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A HOARD OF PROTOMILIARENSES (?) OF CONSTANTINE I WITH CRISPUS AND CONSTANTINE II CAESARS FOUND NEAR THE NORTHERN FORTRESS WALL OF SERDICA

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A Hoard of Protomiliarenses (?) of Constantine I with Crispus and Constantine II Caesars found near the Northern Fortress Wall of Serdica

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Abstract: In 2019, a hoard of 92 identical coins, struck from the same pair of dies at the Sirmium's mint, was discovered during the archaeological excavations north of the Serdica's fortress wall. These coins were minted in 320, and were hidden soon after in a shallow pit next to a wooden pillar of a building within the so-called northern extension of the city – Serdica II. The ongoing political crisis in the Roman Empire at the time, particularly the conflict between Emperor Constantine I (r. 306–337) and Emperor Licinius I (r. 308–324), was the likely reason for the hoard to be deposited in the ground.

The coins belong to the CONSTANTINVS MAX AVG and CRISPVS ET CONSTANTINVS CC, SIRM type, corresponding to RIC VII, 14 (Bruun 1966, 469), and were initially classified as miliarenses (Стоянова 2020, 761). Numismatic catalogues describe them as “small medallions”, despite the absence of any ceremonial imagery. The discovery of an entire series of identical specimens strongly suggests that they were part of the regular monetary system rather than ceremonial issues.

X-ray analysis reveals that the coins contain only small amounts of silver, 2–3% in the core and up to 6.4% near the surface. The total ratio of white metals (silver, tin, lead and antimony) is about 14% in the core and up to 30% near the surface, indicating that they underwent additional acid pickling to create a silver appearance. Their composition and manufacturing align more closely with folles than with miliarenses, but their weight (average 6.50 g) is double that of their contemporary folles, which had already been reduced in mass to 3.40 g by that time. Given this, we suggest that these coins represent a distinct or transitional denomination – possibly a “protomiliarenses”. Based on economic analyses of the period, we estimate their value at 50 *denarii communes* each (the accounting unit standardised after Diocletian's *Edictum de Pretiis* in 301), or a total hoard value of 4,600 *denarii communes*.

Keywords: Protomiliarenses, Serdica's hoard, Constantine I, Monetary system, X-ray analysis.



Historical context of the hoard from Serdica. Other hoards from the same period

During archaeological excavations near the northern fortress wall of the ancient city of Serdica, a remarkable coin hoard was discovered, consisting of 92 identical copper-alloy coins, purposely hidden in the ground in the first half of the 4th century. Similar finds from the same period have been discovered elsewhere in southwestern Bulgaria. These hoards vary in size and are mostly consisting of folles. Some of the hoards¹ originate from graves, and should be considered as grave offerings, while others² can be defined as a treasure deposits in the ground. At least two of the finds, those from Karnalovo and Chukovezer, and probably the one found along the middle course of the Struma River, were likely buried as a consequence of the First Civil War between Licinius I (r. 308–324) and Constantine I (r. 306–337), after the battle of *Campus Martiensis* (modern-day Harmanli, southern Bulgaria) in late 316–early 317 (Borislavov et al. 2019, 596, 599).

The early decades of the 4th century were a time of political crisis in the Roman Empire. Power was divided between four Augusti,³ each of whom pursued their own policies to achieve supremacy. Initially in alliance, Constantine I and Licinius I succeeded in defeating Maxentius (r. 306–312) in 312 and Maximinus Daia (r. 305–313) in 313, effectively ending the Tetrarchy. However, they then began to dispute territories among themselves, leading to the First Civil War (316–317), which ended in victory for Constantine I. The Balkan provinces, with the exception of Thrace, were then finally annexed to his western territories. In a demonstration of his growing authority, his sons Crispus (r. 317–326) and Constantine II (r. 317–340) were proclaimed Caesars of the Western Empire, as was Licinius I's son, Licinius II (r. 317–324), who was made Caesar of the Eastern Empire (Bruun 1966, 76). However, the discord between the two emperors continued in the following years. After a series of military conflicts, known as the Second Civil War, which culminated in the Battles of Adrianople (Eastern Thrace) and Chrysopolis (northwestern Asia Minor), Constantine I ultimately emerged victorious. He became the sole ruler of the whole empire in 324 (Bruun 1966, 77).

The years of conflict in the first quarter of the 4th century, however, led to relative instability and feelings of insecurity among the population. Maintaining the army and providing for the imperial administration consumed considerable financial resources, while commodity inflation continued to rise despite the Edict of Maximum Prices (*Edictum de Pretiis Rerum Venalium*) issued by Emperor Diocletian in 301, which was engraved on the buildings around the larger markets (Cope 1977, 220). Speculation was rampant in the empire, while the supply of gold and silver needed to mint new coins declined, further devaluing the currency. As a result, the tax burden on landowners, livestock farmers, merchants, and artisans increased to the point that many started to hide their additional income, in line with the principle of “saving for a rainy day”.

¹ See the coin hoards from Zabel, Tran Municipality (Владимирова-Паунова 2003, 215–225), Nedelkova Grashitsa, Nevestino Municipality (Юркова 1985, 61; Филипова 2020, 135–137, 244–245), Koprivlen, Hadzhidimovo Municipality (Аладжова 2002, 261–273), and from the vicinity of the necropolis near Krivonos, Breznik Municipality (Филипова 2020, 183, 241).

² See the coin hoards from Erul, Tran Municipality (Филов 1910, 229; Гепов 1961, 329), Karnalovo, Petrich Municipality (Филипова 2010, 85–98), Chukovezer, Dragoman Municipality (Borislavov et al. 2019, 592–606), and one found in the region of the middle course of the Struma River (Филипова 2012, 33).

³ In 308, the Tetrarchy established by Emperor Diocletian (Emperor of the East, 284–306) as a system of sharing and transferring power began to collapse as the heirs to the throne competed for greater control and influence, including by restoring the hereditary succession. At this point, the empire was ruled by four Augusti – Emperor Galerius (r. 293–311) and Emperor Maximinus Daia (r. 305–313) in the eastern provinces, and Emperor Constantine I (r. 306–337) and Emperor Licinius I (r. 308–324) in the western provinces. Following the death of Galerius in 311, power was redistributed – Licinius I secured control over the Balkans, Pannonia and Illyria, while Maximinus Daia took control over Asia and Egypt; Constantine I ruled the westernmost provinces, while Italy and Africa were occupied by Maxentius, the son of Emperor Maximian (Diocletian's Co-Emperor in 286–306), who unlawfully proclaimed himself Caesar in 306, and later Augustus (Vagi 2015, 447–451).

The preferred hiding place was often underground, where *decuriones* (regional tax collectors) would not find them. This repressive and uncertain environment of the Roman Empire likely led to a surge in coin hoarding, with numerous hoards discovered across modern-day Bulgaria, for example at Arnautito (Stara Zagora Municipality), Balchik, Bliznak (Malko Tarnovo Municipality), Gita (Chirpan Municipality), the ancient settlement of Nove (Svishtov Municipality), Razboyna (Ruen Municipality) (Филипова 2020, 235), as well as the already mentioned finds at Karnalovo (Petrich Municipality), Chukovezer (Dragoman Municipality), Erul (Tran Municipality), or the one from the middle course of the Struma River. Considering this historical context, the hoard of coins discovered immediately north of the Serdica's fortress wall fits within the same pattern of concealment and economic uncertainty.

Archaeological context of the hoard from Serdica

The Serdica coin hoard was discovered during rescue archaeological excavations at 35 Ekzarh Yosif Str. in Sofia (**Fig. 1**), carried out between 2017 and 2020.⁴ At this site, part of Serdica's northern fortification system was uncovered, including a main fortification wall with a triangular tower and an additional outer fortification wall, known as the *proteichisma*, located approximately 20 m in front of the main wall (**Fig. 2**). This defensive system remained in use until the late 5th or early 6th century, when significant modifications were made. In addition to the construction of the *proteichisma*, the main fortification was reinforced with a second defensive belt built entirely of bricks,⁵ in contrast to the original wall, which was constructed using the *opus mixtum* technique. Both walls were approximately 2 m thick, a total of about 4 m (Стоянова 2019, 283–284; Стоянова 2020, 758–759).

The first fortification of Serdica was built in the 2nd century following a devastating invasion by the Costoboci tribe, as evidenced by epigraphic inscriptions placed at the city gates (Станчева 1972, 51–54; Станчева 1975, 30–36). At 35 Ekzarh Yosif Str., south of the fortress wall, excavations have uncovered the architectural remains of a representative building with a stylobate, dating to the 2nd–3rd century (**Fig. 2**) (Стоянова 2020, 762). During the same period, the fortification wall was further reinforced by a defensive ditch located approximately 5 m in front of its outer face. However, after the mid-3rd century, the ditch was no longer in use, and the space to the north was actively occupied (Стоянова 2020, 760).

Immediately south of the *proteichisma*, at a depth corresponding to its foundation level, horizontally placed beams were discovered (mean elevation: 535.20 m⁶), which were used as foundations for buildings (**Fig. 3.1**) (Стоянова 2019, 284; Стоянова 2020, 761). Some of these beams intersect at right angles, forming rooms of various sizes and orientations aligned with the cardinal directions. In certain areas in the corners of the rooms, remnants of wooden support pillars were documented, along with a low wattle fence of beech and hazel.⁷ To the west, the timber beams were positioned at a slightly higher elevation (mean elevation: 535.40 m) than those to the east (**Fig. 3.2**), indicating that they were later. These beams formed two more rectangular spaces. However, no clear boundaries for the series of rooms on either level were identified to the west or east, and to the south, only remnants of wooden pillars arranged in a row were found, likely serving a structural or load-bearing function in the buildings' architecture. Immediately adjacent to one of these pillars, on its southern side, a hoard of 92 coins was discovered within

⁴ Scientific supervisor of the archaeological excavations is Polina Stoyanova, Regional History Museum of Sofia, co-author of this publication.

⁵ This reconstruction is most often attributed to the building activities of Justinian I (r. 527–565), as described by Procopius of Caesarea in his treatise *"De aedificiis"*. There the author states that, along with other cities such as *Naisopolis*, *Germaê* and *Pantalia* (Pautalia), the walls of Serdica had deteriorated *"from the passage of time"*. He further notes that Emperor Justinian I *"built them up securely and made them such that they could defy the enemy"* (Procop., Aed. 4.1.31).

⁶ The measured depths are in meters according to the Baltic Height System.

⁷ The identification of the wood from the wattle fence was made by Assoc. Prof. Tsvetana Popova, National Archaeological Institute and Museum of the Bulgarian Academy of Sciences, for which we thank her.

a shallow pit, 15–20 cm below the walking level (**Fig. 3.1; 3.3**), all of the same denomination, bearing the effigies of Emperor Constantine I, along with his sons Crispus and Constantine II as Caesars, minted in Sirmium.

Based on the finds uncovered in the excavations, the two wooden buildings were dated to the late 3rd or early 4th century (the earlier structure) and the first quarter of the 4th century (the later structure). Subsequently, the occupation level of the site was raised by approximately 50 cm, and the area immediately north of the fortress wall was once again designated primarily for security purposes. This is evidenced by the construction of the *proteichisma*, with only a drainage sewer dug in the space between it and the main defensive belt, featuring stone walls and a brick-paved (mean elevation: 535.10 m) (Стоянова 2020, 759) (**Fig. 2**).

In relation to the archaeological situation, it is important to note that the location and dating of the wooden buildings coincide with the territory and period of existence of the so-called Serdica II – the northern expansion of the core of ancient Serdica, whose exact purpose remains unclear. Regardless of its intended function, what stands out is the enormous size of this extension, covering approximately 550–600 dca – three times larger than the already fortified area – without parallel in any other Roman province (Динчев 2013, 259–260). The scale of the project may be explained by megalomaniacal imperial ambitions, as the rulers of this period were known for their struggles to assert power, whether shared or absolute, as well as their aspirations to create a ‘New Rome’ in territories they ruled. In 270, following an administrative reform, Emperor Aurelian (r. 270–275) designated Serdica as the capital of *Dacia Mediterranea*, increasing the city’s political and economic significance. The northern expansion of Serdica may have begun during his reign, but it is more likely that it was initiated later, under Emperor Galerius (r. 293–311), who was born in Serdica and frequently resided there, or under Emperor Constantine I (r. 306–337), who made Serdica one of his main residences after 313. It is logical that after Constantine I chose Byzantium as his capital in 324, this construction initiative was ceased and the resources were rerouted towards the new main city.

The wooden buildings documented north of the Serdica’s fortress wall are undoubtedly connected to the planned large-scale construction of the northern fortification. As a possible hypothesis, these structures may have served as temporary housing for the builders involved in the project and their families. The location is convenient, being close to both the city and the construction site. However, once the construction project was abandoned, the authority’s patronage over the workers likely disappeared, leaving them and their families vulnerable. In this context, it is possible that historical events led to the destruction of the buildings, preventing the owner of the coin hoard from reclaiming the hidden treasure – suggesting that he may have perished before retrieving it.

An intriguing detail that adds to the archaeological context is the discovery of an irregular grave (elevation: 535.43 m) north of the wooden remains, on the opposite side of the *proteichisma*, belonging to a woman aged 25 to 35 years (**Fig. 4.1; 4.2**) (Стоянова 2019, 284). The numismatic material found in the surrounding layer dates entirely to the 4th century. This period is also supported by the results of radiocarbon dating of skeletal remains (**Fig. 5**), which fall within the broad chronological range from the middle of the 3rd to the middle of the 5th century.⁸ With greater probability (59.1%), the date can also be placed within the narrower range from the 330s to the early 5th century, i.e., in the period after the coins from the hoard were minted.

The skeletal remains were positioned south-north (head to the south), with legs bent at the knees and randomly placed arms. Anthropological analysis⁹ revealed bone abnormalities, possibly congenial (*osteogenesis imperfecta*) or acquired (rickets). However, the cause of the death of the woman was violent – she suffered an entrance wound to the right temporal bone

⁸ Radiocarbon dating was performed at the SUERC Radiocarbon Laboratory, Glasgow University, Scotland. Laboratory code: SUERC-134248 (GU71614).

⁹ The anthropological analysis was performed by Assist. Prof. Dr. Nadezhda Atanasova, Institute of Experimental Morphology, Pathology and Anthropology with Museum of the Bulgarian Academy of Sciences, for which we thank her.

and a blow to the right parietal bone, both of which were determined to be potentially fatal injuries. The skeleton was found directly on a layer rich in organic material (decayed wood with admixtures of sticks, straw and twigs) with relatively defined boundaries (**Fig. 4.3**). Given the wooden structures of the same period just to the south, this layer likely represents the remains of a destroyed building. Considering these findings and radiocarbon date, it is reasonable to speculate that the circumstances of the woman's death may be directly linked to the abandoned coin hoard.

Description of the hoard

The Serdica's hoard is remarkably uniform in both its metal composition and the face value of the coins. It consists of 92 copper alloy coins, discovered just below the walking level associated with the early 4th-century wooden building. The coins were clustered in a small hole on the south side of a wooden pillar (**Fig. 3.1; 3.3**), with some specimens even adhering to the surface of the pillar itself. Notably, no traces of textile were found on or around the coins. Due to high groundwater levels and prolonged exposure to a humid environment, the coins had undergone significant corrosion, resulting in thick deposits on both sides. After cleaning, their condition ranged from very poor to near excellent.¹⁰ The coins were minted using classical striking technique, employing upper and lower dies. This is evidenced by characteristic cracks along the uneven edges of some specimens (e.g., see catalogue No. 1), which were likely caused by the strong impact of the striking process. These cracks are common when the coin cores are alloyed to produce higher hardness metal intended for long-term circulation.

The coins from the hoard found near the fortress wall of Serdica were minted from a billon alloy and date to the reign of Emperor Constantine I (r. 306–337), with his portrait appearing on the obverse, while his sons, Crispus¹¹ and Constantine II¹² are depicted as Caesars on the reverse (see the catalogue below). Notably, the head of Crispus (left) appears larger and with more mature facial features, reflecting his age of approximately 21 at the time of minting. In contrast, his half-brother Constantine II, only 8 years old, is depicted with softer and more youthful features. The mintmark 'SIRM' beneath the Caesars' portraits indicated that the coins were struck at the Sirmium's mint, which was established in 320, closer to the border with the Eastern Empire,¹³ when Constantine I began preparing for a military campaign against Licinius I. It remained in operation until 326, two years after Constantine's final victory over Licinius, at which point it was closed (Божкова 1994, 134; Bruun 1966, 462).

The depiction of Constantine I and his sons as co-rulers on coinage became possible in 317 at the earliest, following a temporary peace treaty with Licinius I, known as the Serdica's Peace, when Crispus, Constantine II, and Licinius II were elevated to the rank of Caesars by their fathers (Bruun 1966, 76). This event was commemorated at the time with the issuance of gold coins and medallions, but the first silver coinage featuring the three rulers of the Western Empire only appeared after the Sirmium's mint began operations (Ramskold, Gautier 2017, 268). Constantine I's ambitions to unite the Roman Empire under his sole rule likely led him to propagate his influence through such coin series, though issued in smaller quantities, as evidenced by the limited number of specimens found. These coins were primarily minted in silver and silver alloy – their denomination being the miliarenses. At times, they were also distributed as ceremonial gifts to the Emperor's

¹⁰ The restoration and analysis of the condition of the coins were carried out by Emiliya Koleva, metal conservator at the Regional History Museum of Sofia, for which we thank her.

¹¹ Flavius Julius Crispus was the son of Emperor Constantine I from his marriage to Minervina (his first wife).

¹² Flavius Claudius Constantine II was the eldest of the three sons of Emperor Constantine I from his marriage to Flavia Maxima Fausta (his second wife), daughter of Emperor Maximian, who married her to him as a sign of allied support during the Tetrarchy.

¹³ Between 320 and 324, in the period leading up to his military battles with Licinius I, Constantine I established his military headquarters in Thessalonica. However, he frequently resided in Sirmium, which served as his official capital at the time, as well as in Serdica (Божкова 1994, 134; Bruun 1966, 76–77; 462).

supporters and soldiers (Harl 1996, 161–162). However, the coins under examination in this study are not made of silver alloy. While their compositions contain some silver, the amount is too minimal to define the alloy. A detailed elemental analysis of the coins follows below, but it is worth noting that the composition of their alloy makes them a special and rare case compared to typical Roman coinage from the reign of Emperor Constantine I.

One further feature sets the coins from the Serdica's hoard apart from other specimens of the same type: a spelling error appears in the reverse legend. The name of Caesar Crispus is written as 'CRSPUS', with the letter 'I' missing. Spelling mistakes like this, however, were not unusual for the period, most likely resulting from the carelessness or limited literacy of the engravers. Another possible explanation is that the coins were produced as contemporary imitations. Yet, in this specific case, their discovery – deliberately buried in the ground – and the absence of signs typical of unofficial issues (such as poor iconographic execution, illegibility, or factual inconsistencies), as demonstrated in the analysis below, make such a theory unlikely. On the contrary, there are plenty of examples of misspellings in coin legends even in official Roman mints, including the name of Crispus – for instance, in issues struck in Rome itself (**Fig. 6**).¹⁴ Moreover, considering that the reverse type in question had only just begun to be issued, it seems improbable that imitative copies would have emerged so soon.

After the removal of surface deposits and cleaning of corroded areas, the diameter of the examined Serdica's coins ranges from approximately 19 to 23 mm, with an average weight of 5.30 g. In addition, due to corrosion processes, some coins also have minor chipping along the edges. All this suggests that their original weight was slightly higher, likely up to around 7.0 g, corresponding to the best-preserved specimen in the hoard. However, given the current metric data, it is difficult to accurately determine the exact weight variation from their original mint condition.

Denomination of the coins from the hoard

Initially, based on stylistic similarities of both sides of the coins with known silver-alloy specimens from the literature and digital catalogues, the Serdica's hoard was classified as being made up of *miliarenses*¹⁵ (Стоянова 2020, 761). Even then, however, it was suspected that the coins contained only a minimal amount of silver. Subsequent analysis confirmed that the silver content is even lower than expected. Furthermore, the absence of other identical examples with the same stylistic characteristics led to the conclusion that these coins might represent a previously undefined¹⁶ denomination – a “protonominal” form (transitional nominal), and in this particular case a “protomiliarenses”.

Considering the historical context, it is important to note that after the abolishing of the *argenteus*,¹⁷ which was minted after Diocletian's monetary reform of 294, no genuine silver coins were minted during the early reign of Constantine I (Handy 1985, 466; Bruun 1966, 4). Silver coinage reappeared after 323, with the introduction of the *miliarensis* and *siliqua*¹⁸ at the mint

¹⁴ We are grateful to Mr. Lars Ramskold, independent researcher based in Stockholm, Sweden, for drawing our attention to these examples and kindly providing his photographs to illustrate this fascinating aspect of Roman coinage.

¹⁵ The name *miliarensis* literally means “part of a thousand” (from the Latin word *miliarius*, translated as thousand). The *miliarenses* are silver coins introduced by Emperor Constantine I, with a theoretical weight of 4.55 g, or 1/72 of a silver *libra* (the *libra* is also referred to as Roman pound and weighs about 327.45 g), equivalent to 1/1000 of a gold *libra* (Bruun 1966, 4; Филипова 2020, 18). The basis of the new coinage reform imposed in the provinces of Constantine I after 312 was the gold *solidus*, also weighing 4.55 g, or 1/72 of the gold *libra* (Bruun 1966, 2–3; Филипова 2020, 17).

¹⁶ It should be noted that the actual name of most coin denominations from this period remain unknown. Researchers have assigned names based primarily on the materials used in their production and their weight in relation to each other.

¹⁷ The name comes from Latin and means “of silver”. The theoretical weight of the *argenteus* is 3.41 g or 1/96 of a silver *libra* (Lafaurie 1975, 78).

¹⁸ The term originates from the Latin name of the Carob tree (*Ceratonia Siliqua*). The tree's seed had a

of Sirmium, where the Serdica's hoard was produced (Bruun 1966, 7). It has been suggested that before this time, the large bronze coins, the folles,¹⁹ which had been reduced to 3.40 g after 312, may have been equated in value to the disappearing argenteus (of similar weight), but to maintain public confidence these coins underwent additional surface treatment to produce a silvery appearance (Bruun 1966, 11, 13). Whether the Serdica's coins were meant to mimic a theoretical silver denomination like the miliarensis or held a distinct value of their own remains uncertain. They resemble pre-312 folles in size and exhibit surface enrichment with white metals (to be discussed in the next section); however, their iconographic and historiographic attributes clearly place them in a different nominal category.

The closest known coin series featuring Constantine I (bust with head right on the obverse), Crispus and Constantine II (confronted bare heads on the reverse), and with the identical legend – *CONSTANTINVS MAX AVG* and *CRISPVS ET CONSTANTINVS CC, SIRM* – corresponds to *RIC VII, 14* (Bruun 1966, 469). However, the catalogue description classifies this series as a “small medallion”,²⁰ struck from an alloy with scant traces of silver (“very base metal”) (Bruun 1966, 466). Despite this, it is considered a potential early attempt at a new silver coin (Bruun 1966, 4). Another example of “small medallion” of this type, but in bronze, was listed in the 1989 Numismatik Lanz auction catalogue (*Münzen der Antike* 1989, 69, No. 830). Its entry references P. M. Bruun's 1966 “*The Roman Imperial Coinage*, 7”, and H. Cohen's 1888 “*Description historique des monnaies frappées sous l'empire romain communément appelées médailles imperiales*, 7”, where the issue is described as having poor silver quality, and some of the specimens are even supposed to have been struck entirely from copper alloy (Cohen 1888, 320, No. 3), i.e., with silver content indistinguishable to the eye. To account for that, for the “small medallion” in Numismatik Lanz's 1989 “*Münzen der Antike*” is suggested the possibility of silver plating, a technique also generally observed in folles.

Medallions were commonly used as commemorative or ceremonial tokens (Sutherland 1967, 105), often minted to mark significant events in an Emperor's reign. While their designs resembled standard coinage, medallions were larger, heavier, and more detailed. Their rarity and uncertain circulation as actual money have led to ongoing debates about their function (see Dictionary of Roman Coins 1889, 548–551). The term ‘small medallion’ appears to have been introduced for coin-like tokens that, while smaller than traditional medallions, still met the criteria for rarity and extraordinary, and exceeded the standard coin denominations of the time. The Serdica's coins match the weight of their contemporary folles, but their mass is one and a half to two times greater (given that corrosion has likely reduced their original weight, we assume that the initial weight was closer to double). However, does this alone justify their classification as ‘small medallions’?

If we return to the type of Constantine I and his sons Crispus and Constantine II as Caesars, we can draw the following conclusions. There is undoubtedly information on the coin about an

relatively consistent weight of 0.19 g (1/24 of a gold solidus), which led to the use of *siliqua* as a unit of weight. Additionally, the name was later applied to a small silver coin introduced by Emperor Constantine I, valued based on its weight in gold. The theoretical weight of the *siliqua* is 3.41 g or 1/96 of a silver *libra* (Bruun 1966, 4).

¹⁹ The follis introduced by Emperor Diocletian, initially contained about 4% silver in its alloy (Sutherland 1967, 94). Over time, its weight decreased significantly, from 8.50–11.0 g in the late 3rd century to 6.80 g (1/48 of the *libra*) after 307, and further to 3.36 g (1/96 of the *libra*) after 312–313. Its diameter also shrank from 25–27 mm to 18–19 mm (Филипова 2020, 14–15, and publications cited there), and the silver content dropped to 1–2% (Bruun 1966, 9). The Serdica's coins have a diameter of about 19–23 mm and an average weight of 5.30 g, though corrosion likely reduced their original weight from around 7.0 g (with the best-preserved coin weighing 7.08 g). Based on these metrics, they can be compared to the reduced follis of 307, a change that was implemented in the central and western mints by Emperor Constantine I, which may have been sustained for a longer period in the local areas.

²⁰ These are also referred to as “money medallions”, and they are minted according to a fixed system that ensures they can be exchanged on the market based on their carats for an equivalent amount of regular denominations. Thus, while they are not the product of regular coinage, they can still function as the equivalent of money (Bruun 1966, 3).

important change in the government of the empire – the elevation of the two imperial successors to the rank of rulers. However, this event had already occurred in 317, and the silver issues representing it were struck in 320 at the earliest, meaning the event was no longer new enough to require a “momentous” proclamation. Immediately after the change in the coinage of Siscia, a proclamation gold medallion was issued with a denomination of a solidus and a half, where the three rulers are depicted wearing laurel wreaths (Bruun 1966, 427, No. 26). Later, in 321, when Caesars Crispus and Constantine II celebrated their *quinquennalia* (5th anniversary on the throne) (Bruun 1966, 77; Аладжова 2020, 261), a large gold medallion of the denomination of four and a half solidi (≈ 20 g) was struck for the occasion. On this medallion, the rulers are shown with their distinctive insignia: a laurel wreath, a globe, and a scepter (Bruun 1966, 470, No. 18). In contrast to the above examples, on the Serdica’s specimens and their analogues known from the catalogues, Constantine I and his sons do not bear their distinctive ruler’s marks, meaning their issuance was not prompted by a specific ceremonial occasion, and it is most likely to have happened in 320 (Ramskold, Gautier 2017, 268). Additionally, the characteristics of their images and the lack of more detailed symbols place them closer to the usual coinage style of the period. For this reason, and because of the other ambiguities noted, it is not surprising that discrepancies have been found in the definition of coins of this type. In digital numismatic databases, they are variously referred to as *miliarenses*²¹ or *light miliarenses*²²; medallion of uncertain value²³; or simply silver coin of indeterminate denomination²⁴ (**Fig. 7**).

After the discovery of the Serdica’s hoard, consisting of 92 identical specimens struck in series using the same pair of dies, the argument regarding the rarity and exceptional nature of the coin type no longer seems relevant. In fact, the presence of variation in the style of the images in other identified series of the type suggests a larger production than we might have initially imagined based on the issues published so far. The lack of elemental analysis of the alloy from which they were made prevents us from making a more accurate comparison with the Serdica’s coins on this criterion as well. Judging by the images available to us, we can only assume that at least some of them were also made of an alloy with a predominant copper content (**Fig. 7**). Considering all that has been written so far, as well as the elemental composition of the coins from the collective find in front of the northern wall of Serdica, their nominal value should be determined either as unidentified or as transitional, e.g., as that of a “protomiliarenses”.

Elemental analysis of the hoard

Five coins from the hoard were analysed using an X-ray spectrometer²⁵ (**Fig. 8**). During the restoration process of the more heavily corroded coins a colour difference between the surface layer and the core of coins was observed, suggesting possible differences in the alloy composition.

²¹ One specimen from the collection of the Kunsthistorisches Museum, Wien (<https://www.ikmk.at/object?id=ID84480>, accessed 29.12.2024); one specimen from the collection of the Portable Antiquities Scheme of the British Museum (<https://finds.org.uk/database/artefacts/record/id/934107>, accessed 29.12.2024); one specimen from the collection of the Museum of Fine Arts, Boston (<https://collections.mfa.org/objects/523858>, accessed 29.12.2024).

²² One specimen from the collection of the Kunsthistorisches Museum, Wien (<https://www.ikmk.at/object?id=ID84479>, accessed 15.12.2024).

²³ One specimen from the collection of the American Numismatic Society, New York (<https://numismatics.org/collection/1944.100.7964>, accessed 29.12.2024).

²⁴ Two specimens from the collection of the British Museum, London (https://www.britishmuseum.org/collection/object/C_1844-0425-2559, accessed 15.12.2024; https://www.britishmuseum.org/collection/object/C_B-3785, accessed 29.12.2024); one specimen from the Münzkabinett der Staatlichen Museen, Berlin (<https://ikmk.smb.museum/object?id=18206266>, accessed 15.12.2024).

²⁵ The technique used for the analysis was a Schimadzu EDX-720 X-ray spectrometer. The measurements were conducted by Assist. Prof. Dr. Petya Penkova in the Laboratory for Analysis, Conservation and Restoration at the National Archaeological Institute and Museum of the Bulgarian Academy of Sciences, to whom we extend our gratitude.

This observation forced us to examine both levels of each specimen. The measurement results showed that the predominant chemical element was copper (Cu), and the additional elements were tin (Sn), lead (Pb) and silver (Ag), with minimal amounts (less than 1%) of antimony (Sb). Although the measurement of the alloy composition was taken only at one point in the area of the levels in question, it is still possible to draw a tentative conclusion regarding the percentage ratio of elements on and below the surface of the coins. As the tables in Fig. 8 show, the lead and silver content is higher in the uppermost layers compared to the lower ones. The amount of tin is within the typical range for Antiquity: less than 10% (Кулев 2012, 446), with the higher percentage again measured towards the surface, while in the core it is around 2 to 5%.²⁶ In total, the white metals (tin, lead, silver, and antimony) range from 10 to over 30% at the surface and about 14% in the core. This means that the colour of the alloy was close to silver-grey, especially on the outside; the coins looked as if they had been struck from silver, despite the very small amount of it – about 2–4% in the core and up to 6.4% on the surface.

The enrichment with a mixture of white metals is hardly accidental and is due to technological processes preceding the minting of the coins, i.e., those associated with the manufacture of the coin cores. We assume that one possible method was the removal of the copper oxides from the metal piece by chemical means using citrous fruit acids or vinegar, followed by polishing before the striking stage (La Niece 1993, 206). The same technological approach, the so-called pickling, was applied as early as the second half of the 3rd century, when the Roman Empire suffered from a shortage of silver ore due to continuous wars with the Germanic tribes and the Persians, which led to the temporary abandonment of the mines and the run-out of the reserves (Обчаров, Дзанев 2016, 62–63). However, a more detailed presentation of this aspect of the topic requires additional analyses and consultations with specialists. Therefore, it will not be discussed in detail here. What is important to us, in this case, is that the achievement of the silver colour of the prepared coins by enriching their surface with white metals was a consciously sought effect, closely related to the financial policy of the Roman emperors in the early 4th century. In fact, in this period, the minting of precious metals coins was followed by their rapid disappearance from the market (Аладжова 2018, 109–110), as people preferred to save them due to the uncertain times accompanied by constant wars, inflation, and increasing tax burdens. For rulers at war with each other, the maintenance of the army was a priority, but silver resources often proved insufficient to cover soldiers' stipends. It is likely that this ultimately led to the argenteus shortage crisis and the attempt by Emperor Constantine I to use the folles as a temporary alternative or to create a very low-quality new silver coin.

The whitish or silvery colour on the surface of bronze alloy coins with a low silver content but a high total white metal content does not rule out the possibility that they may have been additionally silvered,²⁷ at least due to the desirable appearance not always achieved by acid pickling or because of the risk of darkening soon after minting. However, no definitive evidence of silvering has been established in this case, so any assumptions about it remain speculative. For this reason, we will not delve into this aspect in detail here.

Coin parallels

No coins analogous to those found near the northern fortress wall of Serdica have been recorded in Bulgaria. A silver specimen from Sirmium (modern-day Sremska Mitrovica, Serbia), where the reverse type *CRISPVS ET CONSTANTINVS CC* was issued, is kept in the National Museum in Belgrade.²⁸ This specimen, however, was initially published as an argenteus (Античко

²⁶ When the tin in the bronze alloy reaches to about 5%, the melting temperature drops by about 100°C relative to that of copper (1083°C), and the hardness of the material increases. The addition of 3–5% lead improves the properties of the alloy in terms of its solid state processing, i.e., by forging or cutting (Кулев 2012, 448), and together with the addition of antimony significantly lower its melting temperature.

²⁷ For more on the types of silvering in Antiquity, see La Niece 1993.

²⁸ We are grateful to Mirjana Vojvoda, PhD, Numismatist, Institute of Archaeology, Belgrade (Serbia), for her assistance in locating coins of the relevant type found in the territory of Sremska Mitrovica (ancient Sirmium).

сребро 1994, 316, No. 262/1) and later as a siliqua (Васић 2008, 215, No. 207), despite its weight of 4.50 g, which places it within the theoretical weight ranges of a miliarensis. While an analysis of its alloy has not been published, its weight as well as its iconographic and stylistic features distinguish it from the Serdica's coins – similar to the other examples in museum collections across Germany, Austria, Great Britain, and the USA²⁹ (Fig. 7).

One of the specimens of the *CRISPVS ET CONSTANTINVS CC* type, previously mentioned, and defined as a bronze “small medallion” with possible silver plating in the 1989 catalogue of the auction house Numismatik Lanz (Münzen der Antike 1989, 69, No. 830), very closely resembles the type and characteristics of the Serdica's coins.³⁰ Even with the naked eye, it is evident that not only the style of the images, but also the lettering – including the misspelling of Crispus's name – and the positioning of the letters in relation to the images are strikingly similar. The comparative examination (Fig. 9), which involved measuring the distances between three identified points along a line between the coin with catalogue No. 1 in the present publication and the one from “Münzen der Antike”, shows unequivocally that these coins belong to the same series and were struck using the same pair of dies. In other words, they share an identical “double die match” production. Unfortunately, information about the original provenance of the specimen identified as a “small medallion” is unavailable, which prevents us from conducting a more detailed interpretative analysis based on the observed similarities. It should also be noted that its weight is 5.44 g, whereas for the Serdica's find the measured weight of the better-preserved coins after restoration ranges from 5.0 to 7.0 g. Before corrosion processes began, their average weight was likely above 6.0–6.50 g. Nonetheless, the difference in weight should not be of great concern, as it is very possible that a similar deviation is present in the example from “Münzen der Antike”.

The value of the hoard

Determining the value of the coins from the Serdica's hoard is quite challenging. The primary reason for this is the lack of reliable data regarding their denomination. Referring again to P. M. Bruun, who suggests that the folles inherited from Diocletian,³¹ in an already reduced variant, temporarily replaced the old silver coin, the argenteus before the introduction of the new silver coins (the miliarensis and the siliqua) (Bruun 1966, 11), we must attempt to place the Serdica's coins within the context of the Diocletian's silver denomination, as minting of the Constantine I's series began only after 323. In the period after 310, when the argenteus was no longer minted, Bruun assumes that the purchasing power of the follis likely increased several times to match the value of the argenteus. However, after 312, the follis weight had been reduced to 3.36 g, and its silver content was only 1–2%.³² Considering that the silver content of the argenteus was at least 90% (Kropff 2017, 168; Sutherland 1967, 99), it seems unlikely that the follis would have been considered equal in value, even if its surface had been enriched with white metals to resemble silver.

Despite our reservations about such a radical financial reform as equating the follis with the argenteus, we will consider the specific calculations based on this assumption. In the 1960s, specialists initially estimated that, based on the amount of silver in the alloy of the follis and the argenteus after Diocletian's reforms of 294 and 301, their value was 5 and 25 *denarii communes*,³³

²⁹ See footnotes 21–24.

³⁰ We extend our thanks to Mr. Lars Ramskold, independent researcher, Stockholm (Sweden), for his invaluable help in identifying this parallel.

³¹ Folles are also referred to as *nummi* in the literature. The term follis was likely introduced later, as during the late 3rd and 4th centuries, it was used to describe leather containers for money – sealed purses (*sacculum signatum*) – which contained a specific number of *nummi*, equivalent to 2.5 or 125 argentei, in contrast to the early 3rd century, when gold aurei or silver denarii were put inside (Handy 1985, 338–341). This system eased transactions, especially in times of frequent price increases, when a larger number of coins was needed to carry out a deal.

³² See footnote 19.

³³ The *denarii communes* were the lowest denomination coins in Emperor Diocletian's coinage system. Made of copper alloy, their low value led to their quick disappearance from the market. However, they

respectively (Sutherland 1967, 98–99). Based on an imperial inscription discovered in 1970 at Aphrodisias (Caria, Western Asia Minor) (Erim et al. 1971, 171–177), which is believed to have laid the groundwork for the new currency revaluation, predating by about three months the Edict of Emperor Diocletian (Kropff 2017, 168), a much higher nominal value for the argenteus was established – 100 *denarii communes* (Handy 1985, 451; Cope 1977, 224), despite, according to the established maximum price for a silver *libra* of 6,000 *denarii communes* (Edict. de Pretiis, XXX.1.9, in English translation: Kropff 2016, 57–58), it should have been 62.5 *denarii communes* (1/96 of the *libra*). M. F. Handy and L. H. Cope explain this discrepancy as an overvaluation of 60% necessary to stabilise the financial system. If the actual value of a follis weighing 3.36 g after 312 was 100 *denarii communes*, then the coins from Serdica, with an average weight of 6.50 g, would be worth double – 200 *denarii communes*, with 92 coins, this would amount to 18,000 *denarii communes*. Around 320, a gold *libra* was valued at about 430,000 *denarii communes* (equivalent to 17,280 folles) (Harl 1996, 159; Handy 1985, 465), meaning the solidus was exchanged for around 6,000 *denarii communes*, and the entire Serdica's hoard would be equivalent to roughly three solidi, or nearly 14.0 g of pure gold. As we have already noted, however, it would be difficult to accept such an equivalence between coins with about 90% silver and those with only 3–4% silver, even if this were considered a deliberate political decision!

It is far more likely that the coins from Serdica are comparable to or close in value to the folles. The inscription from Aphrodisias preserves a fragment of text regarding the pricing of coins, which suggests that the follis had a denomination of 25 *denarii communes* – a re-tariffed, doubled price following the reform of 301 (Kropff 2017, 176; Handy 1985, 456–460). The double-weight coins from Serdica would then have had a single value of 50 *denarii communes*, with a total of 4,600 *denarii communes* for the 92 specimens, representing 76–77% of the gold solidus, or approximately 3.50 g of pure gold. However, at the time of minting at Sirmium or shortly thereafter, there is evidence of a reduction in the value of some of the currency, along with a resumption of the issue of genuine silver money. At this time, the price of the follis was halved, making it worth 12.5 *denarii communes*.³⁴ Relative to the double-weight Serdica's coins, this would suggest that they were likely worth 25 *denarii communes* each, or a total of 2,300 *denarii communes* for all 92 specimens. In terms of gold, this would be about 57% of the solidus, or 2.60 g of pure gold. In fact, in this case, we can consider the Serdica's coins as the result of a new coinage adjustment aimed at establishing a new denomination that restored their previous value after the initial value halving of the folles.

were preserved for a long time as an accounting unit for valuing higher denominations and precious metals. The *denarii communes* were used to price goods and services in the Edict of Maximum Prices of Emperor Diocletian from 301. The mark XXI/XX I on the folles struck in the eastern mints is interpreted by some researchers to mean 20 sestertii (equivalent to 5 *denarii communes*) (Sutherland 1967, 98), while others suggest it represents 20 *denarii communes* (Erim et al. 1971, 176). Subsequent analysis, however, suggests it likely indicates the silver-to-copper ratio, with XX meaning 20 obols (equivalent to 0.57 g or 1/576 of the *libra*), and I representing 1 *libra* (327.45 g) (Handy 1985, 454). Converted to percentages, this ratio was approximately 3.4% silver to 96.6% copper, typical of the alloy used for the folles. Regarding the value of the follis, according to L. H. Cope, its value could not have been less than 10 *denarii communes* before the reform of 301, since the metals used in its production cost at least 8.39 *denarii communes* per coin, and likely 20 *denarii communes* after 301 (Cope 1977, 223). For a comparative table of different coin systems from the late 3rd and early 4th centuries, proposed by specialists over a 66-year period (from 1961 to 2017), along with additional information on the nominal values of coins from the time of Emperor Diocletian, see Kropff 2017, 167–187.

³⁴ To the east, in the lands ruled by Emperor Licinius I, 12.5 *denarii communes* billon coins were struck in 321, marked with $\frac{X}{III}$, which is also confirmed by papyri from the same period (Handy 1985, 463–464). This was done to compensate for their overestimation, as despite their weight reduction from the time of Emperor Constantine I, their nominal value of 25 *denarii communes* remained unchanged (Harl 1996, 163; Handy 1985, 462–463). According to K. W. Harl, 12.5 *denarii communes* coins never circulated in the western provinces (Harl 1996, 165), but such a variant, though temporary, can still be assumed to have existed until the Second Civil War in 324.

Conclusion

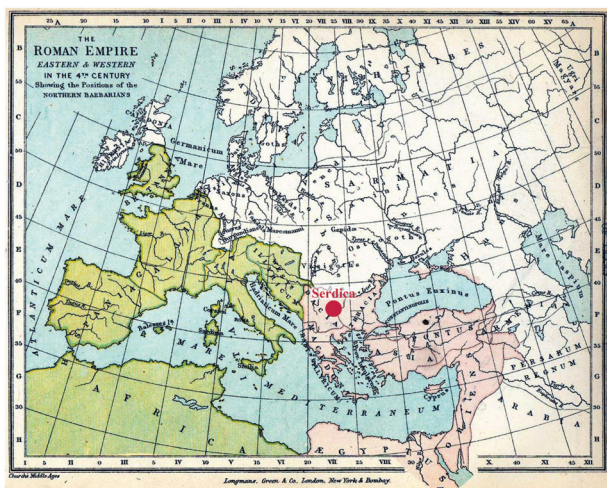
The hoard of 92 billion coins, found north of the fortification wall of Serdica, put forward not only a specific case related to the particular type of coins but also a more general academic issue concerning theoretical knowledge about coinage and economic development in the Roman Empire during the first quarter of the 4th century. The reign of Emperor Constantine I (r. 306–337) is usually associated with a period of prosperity, driven by the unification of the separate Roman territories under a single rule, as well as the romanticised image of the time when Christianity was officially recognised and found its place even within the imperial household. However, during the same period, the empire's economic development was in constant turmoil. Real financial resources were needed to maintain the army, and despite attempts to stabilise the monetary system through changes in the weight and composition of currency, as well as artificially revaluing them beyond their inherent value, commodity prices soared, and the common people grew increasingly impoverished. The fear of the population, fuelled by the ongoing wars between the co-rulers of the so-called Second Tetrarchy, is the most likely reason that coins made of precious metals, when they did reach the subjects, as well as heavier billon coins, became objects of concealment, most often buried in the ground (Божкова 1994, 128). In this uncertain situation, the hoard from Serdica was hidden. Its character, uniformity, and the fact that it is the product of the same pair of dies indicate that after the coins were issued, they were directly or indirectly (through an intermediary) acquired by their owner, who then buried them in the ground. Referring to the salary data from the Edict of Emperor Diocletian (Edict. de Pretiis, VII.1, in English translation: Kropff 2016, 17–22), we can assume that with a total value of the hoard 4,600 *denarii communes*, it would correspond to an average three-month wage for labour in construction (roughly at 50 *denarii communes* daily wage). As we already assumed, although speculatively, the archaeological context of the collective find in the northern extension of Serdica – Serdica II, at a time when it was being constructed, supports such a hypothesis.

The nominal value and actual purchasing power of the billon coins from Serdica is an extremely complex question. The alloy composition, with about 3–4% silver, is close to that of the folles, but their weight and size, as well as their origin from the imperial mint in Sirmium,³⁵ where mostly coins of precious metals were struck, suggest a different nominal value. This is probably the reason why individual specimens of the type *CONSTANTINVS MAX AVG/CRISPVS ET CONSTANTINVS CC, SIRM*, are referred to as “small medallions”, also as prototype coins for the consular gold medallion minted the following year 321 (Bruun 1966, 466) or for a new silver medallion coin (Bruun 1966, 4). However, such a quantity of this type, especially in identical specimens, is found for the first time, which, according to us, categorically rejects any ceremonial character. Undoubtedly, their iconography is tied to the necessary political and imperial propaganda of the time, proclaiming to the population who the rulers of the West were, while ignoring the co-rulers of the East, but the absence of insignia in the images of Constantine I and his sons also shows a lack of solemnity: the apparent goal being to assert power over the lands they controlled. Whether they played the role of “protomiliarenses” or represented a different denomination, or whether they were an attempt to establish a coin with a value of 25 *denarii communes* at the time when Emperor Licinius I (r. 308–324) initiated the minting of half-value folles in the eastern provinces, are all questions that remain open for further analysis. The stress from the anticipated decline in the purchasing power of money is significant enough (see the papyrus letter cited in Handy 1985, 464) to suggest that larger billon coins were valuable to people, and the uncertainty of the time was a reason for their hiding. In this regard, it is also important to note that after 301, silver and gold coins played a minor role in market trade, with billon and bronze coins becoming

³⁵ At the same time, when the mint in Sirmium was operational, Emperor Constantine I resided for an extended period in Serdica. During this period, it was common practice for gold coins to be struck in mints located near the places where the ruler settled (Божкова 1994, 132; Bruun 1961, 23–25). There is no evidence that in 320 there was an active *officina* in Serdica, and no one has suggested that such a minting practice was used for coins struck from or appearing to be struck from silver. Therefore, we consider this hypothesis highly unlikely.

the main currency there (Kropff 2017, 177–178). This is evident from the fact that sealed purses with money (*sacculum signatum*), known as *folles*, now also contained billon and bronze coins, rather than just gold and silver, as was the case in the first half of the 3rd century (Kropff 2017, 178–179; Kenneth 1996, 166; Handy 1985, 339). Therefore, according to M. F. Handy, hoards containing larger number of coins minted by the same *officina* or through the same pair of dies, like the Serdica's hoard, are very likely to originate from a sealed and dispatched purse from the relevant mint (Handy 1985, 341–342).

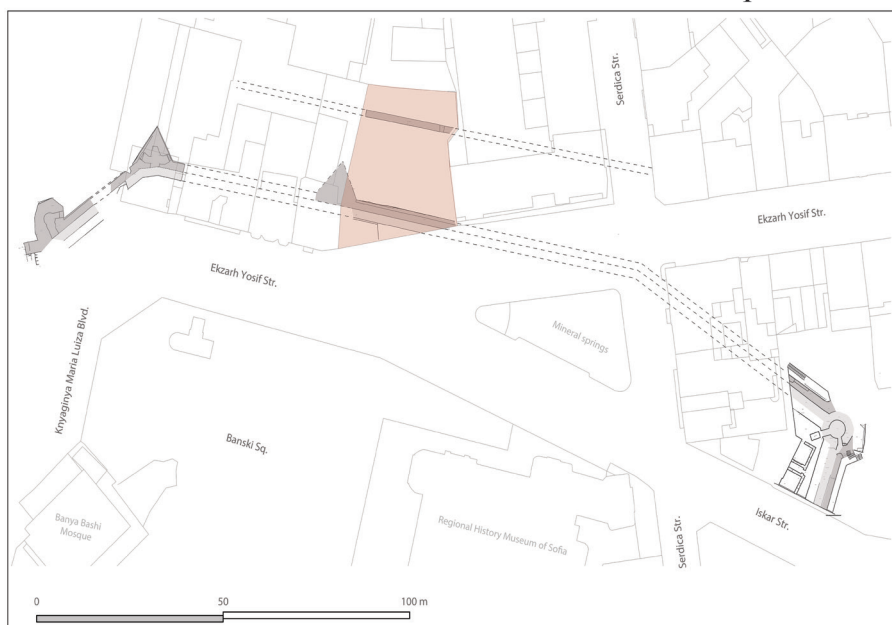
As previously mentioned, it is difficult to determine the purchasing power of the coins from Serdica, but we find it most logical to estimate them at around 50 *denarii communes* each, or a total of 4,600 *denarii communes*. This is not a small sum for the time, considering that the price of 1 *kastrensis modius* (17.5 l) of wheat was 100 *denarii communes* (Edict. de Pretiis, I.1.1a, in English translation: Kropff 2016, 10). The historical and economic events of the early 4th century give us a good idea of why such a considerable sum needed to be hidden. However, it remains a mystery what exactly were the upheavals in the life of its owner that led to its burial. Whatever happened, it ultimately resulted in the discovery in present time of this hoard, which raises many questions but also significantly contributes to our knowledge of the past. And we believe that it also carries the memory of the fate of its former owner.



1

Fig. 1. Location of the site on Ekzarh Yosif Str.:

1. Serdica on the map of the Roman Empire in the 4th century (source: "The Public Schools Historical Atlas" by Charles Colbeck, 1905; https://maps.lib.utexas.edu/maps/historical/colbeck/roman_empire_4_century.jpg, accessed 15.12.2024).
2. The newly discovered section of the northern fortification system of Serdica in present-day Sofia (author: Polina Stoyanova).



2

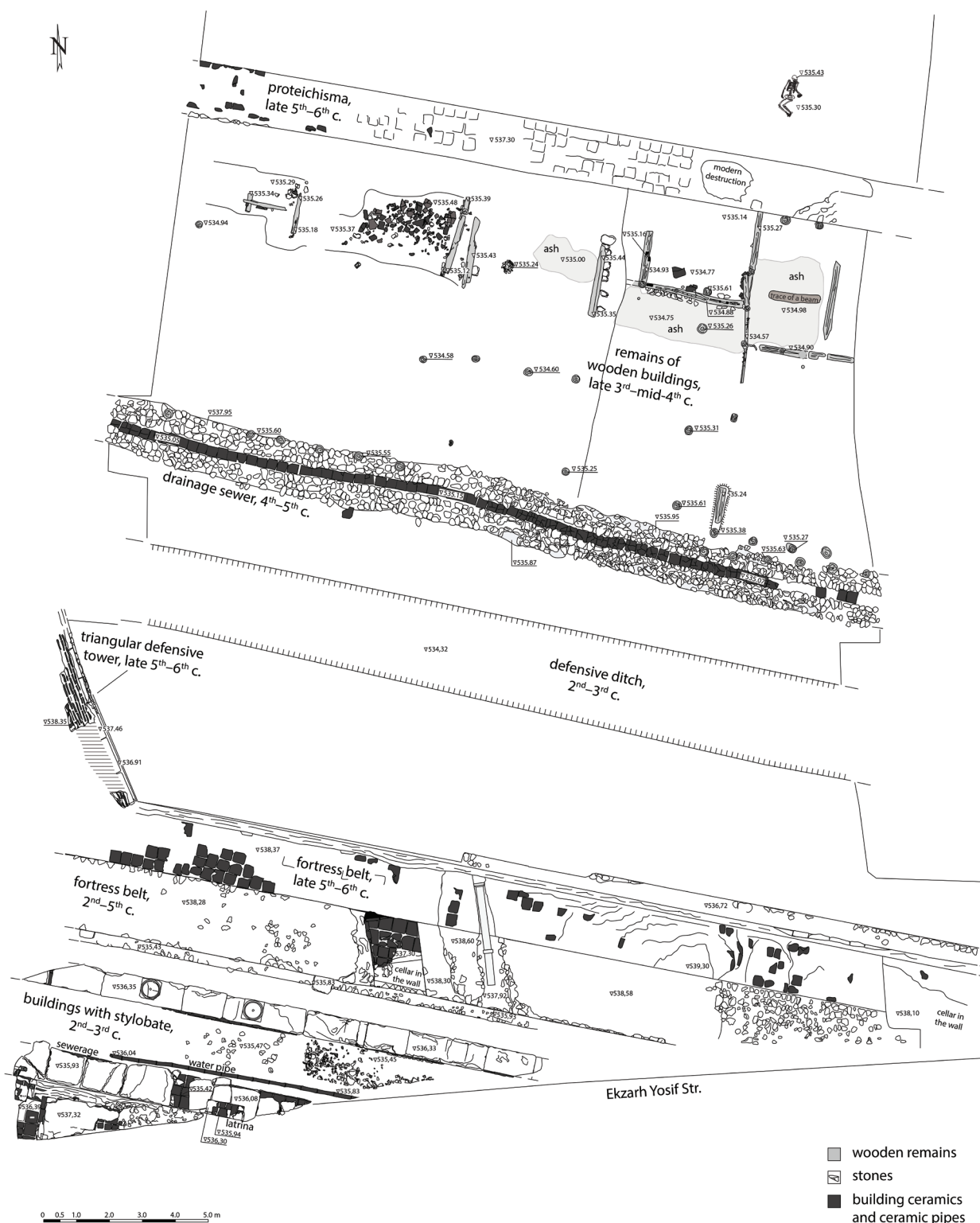


Fig. 2. Graphic plan of the uncovered archaeological structures from 2nd–6th centuries at 35 Ekzarh Yosif Str. (author: Polina Stoyanova).

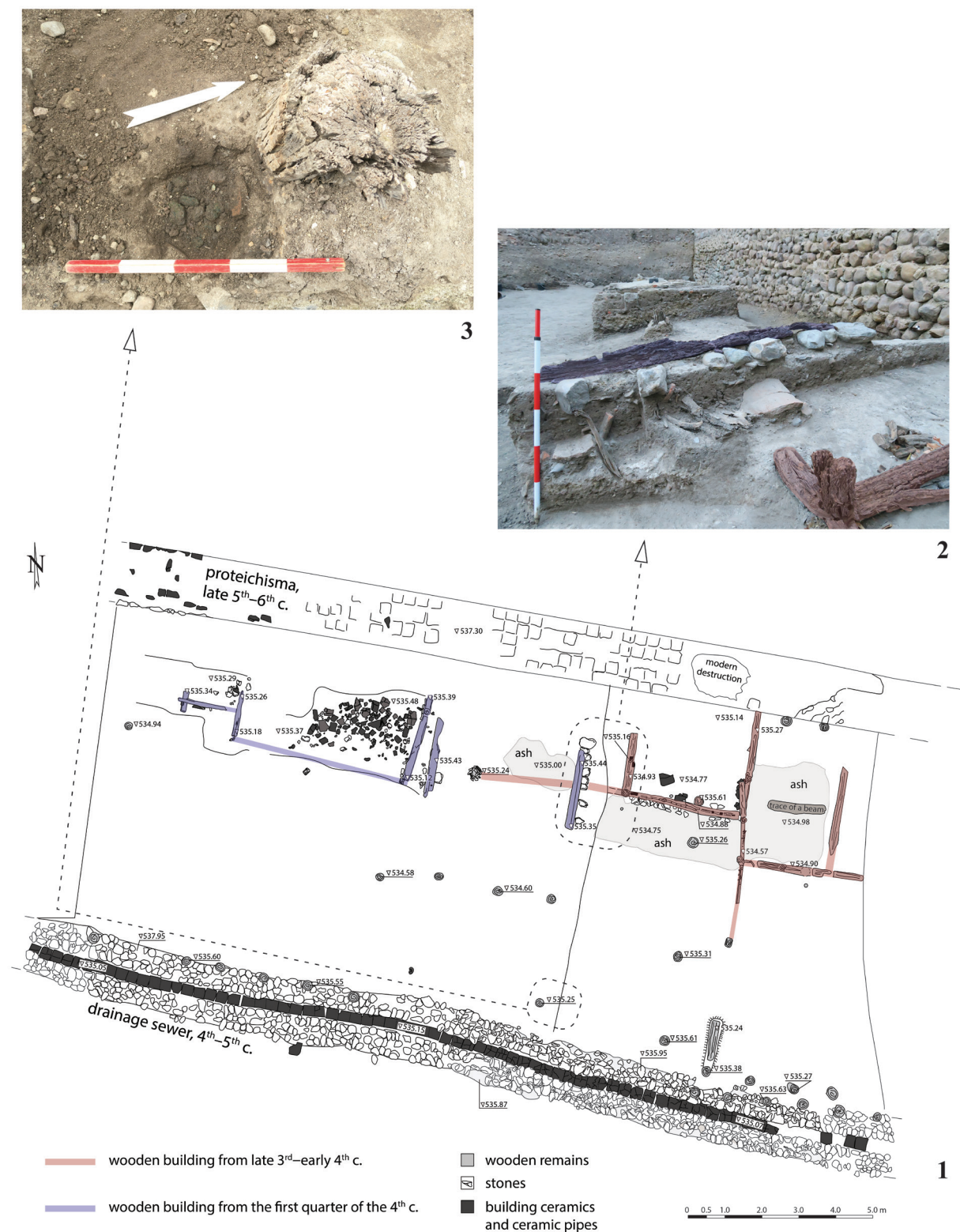
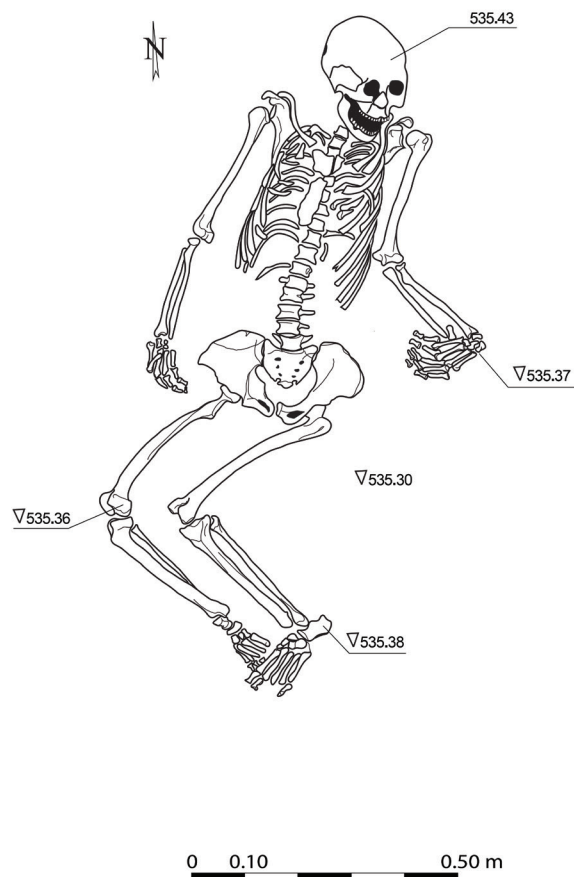


Fig. 3. Wooden buildings: an earlier structure from the late 3rd or early 4th century; a later structure from the first quarter of the 4th century. 1. Graphic plan (author: Polina Stoyanova). 2. Difference in the levels of the earlier and later buildings. 3. Context of the coin hoard.



3



2

proteichisma

1

Fig. 4. Irregular grave, 4th century. 1. Graphic plan (author: Polina Stoyanova). 2. Close-up photo of the skeleton. 3. The skeletal remains lying on an organic layer of a rectangular shape (probably remains of the destroyed wooden buildings).

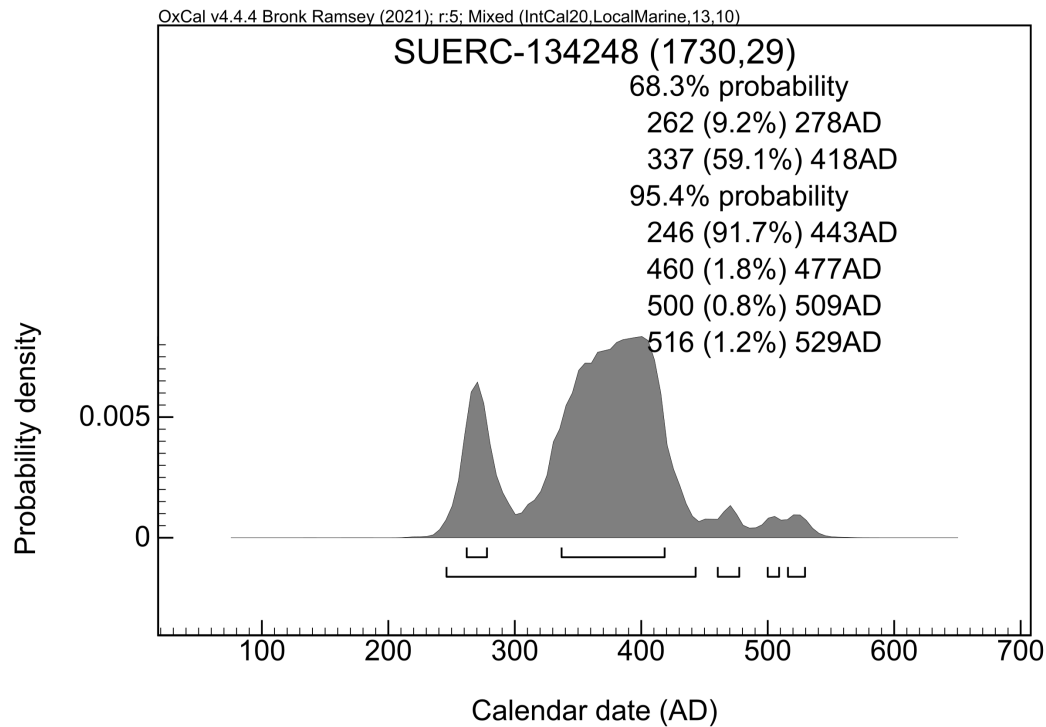


Fig. 5. Results of radiocarbon dating of a sample (see footnote 8) from skeletal remains from the irregular grave found immediately north of the wooden buildings and the *proteichisma*.



Obv.: **CRISP[V]S** NOB CAES,
Laureate head to right.
Rev.: CAESARVM NOSTRORVM,
around wreath containing VOT X;
RS in exergue.
RIC 240 (var.)



Obv.: FL IVL **CRIS[P]VS** NOB CAES,
Laureate, draped and cuirassed bust to left.
Rev.: PROVIDEN-TIAE CAESS,
camp gate with no doors and two turrets;
above star.
RIC 288 (var.)

Fig. 6. Examples of spelling mistakes in the name of Caesar Crispus, as in the case of the Serdica's hoard, on coins minted in Rome (see footnote 14).



Fig. 7. Coins of the CONSTANTINVS MAX AVG/CRISPVS ET CONSTANTINVS CC, SIRM type from different collections:
 1. Kunsthistorisches Museum, Wien (see footnote 21); 2. Portable Antiquities Scheme of the British Museum (see footnote 21);
 3. Kunsthistorisches Museum, Wien (see footnote 22); 4. American Numismatic Society, New York (see footnote 23); 5, 6. British Museum, London (see footnote 24); 7. Münzkabinett der Staatlichen Museen, Berlin (see footnote 24).

Cat. No. 1



Elements	Coin surface, %	Coin core, %
Cu	89.106	85.956
Ag	3.156	2.979
Pb	4.356	6.219
Sn	3.382	4.518
Sb	-	0.327

Cat. No. 2



Elements	Coin surface, %	Coin core, %
Cu	87.857	92.907
Ag	6.431	2.579
Pb	5.712	1.980
Sn	-	2.534

Cat. No. 52



Elements	Coin surface, %	Coin core, %
Cu	75.368	89.083
Ag	3.053	2.156
Pb	11.121	5.532
Sn	9.811	3.229
Sb	0.647	-

Cat. No. 58



Elements	Coin surface, %	Coin core, %
Cu	87.842	93.331
Ag	3.362	2.320
Pb	5.619	2.680
Sn	2.868	1.669
Sb	0.309	-

Cat. No. 71



Elements	Coin surface, %	Coin core, %
Cu	67.490	80.688
Ag	4.116	3.192
Pb	18.683	10.766
Sn	9.201	4.994
Sb	0.510	0.359

Fig. 8. X-ray analysis of the elemental composition of the surface and core of five specimens from the Serdica's hoard (see footnote 25).

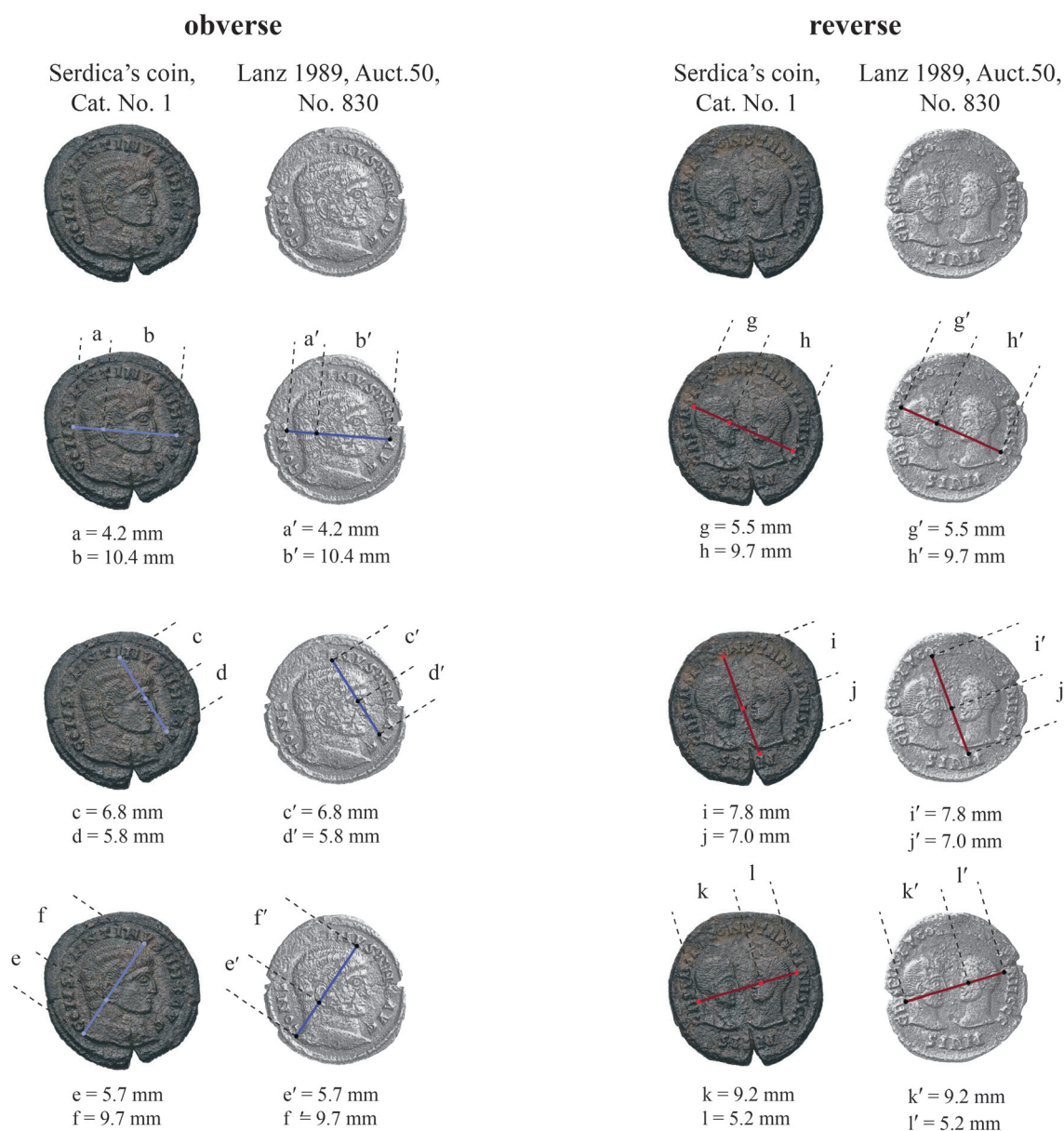


Fig. 9. Comparative examination between the Serdica's coin with Cat. No. 1 here and the specimen with No. 830 in Numismatik Lanz's 1989 'Münzen der Antike'.

CATALOGUE

**The catalogue includes the 92 coins. All specimens are figured at natural size. The coins were photographed using the quickPX®-compact system, purchased through the project "Measuring Ancient Thrace: Re-evaluating Antiquity in Digital Age" at Sofia University "St. Kliment Ohridski", funded by the Bulgarian National Science Fund of the Ministry of Education and Science of the*

STOYANOVA / DOYCHINOVA-ILCHEV

A Hoard of Protomiliarenses (?) of Constantine I with Crispus and Constantine II Caesars found near the Northern Fortress Wall of Serdica

Republic of Bulgaria under contract No. КП-06-Н50/3 from 30.11.2020.

Obv.: Bare head of Constantine I right; around CONSTANTINVS MAX AVG, all within dotted border.

Rev.: Confronted bare heads of Crispus, left, and Constantine II, right; around CR[II]SPVS ET CONSTANTINVS CC, SIRM in exergue, all within dotted border.

RIC VII, 14 (var.)

Cat. No. 1

billon; 7.08 g; 21.9/22.0 mm; 12 h

МИС М_p 1350₁



Cat. No. 2

billon; 5.78 g; 21.7/21.2 mm; 12 h

МИС М_p 1350₂



Cat. No. 3

billon; 6.25 g; 21.5/20.9 mm; 2 h

МИС М_p 1350₃



Cat. No. 4

billon; 5.56 g; 20.8/21.1 mm; 12 h

МИС М_p 1350₄



Cat. No. 5

billon; 5.01 g; 21.5/21.3 mm; 11 h

МИС М_р 1350₅



Cat. No. 6

billon; 5.64 g; 21.5/21.8 mm; 11 h

МИС М_р 1350₆



Cat. No. 7

billon; 4.19 g; 21.4/20.2 mm; 11 h

МИС М_р 1350₇



Cat. No. 8

billon; 4.69 g; 20.1/21.4 mm; 12 h

МИС М_р 1350₈



Cat. No. 9

billon; 5.17 g; 20.9/21.1 mm; 1 h

МИС М_р 1350₉



Cat. No. 10

billon; 3.52 g; 22.2/21.2 mm; 11 h

МИС М_р 1350₁₀



Cat. No. 11

billon; 5.20 g; 20.8/20.6 mm; 11 h

МИС М_р 1350₁₁



Cat. No. 12

billon; 5.14 g; 21.1/20.9 mm; 1 h

МИС М_р 1350₁₂**Cat. No. 13**

billon; 5.42 g; 20.8/21.1 mm; 12 h

МИС М_р 1350₁₃**Cat. No. 14**

billon; 6.63 g; 21.8/21.6 mm; 11 h

МИС М_р 1350₁₄**Cat. No. 15**

billon; 5.53 g; 20.4/20.7 mm; 1 h

МИС М_р 1350₁₅**Cat. No. 16**

billon; 4.98 g; 20.7/21.3 mm; 1 h

МИС М_р 1350₁₆**Cat. No. 17**

billon; 5.11 g; 22.0/21.6 mm; 11 h

МИС М_р 1350₁₇**Cat. No. 18**

billon; 4.45 g; 21.3/22.0 mm; 11 h

МИС М_р 1350₁₈

Cat. No. 19

billon; 4.21 g; 20.5/19.9 mm; 1 h

МИС М_р 1350₁₉



Cat. No. 20

billon; 4.71 g; 20.3/20.5 mm; 5 h

МИС М_р 1350₂₀



Cat. No. 21

billon; 6.33 g; 21.7/20.8 mm; 12 h

МИС М_р 1350₂₁



Cat. No. 22

billon; 4.82 g; 20.3/19.9 mm; 2 h

МИС М_р 1350₂₂



Cat. No. 23

billon; 4.48 g; 20.9/21.5 mm; 1 h

МИС М_р 1350₂₃



Cat. No. 24

billon; 4.86 g; 20.0/20.2 mm; 1 h

МИС М_р 1350₂₄



Cat. No. 25

billon; 4.61 g; 21.2/21.2 mm; 11 h

МИС М_р 1350₂₅**Cat. No. 26**

billon; 3.97 g; 20.6/20.2 mm; 12 h

МИС М_р 1350₂₆**Cat. No. 27**

billon; 3.48 g; 21.1/21.2 mm; 11 h

МИС М_р 1350₂₇**Cat. No. 28**

billon; 3.15 g; 21.3/21.0 mm; 11 h

МИС М_р 1350₂₈**Cat. No. 29**

billon; 2.70 g; 20.7/21.3 mm; 12 h

МИС М_р 1350₂₉**Cat. No. 30**

billon; 3.43 g; 21.1/21.1 mm; 12 h

МИС М_р 1350₃₀**Cat. No. 31**

billon; 5.48 g; 21.3/20.6 mm; 12 h

МИС М_р 1350₃₁

Cat. No. 32

billon; 3.06 g; 21.1/22.1 mm; 12 h

МИС М_р 1350₃₂



Cat. No. 33

billon; 5.47 g; 20.5/20.4 mm; 12 h

МИС М_р 1350₃₃



Cat. No. 34

billon; 4.08 g; 22.2/21.2 mm; 1 h

МИС М_р 1350₃₄



Cat. No. 35

billon; 3.19 g; 22.2/21.8 mm; 12 h

МИС М_р 1350₃₅



Cat. No. 36

billon; 4.73 g; 21.3/20.5 mm; 11 h

МИС М_р 1350₃₆



Cat. No. 37

billon; 4.15 g; 20.7/20.9 mm; 2 h

МИС М_р 1350₃₇



Cat. No. 38

billon; 5.21 g; 21.3/21.6 mm; 1 h

МИС М_р 1350₃₈



Cat. No. 39

billon; 4.74 g; 21.4/20.8 mm; 2 h

МИС М_р 1350₃₉**Cat. No. 40**

billon; 5.53 g; 21.8/21.4 mm; 12 h

МИС М_р 1350₄₀**Cat. No. 41**

billon; 4.52 g; 20.9/21.4 mm; 11 h

МИС М_р 1350₄₁**Cat. No. 42**

billon; 5.05 g; 20.6/20.4 mm; 12 h

МИС М_р 1350₄₂**Cat. No. 43**

billon; 4.86 g; 20.3/20.1 mm; 11 h

МИС М_р 1350₄₃**Cat. No. 44**

billon; 4.71 g; 22.0/21.1 mm; 1 h

МИС М_р 1350₄₄

Cat. No. 45

billon; 3.00 g; 20.3/21.8 mm; 11 h

МИС М_р 1350₄₅



Cat. No. 46

billon; 4.16 g; 19.8/20.2 mm; 11 h

МИС М_р 1350₄₆



Cat. No. 47

billon; 4.58 g; 21.3/21.1 mm; 12 h

МИС М_р 1350₄₇



Cat. No. 48

billon; 6.70 g; 21.9/21.9 mm; 11 h

МИС М_р 1350₄₈



Cat. No. 49

billon; 5.68 g; 23.1/21.2 mm; 12 h

МИС М_р 1350₄₉



Cat. No. 50

billon; 4.93 g; 21.5/21.7 mm; 5 h

МИС М_р 1350₅₀



Cat. No. 51

billon; 4.54 g; 21.5/19.9 mm; 1 h

МИС М_р 1350₅₁



Cat. No. 52

billon; 4.93 g; 22.0/21.2 mm; 10 h

МИС М_р 1350₅₂**Cat. No. 53**

billon; 3.92 g; 19.8/19.4 mm; 11 h

МИС М_р 1350₅₃**Cat. No. 54**

billon; 5.22 g; 20.9/22.0 mm; 12 h

МИС М_р 1350₅₄**Cat. No. 55**

billon; 5.68 g; 21.9/21.4 mm; 1 h

МИС М_р 1350₅₅**Cat. No. 56**

billon; 3.62 g; 21.7/19.9 mm; 10 h

МИС М_р 1350₅₆**Cat. No. 57**

billon; 5.88 g; 21.1/21.1 mm; 12 h

МИС М_р 1350₅₇**Cat. No. 58**

billon; 5.70 g; 22.5/22.4 mm; 1 h

МИС М_р 1350₅₈

Cat. No. 59

billon; 5.39 g; 21.8/20.9 mm; 1 h

МИС М_р 1350₅₉



Cat. No. 60

billon; 5.50 g; 21.6/21.6 mm; 11 h

МИС М_р 1350₆₀



Cat. No. 61

billon; 4.43 g; 22.1/21.3 mm; 11 h

МИС М_р 1350₆₁



Cat. No. 62

billon; 4.39 g; 21.4/21.3 mm; 1 h

МИС М_р 1350₆₂



Cat. No. 63

billon; 3.60 g; 20.7/20.1 mm; 11 h

МИС М_р 1350₆₃



Cat. No. 64

billon; 4.86 g; 21.5/20.8 mm; 1 h

МИС М_р 1350₆₄



Cat. No. 65

billon; 4.45 g; 21.1/21.0 mm; 11 h

МИС М_р 1350₆₅**Cat. No. 66**

billon; 3.38 g; 20.7/21.2 mm; 12 h

МИС М_р 1350₆₆**Cat. No. 67**

billon; 4.74 g; 20.5/20.5 mm; 11 h

МИС М_р 1350₆₇**Cat. No. 68**

billon; 4.09 g; 20.1/20.0 mm; 12 h

МИС М_р 1350₆₈**Cat. No. 69**

billon; 4.99 g; 22.3/21.7 mm; 5 h

МИС М_р 1350₆₉**Cat. No. 70**

billon; 3.49 g; 21.9/21.5 mm; 12 h

МИС М_р 1350₇₀**Cat. No. 71**

billon; 4.49 g; 21.9/22.1 mm; 12 h

МИС М_р 1350₇₁

Cat. No. 72

billon; 3.27 g; 20.3/20.3 mm; 11 h

МИС М_р 1350₇₂



Cat. No. 73

billon; 5.04 g; 21.7/21.5 mm; 12 h

МИС М_р 1350₇₃



Cat. No. 74

billon; 5.16 g; 22.1/21.9 mm; 10 h

МИС М_р 1350₇₄



Cat. No. 75

billon; 4.34 g; 19.3/19.4 mm; 11 h

МИС М_р 1350₇₅



Cat. No. 76

billon; 3.31 g; 18.6/18.9 mm; 11 h

МИС М_р 1350₇₆



Cat. No. 77

billon; 3.28 g; 20.6/19.9 mm; 12 h

МИС М_р 1350₇₇



Cat. No. 78

billon; 3.97 g; 22.9/21.8 mm; 4 h

МИС М_р 1350₇₈



Cat. No. 79

billon; 3.35 g; 22.2/21.6 mm; 12 h

MIC M_p 1350₇₉



Cat. No. 80

billon; 5.77 g; 22.9/23.0 mm; 5 h

MIC M_p 1350₈₀



Cat. No. 81

billon; 3.74 g; 21.2/20.3 mm; 1 h

MIC M_p 1350₈₁



Cat. No. 82

billon; 3.83 g; 20.0/19.1 mm; 4 h

MIC M_p 1350₈₂



Cat. No. 83

billon; 3.19 g; 20.3/19.7 mm; 12 h

MIC M_p 1350₈₃



Cat. No. 84

billon; 4.17 g; 20.9/21.1 mm; 11 h

MIC M_p 1350₈₄



Cat. No. 85

billon; 4.02 g; 20.6/21.1 mm; 1 h

*MIC M_p 1350*₈₅



Cat. No. 86

billon; 2.66 g; 22.2/21.3 mm; 12 h

*MIC M_p 1350*₈₆



Cat. No. 87

billon; 3.67 g; 21.8/20.5 mm; 1 h

*MIC M_p 1350*₈₇



Cat. No. 88

billon; 3.33 g; 22.0/21.9 mm; 1 h

*MIC M_p 1350*₈₈



Cat. No. 89

billon; 2.51 g; 21.5/20.8 mm; 1 h

*MIC M_p 1350*₈₉



Cat. No. 90

billon; 2.88 g; 19.4/19.5 mm; 12 h

*MIC M_p 1350*₉₀



Cat. No. 91

billon; 2.42 g; 18.9/17.8 mm; 12 h

*MIC M_p 1350*₉₁



Cat. No. 92

billon; 1.66 g; 18.9/16.7 mm; 12 h

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