové datovanie do 2. storočia až prvej polovice 3. storočia po Kr.

Obr. 1. Bratislava-Rusovce. Lokalita na mape (podľa *Dragun 2022*, obr. 2; *Varsik 1996a*, 31, Abb. 8). Legenda: a – sektory/sondy; b – sektor/sonda 3c; c – sektory s potvrdeným osídlením z doby rímskej; d – sektory s pravdepodobným osídlením z doby rímskej.

Obr. 2. Fotografie plochy výskumného sektora/sonda 9. 1–3 – časti skúmanej plochy (sektor 9e) so zachovanými sídliskovými vrstvami a s podlahou z doby rímskej (autor T. Kolon, E. Hrnčiarik).

Obr. 3. Fotografie plochy výskumu sektor/sonda 3c. 1 – fotografia výkopu 3c; 2, 3 – fotografie objektu SJ 3c_4/8; 4–6 – fotografie objektu SJ 3c_7a (autor E. Hrnčiarik).

Obr. 4. Plán plochy výskumu sektor/sonda 3c (autor T. Kolon, E. Hrnčiarik).

Pl. I. Bratislava-Rusovce. Výber nálezov z objektu S.J. 3c_7a. 1, 2 – pieskovcové kamenné gule; 3 – fragment kamenného oválneho zaobleného artefaktu; 4 – väčší kameň v „tvare bochníka“ (autor T. Kolon).

Pl. II. Bratislava-Rusovce. Výber nálezov z objektu SJ 3c_7a. 1 – hlinená lampa; 2, 6 – železné stavebné kovanie/korodovaný železný kľúč (?); 3 – sklo; 4, 5, 7, 10 – keramický stavebný materiál (tegulae); 8, 9 – hlinená mazanica; 11–14 – keramika (autor T. Kolon).

Pl. III. Bratislava-Rusovce. Výber nálezov z objektu SJ 3c_7a (1–9) a objektu SJ 3c_4/8 (10–18). 1–9, 11, 12, 14–18 – keramika; 10 – terakotový projektil do praku; 13 – tegula (autor T. Kolon).

Pl. IV. Bratislava-Rusovce. Výber nálezov z objektu S.J. 3c_4/8. Keramika (autor T. Kolon).

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