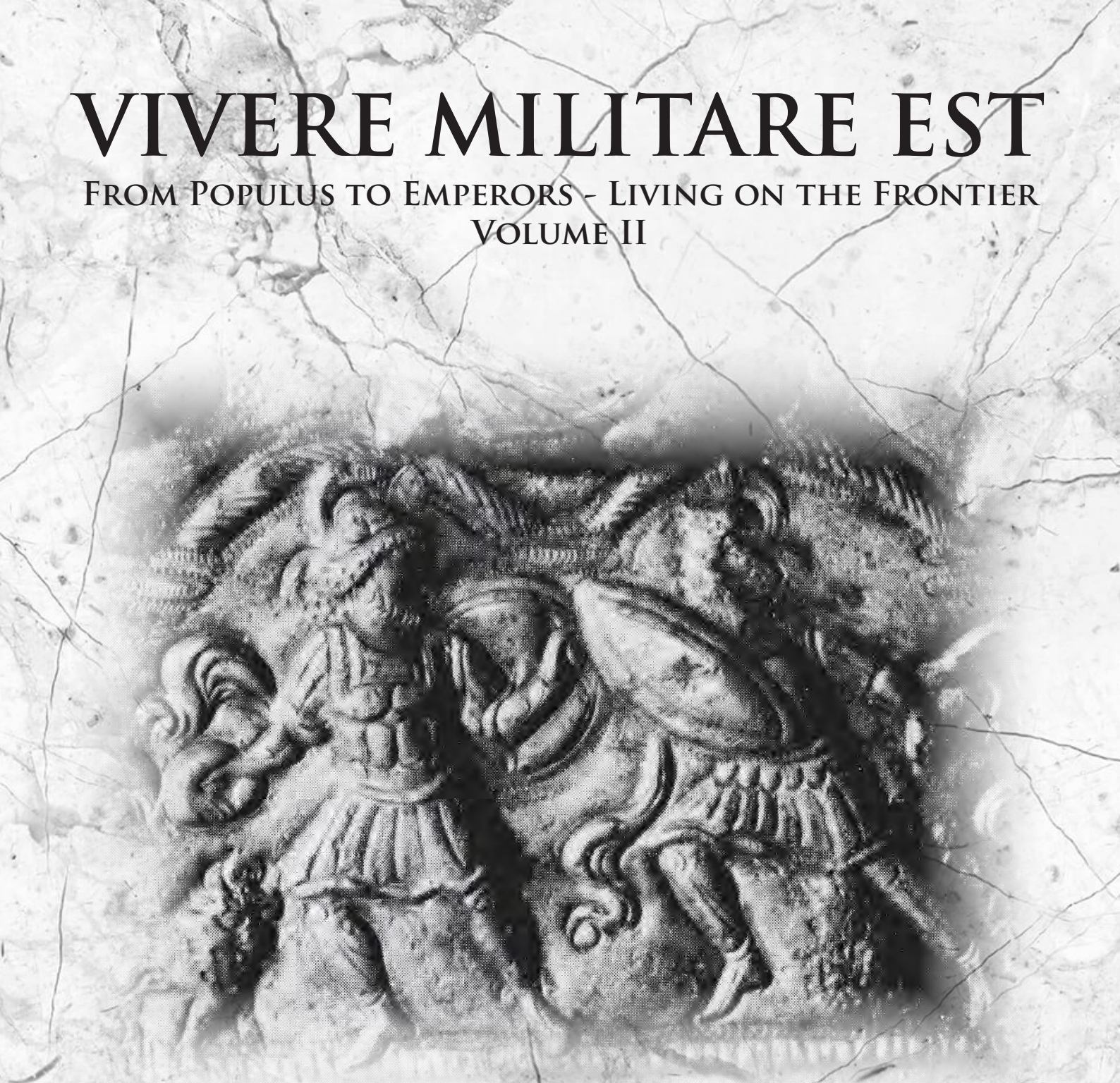
VIVERE MILITARE EST

From Populus to Emperors - Living on the Frontier
Volume II



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From Populus to Emperors - Living on the Frontier

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institut@ai.ac.rs
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PROOFREADING
Dave Calcutt
Ranko Bugarski
Jelena Vitezović
Tamara Rodwell-Jovanović
Rajka Marinković

GRAPHIC DESIGN
Nemanja Mrđić

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REVIEWERS
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POPULATION OF ANCIENT SIRMIUM

NATAŠA MILADINOVIĆ-RADMILOVIĆ, *Institute of Archaeology Belgrade*
E-mail: miladinovic.radmilovic@gmail.com

ABSTRACT

This paper presents the paleodemographic structure of people in the 1st–5th century AD in Sirmium, their economic and social status, level of sanitary conditions, nutrition and health care, diseases which directly left traces on osteological material, and diseases that left no visible marks on bones, and may indeed have been the direct cause of death of people in ancient Sirmium. Based on our research, we can conclude, although the sample is not particularly large, that the quality of life in Sirmium in the 1st–5th century AD, especially at the transition from the 3rd to the 4th century, was at an enviable level.

Key words: Roman necropoles, 1st–4th century AD, 4th and 5th century AD, children, juveniles, adults, health status

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In the last fifteen years, more than 1,200 people who inhabited the area of Sirmium/Sremska Mitrovica and its vicinity in the period from the 1st to the 16th century have been anthropologically investigated in Sremska Mitrovica (Fig. 1).[1] The investigated remains comprise human osteological material that was found in 70 locations.[2] The results of anthropometry showed that the population was heterogeneous in all periods (1st–16th century),[3] which concurs with historical data and the fact that Sirmium/Sremska Mitrovica was always described in historical sources as a city with a "multinational population." The smallest heterogeneity is observed in the Germanic population, which is quite understandable, while a pronounced heterogeneity is observed among the populations living in the area of Sirmium/Sremska Mitrovica during the period of 10th–12th and 13th–16th century.[4]

When it comes to ancient Sirmium, 334 individuals (77 children (23.0%), 34 juveniles (10.2%) and 223 adults (66.8%)), from the periods of the 1st–4th century and from the 4th–5th century, were anthropologically analysed (Tables 1 and 2).[5] It is important to note that during the period of 1st–4th centuries these people were buried outside the city walls, i.e. *extra muros*; that in the 4th century they were buried in particular around the martyrs of St. Irenaeus and St. Sinerotes, also *extra muros*, and later, during the 4th and 5th centuries, when the Huns' invasion took over and when the population was threatened with real danger, inside the city walls – *intra muros* (Fig. 1).

During the investigation of the skeletal remains from the 5th century (the time of the Huns' invasion), we even encountered situations where the skeletons of children, juveniles and adults were dug out of the primary graves by their loved ones, which were probably *extra muros*, and transferred *intra muros*, as secondary burials, in less sarcophagi or masonry tombs. Also, depending on the material possibilities, the population was buried in: sarcophagi, masonry tombs, graves with different shapes of construction or in ordinary grave pits (Fig. 1; Pl. I and II).

1 I would like to express my gratitude to Mr M. Radmilović for the map of the site (Fig. 1.) and for post-production of all illustrations (Fig. 1; Plates I–VI).

2 Miladinović-Radmilović 2011.

3 Miladinović-Radmilović 2011, 575.

4 Miladinović-Radmilović 2011, 560.

5 Miladinović-Radmilović 2011, 224, Table 82; 379, Table 148.

Fig. 1. Location of Sirmium on the map, with the position of the Republic of Serbia in Europe; Sirmium during the 4th century, ideal reconstruction of (Jeremić, 2004: 11, fig. 12)

The city population was found at most sites during the period 1st–5th century. One of the locations where this was not the case is certainly site No. 80. During an archaeological excavation on site No. 80 in 1996, 37 individuals from the ancient period, dating to 2nd–3rd century were excavated. Considering all existing conditions, such as the location of their burial (next to the marsh (Majurska bara) and city dump (many bones had traces of cut-marks); the way they were buried (some were just "thrown away"), the paleodemographic situation (23 males, age between 25 and 50 years old), the presence of bone injuries (two of them were fatal), all kinds of fractures and bone splits, subperiostal and superiostal hematomas, unsuccessful attempts of manual strangulation, joint diseases (osteoarthritis), circulatory disorders, tumors, osteomyelitis, *sinusitis*, dental diseases and considerable traces of skeletal markers of occupational stress, one can conclude that people buried here didn't lead a wealthy life.[6] They were probably part of the urban poor, slaves or freedmen manual labourers, but most likely they were disobedient soldiers. The results of the anthropological investigation shown a high frequency of auditory exostoses in the male sample (30%) (Pl. III,1). Auditory exostoses are commonly recognised as localised hyperplastic growths of a predominantly acquired origin. Several clinical and anthropological studies have pointed out close links between the occurrence of auditory exostoses and prolonged cold water exposure, generally due to the practice of aquatic sports, or to working activities involving water contact or diving.[7] In the 2nd century, Sirmium was the seat of the river fleet command (*Classis prima Flavia Augusta*).[8] As an important communicative centre, Sirmium had a port and bridges. These people could have worked in the port (or built bridges?), made breakwaters or joined ships, and could have been in direct contact with water. It is more likely that they were involved in the process of making canals and draining marshes that Probus organised in this area in the 3rd century.[9]

6 Miladinović-Radmilović 2010, 142.

7 Miladinović-Radmilović 2010.

8 Вулић 1929, 154.

9 Mirković 1971, 35.

METHODOLOGICAL FRAMEWORK

As we have already mentioned, 334 individuals from ancient Sirmium (period 1st–5th century) were anthropologically analysed (Tables 1 and 2).

In determining sex in children and juvenile (*Juvenilis* I) individuals, we put emphasis on the study of morphological elements of the mandible (protrusion of *protuberantia mentalis*, the shape of the alveolar arch, protuberance in the *gonion* area) and the pelvis (the angle of the greater sciatic notch, the position of the pelvic arch, the curvature of crista iliaca). The methodology was based on data obtained by Schutkowski during his extensive research.[10]

For sex determination on skeletal materials of juvenile (*Juvenilis* II) and adult individuals we adopted a combination of morphological and metrical methods. Specific attention was paid to morphological elements of the skull (*glabella, planum nuchale, processus mastoideus, processus zygomaticus, arcus supercilialis, protuberantia occipitalis externa, os zygomaticum, tubera frontale et parietale,* inclination of *os frontale, margo supraorbitalis and* shape of *orbitae*) and the pelvis (*sulcus praearicularis, incisura ischiadica s. ischialis major, arcus pubis s. pubicus et angulus subpubicus, arc compose,* the appearance of *os coxae, corpus ossis ischii, foramen obturatum, crista iliaca, fossa iliaca, pelvis major, pelvis minor;* subpubic region: ventral arc, subpubic concavity and medial appearance of the ischio-pubic branch), whereas the method of operation was adopted from a group of European anthropologists,[11] Buikstra and Ubelaker.[12] Morphological elements were also analysed on the mandible (the overall appearance of mandible (*corpus mandibulae, ramus mandibulae* and *angulus mandibulae), mentum, angulus mandibule* and *margo inferior*), based on criteria defined by Ferembach and his associates,[13] and metric elements relevant for sex determination in skeletons.[14] Teeth were measured for mesio-distal and vestibulo-lingual diameters using a method approved by Hillson.[15] According to these diameters, the difference in tooth size was monitored mostly on canines; should

10 Schutkowski 1993.

11 Ferembach, Schwidetzky and Stloukal 1980, 519–527.

12 Buikstra and Ubelaker 1994, 15–21.

13 Ferembach, Schwidetsky and Stloukal 1980, 523–525.

14 Ferembach, Schwidetsky and Stloukal 1980, 523–525; Bass 1995, 84, 85.

15 Hillson 1990, 240–242; idem. 1996, 80–82.

they be missing from osteological material, other teeth would suffice (molars, premolars and incisors).[16] Morphological and metric elements were observed during the analysis of other postcranial bones as well. Morphological elements that caught our attention the most were the degrees of development of: *tuberositas deltoideae, tuberositas radii* and *margo interosseus* (of the radius), *tuberositas ulnae* and *margo interosseus* (of the ulna), *linea aspera* and *tuberositas tibiae.* Bone appearance, body curvature and *facies auricularis* were morphological elements observed in the sacrum.[17] Metric elements played a more significant role in sex determination based on the postcranial skeleton, and were given additional attention.

Individual age estimation in children and juvenile (*Juvenilis* I and II) individuals was based on degree of formation and teeth eruption (Ubelaker's scheme);[18] degree of ossification of the epiphysis-diaphysis connections (table with time scales (in years) during which epiphysis-diaphysis connections ossificate);[19] length of long bones (tables (with time scales shown in years and months) defined by Bass[20] and Ferembach with associates).[21]

Individual age in juveniles (*Juvenilis* II) and adults was established upon: degree of obliteration of local skull sutures (Vallois' scheme);[22] changes in maxillary and mandibular teeth (changes in occlusal surface on the dental material was compared with the numerical classification of attrition of the upper (occlusal) surface of molars in relation to age, which was defined by Brothwell,[23] and changes on occlusal surface of all teeth in relation to age, defined by Lovejoy;[24] morphological changes in sternal ends of ribs (metamorphoses of depth, joint cavities, shape, edges and ridge configuration were examined, together with overall state of bone, based on ten (0–8) phases of progression covering the period from 18 to over 70 years);[25] morphological

16 Garn, Lewis and Kerewsky 1965.

17 Mikić 1978, 18, 19; Bass 1995, 114.

18 Ferembach, Schwidetzky and Stloukal 1980, 528, 529.

19 Ferembach, Schwidetzky and Stloukal 1980, 531.

20 Bass 1995, 155, 168, 176, 228, 247, 257.

21 Ferembach, Schwidetzky and Stloukal 1980, 532.

22 Vallois 1937.

23 Brothwell 1981, 72.

24 Lovejoy 1985.

25 Işcan, Loth and Wright 1984a; idem. 1984b; idem. 1985.

changes on the medial end of the clavicle (morphological changes of the clavicle documented by Scheuer and Black were observed;[26] they established five (1–5) phases of progression covering periods lasting from 14 to 29 years); morphological changes in pubic symphysis joint surface (Todd's method was used in which the metamorphosis of the pubic symphysis surface is divided in ten chronological phases during aging, starting with age 18 and leading up to the age of 50 and over);[27] sacroiliac region (individual age of adult individuals was determined using models defined by Lovejoy and his associates.[28] They classified the changes in this region in eight stages, from late adolescence to old age phase, with most attention directed to observation of position, edge *lipping* and porosity of the bone in this region).

Twenty-six epigenetic variations on the cranium and eleven on the postcranial skeleton were observed.[29]

Stature in children and juvenile (*juvenilis I*) individuals was calculated using a formula defined by Maresh,[30] whereas for juvenile (*juvenilis II*) and adult individuals Trotter and Gleser's formulas were used.[31]

POPULATION FROM ANCIENT SIRMIUM IN 1ST –4TH CENTURY AD

Osteological material of human origin was found at 28 sites. The material was not available for anthropological analysis from 14 sites.[32] Anthropological analysis revealed that skeletal remains of 188 individuals were discovered at the sites from the 1st–4th century AD, in Sremska Mitrovica and in the vicinity: 44 children (23.4%), 22 juvenile (11.7%) and 122 adult (64.9%) individuals (Fig. 1; Table 1; Plate

26 Scheuer and Black, 2000.

27 Todd 1920, 285–334; idem. 1921a; idem. 1921b.

28 Lovejoy et al. 1985.

29 Hauser and De Stefano 1989; Ђурић-Срејић 1995, 238–260.

30 Walker and Pérez-Pérez, 18.

31 Trotter and Gleser 1952.

32 There are a number of reasons for that, starting with the fact that the material from several sites was sent to the USA for anthropological analysis during the 1970s, up to the fact that part of the material was buried in 1985 in Palanka Street (Sremska Mitrovica) so as to free space in the museum depot for other artefacts, without any analysis having been performed (Miladinović-Radmilović 2013).

I, 1–3; Plates III and IV). The average lifespan of the individuals was 25.14 years, and if only adult individuals are observed, it was 28.61 years. The average life expectancy of adult male individuals was 36.3 years, and women 28.37 years. The average body height of adult female individuals was 159 ± 4 cm, and male 175 ± 5 cm.[33]

DISEASES AFFECTING CHILDREN

Dental analysis showed the presence of enamel hypoplasia and caries (Table 3).[34] Paleopathological analyses revealed several diseases affecting children skeletons: bone injuries, changes in bones caused by blood disorders (*cribra orbitalia, cribra palatina*, *cribra humera, cribra femora et tibia* and deep lesions at the ends of postcranial long bones), joint diseases (osteoarthritis), metabolic bone diseases (scurvy and rickets) and middle ear inflammation (Table 3; Plate III).[35]

*

Markers of occupational stress left traces on the postcranial skeleton of an individual aged 14, from site No. 80 (Table 4).

DISEASES AFFECTING JUVENILES AND ADULTS

Dental analysis showed the presence of abrasion, enamel hypoplasia, periodontal disease, calculus, anomalies of the jaw and dental arch, the significant presence of caries on teeth of these individuals (caries ranged from caries stains, dot-shaped caries, developed caries, so-called "gross-gross" caries, to caries that resulted in teeth loss), cysts and periapical cystic cavities.[36]

When it comes to juveniles and adults, the paleopathological situation is somewhat different. Osteological materials exhibit a larger number of diseases (Table 6; Plates III and IV): *bone fractures, injuries and fissures* (common injuries caused by

33 Miladinović-Radmilović 2011, 224, 233.

34 Miladinović-Radmilović, Vulović and Đukić 2016, 67, Tables 3 and 5.

35 Miladinović-Radmilović, Vulović and Đukić 2016, 67, Tables 3 and 5.

36 Miladinović-Radmilović 2011, 45–235.

accidents, blunt objects, stab wounds and slashes inflicted by a knife,[37] sword or dagger;[38] fissures of ribs, vertebrae, upper and lower limbs, and fractures of hyoid bone, ribs, clavicles, metacarpal bones and upper and lower limbs);[39]*developmental skeletal anomalies* (*spina bifida, foramen sternale*, sacralization of L5, coccyx sacralization, developmental anomaly of the sternum, patellae, atlas and scapulae, as well as bone fusion (ribs and manubrium, innominate bone and sacrum, tibia and fibula)); *joint diseases* (osteoarthritis, spondylosis and spondylarthrosis**,** eburnation of joint surface and Schmorl's nodes); *metabolic bone diseases* (osteoporosis, scurvy and rickets); *changes in bones caused by blood disorders* (*cribra orbitalia* and *cribra femora*); *changes in bones caused by blood circulation disorders* (*osteochondritis dissecans* and tissue necrosis); *bone tumors*; *infectious bone inflammation* (tuberculous osteomyelitis); *periostitis* (superiosteal hematoma which were not caused by trauma or osteomyelitis)*; sinusitis and torus auditivus.*

*

Markers of occupational stress left traces on the postcranial skeleton of 60 individuals (Table 5).

POPULATION FROM ANCIENT SIRMIUM IN 4TH AND 5TH CENTURY AD

Osteological material of human origin was found at 32 sites. The material was not available for anthropological analysis from 16 sites. Anthropological analysis revealed that skeletal remains of 146 individuals were discovered at the sites from the 4th and 5th century AD, in Sremska Mitrovica and in the vicinity: 33 children (22.6%), 12 juvenile (8.2%) and 101 adult (69.2%) individuals (Fig. 1; Table 2; Plate I, 4–6; Plates II, V and VI). The average lifespan of the individuals was 26.3 years, and if only adult individuals are observed, it was 35.2 years. The average life expectancy of adult male individuals was 40.5 years, and women 31.9 years. The average

37 Stab wounds were the direct cause of death in two males from site No. 80 (stab wounds were discovered on the occipital bone and between the third and the fourth cervical vertebra).

38 Миладиновић-Радмиловић, Ђукић и Вуловић 2016.

39 Injuries, fractures and fissures were usually followed by infections and subperiostal and superiostal hematomas.

body height of adult female individuals was 160 ± 4 cm, and male 174 ± 4 cm.[40]

DISEASES AFFECTING CHILDREN

Dental analysis showed the presence of caries in only one male child.[41] Paleopathological analyses revealed several diseases affecting children skeletons: changes in bones caused by blood disorders (*cribra orbitalia*, *cribra femora*, porotic hyperostosis and deep lesions at the ends of postcranial long bones) and metabolic bone diseases (active periostitis (scurvy?)).[42]

*

Markers of occupational stress were not found on children postcranial skeletons (Table 4).

DISEASES AFFECTING JUVENILES AND ADULTS

Dental analysis showed the presence of abrasion, enamel hypoplasia, periodontal disease, calculus, anomalies of the jaw and dental arch, the significant presence of caries on the teeth of these individuals (caries ranged from caries stains, dot-shaped caries, developed caries, so-called "gross-gross" caries, to caries that resulted in teeth loss), cysts and periapical cystic cavities.[43]

When it comes to juveniles and adults, the paleopathological situation is also different in the period from the 1st–4th century AD. Osteological materials exhibit a larger number of diseases (Table 6; Plates V and VI): *bone fractures, injuries and fissures* (injuries of upper and lower limbs, lower limb fissures, and upper and lower limb fractures); *developmental skeletal anomalies* (*foramen sternale,* developmental anomalies of hyoid bone and sternum and fusion of tibia and fibula); *joint diseases* (osteoarthritis, spondylosis and spondylarthrosis, eburnation of joint surface and Schmorl's nodes); *metabolic bone diseases* (osteoporosis and scurvy); *changes in bones caused by blood disorders* (*cribra orbitalia*); *changes in*

40 Miladinović-Radmilović 2011, 379, 387.

41 Miladinović-Radmilović, Vulović and Đukić 2016, 67, Tables 4 and 5.

42 Miladinović-Radmilović, Vulović and Đukić 2016, 67, Tables 4 and 5.

43 Miladinović-Radmilović 2011, 239–388.

bones caused by blood circulation disorders (*osteochondritis dissecans* and embolism *a. subclaviae*); *bone tumors; infectious bone inflammation* (infectious osteomyelitis); *periostitis* (superiosteal hematoma which were not caused by trauma or osteomyelitis) and *Stafne's Defect*.[44]

*

Markers of occupational stress left traces on the postcranial skeleton of 43 individuals (Table 5).

DISCUSSION AND CONCLUSION

Looking at Tables 3 and 6, one can notice that there is a dramatic reduction of the diseases in the 4th and 5th centuries, as well as the fact that the most of these diseases could not have been the direct cause of the death of the population in the ancient Sirmium. Most diseases and causes of death remain undetermined, as they do not leave marks on bones and partly because of the usually poor preservation of osteological materials from archaeological sites.[45] However, even if pathological changes are visible on skeletal material, in some cases it is impossible to establish a differential diagnosis. The reason for this is that it is impossible to track stages of disease development, because different diseases have the same effect on bone tissue as a final outcome (such as tissue production or destruction) and because it is impossible to establish pathognomonic changes that are not related to bone tissue.[46]

Mortality during the 1st–4th century could have been caused by a number of diseases. Alongside the described stab wounds to the cranial bones and vertebrae, the direct cause of death could have also been tuberculous osteomyelitis. There are many diseases that leave no visible marks on bones, and may indeed be the direct cause of death. By all accounts, swamps were a constant source of epidemics (e.g. malaria). Food[47] and lead poisoning[48] was also frequent during the Roman period.

44 Миладиновић-Радмиловић и Димовски 2012.

45 Ђурић-Срејић 1995, 310.

46 Ђурић-Срејић 1995, 310.

47 Brothwell and Brothwell 1998, 189–192.

48 Waldron 1973.

Historical records contain fragmentary data of a "catastrophic plague" that afflicted Sirmium in the spring of 270 AD. This was when Claudius marched into the city, after spectacularly defeating the Goths at Naissus, earning himself the nickname "Goth." Hordes of German prisoners were brought along with him, some of whom were probably carriers of "plague germs." The military triumph quickly turned into a disaster. It is unclear how many inhabitants of Sirmium succumbed to the disease, but the number must have been huge. The scale of the disaster is best illustrated by the fact that Claudius himself died in the city as a result of the plague. The news echoed around the empire, and became the first piece of evidence of plague in this area.[49]

Although the situation was much better during the 4th and 5th century,[50] mortality could also have been the consequence of numerous diseases. A well-planned utility system, the use of clear drinking water from the wells of Fruska gora and other benefits like public baths and local thermal wells created hygienically favourable living conditions for the settlers. However, it is evident that the use of thermal wells did not reduce osteoarthritis and other joint diseases. Likewise, it should be added that respiratory and gastrointestinal infections, poisonings, as well as malaria could have been the main causes of death for the settlers.

*

Study of children's skeletal remains in necropoles are of particularly importance because the data related with children's health influences the overall health status of the whole investigated population. Child mortality is considered an adequate criterion for the social and sanitation conditions of a community and a sensitive indicator of inadequate nutrition. The highest mortality rate in children in ancient Sirmium was during the interval NB–7 years of age (*Infans* I), namely: 1st–4th century 43.2%, and 4th and 5th century 48.5% (Tables 1 and 2). Mortality rate in adult females was the highest in the age range 23–40 (*Adultus* I i II), namely: 1st–4th century 24.4% (age 23–30, *Adultus* I), or 42.2% (age 23–40, *Adultus* I and II), and 4th and 5th century 18.9% (age 23–30, *Adultus* I), or 32.4% (age 23–40, *Adultus* I and II). It is interesting to note that mortality in children was lower

49 Mirković 1971, 35

50 It is interesting to note that during 4th and 5th centuries in Sirmium/Sremska Mitrovica the percentage of individuals with markers of occupational stress is significantly lower than in period 1st–4th century (Tables 4 and 5).

during periods when females lived longer, and vice versa, mortality in children was higher during periods when females lived shorter.[51]

Neonatal mortality (the first four weeks after birth) is most often caused by an infant's physiological and organic weaknesses,[52] genetic and other developmental anomalies. On the other hand, postneonatal mortality (aged one month to one year) almost entirely depends on exogenic conditions. High postneonatal mortality indicates poor sanitary conditions, malnutrition and increased exposure to infections, especially gastrointestinal and respiratory.[53] Infant nutrition is particularly important. Breastfeeding, i.e. mother's milk, satisfies nutritious requirements, enables proper growth and development, maintains immune protection and stops exposure to bad sanitary conditions associated with artificial feeding, reducing instances of diarrhea, acute urinary and respiratory infections, parasitosis, nutrition disorders, anemia and many other diseases, thus lowering mortality.[54] The number of mortalities in children less than one year old at sites in ancient Sirmium and the surrounding area were as follows: 1st–4th century – 6 (13.6%), and 4th and 5th century – 9 (27.3%).[55]

Unquestionably, there are other significant causes of death. Some of them are: sudden infant death syndrome (usually occurs before the fourth month), infanticide, miscarriage, etc.

When mortality of children older than one year is concerned, it can be concluded that although the nutritional needs of children decreased, especially after the age of three, diet still played an important role. Likewise, diarrhea, respiratory and gastrointestinal infections were the leading causes of death, together with accidents.[56]Mortality rates of children over one year old, at sites in ancient Sirmium and the surrounding area, were as follows: 1st–4th century – 38 (86.4%), and 4th and 5th century – 24 (72.7%).[57]

51 Miladinović-Radmilović 2011, 559, 574.

52 Saunders and Katzenberg 1992.

53 Gastrointestinal infections are more frequent during summer, and respiratory during winter months (Миладиновић-Радмиловић, 2008).

54 Katzenberg, Herring and Saunders 1996; Herring, Saunders and Katzenberg 1998.

55 Miladinović-Radmilović 2011, 566, 576.

56 Миладиновић-Радмиловић, 2008.

57 Miladinović-Radmilović 2011, 566, 576.

*

Cribra orbitalia is a pathological condition and an indicator of subadult stress, but also a successful method for determining the living conditions of archaeological populations. It often occurs on skeletal remains in our country. Morphological osteological changes characterised by *cribra orbitalia* are perceived in superior orbital walls in the form of small hollow lesions.

Since the 1950s, most authors have considered that the occurrence of *cribra orbitalia* is associated with an iron deficiency anemia. Factors that affect this type of anemia include: poor and inadequate diet, unhygienic conditions of life, chronic gastro-intestinal disease, gastrointestinal and parasitic infections, lead poisoning, changes in nutritional habits, and nutrition rich in phytate that prevents iron absorption. However, recent hematological research by Walker and his associates, shows that iron-deficiency anemia does not provide a reasonable physiological explanation for the marrow hypertrophy that produces the pathological lesions paleopathologists refer to cribra orbitalia.[58] In their opinion, many cribra orbitalia lesions are a result of the megaloblastic anemia acquired by nursing infants through the synergistic effects of depleted maternal vitamin B_{12} reserves and unsanitary living conditions that are conducive to additional nutrient losses from gastrointestinal infections around the time of weaning.

For that purpose, we examined the frequency and distribution of *cribra orbitalia* in 334 individuals (223 adults – 66.8%, 34 juveniles – 10.2% and 77 children – 23.0%) with 29 sites from the 1st to the 5th century.[59]

The total frequency of *cribra orbitalia* in Sirmium in the 1st–5th century was 14.3%. It is estimated that *cribra orbitalia* occurs in 10% of the population in developed countries and in 25–50% of the population in developing countries.

On the basis of this we can conclude, although the sample is not particularly large, that the quality of life in Sirmium in the 1st–5th AD, especially at the transition from the 3rd to the 4th century, was at an enviable level, that the *cribra orbitalia* was most likely the result of changes in the nutritional habits of the children, the physiology of juvenile and adult female individuals, chronic gastro-intestinal diseases and, to a lesser extent, in the poorer part of the population, unhygienic conditions of life, infectious diseases, parasitic infections and poor nutrition.

58 Walker et al. 2009.

59 Миладиновић-Радмиловић 2012.

This situation can be assumed since we know from historical data that by introducing the Tetrarchy system of rule in the Empire, Sirmium became the capital of one of four parts of the state, along with Mediolanum (Milan) in Italy, Trier in Gaul and Nicomedia in Asia Minor. At the transition from the 3rd to the 4th century, Sirmium was a developed city with a forum, temples, administrative buildings, granaries, baths, a theatre or amphitheatre, a water supply, sewage, and many private buildings. The representative part of the city included a fringe belt from the old forum to The Sava. There were public buildings and palaces of the most prominent representatives of the upper classes; palace with mosaics and small thermal spas in the yard. In that area there was a market and the craft-trade part of Sirmium with workshops and shops (*tabernae*). At that time, the basic components of economic power consisted of agriculture, viticulture, craft and stonemasonry workshops, an armaments factory and trade.

Translated by Nataša Miladinović Radmilović

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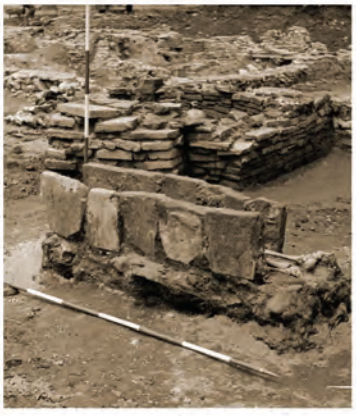

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Plate I
1–3) Site No. 21, "tomb" made of brick, viewed from different angles before and after opening (1–3);
4) Site No. 26, grave;
5) Site No. 47, grave 3;
6) Site No. 67, Grave 1 in sonde 7 (photo documentation of CAID, The Museum of Srem)

Plate II
1–4) Site No. 26, graves (photo documentation from USA); 5) Painted tomb discovered in Mike Antića Street; 6) Site No 74, child's sarcophagus (lapidarium, The Museum of Srem)

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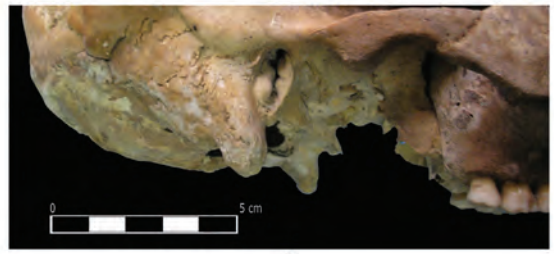

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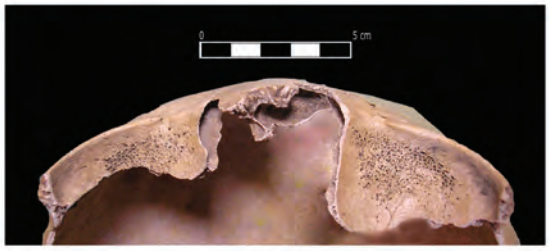

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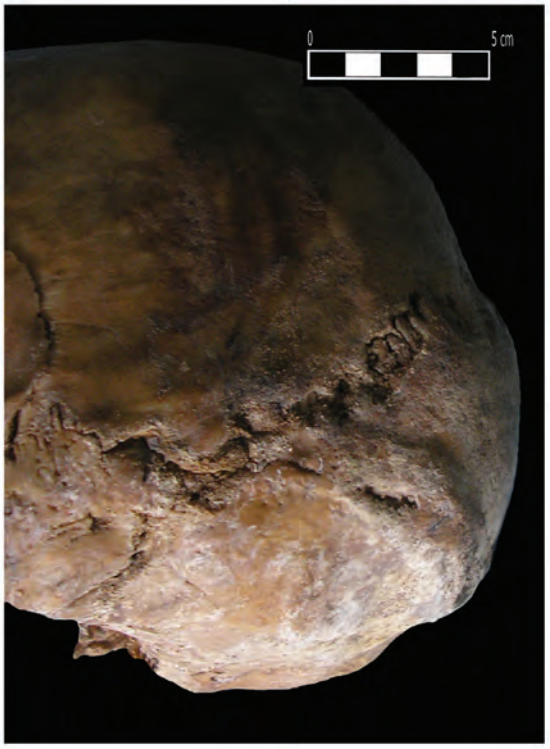

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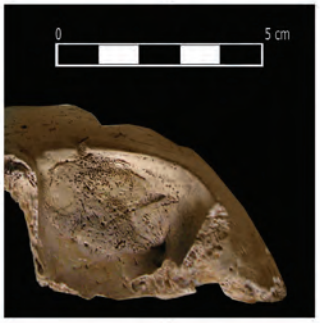

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Plate III
1) Site No. 80, Grave 1, male, 35–45 years old: torus auditivus;
2) Site No. 76, Grave 2 (I), male, 9 years old: cribra orbitalia on orbital roofs;
3) Site No. 77, Grave 1 (I), male (?), 10 years old: cribra femora;
4) Site No. 76, Grave 7, male, 18 months old: traces of scurvy on the left orbital roof;
5) Site No. 80, Grave 1, male, 35–45 years old: stab injury on the occipital bone;
6) Site No. 80, Grave 8, male, 35–40 years old: stab marks inflicted by sword or knife on cervical vertebrae

Plate IV
1) Site No. 12, grob BB (I), male, 33–42 years old: ankylosing spondylitis;
2) Site No. 12, grob BB (I), male, 33–42 years old: sacralization of L5, anterior side of the sacrum;
3) Site No. 12, grob BB (I), male, 33–42 years old: sacralization of L5, posterior side of the sacrum;
4) Site No. 77, Grave 11, male, 36 years old: spondylosis and spondylarthrosis on the cervical vertebrae and possible appearance of tuberculous osteomyelitis on vertebrae;
5) Site No. 77, Grave 2 (I), male, about 45 years old: irregularly healed fracture of the left clavicle;
6) Site Trasa kanalizacije – Arsenija Čarnojevića Street, male, 54–64 years old: traces of healed fractures on ribs

Plate V
1) Site No. 60, Grave 2 (I), male, 46 years old: osteomas on the frontal bone;
2) Site No. 60, Grave 2 (I), male, 46 years old: osteomas on the lambdoid suture;
3) Site No. 55, Grave 2, male, 35–45 years old: Stafne's Defect on the mandible;
4) Site No. 60, Grave 6, male, 35–45 years old: caries on the teeth of the mandible and periapical cystic cavity;
5) Site No. 50, Dislocated bones (I), male, 45–55 years old: teeth attrition;
6) Site No. 60, Grave 2 (I), male, 46 year olds: tumour on the mandible

Plate VI– 1–3) Site No. 55, Grave 1 (I), adult male: irregularly healed fracture of left fibula; 4) Sector I (I), male, about 35 years old: fusion of the upper ends of the left tibia and fibula; 5–6) Site No. 55, Grave 2, male, 35–45 years old: infective osteomyelitis on foot bones

Table 1. Paleodemographic structure of people in the 1st–4th century A. D. in Sirmium (Miladinović-Radmilović 2011, 224, Table 82)

AGE		MALE	FEMALE	UNDE-TER-MINED SEX	TOTAL
INFANS I	Fetus	-	-	-	-
	NB–0.5 year	-	2	1	3
	0.5–1 year	2	-	1	3
	1.5–2 years	1	-	1	2
	2.5–3 years	1	1	-	2
	3.5–4 years	1	1	-	2
	4.5–5 years	-	-	1	1
	5.5–6 years	1	2	2	5
	6.5–7 years	-	-	1	1
INFANS II	7.5–8 years	1	-	1	2
	8.5–9 years	1	-	2	3
	9.5–10 years	2	-	-	2
	10.5–11 years	1	-	2	3
	11.5–12 years	-	-	-	-
	12.5–13 years	1	1	1	3
	13.5–14.5 years	-	1	1	2
UNKNOWN AGE		1	-	9	10
TOTAL NUMBER OF CHILDREN		13	8	23	44
JUVENILIS I (15–18 years)		3	2	5	10
JUVENILIS II (19–22 years)		-	4	2	6
		1	3	2	**6**

ADULTUS I (23–30 years)	14	3	11	2	3	-	28	**5**
ADULTUS II (31–40 years)	17		6		-		23	
MATURUS I (41–50 years)	6	-	5	-	-	-	11	-
MATURUS II (51–60 years)	3		-		-		3	
SENILIS I (61–70 years)	-	-	1	-	-	-	1	-
SENILIS II (71 and more)	-		-		-		-	
UNKNOWN AGE	20		11		20		51	
TOTAL NUMBER OF JUVEN. AND ADULTS	67		45		32		144	
TOTAL NUMBER OF INDIVIDUALS	80		53		55		188	

Table 2. Paleodemographic structure of people in the 4th and 5th century A. D. in Sirmium (Miladinović-Radmilović 2011, 379, Table 148)

AGE		MALE	FEMALE	UNDETER-MINED SEX	TOTAL
INFANS I	Fetus	-	-	-	-
	NB–0.5 year	-	2	5	7
	0.5–1 year	-	-	2	2
	1.5–2 years	1	-	3	4
	2.5–3 years	1	-	3	4
	3.5–4 years	-	-	2	2
	4.5–5 years	-	-	-	-
	5.5–6 years	1	-	2	3
	6.5–7 years	-	-	2	2

INFANS II	7.5–8 years	-		-		1		1	
	8.5–9 years	-		-		-		-	
	9.5–10 years	-		-		-		-	
	10.5–11 years	-		-		-		-	
	11.5–12 years	1		-		1		2	
	12.5–13 years	1		-		-		1	
	13.5–14.5 years	-		-		1		1	
UNKNOWN AGE		1		-		3		4	
TOTAL NUMBER OF CHILDREN		6		2		25		33	
JUVENILIS I (15–18 years)		2	-	1	3	2	3	5	6
JUVENILIS II (19–22 years)		-		1		-		1	
ADULTUS I (23–30 years)		6	-	7	2	1	-	14	2
ADULTUS II (31–40 years)		12		3		-		15	
MATURUS I (41–50 years)		5	5	4	-	-	-	9	5
MATURUS II (51–60 years)		3		-		-		3	
SENILIS I (61–70 years)		2	-	1	-	-	-	3	-
SENILIS II (71 and more)		-		-		-		-	
UNKNOWN AGE		25		15		10		50	
TOTAL NUMBER OF JUVEN. AND ADULTS		60		37		16		113	
TOTAL NUMBER OF INDIVIDUALS		66		39		41		146	

Table 3. Paleopathological finds on children skeletal remains (Miladinović-Radmilović, Vulović i Đukić 2016, 72, Table 5)

CHILDREN DISEASES	**1st–4th century A. D.**	**4th and 5th century A. D.**
Enamel hypoplasia	6 (13.63%)	– –
Caries	3 (6.81%)	1 (3.03%)
Cribra orbitalia	5 (11.36%)	2 (6.06%)
Cribra femora	10 (22.72%)	3 (9.09%)
Cribra humera	6 (13.63%)	– –
Cribra fibula	1 (2.27%)	– –
Cribra palatina	1 (2.27%)	– –
Porotic hyperostosis	– –	1 (3.03%)
Scurvy	5 (11.36%)	– –
Rickets	1 (2.27%)	– –
Bone injuries	1 (2.27%)	– –
Inflammation of the middle ear	2 (4.54%)	– –
Periostitis	– –	2 (6.06%)
Deep lesions	8 (18.18%)	6 (18.18%)

Table 4. Markers of occupational stress (children)
(Miladinović-Radmilović 2011, 572, Table 222)

MARKERS OF OCCUPATIONAL STRESS	1st–4th century AD	4th and 5th century AD
Males	- -	- -
Females	- -	- -
Undeterminated sex	1 (4.3%)	- -
Total number of individuals	1 (2.3%)	- -

Table 5. Markers of occupational stress (juveniles and adults)
(Miladinović-Radmilović 2011, 572, Table 223)

MARKERS OF OCCUPATIONAL STRESS	1st–4th century AD	4th and 5th century AD
Males	42 (62.7%)	25 (41.7%)
Females	14 (31.1%)	15 (40.5%)
Undeterminated sex	4 (12.5%)	3 (18.8%)
Total number of individuals	60 (31.9%)	43 (38.0%)

Table 6. Diseases of juveniles and adults (Miladinović-Radmilović 2011, 569, Table 220; 570, Table 221)

DISEASES OF JUVENIL. AND ADULTS	1st–4th century AD	4th and 5th century AD	DISEASES OF JUVENIL. AND ADULTS	1st–4th century AD	4th and 5th century AD
Fractures of bones, injuries and fissures	30 (16.0%)	8 (7.0%)	Changes in bone caused by circulation disorder	20 (10.6%)	4 (3.5%)
Males	22 (32.8%)	7 (11.7%)	Males	16 (23.9%)	3 (5.0%)
Females	6 (13.3%)	1 (2.7%)	Females	2 (4.4%)	1 (2.7%)
Undeterminated sex	2 (6.3%)	- -	Undeterminated sex	2 (6.3%)	- -
Congenital anomalies	20 (10.6%)	4 (3.5%)	Changes in bone due to endocrine disorders	- -	- -
Males	14 (20.9%)	2 (3.3%)	Males	- -	- -
Females	5 (11.1%)	2 (5.4%)	Females	- -	- -
Undeterminated sex	1 (3.1%)	- -	Bone tumors	10 (5.3%)	7 (6.2%)
Joint diseases	80 (42.6%)	47 (41.6%)	Males	6 (8.9%)	3 (5.0%)
Males	49 (73.1%)	32 (53.3%)	Females	4 (8.9%)	4 (10.8%)
Females	19 (42.2%)	13 (35.1%)	Infectious bone inflammation	8 (4.3%)	2 (1.8%)

Undeterminated sex	12 (37.5%)	2 (12.5%)	Males	7 (10.4%)	1 (1.7%)
Schmorl's node	18 (9.6%)	6 (5.3%)	Females	- -	1 (2.7%)
Males	9 (13.4%)	6 (10.0%)	Undeterminated sex	1 (3.1%)	- -
Females	9 (20.0%)	- -	Periostitis	10 (5.3%)	3 (2.7%)
Metabolic diseases	8 (4.3%)	3 (2.7%)	Males	8 (11.9%)	3 (5.0%)
Males	6 (8.9%)	2 (3.3%)	Females	1 (2.2%)	- -
Females	2 (4.4%)	1 (2.7%)	Undeterminated sex	1 (3.1%)	- -
Undeterminated sex	- -	- -	Sinusitis	1 (0.5%)	- -
Changes in the bones caused by blood disorders	8 (4.3%)	3 (2.7%)	Males	1 (1.5%)	- -
Males	4 (6.0%)	1 (1.7%)	Torus auditivus	3 (1.6%)	- -
Females	4 (8.9%)	2 (5.4%)	Males	3 (4.5%)	- -
Undeterminated sex	- -	- -	Stafne defect	- -	1 (0.9%)
			Males	- -	1 (1.7%)

RESEARCH OF VIMINACIUM AND ITS SUBURBAN ZONES*

MIOMIR KORAĆ, *Institute of Archaeology, Belgrade*
E-mail: misko@mi.sanu.ac.rs
SNEŽANA GOLUBOVIĆ, *Institute of Archaeology, Belgrade*
NEMANJA MRĐIĆ, *Institute of Archaeology, Belgrade*

ABSTRACT

This paper presents the results of long-lasting research of the archaeological site of Viminacium. Since 1882, when the first excavations were conducted, until today, the most explored were the necropolises, with almost 14,000 graves, while research of the legionary fort and the city itself only really gained focus in this century. At the beginning of the 21st century, a new phase of the Viminacium examination began when multidisciplinary research started, including, among other things, remote sensing and anthropological, archaeobotanical, archeozoological and physical-chemical analysis. Systematic excavations of the amphitheatre are now finished, while those of legionary fort are still ongoing.

Keywords: Viminacium, Roman necropolis, amphitheatre, legionary fort, aqueducts

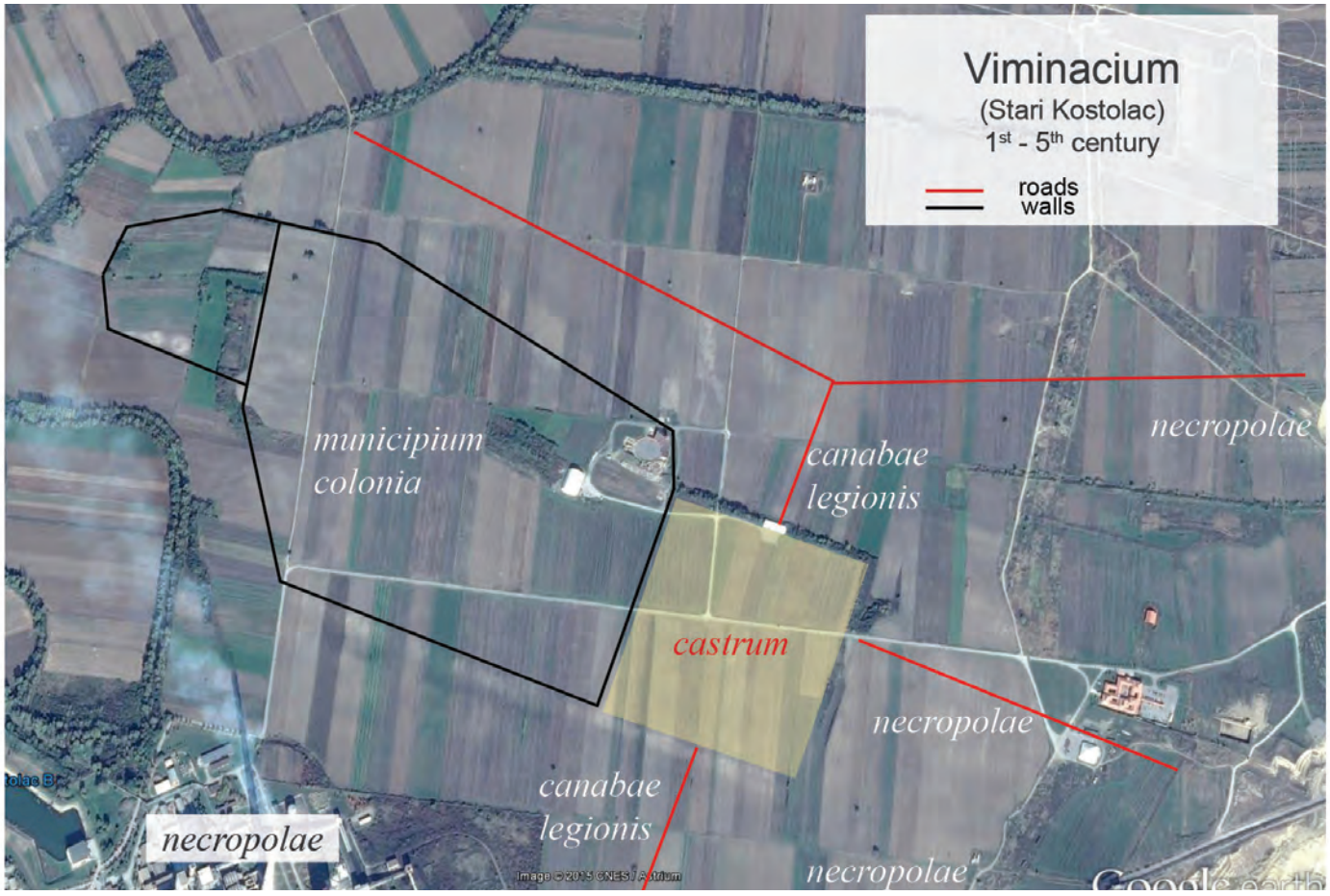
* The article results from the project: *Viminacium, Roman city and military camp – research of material and non- material culture of inhabitants by using the modern technologies of remote detection, geophysics, GIS, digitalization and 3D visualization* (no 47018), funded by The Ministry of Education, Science and Technological Development of the Republic of Serbia.

INTRODUCTION

The remains of the Roman city and Viminacium military camp have, for a long time, attracted the attention of ours and the world's public. Bearing in mind that this was the capital of Upper Moesia, a Roman province that was destroyed by the Huns in the 5th century, almost 1,600 years ago, the fact that, in the minds of the local population, the knowledge and awareness of the Roman city under the name Viminacium still exists testifies to the extent of its significance and size. Its remarkable advantage is that its remains (more than 450 hectares of the city and 220 hectares of the narrower city territory) are located below orchard land, that is, there are no new urban units above the archaeological site. Systematic research of the city itself and the fortification (Map. 1) was prompted by salvage excavations undertaken during the last three decades of the 20th century. At that time, excavations were carried out in the southern necropolis of Viminacium, where more than 13,000 graves were discovered, representing the largest excavated cemetery from the Roman period. Such a large number of graves, the numerous and unique findings from them, and the abundance of archaeological and anthropological materials did not go unnoticed by the public and, at the beginning of the 21st century, the long-awaited systematic research started that brought together an interdisciplinary team composed of outstanding experts from various fields. Today, involved in the Viminacium research, in addition to archaeologists, there are anthropologists, architects, geophysicists, mathematicians, electrical engineers, geologists, petroleum workers and researchers dealing with remote sensing and 3D modelling.

HISTORY OF THE CITY

The city itself was founded at the intersection of the roads connecting the northern part of the Balkan Peninsula with other parts of the Roman Empire. Although these roads had a primarily military and strategic function, they had very lively traffic during the whole of Antiquity, thanks to which Viminacium became not only a military base, but also an important trading and manufacturing seat. The discovery of the Celtic necropolis at Viminacium, at the site of "Pećine", proved that in the pre-Roman period the Celts lived in this area. The research of the necropo-



Map 1 - Viminacium topography

lis confirms that Viminacium was established in the territory of the Celtic tribe of Scordisci. Strabo, in Geography, writes that in this area, the Scythians were mixed with the older Thracian tribes. There is a much data about Viminacium in antique sources from the 2nd to the 9th century. It is mentioned by many ancient writers, from Ptolemy to Hierocles and appears in almost all preserved Roman itineraries such as *Tabula Peutingeriana* and *Itinerarium Burdigalense*, as well as in the *Notitia Dignitatum*, *Codex Theodosianus* and *Codex Iustinianus*. On the *Tabula Peutingeriana*, the site is designated as *Viminatio*; on the *Itinerairum Antonini Augusti* as *Viminacio* and *Euminacio,* and on the *Itinerarium Burdigalense* from 333 it also appears as *civitas Viminacio.*[1]

1 Mirković 1968, 61.

The first Roman legions stationed in Moesia (possibly in Viminacium) were the Legion IV *Scythica* and the Legion V *Macedonica*, probably around 15 A.D. These two legions had a common commander and were most likely placed in a joint camp. According to some authors, they were moved to Viminacium around 33 or 34 A.D. In any case, in the middle of the 1st century or before, most probably in the fourth and the beginning of the fifth decade, Viminacium already had a permanent legion. It seems that since coming to these areas and to the Danube, until the end of the eighth decade of the 1st century, two legions were stationed in Viminacium, most probably the IV *Flavia felix* and the VII *Claudia pia fidelis*, and then the latter remained as a permanent garrison until the end of Antiquity. The last note in sources was in Notitia Dignitatum, when Viminacim was a garrison of 3 units in Late Antiquity: *Cuneus equtumpromotorum, Viminacio; Praefectus legionis septimae Claudiae, Viminacio;*[2]and *Praefectus classis Histricae, Viminacio.*

An adjacent settlement, *canabae legionis,* developed near the *castrum* at an early stage. Special attention to the rebuilding of this settlement was noted in the later imperial inscription that mentions *cana*|[*bas?refec*]*eruntleg (ionis) VII Cl (audiae)* [*A*]*nt(oninianae) p*(*iae*)*f*(*idelis*), during the reigns of *Septimius Severus* and *Caracala* (between the years 197-211 A.D.).[3]

During the reign of *Marcus Aurelius,* the rise of Viminacium was interrupted by an epidemic of the plague, but only temporarily. Archaeological research shows that the plague epidemic did not reflect too much on the economic prosperity of Viminacium, because the city was in full bloom already in the first years of the 3rd century.

Events that were related to a number of barbarian invasions in the second half of the 3rd century and the abandonment of the province of Dacia under Aurelianus had an enormous effect on Viminacium, negatively impacting production, trade and urban development. The city recovered under the Tetrarchy and flourished under *Constantinus* I, for whom it was an important base for actions to the north of the Danube.

2 In *Notitia dignitatum Legio VII Claudia* was mentioned twice, the second time as *Praefectus legionis septimae Claudiae, Cuppis*. In the *Paul* Halsall *Internet History Sourcebooks Project*, which has multiplied all over the internet, *VII Claudia* is, for an unknown reason, omitted from Viminacium, mentioned only in the garrison in Cuppis. In all printed editions as well as in all preserved manuscripts VII Claudia was mentioned in both places.

3 Mirković 1986, 55.

The first line of defence on the Danube frontier was the river fleet (*classis Histrica*). Viminacium was mentioned in *Notitia Dignitatum* as one of its bases, with the *prefectus* residing here *(Praefectus classis Histricae, Viminacio)*. *Menander Protector* writes that, in 580, the *Classis Histrica* for *Moesia Prima* was in Viminacium.[4]

From the end of the 2nd to the end of the 4th century, the Roman emperors, considering Viminacium a very important city, started with more regular visits. There was almost no Roman Emperor who did not go through Viminacium or stayed there for a longer or shorter period time.[5] It is especially interesting that the city gained significance when the Roman state began to weaken. In the last decades of the 3rd century, the city played a key role in resolving the issue of power in the Roman Empire.

In the 3rd century, at the time of Gordian III, Viminacium became a colony and acquired the right to mint coins.[6] In 365 AD, Viminacium became the seat of one of the four episcopacies in Moesia. The names of the bishops *Amantinus* and *Cyriacus* were related to the area of the province of *Moesia Prima* and Viminacium - ... "*Amantinus ... Cyriacus Mysiae*.[7] The city was destroyed in the middle of the 5th century with the invasion of the Huns. This data relies on the testimony of *Priscus*.[8]

It should not, however, be ruled out that the destruction of the city and military camp could have occurred in the eighth decade of the 4th century, during the invasion of the Goths.

The rebuilding of the city during Justinian's rule, can be judged on the basis of the data of *Theophilus Simocata* and the findings at the site of the local church (Todića crkva) and Svetinja, where remains from the 6th century were identified.

Although, in the year 584, the Avars occupied Viminacium,[9] this event did not yet mark the end of its history. Around 600 AD, Byzantium was on the offensive - the Roman army had been concentrated in Viminacium and, from there, moved to the left bank of the Danube.

4 Mirković 1968.

5 Seeck, 1911, 1047; Cod. Theodos, X, 10, 4.

6 Borić-Brešković 1976, 8-23.

7 Zeiller 1918, 148.

8 Prisci fr. 2, 280 and 8, 305.

9 Theoph. Sim. Hist. I 3-4.

VIMINACIUM RESEARCH

The first records of the Viminacium site are almost 300 years old. After the visits of the travellers who cruised through Serbia in the past, there remained descriptions and plans of the ruins of the city and camp.[10] These reports, although often rough, unspecified or imprecise, represented a valuable source of information, since they originated from the time when the parts of the city still were visible, before serious degradation took hold. The first archaeological research in the Viminacium region started due to the endangering and destruction of the site. The architect MihailoValtrović, then the curator of the National Museum, visited Viminacium in 1882 and made the first rough sketch of the site. After this visit, in October of the same year, he also performed the first scientific excavations, funded by the National Museum in Belgrade. Soon after came the research of Miloje Vasić, the first Serbian, educated archaeologist. During the excavations, which were carried out in 1902 and 1903, Viminacium was visited by Queen Draga Obrenović (Fig. 1). Amazed, she gave Vasić 100 golden ducats to continue the research, and he, in gratitude, named the street he discovered Queen Draga Street. This visit was recorded in the newspaper *Novine Serbske*. During these excavations, one part of the city settlement, with an area of 1,600 m², was investigated and a report was published in the *Archaeologischer Anzeiger*[11]. Vasić determined the end of the first half of the 1stcentury for the beginning and placed the end at the first half of the 5th century for the development of the explored part of the city settlement of Viminacium. According to the method of construction and the construction materials used, it has been concluded that all the explored walls did not originate from the same period. Thus, the period ranged from the end of the first half of the 1st century to the end of the first half of the 5th century, divided into three main epochs.[12]

Despite the remarkably significant discoveries, seventy years passed before the continuation of the excavation. With the construction of the Kostolac Thermoelectric Power Plant and then the opening of the coal mine "Drmno", the research of the city of Viminacium was directed towards the necropolises. The excavations, led by Ljubica Zotović, which lasted for twenty years (1977-1997), resulted in the

10Marsigli 1726; Kanitz 1892.

11 Vasić 1905.

12 Vasić 1903b, 208.

Fig. 1 - Queen Draga Obrenović at Viminacium

discovery of over 13,000 graves, the largest number of graves at one site in the whole territory of the Roman Empire.

However, when it comes to research of the necropolises, the first data about them was provided by M. Valtrović, in the year 1882, when he concluded that a large Roman cemetery extending to the right bank of the Mlava, which he then excavated, was located to the south of the town. During the field survey, he determined the existence of the northern and eastern necropolises.[13]

The excavations which began almost a hundred years later confirmed the existence of Roman necropolises east of the military fort and north and south of the fort and settlements established next to the camp. Since today's open coal mining is progressing toward the Roman fort and the city settlement, the current rescue excavations are still ongoing, but now to the east and north of the military camp and settlements.

In the area of the southern Viminacium necropolises, the oldest necropolis belongs to the Celtic population that inhabited this territory at the end of the 4th and the beginning of the 3rd century B.C.[14] In the period of Roman domination,

13 Валтровић1884.

14 Jovanović 1984; Jovanović 1985, 13–18.

burial was carried out at several of the excavated necropolises – Više Grobalja, Pećine, Kod Bresta, Drmske Carine and Velika Kapija (Map 2), which comprised the southern necropolis of Viminacium, and were subject to several monographs and studies.[15] However, until now not all the graves and materials found therein have been completely published, which will follow after the completion of the rescue excavations. We can generally determine that it was a bi-ritual necropolis where both cremations and inhumations were represented, of course in different proportions in respect to the period. As the new research spreads to the east of the site, the type of grave forms changes accordingly. However, it can be concluded that, for example, the forms of the graves with cremations are particularly diverse. The most widespread grave form represents the simple or stepped rectangular pits with the sides burnt to a red and sometimes grey intensity. This form is attributed to the domicile population, who changed their rites of burial due to the influence of the newcomers, but gave them their own authentic feature, and are known as the Mala Kopašnica-Sase grave type according to the eponymous site.[16] Graves of this type are distributed in the area of Pannonia, Moesia, and eastern Thrace. There are many variants of this form: they can be rectangular-shaped pits with a cover of either flat or ridged tiles, or with a wooden board or an amphora split longitudinally for covering, while the stepped graves could be with a brick-built interior step or even with three steps.[17] A lot fewer burials occurred in urns, which were, in fact, ceramic pots in secondary use. The existance of graves in the form of a well are considered a borrowed from other cultures, that is, the bearers of this grave form arrived with the army from other parts of the Roman Empire and settled in the territory of Viminacium, practicing their rituals for quite a long period of time.[18]

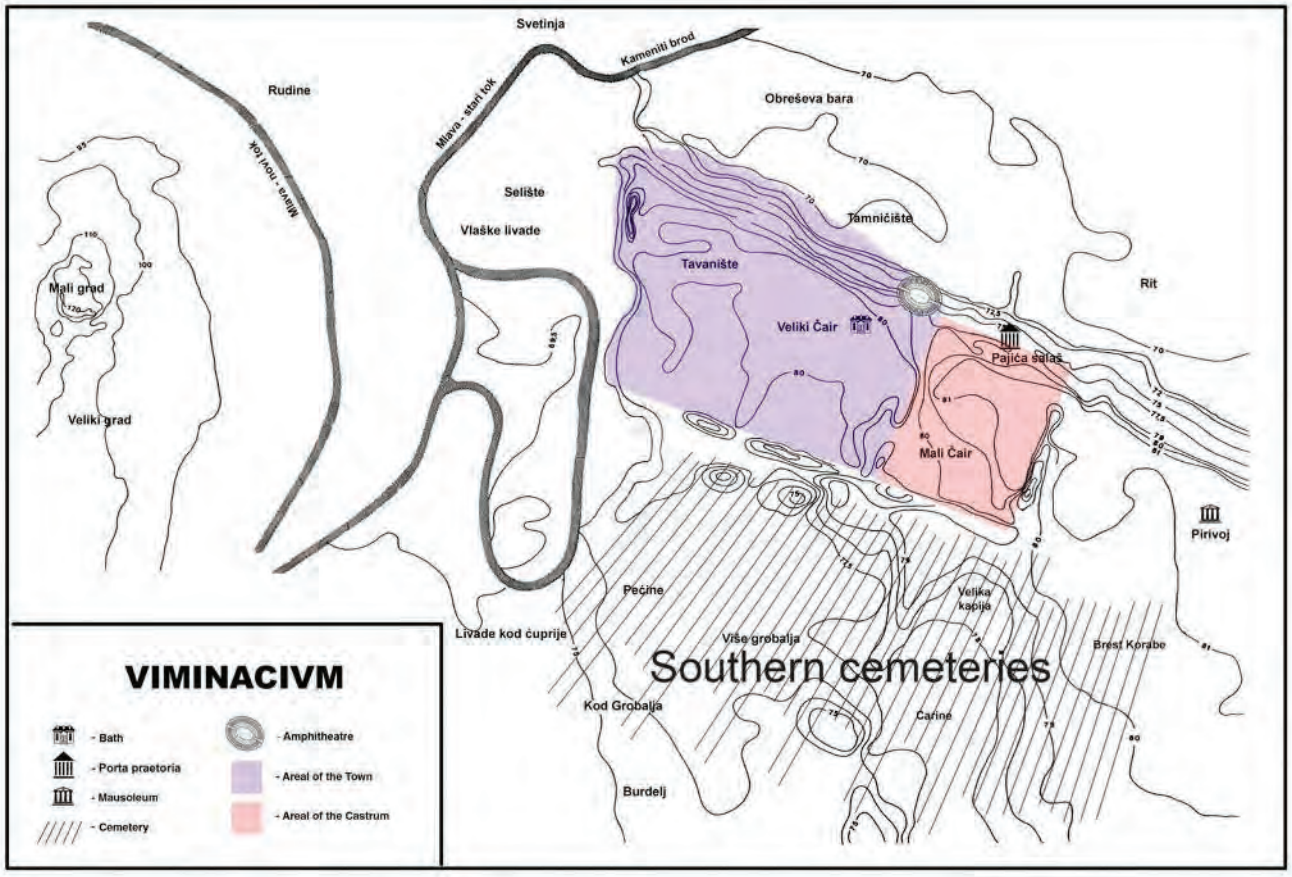
Considering skeletal graves, the deceased was most frequently buried in a plain grave pit, wrapped in a linen shroud. Next, by number, were the burials in wooden coffins, then those with a construction of tiles or bricks, which could be very diverse, while graves with a wooden board as the floor are quite rare.

15 Зотовић1986, 41–60; Зотовић, Јордовић 1990; Korać, Golubović 2009; Golubović 2008; Korać, Mikić 2014.

16 Garašanin 1968.

17 Golubović 1998, 248.

18 Golubović 2008, 141.



Map 2 - Viminacium city, fort and necropolis

A special type of tombs are those built of bricks. This type of grave has been discovered in urban centres such were *Sopianae*[19], *Viminacium*[20], *Sirmium*[21], as well as close to the military forts along the Pannonian and the Moesian part of the Limes, whilst also being characteristic for *Pannonia* and *Moesia*. The trapezoidal cross-section, as a specificity of the necropolis at Viminacium, was first remarked on by Miloje Vasić at the beginning of the 20th century and characterised as a Viminacium type of tombs.[22] The tombs were used for multiple burials, so the bones

19 Fülep1984.

20 Васић 1907, 66-98; Korać 1993, 107–122.

21 Milošević 1971, 3–13.

22 Васић 1907, 66-98; Васић1895, 1 dalje.

Fig. 2 - Viminacium hypogeum

of various deceased, mostly dislocated and fragmented, were found in a single tomb, either W-E or E-W oriented.

A few dozen monumental tombs, above the surface or of the hypogeum (Fig. 2), family tombs intended for the burial of several persons, are concentrated in the northern part of the researched necropolises, closer to the civilian settlement. Some of the tombs decorated with wall paintings of exceptional beauty testify that in Viminacium during the 4th century there existed one of the most important painting workshops.

Almost all the tombs belong to the Late Antique period (the exception is a tomb from the beginning of the second half of the 3rd century) and are located in the Late Antique layer of the necropolis, alone or in a space inside or outside memorial buildings. So far, more than 30 tombs with wall paintings have been found in the Viminacium necropolises. However, due to the poor preservation of the wall paintings, as most of them are in fragments, only two tombs can be reliably identified as Christian or Pagan, and are the most relevant for the perception of painting in an urban centre such as Viminacium.[23] The tombs were painted with

23 Korać 2007.

primary, earthy colours, dominant among which were red, black, ochre, blue and green, with a predomination of geometric and floral motifs while, of the zoomorphic motifs, the most common was the peacock.[24]

Over thirty lead sarcophagi were found at different sites and, compared to other types of burials from the Roman period, represent a relatively rare occurrence. They are mostly without any, or with humble, decoration in the form of geometric motifs and laid directly in the pit. However, there were also those richly decorated with figural motives. The most abundant ornaments on the Viminacium lead sarcophagi were applied using plastic tapes that divided the surface of the sarcophagus into triangles and rhombuses and were characteristic of the Jerusalem workshop. Lead sarcophagi found on the necropolises of Viminacium, although likely, in some way, could be related with Syria, were probably the product of local craftsmen, whose work was undoubtedly influenced by the population originating from the Orient. In any case, they were imported, but not as full and finished products, but as templates as expressions of the widely accepted fashion in a certain period, in this case from the 2nd to the 4th century. From the territory of Viminacium derive the largest number of lead sarcophagi, specially ornamented, but there were no Christian symbols on them. In most of the so-called lead sarcophagi found so far were buried children. The small percentage of burials in lead sarcophagi compared to others forms of burial at the Viminacium necropolises points to the special status of those buried in them.[25]

In the 21st century, as part of the rescue excavations, research of the eastern necropolises has begun to lead to new significant discoveries.

The whole area of the eastern necropolises was threatened by the expansion of the Drmno open-cast coalmine. It should be noted that all excavations were preceded by geophysical prospects (Fig. 3), which have become obligatory and based on which archaeological excavations are planned.

At the eastern cemetery of Viminacium, with the toponym of "Pirivoj", the first excavations began in 1997, and were continued only in 2003. The necropolis is bi-ritual so 412 inhumations and 74 cremations have been researched. The site is especially important due to its mausoleum complex, measuring 20 x 20 m (Fig. 4). The mausoleum is unique since it is surrounded by a square wall built of stone

24 Anđelković, Rogić, Nikolić 2010, 231.

25 Golubović 2002, 633.

Fig. 3 - Geophysical prospection at Viminacium

blocks. In the central part, there is the main building, measuring 5 x 5 m and built from greenschist stone bound with plaster and in the centre of the main building is the tomb. This form of burial, known as a *bustum*, is usually very rare and was even rather extraordinary at that time. The buried was cremated and had to be highly ranked in the Roman hierarchy. Other tombs surrounding this central one had notable inventories, among them about twenty gold artefacts and gilded fibulae.[26] Inhumations and cremations were placed outside the wall around the mausoleum. Among them was a tomb with a wall painting from the beginning of the 4th century. According to the images, it was a pagan tomb, but in the immediate vicinity there were also graves containing findings with Christian symbols. In grave G-212, the tile construction, besides other findings, a finger ring with a carved cross was found.[27]

Another feature of the necropolis of Pirivoj, at the most eastern part of it, is a trench (5 x 5 m) with more than 100 graves containing both skeletons and cremat-

26 Korać, Golubović, Mrđić 2009, 99.

27 Golubović, Korać 2013, 41.

Fig. 4 – Mausoleum at Viminacium

ed individuals. Obviously, the deceased were buried in the trench over a rather short period of time.

At the site of "Kod Koraba", located in the wider area of Viminacium, about 650 m southeast of the legionary fort, during research that lasted from 2005 to 2008, a previously unknown Roman necropolis was discovered, and 211 graves were researched, 132 graves of cremated deceased and 79 inhumations. According to the type of graves and artefacts found there, the necropolis is dated into the period from the middle of the 1st to the middle of the 3rd century, and only one grave is from the 4th century.[28]

Due to the expansion of the coal mine to the east, rescue excavations were shifted and new data on the eastern part of the Viminacium necropolis is emerging. Namely, at the location Nad Klepečkom, now about 800 m east of the legionary fort, 111 graves of cremations and 94 inhumations, all dating from the 2nd and 3rd century, have been researched. Excavations started in 2008 and were completed in 2016. The remains of the road, trench and large buildings were discovered along the former Roman road that led from Viminacium to Lederata. Since the excavations were carried out until 2016, most of the area has been fully explored,

28 Bogdanović 2009, 83-110.

and the boundaries of the necropolis and the city have been defined, so this site is most likely the earliest part of the settlement of Viminacium.

Over 40,000 artefacts from graves of cremated of inhumated deceased, among which over 1,000 gold ones and some quite unique, have been found during 40 years of excavations at Viminacium.

SYSTEMATIC EXCAVATIONS IN THE 21ST CENTURY

At the beginning of the 21st century, a new phase of the Viminacium research began. Namely, since 2002, under the leadership of Miomir Korać, multidisciplinary research has begun, which includes, among other things, remote sensing, and anthropological, archaeobotanical, archeozoological and physical-chemical analysis. All data obtained is merged into a geographic information system (GIS). For aerial photography, remote control aircraft, drones, are used and for the documentation of the investigated units, photogrammetry and 3D modelling.

LEGIONARY FORTRESS

The research of the legionary fortress, whose foundation was determined by previous geophysical survey and analysis of the digital model, began in 2002 in the northern gate sector (*Porta Praetoria*). The remains of this gate, with massive street pavements, canals of a sewer system and richly decorated architectural elements, pointed to a powerful defence system of which the fortress was a part since it was built on the then northern border of the Empire (Fig. 5). In the layer of debris at the northern gate of the military camp (*Porta Praetoria*), under a massive square stone, a hoard of 136 bronze coins was found. The latest coin does not exceed the fourth decade of the 5th century.[29]

The research of the legionary fortress continued in the area between the amphitheatre and the northern gate from 2015 (Fig. 6). In the excavated area, the northwest corner of the fortress was discovered, with a corner tower, a part of the

29 Korać, Golubović, Mrđić 2009, 71.

Fig. 5 - Northern gate of the legionary fortress

north ramparts along the tower and the northern segment of the western ramparts. Based on these results, at least two phases can be clearly identified within the camp. The older phase was built of natural brick quarried in the close vicinity of the archaeological site, and it was dated in the last decades of the 1st century. The fortress built from stone could be only broadly dated to the 2nd century. In front of the corner tower, over a length of 10 m, a defensive rampart was explored, as well as a massive wall above it built of larger limestone blocks. A part of a defensive trench was explored in front of the western ramparts. A channel extends from the fort through the western ramparts and then descends to the bottom of the trench. The arced upper segment of the channel is made of brick bound with mortar, while from the section where the arc is most prominent, northwest towards the opening on the south side of the massive wall; the channel consists of limestone blocks. Four graves built of bricks were discovered in the researched area, one of them located along the western wall.

The results of the research have so far confirmed the existence of two basic phases of the fort's construction. The older phase comprised the remains of the ramparts and towers of "natural brick"[30] while in the younger phase the ramparts

30 Locally referred to as "red stone".

Fig. 6 - Legionary fortress, north-western corner

and towers are made of Greenschist facies stone. The rampart of the younger phase stretches along the north and west faces of the ramparts built of cut pieces of natural brick. The northern rampart was dug to a length of 120 m, while the west was discovered over a length of 220 m. In parts where the rampart was preserved in the negative, below the base, traces of small holes for piles of quadruple, oval or circular bases, whose base was spiked shaped were discovered. The wooden piles went partly into the base of the ramparts and were used to strengthen the earthen groundwork, i.e. to increase soil compaction.

West of the younger ramparts, and above the eastern side of the defensive trench, several late antique objects, built using the drywall technique, and belonging to different phases, were discovered.

In 2017, 22 graves from the Late Antique period were discovered along the western ramparts. The most common were children's graves, tombs built of tiles.

AQUEDUCTS

During 2003, excavations of the Roman aqueduct at Viminacium were undertaken (Fig. 7). More than 1,150 m of two parallel aqueduct channels were explored, from a total of more than 6 km that was mapped using a variety of remote sensing techniques. Excavations were preceded by a geophysical survey of the terrain, after which the precise route of the underground channels was determined. The rest of the water supply system has not been archaeologically researched. Undefined parts were further explored with georadar (GPR – Ground Penetrating Radar) and other methods of remote detection.[31]

It was concluded that the water for Viminacium came through three parallel aqueducts, and estimated that the aqueducts brought water from the hills and springs south east of the city from a distance of several kilometres to the area in front of the legionary fortress (*Castrum)* near the Eastern gate of the fortress. Water from the aqueduct was further distributed through a ceramic or lead pipe system to the end users. Elements of these distribution systems have been found all over the archaeological site.

Multiple aqueducts are most likely related to a large increase in population numbers. The oldest aqueduct can be dated into the end of the 1st century, while the other two are later but probably use same principle of gravity feed and terrain configuration, as well the same water source. The city that became a municipium (*municipium Aelium Viminacium*) and later a colony (*colonia Viminacium*) almost doubled in area and expanded in these decades with a huge increase of inhabitants and public buildings that required massive amounts of water (public baths - *thermae*).

During 2003 the territory on which aqueduct 2 was expected to be identified was researched using an aerial survey, geophysical and geomagnetic recording, as well as a field survey, and this was partially excavated in 2008. On that occasion, one of the castellums (*Castellum aquae)* was discovered and excavated. It was used as a drain and water supply reservoir, measuring 16.35 x 11.8 m and in a W-E orientation, into which both branches of the aqueduct and two pipelines constructed from ceramic pipes fed. The *Castellum aquae* was relocated to a protected location within the Archaeological Park and preserved, ready for presentation.

31 Korać, Mrđić, Mikić 2006, 7.

Fig. 7 - Roman Aqueduct of *Viminacium*

AMPHITHEATRE

The systematic archaeological research of the amphitheatre began in late 2007, and continued until mid-July 2017. The research included: the arena and the wall around the arena, four gates of the amphitheatre and the rooms extending along the arena wall, as well as the area of the grandstands (Fig. 8). Excavations included research of the area around the amphitheatre itself. To the north of this building the city rampart was explored, while east and south east of the amphitheatre a rampart and gates flanked with two rectangular towers, a defensive tower east of the ramparts, as well as two buildings with an apse were discovered. South of the amphitheatre a street was researched, which led from the gate to the west, and two objects and parts of an older communication and drainage channels were discovered. In the area west of the amphitheatre, parts of several buildings were discovered: one built in the drywall technique, one with columns and one with an apse. Following the results of the excavations, it has been concluded that the amphitheatre was built at the beginning of the 2nd century and used until the first

Fig. 8 - Amphitheater at *Viminacium*

half of the 5th century. In the Late Antique period, a necropolis of inhumed deceased was formed in the amphitheatre area.[32] The excavation of the amphitheatre showed the existence of at least three phases of construction, defined by changes in the structures. According to the results of the research, a wooden amphitheatre was first built during the first quarter of the 2nd century and the rule of Trajan, while the second phase, characterised by a construction of stone and wood, in the middle of the 2nd century, mainly relates to the reign of Hadrian. In the period from the second half of the 2nd century until the middle of the 3rd century, changes in the structure of the building were noticed, but at the end of the 3rd century or at the beginning of the 4th century, the amphitheatre was no longer operational, for reasons unknown. This area was abandoned and, in the second half of the 4th century, a necropolis was formed on it.[33] According to the results of the archaeological research, it was estimated that the amphitheatre could hold from 6,500 to 7,300 spectators in the second and third construction phases, while in the first phase, when it had only a wooden construction, 6,000 spectators could be accommodated.[34] The arena wall was painted, testified to by the various remains of wall

32 Excavations in 2017 completed the ten-year research of the amphitheatre and its surrounding area. The north-western part of the stands was left for future research and the possible use of new methodologies. About excavations see reports: Nikolić, Bogdanović 2012, 42-45; Nikolić *et al.* 2014a, 48-52; Nikolić *et al.* 2014b, 93-98;Nikolić *et al.* 2017, 63-70.

33Nikolić, Bogdanović 2015, 553-554.

34 Nikolić, Bogdanović 2015, 550, 553

Fig. 9 - Roman Baths at *Viminacium*

paintings found just next to the wall.[35] Below the auditorium of the amphitheatre, several structures were identified as *aediculae*, which were also painted.[36]

BATHS (THERMAE)

The baths in Viminacium were researched in two periods, from 1973 to 1974, and from 2003 to 2007. So far, archaeological excavations have uncovered five apses (over the pools), a central space with a hypocaust under the floors from two periods and several peripheral chambers in the researched area of 825 m² (Fig. 9). Considering the number and layout of the walls that have been partially researched, extending more within all profiles, it can be concluded that the Viminacium baths were larger in size compared to the structure discovered by the previous research, or that they were part of a larger complex.[37] The Viminacium baths are the oldest thermal baths from the Roman period that have been excavat-

35 Rogić, Bogdanović 2012, 46-49.

36 Rogić 2014, 507-512

37 Nikolić, Milovanović, Raičković 2017, 40.

ed in the territory of Serbia so far. The best researched baths from the territory of the Roman province of *Moesia Superior* are dated from the 3rd and 4th centuries.[38] The excavation of the baths showed that there were three phases of building and that the construction of each subsequent period grew on the ruins of the previous one.[39] The Viminacium *thermae* was in use since the second half of the 1st century AD to the end of the 4th century. The structures belonging to the earliest phase, from the 1st to the 2nd century, have been partially researched. The north-western part was most likely used only until the end of the 3rd century, when the baths were briefly out of function, while the other parts lasted even later, or were renewed in a different manner and used until the end of the 4th century, when the baths were definitely left after a fire which may be related to the period around 380 years and the Gothic invasion.[40] The latest excavations did not provide evidence that the building was in use after the 4th century, although after the research in 1974, such assumptions were made.[41]

The remains of wall paintings, fragments of marble ornamentation, window glass and mosaic tiles indicated that the Viminacium baths were luxuriously decorated. During previous research, a lot of ceramic and numismatic material confirmed several construction phases and they support the assumptions that followed the analysis of building techniques presented in the structures of the building.

38 Kuzmanović 1988, 15

39 Nikolić, Milovanović, Raičković 2017, 41

40 Nikolić, Milovanović, Raičković 2017, 40.

41 Kondić, Zotović 1974, 97.

SUBURBAN VILLAS

Several *villae rusticae* have been researched in the surroundings of Viminacium. On a map with the position and distribution of the *villae rusticae* around Viminacium, it is noted that the villas were distributed across a wider territory west, east and south of the city (Map 3). The villas at Livade kod Ćuprije,[42] and Burdelj[43] were located 650 m, i.e. 1,100 m southwest of the city, near the Mlava River. Two villas were found 550 m south of the city, at the site Više Grobalja.[44]The villa at Rudine[45] was about 500 m west of the city, on the west bank of the Mlava. Five roman villas at the site of Rit were located a couple of hundred meters from the town and the military camp, northeast of the north-eastern corner of the *castrum*.[46] On the area east of the city, one villa was explored at the site of Na Kamenju,[47] three villas at the site of Nad Klepečkom[48], and one at the site of Stig.[49] The villa at site of Na Kamenju is located 1,800 m east of the military camp, the villas at the site of Nad Klepečkom 2,300 m east of the military camp, and the farthest villa, at the site of Stig, is 2,900 m east of the *castrum*. In the wider city area, the remains of villas were discovered in the villages of Drmno and Kravlji Do.[50] This suggests that many villas certainly existed in the wider territory of the *municipium*, in the fertile valley which, in modern times, is called Stig. Some of the villas could be defined as suburban, the suburban residences of richer citizens of the city, however, in some of them, findings confirm the economic and agricultural character of these buildings, so we can, with certainty, define them as *villae rusticae*.

For some of the villas, it is believed that they were in the vicinity of ancient communication routes. Thus, villa Na Kamenju was located directly by the road, at a distance of only 3 m, and a similar situation is apparent with the villas at the

42 Jovičić, Redžić 2011, 369.

43 Зотовић 1986, 51.

44 Redžić, Mrđić, Milovanović 2017, 51.

45 Поповић, Иванишевић 1988, 125-179.

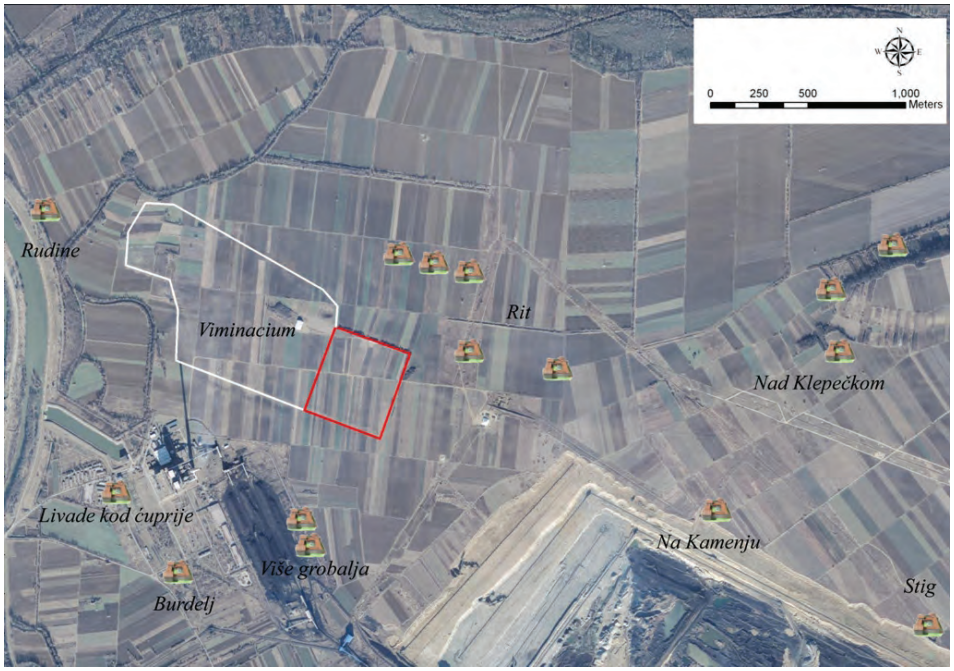
46 Redžić, Jovičić, Danković 2017, 77-86.

47 Golubović, Korać 2010, 33-36; Jovičić 2011, 39-43

48 Jovičić 2011, 44-51; Redžić, Jovičić, Danković 2014; Jovičić, Redžić 2014.

49 Redžić, Raičković, Miletić 2006, 51.

50 Ђокић, Јацановић 1992, 75.



Map 3 - *Villae Rusticae* at *Viminacium*

sites of Rit and Više Grobalja. A road was also found at the locality of Nad Klepečkom, with the villa located 90 m north of it. There are also indications that the villa at Burdelj was located near an ancient communication that led from the city gates to the south. As for the architecture of the researched villas, they vary in size, from 230 to 730 m². The exception is one villa excavated at the site of Nad Klepečkom, which is 2,900 m² in size. The villas are square in shape, with several rooms organised around the central atrium or corridor. The walls of the excavated villas were built of solid materials, stone and mortar, in the *opus incertum* technique or from a combination of stone, brick and mortar, in the *opus mixtum* technique. Traces of a heating system (hypocaust), as well as traces of wall paintings were found in some of villas, but these are rare.

Roman villas in the vicinity of Viminacium are dated from the 2nd to the 4th century A.D. Three villas from the 2nd century were explored at the site of Nad Klepečkom, while two villas at the site of Više Grobalja and five at the site of Rit are dated to the 3rd century. The villas found at the sites of Na Kamenju, Livade kod Ćuprije, Rudine, Stig and Burdelj are dated into the 4th century.[51]

51 Jovičić, Redžić 2011, 378.

TEMPLE COMPLEX

The complex researched from 2002 to 2007, 800 m east of the military camp, consisted of eight buildings, with a length of 500 m.[52] Fragments of bricks, pieces of green schists and red stone were scattered on the surface and, during the excavation, it was concluded that this was material from which the buildings were built. Numerous fragments of architectural plastic together with bronze coins were dated from most of the structures in the middle of the 3rd century, and from only two buildings in the 4th century. Unfortunately, the complex has been robbed for centuries and nothing has been left that could help us to precisely define the function of the buildings. According to the exceptional architectural ornamentation and the arrangement of the objects, the greatest similarities in architecture and arrangement of features leads to the search for analogies in the so-called temple complexes as defined, for example, in Kempten (*Cambodunum*)[53] or in Altbahtal (Altbachtal).[54]

DISCUSSION AND CONCLUSION

After analysing the previous Viminacium research we could divide it into three basic phases:

- the first phase of research carried out at the end of the 19th and the beginning of the 20th century
- the second of large rescue excavations from 1973 to 1997
- the research conducted since 2001, characterised by the application of several methods of various sciences, first used in the preparation of archaeological excavations, and then for the documentation and final processing and interpretation of the results.

In the third phase the most up-to-date methods in recording and analysing georadar signals were used, as well as methods of artificial intelligence and prog-

52 Golubović, Korać 2010, 33-36.

53 Weber 2000.

54 Cüppers1990, 588-91.

nostics with the aim of defining the space and obtaining 3D models. The focus of the third phase was mainly salvage excavations in the zone of the cemeteries and suburban settlements. The coal mine today spreads over 1,200 hectares of Viminacium's surrounding area. The "Kostolac B" thermo electric power plant covers an additional 120 hectares.

Paleodemographic analyses also confirms that Viminacium, from the 1st to the 4th century of the new era, was a major military and urban centre. After researching Viminacium in the 21st century, the excavations of its eastern necropolises, aqueducts and amphitheatre, which brought new data important for the interpretation of the population, the researchers came to the assumption that, in the second half of the 2nd century and at the beginning of the 3rd century, the city was home to some 30,000 inhabitants.[55]

Considering that only a few buildings, part of the rampart with a gate and towers and one street have been archaeologically researched within the city itself and the Viminacium military fort, and that the largest excavations were carried out on the periphery, yielding results related to the necropolises, villas, roads and water supply systems, it is difficult to determine a complete urban matrix. However, geophysical research carried out on a large part of this territory has provided valuable information on the street system and the size of the city blocks, as well as the position of the main communications in the fort that was conceived in a similar way to other legionary fortresses of the Roman Empire.

The research of this city represents the basis for studying Roman provincial culture on the territory of today's Serbia. City itself is also the best witness to the process of Romanization and urbanization after military conquest. Extent of multidisciplinary research, protective excavation of city suburban zones and cemeteries reveals complex and diverse situation that had somewhat different life and evolution then the one we expected at the beginning of the project. This is only the beginning of the long scientific process that will lead us to the understanding of life at the provincial capital.

55 Korać, Mikić 2014, 9.

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CIRCULATION OF PROVINCIAL COINS OF THE VIMINACIUM COLONY*

BOJANA BORIĆ-BREŠKOVIĆ, *National Museum Belgrade*
E-mail: bojanabb@yubc.net
MIRJANA VOJVODA, *Institute of Archaeology Belgrade*
E-mail: mirjana.vojvoda@gmail.com

ABSTRACT

The provincial mint in Viminacium, despite its short period in operation (239-254/255 AD), is significant for numismatic and historical research in several aspects. From the very start, it is distinctive for its large monetary production and broad circulatory coverage. The founding of the mint in Viminacium was the official way to temporarily solve problems in the functioning of the Empire's monetary system. On the basis of registered finds of Viminacium provincial coinage, it is obvious that its circulation in neighbouring and western provinces was much higher than in eastern ones. A considerable number of these issues has also been registered in the area of the Barbaricum. Because of precise chronological data, this currency is among the most reliable sources for researching the history of the mid-3rd century, when the Danubian and Balkan provinces were the main theatre of battle for the survival of a part of the Roman Empire.

Key words: Provincial coinage, Viminacium, circulation of coins

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Parallel to obtaining the status of a colony at the start of the reign of Gordianus III, Viminacium gained the right of minting provincial coins in October 239 AD.[1] The mint operated until the period of the joint reign of Valerian I and Gallienus (254/255), with pauses in the 10th and 11th year of the local era (248/249 and 253/254).[2] The political and economic rise of Viminacium played a great role in its obtaining minting rights, and that was influenced by several factors: the ore-rich hinterlands, a favourable geographic position within the defence system of the Empire, a junction of important road communications, and a developed trade network. Viminacium, the capital of Moesia Superior, which was not directly under threat from the movements of the barbarians, was close enough to other Danubian provinces, to which it could distribute additional amounts of coins.

The lack of bronze coins of the senate issues in circulation in the Danubian and Balkan provinces at the start of the 3rd century was especially pronounced and was probably the main reason for opening the provincial mint in Viminacium, and subsequently in Dacia.[3]

Besides Moesia Superior, the shortage of small bronze denominations was particularly evident in both Pannonias. The quantity of *limesfalsa* coinage, with which to cover this shortage, soared from the beginning of the reign of Septimius Severus. The production of that coinage came to a halt at the start of the reign of Gordianus III and can be connected with the start of the operation of the Viminacium mint, which began supplying Pannonia Superior with bronze coins.[4] For example, issues of the Viminacium mint were the second most frequent in Carnuntum, right after the issues of the Rome mint, by the reign of Gordianus III and, with the start of the reign of Philip I, they became the most frequent.[5] The situation was similar in Pannonia Inferior where, on the example of Mursa, one can see the rapid rise of Viminacium coins in circulation in the period of the reign of Gordianus III, which is also linked with the opening of the mint in Viminacium.[6]

1 Dušanić 1976, 58.

2 Борић-Брешковић 1976, 8.

3 Борић-Брешковић 1976, 8, ref. 2; Црнобрња 1993, 17-19; Găzdac, Alföldy-Găzdac 2008, 136, ref. 14.

4 Martin 1992, 9; Găzdac 2005, 499-500; Găzdac, Alföldy- Găzdac 2008, 136, ref. 10; Nađ 2012a, 387-388, Table 2;

5 Găzdac 2005, 501-502.

6 Nađ 2012a, 388-389, 391 Table 4.

A general drop in the amount of coins in circulation was registered in Dacia in the period from 161 to 192 AD, and then it gradually grew from 193 to 238 AD. The biggest monetary inflow was registered between 238 and 253, peaking during the reign of Philip I. In terms of provincial coinage, the coins of the Viminacium mint are considerably more frequent than the issues in bronze of the domicile mint, as of the end of the reign of Philip I.[7] Numerous provincial mints were in operation in Moesia Inferior and Thrace at that time, which obviously covered the needs of their provinces in small bronze coins. In part, their coins, particularly from Thracian mints, were in circulation in the territory of Moesia Superior until the reign of Gordianus III.[8] On the other hand, the share of imperial bronze coins in circulation in the north-eastern part of Roman Italy – Regio X Venetia et Histria (present-day north-eastern Italy, western and central Slovenia) and Noricum was different, as these areas were supplied in greater measure with imperial coinage. In Aquileia and its vicinity, 39.93% of bronze coin finds were registered in the period from 192 to 238 AD, both imperial and provincial; in Emona, this percentage is 39.18%, while in Celeia, which belonged to the Noricum province, it is 39.66% and in Poetovio in Pannonia Superior – 36.17%. While the Viminacium mint was in operation (239-253), this percentage remained approximately the same in Aquileia (37.14%) and Celeia (40.75%), while it was much higher in Emona (50.35%) and Poetovio (66.21%). Within the mentioned percentages of bronze coins in circulation altogether, the share of provincial coins was 3.8% in Emona (Regio X), 3.7% in Poetovio (Pannonia Superior) and 1.6% in Celeia (Noricum).[9]

Information about the finds of coins from the necropoles of Više Grobalja and Pećine (Viminacium) is valuable for the analysis of monetary circulation in the territory of Moesia Superior in the period from 192 to 238 AD, i.e. the period that preceded the opening of the provincial mint in Viminacium. A large sample of studied coins (6233), which originate from archaeological explorations of the southern necropoles of Viminacium, provides an opportunity for various com-

7 Găzdac 2008, 271-272, Fig. 1 (about the general inflow of money); 277, fig. 9; Găzdac, Alföldy-Găzdac 2008,152, Fig. 10 (about the frequency of Viminacium issues and the province of Dacia).

8 36 specimens of mints from Thrace and 8 from Moesia Inferior were registered at the Viminacium necropoles of Više Grobalja and Pećine (Vojvoda 2011, 139-152; Vojvoda 2018, in print).

9 With a small share of provincial coinage and dominant senate issues, *cf.* Kos 1986, 107-108; Šemrov 2011, 1016-1017; about the finds of provincial coinage in the region of Venetia et Histria, *cf.* Stella 2018a, 409-424; Stella 2018b, in print.

parisons. Of the overall number of registered specimens of imperial and provincial coins (6228),[10] 5128 (82.33%) belong to imperial and 1100 (17.67%) to provincial coinage.[11] If we exclude the coins of the 4th and 5th century (Pećine - 544 coins and Više Grobalja - 42 coins), the ratio between imperial and provincial coins during the first three centuries becomes the following: 80.50% (4542 coins) against 19.50% (1100 coins).

The ratio between imperial and provincial silver and bronze coins in the periods from 192 to 238 and 239 to 255 AD is presented in Table 1

Više Grobalja Pećine	**Imperial Ag pcs. / %**	**Imperial Ae pcs. / %**	**Imperial total pcs. / %**	**Provincial pcs. / %**	**Total pcs. / %**
192-238	221 / 28	56 / 7	277 / 35	511 / 65	788 / 100
239-255	36 / 10.40	2 / 0.60	38 / 11	308 / 89	346 / 100

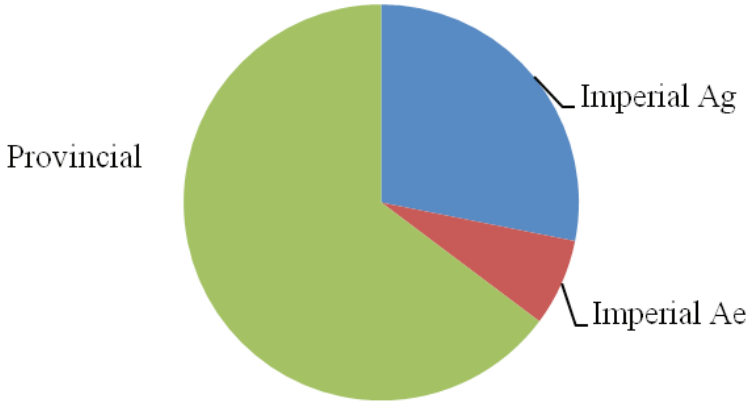
Table 1 – Ratio between imperial and provincial coins in the sample from the Više Grobalja and Pećine necropoles.

Issues of provincial coins are dominant in the period from 192 to 238; however, a much higher frequency of silver than bronze coins is observed within the imperial coinage of the same period (Table 1, Graph 1). Two phases can be observed in the analysis of the representation of provincial mints in this period: Septimius Severus - Elagabalus and Severus Alexander - Gordianus III. The Stobi mint is dominant in the first phase, with 47.05%, followed by the mints of Thrace and Moesia Inferior combined, with 15.70%, while the mints of Bithynia are represented with 13.73%. Represented in lower percentages are other mints of Asia Minor (4/57%) and of Achaea (0.65%), while a certain number of mints remained unidentified (18.30%). In the second phase, the coins that were present was almost exclusively from the Bithynian mints (91.90%), wherein issues of Nicaea alone accounted for 87%. Thracian and Macedonian mints are represented with

10 The total number of coins originating from the necropoles of Više Grobalja and Pećine is 6233. The group of 6228 coins consists of specimens of imperial (1st to 5th century AD) and provincial coinage (1st to 3rd century AD). The five coins that are not included in our analysis are specimens of Republic coinage (2), Greek coinage of the 2nd century BC (1) and imitations (2); *cf.* Vojvoda, Mrđić 2015, 10, Table 1, ref. 6; Vojvoda, Mrđić 2017, 10, Table 1, ref. 5.

11 This count includes the coins of the 4th and 5th century discovered at the latest of the three necropoles of the Pećine archaeological site (Vojvoda, Mrđić 2017, 14-16, ref. 16, Table 4).

0.28% each, while 7.54% are from unidentified mints.



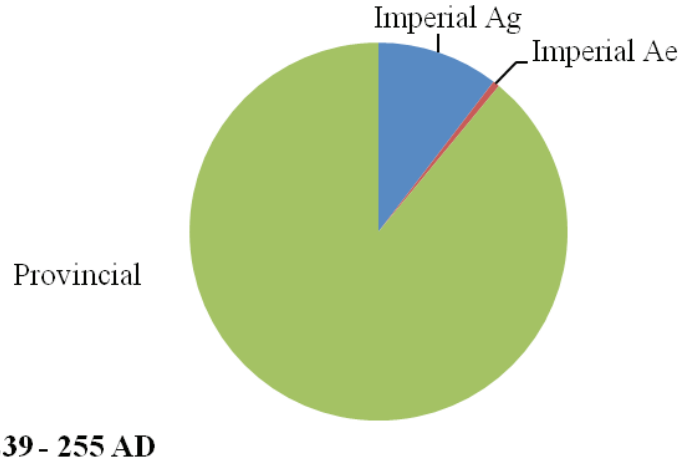
Graph 1 – Frequency of imperial and provincial coinage in the period from 192 to 238 AD, in the sample from the Više Grobalja and Pećine necropoles.

192 - 238 AD

The shortage of bronze coins from the mint in Rome, which is represented in this period with only 7%, is obvious from the above mentioned, and that shortage was covered by issues of provincial mints, which are represented with 65%. In that, the mint in Stobi and then in Nicaea had the greatest share in circulation in the period from 192 to 238 AD, based on the example of monetary finds at the Viminacium necropoles of Više Grobalja and Pećine.

In the period of operation of the Viminacium mint, from the reign of Gordianus III to the joint reign of Valerian and Gallienus, the shortage of bronze coins of the Rome mint was even more prominent, with a frequency of only 0.60%. Silver coins of the imperial mint are also present in lesser scope (10.40%), while as much as 89% of all registered monetary finds in this period belong to provincial coinage (Table 1, Graph 2). Within these provincial issues, the Viminacium mint is dominant with 49.68%, followed by issues of the Nicaea mint with 41.89%, while mints from Dacia and Thrace are represented with 2.27% each, there is one specimen (0.32%) of Macedonian autonomous coinage and 3.57% of coins are undetermined. It is clear from the above mentioned that the Viminacium mint had a large monetary production from the very start of its operation.

Besides, issues of the Viminacium mint circulated within a much broader region, covering areas outside of the borders of Moesia Superior, which made this mint one of the most significant production centres in the Balkans of that period. The



Graph 2 – Frequency of imperial and provincial coins in the period from 239 to 255 AD, in the sample from the Više Grobalja and Pećine necropoles.v

biggest number of specimens, naturally, was registered in the territory of the domicile province, with the most intensive circulation having been registered in the two Pannonias, in Dalmatia and Dacia, but also in the distant areas of the Barbaricum.

As already mentioned, the biggest number of finds of Viminacium provincial coinage was discovered in Moesia Superior. They encompassed finds in hoards, individual finds and parts of earlier private collections which are nowadays kept in several museums in Serbia - a total of 8,072 specimens, with the place of discovery known for only 1,368.[12] Provincial coins of the Viminacium mint has so far been registered in 14 coin hoards in the territory of Moesia Superior:[13] Bošnjane (61 pcs), Brežane (25), Bujkovac (149 → 120), Dragovo (10 → 1), Gornje Štiplje (2), Gradnja (around 270 → 1), Izvore (26), Vicinity of Ćuprija (73), Vicinity of Jagodina (20), Vicinity of Vranje (19), Popovac (15), Samoljica II (around 250 → 1), Spančevac (around 4 kg [around 260 pieces] → 0), Vlajića Brdo I (101).[14]

12 The majority of 8,072 specimens are finds from earlier private collections, which are nowadays kept in museum collections, followed by individual finds and hoard finds. The total sum also includes the lost parts of hoards, where the number of lost specimens is known, which were included with the aim of obtaining a more precise picture about the number of Viminacium provincial coins in circulation.

13 The numbers in parentheses after the names of hoards represent the number of pieces of the Viminacium mint - not the other monetary finds from a hoard. The number in front of the arrow provides information about the original composition, and the one after the arrow - the number of specimens of the Viminacium mint that remained.

14 Bošnjane, Varvarin, (Борић-Брешковић 1988, 89-101; Рашковић 1995, 198; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 162, ref. 27); Brežane, Požarevac (Вулић 1905, 92-93; Mirnik 1981, 60-61, No. 156; Borić-Brešković 1983, 73, ref. 21; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 162, ref. 27); Bujkovac, Vranjska Banja (Борић-Брешковић

The total number of preserved specimens of Viminacium provincial coinage from these hoards is 465 and, if the published data about the contents of dispersed finds is included, that number altogether amounts to around 1,150 pieces.

The collection of the Department of Numismatics of the National Museum in Belgrade possesses a total of 4,770 specimens of Viminacium issues. Of that number, the place of discovery is known for only 18: Kostolac (4), Kličevac (1), Drmno (6), Janjevo (1), Stojnik near Gradište (1), Ušće (2), Sremska Mitrovica (1), Brestovik (1) and Ritopek (1). There are 527 specimens that were individual finds without a known place of discovery, while the remaining specimens are from earlier private collections: Kecskés (3,969), Weifert (230) and Kovačević (26).

The next most numerous is the Dušanić collection of the Museum of the City of Belgrade, with 1,700 specimens of Viminacium provincial coinage.[15] Among them, the place of discovery is known for 424 pieces, which belong to different Roman provinces according to their place of discovery (Moesia Superior, Pannonia Superior and Inferior, Dalmatia). In this collection, 307 monetary finds originate from Moesia Superior: Kostolac (31), vicinity of Kostolac (22), vicinity of Požarevac (4), Salakovac (31), Brestovik (2), vicinity of Brestovik (12), Belgrade (78), Belgrade, Danube bank (98). "Soko" manor near Surčin (1), Surčin (1), vicinity of Obrenovac (1), Ušće (8), Negotin (3), Niš (2), Vrnjačka Banja (1), village of Babe (1), and Prizren (1).[16] Two other specimens originate from Belgrade, from

1988, 91, ref. 13; Арсенијевић 2004, 229; Borić-Brešković, Stamenković 2008, 161, ref. 21; Борић-Брешковић, Митровић 2014, 87-134); Dragovo, Rekovac (Vetnić 1967, 116-118); Gornje Štiplje, Jagodina (Арсенијевић, Додић 2004, 235-250; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 160, ref. 16); Gradnja, Vranje (Митровић 2008, 214; Борић-Брешковић, Митровић 2014, 89, ref. 10); Izvore, Kosovska Mitrovica (Стаменковић, Самарџић 2013, 163-182); Vicinity of Ćuprija (Borić-Brešković 1983, 69-84; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 162, ref. 28); Vicinity of Jagodina (Pegan 1970, 74; Mirnik 1981, 72, No. 233a; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 162, ref. 27); Vicinity of Vranje (Борић-Брешковић 1988, 89-101; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 162, ref. 27); Popovac, Paraćin (Borić-Brešković 1979, 39-54; Borić-Brešković 1983, 72, ref. 21; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 162, ref. 28); Samoljica II, Bujanovac (Митровић 2008, 214; Борић-Брешковић, Митровић 2014, 161, ref. 11); Spančevac, Vranje (Митровић 2008, 214; Борић-Брешковић, Митровић 2014, 161, ref. 12); Vlajića Brdo I, Smederevska Palanka (Арсенијевић 1997, 43-108; Арсенијевић 2004, 228; Borić-Brešković, Stamenković 2008, 160, ref. 15).

15 Борић-Брешковић 1976.

16 The finds from this collection that were discovered in the territories of the two Pannonias and Dalmatia will be listed later, within these provinces.

archaeological explorations in Knez Mihajlova Street.[17]

Next are the finds in the National Museum in Požarevac and those discovered during the archaeological explorations of Viminacium. There are 1,335 Viminacium provincial coins in the numismatic collection of the National Museum in Požarevac.[18] The vast majority are from earlier private collections with unknown places of discovery,[19] while 36 were discovered on several sites in the central and broader Viminacium area. Originating from from archaeological explorations of the southern necropoles of Viminacium are 155 specimens: the Više Grobalja necropolis (59),[20] and the Pećine necropolis (96).[21] One can expect at least as many Viminacium coins among the unprocessed monetary finds from the more recent explorations at Viminacium. We should add to this one specimen from the archaeological explorations at Margum,[22] and four from the archaeological site of Svetinje.[23]

The National Museum in Smederevo keeps 166 specimens from the Dimitrijević collection which, according to published information, originate mostly from the areas around the Danube and Morava rivers (Kostolac, Dubravica, Kulič, Gradište, Golubac). Besides, a certain number of specimens belong to the Spasojević collection, but only the 'most valuable' specimens, 20 of them, have been mentioned in literature.[24]

Apart from the mentioned finds of money, the Museum in Vranje keeps eight other specimens, seven of which have known places of discovery: Starac, Prohor Pčinjski (1), Lianik, Stare Kolibe (3), Klenike (2), Vranje (1).[25] The *Zavičajni muzej* (Homeland Museum) in Jagodina, besides published finds from the hoards

17 Иванишевић, Николић-Ђорђевић 1997, 143, cat. No. 18.

18 We express our deepest gratitude to our colleague Teodora Branković for providing us with data about these unpublished monetary finds.

19 The collections Radojčić, Dušanić, Lederer and Orlov. The biggest number of coins belonged to the Radojčić collection (more than 900 specimens). Since he was a local collector, we can assume that most of the pieces had been found in the vicinity of Viminacium.

20 Vojvoda, Mrđić 2015, 334-341, cat. nos. 2546-2604.

21 Vojvoda, Mrđić 2017, 442-453, cat. nos. 3185-3282; Vojvoda 2017, 51-74.

22 Црнобрња 2007, 199, cat. 2.

23 Иванишевић 1987, 60, cat. nos. 7, 9-11.

24 Павловић 1972, 65.

25 We express our deepest gratitude to our colleague Goran Mitrović for providing us with data about these unpublished monetary finds.

of Gornje Štiplje (2) and Dragovo (1),[26] and from the vicinity of Jagodina (1),[27] also keeps six other specimens: from the vicinity of Jagodina (4), the vicinity of Paraćin (1) and from Mali Popović (1).[28]

The next province according to the number of registered specimens of Viminacium provincial coinage is Pannonia Inferior with a total of 1,253 pieces. This type of monetary finds has also been registered in five hoards originating from the territories of the present-day Serbia, Croatia and Hungary: Sremska Mitrovica (128), Vrkašica (105), Morović (1), Slavonia (a relatively large quantity) and Aquincum I (3).[29] The total number of specimens from the mentioned hoards is 237, with no information about the quantity of hoarded coins that has Slavonia as the broader determinant.

Among the individual finds of Viminacium provincial coinage and parts of earlier or current private collections, the places of discovery are known for 1,016 pieces. The Dušanić collection from the Museum of the City of Belgrade contains 35 specimens: Novi Sad (18), Jarak (1), Surduk (3), Sremska Mitrovica (4), Mačvanska Mitrovica (3), Vukovar (2), vicinity of Vukovar (1) and Osijek (3). 59 specimens originate from the Fajfrić private collection, all of which are individual finds discovered in the area of the village of Banovo Polje, near Sremska Mitrovica.[30] The Museum of Srem in Sremska Mitrovica keeps 15 other specimens from two localities: Mačvanska Mitrovica (14) and Salaš Noćajski (1),[31] while the National Museum in Šabac has two specimens, one from Mačvanska Mitrovica and the other has Mačva as the broader determinant.[32] One specimen originates from Banoštor on

26 *Cf. supra* ref. 14.

27 Додић, Грбовић 2009, 36, cat. 44.

28 We express our deepest gratitude to our colleague Smiljana Dodić for providing us with data about these unpublished monetary finds.

29 Sremska Mitrovica (Орлов 1970, 239-250; Dukat, Mirnik 1978, 26, No. 108; Даутова-Рушевљанин 1981, 64, No. 7; Mirnik 1981, 71, No. 229; Găzdac 2010, Catalogue PI: 5); Vrkašica, Sremska Mitrovica (Орлов 1972, 153-161; Coin Hoards I 1975, 34, No. 125; Dukat, Mirnik 1978, 29, No. 136; Mirnik 1981, 74, No. 252; Даутова-Рушевљанин 1981, 64-65, No. 8; Borić-Brešković, Stamenković 2008, 162, ref. 27); Morović, Sremska Mitrovica (Даутова-Рушевљанин 1981, 65, No. 10; Borić-Brešković 1994, 104, ref. 50; Popović 1997, 19); Slavonia (Margetić – Margetić 2005, 27; Nađ 2012b, 405, No. 45); Aquincum I, Budapest (Kerekes 1914, 71; Fitz 1978, 98-99; Găzdac 2010, Catalogue PI:5).

30 Борић-Брешковић, Петровић 2012, 135, ref. 1.

31 Борић-Брешковић, Петровић 2012, 135.

32 Борић-Брешковић, Петровић 2012, 135-136.

the Danube River, and three others from Gomoglava on the Sava River.[33]

A large number of specimens of the Viminacium provincial mint have been discovered in the area of ancient Mursa (Osijek) – 533 pieces.[34] Celestin also mentioned the additional 48 pieces that were discovered in Osijek and belonged to the collection of the dentist, Müller, kept in the Archaeological Museum in Zagreb.[35]

A significant number of individual finds of the Viminacium mint originate from present-day Hungary, which was part of the Roman province of Pannonia Inferior: Budapest (107), Tác (26), Pécs (3), Százhalombatta (2), Adony (1), Dunaújváros (163).[36]

A total of 831 specimens of Viminacium provincial coinage have been registered within the Roman province of Dalmatia. The majority of them are part of the hoard from Sikirići on the Drina River (813).[37] Data about individual finds is much more scarce: Mostar (1), railway near Mostar (1), Klobuk (2), Stolae (1), Čelebić (1), Srebrenica (1), convent of Tolisi (1), convent of Fojnički (1), county of Fojnica (1), Bosna (1).[38] The finds Bosna (1) and Sarajevo (6) from the Dušanić collection of the Museum of the City of Belgrade can be added to these.[39]

So far, 727 specimens[40] have been registered in the territory of the Roman province of Pannonia Superior (present-day Croatia, Hungary, Austria and Slove-

33 Dautova-Ruševljanin 1989, 89, cat. 11 (Banoštor); Dautova-Ruševljanin 1983, 59.

34 Celestin 1904: 17-21, cat. nos. 1-54. Specimens that were originally published by Celestin were included in the subsequent paper by Spajić and account for 308 Viminacium pieces that were published there; Spajić 1975, 173-220 (308 pieces); Nađ 2012a, 390-392 (245 pieces).

35 Celestin 1904, 26-28, cat. nos. 6-54 (48 pieces).

36 Budapest/Aquincum (Găzdac 2010, Catalogue site finds PI); Tác/Gorsium (Găzdac 2008, 156, Table 1); Pécs/Sopianae (Găzdac 2010, Catalogue site finds PI); Százhalombatta/Matrica (Găzdac 2010, Catalogue site finds PI); Adony/Vetvs Salina (Găzdac 2010, Catalogue site finds PI); Dunaújváros/Intercisa (Găzdac 2008, 156, Table 1).

37 The hoard consisted exclusively of provincial coins of Viminacium and Dacia. Truhelka also listed the contents according to rulers, with the note than 51 specimens are illegible. On the basis of the published contents, one can expect that the majority of the illegible ones are Viminacium issues, *cf.* Truhelka 1893, 310-311; Vjesnik Arheološkog muzeja u Zagrebu 1891, 86; Patsch 1902, 13; Brunšmid 1907, 13; Orlov 1970, 239-240.

38 Patsch 1902, 12-13; Brunšmid 1907, 14.

39 *Cf. supra* ref. 16.

40 A portion of the 36 specimens from the territory of present-day Slovenia, which have not been classified according to ancient provinces and areas, should probably be added to this number; *cf.* infra ref. 41.

nia) and all were individual finds: Orešac (2) and Sisak (28), Szöny (131), Sopron (8), Szombathely (30), Árpás (5), Györ (5), Ács (12), Esztergom (48), Hegykö-Téglástó (1), Koroncó (1), Bajót (2), Dorog (1), Epöl-Kökút (2), Héreg (5), Környe (1), Tarján (1), Tokod (6), Petronell (259); Wien (9), Schützen am Gebirge (2), Marz (1), Neusiedl am See (1), Apetlon (1), Halbturn (2), Illmitz (1), Winden am See (4), Zurndorf (1), Deutschkreutz (1), Strebersdorf (8), Neckenmarkt (14), Ptuj (108), Drnovo (6).[41]

The next province according to the number of known specimens of Viminacium provincial money is Dacia with 387 registered pieces. They were registered within one hoard: Săpata de Jos (2),[42] while the remaining pieces were individual finds: Sarmizegetusa (28), Alba Iulia (27), Bacău (1), Buciumi (3), Bucureşti (4), Bumbeşti (7), Burila Mare (1), Buzău (1), Carei (2), Călimăneşti (1), Câmpulung-Muscel (1), Celei (16), Cetate (1), Cioroiu Nou (1), Cluj-Napoka (1), Coroieni (1), Dulceanca (1), Feldioara (1), Gârla Mare (2), Gilău (1), Gornea (2), Greoni (1), Gruia (1), Gruiu (1), Hârlău (1), Hinova (2), Hoghiz (2), Husnicioara (1), Inlăceni (2), Jidava (2), Jupa (19), Mătăsari/Mătăsaru (1), Mehadia (6), Mihai Viteazu (1), Moigrad (3), Obârşia de Câmp (1), Orlea (7), Orşova (9), Pecica (1), Poieneşti (1), Pojejena (7), Răcari (4), Râmnicu Vâlcea (1), Reşca (3), Săcueni (3), Samum (1), Slăveni (8), Snagov (1), Tîrgu-Jiu (3), Turda (42), Turnu-Severin (39),

41 Croatia: Orešac, Virovitica (Dukat, Mirnik 2005, 132; Bertol 2011, 240, No. 8); Sisak/Siscia (Nađ 2012a, 392-393, Chart 7); Hungary: Szöny/Brigetio (Găzdac 2008, 160, Table 1; Juhász 2018, in print); Sopron/ Scarabantia (Găzdac 2008, 158, Table 1); Szombathely/Savaria, Árpás/Mursella, Györ/Arrabona, Ács/Ad Mures (Găzdac 2010, Catalogue site finds PS); Esztergom/Solva, (Găzdac 2008, 159, Table 1); Hegykö-Téglástó, Koroncó, Bajót, Dorog, Epöl-Kökút, Héreg, Környe/Vincentia, Tarján, Tokod, Austria: Petronell/Carnuntum, Wien/Vindobona, Schützen am Gebirge, Marz, Neusiedl am See, Apetlon, Halbturn, Illmitz, Winden am See, Zurndorf, Deutschkreutz, Strebersdorf, Neckenmarkt (Găzdac 2010, Catalogue site finds PS); Slovenia: Ptuj/Poetovio, Drnovo/Neviodunum (Miškec 2018, in print). So far, 171 specimens of Viminacium provincial coinage have been registered in the territory of present-day Slovenia (which covered parts of the Roman provinces of Pannonia Superior and Noricum, and Regio X Venetia et Histria). The authors who have so far published these finds (Kos 1986, 105-111; Šemrov 2011, 1013-1018; Miškec 2018, in print) have not classified the finds from present-day Slovenia according to Roman provinces and areas, but considered them jointly, as »south-eastern Alpine area and western Pannonia« or » present-day Slovenia«. Ptuj and Drnovo certainly belonged to Pannonia Superior, so these finds can be added to the mentioned province. Celje (9 pieces) was located in Noricum, and Ljubljana (12 pieces) belonged to Regio X Venetia et Histria. There are 36 other specimens with known places of discovery for which the ancient area they belonged to has not been defined.

42 Munteanu 2007, 282, no. 52.

Urluieni (1), Valea Mânastirii-Rîmet (1), Vărădia (1), Veţel (2).[43]

A certain number of specimens of Viminacium coinage from the territory of the province of Dacia have no precise territorial determinant - only the area within the province is known: Banat (2),[44] Mureş (1),[45] Alba (7),[46] Sibiu (71).[47]

A total of 77 specimens of Viminacium coinage has so far been registered in Regio X Venetia et Histria: Ljubljana (12),[48] Aquileia (44), Venetia et Histria (except Aquileia) (21).[49]

As for the territory of the former Roman province of Noricum, the best documented are finds from the present-day Slovenia: Celje (9),[50] and Austria: Salzburg (1), Wagna (17) and Wels (2).[51] One should reckon here with a certain smaller number of specimens that belong to Noricum according to the place of discovery, but originate from unspecified locations in the territory of the present-day Slovenia.[52]

A total of 66 specimens have been registered in the territory of ancient Thrace, some of which belong to the hoards: Sestrimo II (1), Bojana II (16), Kyustendil (Pautalia III) (5), Borimečkovo I (1).[53] Other specimens are individual finds:

43 Sarmizegetusa/Ulpia Traiana (Munteanu 2007, 280-282, no. 50; Găzdac 2010, Catalogue site finds Dacia; Ardevan 2012, 73, cat. nos. 130-131); Jupa/Tibiscum (Matei 2015, 66-68, cat. nos. 76-78, 81; 72, cat. no. 93; 148, cat. no. 167; 155, cat. no. 184; 158-159, cat. nos. 191, 194; 234, cat. no. 31; Demian 2017, poster); Alba Iulia/Apulum; Bacău, Buciumi, Bucureşti, Bumbeşti, Burila Mare, Buzău, Carei, Călimăneşti, Câmpulung-Muscel, Celei/Sucidava, Cetate, Cioroiu Nou, Cluj-Napoca/Napoca, Coroieni, Dulceanca, Feldioara, Gârla Mare, Gilău, Gornea, Greoni, Gruia, Gruiu, Hârlău, Hinova, Hoghiz, Husnicioara, Inlăceni, Jidava, Mătăsari/Mătăsaru, Mehadia/Praetorium, Mihai Viteazu, Moigrad/Porolissum, Obârşia de Câmp, Orlea, Orşova/Dierna, Pecica, Poieneşti, Pojejena, Răcari, Râmnicu Vâlcea, Reşca/Romula, Săcueni, Samum, Slăveni, Snagov, Tîrgu-Jiu, Turda/Potaissa, Turnu-Severin/Drobeta, Urluieni, Valea Mânastirii-Rîmet, Vărădia/Arcidava, Veţel/Micia, (Munteanu 2007, 272-285, nos. 1-63; Găzdac 2010, Catalogue site finds Dacia).

44 Munteanu 2007, 272, no. 3 a, 3b.

45 Munteanu 2007, 272, no. 38.

46 Munteanu 2007, 282, no. 53.

47 Munteanu 2007, 282-283, no. 54.

48 Ljubljana/Emona, (Miškec 2018, in print).

49 Aquileia and Venetio et Histria (Stella 2018, in print).

50 Celje/Celeia (Miškec 2018, in print).

51 Salzburg/Claudium Iuvavum (Schachinger 2017, 335, cat. no.501); Wagna/Flavia Solva; Wels/Aelium Ovilavis (Stella 2018, in print, ref. 13).

52 *Cf. supra* ref. 40.

53 Sestrimo II (CCCHBulg. V, 136-137, no. 695; Върбанов 2017, 82, no. 636); Bojana II, Kyustendil, Borimečkovo I (Върбанов 2017, 74, no. 568; 75, no. 597; 80, no. 614).

Pazardzhik (4), Blagoevgrad (1), Kyustendil (38).[54]

Viminacium provincial money appeared in as many as eight hoards from the province of **Moesia Inferior**: Eliseyna (2), Kravoder (a large number of pieces ? → 6), Kneža III (5), Malinovo (2), Rusensko I (1), Šumensko II (1), Šumensko XI (2) and Šumensko XII (1).[55] The following were individual finds: Dobrogea (1), Pecineaga (2), Nikyup (2) and Istria (6).[56] A total of 31 specimens have been registered, while it should be noted that the number would probably be higher if the number of specimens in the Kravoder hoard were known.

In the western provinces, Viminacium coins were present in even smaller numbers: Raetia: Ilmmünster (1), Markstschellenberg (1); Germania Inferior: Köln (1); Germania Superior: Mainz (1), Saalburg (1), Esslingen am Nachar (1), Rottenburg am Nachar (1); Galia: Bourges (1).[57] Its presence in the east was even less significant: Mesopotamia: Commagene (1); Syria: Antioch (1), Dura-Europos (1).[58]

As for the finds from the B**arbaricum**, a total of 295 specimens have been registered, with the place of discovery known for 199. The closest to the mint were those from the Serbian and Romanian part of Banat: Sapaja (1), Banatska Palanka (2), Vatin (2), Bela Palanka (2). The City Museum of Vršac keeps another 21 specimens from the former Weifert collection, but without data about the place of discovery.[59] Apart from one specimen in the National Museum of Banat in Timișoara (1), this museum houses the additional 75 pieces of Viminacium coinage which belonged to earlier private collections, without the place of discovery.[60]

A large concentration of this type of monetary find has been observed in the territory of present-day Ukraine, discovered between the Dnieper and Dniester

54 Pazardzhik (CCCHBulg V, 50-52, cat. no. 101-104), Blagoevgrad/Skaptopara (CCCHBulg IV, 82, cat. no. 303), Kyustendil/Pautalia (CCCHBulg II, 48-50, cat. nos. 221-258).

55 Eliseyna, Kravoder, Kneža III, Malinovo, Rusensko I, Šumensko II, Šumensko XI and Šumensko XII (Върбанов 2017, 11, nos. 68, 71; 17, no. 116; 23, no. 175; 35, no. 269; 57, no. 453; 58, nos. 462, 463).

56 Dobrogea, Pecineaga (Munteanu 2007, 274, no. 17; 279, no. 43), Nikyup/Nicopolis ad Istrum, Istria (Găzdac 2010, Catalogue site finds MI).

57 Ilmmünster, Markstschellenberg, Köln, Mainz, Saalburg, Esslingen am Nachar,, Rottenburg am Nachar, Bourges (Callu 1969, 112-113).

58 Commagene (Callu 1969, 55), Antioch (Callu 1969, 51; Katsari 2011, 228, ref. 112), Dura-Europus (Depeyrot online, p. 391, cat. no. 7222).

59 Bakić 2016, 170-171, ref. 6; 178-181, cat. nos. 7, 13, 15, 21.

60 Demian 2017, poster.

rivers - 170 pieces according to the latest data.[61] In the territory of present-day Belarus, finds of Viminacium coinage were registered in the Dnieper basin: Stary Kryŭsk (1), unknown location, Brest raion (1).[62] One specimen has been registered in north-western Poland, in the so-called Westbalt circle, two more in the area between the Elbe and Oder rivers in present-day Germany,[63] in southern Poland (1), Bohemia and Moravia (6), Slovakia (9).[64]

Issues of the Viminacium provincial mint had a much broader area of circulation than the borders of the domicile province. The frequency and circulation reaches of these coins in particular parts of the Empire become clearer from the above mentioned. It is obvious that Viminacium issues had the purpose of covering the shortage of bronze coins from Rome, primarily in Moesia Superior, both Pannonias and, to an extent, in Dacia in a certain period (Graph 3; Map 1, 2).[65] The founding of the mint in Viminacium and, a little later, in Dacia, represented the official way for temporarily solving the problem in the functioning of the Empire's monetary system. However, it seems that the two newly founded mints had different roles. As shown by comparative analyses of monetary finds of these two mints in the territory of the province of Dacia, issues of Viminacium were intended for broader circulation, while issues of the province of Dacia seem to have been minted solely for the needs of the domicile province. Namely, the Dacia mint had large production only from 246 to 249 AD and exceeded the number of Viminacium issues in Dacia, only for Viminacium issues to become more numerous in the period from the reign of Philip I to that of Valerian I.[66] This is also confirmed by the finds in hoards from Moesia Superior and the Serbian part of Pannonia Inferior, which contain coins from both mints: Vlajića Brdo I (14:101),

61 Мызгин 2016, 160, Fig. 4 (listing more than 90 pieces); Myzgīn 2018, in print, Graph 7 (listing 170 specimens).

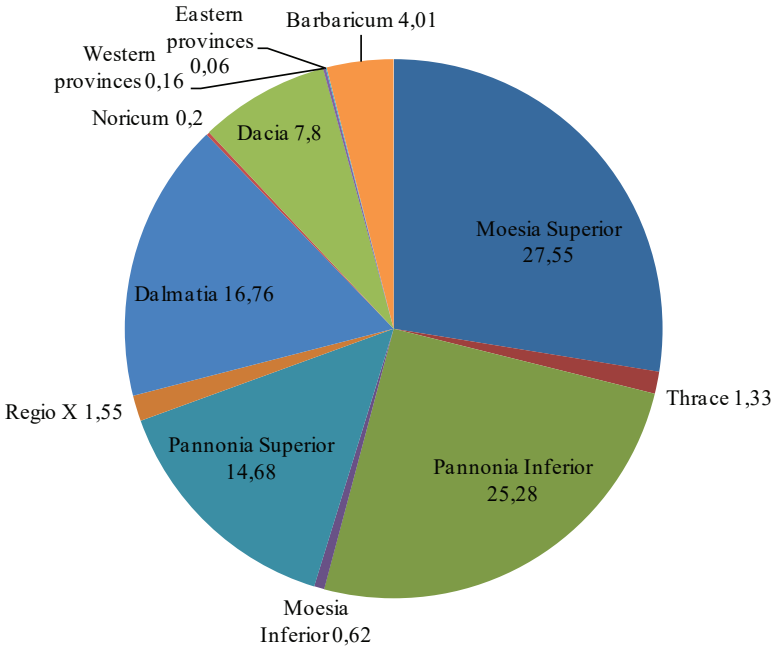
62 Sidarovich 2014, 76, 86, cat. nos. 14, 15.

63 Callu 1969, 112; Bursche 1992, 5; Zapolska 2013, 107-108.

64 Kunisz 1973, 38-39 Table 1.

65 According to current information about the number of specimens in Dalmatia, the presented percentage (Graph 3) of 16.76% is mostly (98%) related to the monetary finds from one hoard. Only 18 pieces were individual finds, so the obtained result cannot be brought into connection with a greater circulation of Viminacium provincial coins in Dalmatia.

66 Găzdac 2008, 275, 277, Fig. 9; Găzdac, Alföldy-Găzdac 2008,152, Fig. 10.



Graph 3 – Percentages of Viminacium provincial coins with known places of discovery, according to province.

Popovac (2:15), Bošnjane (2:61), vicinity of Vranje (3:19),[67] Brežane (2:25),[68] Bujkovac (14:120),[69] Izvore (2:26),[70] vicinity of Ćuprija (6:73);[71] for the hoards of Gradnja and Spančevac, there is no data about these ratios, except that they contained coins from both mints;[72] Sremska Mitrovica (8:137), Vrkašice (8:116).[73] At the same time, these are all the known hoards which contained coins from both mints. In the neighbouring provinces, they were either not present in the hoards, or the hoards contained only Viminacium coinage. If we compare the processed finds from the southern necropoles of Viminacium, the obtained results are similar (7:155).[74]

A small number of Viminacium provincial issues is known in the territory of

67 Арсенијевић 1997, 46, ref. 19, 22-23.

68 Вулић 1905, 92-93.

69 Борић-Брешковић, Митровић 2014, 87.

70 Стаменковић, Самарџић 2013, 165.

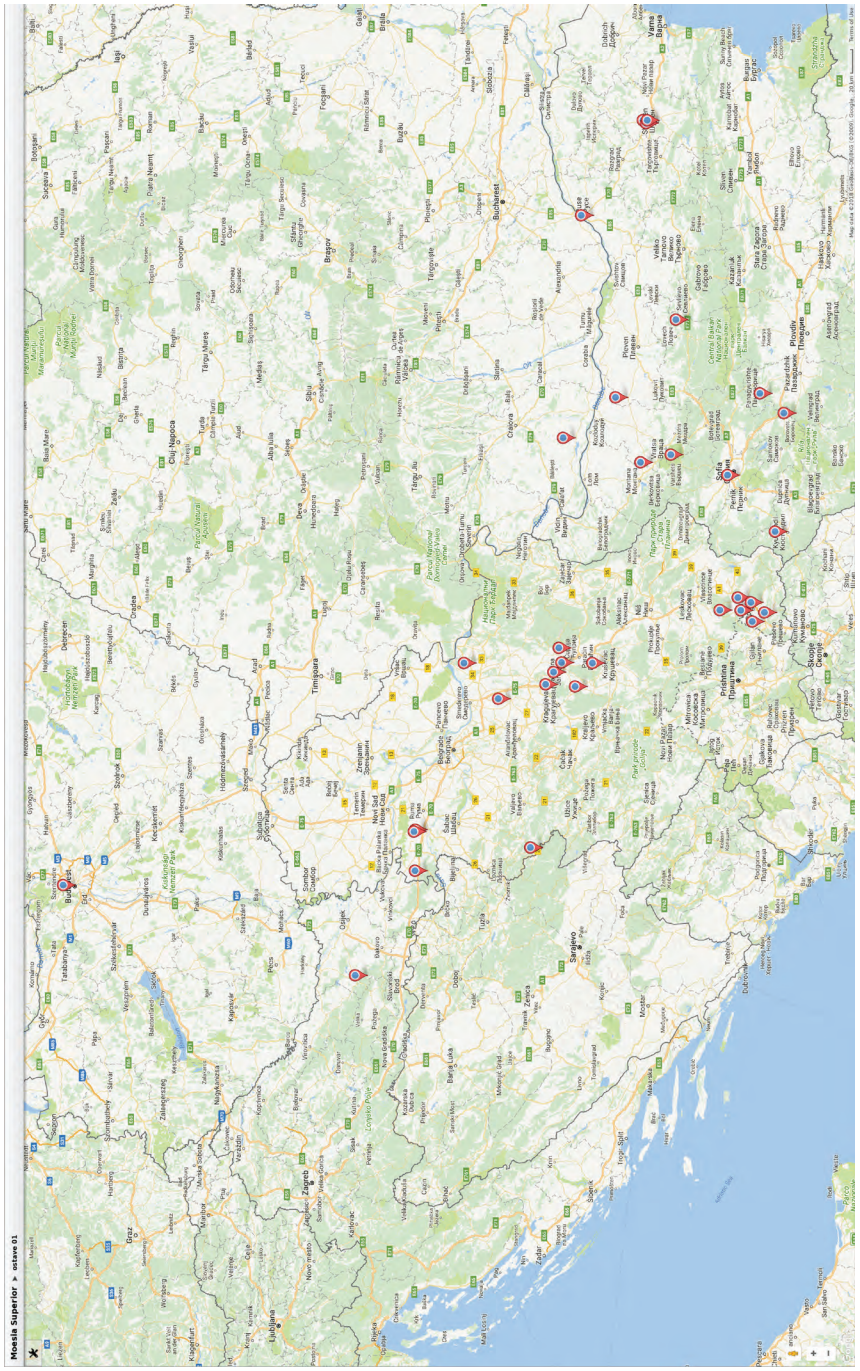
71 Borić-Brešković 1983, 70.

72 *Cf. supra* ref. 14.

73 Арсенијевић 1997, 46, ref. 20-21.

74 *Cf. supra* ref. 20, 21.

Map 1 - Individual finds of Viminacium provincial coinage



Map 2 - Hoards that contain Viminacium provincial coinage

ancient Thrace and Moesia Inferior (Map 1, 2) because it is obvious that the numerous provincial mints which operated in the territory of these two provinces succeeded in meeting the needs for small bronze coins in circulation. When the two mentioned provinces are taken as a whole, and when chance finds and hoards are included, 97 specimens of Viminacium coins have been discovered (Thrace - 66, Moesia Inferior - 31). It is interesting that, to the north-east, in the Barbaricum, as many as 170 specimens have been registered between the lower courses of the Dnieper and Dniester rivers.[75] In attempts to explain the large presence of issues of Balkan mints and, especially, those of Viminacium, contemporary authors dismiss theories about the existence of trade connections between the population in the eastern Barbaricum and in Roman provinces in the 3rd century. Instead, they link the appearance of this coinage in the eastern Barbaricum with the military activities of Gothic tribes and their raids of the Bosphorus Kingdom, Pontes, Paphlagonia and the Roman Balkan provinces, for which they find confirmation in historical sources and in contemporary professional literature.[76] On the basis of an analysis of finds of provincial coinage in the eastern Barbaricum, they conclude that the tribes which limited their campaigns to the Bosphorus Kingdom and provinces of Asia Minor lived to the east of the Dnieper and, to the west of the Dnieper - tribes which directed their raids towards the Roman Balkan provinces.[77] More monetary finds of Asia Minor mints have been registered in the territory of present-day Belarus (24 pieces) than those from the Balkans (11), two specimens of which belong to Viminacium issues. These finds in present-day Belarus are also brought into connection with the Gothic raids of Roman provinces.[78] The reasons for their appearance are still the subject of debate - whether they were Roman contributions, a result of pillaging raids, or if the monetary finds arrived with the Germans who served in the Roman auxilia units.[79] Moreover, there are ongoing debates about the paths whereby Roman provincial coins reached the Western Baltic circle (Po-

75 *Cf. supra* ref. 61. Finds of Viminacium provincial coins and those of other Balkan mints are concentrated to the west of the Dnieper River, i.e. between the Dnieper and the Dniester. On the other hand, provincial issues of mints from Asia Minor are dominant to the east of the Dnieper.

76 Myzgīn 2018, in print, ref. 50.

77 Myzgīn 2018, in print, with mentioned literature.

78 Sidarovich 2014, 75-82.

79 Sidarovich 2014, 82, ref. 47, 48; Myzgīn 2018, in print.

land, Lithuania), where one specimen of Viminacium provincial coinage has also been registered.[80] The question remains open as to whether that path led from the eastern Barbaricum (present-day Ukraine), down the Dnieper basin (present-day Belarus) to the Baltic, or from the western provinces, i.e. across the Rheine limes.[81]

On the basis of registered finds of Viminacium provincial coinage, it is obvious that its westward circulation was much greater than eastwards. As was already mentioned, a significantly lower presence has been registered in the neighbouring eastern provinces than in the neighbouring western ones. Only three specimens of Viminacium issues have been registered in the distant eastern provinces.

Except in Pannonia Superior and Inferior, where most of these monetary finds were discovered, other than in the domicile province, they were also present in significant numbers in the territory of the ancient Regio X (present-day north-eastern Italy and central and western Slovenia). Finds of Viminacium provincial coinage have also been registered in the territories of present-day Austria, Germany, the Czech Republic and Slovakia. It is hard to provide a general answer about the reasons for the appearance of Roman provincial coins, including those from Viminacium, outside of the main circulation area (Moesia Superior, both Pannonias, Dacia). For each of these areas, one would have to perform a special analysis not just of the numismatic, but of all the other archaeological evidence, as well as historical sources. The reasons were certainly not uniform and were probably different for certain distant parts of the empire and, especially, for the Barbaricum.

Despite its brief period in operation, there are many reasons why the provincial mint in Viminacium is significant for numismatic and historical research. From the very start, it is quite distinctive owing to its large monetary production and the reach of its broad circulation, which places it among the most significant production centres in the Balkans. Due to precise chronological data, this currency is among the most reliable sources for studying the history of the middle of the 3rd century AD, when the Danubian and Balkan provinces were the main theatre where the battle took place for the survival of part of the Roman Empire.

Translated by Staša Grgić
Lectured by Tamara Rodwell-Jovanović

80 Bursche 1992, 5; Zapolska 2013, 107-108.

81 Bursche 1992, 9; Zapolska 2013, 112-115; Sidarovich 2014, 82.

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JEWELLERY AS A SYMBOL OF PRESTIGE, POWER AND WEALTH OF THE CITIZENS OF VIMINACIUM*

BEBINA MILOVANOVIĆ, *Institute of Archaeology, Belgrade*
E-mail: bebina27@yahoo.com

ABSTRACT

Numerous jewellery finds, mostly from necropolises, are proof of the wealth of the citizens of Viminacium. We will note here only some of the examples from the latest archaeological excavations from the eastern necropolises of Viminacium: "Pirivoj", "Nad Klepečkom", and "Kod Koraba." For the production of jewellery various materials are used: metals, precious stones, glass and rare materials such as jet and amber. The city's location on an important military, strategic and also merchant crossroads enabled its citizens the import of luxurious raw materials and goods from both East and West. Besides this, the majority of jewellery is locally manufactured by both local and foreign masters.

Key words: jewellery, Viminacium, grave, necropolis, necklace, earring, pendant, bracelet, ring

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In an important geo-strategic position during the first decades of the 1st century, the future capital of the Upper Moesia province emerges: Viminacium. Its development went gradually, from buildings made of wood to the massive walls of stone and brick. The army played a vital role in the urbanisation and building of a city on uninviting swampy grounds on the right bank of the Mlava River, close to its confluence with the Danube. Throughout history, the role and importance of Viminacium was rising. Numerous historical writings are there to show the geo-strategic significance of Viminacium and the city is also marked in all three Roman itineraria (*Tabula Peutingeriana; Itinerarium Antonini; Itinerarium Burdigalense*)[1]. Viminacium represented an important military centre during the Dacian wars led by Trajan. This city was where the army would be crossing to the Dacian coast.[2] The conflicts with barbarian tribes brought Marcus Aurelius to Viminacium, to defend the borders of the Empire from there. The greatest development this city saw was during the rule of Severus, when the city grew to appear as archaeologists are discovering it today. The period of frequent usurpation of power of the so-called "barracks emperors" did not skip this city, where the army had a crucial role. Instability and crisis affected the development of Viminacium, so a degree of stagnation can be noticed. The final peak the city experienced was during the rule of Constantine and his sons. Burned, destroyed and looted by the Huns, and Avars, the city was left beneath arable land to wait some other time for its story to be told.

Life in Viminacium can be followed by studying different segments of its economic, military, cultural and artistic development. One of these segments is jewellery, as a part of another, broader aspect, where the object, apart from having aesthetic value, has both practical and apotropaic symbolic importance as well. The Romans did not exhibit a refined taste with jewellery, but were rather prone to exaggerate and, even through kitsch, show their wealth and power. For this reason they would decorate the visible parts of their bodies with jewellery. These items needed to be extravagant and on places not covered by clothes. Drawing attention was, thus, one of the aims of wearing the luxury pieces of jewellery, to show the respect an individual had in the eyes of the public. We should not neglect the fact that jewellery represented a kind of accumulative wealth that was passed on from generation to generation. It always had a constant value, and was inherited. The

1 Mirković 1986, 21–27.

2 Mirković 1968, 56; Mirković 1986, 38.

jewellery found in graves belonged among the personal items of the deceased, but it was not necessarily a part of their everyday clothing. The inherited pieces were often kept in chests and worn only on special occasions. This makes it difficult to be exact when it comes to chronologically dating the jewellery, especially witch of precious metals, as one piece could be in one family for several generations.

Different techniques were used to make jewellery. The two basic ones for the production of metal jewellery were blacksmithing and extraction. Blacksmithing was used for producing a thin metal sheet and the artisans whose job this was were called *bratarii*. With extraction, a fine wire was made, which was further shaped into various types of jewellery. Engraving, repoussage and chasing are additional techniques for artistic refining of the jewellery to make decorative motifs. For all these techniques, great craftsmanship and patience was needed. Engraving was done by carving the motifs based on a previously drawn design. With repoussage, using special tools, the metal was shaped from the reverse side to create a design in low relief, whereas chasing is the opposite process. The metal was hammered on the other side to make the desired motif. Particularly luxurious techniques for jewellery making included granulation and filigree. They were mostly used for decorating gold, and sometimes silver jewellery. The two often complement each other, and are applied simultaneously on the same item. Filigree is the soldering of thin wire thread onto a flat metal surface to create a distinct ornament. The granulation technique involves soldering tiny granules of metal onto a surface. If these ornaments were made by melting, then the process would be called pseudo-granulation. The technique of carving the drawn motif onto a piece of jewellery to achieve a lacy ornament, the Romans called *opus interrasile* and it was used in the 3rd and 4th centuries. Oftentimes, different types of jewellery were made in the same way (a ring, an earring, and a bracelet), and can be distinguished only by their size and based on the context of the find.

Jewellery was made of a variety of different materials. Gold has always been among the favourite materials, as still is, particularly because all the advantages of this metal were noticed very early on. The brightness, durability, and the ease with which it can be shaped are characteristics that have given a constant value to this metal throughout history. The goldsmith shops were called *aurifices*, although these were further categorised into those who were making rings – *anularii* or bracelets – *armillarii*.

Apart from gold, other materials had a notable place in jewellery production. The rarity and aesthetics of certain materials were of crucial significance for them to be considered highly valued finds. Semiprecious stone, glass and jet (a type of flat surfaced matte black coal) were used, and jet was among the favourites for making rings, bracelets and beads. This material was popularly called "black amber", whereas identical examples of jewellery were made of black glass paste resembling jet. There are historical sources that confirm that jet was mostly mined in Britain during the Roman rule (Whitby, York) and transported to continental Europe.[3] A significantly large number of jet artefacts were found in Gaul, as along with the mineral itself. Cologne was one of the most important centres for crafting items from jet.[4] Our findings have so far suggested that jet jewellery was mostly discovered in the graves of female individuals. In the historical writings of Pliny the Elder and Galen, the health benefits of this material were emphasised, especially in treating uterine diseases.[5] It is highly likely that jet jewellery could be expected in the graves of mature females. The material was used to make bracelets, beads as necklace or bracelet segments, and pendants.

Amber had a significant place in jewellery making, for its rarity and symbolism. During the time of Tacitus and Pliny the Elder, a general opinion prevailed that amber was hardened resin of trees (mostly coniferous) that came to Europe from the coasts of the Baltic via various merchant routes.[6] In the ancient era, the magical and healing characteristics of amber were known, and these refer to its electrostatics. Pliny the Elder notes that amber protects from sore throat and helps with some nervous and bladder diseases when worn either as an amulet or drunk dissolved in water.[7]

The Roman doctor Galen also wrote about the health benefits of amber, citing recipes and popular tradition.[8] The greatest manufacture of amber during the Roman times was noted during the rule of Flavians and Antonines (from 69 to 192 AD). The most important centre for the manufacture of amber goods was

3 Parker 2014, 16; Solin *De Mir. M.* XXIII

4 Todd 1992, 246.

5 Plinije, *Hist. Nat.* XXXVI.XXXIV

6 Plinije, *Hist. Nat,* XXXVII, 32–53.

7 Plinije, *Hist. Nat,* XXXVII, 51.

8 Палавестра, Крстић 2006, 28.

in Aquileia, where the amber was imported from the Baltics as early as in the Bronze Age. The workshops were active until the beginning of the 3rd century.[9] Items made of amber were valued more than gold at the start of the Roman Empire.[10] Various ornaments, toiletries, and cosmetic items, toys or ceremonial gifts made of amber on the territory of Serbia are mostly found in necropolises (Kosmaj-Gomilice, Babe; Singidunum and Viminacium).[11]

Numerous jewellery finds, mostly from necropolises, are proof of the wealth of the citizens of Viminacium.[12] We will note here only some of the examples from the latest archaeological excavations from the eastern necropolises of Viminacium ("Pirivoj", "Nad Klepečkom", "Kod Koraba" and the other).[13]

In a grave of a female individual buried in a pit without any construction (Fig. 1), several pieces of gold, semiprecious stone (opal) and glass paste jewellery were found. A pair of gold earrings with green stone was found on each side of the skull, whereas a necklace made of 170 jet beads and a gold medallion was found on the chest. The medallion contains a cameo made of opal. On the fingers of the left hand, two rings were found: made of jet and gold with a red stone in them. This set of jewellery, where two different materials are dominant–jet and gold, represents a refined taste where elegance and contrast are achieved by a highly visible colouristic effect (black and yellow). Even though the deceased was buried

9 Палавестра, Крстић 2006, 70-71.

10 Facsady 1995, 49.

11 Палавестра, Крстић 2006, 296, 297-302, кат. 458-468 (Kosmaj-Guberevac, Babe); 368-376, кат. 608-629 (Viminacijum); 380, кат. 640-642 (Singidunum).

12 Part of the findings, including the jewellery from older archaeological excavations of the southern necropolis of Viminacium, has been published in: Зотовић, Јордовић 1990 and Korać, Golubović, 2009.

13 The mentioned necropolis spread east and northeast of the city. In the eastern necropolis "Pirivoj", during the rescue archaeological excavations in the period from 1997 to 2016, with minor interruptions, 511 graves were explored (436 inhumations and 74 cremations). Burying was performed in the period from the 2nd to the mid-4th century. At the north-eastern necropolis "Nad Klepečkom" salvage excavations were conducted in the period from 2008 to 2013. A total of 205 graves (94 inhumations and 111 cremations) were explored. Burials were carried out in the period of the 2nd and 3rd century. The necropolis "Kod Koraba" salvage excavations were conducted from 2005 to 2008. A total of 211 graves were investigated (132 cremations and 79 inhumations). Burials were carried out over a period from the second half of the 2nd to the end of the 3rd century. The exceptions are two graves (G-71 and G-78) belonging to the 4th century. See: Bogdanović 2010 83-99. In the following, the graves with inhumed deceased are marked with letter G, while the cremations are identified as G1. All finds were photographed by G. Stojić, for which I am deeply grateful.

Fig. 1. Jewellery from the grave 290, the site Pirivoj.

in a common grave, without any construction, her personal jewellery meant that she belonged to the higher social circles. It is assumed that the early death of the young girl required that she be buried with all her precious items. When it comes to the dating of this find, a bronze coin on the chests of the deceased was of assistance. It was a coin of Julia Domna, minted between 211 and 217 AD.[14]

An identical case of a combination of gold and jet jewellery was found in the brick constructed grave of a child (Fig. 2). One hundred beads made of jet (97 chevroned beads, two tubes and one circular) and 21 spherical beads of gold sheet metal were found near the head. These were the remains of two necklaces combined in strings of the mentioned beads. As the grave was ruined and looted, we do not have the exact number of beads, and suspect that there were more. In the middle section of the grave, thirteen more jet beads representing a bracelet made of segments were found. These were crescent on one side, and flat on the other, and each had a double perforation. Two beads or plates are faceted on the side, the crescent edge, whereas one bead is in the form of a slice (*melonen* type). They were all highly polished.[15] A pair of earrings made of link-shaped gold wire was found next to the head.[16]

An almost identical construction with tegulae is a grave of a young female individual (between 30 and 35 years of age), buried with numerous pieces of jewellery (Fig.3). The fragments of two necklaces were found in the neck area. The first one was formed by gold wire with a string of beads made of glass and a wire pendant with green beads. The other necklace consists of a triple interwoven string of beads, made of jet (285 pieces), bones (36 pieces), and glass and amber (2 pieces). There was a medallion with it, with a cameo representing a Medusa and a smaller gold metal sheet frame (perhaps a part of a pendant). On the right side of the necklace a smaller radial link was found, made of gold, a silver monetary medallion with illegible bronze coins, three fragmented silver tubuli and a silver ring with a gem. On the right side of the skull, a silver pendant was found, with a purple stone and one radial silver link. In the skull itself, there was a gold earring with an 'S' shaped link and a circular, solid head. Apart from the jewellery, bronze

14 RIC IV, 375. There were no other findings.

15 These types of bracelets were known from graves from the older archaeological excavations, both in Viminacium and the surrounding area, see: Спасић-Ђурић 2011, 9–60; Спасић-Ђурић 2007а, 176, 188–190; Спасић-Ђурић 2007б, 333–337; Микулчић 1975, 96–97; Jovanović 1978, 28.

16 There were no other finds in the grave.

Fig. 2. Jewellery from the grave 205, the site Pirivoj.

Fig. 3. Jewellery from the grave 134, the site Pirivoj.

coins were also found in the grave, which were minted in Nicaea during the 3rd century,[17] alongside a smaller quantity of green glass bottles with berries at the bottom. The mentioned jewellery can be divided into two sets. The first one would be comprised of the gold items found (the necklace, the earring, the medallion with a cameo, radial link and gold frame). The other set consists of silver pieces (the ring, the tubuli, the monetary medallion, the purple stone pendant and the radial link). A string of beads made of jet and bones shows a kind of border between these two sets. The variety of shapes and materials in jewellery of this age suggest the colourful aspect widely present in Roman lives. Aesthetics was apparently neglected, and if we were to discuss any meaning behind wearing jewellery this way, this would be interpreted from an apotropaic and symbolic aspect. The jet and amber as materials have certain apotropaic characteristics. On the other hand, the silver tubuli probably contained plants or seeds that had a protective purpose. Furthermore, it is highly unlikely that this individual wore all her jewellery at the same time. We need to bear in mind that these were just goods to be carried to 'the other side', to prove the importance of this individual in her earthly life, and to protect her from any inconveniences in the afterlife.

Sets of necklaces with earrings or single pieces of jewellery made of precious metals, semiprecious stones, and various strings of beads in different shapes are present in the rest of the graves as well. In most cases we were not lucky enough to find a grave that had not been looted. Most graves were destroyed and pillaged as early as the ancient times and, thus, a many goods are missing. We are, therefore, not privy to the real circumstances. Distinctive stylistic features are found in all types of jewellery. Influenced by eastern Mediterranean culture, during the 2nd and 3rd century, a polychromous type of jewellery was being developed. This type was called *uniones*, and was characterised by the combination of colourful semiprecious stones with pearls and beads made of glass. The favourite technique was *opus interrasile,* which included the piercing of metal to achieve a "lacy" look. All mentioned novelties are present in the Viminacium jewellery, and the items were probably made in local workshops where the locals and inhabitants from the eastern provinces were working. However, jewellery workshops have not been archaeologically confirmed in Viminacium, and it is doubtful that they did not exist, as the large quantity of jewellery found suggests their presence.

17 BMC, 168, no. 100; WBR, 477, no. 617; Weiser 030.

NECKLACES

The term *monile* referred to all ornaments carried around the neck. This term was applied to all necklaces intertwined with wires of beads and glass paste, pearls and gemstones, whereas the metal wires connected in different ways refer to chains. A luxury example of a necklace known as *hormoi* was found in the aforementioned grave (Fig. 3, 4).[18] It consists of a gold noose chain with various beads in different shapes and materials. Discoid pearls are dominant, made of stone and red glass. There is a pendant on the necklace, made of intertwined heart-shaped wire with volutes at the ends and a polyhedral green stone bead (emerald?). An identical pendant made of bronze was found on a fragmented earring from the same site, but with a white bead (G-232, C-687). Identical heart-shaped decoration is often found at the ends of a necklace of this type.[19] Similar examples of whole or fragmented necklaces are kept in the National Museum in Belgrade and the Museum of the City of Belgrade.[20] Numerous analogous examples can be found in the *Aquincum* Museum in Budapest, as well as in Mainz.[21]

The necklace with cylindrical jet beads and a medallion pendant is elegantly shaped. The pendant is made of gold and has a cameo (Fig. 1, 5).[22] Contrary to the monotone and monochromatic beads, the elliptically shaped medallion made of gold metal sheet with a frame decorated with palmettes, made using the grooving technique, makes this necklace a special one. There is a cameo of two-coloured blue and white opal, with an engraved female face in the white part, in right profile, in the medallion. The facial features are schematically represented, and the haircut is typical of empresses in the second decade of the 3rd century.[23] In the tomb were found bronze coins of Julia Domna, who minted between 211 and 217 AD.[24]

18 Raičković, Milovanović 2010, 97, Fig. 44.

19 Popović et al 2005, 62–63, Fig. 46; Поповић 1996, 89, кат. 104; Ruseva-Slokoska 1991, 138, Cat. No. 97; 141–142, Cat. No. 103; Marshall 1911, Pl. LXI, 2746.

20 Поповић 1996, тип III, кат. 107–114; Крунић, Игњатовић 2016, 61, 145, кат. 48–51.

21 Facsády 2009, 114, Type II, Cat. Nos. 219–220; Deppert-Lippitz 1980, Cat. 5.

22 Raičković, Milovanović 2010, 97–98, Fig. 45.

23 Поповић 1996, 37–38, тип IV; Vágó–Bóna, 1976, 193, Taf. XXIII; XXV, 1.

24 RIC 375.

Fig. 4. Necklace with the pendant, the site Pirivoj, grave 134, C-349.

Fig. 5. Necklace with medallion, the site Pirivoj, grave 290, C-844 and 846.

Fig. 6. Golden necklace, the site Pirivoj, grave 205, C-740.

A necklace found in grave G-205 (Fig. 2, 6) is formed from gold spherical beads, but the clasp is unusual. The beads were probably strung on a thread that has since perished. Hollow beads of gold sheet are known in various shapes since the Archaic period, and the Roman examples were derived from the Hellenistic tradition. During the Roman period, beads of gold were favourites from the 2nd century until the end of Late Antiquity.[25] There are numerous finds of necklaces made of colourful glass beads, stone, and amber, which make the necklace luxurious by being polychromatic, and with its shapes and size. This was a cheaper and simpler way for the lower social strata to get closer to the respectable members of Roman society.

EARRINGS

The most diverse type of jewellery is the earrings. There are two basic earring types: the open or closed link type and the "S"-shaped hook type. Chronologically, they overlap and it is difficult to date them precisely. Viminacium earring typological analysis was performed by Lj. Zotović some time ago.[26] Listed here are just some of the more luxurious pieces from the latest Viminacium necropolises excavations.

25 Поповић 1996, 40, тип III.

26 Зотовић 1995, 233-242.

7

8

Fig. 7. Earring with a hook and loop, the site Pirivoj, grave 126, C-335.

Fig. 8. Earring with a hook and loop, the site Pirivoj, grave 198, C-703.

9

Fig. 9. The pair earrings with hook and loop, the site Pirivoj, grave 212, C-758.

The more simple examples are thin wire-link type earrings that close simply using a hook and a loop.[27] In a grave that was constructed of fragmented bricks, apart from a gold earring (the site "Pirivoj", G-126; Fig. 7), a bronze coin of A. Severus was found.[28] In another grave of the same type as the previous one, as well as an earring with a hook and loop (the site "Pirivoj", G-198; Fig. 8), a spherical bead made of dark brown paste was also found. In addition to the findings of the individual, is found a pair of earrings of the same type in the grave from the same site (the site "Pirivoj", G-212; Fig. 9). In a destroyed grave with a structure of bricks, gold earrings with a hook and loop were found along with a gold earring with an insert of green glass paste and a gold ring also with an insert of green glass (Fig. 18).[29] This simple form earrings with hook and loop, has long been in use and the earliest samples are known from the 2nd century and last until the end of the 4th century.

27 Зотовић 1995, 234, тип II; Поповић 1996, 17-18, Тип I/2; Миловановић 2007, 12-13, тип II а.

28 BMC 168, no. 100; WBR, 477, no. 617; Weiser 030.

29 There were also three more beads made of glass and a bronze ring in the grave. The earring and the ring with the green glass will be specifically described afterwards.

Fig. 10. The pair earrings with hook and loop, the site Pirivoj, grave 205, C-741.

Fig. 11. Earring with wrapped wire around the link, the site Pirivoj, grave 275, C-820.

Earrings that have several layers of wrapped wire around the link represent a more developed form. The one pair of earrings is from the above-described grave (G-205; Fig. 10), while the other (G-275; Fig. 11) is from child grave in which was subsequently located a bronze coin from mid-3rd century.[30] In some cases the wire is spirally wrapped around the loop itself so that the spiral represents the head of the earring (G-319; Fig. 12).[31] Two pairs of earring-chains (Fig. 13 and 15) are from the graves of children.[32] The second tomb contained the skeletal remains of two children. In addition to the other items, next to the deceased a bronze coin was found.[33]

30 BMC 168, no. 100; WBR 477, no. 617; Weiser 030. Besides the earrings and a coin in the grave of the newborn, eleven wedges for footwear and a ceramic lamp were also found

31 Зотовић 1995, 234, тип IIa; Поповић 1996, 17–19, Тип I/3–4; Миловановић 2007, 16, тип Va, b.

32 The grave of a child (G-44) buried in a wooden coffin with a ceramic lamp with palmette on the disc and a small grey baked cup. There was one earring on both sides of the head. Around her neck more colourful beads made of glass were found.

33 The coin from the 3rd century, was damaged. With skeleton A, six cylindrical pearls of black-coloured paste were found around the neck. In addition to the second deceased (B) who was buried in a wooden casket. Besides the earrings, a fragmented pot with one striped handle of white-coloured clay was found.

Fig. 12. Earring with spirally wrapped wire, the site Pirivoj, grave 319, C-930b.

Fig. 13. The pair earring with spirally wrapped wire, the site Kod Koraba, grave 44, C-233.

The majority of this type of earring was found in the graves of inhumed children, located individually or in pairs.[34] There is evidence that boys of Eastern origin wore one earring, which may be the case in these graves. Such examples are often found in the graves of Viminacium necropolises from the 2nd to the 4th century.

Rarely is this type of earrings found in the graves with other jewellery. However, there are exceptions, as was the case with the findings of the earlier mentioned graves (G-86, G-205), and in the grave (G-212) with a pair of gold earring type chains, five rings, two identical bracelets made of bronze closed with ribbed decoration on the rim and a necklace of glass beads. Two bronze rings are fragmented, of the same type with a circular head, without decoration, the third is of the same type, but with an engraved lion presented jumping to the right, while the fourth ring of silver has an etched monogram of Christ. On the fifth ring, which is silver, is a gem, reddish in colour, with a carved human figure – possibly a deity.[35] The

34 In the grave of a child buried in a pit without any construction (the site of "Pirivoi", G-191, between the ages of 8 and 12) on the right side of the skull there was one earring (C-503) and an unreadable bronze coin in the mouth (C-502, significantly damaged, probably from the 2nd century).

35 In the grave (G-212), in addition to the above mentioned finds, more items were found: two

Fig. 14. Earring with spirally wrapped wire on the inner side, the site Pirivoj, grave 191, C-503 (1)

Fig. 15. The pair earrings with wrapped wire around the link, the site Kod Koraba, grave 62B C-400a.

objects were found with bronze coins of the emperor Constans 341–346.[36]

It is interesting to point out that some earrings show the craftsmen's mistakes, probably due to some negligence, which indicates local manufacturing, because such oversights were inadmissible with master goldsmiths. On the earring ending with a loop and a hook (Fig. 14), the spirally wrapped wire next to a loop forming the earring head is positioned usually on the outer side, but on this piece it is on the inner side. In a dual grave containing the skeletal remains of two children in the B skeleton arms area, two gold earrings were found (G-62 A, B; Fig. 15). Based on the context of the find, we would assume that they are from the same pair, one of the earrings, however, ends with a hook and a loop with a triply wrapped wire around the link, while the wire is spirally wrapped above the loop on the other. In this case, it is hard to say with any certainty if this was a mistake by the craftsmen or if these pieces are from different pairs. On the other hand, we know gold to be

glass vessels, one of which is a bottle of pear-greenish glass body, a long cylindrical neck, an annular thickened rim and a slightly recessed bottom. The second bottle is stored in small fragments which cannot be reconstructed; an unguentarium, cosmetic palette, a fragmented iron object with panelling, wall panelling and pieces of bone fragments and silver tubules.

36 LRBC I-860.

Fig. 16. Earring with a soldered calotte-shaped head, the site Kod Koraba, grave 66, C-216.

a precious material so it is possible that after the loss of one, it was replaced with a similarly shaped earring from another pair. It is also possible that each deceased had only one earring.

A special thin gold wire hook type earring with a soldered calotte-shaped head was found in a grave of an cremated deceased (Fig. 16).[37] In the tomb, a bronze coin of Faustina I minted after 141 AD was found.[38] Earrings of this type can be decorated with pseudo granulation around the edge (Fig. 17).[39] They are often present in graves from 2nd and 3rd century.[40] A gold earring with a gold sheet circular head on the link and faceted green paste is a more luxurious example. The frame is decorated with a chain motif with the art embossed on the matrix (Fig. 18).[41] Earrings with a head in the shape of a flower usually have not hook and

37 Зотовић 1995, 236, тип V; Поповић 1996, 20, Тип II/1–2; Миловановић 2007, 17, тип VI a. In the grave (the site of "Kod Koraba" G1-66) on both of theétages there were a multitude of attachments. Among the items of pottery were found: fragments of plate, bowl, amphorae, pot, and lamp. Then, a bronze crank fibula with semicircular support beams, at the head, two glass balsamaria, and the remains of letter-boxes (three bronze handles, the formwork for the lock, the angular profiled formwork and bronze pins with conical heads).

38 RIC 1124.

39 The gold earrings were found in the grave (the site "Pirivoj", G-258) of buried deceased whose bones were dislocated, and were the only find.

40 Ruseva-Slokoska 1991, Cat. No 8a, b; Пешић 1995, 32, сл. 11; Jovanović 1978, 35, kat. 6–7; Ratković et al. 2013, 130, kat. 1175, 1184 and 1187.

41 The earring was found in a severely damaged brick grave (the site "Nad Klepečkom", G-86) of an inhumated deceased. Since the structure is preserved only in the lowest zone of the coffin made of bricks, very few bones of the deceased were found in the tomb, and they were all dislocated. Apart from the said earring, one type of small gold earring link was found, together with a gold ring with inserted green glass paste. About the other findings of the course see note number 30.

Fig. 17. Earring decorated with pseudogranulatio, the site Pirivoj, grave 258, C-767.

loop fasteners, and identical specimens are known on the earrings with an "S" link. On the other pair of gold links, there is an almond-shaped cassette with a dark red stone - ruby (Fig. 19).[42] These types of earring is rarely represented in this form and usually contains hanging charms and have been found in the southern Viminacium necropoles' graves in the 2nd and the first half of the 3rd century.[43]

Earrings with a hook and loop often have hanging pendants in the form of pearls, stone or glass beads. Of this type is a gold pair (Fig. 20), with a spiral twist forming the head of the earring.[44] Among other findings in the tomb is a coin of A. Severus, minted in Nicaea between 222–235 AD.[45] The gold example earrings are the most dominant in Viminacium, although two silver earrings of the same type have also been found.[46] To date, one almost identical example is known from the vicinity of Viminacium (Salakovac and Malo Crniće).[47] Particularly interesting is the gold earring with a deformed hook made of wire which has a fixed ornamental head on the lower end formed by a plate teardrop shaped frame inside of which is a dark red glass. The wire is spirally wrapped around the teardrop frame resembling the shape of a flower (Fig. 21).[48] It is possible that the link of the hanging wire pendant was deformed and secured with a link. We do not know the direct

42 The earrings are from the grave of a cremated deceased (the site "Kod Koraba", G1-56), which had a walled lower étage. On the bottom of the first étage, apart from pairs of gold earrings, a fragmented ceramic pot was found. On the bottom of second étage, there was a fragmented bone needle.

43 Поповић 1996, 21, Тип II/2; Миловановић 2007, 17, Тип VI б.

44 Raičković, Milovanović 2010, 98, fig. 51. A pair of earrings were found in the brick grave, with semi spherical arches (the site "Pirivoj", G-67). The deceased was a female aged between 20 and 22 years. Inside four iron nails were found, as well as pieces of wood, which testify to a funeral in a wooden coffin. In addition to the earrings, the following items were found: fragmented ceramic vessels, part of a container of clear glass and two fragmented objects of copper sheet.

45 BMC 168, no. 100; WBR 477, no. 617; Weiser 030.

46 Поповић 1996, 20, Тип I 4а; Миловановић 2007, 17, Тип Vб1.

47 Крунић, Игњатовић 2016, 50, сл. 25, кат. 16.

48 It is a cremation grave with two étages (the site "Više grobalja", G1-1782), in which, in addition to the bronze plating earrings, a suitcase, three fragments of bone pins, and some metal nails were found.

Fig. 18. Earring and ring with a green glass, the site Nad Klepečkom, grave 86, C-1401 and C-1402.

analogy for this item, but the head of the earrings have certain similarities with examples with "S" links.[49]

The other earring type is the "S"-link type that has much more diversity compared with the previous. One of the more simple examples is a pair of "S"-hook, six-sided pyramid shaped sheet plate head (Fig. 22).[50] This type representing the original late Etruscan model, still in existence even during the Roman period, until the end of the 3rd century.[51] Earrings of this type are made only out of gold and the Viminacium examples are, by quantity, paralleled only by examples from Bulgaria,[52] while other sites only have a few finds.[53] Two pairs of "S"-link earrings have a transversal gold sheet band with a six-sided processed green glass (Fig. 23).[54] On an

49 Поповић 1996, 25, Тип VIII 2/2.

50 Raičković, Milovanović 2010, 98, fig. 49. The earrings were found in a grave made of bricks (the site "Pirivoj", G 313). One was on the chest, and the other to the right of the skull. There were no other findings.

51 Зотовић 1995, 236–237, Тип VI; Поповић 1996, 24, Тип VI 1; Миловановић 2007, 18–19, Тип VIII a1.

52 Ruseva-Slokoska 1991, 121, Cat. No 43-46a, b.

53 Крунић, Игњатовић 2016, 52, кат. 27; Цермановић-Кузмановић, Велимировић-Жижић, Срејовић 1975, Г-40; Girardi-Jurkić, Džin 2003, kat. 191.

54 The grave (the site of "Rit", G-121) belongs to a plain grave pit. Under the jaw, the ribs and vertebrae, several different coloured beads of glass paste and jet, including a bead of gold sheet were found. On the left side of the skull the aforementioned pair of gold earrings was found. In the vertebra, at the breast, an anthropomorphic pendant made of amber was found. In the left hand on the pelvis, bronze coins from the mid-3rd century, minted in Viminacium, were found. At the

Fig. 19. The pair earrings with almond-shaped cassette with red stone-ruby, the site Kod Koraba, grave 56, C-154.

almost identical pair from the other grave, in place of the glass, there are beads (Fig. 24).[55] Both graves date back to coins from the middle of the 3rd century. The first grave was found with a coin from the Viminacium mint, while the second bronze coin is of Trajan Decius, 249–250 AD.[56] There are identical examples throughout the Empire from a long chronological period, from the 2nd to the first half of the 4th century. Two identical examples purchased from Viminacium are located today at the Zagreb Archaeological Museum, besides other examples of this type.[57]

A pair of "S"-link earrings with a square gold cassette shaped head decorated with grooves with polyhedral green paste is a particularly lavish example (Fig. 25).[58] The cassette is even more adorned by the application of loop-shaped golden wire bent on all four sides on the ends where beads or pearls would be expected. Similar are the earrings from Solin which on all four sides of the bearings have one wire with preserved pearls.[59] Interesting wire extensions are present on the pair of gold earrings from the marble sarcophagus in Viminacium,[60] but there are

right forearm lay a whole glass balsamarium and on the chest, close to the amber pendant, was a fragmented bronze bullae.

55 The pair of earrings with pearls of a coarse structure were found together with masonry and brick fragments (the site of "Pirivoj", G-70). A coin of Trajan Decius and an iron case of rectangular cross-section were found with the earrings.

56 Црнобрња 1993, бр. 69

57 Perok 2012, 47–49, kat. 31–38; Поповић 1996, 25, Тип VIII 1; Миловановић 2007, 19-20, Тип IX a.

58 Raičković, Milovanović 2010, 98, fig. 50.

59 Perok 2012, 47, kat. 30.

60 Спасић-Ђурић 2002, 89–90, сл. 71.

21

Fig. 20. The pair earrings with hanging pendants in the form of pearls, the site Pirivoj, grave 67, C-164.

Fig. 21. Fragmented earring with red glass, the site Više grobalja, grave 1782, C-12345

20

Fig. 22. The pair earrings with pyramid shaped sheet plate head, the site Pirivoj, grave 313, C-913.

22

23

Fig. 23. The pair earrings with a six-sided processed green glass stone-emerald, the site Rit, grave 121, C-2417.

24

Fig. 24. The pair earrings with beads, the site Pirivoj, grave 70, C-161.

Fig. 25. The pair earrings with a square cassette and polyhedral green glass, the site Pirivoj, grave 290, C-843.

Fig. 27. Earring decorated with peltas and polyhedral green stone, the site Pirivoj, grave 31, C-487.

also examples from Siscia, Serdica, Carnuntum and Aquincum.[61] All the mentioned earrings belong to the 3rd and the first half of the 4th century period. An earring with a skilfully worked flower shaped head is made with extraordinary craftsmanship (Fig. 26).[62] An eight petal flower is made out of hammered gold sheet, while in the middle is a protruding circular dark red stone – possibly a ruby. Beneath the head there is a trapezoidal sheet plate band with remains of the links for missing pendants. The earring was found in a cremated burial from the late 2nd or first half of the 3rd century. A similar pair of earrings was found in a Singidunum brick grave.[63] On that pair, a stone in the middle is to be expected. An identical petal shape was made on a gold pair from Ratiaria, found in a grave from the 3rd century.[64] The most extraordinary achievement was made in making the "S"-shaped link and circular head of thin metal sheet. The head is decorated with peltae, in the technique of piercing. A polyhedral green stone is fastened in the middle (Fig. 27).[65] Beneath the head, a band in the shape of stylised dolphins is laid. Only one pendant was preserved on the band, made of twisted wire with a pearl at the end. The earliest dated example of this type comes from Plovdiv, from the second half of the 2nd century.[66] Two analogous pairs of earrings from an unknown Viminacium site are today at the National Museum in Belgrade, and belong to the 3rd century.[67] Examples from the Zagreb Archaeological Museum, Mainz Museum and the British Museum are also dated in the 3rd century.[68]

Fig. 26. Earring with flower shaped head and red stone-ruby, the site Pirivoj, grave 5, C-72.

61 Perok 2012, 51, kat. 40; Ruseva-Slokoska 1991,123, Cat. No. 48; Facsády 2009, 12, Type VII, cat. 281

62 The earring is from the grave of a cremated deceased (the site of "Pirivoj", G1-5, C-72). There were no other findings.

63 Pop-Lazić 2002, sl. 21/1; Крунић 2016, 56, сл. 35 а, б; кат. 38а, б.

64 Ruseva-Slokoska 1991, 125, Cat. No. 54a, b.

65 Raičković-Milovanovic 2010, 98, fig. 51. It is a grave of the cremated deceased (the site of "Pirivoj" G1-31, C-487). The lower étage was built of horizontally placed masonry bricks. At the bottom of the first étage, other than the aforementioned earring, a small bluish glass vessel was found and about 40 wedges for footwear.

66 Ковачева 1973, 51-52, сл. 4а, б.

67 Поповић 1996, кат. 97-98; Миловановић 2007, 101-102, кат. 477-478, Т. XVI, 199.

68 Perok 2012, 59-61, kat. 58, 59 and 60; Deppert-Lippitz 1985, Taf. 33, 76; Marshall 1911, Pl. 2665.

Fig. 29. The pair earrings with Medusa, the site Kod Koraba, grave 76, C-465.

CAMEOS

Fig. 28. Medallion with Medusa, the site Pirivoj, grave 134, C-352.

Glyptic art, although not originating from Rome, but taken from the ancient craftsmen of Egypt, Greece and Etruria, has left a special mark in the production of jewellery in the Roman period. In the Hellenistic period, colourful gemstones were carved into figures, so as to form reliefs, that is, cameos. These were usually worn on necklaces, within cassettes of gold or on earrings. Numerous gems and cameos found in Viminacium confirm the existence of a workshop in this city, which supplied wealthy citizens with these highly valued art pieces.[69] On cameos found in Viminacium, mostly portraits of women were represented, which resembled, by their haircuts, the empress of the time. Oftentimes, a representation of Medusa would be shown. On a necklace with cylindrical black beads, the face of one of these women is shown (Fig. 5), and on a medallion (Fig. 28) a head of Medusa, en face.[70] A pair of gold earrings with an 'S'-hook and elliptical head made of gold metal sheet with grooved ornament has a cassette that contains a cameo made of white opal with the Medusa head en face (Fig. 29).[71] A pair of earrings

69 Поповић 1989, 8-13.

70 Milovanović, Anđelković Grašar 2017, 173-174, Fig. 15.

71 Milovanović, Anđelković Grašar 2017,175, Fig. 16. In the plain grave pit (the site of "Kod Koraba",

was found in a grave with a bronze coin of A. Severus, minted in Nicea between 238 and 244 AD.[72] Earrings of the same type with three hanging pendants are known from Prahovo (*Aquae*) and also belong to the 3rd century.[73]

PENDANTS

Apart from the pendants of the medallion type that contain gems, cameos, coins and a semiprecious stone, a special kind can be isolated: pendants that were used as a status symbol, or had an apotropaic character. Such types are calotte pendants, that is, bulla and cylindrical boxes or tubules. A bulla (*bulla*) was worn as part of the Etruscan heritage by the sons of free Romans, until they reached maturity. However, in time this tradition lost its significance and the bulla started to be worn by children of both sexes, and men and women. Besides emphasising status, different contents of the calotte (plants, parts of cloth, hair) gave this pendant an apotropaic character.[74] There are two basic forms of this kind of pendant – with flat or radial edges. The majority of examples were made of bronze, and we can rarely find those made of silver or gold (Fig. 30).[75] The grave with the gold bullae is a part of the northern Viminacium necropolis of "Rit", where the burial of cremated and inhumation deceased in the 2nd and 3rd century was carried out.[76] They are mostly found in graves, independently or as a part of a bead necklace or other kind of pendants located in the torso area. They are most often found in the graves of children, but are present in adult graves as well. Chronologically, they cover a wide scope from the end of the 1st to the 4th century.[77]

Fig. 30. The gold bullae, the site Rit, grave 130, C-2459.

G-76), the skeleton is partially damaged. In addition to the earrings, there was found: a bronze ring, beaded pearls, and gilded paste; a bronze coin of A. Severus and a smaller number of iron wedges for footwear.

72 BMC 101.

73 Јањић 2016, 67, кат. 8.

74 The contents of the bullae are more diverse among the finds from the other parts of the Empire. These can be seeds of fruit, and even a small figurine of Hippocrites. See in, Migotti 2007, 187–219.

75 In the devastated brick-built tomb (the site of "Rit", G-130), the dislocated remains of a skeleton (skull and long bones of an adult), gold bullae and iron wedges for footwear, were found.

76 Milovanović, Redžić, Jovičić 2017, 71–76.

77 Stojić 2015, 48, 51; Milovanović 2017, 110-112. In a grave of a newborn (the site of "Pirivoj",

Fig. 31. The silver tubuli, the site Pirivoj, grave 304, C-882.

Hollow tubuli are small cylindrical tubes of thin metal sheet which usually have links for attaching to a chain. Luxurious examples made of gold and decorated with filigree and granulation have not been found in Viminacium so far. There are no known examples with monetary pendants that were worn in the late ancient era.[78] The tubuli from Viminacium are made of silver, simple in design, without ornament and with two or three attachment links. Their function was primarily symbolic and apotropaic. In almost all better preserved examples the rolled-up metal sheet plate-lamellas were found. These were made of gold and silver, with inscriptions or symbols carved onto them. Demons and deities that had a protective purpose are usually mentioned in the inscriptions.[79] These types of tubuli are found in graves of inhumated children (Fig. 31).[80] Hence, it is understandable that these were meant to protect the weak children from diseases, the evil eye and other 'evil' forces – both in this and in the afterlife.

G-379) three bullae were found, a silver, a bronze and one made of lead. The lead example is, for now, the only known find of its kind. On the necropolis of "Više grobalja" from earlier archaeological excavations, in the grave (G-216), four bullae were found with the skeletal remains of a child up to one year old. The grave is, based on the finding of coins of the Nerva and Domitian, dated to the end of the 1st century, see in, Зотовић, Јордовић 1990, 68, T. XXXVI, 2–5.

78 Поповић 2001, 53–58.

79 Korać, Ricl 2017, 164–175.

80 It is an individual who was probably buried in a wooden coffin, as indicated by two iron wedges found next to the bones of his legs (the site of "Pirivoj", G-304). The deceased was of a child's age. Bronze bullae and a silver cylindrical box – tubuli were found between the right shoulder bone and the skull. On the chest was found one iron ring.

Fig. 32. A closed-type bracelet made of multi-stranded bronze wire, the site Pirivoj, C-685.

BRACELETS

Bracelets (*armillae*) that were most often worn on their wrists, and rarely on their ankles (*periscelides*), were mostly part of female jewellery. However, as part of military decorations (*dona militaria*) together with torques and phalerae, they were given to soldiers for special merit.[81] Bracelets from older archaeological excavations of Viminacium are typologically defined in fourteen types.[82] They are made of different materials: from gold, silver, bronze, iron, bone, glass and jet. The most numerous are bronze and silver specimens. Based on the closing method, there are two basic groups of bracelets: with closed and open ends.

We will only mention the representatives of some types of graves from the recent excavations of the eastern Viminacium necropolises. Among the bracelets of the closed areas, the specimens exhibit hook and loop, as well as with coiled and wound ends, sometimes with spiral decorations.[83] A closed-type bracelet made of multi-stranded bronze wire with a hook and loop at the ends (Fig. 32)[84] was found on the left forearm of a deceased, along with three more bronze bracelets, while a fifth bronze bracelet was on the right forearm.[85] There were no other findings. In a brick constructed grave with

81 Maxfield 1981, 89–91.

82 Радуловић 2006, 355–374.

83 Радуловић 2006, 362–365, Тип VII, VIII.

84 Raičković, Milovanović 2010, 99, fig. 57.

85 The bracelet is from a grave from the site "Pirivoj", G-232. The bronze bracelet (C-682) is a closed type with coated and wound ends; the second bronze bracelet (C-683) is an open type with snake

Fig. 33. The bronze bracelet of coated ends, the site Nad Klepečkom, grave 98, C-1399.

Fig. 34. The bronze bracelet with pendants, the site Kod Koraba, grave 3, C-9.

a plain cover, on the left forearm of the deceased, three bronze bracelets were found, one of which ended with a hook and loop.[86] The examples from Viminacium with hook and loop, based on the conditions of the findings, belong to the 3rd and 4th centuries, while some findings from Bulgaria were given earlier in the 2nd –3rd century.[87]

Bracelets with coated ends are usually without pendants, but there are also rare items with pendants (Fig. 32 and 33).[88] On a large bronze bracelet from the grave of a cremated deceased, there are five hoops of covered and twisted ends, and in one of them a heart-shaped

heads at both ends; the bronze bracelet (C-684) has open ends with stylised snake heads on both ends that overlap; the bronze bracelet (C-686) is of a closed type of twisted wire with a loop on one and a hook on the other end.

86 In a grave at the site of "Pirivoj", G-248, there were two other bronze bracelets of the same type with ends in the form of snake heads. The heads are enlarged, with square cross sections and are separated from the arc by incisions. On the sides, the eyes were pierced. The mouths are open and linearly emphasised. In the perforations for the eyes there may have been a stone or glass. Around the neck, there were seventeen beads of glass and a deformed object made of glass.

87 Радуловић 2006, 362-363, Тип VII/1-2; Ruseva-Slokoska 1991, 153, Cat. No. 142; 156, Cat. No. 153a, b.

88 The bracelet from the grave of a cremated deceased (the site of "Nad Klepečkom", G1-98) was found among burnt bones in a brick-built casket. In the filling box, another fragmented bronze wire bracelet was found, probably with a hook and loop missing; eight bronze alloys with enamelled filament; a bone cube; a bronzed ring with an expanded shoulder with an incised representation of a lion on an elliptical head, eight beads (four of amber and four of glass); a cosmetic pallet made of stone; a bronze medical probe (cyathiscomella); fragmented bone needles with sloping cuts, a bronze bracelet of a closed type with coated and wound ends and a fragmented iron ring with a red gemstone. In addition in the grave, eight iron wedges and three shells were found. In the second grave (the site of "Kod Koraba", G1-3) of rectangular shape with rounded corners, among the cremated bones only the mentioned bracelet with hoops was found.

Fig. 35. The bronze bracelet with snake ends, the site Pirivoj, grave 232, C-683.

pendant is preserved.[89] Bracelets of this type represent the Laten heritage and, in addition, they belong to the most widespread and longest lasting type that did not change form from the 1st to the 4th century. The same forms are also torques, rings and earrings. This jewellery can differ from each other only by dimensions and place of finding, if it is from a grave. There are numerous analogies both from immediate region and beyond. Among the earliest specimens are the finds from Tekija and Bare, which were dated to the end of the 1st century.[90] Similar examples have been found in *Aquincum*.[91] The specimens with coiled and wound ends were in use longer, from the 1st to the middle of the 4th century, while a somewhat more developed form with spirals was present in the whole Balkan region from the end 1st to the last quarter of the 3rd century.[92]

Chronologically younger specimens appear as bronze wire enclosed bracelets, whose outer side is ribbed and grooved.[93] In the previously mentioned grave (G-212), two bracelets of this type were found. A coin from the middle of the 4th century, found in the grave, confirms the chronological presence of these specimens, which are numerous at other late antique sites.[94]

Among those usually found are the open-ended bracelets made of bronze with

89 Two examples of this type are known from the twisted wire finds from Viminacium with one ring, or bulla, as a pendant. See in, Радуловић 2006, 363-365, Тип VIII/1.

90 Mano-Zisi 1957, T.III/8; IV/10; Поповић, Борић-Брешковић 1994, кат. 7-9; сл. 5; 8/5-8; 9/1-15.

91 Facsády 2009, 105, Type IV, Cat. 139-140.

92 Радуловић 2006, 368-369.

93 Радуловић 2006, 357.

94 Радуловић 2006, 357, Тип Iб.

Fig. 36. The bronze bracelet with snake ends, the site Pirivoj, grave 248, C-723.

Fig. 37. The bronze bracelet with snake ends, the site Pirivoj, grave 122, C-316.

Fig. 38. The open-type bracelets, the site Pirivoj, grave 135, C-343.

the ends in the shape of a snake head. One end can have a snake's head, while the other ends in the shape of a snake tail; both ends are in the form of a snake's head or the ends are minted and the cuts are supported by snake patterns. It is a Greek–Hellenistic form of jewellery that has remained in the tradition of the local population.[95] The bronze bracelets with both ends formed in the shape of a snake head are located in several graves. In the site of "Pirivoj", in the graves (G-232 and G-248), besides a bracelet with twisted wire with a hook and loop, a bronze bracelets with snake ends were found (Fig. 35 and 36). Four fragmented and whole bronze bracelets were found in the plain grave pit (G-122).[96] Among them there was a bracelet with serpentine heads (Fig. 37). The abovementioned bracelets with both the snake ends belong to a younger version that was in use during the 4th century. Silver samples from Bulgaria were dated sometime earlier in the 2nd and 3rd century.[97]

Among the open-type bracelets, specimens with profiled, thickened ends, often decorated with geometric notches from Viminacium, Singidunum, Naissus, Sagvar, Intercisa and Emona, were dated to the 4th

95 Радуловић 2006, 359–361, 368; Тип V/1–3.

96 In addition to these bracelets, among the finds there were two ceramic bowls with an olive green glossy inner surface, a grey coloured ceramic pot, a fragmented bronze bell, three glass beads and one stone, as well as a fragmented object made of bronze sheet.

97 Ruseva-Slokoska 1991, 159 Cat. No. 161; 162a, b

Fig. 39. The open-type bracelets, the site Pirivoj, grave 135, 344.

Fig. 40. The bronze bracelet with double profiled ends, the site Pirivoj, grave 165, C-488.

century.[98] In a grave with a brick construction with a plain cover a deceased man with two bronze bracelets of this type was buried (Fig. 38, 39). One was on the left, the other on the right forearm. In the same grave were found two more bronze bracelets on the left forearm. One is fragmented and striped, while the other, coated and with wound ends.[99] The same type, but the second variant[100] belongs to the bronze bracelet with double profiled ends (Fig. 40). It was found in a grave (the site "Pirivoj", G-165) of a imhumated deceased together with another closed-type bracelet of thicker wire circular cross-section and two fragmented bronze rings on his left hand. On the circular, plating heads of the rings, a representation of a ship, or a scorpion, is engraved. Open-type bracelets with thickened ends from Viminacium belong to the middle and second half of the 4th century, while they were present in *Aquincum* at the beginning of the 5th century.[101]

98 Радуловић 2006, 357–359, Тип III/1.

99 In the grave (the site of "Pirivoj", G-135), besides the bracelets, there were 32 beads of blue glass, a bronze ring lacking a stone, a part of a silver chain and part of a bone needle.

100 Радуловић 2006, 359, Тип III/2.

101 Радуловић 2006, 359; Facsády 2009, 109, Type VI/c, cat. 173–175.

RINGS

Fig. 41. Silver ring with gem, the site Nad Klepečkom, grave 43, C-220.

Fig. 42. Silver ring with gemme, the site Pirivoj, grave 134, C-356.

Fig. 43. Silver ring with gemme, the site Pirivoj, grave 134, C-356.

Wearing gold rings in Roman times was mostly characteristic of aristocrats, senators and other powerful figures. Only iron rings were worn by the wider population. However, this practice changed in time, and it was only during the rule of Septimius Severus (197. AD) that soldiers were allowed gold rings. The rings were not only used for decorative and social or political reasons, but were used as seals. The inscriptions on the heads or ring shoulders were a mark of its owner or contained messages for luck, piety or loyalty. The link and the head of the ring would become more and more massive in time, with cameos, gemstones or glass. The silver examples from Viminacium often have a head with a gem or glass, while the more luxurious ones made of gold contain precious stones. We will only mention some of the silver and gold rings from the eastern Viminacium necropolises. A silver ring with a gem on the head showing a lion's head (Fig. 41) belongs to the type where the ring and the head form the whole. A rectangular cross section gradually extends towards a head which is expanded and contains a gemstone with a cut-in representation of a lion jumping to the left. The shoulders are rounded. This type is present in the 2nd and 3rd centuries.[102] A fragmented silver ring with a reddish, hemispherical gem (Fig. 3 and 42) was found in a grave with the number of jewellery, about which the above text has already mentioned. Of the same form is a whole silver ring with a gem of reddish, semiprecious stone on which a human figure or a deity is shown (Fig. 43).[103] By their type, the two rings are similar to the one above; the only difference is a stone cassette above the ring line, while the shoulders are accentuated and wider than the ring. These differences define the ring into a special type that is chronologically present from the end of the 2nd to the mid-4th century.[104] With the ring with an engraved deity, numerous pieces of jewellery were found, as well as a coin from the middle of the 4th century.[105] A large gold ring with a dark red coloured glass paste (Fig. 1 and 44)[106] was found in the aforementioned grave with a bronze coin of Julia Domna, from 211 and 217 AD.

102 Поповић 192, 10, Тип II.

103 Raičković, Milovanović 2010, 100, fig. 60.

104 Поповић 1992, 10, Тип II.

105 See note number 35 and 36.

106 Raičković, Milovanović 2010, 100, fig. 61.

The extended shoulder of the ring has two peltae made in the technique of piercing. An identical blue stone ring was found at Šarkamen. The rings in this form are present from the end of the 1st to the middle of 3rd century.[107] Similar examples are found at sites from the surrounding area.[108] The gold ring from the grave with a brick-built construction (Fig. 45) has a circular ring, decorated with horizontal incisions, while on the head, in an oval cassette, is a gem with a *dextrarum iunictio* depiction. This type of rings were typical of the so-called "engagement rings" of the 2nd to the 3rd centuries. In the grave with the jewellery there were two more fragments of a ring of bronze wire of a circular cross-section and a bracelet of a closed type of bronze sheet of a half-sized cross-section.[109]

Fig. 44. Golden ring with two peltas, the site Pirivoj, grave 290, C-848.

Fig. 45. Golden ring with a gemma, the site Pirivoj, grave C-848.

CONCLUSION

Studying the jewellery from the graves of the Viminacium necropolises, we can partly get to know the people that lived there. Bearing in mind that we only have access to a very small number of graves that have not been looted, the preserved jewellery represents an image of a wealthy population that dwelled in this area. The use of various metals, precious stones, pearls, rare materials such as jet and amber, puts the citizens of Viminacium among a wealthy population of refined taste. Through a brief depiction of jewelry from recent archaeological excavations of the Viminacium necropolises, we conclude that the earrings and necklaces are the most numerous among the golden jewelry, while the rings are somewhat less represented. The bracelets were made mostly of bronze, while gold pieces are not known at the moment. Certain types of jewellery were comprised of multiple pieces. It is similar with the rings, which are sometimes found in two or three pieces in the same grave. The most numerous jewelry in the graves of newborns and children are pendants with apot-

107 Поповић 1992, 10, Тип III.

108 Popović et al 2005, 62-63; Ruseva-Slokoska 1991, 172, 187, 193, Cat. No. 198, 237, 251; Facsády 2009, 91, Type I, Cat. Nos. 2 and 3.

109 The above findings were in a grave (the site of "Pirivoj", G-163), which was partly destroyed by mechanised groundwork. In addition to jewellery, a ceramic lamp depicting a deity (?) displayed on a disc and a ceramic pot with three handles were also found.

ropaic character (bullae, tubuli) and the type of simple gold wire earrings with hook and loop fasteners. Luxurious examples of jewellery are usually found in graves of young, prematurely deceased women. In this way, not only was the high social status of the deceased person highlighted, but the grave inventory can be understood as a dowry that is stored together with an unmarried or recently engaged girl.

The city's location on an important military, strategic and also merchant crossroads enabled its citizens the import of luxurious raw materials and goods from both East and West. Besides this, the majority of jewellery is locally manufactured by both local and foreign masters. This is confirmed by the number of finds and typologically similar examples, moulds and an anvil found on the site itself.[110] The most luxurious and lavish pieces are found in the graves from the end of the 2nd and the 3rd century. At the time, the canabae of the *VII Claudia* legion were rebuilt and more investments into the city curia were noticed. At the same time, one of the veterans and a decurion of Viminacium rebuilt the temple of Mithras.[111] Therefore, most precious jewellery belongs to the population of the mentioned period and testifies to the power and luxury that marked the era of greatest prosperity in this region.

110 Спасић-Ђурић 2002, 86.

111 Mirković 1968, 63-65.

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CERAMIC VESSELS AS GRAVE GOODS IN THE NECROPOLISES OF VIMINACIUM*

ANGELINA RAIČKOVIĆ SAVIĆ, *Institute of Archaeology Belgrade*
E-mail: araickovic@yahoo.com

ABSTRACT

During the decades-long research of the Viminacium necropolises, numerous ceramic vessels were discovered in graves of cremated and inhumated individuals. Their research helps to a better understanding of not only funeral rituals, but also the everyday life, customs and economy of the ancient population. The wide repertoire of discovered vessels indicates developed trade links with other parts of the Empire. The majority of these vessels represent local products, which indicates the inventiveness of domestic potters who supplied all of the Viminacium necropolises with their products. The paper presents an overview of the most common forms and types of vessels discovered in Viminacium graves and whose timeframe covers the period from the 1st to the 4th century AD.

Keywords. – Cremation, inhumation, grave, necropolis, pottery vessel, bowl, pot, plate, goblet, censer, antiquity, Viminacium.

1The article results from the project: *IRS – Viminacium, roman city and military legion camp – research of material and non-material cultureof inhabitants by using the modern technologies of remote detection, geophysics, GIS, digitalization and 3D visualization* (no. 47018), funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

Ceramic vessels discovered across Viminacium's necropolises provide us with information of great significance in the understanding and grasping of not only the idea of the afterlife of its residents at the time, but also their daily life, economic status and ethnicity.

Through the change in form, ornamentation and workmanship techniques, as well as the chemical composition of the ceramic, it is possible to track the development of the material culture of Roman provinces. The abundance of such material has been unearthed during the decades-long research of Viminacium, its necropolises and the settlements east of Viminacium. As grave goods, ceramic vessels have been registered in large numbers. The research of the crafts centre in the southern necropolises confirmed the location from which they were supplied with the ceramic grave goods and from which the local population obtained pottery necessary in daily life.

The largest portion of the discovered vessels has analogies in form and usage across the Roman Empire. According to them, a clear picture of their usage, ubiquity and frequency is obtained. Modern petrological analyses can determine the common characteristics of the vessels, as well as their differences. We are now able to track the routes of distribution of the final products to other parts of the Empire.

Depending on their function, ceramic vessels can be classified as tableware, storage, transportation or cooking vessels, and special-purpose vessels. The reliably dated forms from the archaeological units, the graves in which these vessels were discovered, together with certain forms of jewellery and, most importantly, coins, are of greatest significance in establishing their chronology. Not all of the shapes found in the graves have been confirmed in the settlement layers. Although most of the graves were looted during the period of Antiquity or in modern times, or damaged by machinery prior to the discovery of the sites, the ceramic material still appears in quantities large enough to give us an idea of life in those times. The most common grave goods belong to tableware and cooking vessels. The vessels used for transportation most often functioned as urns, mostly in the form of a recipient for laying an infant in, while they rarely appear as grave covers (Fig. 1). The types of ceramic vessels used for storage appear in tombs as grave goods least frequently.

What is typical of the vessels discovered in graves, whether in inhumation or cremation burials, is that they are mostly the products of local craftsmen; there are few imported, luxurious vessels. Occasional finds of *terra sigillata* vessels are

Fig. 1. Amphora with the role of a grave cover

an exception, not a regular occurrence in Viminacium's necropolises. With the formation of the settlements, the population became more diverse in terms of the existing occupations; primarily, there appeared tradesmen who supplied the settlement with their goods, while canabae, where the soldiers' families were lodged, began to emerge around the military camp. Hence, different types of burials interweaved in the necropolises of Viminacium.

The economic crisis following the Marcomannic wars is reflected in the decline in production; however, it is not noticeable in the ceramic material from Viminacium. A rise in local production occurred at that time, due to the shortage of quality vessels. Around the end of the 2nd and during the 3rd century, there occurred a rapid development of crafts in Viminacium. Having met the needs of the local population, the craft centres began to further distribute their goods to other regions and provinces, while the proximity of the Danube facilitated the transportation.

Since the necropolises surrounding Viminacium emerged at different times and functioned over shorter or longer periods, a wide variety of ceramic vessels has been unearthed in them, encompassing the period from the 1st until the end of the 4th century.

The foundation of the castrum in Viminacium is associated with the arrival of the *VII Claudia* legion in the 70's of the 1st century. The earliest period of the necropolises in Viminacium was confirmed by the coins of Augustus, Nerva and Vespasian. Coins of several emperors appear in the graves, indicating that not only the currencies of the time, but also earlier ones were laid in the graves as grave goods. There are even graves in which that span stretches across 300 years (G1-337 from Više grobalja). The most common chronological framework observed in the graves with currencies from different periods encompasses a span of 50 to 100 years.[1] Though scarce, the luxurious *terra sigillata* forms of bowls, plates and goblets represent the earliest phase of the necropolises with vessels. These are the Drag. 35 and Drag. 36 forms (Drawing 1), and their local imitations appear even in this early phase. Drag. 33 (Drawing 2) forms from the necropolis of Više grobalja also belong to the last quarter of the 1st century.[2] There is also an unusual find of an imported plate, from an inhumation burial, dated to the second half of the 1st century and made using the *terra sigillata* technique, the Drag. 17b type. (Drawing 3) The influence of Aquileia and Emona is noticed in the vessels that remind of the imported ones by their form (Više grobalja, C-7479 G1-1068). Such bowls appear from the end of the 1st to the middle of the 2nd century. Bowls decorated with marbleizing, which imitate the forms of glass and marble vessels, also appear. Thin walled bowls with a calotte-shaped recipient are the most typical vessels of the earliest period of Viminacium's necropolises. There are several types of bowls and goblets made of highly refined clay and decorated with barbotine patterns (Drawings 4, 5 and 6). One of them is an ovoid goblet with a slanting, ribbed rim and a ring-shaped profile at the base. They were made of medium-refined red fired clay, with the outer surface painted in red tones. The decoration is made with barbotine and a pounce wheel. Then, there are goblets with a thin walled spherical bowl, and a slanting, short stem, made of highly refined white fired clay. Such goblets are decorated by either faceting or barbotine (Drawing 7). The ornamentation can appear in the form of stylised leaves. Although they are a local product, the influence of Pannonian products is noticeable.[3] The appearance of three jugs in cremation burials is registered as early as with Domitian's coins. This custom of depositing three vessels of the same shape was retained in later

1 Vojvoda, Mrđić 2015, 19.

2 Bjelajac, 1990, 134.

3 Brukner 1981, 36.

Fig. 2. Example of three jugs in the grave

periods, too, throughout the 2nd and 3rd centuries (Fig. 2). Tombs with two ceramic pitchers and one ceramic or glass balsamarium have also been registered; over time, glass grave goods began to exceed the ceramic ones in quantity. Biconical pots with a narrow neck and a short, horizontally flared rim, made of grey fired medium-refined clay and with an untreated outer surface have been discovered in cremation burials together with Trajan's coins. In the necropolises, the 1st century is primarily characterised by fragments of amphorae. These are forms with a bell-shaped mouth, classified as Western Mediterranean amphorae (Dressel 6B). The rim fragment with an OFF DAS stamp and a *hedera* motif (G1-151 Više grobalja), which has frequent analogies in Pannonia, belongs to this type.[4]

During Hadrian's reign, in the course of his travels from Syria to the Danubian regions, in 117, Viminacium gained the status of a municipium with the official title *Municipium Aelia Viminacium*, it became a legal municipality of Roman citizens, and there are several different ceramic forms from that period in its necropolises. The form of bowls appears at that time, and lasts not only during the entire 2nd century, but also until the middle of the 3rd century, while some even last until the middle of the 4th century, with only slight changes in the basic form. In

4 Bjelajac 1996, 18.

terms of the various types of pottery, there are bowls made of refined clay after the model of the imported *terra sigillata*, primarily the forms Drag. 24/25 and Drag. 25 (Drawing 8), dated to the end of the 1st and the first half of the 2nd century, as well as the most frequent one, Drag. 37 (Drawing 9). Smaller, thin walled bowls without an accentuated rim and with a calotte-shaped "belly" ending in a base which can be flat or ring-profiled also appear around the beginning of the 2nd century. Such bowls were made of medium-refined red or grey fired clay, while their outer surface was painted in hues ranging from brownish red to grey and black. They were often polished and varnished. These vessels are very durable, so they can even be found around the beginning of the 4th century, and similar bowls (Drawing 10), only with an inverted rim, appear from the end of the 2nd until the middle of the 3rd century (Drawings 11 and 12). Among the calotte-shaped bowls, there is also a type with a vertically profiled rim on a narrow foot. They also appear from the first half of the 2nd century. From south Gaulish workshops, among the calotte-shaped vessels, here appear those with an arched, flared rim, made after the model of Drag. 35. Although this form appears in the import workshops as early as in the 1st century, in Viminacium it has been found in the layers from the beginning of the 2nd until the middle of the 3rd century. These bowls have a barbotine decoration on the rim, and vegetal ornamentation- motifs of vine, lilies or heart-shaped leaves. The inside of these vessels is occasionally decorated with a series of incisions made with a pounce wheel, while the base can be decorated with stamped leaves, placed facing one another. Specimens made by the local craftsmen, but after the model of the imported thin walled bowls with a narrow base, have been discovered in cremation burials. They are dated to the first half of the 2nd century (Drawing 13). The volume of these small bowls rarely exceeds 200 ml. The imported vessels predominantly come from South Gaul (Drawing 14) (Peć C-7603, G1-690). Certainly, the most common and long-lasting form of bowls in both cremation and inhumation burials is that with a biconical recipient which has an accentuated plastic strip on the juncture of the belly. They are made of the same type of clay as the other vessels of this period (Drawing 15). Besides these, tableware is also represented by the larger calotte-shaped bowls with a thickened rim made of medium refined red fired clay. One of the most frequent forms of tableware pots from the second period of production is the two- or three-handled example with a horizontal rim, cylindrical stem and a spherical belly placed on a

ring-shaped heel (Drawing 16). Such pots appear in all dimensions and with diverse decoration: painting, faceting, incision, while certain specimens with snake representations appear within a cult.[5] Their common characteristic is that they are made of medium-refined red fired clay, and their outer surface is painted in red tones, the paint being more or less durable. In tiered tombs from the beginning of the 2nd century there also occur goblets with exceptionally thin walls, an unaccentuated, slightly slanting rim and a biconical recipient. Such vessels are made of highly refined white or grey fired clay, and their outer surface is polished. They are a local product (Drawing 17). The conical shapes of goblets appear in specimens made of sandy clay, fired grey, and with an untreated outer surface. Their rim is made in the form of a strip, with a groove on the inside (Drawing 18). In this period, there also appear biconical and spherical goblets with a grooved rim and two handles on a narrow ring-shaped foot. They are mostly fired red and painted in tones of the same colour. Among the spherical specimens, there are also those that are painted in grey tones (Drawings 19 and 20). Pottery used for cooking is mostly represented by pots of the La Tène form, with arched rims. They are made of medium-refined or sandy clay and fired grey. Of the same fabric, there also appear deep bowls of various profilation types with a grooved rim, highly placed belly and short foot with a narrow base (Fig. 3). They appear from the first half of the 2nd century (in Kod Bresta necropolis) until the first half of the 3rd century (in Pećine necropolis) (Drawing 21). In this period, there are forms made without the use of a potter's wheel, handcrafted pots with a slightly flared rim, curved belly walls and a flat base. Their fabric shows traces of sea shells and snail shells, and they are fired brown to greyish-brown. Their outer surface is occasionally decorated with fan-shaped ornament or punched decoration. Such forms show certain traces of the Dacian tradition, although they are a local product from the beginning of the 2nd century (Drawing 22). In tombs that contain coins spanning across a century, there also appear goblets made of medium-refined clay, mostly fired red and painted in the same tones. These spherical goblets with one handle, an intensely or slightly flared rim and an accentuated, flat or narrow base, appear from the third decade of the 2nd until after the middle of the 3rd century (Drawing 23).

Censers, as a specific ceramic form, are a local product. They are characterised by a tall, hollow foot, most often with a calotte-shaped or, in rare cases, conical

5 Jovičić, Bogdanović 2017, 36.

3. Hearth baked forms of pottery cooking ware

recipient and intricate ornamentation, with strips or incisions arranged in various patterns, and they are engobe coated. They have been found in both cremation and inhumation burials and, recently, their number has increased with a discovery in the settlement layers (Drawing 24). Since the first half of the 2nd century, there also began to appear "S"- profiled bowls with a polished grey surface (Drawing 25). Curiously, they appear only in cremation burials. From the middle of the 2nd century, numerous forms made of the so-called "kaolin" clay, yellow-whitish specimens of bowls, pots and pitchers, appear in large numbers as grave goods. Kaolin was predominantly used for making pots with a grooved, everted rim, a rib-profiled belly and a narrow, flat base with an accentuated edge and one or two short, wide strip-shaped handles beginning from under the edge of the base. Such pots are the most frequent grave goods in cremation burials and, most often, they functioned as urns. There are two phases of these vessels, where the specimens with an indented base belong to the older one (Drawing 26). These pots appear in the necropolises of Viminacium until the end of the 3rd century. In tombs dated to the beginning of the 2nd century, among the vessels which functioned as urns, there are also forms

with a horizontally shaped rim, slightly curved around the ends, an accentuated short neck and an elongated belly ending in a flat, unaccentuated base (Drawing 27). A calotte-shaped bowl made of *terra sigillat*a, type Drag. 41 (Drawing 28) (VG, C-5897, G-942), and decorated with vertical incisions which create a vegetal, vine ornament, belongs to the second half of the 2nd century. This is evidently an imported specimen, which is a very rare find in graves. Among the imported material from the last third of the 2nd century there are also conical bowls with a ring-profiled rim and a slanting foot, types Drag. 18/31 and Drag. 31. Very often, they have craftsmen's signatures on the inside. The vessels which also appear with a signature stamp are smaller conical bowls of type Drag. 33 (Drawing 29), which confirms that goods were also imported from middle Gaulish workshops, Lezoux (VG, G -1018, C-6311).[6] Such bowls have also been discovered in the local production, and the circumstances of the finds moved the period of their appearance to the beginning of the 2nd century. A form with craftsmen's signatures, Drag. 32, is also present, and comes from three workshops- Rheinzabern, Lezoux and Westendorf.[7] In inhumation burials, the second half of the 2nd century is represented by locally produced shallow, calotte-shaped bowls with an unprofiled edge of a flat base. They are made of clay common in this period (Drawing 30). The most frequent forms of plates in inhumation burials are the forms with a flared rim and profiled walls which slant down to a ring-shape profiled base. They are made of medium-refined clay and painted in red tones. Their surface is often polished (Drawing 31). The diameter of these plates ranges from 17 to 35 cm. Plates made after the model of form Drag. 32 (Drawing 32) with an unprofiled, slightly inverted rim and slanting walls of the belly on a narrow, ring-shaped base, also belong to the same chronological framework. The most frequent grave goods are certainly one-handled pitchers, with a conically profiled grooved rim, narrow neck and spherical belly. They are made of medium-refined clay, fired red, with the outer surface painted in red tones, and the colour often wipes off (Drawing 33). Besides this type of pitchers, the ones frequently of the same fabric are the two-handled forms, with a grooved rim, a strip-like profilation of the outer edge, biconical or ovoid belly on a ring-profiled foot (Drawing 34). In the south-eastern necropolises of Viminacium, three pitchers commonly appear within the one-handled type

6 The stamp of the craftsman CRACVNA˚F published in Bjeljac 1990, 133,134.

7 Bjelajac 1990, 132 and 134.

of smaller dimensions, with a ring-profiled rim, short neck and spherical belly on a ring-profiled foot. They are made of medium-refined red fired clay, with the outer surface painted in the same tones (Drawing 35). Pitchers with one handle and a strip-profiled outer edge of the rim, a long, narrow neck, spherical belly and a ring-profiled foot (Drawing 36) are also frequent in this same necropolis. The type of pitcher with one handle and a wide mouth with three spouts, conical neck and spherical belly (Drawing 37) is also frequent.

During the reign of Septimius Severus and his dynasty, Viminacium went through a phase of a flourishing economy, and most of the ceramic material discovered in the graves comes from this period. Besides the standard ceramic forms, there also appear some unusual ones. A time-measuring vessel – a clepsydra (G1-15, C-656, the site of Kod Bresta), mould-made and decorated with a frieze of running wild boars, is an exceptionally interesting find. The entire vessel is coated with a yellowish-green glaze. On the base of the vessel, there are seven round perforations, forming a grid for drainage. On the upper part of the handle, there is a small round opening.[8] Such types of vessels appear very rarely, while in the graves in the necropolises of Viminacium this is a unique specimen, classified as a local product by the technique of decoration. A small three-handled pot (G-51, C-786 lok. Kod Bresta) was decorated using the same technique of glazing, but the colour of its glaze is olive-green. Such specimens with strip-shaped, fluted handles and a grooved neck decorated with two plastic ribs and without glaze predominantly appear with two handles, although there are also specimens with three handles. Tableware is primarily represented by "S"- profiled bowls with slanting, flared rims, an accentuated shoulder and a ring-profiled base. Goblets with an unprofiled rim and slanting walls of the bowl on a narrow ring-profiled foot belong to the most frequent grave goods. They appear in Viminacium from the end of the 2nd century until the first half of the 3rd century, while the earliest ones have been discovered with Nero's coins at other sites (Drawing 38). Conical goblets with an unprofiled rim and a ring-shaped foot, made after the model of the Drag. 64 form, appear in both inhumation and cremation burials. In cremation burials, they are dated to the second half of the 2nd century, while those discovered with skeletal remains are dated to the end of the 2nd and the beginning of the 3rd century (Drawing 39). Plates which appear in inhumation burials together with the coins

8 Spasić 2015, 48.

of Septimius Severus are the forms of shallow plates with an unprofiled rim, slanting walls of the recipient and a ring-shaped foot. They have a groove on the inside of the rim. These plates are made of medium-refined clay fired red or grey, and painted in red or grey tones, while their surface can be glazed or varnished (Drawing 40). During the 3rd century, ovoid goblets with a grooved rim and flat base also appear in the graves. They are made of medium-refined clay fired red or grey. They are equally frequent in both inhumation and cremation burials (Drawing 41). Cooking vessels are present in the graves in the forms of biconical pots with a strip-profiled rim with a flat edge, grooved on the inside (Drawing 42). The strip-like handle begins from under the edge. Besides these, pots with a spherical belly with a ring-profiled rim, grooved on the inside, are also frequent (Drawing 43).

Under the rule of Gordian III, Viminacium gained the status of a colony. With the arrival of the veterans, there occurred mixed influences. The fifth decade of the 3rd century in the necropolises of Viminacium is represented by numerous finds of all forms of vessels. The most frequent forms of bowls are the calotte-shaped ones, with different profilation of the rim (Drawing 44). In a grave with a cremated decedent and Gordian's coins, a calotte-shaped bowl with a plain rim and base was discovered; it is made of medium-refined clay fired grey, and its outer surface is untreated (VG G1-1375, C-9370). The most common forms of plates are the Pompeian types of various dimensions, and there also appear specimens of simpler forms, with slightly inverted rim edges, slanting belly walls and a flat base, as well as those made after the model of luxurious forms, with a flared or arched rim, slanting belly and ring-shaped foot. Occasionally, such plates have a painted and also varnished surface, and the decoration sometimes occurs in the form of stamped ornament, most often stylised leaf motifs or *planta pedis.* These forms remained in use for a long period of time. Cooking pots are the most frequent grave goods in the graves from this period, functioning as urns. These are the forms with a horizontally flared rim grooved on the inside, which goes down to the highly placed belly and a flat base. They are made of medium-refined clay fired grey or brownish-grey, and their outer surface is untreated. Occasionally, the upper part of the belly is decorated with grooves. Their volume ranges from 1,700 to 3,800 ml (Drawing 45).

In the 3rd century, the techniques typical of the Early Imperial period still occurred, but were of considerably poorer workmanship. The number of vessels made of sandy clay increased, and eventually, this type of fabric became predom-

inant in the 4th century. The La Tène forms of biconical bowls, as well as the variants of bowls produced in the sophisticated techniques of the Early Imperial period survive, even in this kind of fabric. Numerous vessels with a glazed surface appeared as a novelty in the 4th century (Fig. 4). The surface treated with olive-green, green-yellowish or brown glaze is most frequent in bowls and pitchers, although it appears in other forms, too. They are local products. The impoverished repertoire of forms in the second half of the 3rd century is also noticeable in the settlement layers. The increasing usage of glass vessels could be one of the reasons for that.

In the earliest graves in Viminacium's necropolises, there are coins of Constantius Chlorus, Constantius II, Valentinian I, Valens, Gratian, Valentinian II and Theodosius I. Grey sandy fabric, more or less finely grained and with a rough outer surface is predominant in this period. Red and brown vessels, fired to lighter or darker tones, were produced of medium-refined clay or fine-grained sandy clay. Forms of cooking pots appear in this fabric most frequently. A small, spherical pot with a slanting, flared rim and narrow, accentuated flat base, which was discovered in the necropolis of Pirivoj, in an inhumation burial with coins dated to 324- 330, is like this. Forms of smaller biconical pots with a slanting rim, whose edge is triangle-profiled, with a narrow, flat base, have been registered at the same necropolis (Drawing 46). Glazed pot specimens appear as biconical forms with a short, grooved rim and a flat base (Drawing 47). One-handled glazed goblets with a slanting rim also appear in this same shape, only their dimensions are smaller. They have a flat base and ribbed belly (Drawing 48). A glazed goblet with two strip-like handles which exceed the edge of the rim in height was registered in the eastern necropolis of Viminacium (Drawing 49). The second half of the 4th century is represented by the calotte-shaped bowls with a flat, unaccentuated or slightly accentuated base, found in inhumation burials (Pirivoj C-650, G-217). The horizontally shaped rim is decorated by grooving or punching. The outer, sand-like surface of these bowls most often has an olive-green glaze (Drawing 50). They are not common as grave goods, since they are far more numerous in the settlement layers of Viminacium.

Viminacium, as the capital of Upper Moesia, occupied an area at the crossroads of essential communications of the ancient world with its geographical position. This led not only to the development of trade, but also to the fusion of ethnic structures in its very centre. What resulted from this can be seen in the

Fig. 4. An example of a glazed bowl

variations of grave goods discovered within the Viminacium necropolises, which were in use for more than four centuries, thus suggesting connections to all parts of the Empire (Fig. 5).

The material of the 1st century, from the Flavian period, points to the presence of the army and the migration of the Italic peoples. In the 2nd century, local workshops for ceramic production were strengthened, and imports arrived from the workshops of Rheinzabern and Westendorf. All decorating techniques that would suggest high product quality were used. In the 3rd century, the influence of the Danube trade with the Black Sea coast was great. From the 4th century, ceramic production was largely subordinate to the needs of the army, and the quality of the products was in sharp decline.

By analysing the grave goods, it was determined that there were numerous jugs, pots and bowls, but the largest number of typological variants was linked with bowls. Variations in grave goods can differ not only in the type of burial (cremation/inhumation), but deviations in the number of ceramic items in the graves can also be visible within the necropolises.

This paper presents a review of the most frequent forms of ceramic vessels which appear in inhumation and cremation burials in Viminacium. The largest portion of the grave goods was produced locally, which once again highlights the

Fig. 5. Forms of the most common pottery vessels as grave goods

importance of their production centre discovered within the southern necropolises. The innovative spirit of the craftsmen is remarkable, as is the wide variety of raw materials that were available to them.

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English language editing Dave Calcutt

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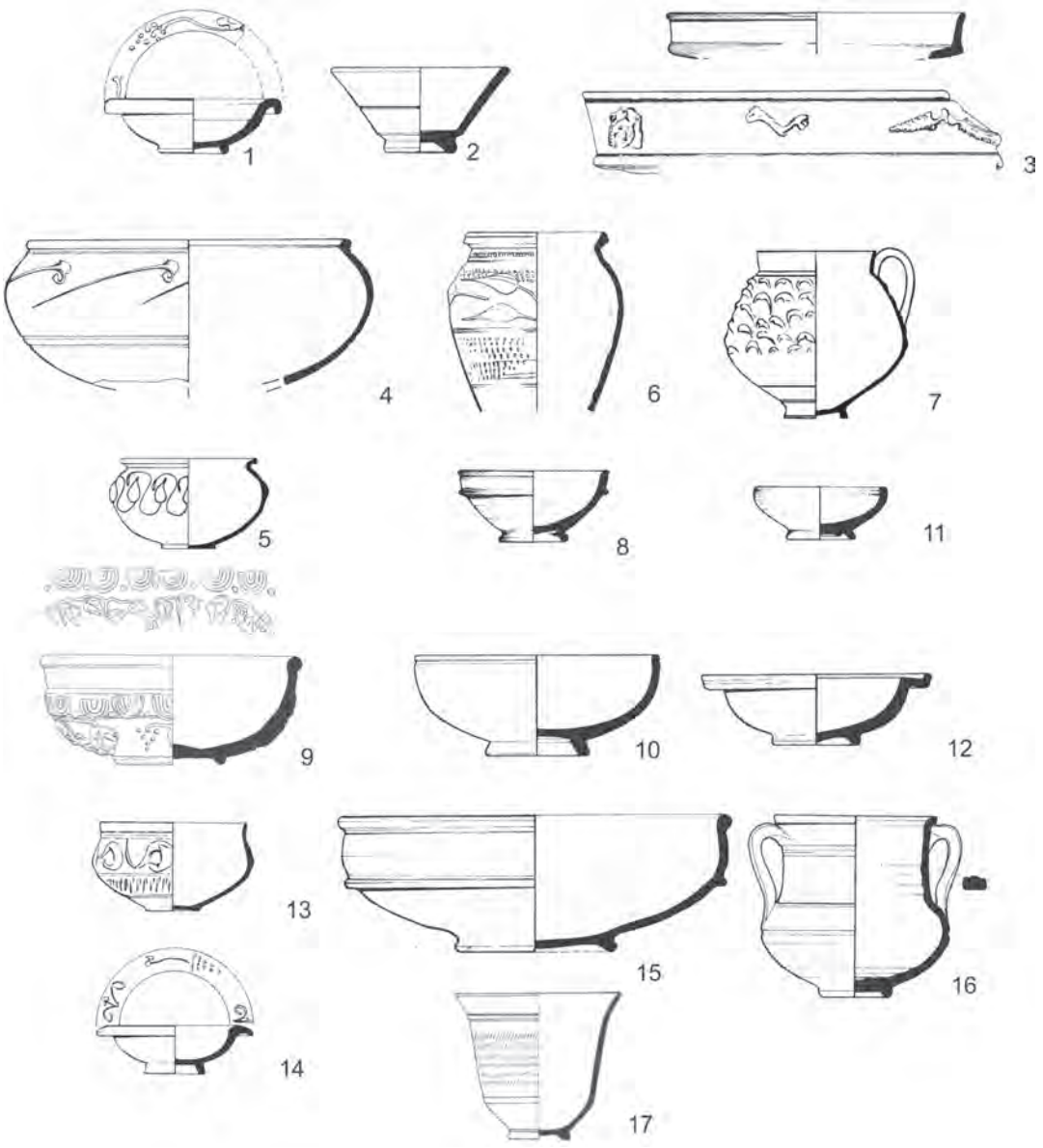

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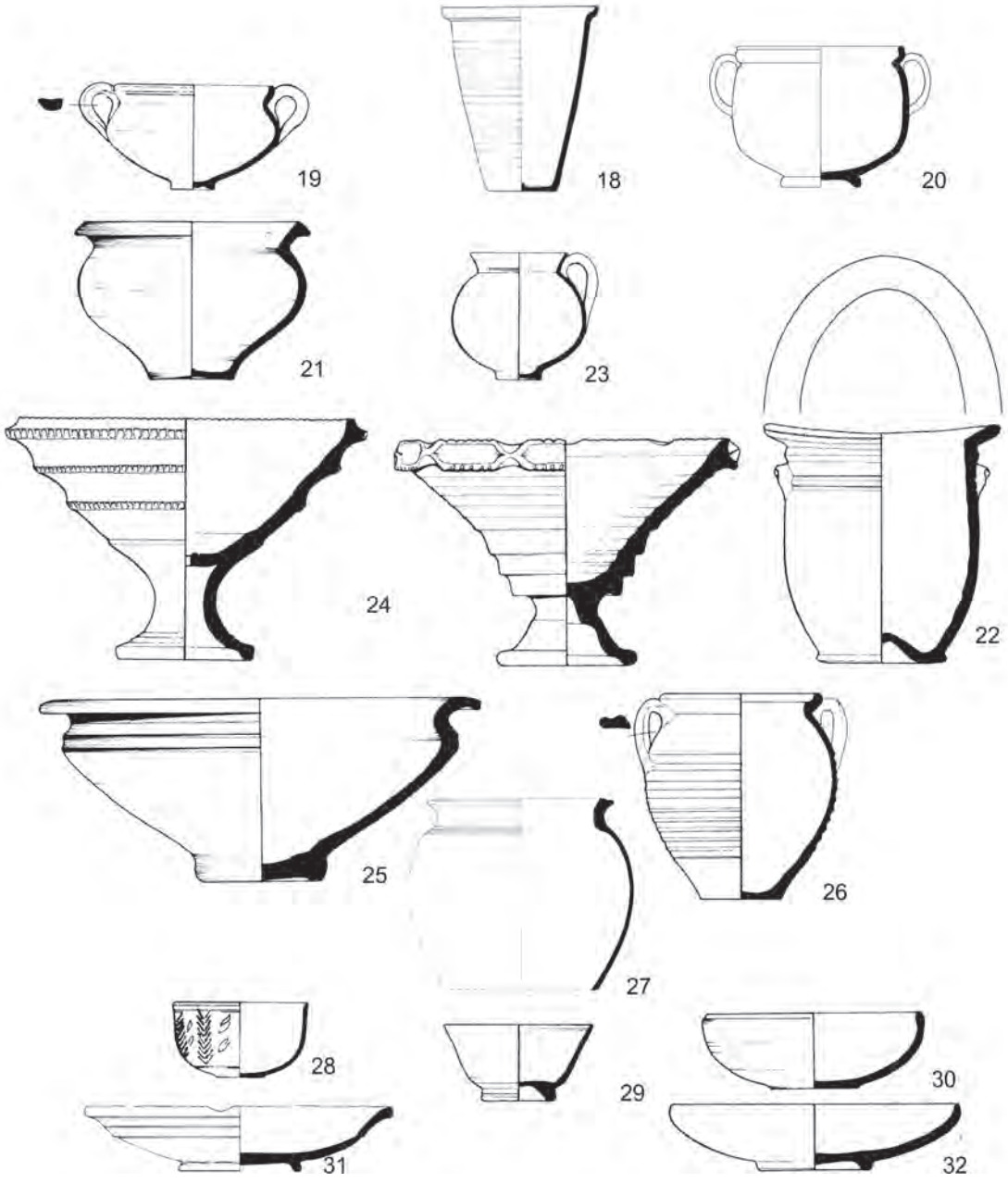

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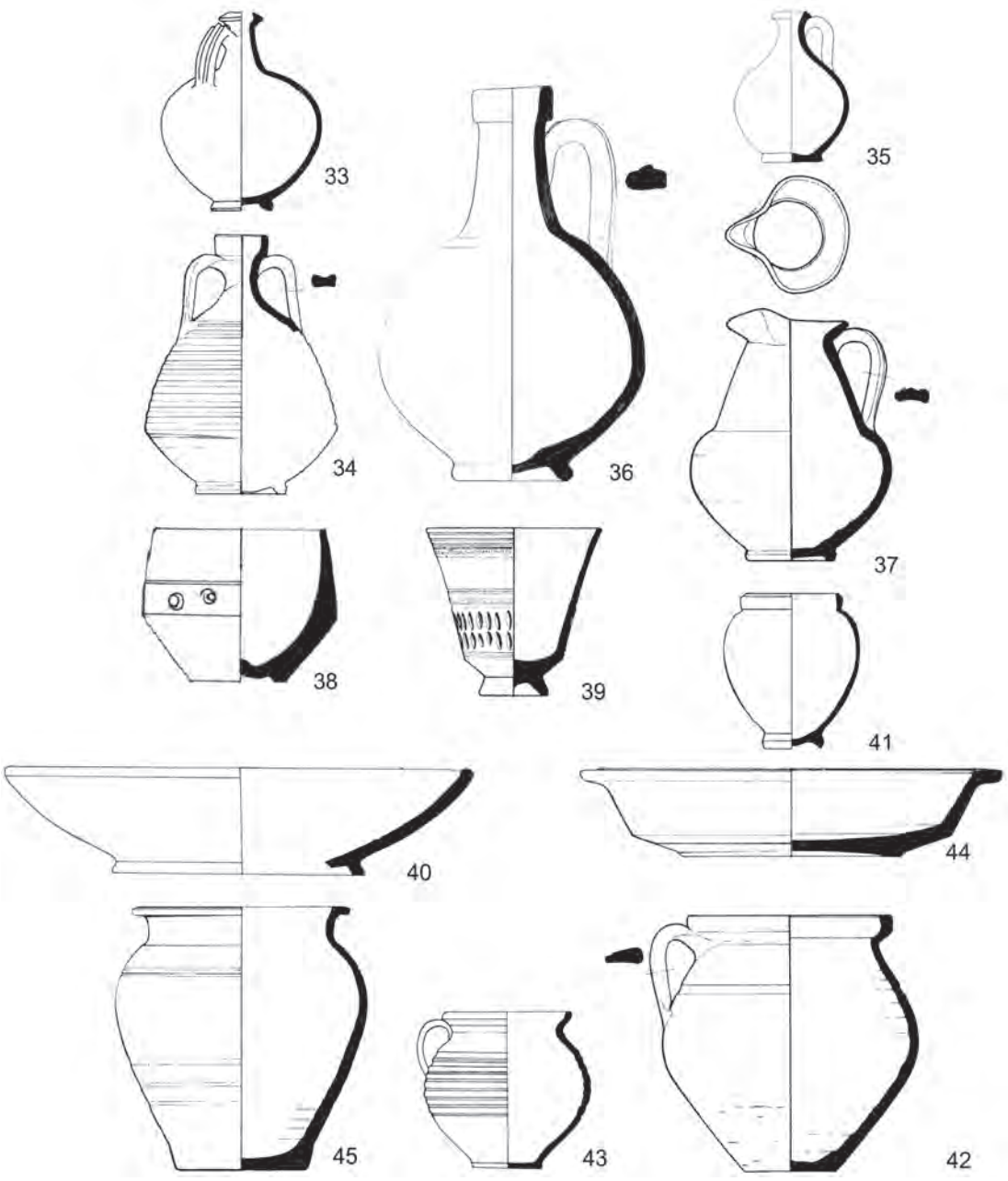

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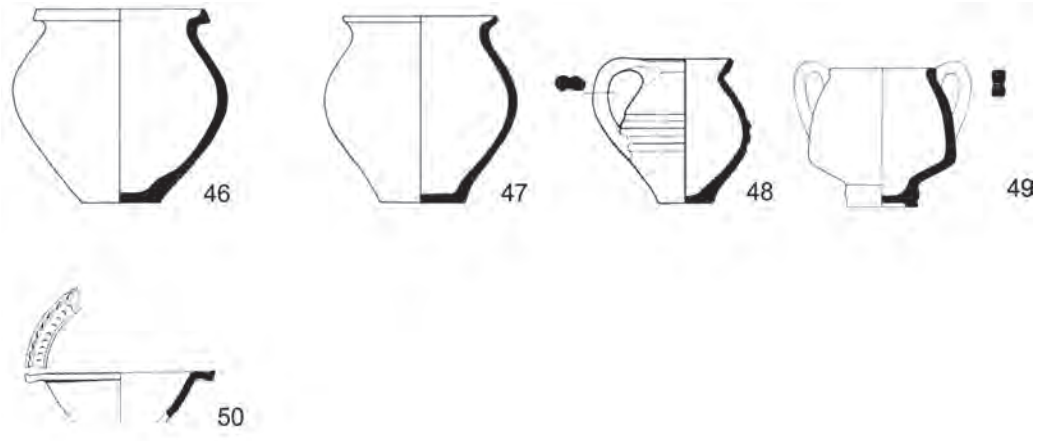

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PAINTED DECORATION FROM A VIMINACIUM TOMB*

DRAGANA ROGIĆ, *Institute of Archaeology Belgrade*
E-mail: rogic.dragana@gmail.com

ABSTRACT

This paper addresses the technological and iconographic aspects of the wall painting of tomb 3130. The tomb differs from most tombs with preserved wall painting in Viminacium by its vaulted architectural construction. During the conservation of the wall painting in 2017, significant technological and iconographic conclusions were reached. An attempt was made to identify the stone panels of the lateral sides and the motifs on the frontal sides of the tomb by iconographic interpretation.

Key words: Wall painting, technology, mortar, pigments, stone panels, conglomerate, Numidian marble, edXRF, peacock

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INTRODUCTION

Most of the discovered examples of Roman wall painting from funerary monuments in modern day Serbia come from the area of Viminacium.[1] The wall painting of tombs G-3130, G-5464, G-5 and G-5868 are exhibited at the archaeological site of Viminacium itself, in Domus Scientiarium. "The tomb with cupids" - G-160, was conserved and exhibited in situ, at the site of Pirivoj in Viminacium. Frescoes from two Viminacium tombs, G-5517 and G-2624, are exhibited in the National Museum in Požarevac.

Tomb 3130 was discovered during archaeological research in 1983 (Fig. 1). According to the archaeological data, it was dated to the second half of the 4th century. The tomb was constructed using horizontal brickwork bound by lime mortar, and with a rectangular base. The outer dimensions of the grave are 260 x 205 x 80 cm, the wall thickness is 30 cm. The inner depth is 75.08 cm. The floor is not preserved, but it had a brick covering. On the preserved upper wall gradient the beginning of wedge-shaped mortar joints indicates that there existed a barrel vault. The tomb was oriented west-east, with a deviation of 12° towards the south in the western part but was, for the most part, destroyed in a looting. No artefacts were found and the skeleton was not preserved.[2]

This grave is very specific because of its vaulted architectural construction. Of the six tombs with preserved wall painting, three have a trapezoidal cross-section. According to the data from 2007, of 29 graves and tombs, 17 have a trapezoidal cross-section, 6 have a barrel vault, 3 have a rectangular cross-section and 3 have a cross vault.[3]

Two sides of this grave (west lateral and south frontal) were discovered and conserved by the experts of the Republic Institute for the Protection of Cultural Heritage, in Belgrade, from 1983 to 2009. These two units are displayed in the Domus Scientiarum Viminacium, while the north and east side were conserved in 2017.

1 Also, a large number of examples of wall painting from various buildings: thermae, amphitheatres, villas, basilicas etc, was discovered in Viminacium during archaeological research, in: Rogić 2017, 153 – 157; Nikolić et. al. 2017, 62 – 70; Rogić 2014, 507-512.

2 Documentation of the Institute of Archaeology.

3 Korać 2007, 29; Kitanov 2017, 98-99.

Fig. 1. Photographs of tomb 3130, from the archaeological research in 1983.

Fig.2. The back of the wall painting before the works, showing the overhang of the wall painting on the edge of the support.

During conservation works in 1983, the wall painting from the frontal (north) side of the tomb was removed together with the bricks - that is, a part of the wall. The conservation works on this wall painting in 2017 began with the removal of bricks from the back of the wall painting. The brick layer was removed by chisels and a grinder. The plaster surface was very loose, since the lime had almost completely lost its binding power, for which reason a gradual consolidation was carried out, and the lacunas were consolidated with a new material. The first step to follow the consolidation was the levelling of the plaster, i.e. making it thinner by removing the majority of the arriccio (a coarser layer of plaster).

The narrower, lateral edges of the wall painting were bent so that the painting assumed the dimensions of a temporary support, a plank, rather than its original dimensions (Fig. 2). The hanging edge was later straightened, allowing the actual dimensions of the painting to be determined. New plaster was applied to the back of the wall painting, which further consolidated and fortified the unit. Then, a reinforced polyester support was constructed. Although aluminium honeycomb panels have been used as supports for years in the conservation atelier in Viminacium, it was decided to use the polyester type of support this time, so as to cohere the conservation methodologies applied on the two sides of the tomb, conserved by the experts of IPCH.[4] The reinforced polyester supports are lightweight

4 Institute for the Protection of Cultural Heritage (of Serbia).

and thin and paintings conserved this way can be hung on a wall. Any other type of presentation, such as the one discovered in situ (in the object's walls), would require a huge space for display,[5] which would currently be impossible since a large collection of conserved wall paintings already exists in Viminacium.

When the support was dry, the unit was turned face up and its original panels and, afterwards, the facing, too, were removed. The painted part was covered with a thick layer of dirt and salt. It was cleaned both chemically and mechanically. The best effect was obtained by using the Mixture AB 57[6] then, after neutralisation, the softened dirt layers were removed using scalpels. The red painted areas were considerably worn. The consolidation of the painted layer was carried out using 3% Paraloid B-72 in acetone. The old putty fillings were removed, after which the filling of the damaged areas was carried out, and then boarding and decorative plaster was added. The decorative plaster was made in the same way as that used by the experts of IPCH, with grey sifted sand used as the aggregate. The grey colour of the decorative plaster is neutral and makes the painted content more prominent. The dimensions of the north conserved unit are 68 x 147 cm.

The back of the plaster on the lateral (east) side of the tomb was levelled in the conservation campaign of 2009, under the direction of M.A. Miroslav Stanojlović,[7] on which occasion the consolidation of the back, together with the plaster layers, was also carried out. During the project in 2017, a polyester "support" was cast (as in the case of the north side). All the other conservation procedures were carried out in an identical way to the front of the tomb. The dimensions of the conserved lateral side are 79.5 x 204 cm.[8]

5 Станојловић 1997, 59-60.

6 Mora, Mora, Philippot 1984, 342.

7 Conservator from IPCH.

8 The conservation and restauration were carried out by: Sanja Blagojević, Mihajlo Mandrapa, Kristina Ponjavić and Dragana Rogić. The works on the conservation and restauration lasted for two months.

Fig. 3. The plaster on the wall painting of tomb 3130.

TECHNOLOGICAL CHARACTERISTICS OF PLASTER AND PIGMENTS

The plaster of this tomb's wall painting has two layers. The arriccio is composed of slaked lime and fine sand, about 2-3cm thick while the intonaco contains a high percentage of ground brick (of very fine granulation), the thickness of this layer being 0.5 to 1 cm. This was covered with a thin layer of whitewash, onto which the painting was applied using the fresco technique. Intonaco with brick powder filler and whitewash was also identified on the wall painting of tombs 5517,[9] 2624 and 5464 (Fig. 3).

The pigments of the wall painting were processed using the pEDXRF[10] (portable energy dispersive X-ray fluorescence) analytical technique. This analytical technique was chosen because it is non destructive and is especially suitable for work with archaeological artefacts.[11] The elemental composition of all the inorganic materials is obtained using this type of analysis. Its important characteristic is the possibility for it to be applied outside the laboratory, i.e. directly on archaeological sites, in museums, on cultural heritage artefacts, etc.[12] The pigments of the

9 Станојловић 1992, 57.

10 Portable EDXRF spectrometer, used for the analyses shown in this paper, was developed in the Laboratory for Chemical Dynamics and Permanent Education (060), at the Vinča Institute in Belgrade.

11 Desnica 2012, 187-196.

12 Gajić-Kvaščev et al. 2012, 1025-1033.

Fig.4. A detail of the analytical process of identifying the green pigment, carried out by applying the pEDXRF technique

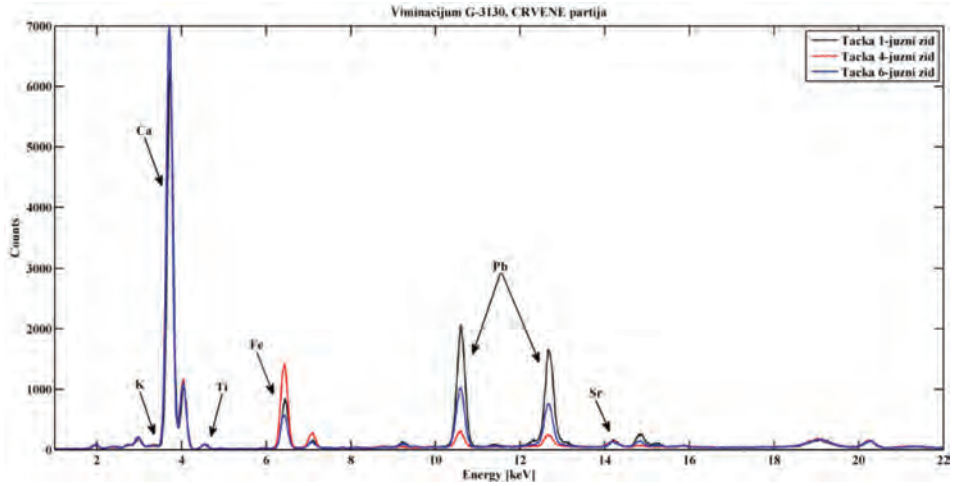

Fig. 5. Comparative spectrums scanned on the red areas of the painted layer of the frescoes from tomb G-3130

wall painting of tomb 3130 were analysed in the *Domus Scientiarum Viminacium* (Fig. 4). The painted layer of the west side of the wall painting was analysed in eight spots, while the painted layer of the south side was analysed in six spots.

Tables 1 and 2 show the results of these measurements: the detected elemental composition in the examined spots and, based to that, the identified pigments.[13]

13 I.e. the predominant elements, those present in a moderate percentage, and those present in trace

The palette of the pigments used for painting the frescoes from the tomb is limited to the usage of earth tones: green earth, red and yellow ochre. On certain red areas of the painted layer on the fresco of the south wall an intense peak of lead was detected. By the hue of the examined area, the use of lead oxide (Fig. 5), which was probably mixed with red ochre, can also be presumed. The applied analytical technique cannot yield the data that would make precise identification of the pigment used on the black areas of the painted layer possible.[14]

The results of the qualitative EDXRF analysis:

Table 1. Elemental composition of pigments, G-3130

Spot of analysis	**Colour of the analysed spot**	**Detected chemical elements**	**Identified pigment(s)**
1	Ochre	Ca, Fe, Sr	Yellow ochre
2	Red	Ca, Fe, Sr, K, Hg, Pb, Ti, Mn	Red ochre
3	Green	Ca, Fe, Sr, K, Ti, Mn	Green earth
4	Ochre	Ca, Fe, Sr	Yellow ochre
5	Ochre	Ca, Fe, Sr	Yellow ochre
6	Brown	Ca, Fe, Sr, Mn, Ti,	Red ochre
7	Black	Ca, Fe, Sr, K	Precise identification is not possible using the applied technique
8	Ochre	Ca, Fe, Sr	Yellow ochre

amounts only.

14 I would like to thank Dr Maja Gajić-Kvaščev and Velibor Andrić, experts at the Vinča Institute of Nuclear Sciences (Laboratory for Chemical Dynamics and Permanent Education (060) Dept. of Chemical Dynamics) for the scanning and identification of the pigments.

Table 2. Elemental composition of pigments, G-3130

Spot of analysis	Colour of the analysed spot	Detected chemical elements	Identified pigment(s)
1	Red	Ca, Pb, Fe, Sr, Ti, K	Red ochre, Red lead-minium
2	Green	Ca, Fe, Sr, K, Ti	Green earth
3	Green	Ca, Fe, Sr	Green earth
4	Red	Ca, Fe, Pb, Sr, Ti	Red ochre, Red lead-minium
5	Red	Ca, Fe, Sr, K, Ti	Red ochre
6	Red	Ca, Pb, Fe, Sr, Ti	Red ochre, Red lead-minium

ICONOGRAPHIC ANALYSIS

The wall painting was preserved only in the lower zone of tomb 3130; since the tomb was vaulted, there probably existed some kind of painted ceiling decoration as well.

Completely symmetrical iconographic patterns (Fig. 6) are visible on the remains of the wall painting of the lateral walls (west and east) of tomb 3130. Two identical quadrilateral fields with panels are presented. The background of the wall painting is white and while, in one field, diagonal orange stripes were painted (on the left side), in the other they are green and blue (on the right). Over them, in the form of a drawing, there are brown ellipsoids and circles. The larger ellipsoids are inclined to the left, while the smaller ones and small circles fill in the space around them. The ellipsoids are painted very precisely, with a thin brush and in brown paint, evidently by an expert painter. The frames are also precise, as if for that purpose a ruler was used. A quadrilateral frame was rendered as a thick black line, then another, smaller and thinner one, was drawn, its outer edges connected to the inner edges of the larger one by diagonal black lines. These frames seem to

imitate the slanted and treated stone edges. The frames with ellipsoids are bordered by an ochre area, while a red vertical border in the middle of the painting divides it into the right and left side. The painting also has a red horizontal border, about 40 cm from the lower edge of the wall painting. Both the red and the ochre border are 10 to 15 cm wide.

It is very difficult to determine what kind of panels were actually simulated here; panels of this kind are commonly referred to as marble panels in bibliography, but geologists and petrologists would not consider this terminology correct. Marble, as one of the most durable and luxurious materials, was widely used as a wall covering, for entire walls (in the Hellenistic period) or just for the lower wall zones in Late Antiquity. This material, besides being exceptionally decorative, also served as an insulation material and was easy to maintain.

Pliny notes that marble is cut with sand and a saw, so that the saw pushes the sand and disperses it. The luxurious marble interiors and the exploitation of marble were considered useless, decadent and pretentious by Pliny, because of the difficulties with its transportation from the remote parts of the Empire and the disruption of the balance of nature. After the defeat of Egypt in the thirties BC, the Romans "discovered" a whole new spectrum of polychromatic marbles. Marble was imported from Egypt, as well as from Attica, Euboea, Chios, Phrygia, Teos, Paros, Scyros and Numidia. The choice of marble did not only convey an economic and exotic message, it also revealed information about the political situation and the territory which became Roman, whereby different kinds of marble were called: Phrygian, Sidonian, Numidian, etc. In the Augustan Age, every respectable monument or tomb had marble panels.

Although marble covered walls looked magnificent, the look of different types of marble was often mimicked in painting throughout the Empire. The reason for this lies not only in its precious nature, but also in the fact that it was very difficult to obtain marble from remote parts of the Empire.

As the most popular motif, marble was mimicked everywhere in temples, basilicas, villas, porticos, public baths etc. Certain patterns were vividly coloured, imitating the exotic stone. Sometimes these imitations even had a three-dimensional effect, where engraved and cut stone was mimicked. The imitation of marble and stone is very frequent in the lower zones of funerary

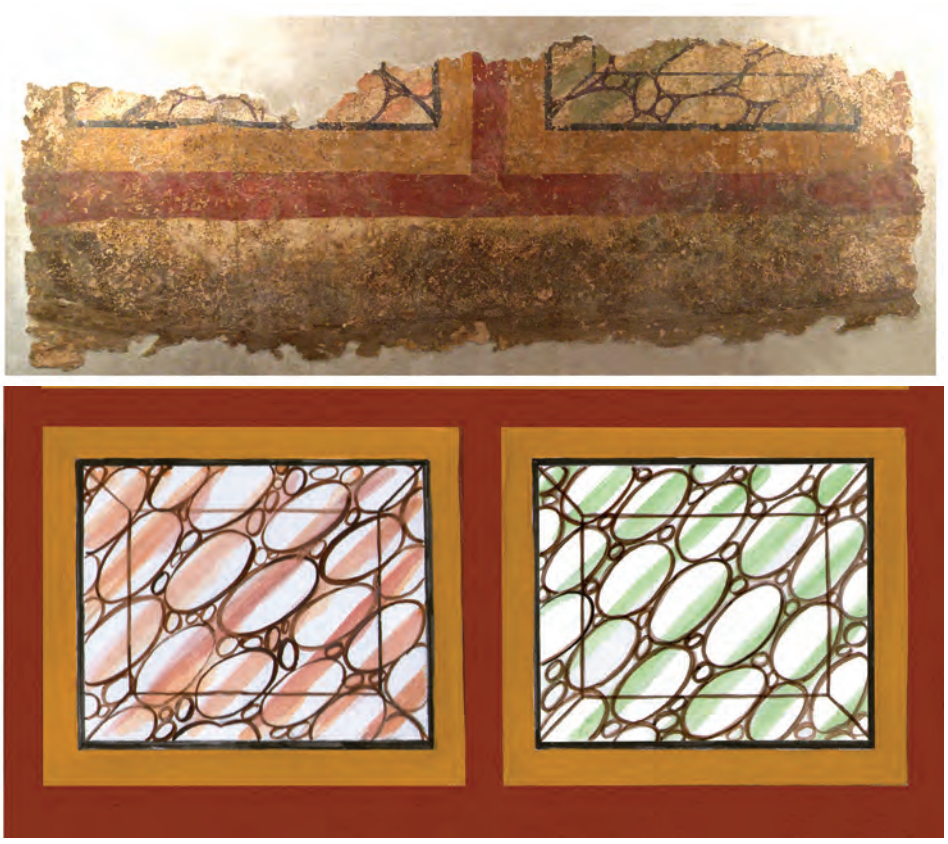

Fig. 6.
a. The lower zone of G-3130, the east side (the original wall painting)
b. A reconstruction of stone panels from tomb 3130, painted by D. Rogić

painting in Late Antiquity. These imitations are simplified and schematised and often cannot compare with the more realistic works from the earlier periods.

Searching for analogies in petrology, it was premised that the panels of some types of sedimentary rocks, such as conglomerates and breccia, were depicted on the painted surfaces of tomb 3130. Conglomerates (Latin *Conglomerare* – accumulate, Fig. 7) are made of round rock segments. These ellipsoid and round shapes are actually pebbles and can occur in a uniform or random pattern. The round shapes are connected by an adhesive, that is, the "cement". Conglomerates can be of various colours, most often white, grey or red. Granites and other types of igneous rock can give completely spherical shapes. The roundness of the fragments is the result of transport and these are mostly fragments of less durable types of rock.[15] Breccia (Latin *Breccia* – crushed rock, Fig. 8) is, unlike conglom-

15 Terzić, Obradović, Aleksić 1967, 113-115; Протић 1984, 34-58.

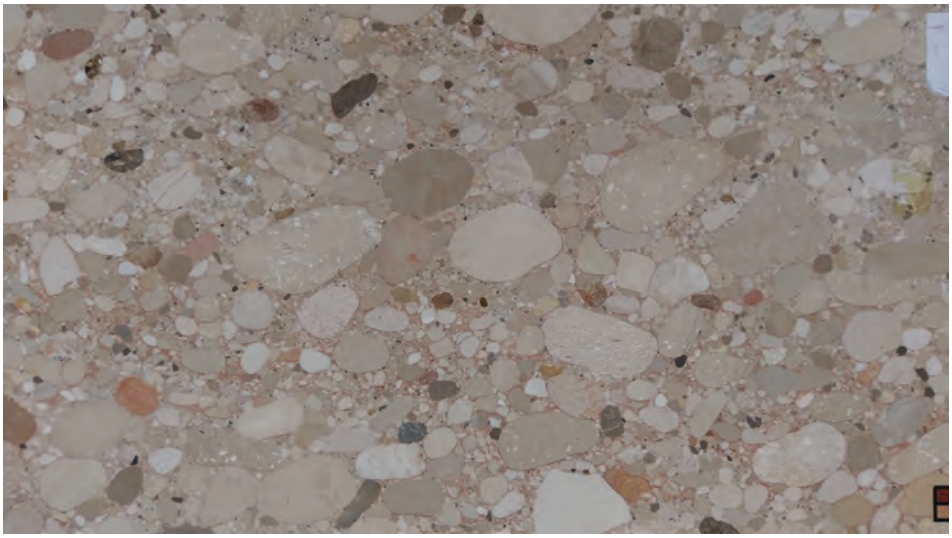

Fig. 7 A sample of conglomerate from the collection of the Faculty of Mining and Geology, in Belgrade.

erate, composed of coarse fragments of rock of the same or various kinds of stone and the adhesive, the "cement". The size of fragments and their relationship with the adhesive vary. Usually, the cement has the same composition as the breccia itself, but there are also cements with a different composition.[16] Because of its angled fragments, breccia will not be taken into consideration as a possible pattern for the examples examined further in the paper.

In the examples from the bibliography focused on the identification of panels in the painting of Villa A of Poppaea, a similar type of representation is defined as "marmor numidicum", i.e. giallo antico.[17] The examples of Numidian marble from Villa A of Poppaea are very different from one another, which was probably as a result of the artists who rendered these paintings. Numidian marble, which came from a quarry in the ancient town of Simitthus[18] in Tunisia, is ochre to almost white, with dark yellow, reddish or brown veins.[19] Diocletian produced a list of 19 kinds of marble, of which pavonazzeto and giallo antico are the most expensive. This was data from the 4th century, and in the Augustan Age the prices

16 Terzić, Obradović, Aleksić 1967, 115-116.

17 Malacrino 2010, 28.

18 The Roman Simitthus was founded as a Berber town of Chemtou near Mount Chemtou (Djebel Chemtou), from where the precious Numidian marble was extracted.

19 Malacrino 2010, 28.

were probably even higher.[20] Consul M. Lepidus (year 676 from the founding of Rome) is the first person to have a numidian marble threshold in his house.[21] Also, a combination of porphypy and giallo antico marble was identified on an example of a wall painting from France (Fig. 9, Soissons, rue Paul Deviolaine, salle XIII).[22] However, since the analogous examples from Italy and France have decorations with reddish ellipsoids on a yellow background, which is defined as giallo antico, they will not be taken into consideration as possible models for the examples from Serbia, since they are rendered in a different colour scheme.

Fig. 8 A sample of breccia from the collection of the Faculty of Mining and Geology, in Belgrade.

Analogous representations of panels from Serbia can be seen in the wall painting from tomb no. 4 (the tomb with an anchor) at Naissus[23] (Fig. 10) and a tomb from Beška[24] (Fig. 11 and 12). If we compare the wall painting of these three tombs (the tombs from Viminacium, Beška and Naissus), they can all be connected by the ellipsoid motifs, in all three fields of the lower zone of the north wall in Beška, two fields on both the west and the east side of tomb 3130 from Viminacium, and in one field of the tomb with an anchor from Niš.

In the lower zone of the west wall of tomb no. 4 from Niš (end of the 4th - middle of the 5th century),[25] a grey marble frame is painted and the panel is inside it. It was concluded that the panel from Niš is conglomerate,[26] in which a reddish-orange area can be seen, which would be the "cement", with ochre and umber ovoid motifs. In the tomb from Niš there are no diagonal lines and representations of slanting stone edges.

The tomb from Beška (4th century) contains three fields in the lower zone of the north side, i.e. panels with a pattern of ellipsoid shapes. The panels are inserted into black square frames, which are, as in tomb 3130 from Viminacium, bordered by another, larger frame; they are connected by diagonal lines, which look like supports (?). Unlike the representations from Viminacium, these have the frames

20 Fant 2007, 339; Malacrino 2010, 30.

21 Plin. NH. XXXVI, 2, 6.

22 Allag, Monier, 2003, 361.

23 Ракоција 2009, 94-95.

24 Marijanski – Manojlović 1987, 23.

25 Ракоција 2009, 87 - 88

26 I am grateful to Dr. Violeta Gajić, Dr. Nebojša Vasić and Dr. Predrag Vulić, professors at the Faculty of Mining and Geology, for their help in the interpretation of the stone panels in the wall paintings of Viminacium, Naissus and Beška.

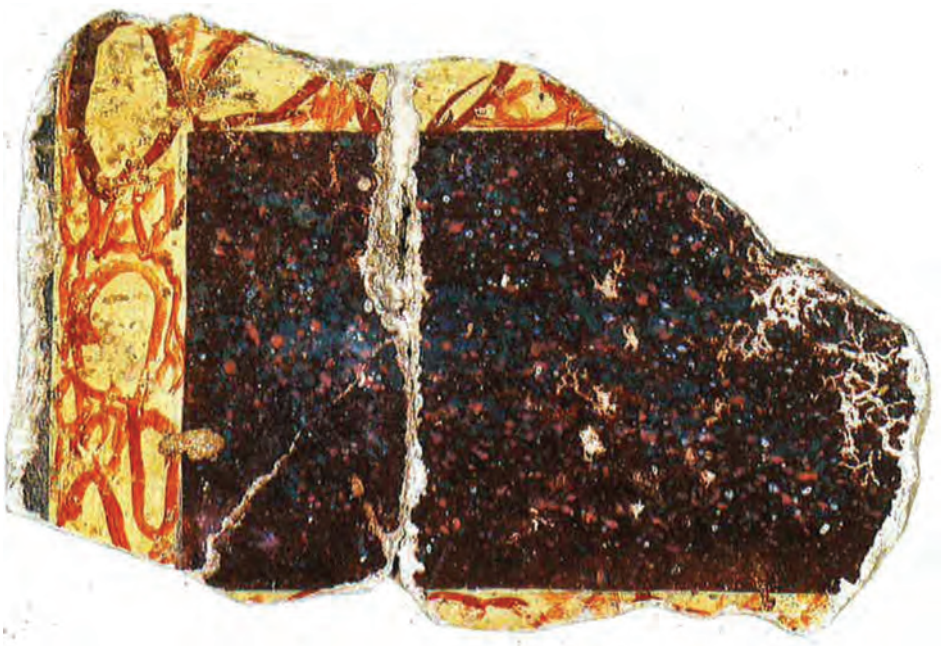

Fig. 9 After: Allag, Monier, 2003, 361, fig 10 Cliché J.- F. Lefevre, CEPMR.

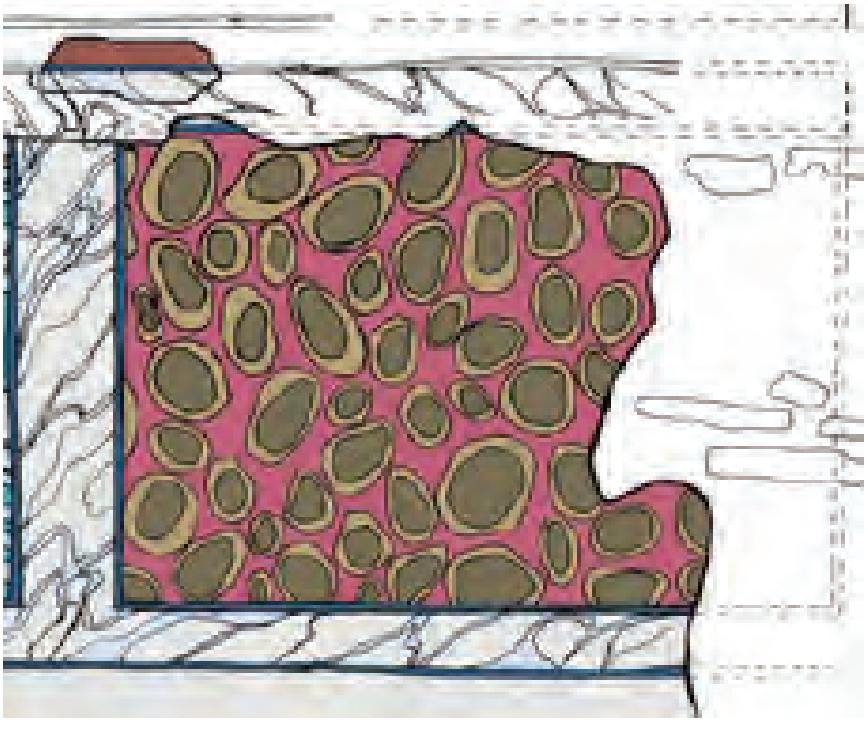

Fig. 10. After: Ракоција 2009, fig. 27.

Fig. 11. A field on the right side of the tomb in Beška, after: Marijanski - Manojlović 1987, 23.

Fig. 12, The middle field, after: Marijanski - Manojlović 1987, 23.

connected not only by diagonal lines in the corners but also by three straight lines at right angles on each of the longer sides. The fields on the left and right side have the same painted content - on the white plaster background, ellipsoid motifs of various sizes are painted and outlined in brown. Over the patterns with pebbles, thicker ochre, green and blue lines are painted. These patterns of round and ellipsoid shapes with diagonal lines (Fig. 11) are the most similar to the patterns from Viminacium tomb 3130. The middle field of the north side of the tomb from Beška contains irregular shapes that resemble ellipsoids (Fig. 12). These shapes are outlined in red and the space around them is decorated with red curved lines. The inside of the ellipsoids is filled with ochre, but in such a way that the white mortar background is visible between the red line and the ochre. Again, the analysis of this example shows that this could be a representation of conglomerate.

In other countries in this region, various examples that are reminiscent of conglomerate can be observed in tombs, with examples from Bulgaria, Greece and Hungary. On the lateral sides of tomb 7 from Serdica (Bulgaria),[27] three rectangular fields are observed, and here, the left and the right one are important for the current research (Fig. 13), since they contain deformed smaller and larger ellipsoid forms, outlined in dark red, while the inside areas are ochre, but there is some space between the red outer line and inner ochre colour where the colour of the background is visible (as in the case of the middle field of the tomb from Beška). The fields with red and green backgrounds containing ellipsoid forms are also seen in the lower zone of The Burial Chamber of the "Jug" (Sopianae, modern Pecs, 4th century),[28] next to the niche. A strikingly similar motif, which can be compared to conglomerate, is an example from the Early Christian mausoleum in Pecs (4th century, Fig. 14),[29] where the frames with panels are on the north and south wall. A Christogram is painted on the east wall. [30]

In Thessaloniki tombs and graves from the period of Late Antiquity (no. 20, 49, 53, 78, 91, 94 and 99), stone panels are a common motif in the lower zones, and marble, conglomerate and breccia are the most frequently depicted types

27 Pandurski in Pillinger et al. 1999, 67, Tafel 68, Abb. 133.

28 Magyar 2009, 113-114, fig 6.

29 "Early Christian Mausoleum" along St. Stephen's Square – just one component of Pecs, Hungary.

30 Fülep, Bachman, Pintér 1988, fig. XVI.

Fig. 13. Serdica, tomb 7, watercolour painting of the east side, (photo by K. Šestakov-A. Michailov), after: Pillinger, et al. 1999, Tafel 68, Abb. 133.

Fig. 14. Early Christian mausoleum in Pecs, after: Fülep, Bachman, Pintér 1988, fig. XVI.

Fig. 15.
a. South "frontal" side
b. A detail of the north frontal side

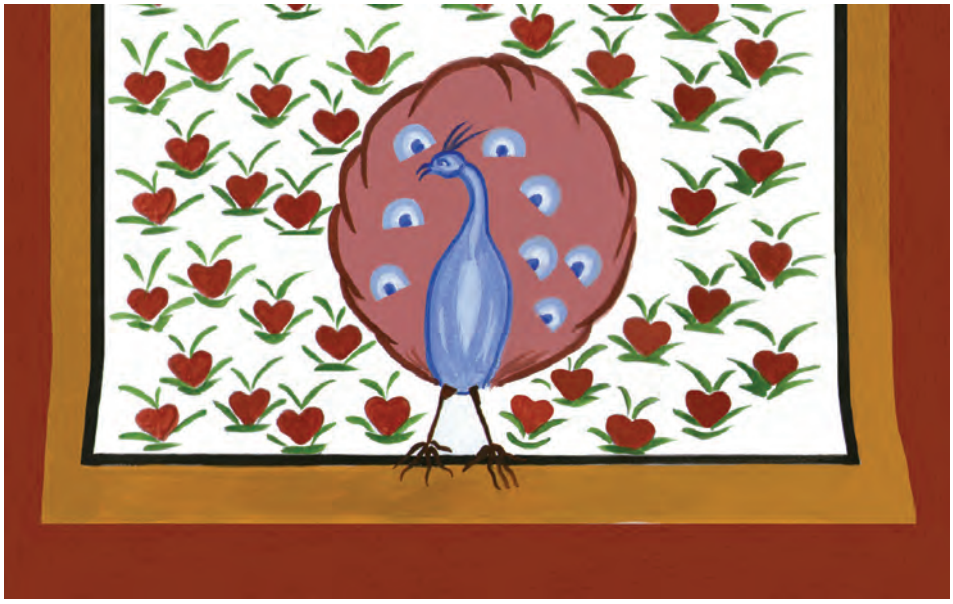

Fig. 16. Theoretical reconstruction of the frontal side of tomb 3130, painted by: D. Rogić

of stone.[31] Various kinds of conglomerate can be seen in "Stasovski" tomb from Kerch.[32] Most of the described tombs with stone panels contain paradisiacal motifs, i.e. floral and bird motifs, in the upper zones.

The representations of panels from the Viminacium tomb are considered a type of conglomerate; however, what makes them different from conglomerate are the diagonal lines, which cannot be seen in the natural stone. Taking all of the illogicalities of these explanations into consideration, it might be better to rely on the artistic imagination, which fuses together dissimilar elements and produces specific examples like these. The above mentioned tomb is the only one with a depiction of conglomerate at Viminacium.

THE NORTH AND SOUTH SIDES

A quadrilateral entrance to the tomb probably existed on the north or south side, and it could have been placed in the upper zone. These two "frontal" sides had identical iconographic representations, judging by their remains. A large bird surrounded by fruits or floral motifs (?) was painted inside a "frame" of red and ochre borders. On both sides, only the lower portion of the painting is preserved, and only a pair of bird's legs (of a dark brown colour), as well as red heart-shaped fruits - or flowers, are visible. The fruits are similar to apples and there are two small leaves in each of the upper gaps. In all likelihood, the frontal, vaulted side was decorated with a large representation of a peacock, judging by the size of the bird's legs, and its tail was depicted on the vaulted part. A part of the bird's body, i.e. its blue stomach, is preserved. Other peacocks from the funerary objects of Viminacium, where they are represented in pairs or individually, are also painted in blue. Their tails are most often depicted in a reddish hue, which served as guidance in the reconstruction.

The red fruits are preserved only at the level of the bird's legs (Fig. 15). The fruits possibly surrounded a large representation of a peacock in the lower zone, and probably ornamented the ceiling as well (Fig. 16). Fruits of a similar shape

31 ***Μαρκή*** 2006: Tomb no. 94, 178; Tomb no. 49, 143, 144; Tomb no. 53, Πίνακας 19, 174, 175; Tomb no. 91, 177; Tomb no. 78, 176; Tomb no. 20, 157; Tomb no. 99, Πίνακας 21, 178.

32 Logdacheva et al. 2011, 201, 202.

can be seen in the "Stasovski" tomb from Kerch,[33] and their spatial distribution is random, they are placed in the upper zones and on the ceiling, around all the representations, but do not appear on the "floor". Heart shaped forms can also be seen in a tomb from Thessaloniki.[34] Peacocks combined with a variety of other motifs: floral, vines, other birds, garlands, wreaths etc., appear in Thessaloniki tombs, but only those representations of peacocks which can be connected to representations of stone panels will be taken into consideration here. In tomb 94, a peacock with a floral background is painted in a lunette, while stone panels are depicted in the lower zone. A peacock and a peahen are painted in the lunette of tomb 91, and below them there is a frieze with grapevine motifs, while the lower zones are decorated with representations of stone panels. A panel with conglomerate is presented in tomb 20, where the other sides of the tomb are decorated by bird and floral motifs. [35]

In the upper zone of the vaulted, frontal side of the tomb in Silistra,[36] two peacocks flanking a kantharos, surrounded by red flowers on green leafy stems, are painted. In addition, a tomb from Iznik[37] has a painting of two peacocks facing each other in a flower garden.

A peacock as an iconographic motif was very common in the funerary art of the period of Late Antiquity, both pagan and Christian. It represents a symbol of the victory over death.[38]

As has already been mentioned, peacocks were used to decorate the walls of the following Viminacium tombs: G-5517, G-5464, G-5313, G-2624 and G-160. In tomb G-5517, on the west "frontal" side, a Christogram in a laurel wreath is painted, while on the east side there is a representation of the Garden of Eden - two peacocks flanking a kantharos (Fig. 17). The lateral sides are decorated with hunting scenes.[39] On the west side of tomb G-2624 there is a waist up painting of a woman, which is one of the most beautiful Late Antique representations, while

33 Rostovtzeff 1919, 148-149.

34 ***Μαρκή*** 2006, fig. 59, 127.

35 ***Μαρκή*** 2006: Tomb no. 94, 178 (fig. 132); Tomb no. 91, 177 (fig. 131); Tomb no. 20, 157.

36 Atanasov 2007, 451.

37 Barbet, Selçuk Şener 1999, 213.

38 Anđelković, Nikolić, Rogić 2011, 233-238.

39 Korać 2007, 41.

Fig. 17. The east side of tomb G-5517, Photo by: M. Korać

on the east side there is a servant with offerings. Large greyish-blue peacocks with a kantharos, turned towards a female figure (Fig. 18)[40] are painted on the lateral sides. In tomb G-5464, two peacocks facing each other with an amphora between them are placed on the west "frontal" side (Fig. 19). The peacocks are painted in light blue. The other sides of the tomb are decorated by stylised vine motifs. Tomb G-160 is referred to as "The tomb with Cupids". The scene on the west frontal wall is indistinguishable but, according to analogies, it can be presumed that this side was dedicated to the deceased. A representation of two Cupids is painted on the east side. The iconographic content of the south and north wall is almost identical. Standing figures in an "offering (procession)" scene are painted inside large

40 Anđelković Grašar, Tapavički Ilić 2015, 18; Anđelković Grašar 2015, 271–272.

Fig. 18. The lateral side of tomb G-2624, Photo by: M. Korać

Fig. 19. The west frontal side of tomb G-5464. Photo by: M. Korać

frames. On the north wall, there is a male figure in a short blue robe. A female figure is depicted in a larger frame on the south wall. Grapevine motifs ornament the upper frieze of the north and south wall. Below, there are two smaller frames with painted peacocks surrounded by flowers and *kalathoi* (Fig. 20). In the next frame (closer to the west wall) there are two birds flanking a bowl filled with flowers. [41]

41 Korać 2007, 125-140; Anđelković Grašar, Nikolić, Rogić 2013, 73-100.

Fig. 20. One of the frames on a lateral side of tomb G-160. Photo by: M. Korać.

In tomb G-5313, a peacock is painted inside a trapezoidal field (Fig. 21) of the east frontal side, but the painting is damaged to a large extent.[42] On the south and north side there is a representation of *hortus conclusus*.

The greatest number of vaulted tombs is actually located in Bulgaria, and vaults of tombs no. 6, 7 and 8[43] from Serdica have floral decoration. Tomb no. 7 from Serdica has an almost square base, is vaulted and has a square entrance on the north side, in the vaulted part. It is maintained that this tomb's lower part was below ground level while its upper half was above ground. Floral decoration is painted on the vault. The lateral sides contain representations of stone panels. The panels from the lower zone, as well as the floral motifs on the vault, could serve as inspiration in the reconstruction of the decorative repertoire of tomb G-3130.

A floral repertoire with garlands, kalathoi and birds is painted on the vaults and vaulted sides of tomb 2007.03 and the "Tomb of Chrysanthios", in Sardis.[44] According to all the information about the wall painting of the above mentioned tombs, it is highly probable that the vault of tomb G-3130 from Viminacium was ornamented by some other motifs as well.

42 Korać, 2007, 23 – 24; Anđelković, Nikolić, Rogić 2011, 231-248.

43 Миятев 1925, Serdica, tomb 5, 35-44 (Fig. 12 and 13); Serdica, tomb 6, 45-54 (Fig. 17 and 18); Serdica, tomb 7 55-67 (Fig. 20); tomb 8, Kitanov 2014, Abb. 1 and 2.

44 Rousseau 2014, 193, 194, fig. 2, 4 and 5.

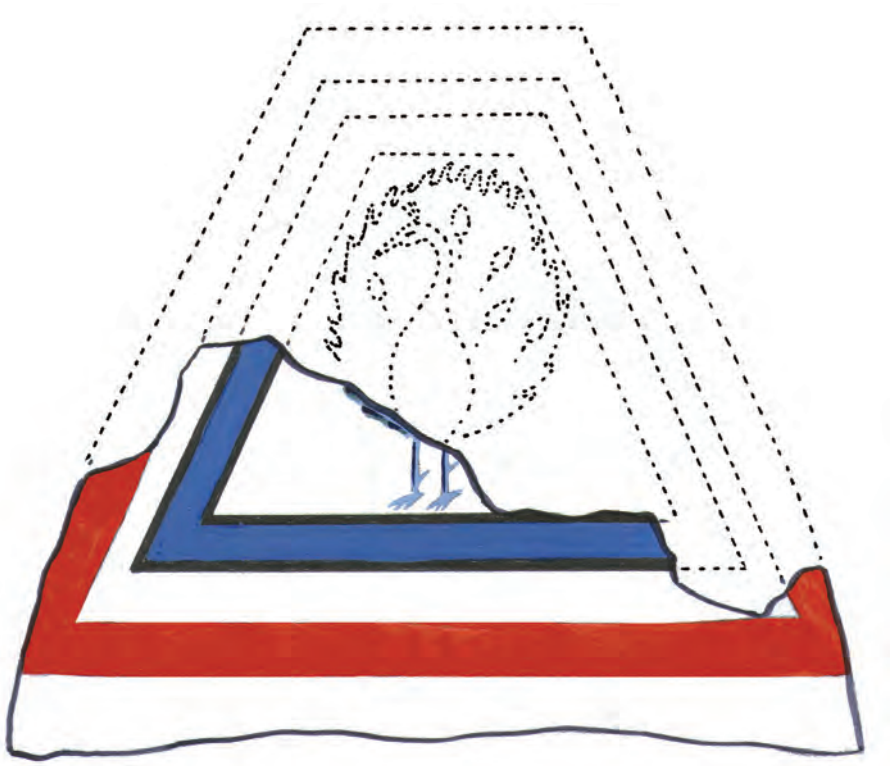

Fig. 21. Presumed reconstruction of the frontal side tomb G-5313, painted by: D. Rogić

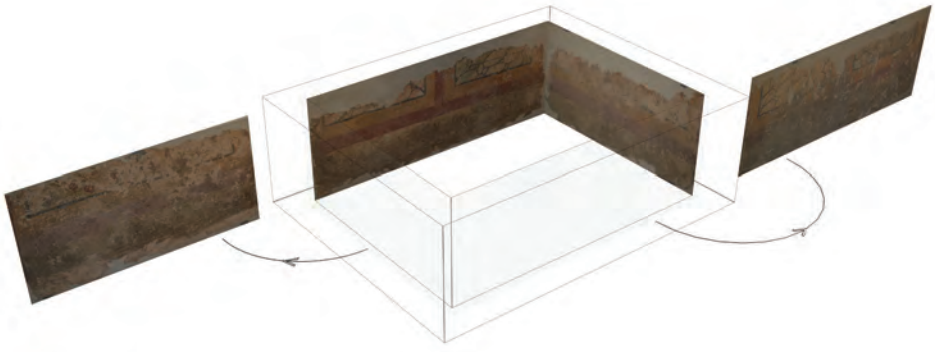

Fig. 22. Scheme of the distribution of wall paintings in tomb G-3130

CONCLUSION

Through the work on the conservation of these wall paintings, a number of technological and iconographic conclusions were reached. The intonaco of tomb G-3130 contains a high percentage of ground brick and is covered with a thin layer of whitewash on which the painting was rendered, as in tombs G-5517, G-2624 and G-5464. According to the technological details, such as the composition of the plaster and the white lime background for the painting, it could be concluded that the wall painting of the above mentioned tombs comes from artists from the same painting atelier, with established technological regulations. Pigments in earth tones and red lead paint were used in the decoration of tomb G-3130, a fact which was determined by the application of the pEDXRF analytical technique.

Since this tomb was vaulted, in all likelihood, the upper zones and the vault itself probably had a rich iconographical content. On the remains of the painting of the lateral sides (west and east) of tomb G-3130, a completely identical iconographic pattern is seen. On each side there are representations of two identical quadrilateral frames with imitations of stone panels. Similar representations of panels can be seen on the wall paintings in tomb no.4 from Naissus and a tomb from Beška (in Serbia). All of these paintings differ in colour, pattern and size of the ellipsoids. Also, it can be deduced that they do not represent imitations of natural stone, but that the painters were focused on details which they multiplied, and these details closely resemble conglomerate. However, in the cases of tomb G-3130 and the tomb from Beška, the painters combined the conglomerate details with veins of marble, thus creating very original results. Certain researchers mention the possible use of catalogues which itinerant painters used in their painting. The extent of the success of copying these motifs depended on the individual artist. Since the desire for change is in an artist's nature, it would be natural to rely on the artistic imagination, which is always vivid and tends toward modification. The extent to which copying was faithfully carried out depended on the artist. It seems that it was not required to imitate a certain type of marble and that the choice of colours was more liberal. If we bear this in mind while studying the examples of panels from Viminacium, then they could represent a fusion of conglomerate and marble.

In other nearby countries, analogous examples which come from tombs can be seen among finds from Bulgaria, Pecs and Thessaloniki. In tombs from the period

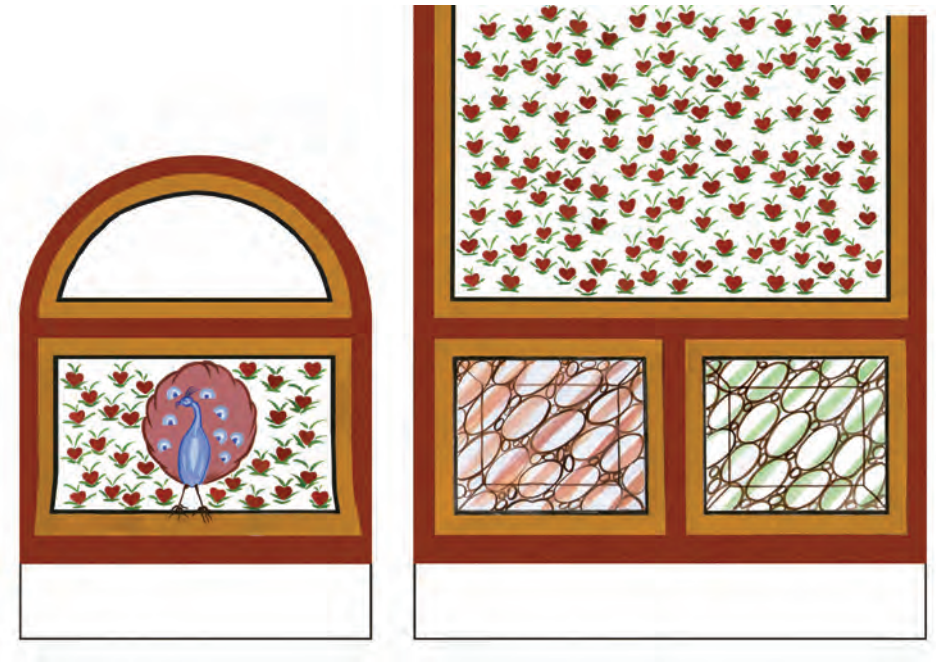

Fig. 23. Presumed reconstruction of tomb G-3130, painted by: D. Rogić

of Late Antiquity, the motif of stone panels is common in the lower zones, while the upper zones contain representations of birds and floral motifs.

On the north and south side (of tomb G-3130) the lower zone contained a painting of a peacock surrounded by red fruits. Since the available elements were insufficient for an accurate reconstruction, the visual representation was reconstructed according to analogous examples and logic (Fig. 23). The representation in the lunette could not be reconstructed; it might have been a representation of an amphora, grapevine, wreaths, Christogram etc., which would make it possible to determine this tomb as pagan or Christian.

Translated by Jelena Mitić

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ARCHITECTURAL SPACE IN THE WALL PAINTING OF THE ROMAN TOMB IN BRESTOVIK*

EMILIJA NIKOLIĆ, *Institute of Archaeology, Belgrade*
E-mail: e.nikolic@ai.ac.rs
DRAGANA ROGIĆ, *Institute of Archaeology, Belgrade*
JELENA ANĐELKOVIĆ GRAŠAR, *Institute of Archaeology, Belgrade*

ABSTRACT

Previous scientific research of the Roman tomb in the village of Brestovik, on the Danube near Belgrade, was focused on its architectural structure. The painted decoration is described in detail only in the work of Mihailo Valtrović, who recorded what he saw during excavations at the end of the 19th century. Although there is an assumption that all the rooms of the tomb were once painted, today the decoration exists only in the room with graves, and in a very poor state of preservation.
Discussed in this paper is the treatment of space in the wall painting of the tomb, with the use of imitations of architectural techniques and elements. Apart from the imitation of the opus sectile technique on the walls of the tomb, as well as the coffered ceiling painted on its vault, special attention will be devoted to the three-dimensional presentation of the beams on the walls, since in the ancient painting in the territory of today's Serbia, it has been found only in the tomb in Brestovik.

Key words: Brestovik, Roman wall painting, ancient painting styles, Roman tomb, architectural space, oblique projection, coffered ceiling, opus sectile, beam, Hellenism, East.

1The article results from the project: *IRS – Viminacium, roman city and military legion camp – research of material and non-material cultureof inhabitants by using the modern technologies of remote detection, geophysics, GIS, digitalization and 3D visualization* (no. 47018), funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

INTRODUCTION

Ancient tombs, by their size, structure and organisation, often had the character and monumentality of palaces and public buildings, especially when they were imperial mausoleums and tombs of publicly respected and wealthy people.[1] Some members of the Roman nobility had the privilege of being buried within their properties, separated from the rest of the population, thus emphasising the privacy of the ritual.[2]

In the fertile valleys of today's wider area of Belgrade, near the Danube, along with the settlements of Ritopek (*Castra Tricornia*) and Grocka (*Ad Sextum Militare*) and the road connecting Singidunum with Viminacium, numerous villas were built during the Roman period (Fig. 1).[3] The tomb in the Brestovik settlement in the Belgrade municipality of Grocka, as a family mausoleum, probably belonged to a private estate of this type,[4] which was halfway between the ancient civilian settlement of *Aureus Mons* (today's Seone settlement) and *Ad Sextum Militare*, in the *Singidunum* municipality or in the territory of *Aureus Mons*. The person who erected this tomb was probably an important military or state official who built it for himself and his family.[5]

The painted tomb was accidentally found by Vukašin Milosavljević, a villager, digging in his estate in the spring of 1895, near the village cemetery. In the same year, Mihailo Valtrović (1839-1915) excavated the tomb that had already been partly ruined and looted, and whose painted surfaces had been damaged (Fig. 2).[6]

According to Miloje Vasić (1869-1956), the construction of the tomb can be associated with the period of the 3rd century.[7] After the revision excavations that he performed in 1955, Đorđe Stričević dated it to the 3rd or 4th century,[8] while Gordana Milošević associated it with the beginning of the 4th century.[9]

1 Milošević-Jevtić 2014, 329.

2 Milošević 2009, 748; Milošević-Jevtić 2014, 329.

3 Bojović 1975, 114-115.

4 Milošević 2014, 1.

5 Milošević 2009, 749-750.

6 Валтровић1906, 128; Валтровић1895, 130-132.

7 Васић 1906, 140.

8 Стричевић, 1957, 413.

9 Milošević 2006, 371.

Fig. 1 Location of Brestovik in Serbia (Google Earth Pro 7.3.0.3832 (32-bit) image from April 2018, with markings applied by the authors of the paper).

The previous scientific research of the tomb in Brestovik was mostly related to its architecture. It is also interesting to read the discussions about the sculpture of a dressed man who was only recently linked to the tomb, which allowed new observations regarding its owner.[10] The painted decoration was described in the study by Mihailo Valtrović from 1906, who wrote in detail about what he saw during the excavation. Despite the slight ambiguity and disagreement between his text and drawings and the elements of painting that can still be seen today, his study represents the most valuable source of data for the reconstruction of the tomb decoration, which has largely disappeared.

10 See in: Tomović 1997; Milošević 2009.

During 1964, works on the conservation and restoration of the architecture and painting of the tomb were carried out, under the supervision of architect Mila Vujičić Vulović (Figs. 2a, 2b, 2d, 2g).[11] After the executed works, which, according to the project, were conceived as the first phase, the conservators published a report, but it is not understandable what interventions were performed regarding the painting. It is only mentioned that a preventive protection of the painting was carried out and that its further protection is urgent.[12] Based on today's situation on the site, it can be assumed that the vanished motifs on the damaged paintings were not reconstructed, but that they were covered with ochre paint. On the vault of the tomb, traces of restoration are clearly visible today and we can recognise the newly-painted motifs that could have be reconstructed, while on the walls it seems that attempts were made to reconstruct some of the elements or that the restoration has not yet been completed. Conservation works on the building during this period, which also included the restoration of the walls of the room with graves, saved what was left of the painting.[13]

The tomb was protected by the Institute for the Protection and Scientific Research of Cultural Monuments of the NRS, in 1948,[14] and it was proclaimed in 1979 as a cultural property of great importance.[15] However, access to the tomb as a place which should be protected and presented to visitors today is very problematic since it is on private property and it is necessary to pass through a private gate next to the residential house to get to it (Fig. 3). The painting of the tomb is in a very bad condition. In the grave, villagers hold icons and burn candles, and recently in the area of the tomb, organised by the Church of the Holy Trinity in Grocka, the commemoration of the martyrs Saint Ermil and Stratonic has been carried out. The use of the tomb in this way implies the constant cleaning of its space and surroundings, which has not been the case in the past decades when rubbish has been dumped here, but it is certain that these processes also endanger

11 Вујичић - Вуловић 1967.

12 Preventive conservation works on painting were done by Radoman Gašić, painter-conservator from the Institute for the Protection of Monuments of the Republic of Serbia.

13 Вујичић - Вуловић 1967, 86-92.

14 Решење Завода за заштиту и научно проучавање споменика културе НРС бр.200/48 од 12.2.1948.

15 Одлука о утврђивању непокретних културних добара од изузетног значаја и од великог значаја, *Службени гласник СРС бр.14/1979.*

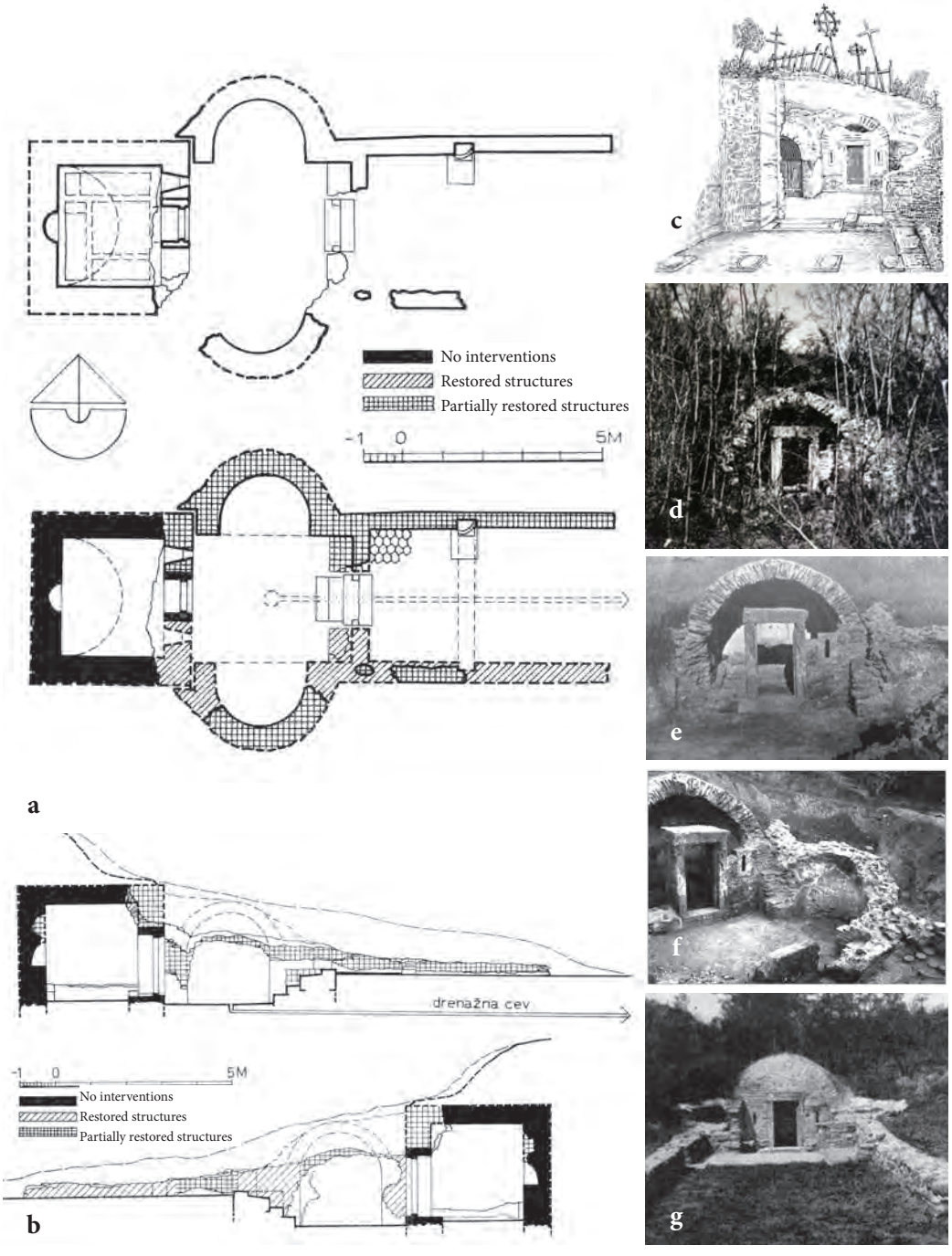


Fig. 2. Brestovik tomb before and after the conservation works:
a. Plan,
b. Sections of the tomb after the conservation works with the suggestion for the reconstruction of the conches (Вујичић - Вуловић 1967, 87-88, Figs. 2-3);
c. As it was seen by Mihailo Valtrović after the excavations (Валтровић 1906, Table IV);
d. Before the conservation works (Вујичић - Вуловић 1967, 89, Fig. 4);
e. Before the conservation works (Стричевић 1957, 412, Fig.1);
f. Before the conservation works (Milošević 2009, 744, Fig. 3);
g. After the conservation works (Вујичић - Вуловић 1967, 97, Fig. 5).

Fig. 3. Brestovik tomb today (photos by the authors of the paper).

the remains of the painting. Perhaps it is already too late for the painting to be returned to its former splendour, but the authors of this study hope that this will happen anyway and that this study, with the drawings of the reconstructions, will represent a small contribution to the future conservation works that are necessary and which will enable its satisfactory public presentation.

TOMB ARCHITECTURE

Mihailo Valtrović wrote long ago: "The architectural arrangement of this tomb, which in the first place should have corresponded to the needs of the mortuary rituals, was conceived and executed with an account of the noble impression".[16] In his text, he described the tomb architecture as it had been experienced during the excavation itself, and after him, it has remained a challenging and interesting topic for the further interpretations of many authors.

In a short report given after the excavations of the tomb in Brestovik, an east-west orientated structure, Valtrović divided its space into four "sections". The first space he presented as a "three-coffin grave" with a "cylindrical vault", and in front of it, he described an open-air space consisting of a middle open space and two vaulted semicircular spaces - niches. The third open part was elevated and served as a hallway. In front of it, there was a fourth space like an entrance, with four stone columns.[17] However, in an extensive text published almost a decade later, he divided the tomb into three parts, which would remain as partitions in the works of later researchers. The first elevated part was the place for burials, the other space, the open part, served for the purpose of posthumous rituals, and its niches were shelters and places for rest, while the third space, in "the oblong form", was the vestibule, that is, the entrance with the columns bearing the ceiling and the roof, accessed along a small gradient with walled sides. According to him, with its columns, beams, and tympanum, it was supposed to give "the first impression of the funeral building of a richer layout" (Figs. 4a - 4c).[18] Miloje Vasić had the

16 Валтровић 1906, 128.

17 Валтровић 1895, 131-132.

18 Валтровић 1906, 128-130.

same opinion on the division of the space into three parts, while distinguishing a corridor with columns, a central space with niches - probably uncovered, and a "real tomb with sarcophagi".[19]

Later on, Đordje Stričević concluded that the premises of the tomb were not erected at the same time, but that the "rectangular compartment with built-in grave constructions" was later expanded with the space with apses, a porch, and an access corridor, but left open the question of the closure of the central space. Although he considered the method of covering it, and between the vault and the wooden roof structure he preferred another option, he finally concluded that the space, due to the "facade character" of the entrance wall of the room with graves, could have been open to the air.[20] Mila Vujičić Vulović suggested that the central area was covered with a wooden roof, which, among other things, she justified by the existence of painting in this area. According to her, the space was covered and the walls of the apses were "strong enough" to carry the roof. The existence of painting in this space, the level of the floor which is lower here than in the remaining spaces of the building, as well as the climatic conditions characteristic for the area, she used to justify the assumption of the space being closed in.[21] She accepted that not all parts of the building were built at the same time and assumed that the room with the graves belonged to the 3rd century, while the construction of other parts of the building she connected to the 4th century. The facade character of the outer side of the wall of the room with the graves she justified by the fact that this room was built first.[22]

According to Gordana Milošević, the tomb belongs to the tombs with multiple spaces and an elongated rectangular plan, like the majority of late antique tombs in Serbia, but with additional apses and an access corridor.[23] She described the tomb as an assembly made up of a rectangular room with three masonry graves vaulted with a barrel vault and located on the west side of the tomb, a central space with apses on its south and north side, and an entrance area – a vestibule,

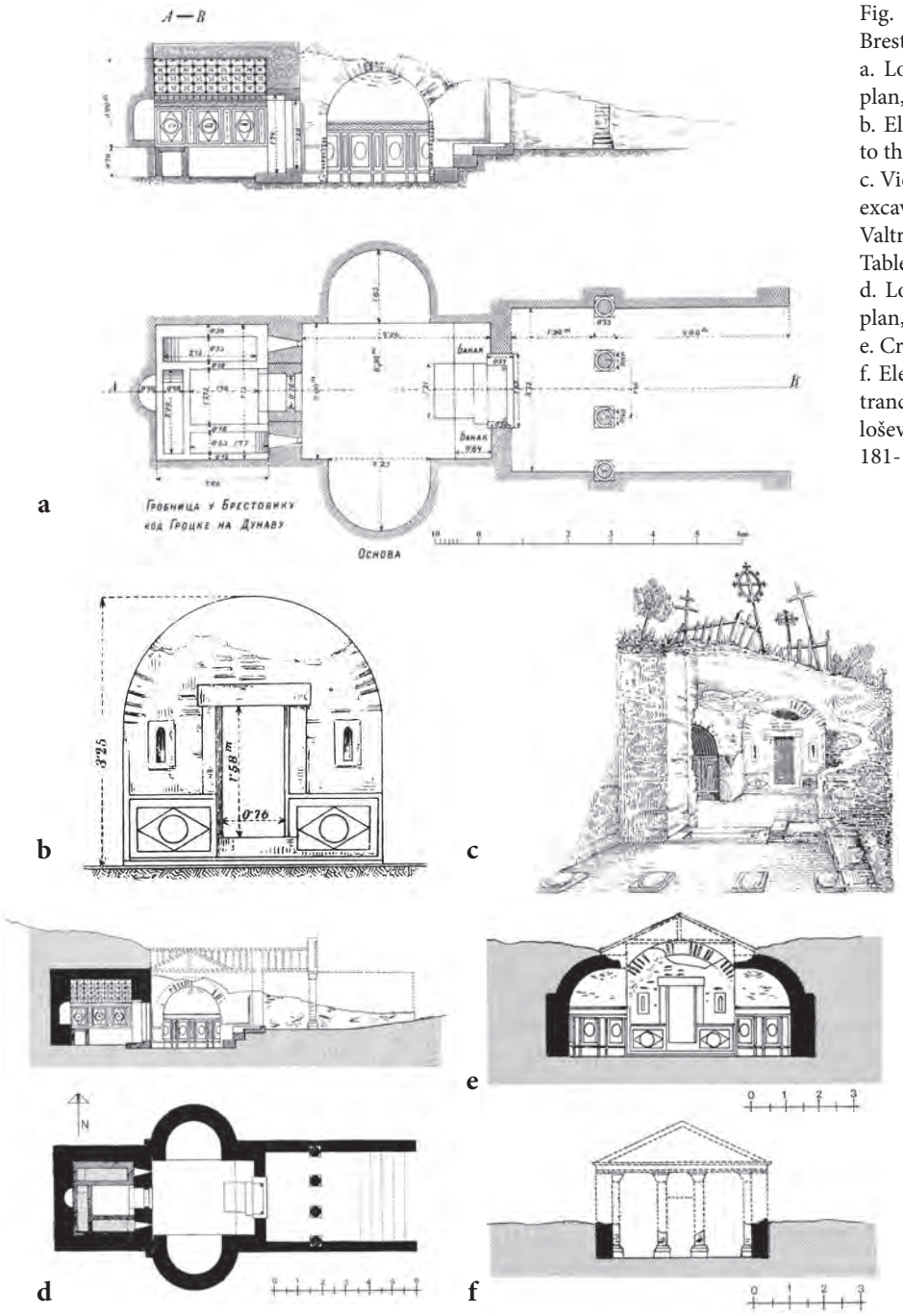
19 Васић 1906, 139.

20 Стричевић 1957, 412-413.

21 Вујичић - Вуловић 1967, 86- 87.

22 Mihailo Valtrović wrote that the roof over middle space has no constructive support. See in: Валтровић 1906, 138.

23 Милошевић 2006, 373, 375, 382, 384.



a

b

c

d

e

f

Fig. 4. Architecture of the Brestovik tomb:
a. Longitudinal section and plan,
b. Elevation of the entrance to the grave chamber,
c. View of the tomb after the excavations (drawings by M. Valtrović - Valtrović 1906, Tables IV - V);
d. Longitudinal section and plan,
e. Cross-section,
f. Elevation of the tomb entrance (drawings by G. Milošević - Милошевић 1993, 181-182, Figs. 101-102).

one meter higher than the central space, with walls on the sides and embedded in a hill with four stone bases for columns, which, as Valtrović had assumed, probably carried a tympanum.[24] However, although Gordana Milošević confirms the assumption of the above-mentioned authors that there were several construction phases, she finds the reason for this in the dynamics of construction and not in the change of the original idea of a compact building and, therefore, the dilation that exists between the room with graves and the central space she describes as constructive. She is of the opinion that the tomb was conceived as a unique three-part structure, prepared long before the first burial, and consisting of a grave chamber, a space for performing a cult and an accessory dromos, which is, according to her, supported by her claim that the painting of the burial and central space was simultaneously done and stylishly uniform. According to her, the burial chamber was completely buried, while the central space and the dromos were partially or completely visible. Like Vujičić Vulović, she thinks that the central space could have been covered with a wooden gabled roof, but proposes, as a more likely solution, a crossed vault, the existence of which she explains by the large amount of rubble found in the central space during the first excavations (Figs. 4d - 4f).[25]

In 1906, Miloje Vasić gave a brief discussion of possible analogies to the Brestovik tomb researched until that time, that is, the very beginning of the twentieth century, linking it to tombs in Alexandria. He believed that tombs of this type originated in Macedonia and that after Alexander the Great, this concept was transferred to the East and Africa. According to him, the Brestovik tomb was not created under the direct influence of Macedonia, but influences came indirectly from the mentioned regions. Also, he found analogous examples in southern Russia, around the Black Sea.[26] Đorđe Stričević found analogies in examples in Syria dated to the beginning of the 5th century.[27] According to Gordana Milošević, the tomb from Brestovik has similarities with graves from *Viminacium*, *Margum*, Karataš, Niš, *Ulpiana,* and *Sirmium*, but also with those from many sites

24 Milošević 2009, 741-742, Милошевић 1993, 182-183. More on details of architecture see in: Валтровић 1906, 128-132.

25 Milošević 2009, 747-748, 750. The dilatation was also noted by Mila Vujičič Vulović. See in: Vujičič Vulović 1967, 87 (Fig. 2) The found rubble noted in: Валтровић 1906, 131.

26 Васић, 1906, 138-140.

27 Стричевић 1957, 413.

in Bulgaria.[28] However, according to the general organisation and construction, with subterranean burial space, the central area and the vestibule with columns, she finds the closest analogies in Syria.[29] The architectural structure of a grave in *Anemurium*, in today's Turkey, with a long corridor leading to a vestibule from which one can enter the burial chamber,[30] also carries similarities with the Brestovik tomb. In a tomb of the Late Hellenistic or Roman period in Larnaca (ancient *Kition*), in Cyprus (the so-called Cobham's tomb), a stepped dromos leads up to three chambers, arranged one behind the other, where the first one has a flat coffered ceiling, while the other two are vaulted with a barrel vault.[31]

Nearly all researchers have discussed the character of the tomb in Brestovik in relation to pagan or Christian cults, but this comparison is still vague, which is a common situation when researching funeral structures from this period.[32] Mihailo

28 Milošević 2014, 7.

29 Милошевић 1993, 183.

30 Hembrey 2008, 6-7.

31 Carstens 2005, 156,157.

32 After the accidental discovery of the building of the sanctuary of Santa Eulalia De Boveda, near the city of Lugo in Spain, while exploring the area under the church built in the 18th century (it was said that another church was hidden under it), excavations were carried out in 1926. After these excavations, the building of the sanctuary was defined as Roman, according to the construction of the brick vault. The openings for windows, made of stone, which are located to the left and right of the door, and above it, are like fenestellas in Brestovik (except that they have an additional blind niche in the shape of a triangle above). In front of the room is a vestibule with two columns. The architectural characteristics, according to some authors, bear an oriental influence that manifested in parallel in Hellenistic Syria and Russia, such as the use of a horseshoe's arched opening through which space is accessed, which is a legacy of Syria and Asia Minor connected with the arrival of Roman legions from the East. It was also written that the characteristics were similar to those of the funerary architecture of the eastern Mediterranean, and in particular southern Russia and Syria (monuments with an approaching staircase to the vestibule and a central grave chamber with niches or apses - the Russian examples were vaulted and Syrian examples were carved in the rock with robust facades, porticos, and two pillars). With the excavations of the fountain, the building was connected with a sanctuary rather than with a tomb. Since then, according to various authors, it has been defined as a pagan temple, a Roman building dedicated to the Christian cult, a Roman thermal centre that, at the end of the 4th century, was converted into a martyrium where the body of the martyr Prisilian was brought, a sanctuary devoted to nymphs from the 4th century that was later transformed into a Christian church, and a Visigoth Church. The authors recognised two phases of the building, where the first was Roman, and the second, with the addition of side aisles in the 4th century, was Christian. Some thought that the entire building was built around the 4th century and that it later changed its purpose. Finally, some confirmed that the phases of the construction existed, but that they were not related to religious changes (Montenegro Rúa et al, 169, 177-183).

Valtrović wrote that the tomb was "tailored and arranged according to the Roman view of death, with its associated rites and customs in honor and commemoration of the deceased".[33] Đorđe Stričević, according to the tomb disposition and found sculptures, defined it as a pagan one, but stressed the plan of the tomb as an important part of the relationship between the "pagan heroons" and early Christian cult buildings.[34] The late antique sacred space of the tomb actually stands halfway between the cult of the tomb of the deceased hero (mausoleum) from the eastern Mediterranean and the consecrated Christian space of the Roman catacombs.[35] On the eastern wall, on both sides of the entrance, windows were formed from single stone blocks, of which the door itself was formed (Fig. 3). Stričević connected these windows with *fenestellae confessionis*, and the entry area with the columns to the pronaos of early Christian churches.[36] Gordana Milošević writes that the sculptural and painted decoration of the tomb indicates the pagan affiliation of the deceased and that, for now, there is no archaeological evidence for its Christian character, nor a connection with the martyrs Ermil and Stratonic, which is one of the theses of some authors. According to her, the characterisation of ancient tombs according to religious affiliation is not reflected in the internal arrangement or applied constructions, and can be made only on the basis of evidence in the form of Christian representations or on the basis of the general context of various findings.[37]

WALL PAINTING OF THE TOMB

Although it is assumed that all the rooms of the tomb in Brestovik were once painted, today the decoration exists only in the room with graves. As Mihailo Vatrović noticed, in all the rooms of the tomb, the decoration was done as an architectural assembly of the three elements – foot, shaft and ending (Fig. 5).[38]

33 Валтровић 1906, 130.

34 Стричевић 1957, 412-413.

35 Anđelković Grašar et al. 2013, 95.

36 Стричевић 1957, 413.

37 Милошевић 2006, 394.

38 Валтровић 1906, 133.

In the room with graves, the decoration on the wall is made of three broad and three narrow rectangular fields framed in green. In the wide fields, one "upright" rhomb is drawn[39], in a dark colour, and with an inscribed circle of the same colour, while the surfaces around the lines are faintly coloured in yellow. In the centre of the circles, there were painted motifs of birds, Anatidae, and fish, which, at the time of Valtrović's excavations, were not preserved in their entirety, and today have almost completely disappeared. In the narrow fields, "one straight twig is ornamented by three ribbons". [40] A band with wavy lines and a row of "protruding little beams like in a kind of an eave" are located above these fields.[41] On the west wall, there is one wide and one narrow rectangular field on both sides of the niche. The painted motifs within the larger fields did not exist even during Valtrović's excavations, and in the small fields, there are the mentioned twigs. Valtrović's assumption was that above the niche, painted in white or a slightly yellow colour, human beings were also depicted, because in the fragments found in the niche, painted pearls and clothes were seen, and on one of its *in situ* preserved parts, on a blue background, he recognised parts of clothes. On the eastern wall of the space that was largely destroyed after the excavation, and restored in 1964, there are no painted motifs today. Valtrović saw a decoration made of narrow fields with one ornamented twig, on both sides of the entrance. The decoration on the vault of the room with graves reminded him of the "ordinary ceilings in Roman public buildings, made up of coffers" that had "discs" on the corners of the crossed "strings of pearls" and a "rose" in the middle (Fig. 5; Fig. 6; Fig. 7).[42]

As for the central space of the tomb with apses, whose decoration is now completely lost, according to Valtrović's observations, the already mentioned geometric shapes (without rhombs) were used in the central zones of the walls and above them a finishing band with wavy lines was painted. In the narrow fields, there were "thin branches" depicted. The upper zones of the apses were painted in yellow. The decorations, as in the room with the graves, were separated by a red painted band. The background of the decoration was yellowish, the rectangles were green, and the circles were green or yellow. On the outer surface of the entrance wall of the

39 Валтровић 1906, 134.

40 Валтровић 1906, 134.

41 Валтровић 1906, 135.

42 Валтровић 1906, 134-136.

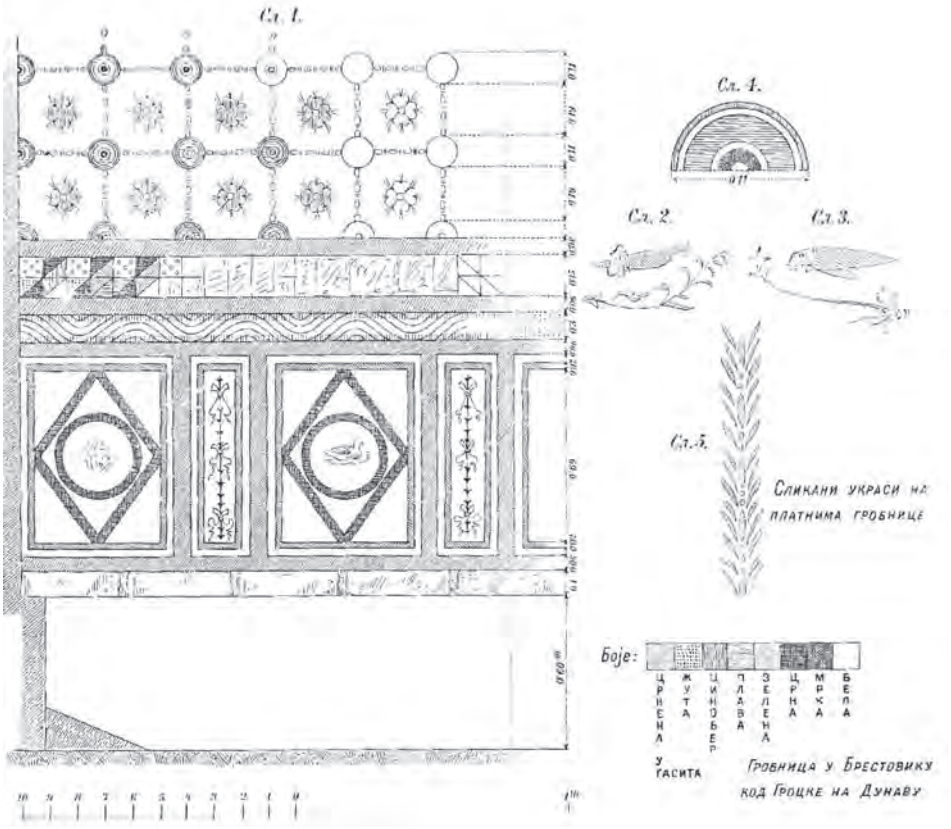


Fig. 5. Painted decoration of the burial chamber, by M. Valtrović (Валтровић 1906, Table V).

room with graves, and in its lower zone, on both sides of the entrance, there was one horizontally laid rectangular field, in which a rhomb and circle were inscribed. In the parts of the eastern and western wall of the central area, and alongside the apses, there were yellow fields with "wider branches". Valtrović's assumption was that the walls and columns of the next, entrance, area were also painted "so that they imitate marble or some other stone" (Figs 4a-4b; Figs. 5-7).[43]

Since the aforementioned authors who wrote about the architecture of the tomb in Brestovik found its origins in the East and in North Africa, i.e. Syria, Asia Minor and Egypt, it is interesting to see how Michael Rostovtzeff *(Михаи́л Ива́нович Росто́вцев,* 1870-1952*),* while describing the buildings created under these influences in southern Russia (when he also mentioned ancient painting in

43 Валтровић 1906, 130-131, 133, 136-137.

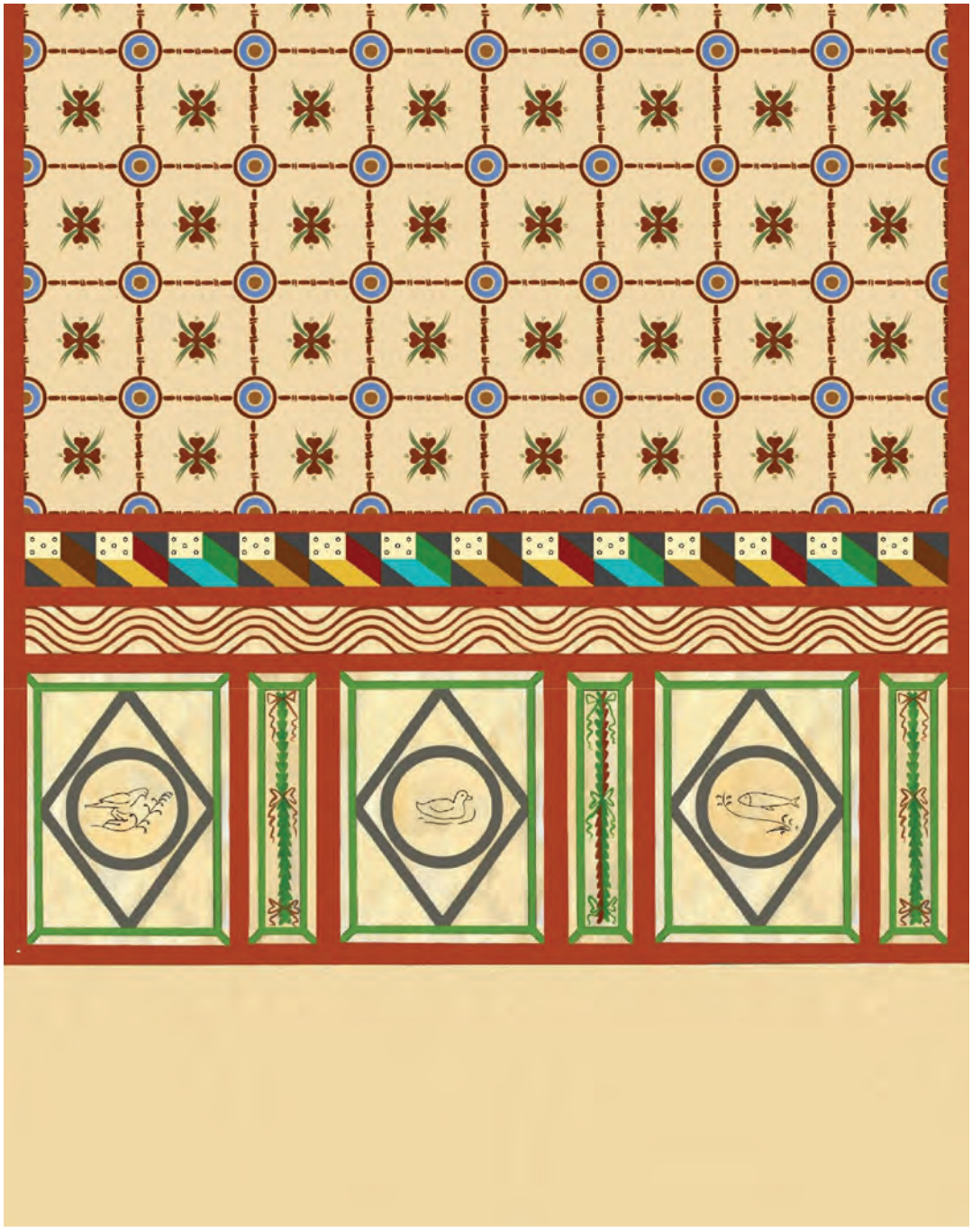


Fig. 6. Painted decoration of the burial chamber - ideal reconstruction of the northern wall (drawing by Dragana Rogić).

the territory of Serbia) - and which Miloje Vasić found analogous to the Brestovik tomb, writes about the development of styles in ancient painting. It was precisely Rostovtzeff who, after Valtrović (in 1917), performed an analysis of ancient painting from the territory of today's Serbia, that is, one grave from *Viminacium*.[44]

In the discussion about monuments from southern Russia, published in 1919, Rostovtzeff gave his overview of the occurrence of styles in ancient painting.[45] For further analysis of the Brestovk tomb painting, two styles are important, which he called "the true incrustation style" and "the floral style". The origin of the first one, according to him, should be sought in Mesopotamia and today's Iran. There, the buildings were usually made of adobe and stone, the walls were divided into zones and, to obtain a polychromous effect, stone plates in one colour were incrusted in others, creating a geometric ornament and separating the figures or scenes one from another. So, the real incrustation style was created by the imitation of this type of wall covering. The earliest painted examples are from Pompeii, and after that, this style appeared everywhere - in homes, catacombs, churches, and tombs, in Rome, Egypt, and Palmyra. Rostovtzeff further distinguishes two

44 Ростовцевь1917; Николић et al. 2017.

45 The oldest system of ancient wall decoration in continental Greece, Rostovtzeff called "the Greek structural style", originating from the very structure of the walls of houses and tombs that had to be rendered and plastered, and during which the different wall zones, depending on the material, were painted differently. The wall of adobe was painted in one colour, the stone base was painted as stone imitation, while the bonding zones of wooden and stone parts were suitable for painting ornaments. He further wrote that later walls of the Hellenistic palaces of Asia Minor and Egypt, mostly made of brick, were covered with stone slabs of different colours, while in rich houses and tombs, stone covering was imitated in painted and stucco decoration, which led to the emergence of the "Hellenistic structural style" also called the First Pompeiian style or the incrustation style. According to Rostovtzeff, it should be called the Hellenistic structural style, as it does not belong to Pompeii, because the incrustation is a completely different technique (the process of incrustation of marble of one colour into marble slabs of another colour), and because the style is similar to the Greek structural style (it differs only by the fineness and richness of the colours and details). During the 2nd and 1st centuries BC, in the period of the economic decline of the East, well-paid Greek artists beautified the palaces and villas of the Romans in wealthy parts of Italy, so further styles were developed here. The enrichment of the Hellenistic structural style using strongly emphasised vertical divisions (columns, pilasters, door frames and window frames) in Italy and the western provinces gradually led to the emergence of the Second Pompeian style - architectural style, an imitation of actual architecture and theatre, and later, to the development of the Third and Fourth Pompeian style. When the East, under the Roman Emperors, became rich again, the Pompeian styles were no longer fashionable, and also not in accordance with "the taste of the new world in the East", where, even during the late Hellenistic period, a simplification of the structural style began, and where in the 1st and 2nd centuries AD, two different styles appeared – "the true incrustation style" and "the floral style" (Rostovtzeff 1919, 147-148, 150-151).

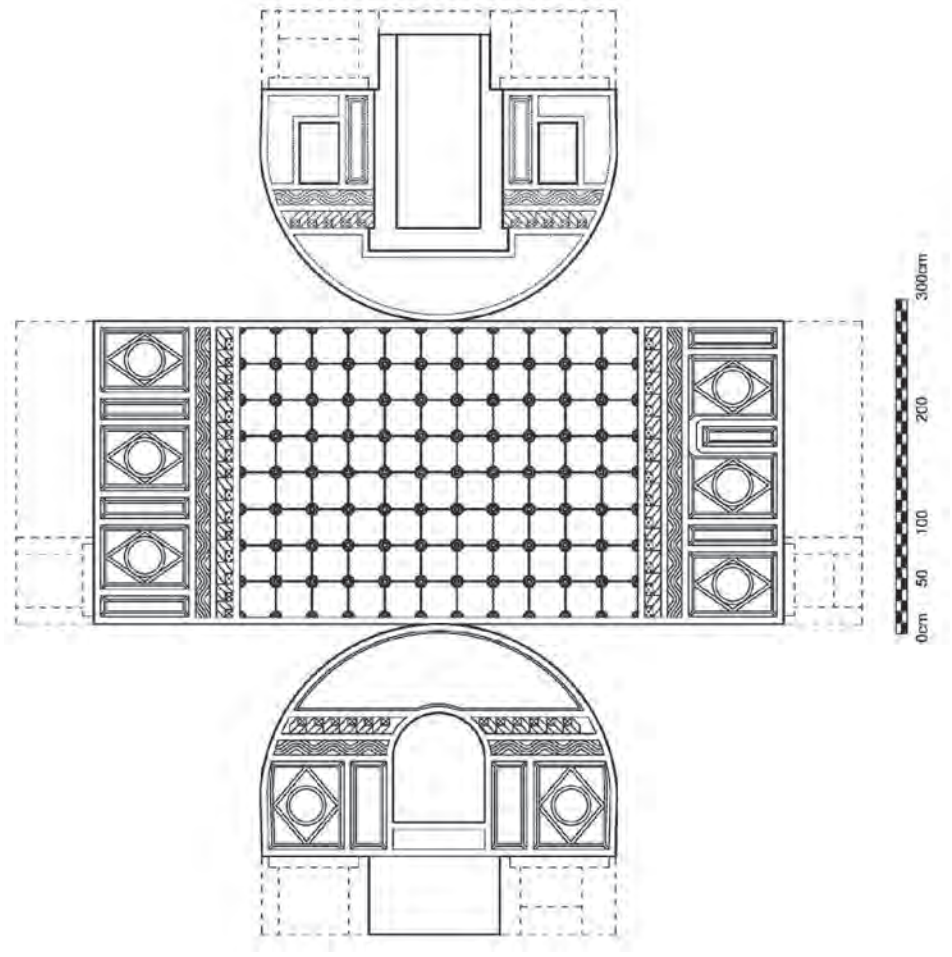


Fig. 7. Painted decoration of the burial chamber today and the reconstruction (photo and drawing by Emilija Nikolić)

groups of floral styles: the so-called "carpet style" and "true floral style". The inspiration for the carpet style was found in the tents of nomadic tribes, covered with carpets. During the Second and Fourth Pompeian style in Italy and in the buildings of North Africa, it seemed that the reproduction of rich woven carpet or fabric with flowers covered the walls or ceilings. According to Rostovtzeff, the true floral style originated from naturalistic tendencies in Hellenistic and Roman art, and fashion developed from the Ptolemaic restoration of Egyptian art, so the walls and ceilings were painted with motifs of flowers, garlands, other plants, and animals, without any order, and with figures in the central fields and lunettes. This style expanded throughout the whole ancient world, with the earliest occurrences in the small home temples of Pompeii, beginning from the second half of the 1st century AD and through the 2nd century AD, and in the sepulchral buildings of Rome and catacombs, the tombs of Leptis Magna and Palmyra, Phoenicia, Salona, Serbia and Bulgaria, but also in the houses in Pergamon and Rome. Consequently, it can not be linked only with religion. At the end of the study, Michael Rostovtzeff concluded that the combination of incrustation and floral style for the late Roman Empire and the Middle Ages become "a style".[46]

Considering the research of the ancient tombs in Serbia until the first decades of the 20th century, with only the tomb in Brestovik and the grave from *Viminacium* mentioned until that time, we can assume that, by writing that, in the ancient tombs in Serbia, free floral style is visible, Rostovtzeff was considering these two structures. However, for the painting of the *Viminacium* grave, in which a three-dimensional meander is depicted, he wrote that it emerged from a typical late Hellenism, almost without any element of incrustation and elements of the floral style, and that it represented a purified Hellenistic decoration originating from Syria and Egypt.[47] On the other hand, in view of the presence of order and geometry, the painting of the vault imitating a coffered ceiling with floral motifs in the Brestovik tomb is difficult to attribute to the free flower style. Rostovtzeff also wrote that since the beginning of the 3rd century, the floral and incrustation styles slowly lost popularity in southern Russia and that there were no rich colours and forms anymore, with everything based on geometry, lines, and contours, whereas after the establishment of Christianity during the 3rd century, painting under the

46 Rostovtzeff 1919, 151-152, 161-163.

47 Ростовцевь1917, 57.

influence of Syria and Palestine returned.[48] In architecture, as well as in the painting of the tomb in Brestovik, Aleksandar Jovanović (1947-2009) saw Syrian elements, actually those of Palmyrian art.[49] For all of these reasons, in relation to the period of creation and the story of geometry, we can also associate the Brestovik tomb with a reduced use of the floral and incrustation styles, i.e. to the mentioned influences related to Christianity and Syria.

Julia Valeva wrote that the decorative system of the tombs of the Eastern provinces from the end of the 4th to the 6th/7th centuries extended a tradition originated in the 1st century AD, as a pattern that persisted until the end of Antiquity: orthostats at the base as the frames for figures, a ceiling or a vault that symbolises the space above the terrestrial one, and a frieze as the border between the real world and the celestial dwellings.[50] In an attempt to make a typology of the painted tombs dated to this period, Valeva made a proposal that considered the deductions of two scientists – K. Myatev (*Крьстю Миятевь,* 1892-1966) (who discerned two groups – a decorative one with vegetative motifs and birds bearing ideas of pagan antiquity, and those with a painted cross, noting that many tombs were between the two groups, reflecting the transition between pagan decorative art and Christian art), and D. Ovčarov (who classified the tombs in more detail, whilst also emphasising the "transition of ancient illusionism to the symbolism of Christian art in the sepulchral decoration"). Thus, while writing about the degradation of ancient constructive systems and their replacement by eclectic systems, she classified types of the tomb painting from the mentioned period into: "pseudo-constructive" ("pseudo-structural"), which followed the constructive idea of ancient wall decoration and bore reminiscences of the decorative ideas of "the structural style" (with orthostats, rows of beams and ceiling boxes),[51] and other types, "totally different from the constructive idea" - with garland festoons on the walls and representations of birds and flowers, or with combinations of symbolic patterns connected to Christianity.[52] Valeva also mentioned here the Brestovik tomb classifying

48 Rostovtzeff 1919, 153.

49 Јовановић 2006, 315 .

50 Valeva 2001, 169-170.

51 Valeva 1989, 1248, 1250.

52 See footnote 45, and the description of "the Hellenistic structural style" made by M. Rostovtzeff.

it, together with the tombs from Silistra and Iznik,[53] as the first type (also writing that in the tombs of this type, instead of coffers, plant motifs could have been used and, instead of beams, ornamental friezes were sometimes present, or there were no bands of any kind on this spot).[54] According to her, this style reflected "the trend towards classicism" at the end of the 3rd and into the 4th century, created to "emphasize the stabilization of imperial power", while the orthostats imitating marble cladding and vegetal motifs on the vault gave this art an eclectic character.[55]

Mihailo Valtrović wrote of the tomb in Brestovik that "a good impression made by decoration with the arrangement of its parts, which are characterized by attractive proportions and easy workmanship, was raised particularly by full and compatible colours".[56] Today, due to fading and, in general, the degradation of some organic colours, they are recognised as some other colours or they do not exist at all.[57] Therefore, today it is impossible to perform an ideal reconstruction of the painted decoration, and the proposal of this study is given on the basis of a combination of all available data, that is, old photographs, the descriptions and drawings of Mihailo Valtrović, a visual overview of today's state of painting by the authors of this study and the knowledge of analogies.

53 Valeva 1989, 1248.

54 These two tombs will be analysed later in this paper.

55 Valeva 1989, 1250.

56 Valeva 1989, 1250.

57 Валтровић 1906, 133. As for the colours used in the decoration of the room with the graves, Valtrović listed yellow ochre ("dark" and "light"), "burnt ochre", cinnabar, blue, green, brown and black, while in the drawing he denoted "dark" red, yellow, cinnabar, blue, green, black, brown and white, which was obviously the background of the whole decoration, since he mentioned yellow-ochre "narrow sprays" and dark yellow "stripes" along the edges, which "softened the whiteness of the surface, which would come up to the surface more than the other colours and thereby spoil the harmony" (Валтровић 1906, 133-135, table V).

ARCHITECTURAL ELEMENTS IN PAINTED DECORATION

Architectural elements were very often imitated in Roman wall painting.[58] From the architectural elements in the preserved painting of the Brestovik tomb, one can recognise the technique of *opus sectile*, the stucco decoration of the coffered ceiling, and beams in the burial chamber, while in the central room, where there is no decoration today, according to Mihailo Valtrović, there was painting depicting the technique of *opus sectile* (Figs. 4a-4b, 4d-4e; Figs. 5-7).

Opus sectile. Throughout the history of art and architecture, the walls of many luxurious buildings, most often in the area of the socle, were covered with rectangular stone slabs, but also with various stone forms using the *opus sectile* technique. The same decorations were performed in the imitation of slab compositions or stone textures with line and colour in wall paintings.[59] Michael Rostovtzeff wrote that schemes and decorative wall painting systems never change, regardless of whether they are used for "decoration of the flats for the living or dead people".[60] Thus, the technique of *opus sectile* - which we associate with Rostovtzeff's "real incrustation style", besides in public and private buildings, was also used to paint tombs, where marble and its structure were often realistically imitated, but also where the technique served only as a geometric inspiration, as is the case on the walls of the Brestovik tomb (Figs. 8a-8b).

As has been already mentioned, the wall zones above the graves on the southern and northern walls of the room with graves in the Brestovik tomb are divided by wide red bands into six rectangular fields - three wide and three narrow fields. Within each rectangular field, a frame is painted with a narrow green line. The angles of each green frame are connected, by green diagonal lines, with the inner corners of the red bands. These short diagonal lines create the impression of three-dimensionality, that is, the bevelled and processed edges of the stone. Multicoloured marbles are not imitated here, but geometric shapes characteristic of the *opus sectile* technique, in which figural and vegetative motifs are placed,

58 Valtrović noted that the black colour he saw could also come from some other colour, such as blue or brown (Валтровић 1906, 134).

59 Some were discussed in Rogić, Nikolić 2016, where, through the analyses of *Sirmium* painting, examples of painted architectural elements in profane buildings were presented.

60 More on stone imitation in Rogić 2018.

Fig. 8. Opus sectile: a.b. Brestovik tomb (photos by the authors of the paper);

c. "Tomb with the Anchor" in Niš (Ракоција, 2009, Fig. 27);

d. Model of tomb no.7 in Sofia (Valeva 2001, 168, Fig. 1);

e. "Tomb of the Banquet" in Constanța (Valeva 2001, 173, Fig. 15);

f. Burial chamber II in Pécs (© User:Thaler / Wikimedia Commons / CC BY-SA-3.0; (https://commons.wikimedia.org/wiki/File:%C3%93keresztt%C3%A9ny_mauz%C3%B3leum2.JPG);

g. The Episcopal Basilica in Stobi (Dimitrova 2012, 22);

h. Grave no. 16, Thessaloniki (Μαρκή 2006, πινακασ / T. 18);

i. Early Christian tomb 1903, in Sevastopol (Zavadskaya 2013, 50, Fig. 11);

j. Grave no. 8, found below St. Sophia, in Sofia (Kitanov 2014, Tafel CXC –Abb.1).

are shown. In this way, the composition deviated from the strict form of the technique. Rectangles, rhombs, and circles in wide fields are underpainted with light ochre, and their form is highlighted in green. The circles form discs that take the role of medallions with painted animal imagery. In this case, the rhombs *frame* the medallions and *break* the rectangular composition. The narrow rectangular fields are formed in a similar way to the wide fields, but without rhombs and circles, and with garlands– twigs, as was already described before[61] (Figs. 5-7; Figs. 8a-8b).

A large number of lower zones in ancient painted tombs had an imitation stone lining. In Serbia, this is the case with the "Tomb with the Anchor" in Niš (*Naissus*) (Fig. 8c).[62] Analogous motifs are also encountered in tombs no. 7,[63] and no. 9 in Sofia (*Serdica*) (Fig. 8d),[64] in the "Tomb of the Banquet" (Fig. 8e),[65] and in the crypt of the Paleo-Christian basilica in Constanța (*Tomis*).[66] Various marble incrustations are also painted in burial chamber II in Pécs (*Sopianae*) (Fig. 8f).[67] In the Episcopal Basilica in *Stobi*, on the lower zone of the walls, there are painted panels separated by painted pilasters (columns), dated to the first half of the 4th century. The panels are formed with rhombs in rectangles, and inside the rhombs there are discs or squares (Fig. 8g).[68] Circles inside rhombs, like in Brestovik, can be seen in grave no. 16 (Fig. 8h) and grave no. 53 from Thessaloniki (*Thessalonica*), dated to the 4th century.[69] However, figures, vegetative motifs or scenes within geometric fields in painted imitations using the *opus sectile* technique are not frequent. Vegetative motifs (trees) in medallions within rhombs inside rectangles can be seen in the early Christian tomb 1903, in today's Sevastopol (*Chersonesus*) (Fig. 8i).[70] A similar

61 A group of French authors dealing with Roman painting classified the geometric scheme used in opus sectile of the Brestovik tomb, as one of the characteristic schemes using the rhomb as a basic figure (Barbet et al., 1997, 12).

62 Rostovtzeff 1919, 145.

63 Ракоција 2009, 94-95.

64 Valeva 2001, 174, Fig.17; Миятевь 1925, 55-67, Figs. 20, 21; More on the tomb see in: Valeva 1986.

65 Valeva 2001, 168, Fig.1; Миятевь 1925, 86-105, Figs. 31, 32.

66 Barbet, 1994, figs: 2,8 and 9; Valeva 2011, 173, Fig.15, 179, Fig. 30.

67 Barbet, Monier 2001, pl. XLI-XLII, 377-378, Figs. 3, 4, 6.

68 Magyar 2009, 113, 114, Fig 6.

69 Blaževska, Tutkovski 2012, 12,13,16; Dimitrova 2012, 22, 24; Tutkovski 2012, 38.

70 Μαρκή 2006, 172, 173: Σχέδ 124, 174, 175: Σχέδ 126, 223, πινακεσ 18, 20.

division of the fields on the wall is, like in Brestovik, carried out in the vaulted grave no. 8, found below St. Sophia in Sofia, dating back to the late 3rd or early 4th century. The wide rectangular fields on the walls are empty, but with accentuated plasticity, while in the narrow fields, vertically set twigs are present. Some authors describe this decorative system as a product of influences from Asia Minor (Fig. 8j).[71]

Here, the words of Mihailo Valtrović can be quoted, who, in his description of the tomb in Brestovik, wrote that "the painted surfaces showed the character of the stone slab lining", "striving for the excellent impression of the walls in rich, monumental buildings".[72] However, today, some authors have a different attitude from that of the past, when it was believed that the imitation of marble by some other technique was due to the lack of material resources, although it is a fact that the purchase of marble was expensive.[73] One fact that the authors Vranešević and Špehar use to support the contemporary attitude is that rich Roman families often decorated their villas by painting imitations of marble, and cite the example of "the Villa with Peristyle" in *Mediana,* dated to the beginning of the 4th century. They also apply this to early Christian buildings, where, despite this painted decoration, the remains of marble were found, noting also that in the triconchal church in Caričin Grad (*Iustiniana Prima*), there is a painted imitation of the *opus sectile* technique, as well as mosaics of high quality.[74] Authors Vranešević and Špehar write that ancient man evaluated the visual impression more than the authenticity of the materials used for decoration, and that the marble was not only a decoration but also an active surface that produced a certain impression on the viewer. According to them, the imitation of marble in painting formed a new image of the material through the painted image, and something "powerful and strong", such as the marble, attained immateriality.[75] The difference in its use in buildings built by the wealthy citizens of the Roman Empire and later Christian buildings, as they write, is that this "deception" did not have a status related function in Christianity, because they adopted the technique only as a traditional

71 Zavadskaya 2013, 41, 49, 50, Fig. 11.

72 Kitanov 2014, 669, Tafel CXC –Abb.1. About the tomb see also in: Миятевь 1925, 68-85, Figs. 24, 25, 26, 30.

73 Валтровић1906, 133.

74 Вранешевић, Шпехар 2016, 50.

75 Вранешевић, Шпехар 2016, 50-52.

practice in accordance with the time in which they lived.[76] However, we can quote Gordana Milošević, who wrote that the elements of pagan and Christian decoration were indeed shared and taken from the architecture of monumental public buildings, and that, in addition to their religious attitudes, Christians "did not easily deny to show a costly and luxurious grave".[77]

THE BEAMS

The depiction of beams is much more common in ancient mosaics than in painting. One painted example is that from the tomb in Brestovik (Figs. 5-7, 9). The beams are shown here in an oblique projection on three walls of the room with graves and painted in different colours. Their frontal sides were white and, as Mihailo Valtrović wrote, had "the decoration of five small wheels".[78] According to his drawing of the southern wall, viewed from the east to the west, they were arranged in the following sequence and combinations of colours: red-yellow, cinnabar-yellow and green-blue, and so on with repetitions.[79] Unfortunately, the decoration of these five white circles in a *quincunx* arrangement is now lost, and the colours of the beams can not be fully recognised. Valtrović wrote that the beams on the northern, southern and western walls were differently depicted in relation to their directions. However, in the drawing of the southern wall, he marked a change in the direction of the beams, which is characteristic only for the western wall. The drawing also lacks the edge bands of the vault, and some dimensions are incorrectly written, so it is likely that this drawing could have been a scheme (Fig. 5).[80]

An example of a beam representation in wall paintings is found in the Hellenistic age. The tomb in Kazanlak, Bulgaria, dating back to the late classical and early Hellenistic period, is a Thracian tomb in which pictorial and decorative elements produce an overall effect in the manner of the "well-known Ionic decora-

76 Вранешевић, Шпехар 2016, 52.

77 Вранешевић, Шпехар 2016, 52.

78 Милошевић 2006, 380, 394.

79 Валтровић1906, 135.

80 Валтровић1906, 135, table V.

Fig. 9. Depiction of the beams in the Brestovik tomb (photos by the authors of the paper).

tive style".[81] Here, the beams are painted in a circular edge band in the dome of the tomb, as part of an Ionian cornice and defined as a denticulated motif by Živkova, who also concluded that the three Ionic columns in the chariot race frieze are actually the only architectural detail in the tomb's decoration.[82] The frontal sides of the beams are white, with short dark ochre lines, which seem to show the structure of a tree, while the two other sides are dark ochre (Fig. 10a).

In the vaulted Macedonian "Tomb of Lyson and Kalikles" in Lefkada, dating back to 168 BC,[83] painted pilasters (or perhaps columns), architrave and mutules with guttae in the Doric order, are shown (Fig. 10b). Here, it can be undoubtedly determined which architectural elements are represented regarding the reality of the display, but for later presentations (except perhaps those from the scenes of the Second Pompeian style), regardless of their complexity, it is often difficult to

81 One of the mistakes is the drawing of the coffered ceiling, which is actually a grid of 8 fields x11 fields, while Valtrović drew a grid with a side of 9 fields. See in: Валтровић1906, table V.

82 Zhivkova 1975, 38.

83 Zhivkova 1975, 69, 72, Figs. 17, 20, 26.

connect them with certain elements.[84] Thus, they can be an imitation of decorative elements of architecture (mutules, dentils, and modillions, which differ in appearance depending on the order), as well as structural elements of the roof (rafters) or some of the horizontal beams (ceiling joists). However, henceforth, this motif will be called *beams*, since decorative stone elements were probably created due to the *petrification* of wooden construction beams[85], and also because of their probable symbolic role in the painting, where, although decoration, they had a kind of constructive function – serving as "carriers of the vault"[86], as Mihailo Valtrović felt in his first encounter with the tomb in Brestovik, as did Miloje Vasić, who described them "very plastically represented beams", which *carried* a roof, i.e. a vault.[87]

In the next examples of tombs, the beams are painted in several colours, and most often the frontal side and other two sides of a beam are differently coloured, although there are examples where all three sides are different, as is the case with the tomb in Brestovik. Sometimes all the beams are painted in the same way, while in some cases there are two or three different beams that change in a row. However, the frontal side of a beam is always light. Sometimes the beams have specific decorations on the frontal side which look like tree rings or carry decoration in the form of dots in different arrangements.[88]

Carved into a rock and in an irregular form, in the tomb of Kerch 1872, in southern Russia, formerly *Pantikápaion*, the capital of The Bosporan Kingdom, dating from the 2nd century AD, the entire lower zone was decorated with an imitation of the *opus sectile* technique, and the pilasters were also painted. Above the pilasters the precisely drawn beams are represented in an oblique projection and

84 Grobel Miller 1993.

85 Николић et al. 2017, 201. Wooden beams are very realistically depicted in Pompeian painting. One of the many examples is the table in *Casa di Apolline* in Pompeii, whose painting belongs to the Fourth Pompeian style (Strocka 2014, Tafel I, Abb. 2). As one of the many examples of the Second Pompeian style with depicted beams, we can specify Room 23 from *Villa Oplontis* (Stinson 2011, 414, Fig. 9). In these Pompeian cases, the beams are depictions of wooden beams in clear architectural constructions, mostly roofs in architectural scenes. In the Second Pompeian style, stone cornices with dentils are often painted, like in of *Villa Ariana* in *Stabiae*. (Fig. 10d) The dentils are also often depicted in the stucco decoration of the First Pompeiian style, which we can see in "The Samnite House" in Herculaneum (Fig. 10c).

86 Discussions on this see in: Wilson Jones 2002; Ridgway 1966; Washburn 1919; Holland 1917.

87 Валтровић 1906, 135.

88 Васић, 1906, 139-140.

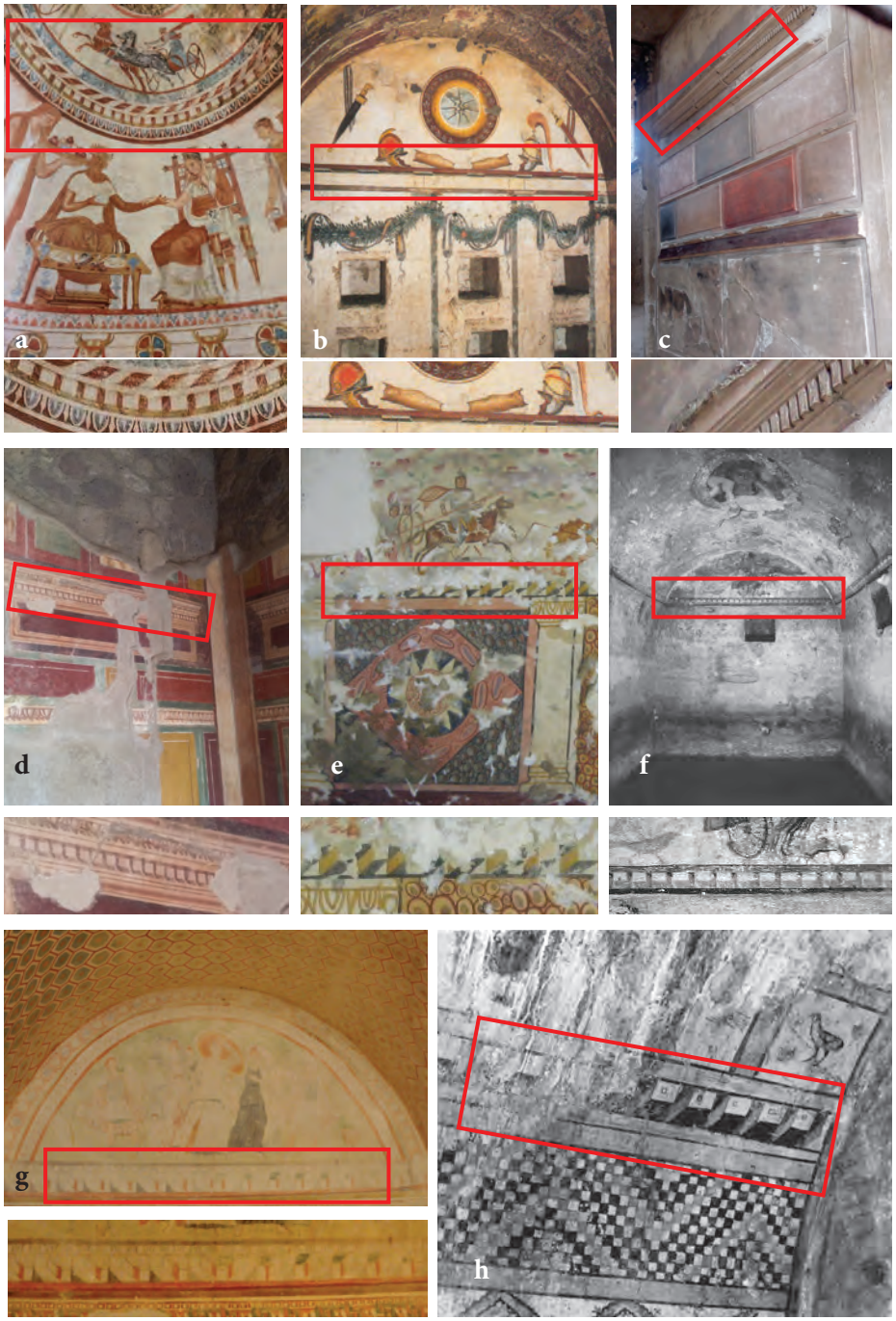


Fig. 10. The beams:
a. The Kazanlak tomb (Živkova 1975, Plate 20);

b. "Tomb of Lyson and Kalikles", in Lefkada (Rhômiopoulou 2007, 24, Fig.11); ;

c. "The Samnite House", in Herculaneum (photo by the authors of the paper);

d. Villa Ariana, in Stabiae (photo by the authors of the paper);

e. Tomb of Kerch 1872 (http://bosporuscrypt.ru/content/crypts/crypt_1872_img.htm?pict=0&arr=12-28);

f. "The Demeter Crypt", in Kerch (Савостина 2009, http://bosporuscrypt.ru/content/library/text_04_04.htm; Зинько 2009, http://bosporuscrypt.ru/content/library/text_04_03.htm);

g. "The Tomb of Three Brothers", in Palmyra (© Livius.org / CC BY-SA-3.0, https://vici.org/image.php?id=5867)

h. Tomb "A VI 2", from Anemurium (Russell 1977, 52, Fig. 8).

in two colours, with a white frontal side, on a dark background. Above them, on the vault, there are vegetative motives, that is, apples (roses) and leaves, as well as horsemen, wild animals, trees and a square mesh of crossed bands and fields with an imitation of marble texture (Fig. 10e).[89] In the vaulted tomb of Kerch, bearing the name of "The Demeter Crypt", dated to the period of the 1st century AD, walls painted with vegetative motifs, grapes and human figures are separated from the vault (in the centre of which is a medallion with the head of Demeter surrounded by flowers and birds) by a band of beams in an oblique projection, while in the lunettes there are vegetative motifs and scenes from mythology.[90] The frontal side of the beams is white, the other sides are ochre-coloured, and the beams are arranged in one continuous direction along the whole tomb, that is, they create a continuous band crossing from one wall to another. The background is black, one can see the link of the beam with the element of the construction behind, but the beams look like dentiles. They appear to be individually displayed in a slightly inverted perspective (Fig. 10f). In a vaulted tomb near Anapa, ancient *Gorgippia*, also in southern Russia, painted in the 3rd century AD, in the lower zone of the walls, stone blocks in several rows are shown, above which is a cyma, then a three-dimensional polychrome meander, and a row of white dentils on a dark red background, while the vault is coloured blue.[91]

Painted beams can be seen in the "The Tomb of Three Brothers", which was built in the middle of the 2nd century AD and painted until the half of the 3rd century, found in the south-western necropolis of Palmyra.[92] These beams are an imitation

89 Dot arrangements can be further discussed within the history of ornamentation, as well as within symbolic systems.

90 Burgunder, Sinenko 2010, 913-914, Fig.1.

91 Зинько 2009.

92 Ернштедт 1955, рис. 4. A similar example can be seen on the wall paintings of a house in Kerch dating back to the 2nd century BC, where a black-coloured socle, rows of stone in different colours and dark bands, spiral floral ornaments, a three-dimensional meander and dentils are depicted. Some authors see here evidence that Greek craftsmen from Asia Minor worked on the buildings of ancient *Pantikápaion*. These decorations are also frequent in houses in Delos and Alexandria as well as in Priena (Ернштедт 1955). An example of painted beams in a profane building is also found in house II, unit IV, in Ephesus, built in the 1st century BC, and whose subsequent phases can be traced to the 7th century. During the early 3rd century, a garden with flowers, trees, fruits and a blue sky, as well as birds, were painted above a socle of marble slabs in the yard. Above the tree line, there is a row of very realistically depicted beams in an oblique projection that are part of the architectural construction shown in the same projection, and which frames the whole scene. In the second phase

of simple stone modillions, which are elements of the cornice in Corinthian and Composite order, realistically represented by the interconnection and the connection to the structural elements to which they belong. In the lunette, characters from Greek mythology are shown, and there is also the painted opus sectile technique in the lower zone of the walls, with the use of laid rectangles in which rectangles with circles are painted. An almost monochrome cornice with modillions (the colours are faded) is located on all four walls. This tomb depicts Palmyrian art, which, according to some authors, was developed between Hellenistic and local traditions.[93] Here, the modillions are shown in an oblique projection. Below the lunette they are symmetrically separated in two directions, while on the longitudinal walls they have one direction, but opposed to the row below the lunette, so at the joining of the longitudinal walls and the lunette the frontal sides of the modillions face each other and, thus, do not give the impression of the continuity of the cornice. However, on the other hand, this situation creates a new spaciousness, where it seems that the cornice aspires towards the heights (Fig. 10g).[94] Julia Valeva defines this tomb as an example of a tomb from the imperial epoch, whose painting solution was later "prolongated" in the tombs of Brestovik, Silistra and Iznik, having a band of beams as "the illusion of an enlargement of the space".[95]

In a vaulted tomb, named "A VI 2" at the necropolis in *Anemurium*, in present-day Turkey, dating back to the 3rd century,[96] beneath zoomorphic depictions on the ceiling, divided into fields, there is a rich precise geometric decoration of the upper zone with bands formed of crossed zig-zag lines that made a series of squares (or rhombs), that is, a chessboard of colourful squares (whose analysis requires special attention, with regard to the origin of the ornaments and its use in wall painting) and a row of beams in an oblique projection. They have light frontal

of the decoration, motifs of marble imitation were painted over the scene (Hembrey 2008, 28, fig. 41).

93 Hembrey 2008, 9-10.

94 Eristov, Vibert-Guigue 2014, 349, Tafel CXXII – Abb.1 Abb.2.

95 As decoration, a similar depiction of beams – modillions, can be seen in the tablinum of the *Villa d'Orbe Boscéaz,* in Switzerland, dated to the second half of the 2nd century AD (Luginbühl et al. 2001, 49, 50, 67, fig. 61). They are present in the mosaic floor, as a frame of the whole space with geometrical motifs and depictions of Achilles on Skyros. The modillions are very precisely represented, arranged in an oblique projection and symmetrically set in relation to the longitudinal axis of the mosaic. Their frontal sides are light ochre, the other sides are dark ochre, the bottom is brown, and the construction elements above are represented in several colours. The background is black.

96 Valeva 2001, 171-172.

sides with a small square displayed on them (Fig. 10h).

On the walls of vaulted tomb in Iznik (*Nicaea*), in present-day Turkey, dating back to the middle of the 4th century,[97] wide rectangular fields can be seen in the lower zones of the walls, filled with geometric motifs and harmonious representations of birds and vegetative motifs, as well as narrow fields with upright twigs, as in the tomb from Brestovik. The geometric field decoration includes rhombs, squares, and triangles, mutually combined in a composition that imitates *opus sectile*. Above this zone, a frequent and simple floral motif is painted, and then we see a motif of the beams in an oblique projection, like in Brestovik, which is not present on all the walls but only on the longitudinal ones. On the main wall of the tomb, the Christogram is present. Two differently coloured beams alternate, with white frontal sides and white-coloured decoration that resembles tree rings, and two other sides painted in two colours (green or red lower surfaces and ochre and pink lateral sides), on a black background with three white points. Alix Barbet described the beams as solids in perspective having optical illusion, with dots as nails, comparing the tomb painting with the one in Silistra, but also with the Brestovik tomb. She accepted the tomb decoration as a part of an iconographic and stylistic tradition of the 4th century, and a representation of the Christian paradise[98] (Fig. 11).

In a vaulted tomb in Silistra (*Durostorum*), in today's Bulgaria, dating back to the middle of the 4th century,[99] there are painted human figures on the walls within rectangular fields, above which there is a band with beams shown in an oblique projection in two colour variants, so that the trio consisting of green-blue and two orange-yellow beams with a white frontal side and red dots on them alternate. Dots are also present in the interstices in the lower zone of the band, while in the upper zone the space is filled with a dark colour without dots. Some authors link guttae shown on mutules with these dot-wreaths of points.[100] Above the beams, on the frontal wall, there is a lunette with peacocks. Although imprecisely executed - the beams are depicted in mutually different dimensions and bevels, there is the symmetry of the beams' representation in relation to the longitudinal axis of the

97 Hembrey 2008, 6-7, Fig. 6; Russell 1977, 45-46, 48, 52, Fig.2.

98 Barbet 2013, 69, 73.

99 Atanasov 2007, 450. More on the tomb, see in: Димитров, Чичикова 1986.

100 Зинько et al. 2009.

Fig. 11. The tomb in Iznik:
a. Painted surfaces,

b. Plan and cross-section (Firatli 1974, 921, 923, Figs. 129-130);

c. Southern wall (Barbet 2013, 80, Figure 10);

d. Painted beams (Barbet 2013, 81, Figure 12);

e. Western wall (Barbet 2013, 78, Figure 6)

f. Eastern wall (Barbet 2013, 77, Fig. 4).

vault. The beams on the left side of the wall with the lunette are depicted as they are viewed from the right, and the beams on the right side of the wall are depicted as they are viewed from the left. These directions are followed on the longitudinal walls, as the line of the beams continues, enclosing the space of the tomb at the entrance wall, where the directions of the beams cross in the space above the line. In contrast to the tomb in Brestovik, here the beams go from the centre of the frontal wall to the outside, and not the other way around. Georgi Atanasov wrote that the artist in the Silistra tomb probably wanted to portray the line between the earthly life and the desired eternal one when painting these beams.[101] He also mentioned the motif of beams as "illusionary", but "very well molded" elements as "perspective trimmer joists."[102] According to Atanasov, decorative system and simplified architectural - spatial composition with the Roman - Hellenistic elements, as well as mirror symmetry and inverted perspective he recognized in the depiction of beams, are part of the last classical phase in the tomb painting. He connected the Silistra tomb painting with the rule of the Constantine the Great and his heirs. It was an epoch, as he wrote, that brought the end of the classical pagan art and the preparation for the expression of the early Christian art[103] (Fig. 12).

In the tomb found in Beit-Ras, Jordan, we find an interesting motif of the beams, forming a circle, painted in one arcosolium. The tomb is dated to the 2nd century AD. The beams, painted on the black background, are coloured identically to those in Iznik, but have the five black dots like those in Brestovik. In the other arcosolium, the twisted rope is depicted, painted with the same colurs. The stone imitation is presented in the lower parts of the walls, while in the upper zones, there are different scenes. Here, the motif of beams in the arcosolium can be interpreted as an ornament, considering the presence of the twisted rope ornament in the analogous spot on the other arcosolium[104] (Figs. 13a-13b).

The vaulted grave no. 49, was damaged by infrastructure works in Apolloniados Street, in Thessaloniki. It is dated to the first half of the 4th century. In the lower zones of the four walls stone plates are imitated, the middle zones are filled with Christian scenes, and above it, a band with a continuous rhomboid pattern

101 Atanasov 2007, 450.

102 Atanasov 2014, 13.

103 Atanasov 2014, 15

104 Base Décors antiques 2017, BEIT.00004.

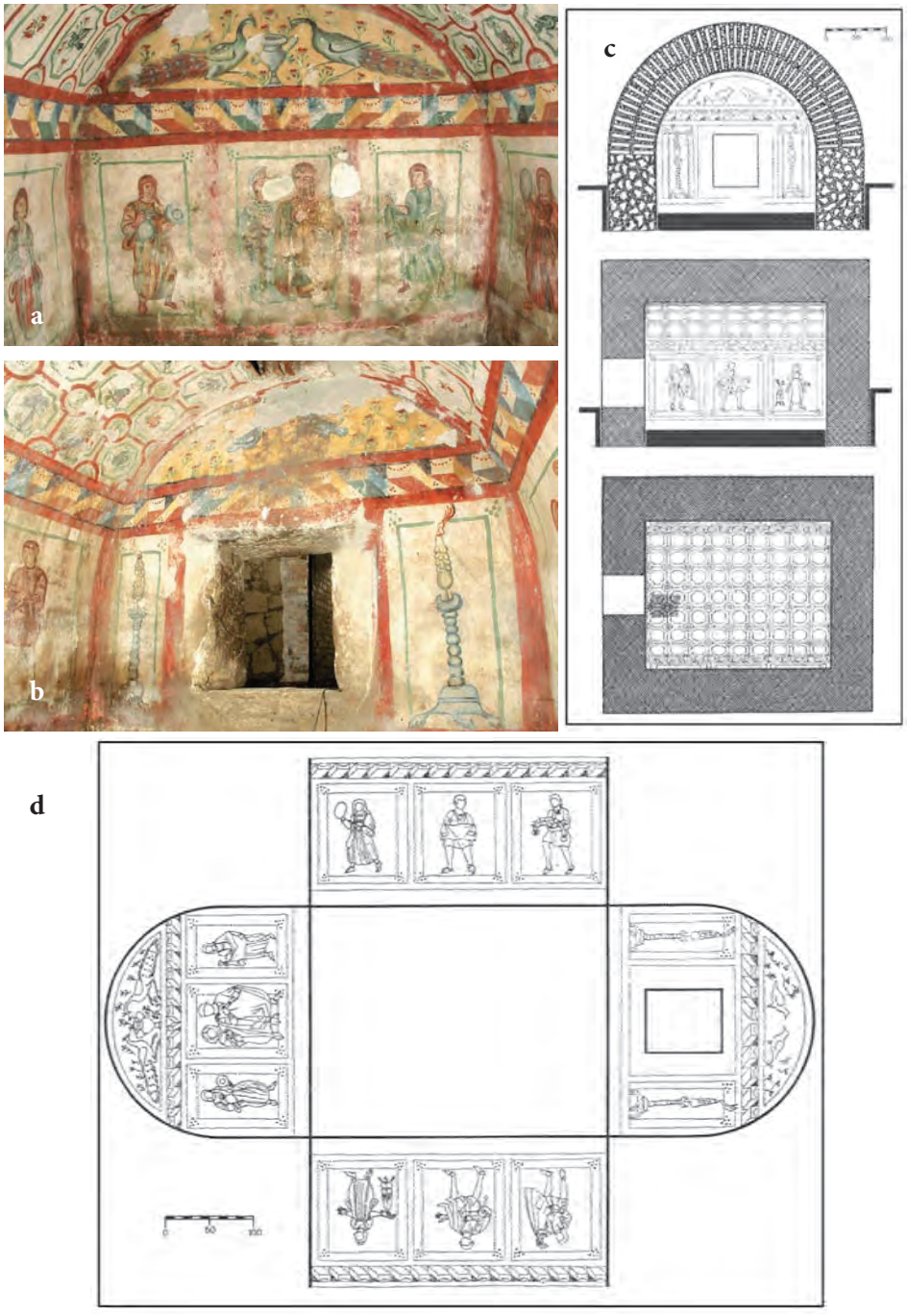


Fig. 12. The tomb in Silistra:
a. The view from the entrance (Atanasov 2014, 1, Fig.1);

b. Eastern wall (Atanasov 2014, 24, Fig.30);

c. Plan and sections (Atanasov 2007, 462, Fig.4);

d. Painted surfaces (Atanasov 2007, 463, Fig.6).

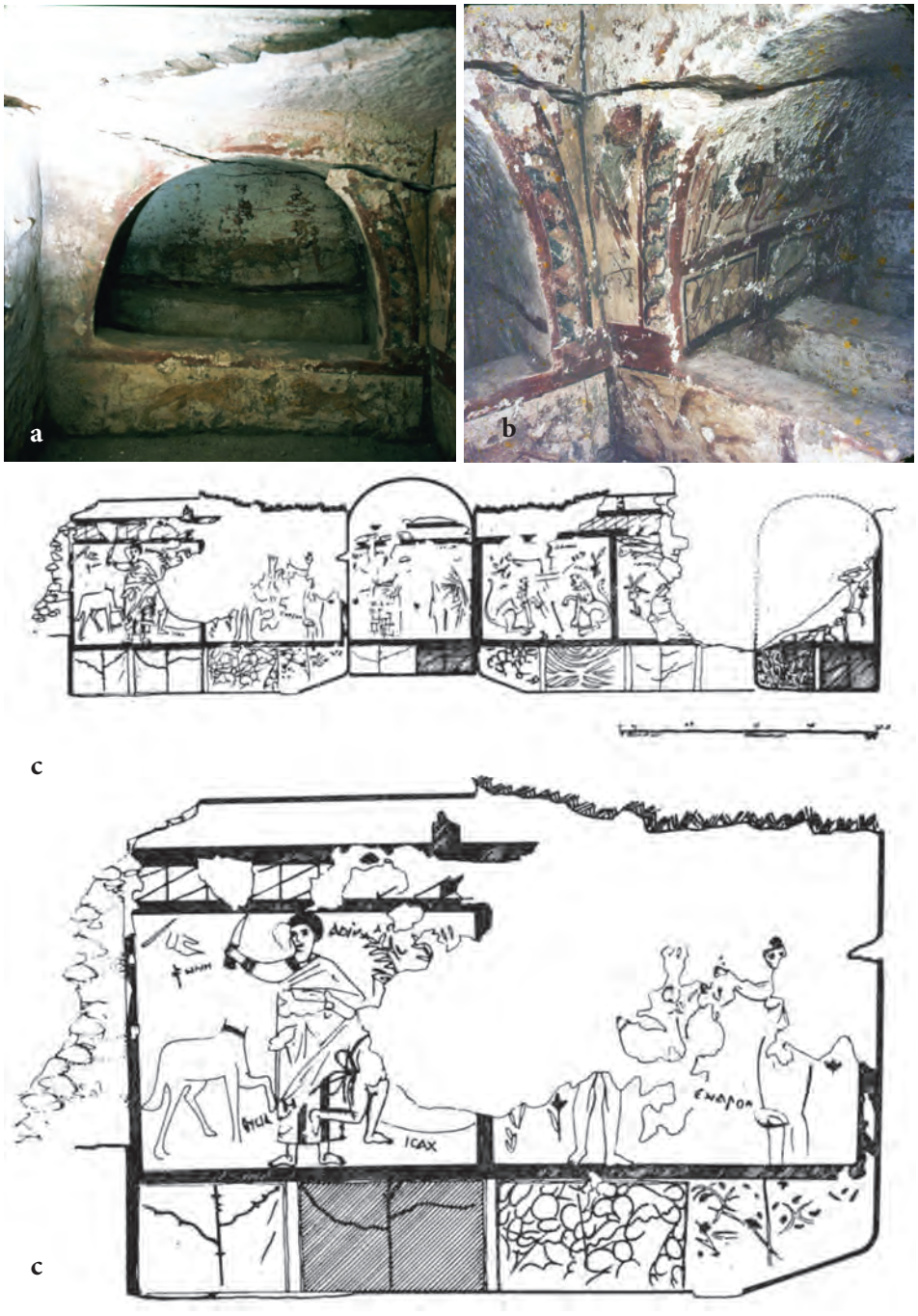


Fig. 13.
Arcosolium in the tomb of Be-it-Ras, Jordan
a. From Base Décors antiques - UMR 8546 CNRS/ENS - AOrOc - Archéologie & Philologie, OPUS Alix Barbet Saisie, Image No. Inv BEIT.00010 (Methodologie de la base: Alix Barbet, Joëlle Carayon. Conception, architecture et conventions de saisie: Joëlle Carayon, CNRS – IMR 8546,) (http://129.199.58.244/fmi/iwp/cgi?-db=DE-CORS_ANTIQUES_2013%20base-m%C3%A8re%2B-pays&-loadframes)

b. From Base Décors antiques - UMR 8546 CNRS/ENS - AOrOc - Archéologie & Philologie, OPUS Alix Barbet Saisie, Image No. Inv BEIT.00004 (Methodologie de la base: Alix Barbet, Joëlle Carayon. Conception, architecture et conventions de saisie: Joëlle Carayon, CNRS – IMR 8546) (http://129.199.58.244/fmi/iwp/cgi?-db=DE-CORS_ANTIQUES_2013%20base-m%C3%A8re%2B-pays&-loadframes)

Grave no. 49, in Apolloniados Street, Thessaloniki (Παζαράς 1981, 380, 381, Σχέδ 5-7, Πίν. 4.):
c. Painted surfaces,

d. Southern painted wall, detail with beams

is present. This band is associated with the beams presented in Iznik by some authors (Figs. 13c-13d).[105]

An interesting painted geometric composition on the walls, made of squares and inscribed circles, alternating with narrow fields with twigs and a band of small dark squares above is presented in the vaulted "Tomb of Cristo-Sole" ("Mausoleum M", or "The Tomb of the Julii") in the Vatican necropolis. The tomb was originally built as pagan, and was painted. However, in the 3rd century it was redecorated with Christian scenes in mosaic, which have been preserved only partially on the lunettes and the vault.[106]

In the Spanish city of Lugo, there is the sanctuary of Santa Eulalia de Boveda, where we find an interesting example of a motif of beams in an oblique projection on the walls, at the level of the cornice, presented in two rows. However, some authors call it a motif of a chessboard in perspective,[107] or "a double net of real and diminished squares"[108] (Fig. 14). The beams are represented here in two rows with bright sides and on a black background. The motif was called "the chessboard" by those who attributed the building and its art to a pagan origin, finding parallels in Pompeii, but also in catacombs.[109] However, it is undoubtedly a motif of beams, depicted very illusionistically. It is achieved using a combination of colours (white coloured frontal sides, and the other two sides painted in blue and black) which allows us to imagine more rows above and under the presented two, and makes the motif look like an ornament. The vault is painted in the central part as a coffered ceiling, with geometric motifs of rhombs and, in the other zones, as a coffered ceiling with crossed coloured bands in the form of flower buds, which form fields with depictions of birds. With the same motifs, the arcades and frontal wall are painted.[110] The assumption is that in a zone that is not preserved there was an imitation of the *opus sectile* technique under the motif of the beams.[111]As an analogous example, some authors use the Iznik tomb, which is religiously affiliated

105 Μαρκή 2006, 142-145, Σχέδ 77-80; Παζαράς 1981, 379-382, 388-389, Σχέδ 5-7, Πίν. 4-8.

106 Smothers 1956, 300-301

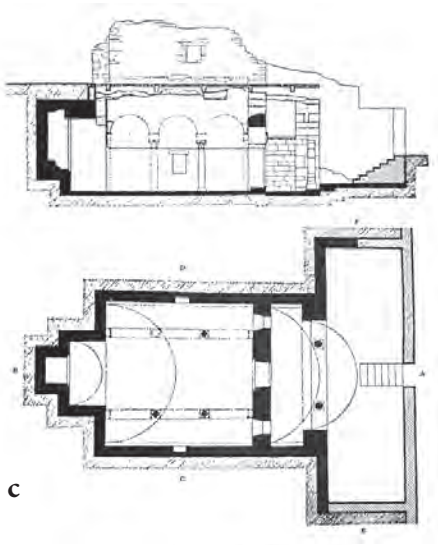
107 Blanco-Rotea et al. 2009, 195.

108 Guardia 2002, 267.

109 Montenegro Rúa et al., 169, 177-183.

110 Blanco-Rotea et al. 2009, 183, 185, 195.

111 Blanco-Rotea et al. 2009, 184.



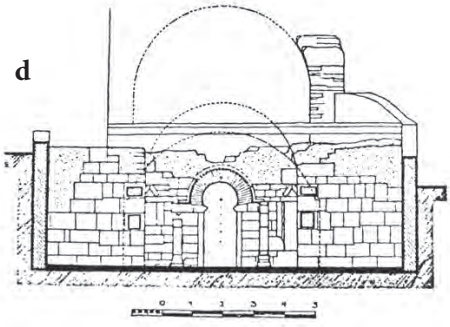


Fig. 14. Santa Eulalia de Boveda:
a. Entrance to the building (© Potoma15 / Wikimedia Commons / CC BY 2.0, https://commons.wikimedia.org/wiki/File:Santa_eulalia_de_boveda_fachada.jpg)

b. Interior space (©File Upload Bot (Magnus Manske) / Wikimedia Commons / CC BY 2.0, https://commons.wikimedia.org/wiki/File:Templo_romano_de_Santalla_de_B%C3%B3veda.jpg);

c. Longitudinal section and plan,

d. Elevation of the entrance wall,

e. The painted beams (Blanco-Rotea et al. 2009, 151, 184, Figs. 3, 35);

f. The painted beams (Montenegro Rúa et al. 2008, cover page).

by the presence of the Christ monogram.[112] The painted motifs are located in the vaulted part of the building with two arcades on the columns that divide the space, and the construction of the sanctuary is connected with different periods of history, with the earliest one placed in the 3rd century AD. During numerous attempts at identifying the sanctuary as either pagan or Christian, the painting has been placed in different periods, i.e. in the 3rd, 4th, 5th or even the 9th century (Fig. 14).[113]

To date, there are no painted examples of beams in ancient tombs on the territory of Serbia, except in Brestovik.[114] Two painted depictions of a three-dimensional meander in an oblique projection found in graves at Beška and *Viminacium* can be conditionally connected with the beam representation.[115] We can conclude that only in the tombs of Iznik, Silistra, Beit-Ras, and Brestovik, the vividly coloured beams can be seen, while in the other examples they are depicted using two or three (mostly pale) colours.

Apart from the beams, it is important to mention the wavy line below them, present in the Brestovik tomb (Fig. 15a) which can be understood as a simplification of vegetative or floral motifs. It is also possible that this image imitated the architrave, where the wavy line was a representation of tree rings (since the curved lines are recognised as probable tree ring imitations in the analogous examples mentioned above). It is interesting to mention that a very similar motif can be seen carved on the underside of the architrave stone blocks (in the field between the holes for connecting the architrave to the column capitals), among the remains that were once part of the porticos near the eastern gate in Roman

112 Montenegro Rúa et al. 177.

113 Montenegro Rúa et al. 27, 169, 177-183.

114 Mihailo Valtrović, as an example of the similar use of motifs in painting on the territory of Serbia, mentioned the medieval monastery Ježevica, near Čačak, where within the square field on the wall there are polychrome ornaments in the form of beams in several rows, painted in left and right, alternating directions (Валтровић 1906, 135).

115 More on meander motif in mosaic and funerary painting and its connection to the three-dimensional presentation of the beams, see in::Николић et al. 2017, 175-216. The most interesting to compare is the one in the hypogeum of Santa Maria in Stella in Verona, which painting is dated to the end of the 4th and the beginning of the 5th century. See in: Николић et al. 2017, 200-201; Bisconti, Braconi 2012. The painted two-dimensional meander with the three-dimensional elements - cubes (connecting with the beams) can be also seen on the vault of the arcosolium in the tomb named "Q10 - a Tomb with two Cocks", found in Qweilbeh-Abila, Jordan, and dated to the 2nd century AD. In the same space we can see the dentils and other architectural elements depicted on the walls. (Base Décors antiques 2017, QWEI.00097.)

Philippopolis, today Plovdiv, in Bulgaria (Fig. 15b).[116]

We see the same wavy motif in the baptistery of the house - church in *Dura Europos*, in a painting belonging to one of the oldest with a Christian theme, dated to around 232 AD. It is depicted at the point of separation of the two wall zones – the lower one - which, according to the widespread, contemporary opinion, contains the scene named "Women at the Tomb" (Figs. 15c), and the upper one - where the scenes of "The Wonders of Christ", "Christ's Healing of the Paralytic", and "Christ Walking on Water" are shown.[117] It is interesting that the wavy line is depicted here between two bands that look like two rows of beams. Michael Peppard wrote that this wavy line suggested a paradise river or the rivers "that flowed around the room underneath the series of mighty deeds". [118] It is interesting to mention another example from Dura Europos, where in the painting originating from a residential building, dated to the 2nd century AD, the beams, painted in two colours, are depicted below the hunting scene[119]. Also, the motif can maybe be linked to the wavy one encountered as a frame of the wall painting scenes in the Synagoge of Dura Europos, dated to the period of 245-256 AD.[120]

In the painting found in fragments, originating from the unknown building in "oppidum de Puech Balat", Aumes, France, and dated to the 1st century BC, we see the imitation of stone slabs and the same wavy motif done with brown, ochre, and red colours (Fig. 15d). Alix Barbet described it as an imitation of alabaster.[121]

Also, we can see the similar motif in the painting fragments, originating from the unknown building, found in Bavillier, France, and dated to the period of the 3rd and 4th century AD. Here, the wavy motif is depicted with the beams (or irregular chess board), garlands, and ribbons. It is painted using the ochre and white colours. It is different from the previously mentioned examples because the curves are disconnected, except the one continuous curvy line that flows along the band (Fig.15e).[122]

116 We thank Julia Valeva for this information and the photo in this paper depicting the mentioned blocks.

117 Peppard 2011, 103-104.

118 Peppard 2016, 91

119 Base Décors antiques 2017, DOUR.00025

120 Berger 2011, 128, 130, 132-133.

121 Base Décors antiques 2017, AUME.00001

122 Base Décors antiques 2017, AUME.00001

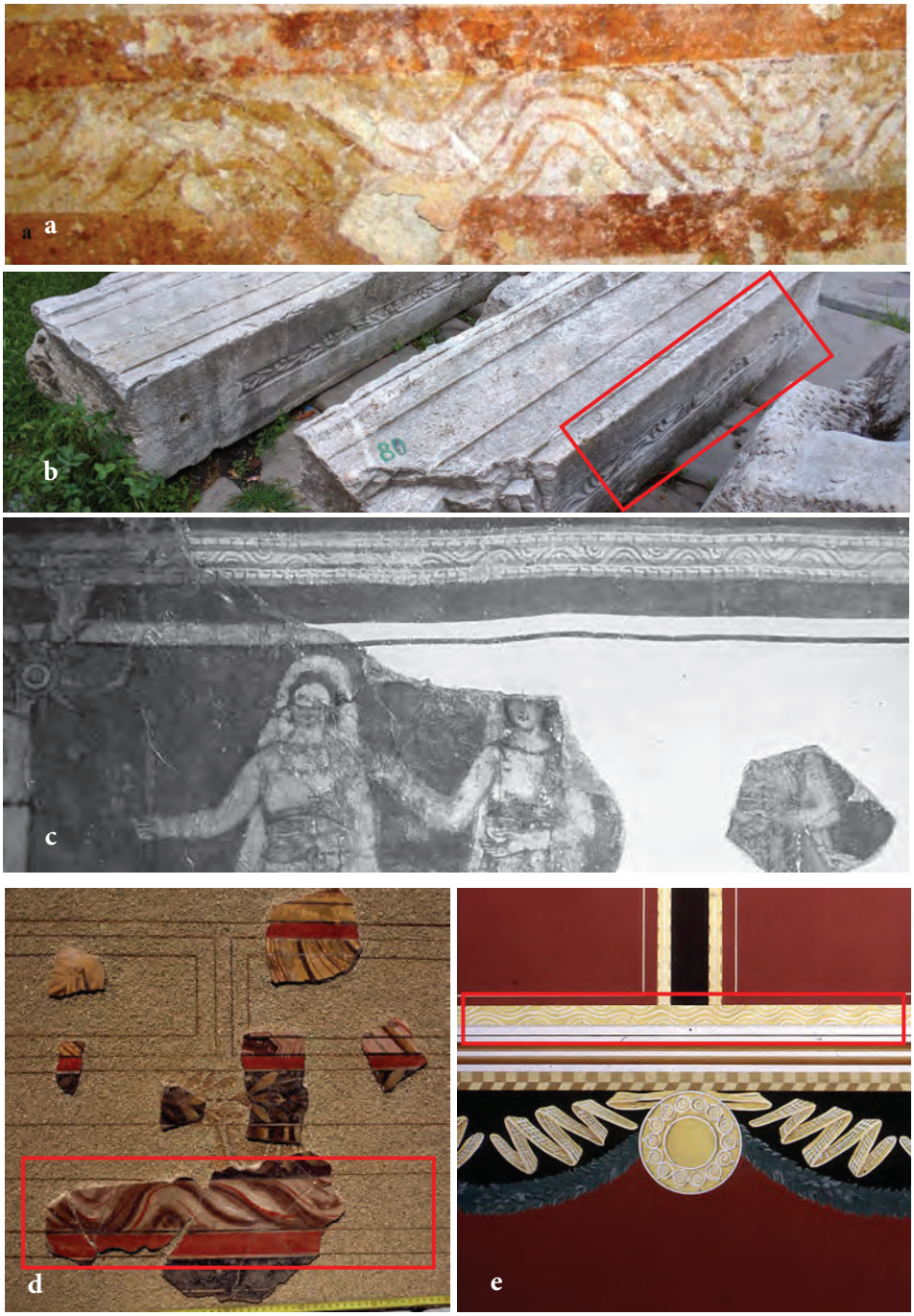


Fig. 15. The wavy line:
a. Brestovik tomb (photo by the authors of the paper);

b. Architrave block from Philippopolis (photo by Julia Valeva).

c. Dura Europos house – church (Peppard 2012, 559, Fig. 9);

d. Aumes, France From Base Décors antiques - UMR 8546 CNRS/ENS - AOrOc - Archéologie & Philologie, OPUS Alix Barbet Saisie, Image No. Inv AUME.00001 (Methodologie de la base: Alix Barbet, Joëlle Carayon. Conception, architecture et conventions de saisie: Joëlle Carayon, CNRS – IMR 8546 (http://129.199.58.244/fmi/iwp/cgi?-db=DECORS_ANTIQUES_2013%20base-m%C3%A8re%2Bpays&-loadframes)

e.Bavilliers, France(reconstruction) From Base Décors antiques - UMR 8546 CNRS/ENS - AOrOc - Archéologie & Philologie, OPUS Alix Barbet Saisie, Image No. Inv BAVI.00005 (Methodologie de la base: Alix Barbet, Joëlle Carayon. Conception, architecture et conventions de saisie: Joëlle Carayon, CNRS – IMR 8546 (http://129.199.58.244/fmi/iwp/cgi?-db=DECORS_ANTIQUES_2013%20base-m%C3%A8re%2Bpays&-loadframes)

THE COFFERED CEILING

Stucco decoration was very often imitated in the history of wall painting. The motifs of coffered ceilings in the stucco technique are different, and they can be both simple as well as very complex. The imitation was applied in buildings for various purposes, as well as in tombs. Anthropomorphic and zoomorphic depictions, usually coloured, were often represented within coffers. An example of the imitation of this type of decoration is represented in the vault of the tomb in Brestovik (Figs. 16a-16c). This kind of painting of vaults has been already mentioned in the analysis of the development of the floral style in the history of painting during the first centuries of the new era, by Michael Rostovtzeff.[123]

The barrel vault of the tomb at Brestovik was underpainted with the same ochre tone as the southern and northern walls. It is decorated with very precisely rendered bands of red astragals, which are crossed at right angles. The astragal motif is one of the most commonly used decorations in classical architectural decoration in all materials.[124] In the tomb at Brestovik the angles of the square fields which are formed with the astragal bands are decorated with concentric circles and the fields between them are painted in three colours. The circle of the largest diameter is coloured red, a blue circle is in the middle, while in the centre there is a small ochre circle. In the middle of each square field, a red, four-petal flower is depicted.[125] When describing the painting of the vault, Mihailo Valtrović wrote that the strings of "pearls" are crossed, that one round plate is placed on the point of intersection, and one "rose" is in the middle of the field. The pearls and the roses are coloured red, and "the tops

123 The coffered ceiling was also present in funerary structures as a stone decoration, which is visible in the Thracian Ostrusha tomb, near the town of Shipka, in Bulgaria, dated to the Late Classical and Early Hellenistic period. In the stone coffers, figurative scenes from mythology, heads and floral motifs are painted. Julia Valeva characterised the tomb as a mixture of local, Greek and Mesopotamian elements, with the external appearance influenced by Persia. Of interest is the central field of the ceiling with a sculpted square. Inside the square there is another rotated square with an inscribed circle (Valeva 2005, we need to put the page number). Stone coffers with sculpted floral motifs are also present on the ceilings of classical Greek buildings, as is the case in the Tholos of Epidaurus, but also in later monuments, as is the case with the Palmyrian monuments and Roman temple in Maison Carrée, in Nîmes, France.

124 About astragal depictions in ancient paintings see in: Rogić et al. 2011.

125 About the four petal flowers see in: Rogić, Anđelković Grašar 2015, 206-207.

Fig. 16.
The coffered ceiling:
a. b. c. Brestovik tomb (photos by the authors of the paper);

d. Columbarium I, in Rome (Mancioli 1997, 7);

e. "Tomb of the Three Brothers" (https://vici.org/vici/18090/);

f. Tomb in Iznik From Base Décors antiques - UMR 8546 CNRS/ENS - AOrOc - Archéologie & Philologie, OPUS Alix Barbet Saisie, Image No. Inv IZNI.00001 (Methodologie de la base: Alix Barbet, Joëlle Carayon. Conception, architecture et conventions de saisie: Joëlle Carayon, CNRS – IMR 8546 (http://129.199.58.244/fmi/iwp/cgi?-db=DECORS_ANTIQUES_2013%20base-m%C3%A8re%2Bpays&-loadframes)

g. Tomb in Silistra (Atanasov 2014, 28, Fig.35);

h. "Tomb with stylised paradise garden", in Ephesus (Zimmerman 2014, Tafel CCII, Abb. 3);

i. The Episcopal Basilica, in Stobi (Dimitrova 2012, 27).

of the flower sepals are emerging between their leaves".[126] As Valtrović wrote, here the ornament retained a strictly decorative character, without plasticity.[127]

A vault with crossed bands of astragals and squares with flowers was painted in Columbarium I in Rome, in Via Taranto, dated to the 2nd century (Fig. 16d).[128] On a vault in the "Tomb of the Three Brothers", a coffered ceiling composed of hexagonal fields with geometric motifs is depicted (Fig. 16e).[129] According to some authors, the vault is "covered with a carpet-like scheme", and with its strictness, it is remarkably similar to luxurious stucco ceilings.[130] On the vault of the tomb of Iznik, a geometric net is painted, made of crossed bands forming small squares, within which there are several variants of a four-petal flower (Figs. 16f). On the vault of the tomb in Silistra, there are concentric circles on the cross-sections of the bands, as well as green-coloured octagons in the fields obtained, showing red flowers with four petals, as in Brestovik, birds, and trees (Fig. 16g).[131] A painted vault, designated by Norbert Zimmermann as a "stylised paradise garden", is located in the "Tomb with stylised paradise garden" in the Harbour-Necropolis in Ephesus, dated to the period of the 4th century (Fig. 16h). Here, the white background of the vault is divided into staggered rectangular fields formed of red bands and with a red, four petal flower, similar to that in Brestovik. In this tomb, this scheme is spread over the entire vault and all the walls. Norbert Zimmermann wrote that the motif of this ceiling provided the idea of a paradise garden that surrounded the tomb from all sides, which was meant to express the "peaceful atmosphere of a Christian paradise", and this type of funerary architecture he classified into a local type, consisting of simple mausoleums of rectangular plan and with a barrel

126 Валтровић 1906, 136.

127 Валтровић 1906, 136. A group of French authors dealing with Roman painting classified the scheme of Brestovik painted coffered ceiling as a regular grid made of three-petal flowers with the circles in the intersections, and circles with inscribed flowers in the coffers (scheme 15j) (Barbet et al., 1997, 21). However, the Brestovik painting scheme should rather be classified as a combination of many other schemes the authors offered.

128 Baldassarre, et al. 2002, 303.

129 Eristov, Vibert-Guigue 2014, 349, Tafel CXXII – Abb.1 Abb.2.

130 Hembrey 2008, 10.

131 Димитров, Чичикова, 1986, сл. 70. Concentric circles were represented at the intersection of the bands on the ceiling in the Roman house at Via Bella Rocca, in Cremona, dating from the 3rd and the beginning of the 4th century. Within the obtained fields, green bands form hexagons in which the flowers are painted (See in: Pitcher, Mariani 2014, 441, Tafel CL - Abb.4, Abb.5).

vault.[132] On the vault of the vaulted tomb at Iznik, a dense geometric net is painted, made of crossed bands which form squares, within which there are several variants of a cross-shaped flower form.

On the ceiling of the Episcopal Basilica in Stobi, a square net is painted in which four different fields alternate, i.e. coffers (concentric squares), beams - hollow cubes in an oblique projection with one dot in the centre,[133] circles with flowers, and concentric squares. This "illusionistic panorama" framed by flower garlands dates back to the second half of the 4th century. Concentric squares are located "on a background of small stars" as the authors described dots on a black background around the squares. In one part of this ceiling, there is also a cross in a wreath (Fig. 16i).[134]

The decorated ceiling in ancient times was a mixture of depictions of rich terrestrial ceiling decoration and stylised celestial paradise gardens. In the painting of the vaulted tombs, usually, the dividing band between the walls and the vaults was interpreted as the border between the earth and the sky. In the vaults of a large number of catacombs' cubiculi, artists used various presentations that authors interpret as "paradisiac", containing a series of panels grouped around a central motif – the main symbol of salvation. However, in the vaults of the arcosolia, representations that differ in shape, but which are essentially the same, often appear. The space is divided into the squares or hexagons, with a rosette inside. This kind of composition is also referred to as paradise, with the rosettes as stars, according to the literature. Regarding this, there are two interpretations given by Erwin Goodenough. The first one is that the early Christians probably aspired only toward the decoration and that they used formal motives from mystical symbolism, mythology and the Bible, because these forms were close to them, but without thinking about their religious implications. Thus, garlands, wreaths, birds or starry ceilings are often motifs which fill the spaces. However, the rejection of the meaning of these ancient representations is often presupposed, because if these representations have no meaning for us today, that does not mean that they did not have meanings for the painters or those who were ordering the paintings.

132 Zimmermann 2014, 729, 732, Tafel CCII – Abb.3 I Abb.4.

133 Compare the meander depictions in the graves from Beška and Viminacium and the analogous examples in Николић et al. 2017.

134 Dimitrova 2012, 26, 27.

If we consider the second interpretation, the constant filling of space with specific motifs, can be comprehended as the creation of an atmosphere and the expression of hope. For centuries, early Christians rarely aspired to depict characteristic Christian scenes or motifs, which became very important in the future of Christian art and iconography. Instead, the first Christian images represented the faith very indirectly, with borrowed types. When the vocabulary of painting was pagan, it often expressed Christian hopes.[135]

In the room with the graves of the tomb in Brestovik, the central zone of the wall could represent a terrestrial residence, and the beams as the *supportive* elements of ceiling decoration could symbolise the border between the two worlds, while the vault with flowers may recall a dwelling in paradise.[136] The use of such elements has often enabled the hiding of certain symbolisms, which could have had a Christian character. A cruciform flower in the centre of a coffer could also be a Christian symbol, informative enough for believers, as is the case in a Thessaloniki tomb,[137] although this four-petal flower of a simple form was a very well known motif in pagan painting as well. According to Michael Rostovtzeff, the four-petal flower which was painted in the grave from *Viminacium* is typically Hellenistic or moreover, of Egyptian-Hellenistic origin. The author used the tomb from Brestovik as an example for comparison regarding the motif.[138]

135 Goodenough 1962, 11-117.

136 A wider discussion of the topic is developed in the analysis of the painting from Beška and *Viminacium* graves. See in: Николић et al. 2017, 206-207.

137 In the example of tomb no. 37, the four-petal flower and other motives define the tomb as Christian. See in: Μαρκή 2006, 162-164, 220, Σχέδ 108-109.

138 Ростовцевь 1917, 57.

DISCUSSION ON THE MUTUAL RELATIONSHIP BETWEEN ELEMENTS OF PAINTED DECORATION

The projection systems

The existence of beams shown in three dimensions, that is, in an oblique projection, the slight emphasis of the plasticity of the fields made in the technique of *opus sectile* by introducing diagonals, and the complete absence of space in the depiction of the coffered ceiling refer to thoughts about the methods of space presentation and projection systems used in the painting of the tomb in Brestovik. Considering the rare instances of the three-dimensional representation of elements in ancient examples of painting from the territory of today's Serbia and only one example of the depiction of an architectural scene with the construction (from *Sirmium*),[139] it its very interesting to analyse the beams represented in the Brestovik tomb.

Anka Stojaković (1925-2015), in her study of architectural space in wall painting, directly connected the features of the painted space with the application of a certain projection system. Although, as she wrote, ancient artists knew about perspective, they failed to consistently apply the convergence of parallel lines of all the planes to the same vanishing point. They knew about the phenomenon that two parallel lines converge towards infinity, but it is disputable whether they knew about the vanishing point for the space, so this perspective can be called *an ancient perspective*, different from the one we know today as *a scientific perspective*, developed in the Renaissance. When a scientific perspective in ancient examples is seen, it can be considered coincidental or extraordinary.[140]

An oblique projection represents something between an orthogonal projection and an ancient perspective and, therefore, it carries the elements of both systems. Here, architectural forms are created by a system of parallel rays, which are projected at an angle relative to the surface of the image. This construction gives an illusion of architectural volume, which makes it close to perspective but, because of the lack of convergence, it differs from it. An oblique projection is closer to the natural vision than an orthogonal projection, but it does not coincide with normal visual perception. It does not deform images as perspective, but leaves

139 See in: Rogić, Nikolić 2016, 84-85, 89; Rogić et al. 2017, 107-11.

140 Стојаковић 1970, 12-13, 23-26, 91, 160.

their actual sizes as an orthogonal projection. Still, with an oblique projection, the painted architectural forms penetrate in the direction of the third dimension and emphasise the depth of space.[141]

In ancient art, a particular type of oblique projection was often used, which Anka Stojaković called "oblique binocular projection" or "dividing construction" in which the parallelism of the lines for all the elements within their half of the image is retained. The impression of depth was achieved by the binocular character of this construction, conditioned by the infinitely distant eye for the left and right symmetric side of the composition, but the incident angle of the projectors had to be the same. The dividing construction could not always be used and was limited to symmetric compositions and the symmetry of the architectural frame. It is, thus, a projection where the pairs of projectors of symmetrically arranged elements intersect in a series of specific points, all of which are in the image's axis of symmetry. In the case of an asymmetric composition, the rays lose their pairs, so the impression of space is lost. If we remove one half of the architecture painted using the dividing construction, we have a clear oblique projection. In ancient painting, the dividing construction was mainly applied to display the ceiling joists or consoles, which were used for an impression of depth, protruding towards the third dimension.[142]

According to Philip Stinson, who analysed the Second Pompeian style, projections in Roman wall painting can be called "non-scientific types of architectural perspective", which include *a parallel perspective* (the dividing construction of Anka Stojaković) and *a convergence perspective* (Anka Stojaković's ancient perspective), both seen in the Second Pompeian style. According to him, each system served a special purpose. The location of the scenes with perspective was conditioned by the function of the room, and it was supposed that the maximum effective impression left on the observers was by the upper zone of the walls where convergence perspective was used. The parts of the painting that were not visible from the entrance, or those obscured by the furniture, were not depicted in this way. This perspective disappears with the arrival of the Third and Fourth styles. In dense Fourth-style compositions, a parallel perspective became sufficient for depiction, and convergence perspective was no longer used.[143]

141 Стојаковић 1970, 55-56.

142 Стојаковић 1970, 86-89.

143 Stinson 2011, 403, 405, 420, 424.

It is precisely in the system of the dividing construction or parallel perspective that the beams are displayed on the west wall of the tomb in Brestovik, while the beams on the north and south walls are shown in an oblique projection. On the west wall, the beams are depicted on the left and right side of the niche, sloped on different sides, so that they appear to tend towards one another. It appears that the beams from the south and north sides of the west wall are equal in number, shape, and angle direction, however, given the very poor preservation of this segment of painting together with the incomplete conservation interventions, there may have been deviations in this regard (Fig. 17a).

In ancient perspective, the realistic concept of the image was developed to an utterly illusionary extent, while, with the development of Christian art, new relationships between a human and the space were introduced, so painted architecture attained a new role, and objective relationships, among which were those in perspective, were destroyed and became subjective, emphasising symbolism.[144] There was no longer a visual shortening achieved by the convergence of parallel rays, which would bring the human figure into real relationships. "Archaic projection constructions", among which were orthogonal projection and oblique projection, received primacy, and the inverted perspective was conceived.[145] Early Christian art adopted an orthogonal projection system by showing the surface of the objects as unfolded, as a reaction to the optical realistic projection of the ancient perspective and illusionism.[146] However, the earliest monuments of the 4th century were still related to the realistic understanding of space, and the ambitions were directed to giving the impression of depth to the viewer.[147] This system was connected with the East, where the illusionist conception of perspective was a foreign concept, and the forms in real, unchanged measures were a familiar one.[148] Unfortunately, the depictions of the characters in the niche on the west wall and the lunette of the tomb in Brestovik have not been preserved, so we cannot discuss the applied projections here and their relationship to the surroundings.[149]

144 Стојаковић 1970, 25-26.

145 Стојаковић 1970, 26.

146 Стојаковић 1970, 50.

147 Стојаковић 1970, 38.

148 Стојаковић 1970, 54.

149 About interpretations of the characters, see in: Valtrović 1906, 134-135; Đurić 1985, 7; Anđelković

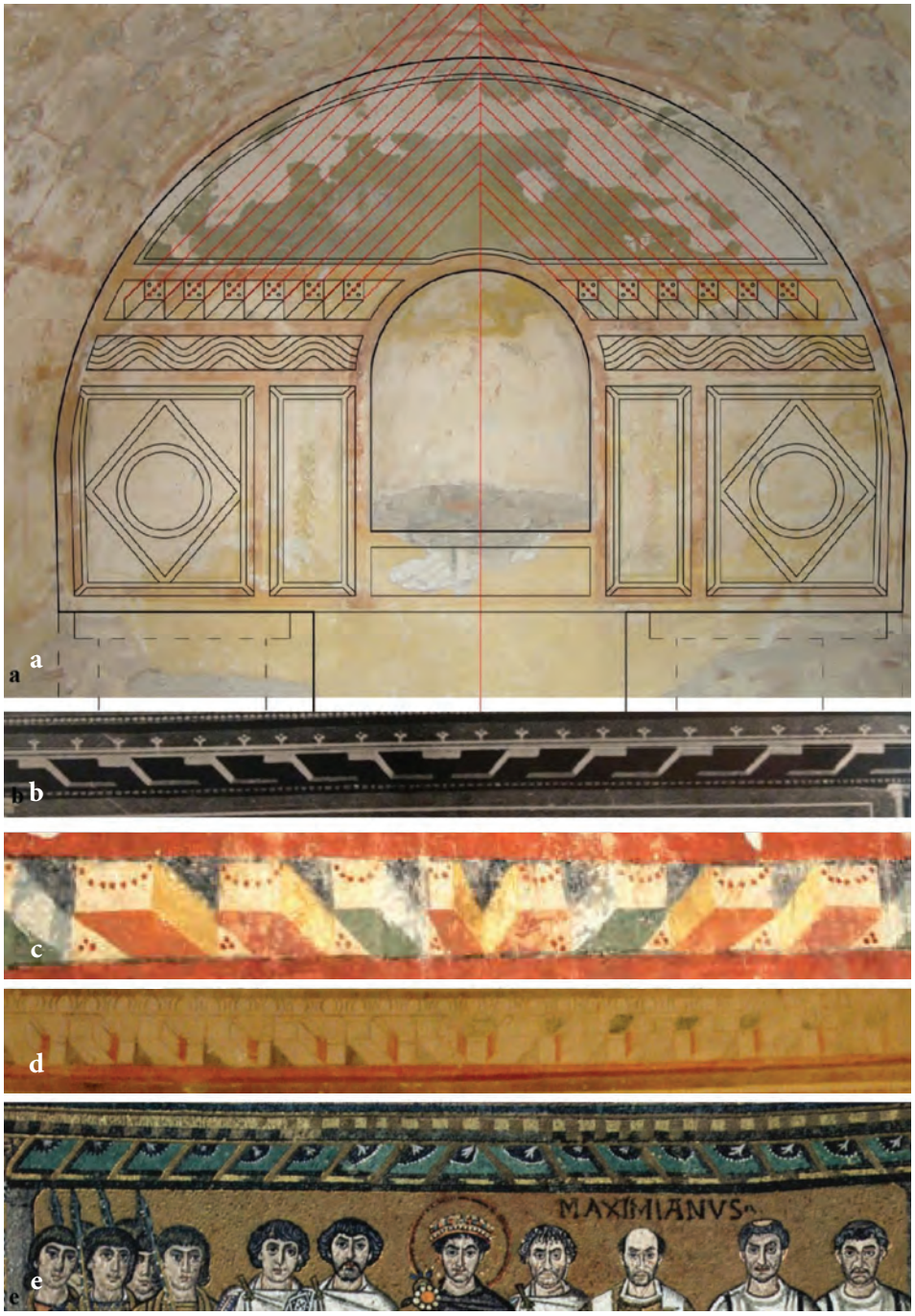


Fig. 17. Projection systems of the beams:
a. Brestovik tomb (photo by Dragana Rogić with the drawing by Emilija Nikolić);

b. "The Ariadne's House", in Pompeii (Стојаковић 1970, 33);

c. Tomb in Silistra (Atanasov 2014, 26, Fig.33);

d. "The Tomb of Three Brothers" (© Livius.org / CC BY-SA-3.0, https://vici.org/image.php?id=5867);

e. San Vitale, in Ravenna (https://commons.wikimedia.org/wiki/File:Meister_von_San_Vitale_in_Ravenna_003.jpg)

The painted beams row in the western wall of the burial chamber in the Brestovik tomb, as already mentioned above, is interrupted in the middle with the niche. The interruption of a row of beams with the insertion of a motif was observed by Anka Stojaković as a common situation that avoided the solution of the "node" that emerged in the axis of symmetry.[150] However, if the beams system is represented in its entirety, without interruption, then this node could be solved so that the inner edges of the last pair of beams converge with each other (because the central element could not be turned to either side, so as not to disturb the symmetry), thus creating a central element of a trapezial shape.[151] In the tomb in Silistra, the location of the node is resolved differently, that is, the middle of the display is not a trapezial beam, but an empty space between the two beams. However, the unequal dimensions of the beams[152] led to the need for the narrowing of the last beam in a part of the row on the left side, and almost to the disappearance of the central space between the beams, which partly disturbed the symmetry of this wall, on which peacocks and human figures are symmetrically painted (Fig. 17c). In *"The Tomb of Three Brothers",* the node is resolved in the same way, but much more precisely (Fig. 17d). In the previously mentioned painting found in Bavilliers, France (Fig. 15e) the "beams" are drawn irregularly with no complete volumes, but can be also interpreted as attached to one another, having sides conversely coloured. The central empty space between two rows of the beams converging with each other is in the form of trapezium. Solving the node, either with a motif that hides it, a central trapezial beam or with a solution where there is an empty space between the two beams, is often present in Pompeian painting, performed precisely and with respect to symmetry.[153]

In the tomb in Brestovik, as previously mentioned, a node on the west wall could not be created, because there is a niche that interrupts the row of beams. The beams are positioned almost symmetrically from both sides of the niche so that they *ap-*

Grašar 2015, 274.

150 One of the examples is found in Pompeii and "The House of Epidius Sabinus". See in: Стојаковић 1970, fig. 32.

151 One of the examples is found in Pompeii and "The Ariadne's House". See in: Стојаковић 1970, fig. 32 (Fig. 17b).

152 Unequal dimensions of the beams are also visible in Iznik tomb.

153 An example is the aforementioned tablinum in *Casa di Apolline*, in Pompeii (Strocka 2014, Tafel I, Abb. 2).

proach one another in the space *in front of the wall*, and not in *the depth of the wall* itself. In other words, they do not create the connection of the pairs of rays of the dividing construction below themselves, but above. Since the direction of the beams can emphasise the scene painted in the wall zone to which they are tending towards, in this way, it might have been used to emphasise today's missing part of the painting on the part of the wall above the niche – the lunette. This way of displaying the beams has some similarity with the inverted perspective. Here, the individual beam elements are not shown in an inverted perspective, but the entire row of beams can be viewed as an element depicted in this way. This situation in painting is rare, and the same case can be seen on the mosaic of Justinian with his escort from San Vitale, in Ravenna.[154] Here, the beams are shown in an inverse form of the dividing construction, as in Brestovik, converging to the viewer. Below the motif of the beams, the coffered ceiling is shown on the same mosaic, executed in the same projection system, and its central field is formed in the form of a trapezium. Anka Stojaković associated this kind of presentation with the early Middle Ages and a complete lack of awareness for the realistic representation of the interior.[155] On the other hand, Rudolf Arnheim (1904-2007) wrote that, with the arrangement of the beams converging to the viewer, and which are located above an object or a person, in this case above Justinian and his escort, those *covered* motifs are emphasised, forming a kind of roof above them (Fig. 17e).[156] For these reasons, we can assume that in the Brestovik tomb, the representation of the beams on the western wall was created to accentuate the scene in the niche, and not the one above it, as was written previously. However, although the same situation exists in the decoration of the entrance wall in the tomb of Silistra, we cannot say that the beams are tending towards one another to emphasise the scene below, because it is the space of the door. If we accept that on the unpreserved decoration of the eastern wall in Brestovik beams were also present, following the circle of their direction as in Silistra,[157] thus having them *converge* at some point in the lower zone of the wall, we see two mutually reversed

154 See in: Andreescu-Treadgold and, Treadgold 1997, 709, fig.1.

155 Стојаковић 1970, 89-90, 161. See fig. 37 in Стојаковић 1970.

156 Arnheim 1972, 128, 135.

157 Valtrović only mentioned the depiction of two fields with twigs on the eastern wall, but, according to the fact that the painting was poorly preserved even at the time of excavation, and other analogous examples with all four walls painted in the same manner, it can not be taken for granted that the eastern wall in the tomb of Brestovik was without other decorative motifs.

situations in these tombs which can raise further questions about the possibility of intentional or accidental depiction of the beams' direction.

THE SYMMETRY OF PAINTING

Small diagrams with sketches were part of the preliminary process of wall painting, which was confirmed by the examples dated to the 1st century BC, in Italy. These sketches could have been transmitted to one or more walls using a mesh that allowed the artists to enlarge them precisely or even to make them as mirror images. However, on some examples from Pompeii, it can be seen that the painters drew precise lines for the main elements, that the details were drawn freely, and that some elements were not even drawn, but were painted freely in the final phases of painting.[158] During these processes, often there were differences, which we perceive today as mistakes. Many examples show us the mistakes made during the performing of works of art in antiquity, the differences between drawing bases and subsequent filling –with colour, stone or other material, most often as a result of disorientation with complex spatial motifs.[159]

The symmetry of the Brestovik tomb architecture was achieved by the arrangement of its walls and columns, and the symmetry of the room with graves was achieved by the position of the entrance, the windows, and the niche. The desired symmetry of the tomb is also witnessed by found sculptures, whose symmetrical position was described by Mihailo Valtrović. According to his records, two marble statues of the genii of death were designed to be symmetrically placed, since they were leaning against a torch with their left or right side of the body. Two lions were also designed to be set symmetrically, and they probably stood in front of the door of the room with the graves, in order to guard the entrance.[160] Although it can be assumed that it was imagined to be executed symmetrically, the wall painting of this room actually has no symmetry. Valtrović noted that the northern and southern wall mutually differed "in fine details", but that their ornaments were similar (Figs. 18a-18b).[161]

158 Stinson 2011, 416,418.

159 Николић et al. 2017, 204.

160 Валтровић 1906, 137.

161 Валтровић 1906, 134.

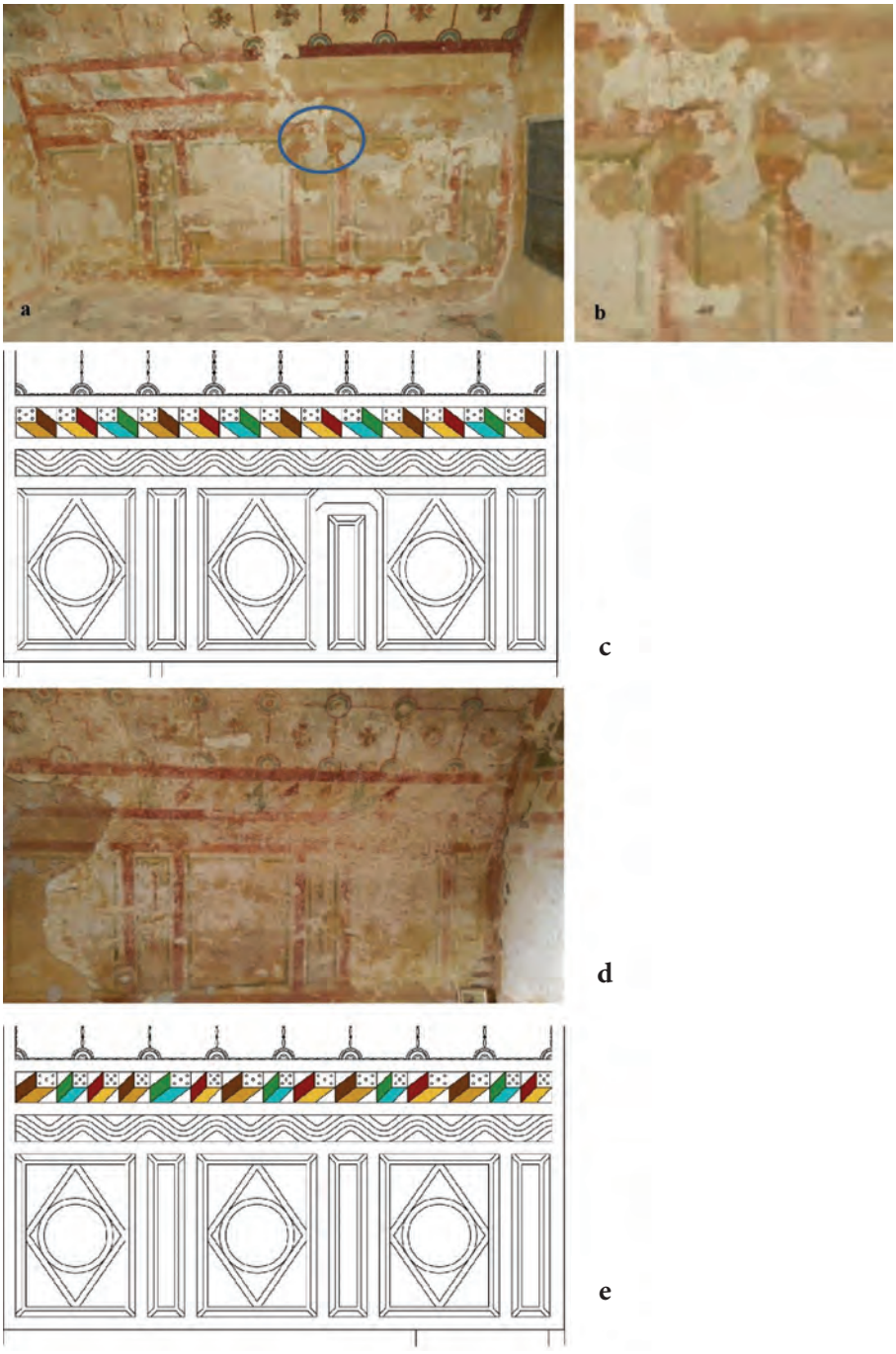


Fig. 18. The beams in the Brestovik tomb:
a.c. Northern wall;

b. Northern wall (detail);

d. e Southern wall (photos by the authors of the paper and drawings by Emilija Nikolić).

When forming a rectangular field layout on the northern and southern walls of the burial chamber in the Brestovik tomb, it is likely that the painter followed one set scheme or pattern. However, it seems that he literally applied it painting from the left to the right side on both walls, in the same arrangement, without setting up representations in the fields on the opposite walls in mirror symmetry.[162] Although the painted motifs within the circles on the walls are lost, the assumption is that they were the same on both walls. Judging by the drawings made by Mihailo Valtrović, while some of the motifs were still visible, their layout was also not symmetrical in relation to the whole room, which is in keeping with the literal application of the wall scheme. However, when determining the position of the beams, their direction was oriented consciously always to face the west wall, while on the west wall the beams of the north and south halves of the wall were directed towards the niche, as discussed previously, so the overall symmetry of the beams was achieved. Mihailo Valtrović showed in his drawing a cornice of the beams as a result of a grid created by the geometric division of the horizontal band. The horizontal division is made at half the height of the band, and then it is divided into squares, which probably seemed to the author as the most likely geometry in relation to the ease of performance.[163] However, the beams are not painted as the same elements on each wall, neither in terms of dimensions, nor in the angle of the projection. It is also likely that they are presented in a different number on the southern and northern walls. Their frontal sides – faces, are not always squares, and the beams are not directed always using the same angle (although the mesh was conceived to make a base for an angle of 45º). In this way, the desire for symmetry in the mutual relationship between the southern and the northern walls is partially lost. Due to the different angle of the oblique projection and the different gap between the beams, a smaller number of beams (13) were depicted on the

162 There are few examples of funerary painting in Viminacium, where the symmetry was executed almost ideally as it was very important in an aesthetic, but also symbolic sense. Cf. Anđelković Grašar et al. 2012. Similar observations about the symmetry in painting were given by Alix Barbet in the discussion about the Iznik tomb (See in: Barbet 2013, 69).

163 In one part of the western wall, there seems to be a fragment of a drawing of such a network, however, it is not certain if this network is part of the original image or conservation works. Compare the text above on the sanctuary of Santa Eulalia de Boveda and the beams that are derived from the chessboard and Montenegro Rúa 2016, CL table, Fig. 245, and Montenegro Rúa 2016, tabla CL, fig. 245.

northern wall, than on the southern wall (15).[164] As for the colour of the beams, they are consistently depicted on the longitudinal walls using the same alternation of colours in a row, but also symmetrically, regarding the colour scheme, if we start from the entrance to the grave room and compare the relationship between these two walls. However, this does not fit into the previous assumption that the painter painted two walls according to the same pattern, moving from left to right, because if the painter did so, the arrangement of the colour variants for the beams would not be symmetrical, when comparing the two walls. The question arises as to why symmetry in the painted decoration in the room with graves exists only on some parts of the walls. Is our understanding of the direction of painting from the left to the right side a consequence of the habit developed by the direction of writing, which is a European inheritance? Since several eastern scripts are written in the opposite direction, can an eastern origin of the painter be presumed? If we assume that the painter painted from the right to the left, the arrangement of the rhombs, rectangular fields, and the beams using the pattern that the painter literally followed, becomes logical (Figs. 18a, 18c-18e).[165] It is also unknown why the red band around one of the narrow rectangular fields is incoherently executed on the north wall, that is, it does not create a whole with a horizontal band that divides these fields from a field with a wavy line (Fig. 18b).

164 These numbers need to be accepted as an assumption because of the poor state of the conservation of the painting. The beams displayed in the mosaic of the Santa Maria della Croce, in Casarano, Italy, dated back to the middle of the 5th century, were executed in three variants of colour combinations, but always having a bright frontal side with a square and five-points in a *quincunx* arrangement inside. An unevenness can be seen here, that is, the beams are not shown in the same number on the opposite walls that carry a vault (on which, in addition to geometric and decorative motifs, zoomorphic motifs - ducks, fish, rabbits, herbs, a pomegranate and carob, are also shown (Spinosa 2012, 155-159).

165 The problem with the assumption of the existence of a scheme for the northern and southern wall painting, irrespective of the direction of the painting, is the representation of vertical twigs in narrow rectangular fields that are not coloured in accordance with some pattern. Two of the three twigs depicted on the southern wall are preserved (Valtrović saw only one red twig with a green ribbon). One is red and green with a green strip, while the other is green (probably with a red strip that is not preserved). On the northern wall, today we can see only one twig preserved – a green one with a red strip (Valtrović described more twigs, all green with red strips) (Валтровић 1906, 134). Here, we can see no scheme or symmetry which can mutually connect these depictions on the two opposite walls, but can assume the painter's desire to have one red-green strip "in the middle", surrounded by two green twigs on the one wall (northern) and one green twig "in the middle", surrounded by two red-green twigs on the other wall (southern). The other possibility is that there were red twigs on the southern wall, and green twigs on the southern one, as Valtrović wrote, but that changes in colours were made during conservation works.

On the western wall, there is a much less preserved depiction of the beams, but it seems that the number of beams on both sides of the niche is equal. The arrangement of the beams by colours, however, has no symmetry, but the left and the right row of beams were conceived as one row, so that three variants of colour combination alternate. The two twigs shown on this wall are not painted in accordance with the symmetry of the wall, one is green and the other is formed using green and red. However, Mihailo Valtrović saw these twigs differently. He wrote that in the southern part of the western wall the twig was green, and the strip was red, while on the northern wall the colours were reversed (Fig. 19).[166]

Regarding the vault of the Brestovik tomb, the division of the fields is very precise, although it was more difficult to perform, given the position and curvature of the surface for the painting (Fig. 16a). By small holes in the walls and the vault, it is noticed that a divider was used for the formation of circles. The precision of the square grid of the vault leads to this conclusion. Why are all the elements not performed so precisely? Could there have been two painters, one of whom was more skilled in measuring and drew "more complicated" elements, such as a large number of equal fields on a curved surface and concentric circles, and the other, who painted motifs and drew simple elements? Looking at the diversity of the beams and their different numbers on the northern and southern walls of the tomb, the possibility that two painters split the work becomes more likely.

THE POSITION OF THE BEAMS

Observing the beams in the Brestovik tomb, it can be seen that the beam band is on an already curved part of the wall, which raises further questions regarding the architectural element they imitate, that is, the presumed cornice. The band with wavy lines below the beams may represent architrave, but this line (and even the upper zone of the central wall the fields in opus sectile) is located above the imaginary line of the joint of the wall and the vault, that is, on the curved part of the wall. The reasons for this may be found in the next discussion about "The Demeter Crypt". Namely, the picture of the cornice made of beams in this tomb is also located on the curved surface belonging to a part of the vault. The origin

157 Валтровић 1906, 134.

Fig. 19. The beams in the Brestovik tomb - western wall (pphoto by Dragana Rogić and drawing by Emilija Nikolić).

of these built-in tomb structures, with slightly inclined walls to the interior space is, according to Michael Rostovtzeff, connected to the tombs carved in the rocks, where such a construction was common place. He saw the construction of the "The Demeter Crypt" as a cause for the position of the cornice, and he thought that the painter could not determine exactly where the vault began and did it according to his own free decision, separating the wall from the vault with the cornice at the spot where he thought it was convenient.[167] However, Alla Valerievna Bujskikh (Алла Валеріївна Буйських) considered this tomb to be the beginning of a new constructive line of development of underground grave crypts with walls inclined inside the chamber. She compared "The Demeter Crypt" with "The Tomb of Lyson and Kalikles", where a clear separation of the wall from the vault is shown and where the walls are not sloped (whose painted architrave and mutules with guttae are in the zone of curvature), and concluded that in "The Demeter Crypt" the position of the painted cornice is just above the imaginary architrave in the contact zone of the wall and the vault, but whose spatial relationship is hardly noticeable in the tomb in the absence of the architrave. Raising a cornice toward the curved part of the vault, according to her, therefore, does not only indicate the impossibility of an exact determination of the cornice place by the painter, but also a change in approach, where the architrave is no longer depicted, so that the observer thinks that the cornice is too elevated. According to her, this became a trend in painted scenic decorations that imitated architectural elements in the first centuries of our era.[168]In the tomb of Silistra, where the element associated to the architrave is absent, the walls are not slightly inclined, but the beam cornice is indeed raised in the curved zone, which confirms the previous thesis. The tomb in Iznik is a different case from the examples already mentioned. Here the vault seems to start immediately above the graves, so the whole painted decoration is on the curved surface and the role of the beams as a point of the boundary of the vault cannot be discussed.[169] It is difficult to make clear conclusions regarding the

167 Буйских 2009

168 Буйских 2009

169 In this tomb, the decoration is made very precisely for the beams and the ceiling, and the lines of geometric motifs in the zone with *opus sectile* are almost perfectly made, which is interesting since the painter carried it out on a completely curved surface. Above and below the beams, there is a cyma. However, it is not positioned in the separate zones, but freely drawn in white over a red band that separated the beams from the *opus sectile* on the wall and coffered ceiling on the vault.

painting of the tomb in Brestovik, since its cross-section also has slightly curved walls, and is even reminiscent of a horseshoe. However, it could have been deformed during the centuries, or badly executed. In the tomb in Constanța, where there is neither a cornice of beams nor an architrave, there is only a decoration in the form of a motif of an ovolo (a part of the cornice), and a part of the wall with *opus sectile* enters the curved zone of the vault.[170] In the vaulted tomb no. 8,[171] found beneath St. Sophia, in Sofia, there is an imitation of a cyma (which can be a part of the architrave and of the cornice). In tombs no. 1,[172] and no. 9 in Sofia, this zone was presented only as a band.

It is likely that this architectural motif originally painted above the architrave and located at the ideal spot on the connection between the wall and the vault, through ancient art history became a pure decoration, and it was only important to be at some imaginary height above the graves, which is seen in the Iznik tomb. In the end, the primary role of the beams as decoration can in fact be attributed to those in Brestovik too, where, as in Iznik, according to the preserved decoration, they do not have a clearly shown connection with the construction behind (it is a completely dark background, with or without decoration). In the case where the beams were independent of each other, they would have to be correctly displayed on the lateral sides, which in this case would have excluded the filling of the lower space with paint and decoration. In the Silistra tomb, the colour of the lower surface behind the beams is in the same colour as the beams, which makes the beams have the aforementioned constructive connection with the surface behind. Decoration with dots is done in this respect consistently, since they are located on the beams itself and on the mentioned surface, and do not exist in the intermediate space - air.

In this way, it became pure decoration on the linear ornament on the wall. See in: Firatli 1974, 926.

170 Above the row of the beams, there is also an ovolo in "The Tomb of Three Brothers".

171 Valeva 2001, 175, fig. 21.

172 Миятевь 1925, 5-14, Figs.1.

CONCLUSION

MihailoValtrović described the tomb of Brestovik as a monumental tomb built "at the height of ordinary good craftsmanship", and he rated painting as "ordinary" and "with its harmony admirable", from an architectural point of view arranged "properly and meaningfully", made "diligently, by a light and practical handcrafted hand". There is no decorative architecture in the tomb, the surfaces of the walls are smooth, without profiles, and, according to him, the tomb painting helped to obtain this impression and introduced "constructive clarity" into the building, "revived" areas and "usefully supplemented the architectural idea of the builder". The builders of this tomb "were not artists, but practiced craftsmen", "the materials were not mosaics and marbles, but the painter imitated them".[173] Although Gordana Milošević rated the decoration as "pedantic",[174] after the analysis of the architectural elements on the wall paintings of the tomb, it can be said that there is a mild disparity between the different representations in terms of their precision and dimensions, and that the strict following of the pattern probably led to a loss of symmetry of the entire architectural space in painting, which was otherwise consistently carried out in the architecture of the tomb.

The architectural space in painting should be discussed based on an analysis of the system of applied projection systems.[175] Although the reverse system of the dividing construction cannot be linked with the inverted perspective, because it does not possess a vanishing point, features of the inverted perspective, which, as Anka Stojaković wrote, is "beyond the law of an objective projection treatment of space based on realistic principles of optics",[176] may be related to the reason for the use of the reverse dividing construction in the Brestovik tomb. Being used in the medieval art of Byzantine tradition, Anka Stojaković characterised it as an unreal way of representation which was most suitable for the transcendental character of this art,[177] while its appearance in ancient art is rare and ancient perspective is the carrier of the whole style, not characterising the structure of the painting in its

173 Валтровић 1906, 132, 136-137.

174 Milošević 2009, 748.

175 Стојаковић 1970, 11.

176 Стојаковић 1970, 77.

177 Стојаковић 1970, 77.

entirety.[178]The tomb in Brestovik, where an oblique projection, the dividing construction, and its reverse variant were applied, belongs to the period of the return to "archaic" structures in painting, with the development of Christian art, as was previously mentioned in this text.

According to Gordana Milošević, the tomb from Brestovik belongs to the oldest period of family tomb building tradition in the Central Balkans, from the beginning of the 4th century.[179] At the beginning of the last century, Miloje Vasić wrote: "In all cultural periods, the graves are a faithful and reliable image of the cultural life of the time in which they existed. If life is in one human settlement at a higher level, and if it is more rich and diverse, the graves themselves, as well as their content, will be richer and more diverse".[180]

The same author also wrote that "probably somewhere in the southeast or in Egypt, the later forms served for the execution of this construction in Brestovik, which has so little specifically Roman in it".[181] Gordana Milošević wrote that in the Late Roman era the idea of choosing a burial site on the property was renewed under the Hellenistic-monarchist models, where inspiration for construction was sought, and the family grave in the late antique provinces in the Balkans "underwent a similar transformation with a little delay", in accordance with the social position and status of the commissioner.[182] Her conclusion regarding the analysis of funeral architecture in the Central Balkans provinces from the 4th to the 6th century is that the architecture of Late Antiquity in the Balkans was the product of local masters, which was developed due to the geographical location between the west and the east under the influence of the western provinces and the Orient.[183] The conclusion that arises during the analysis of the origin of the painting of the Brestovik tomb is similar, that is, that the effects of the East and the West can be seen on it, more specifically a combination of the incrustation and the floral styles that "are fighting" against the Second Pompeian style from the West.[184]

178 Стојаковић 1970, 74.

179 Милошевић 2006, 380.

180 Васић 1907, 97-98.

181 Vasić 1906, 140.

182 Милошевић 2006, 371.

183 Милошевић 2006, 392.

184 About this *fight* see in: Rostovtzeff 1919, 163.

The architectural elements depicted in the painting of the Brestovik tomb can be interpreted as decorative incrustations on the wall, constructive beams or a coffered ceiling, but also as windows and doors, carriers of the vault or a paradise garden. It would be almost impossible for us as interpreters to unveil and understand the true intent of the one who had chosen and rendered these motives. The most interesting architectural elements represented in the Brestovik tomb are the beams, since in antique painting from the territory of today's Serbia, this kind of motif has been found only in this tomb thus far. This important constructive element in architecture, through the history of stone decoration, although retaining three dimensions, had lost its basic role of the carrier, which was returned to it often in the two-dimensional art of tomb painting, through symbolism, when, although often clumsy, it "carried" the heavenly vault.

While searching for the formative or mathematical principles behind the creation of a historical building, we are in fact looking for different schemes that would point us to the meaning of a building. However, the nature of the building is such that the connection between the planned and the derived state is not clear enough. Seeking explanations for atypical or confusing features, we encourage views on architecture that may be more valuable than conclusions.[185] Linking the tomb in Brestovik, including its painting, only with *typologically* similar buildings, can lead researchers in the wrong direction. Sheila Campbell wrote that the mosaic floors of ancient *Anemurium,* with human and zoomorphic representations, as well as geometric motifs (which are a close analogy to the aforementioned meander motifs from Viminacium and Beška graves), demonstrate the links between this site and other places in southern Asia Minor, and that the similarities between iconography, Christian and pagan, and combinations of geometric forms, clearly express the movement of ideas and people in this region through the late (early Christian) period.[186] The similarities between the architecture of the tombs from the distant territories, as well as between the paintings of buildings of different purposes, are often greater than would have been assumed. Sometimes the old texts of the first researchers of the monuments seem to be insufficiently argued and with prematurely drawn conclusions when accepting analogies, especially when we remember that their authors had no such number of explored monuments

185 Wilson Jones 2009, 14,71.

186 Campbell 1989, 1639.

in front of them or almost unlimited access to information, as is the case today. However, their almost crude perceptions after travelling and the visual overview of the monuments, shaped through thoughts and long interactions, with knowledge of history and the use of logic in the conclusions, are often more important than the finding of an *ideal* analogy. Perhaps something else is completely true and important, as noted by Mihailo Valtrović, when he wrote that the realisation of the entirety of the tomb in Brestovik, made of three buildings "different in form and purpose", was guided by "the established folk notion and he feeling of man's duty to the deceased",[187] with a small addition - that it was done regardless of the national or religious affiliation was of the deceased.

All the aforementioned, as part of the analysis of the interrelation between the elements of the architecture depicted in the painting of the Brestovik tomb, has to be taken as only one side of the perception and the sum of the assumptions regarding the painting's poor preservation. However, this study raises a large number of further questions, including the origin of painting and the various influences that effected it, the issue of the manner of painting, the use of projection systems and the existence of mistakes, or the origin and skill of painters, which together with the already existing themes of tomb architecture, the question of its owner, that is, the origin of the deceased, as well as the belonging of a tomb to a pagan or Christian cult, together constitute a collection of secrets hidden by this tomb.

Works on the protection of the painting of the tomb in Brestovik, further conservation of the building, the arrangement of its immediate environment, the provision of guardians and regular maintenance of the monument were set as conditions for preventing the monument's collapse, in 1964, after partly conducted conservation and restoration work.[188] Unfortunately, none of this happened and today the tomb, and especially its painting, is in an extremely bad condition. We hope that this research, together with that from the past and with the new illustrations of the painting of the tomb that the research brings, will help during its future conservation, and we appeal for its urgent implementation, as did authors before us, if it is not already too late. Although from 1895 to the present day, a large number of late antique painted tombs with valuable painting have been found in the territory of Serbia, some of which are of high artistic value, the tomb

187 Валтровић 1906, 132.

188 Вујичић – Вуловић 1967, 91.

in Brestovik is still a "unique Roman building in Serbia",[189] "whose equal in design and decoration, is not yet known in our country."[190]

Translated by Emilija Nikolić and Jelena Anđelković Grašar

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189 Валтровић 1906, 137.

190 Валтровић 1895, 131.

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MEAT DIET AT THE UPPER MOESIAN LIMES: ARCHAEOZOOLOGICAL EVIDENCES FROM THE CITY OF VIMINACIUM AND ITS SURROUNDINGS*

SONJA VUKOVIĆ – BOGDANOVIĆ, *Laboratory for bioarchaeology, Archaeology Department, Faculty of Philosophy, University of Belgrade*
E-mail: sonja.vukovic@f.bg.ac.rs

ABSTRACT

This paper is a study of meat diet at the Upper Moesian limes according to archaeozoological results obtained from one of the greatest faunal assemblages in this part of the Roman world – the Roman city of Viminacium. For the purpose of the research three faunal assemblages from Viminacium – two from different periods of the area of the city amphitheater and one from the area outside the city - are intercompared. The study shows that citizens of Viminacium and adjacent areas mostly relied on the meat of older, usually improved cattle, but also on pork, chevon and lamb, while meat of horses, fowl, wild game, fish and some exotic species, such as camel and oysters were eaten just occasionally. The differences in faunal composition, age profiles, butchery patterns and biometric characteristics of animal remains showed slight variations of dietary patterns in diachronic perspective and also between the studied areas.

Keywords: Upper Moesia, Viminacium, meat diet, archaeozoology

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INTRODUCTION[1]

The understanding of Roman cultural patterns and everyday life in contemporary archaeology is almost impossible without a broad variety of evidence provided by data collected from both "typical" finds, such as architecture, coins, pottery and other artefacts, but also from ecofacts, among which animal bones usually predominate at archaeological sites. At provincial sites which lack ancient textual data, the understanding of the diet in the Roman world is possible solely by studying direct evidences of the diet – animal, plant and human remains (isotopes). Former archaeozoological studies within the Roman sites in Central Balkans[2] are mostly scarce and limited to just a few faunal reports that have not been sufficient for the understanding of the Roman diet in this part of the world. This study will present archaeozoological results that come from one of the greatest faunal assemblages in the region and the only one in Upper Moesian limes - the area of the legionary fortress and capital of the province of Upper Moesia (and Moesia Prima in late antiquity) – Viminacium. The paper studies the dietary perspective according to data obtained from animal remains in Viminacium (taxonomic composition, age profiles, butchery patterns and biometric data) with the focus on the changes in dietary patterns from the beginning of the 2nd until the end of the 4th century AD.

1 The author of the paper is very grateful to Viminacium archaeological team and its director dr M. Korać for the engagement in the project. Special thanks go to archaeologists that were excavating Viminacium amphitheatre (S. Nikolić, I. Bogdanović, G. Stojić, Lj. Jevtović and M. Mitić) and also those who were excavating „Nad Klepečkom" site (dr S. Redžić, dr N. Mrđić, M. Jovičić and I. Danković), for the enourmous help with the documentation and with contextualizing the archaeozoological finds. Thanks also go to MA student D. Marković for the assistence in primary archaeozoological analysis.

2 Blažić 1995; 1993; Nedeljković 1997; 2009; Vuković - Bogdanović 2017; Vuković 2010; Bökönyi 1976

MATERIALS AND METHODS

The sites

Viminacium is situated on the right bank of the river Mlava, close to its confluence with the Danube, in today's Eastern Serbia **(Fig. 1)**. It was founded as a military camp where Legion VII Claudia was stationed from the second half of the 1st century AD. Next to the camp, a city arose, which became the capital of the province of *Moesia Superior* and later *Moesia Prima*. In 117 AD, during the reign of the Emperor Hadrian, Viminacium acquired the status of a municipium, while under the Emperor Gordian III in 239 AD it became a colony. As known from both archaeological and historical data, Viminacium achieved great prosperity during the end of the 2nd and the beginning of the 3rd century AD, but the crisis of the Roman Empire caused by usurpation of authority and also the attack of foreign tribes – the wars that Moesian legions also participated in, caused instability in Viminacium. Viminacium was destroyed by Huns in 441 AD and then, after the collapse of Huns' reign, the area was populated by Germanic tribes. In the early Byzantine Period Viminacium was renewed and it was finally destroyed by Slavs in the beginning of the 7th century AD[3]. Archaeological excavations of Viminacium and its surroundings started in the beginning of the 20th century. They were mostly focused on the areas that surrounded the city and the fort, where several Roman graveyards (with ca. 13.500 graves) and also a few settlements have been investigated in the course of salvage excavations[4]. However, just a small part of the city has been excavated (Roman baths, the amphitheater, a part of city ramparts and streets)[5], while large scale systematic excavations of the legionary fort started only in 2017.

The archaeozoological data presented here (Table 1) originate from three faunal assemblages, two from the area of the amphitheater (one that relates to the period of its utilization, i.e. 2nd – 3rd century AD, the other which dates back to the period of the burying of the amphitheatre, i.e. 4th century AD) and one from the economic – industrial zone located outside of Viminacium, that has been excavated during rescue excavations at the site called Nad Klepečkom.

3 Mirković 1968; Korać et al. 2009; Spasić-Đurić 2015.

4 Korać, Golubović 2009; 2013

5 Nikolić et al. 2017; Zotović 1973; Nikolić, Bogdanović 2015.

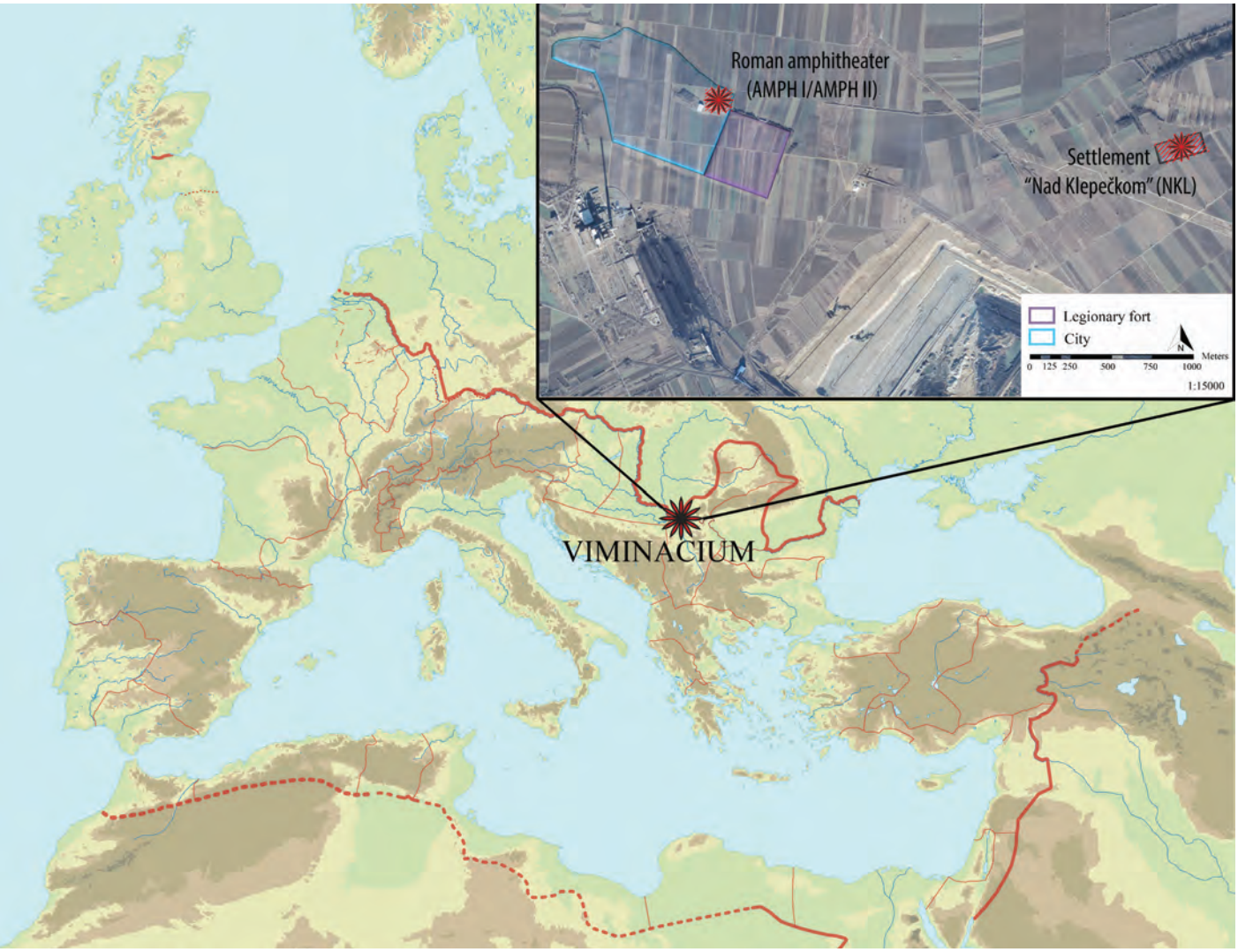


Fig.1 - Location of Viminacium within the map of the Roman provinces and frontiers in the 2nd century AD and location of Viminacium sites studied in the paper

THE AMPHITHEATRE

The Amphitheatre of Viminacium is located at the north-eastern corner of the city. The first excavations took place at the end of the 19th century and were conducted by M. Valtrović[6]. New systematic excavations, conducted by the Institute of Archaeology in Belgrade, directed by Dr M. Korać, lasted from 2007 to 2017 year.

6 Валтровић 1884.

Table 1 - List of animal bone assembladges studied in the paper

Site	Assembladge name	Dating	Reference	NISP	Cattle (%)	Pig (%)	Sheep/Goat (%)
Amphitheater	AMPH I	2nd/3rd century AD	Vuković 2015, preliminary data	12325	48	24.8	8.6
Amphitheater	AMPH II	4th century AD	Preliminary data	7221	46.8	16.3	7.1
Nad Klepečkom	NKL	2nd/3rd century AD	Vuković - Bogdanović in preparation	2080	44.3	16.7	18.4

In the course of the excavations, almost the complete building itself consisting of the arena, the arena wall, outer wall, timber stands, drainage channels, entrances and also the area of the city that surrounded the building have been unearthed. The amphitheatre was built in the begining of the 2nd century and it was used at the most until the first half of the 4th century AD. Several phases of the building of the amphitheater have been suggested: the first amphitheater was built of timber, the second one was made of both of timber and stone, while it underwent at least one rebuilding. By the middle of the 4th century AD the amphitheater was not in use anymore, while the area was used for a cemetery and also as the city dump in the course of the 4th century AD[7]. During the excavations a huge amount of animal remains has been collected. The analyses of animal remains are still in progress; while here the hitherto results are given. For the purposes of this study the faunal assemblage is divided into two time-sections, one that relates to the period of the building, rebuilding and usage of the object (2nd – 3rd century AD) and the other that relates to the period after the abandoning of the area (4th century AD).

Faunal assemblage
***Amphitheater, 2nd-3rd century AD* (AMPH I)**

The faunal assemblage that relates to the period of the usage of this place as the site of spectacles derives mostly from the area of timber stands (*cavea*), more

7 Nikolić, Bogdanović 2012; 2015; Vuković, Bogdanović 2013; Bogdanović, Nikolić 2017.

precisely from the earth mound that fastened the timber construction of the amphitheater and also from the entrances to the construction. One portion of the assemblage originates from a big ditch located to the west of the building that has been filled with archaeological material (ceramics, bones and other finds) and that has been related to the building although located outside the amphitheater. The animal bone assemblage consists of 12325 specimens defined to the genus/species level. Domestic fauna comprises of cattle, pig, sheep, goats, dogs, cats, equids (horse, ass and mule), fowl, while among wild mammals the majority belong to red deer and wild boar remains, but also brown bears, hares, roe deer, wolves, foxes, freshwater and migratory fish and Mediterranean and freshwater mollusks[8].

***Amphitheatre, 4th century* (AMPH II)**

Faunal remains originate from the layers that completely buried the amphitheater. A large portion of animal remains comes from the arena, where a number of pits, which date back to the middle and the second half of the 4th century AD, have been discovered. After the burial of pits and the amphitheatre, a graveyard was set in the second half of the 4th century within the space. There are 7221 remains determined to species/genus level and the assemblage consists of the same species as in AMPH I assemblage, with the addition of camel remains[9].

NAD KLEPECKOM SITE

The site called "Nad Klepečkom" is located ca.3km to the east of the legionary fortress of Viminacium and is situated at the right bank of the river Klepečka that poured out to the Danube branch. The site has been excavated during the salvage excavations in the course of years 2008 to 2013 years, that have been conducted by the Institute of Archaeology in Belgrade, directed by dr M. Korać. At the site, archaeological features dating back from Eneolithic to the middle ages have been excavated[10]. Roman period sites include villas, cemeteries and parts of the settlement

8 Vuković 2015.

9 Vuković, Bogdanović 2013.

10 Mrđić, Jovičić 2012; Redžić et al. 2014a; 2014b.

that has been attributed as industrial – economic zone of the city of Viminacium and those features date back to the 2nd and 3rd centuries AD.

Faunal assemblage (NKL)

Animal remains from Nad Klepečkom site come from the settlement - industrial – economic zone of Viminacium. So far 2080 animal bones have been determined to genus/species level, majority of which originate from domestic animals (cattle, sheep, goats, pigs, equids, cats, dogs, fowl), while just a few wild animal remains have been found (hare, a brown bear and a griffon vulture)[11].

METHODS

In Viminacium animal remains are collected by hand, wherefore the results are biased against the recovery of smaller mammals, fish and bird remains. The recording protocol of Viminacium amphitheater is adjusted to the sample size and follows the diagnostic zone approach suggested by S. Davis[12], with a few alternations, while the smaller assemblages, such as NKL assemblage, are being recorded in more detail.

In order to study the meat dietary perspective in Viminacium, the faunal composition, age profiles, biometry and butchery patterns of four main domesticates used in the diet (cattle, pig, sheep and goat) are studied and mutually compared between assemblages, and the evidence of other domesticates used in the diet and also that of game, fish and mollusks is also considered. Faunal compositions are quantified according to NISP (Number of identified specimens). The remains of sheep and goat are quantified together for faunal composition and butchery marks comparisons, while the age structures and biometric data are studied separately for each species. Aging data is presented according to mandibular wear stages, that have been assigned according to dynamics of teeth eruption and wear[13]. The bones and teeth were measured after A. von den Driesch[14] manual. Wither heights

11 Vuković - Bogdanović in-press.

12 Davis 1992.

13 Silver 1969; Habermehl 1975; Hillson 2005; Bull, Payne 1982.

14 Driesch 1976.

were calculated according to the criteria of J. Matolcsi[15] for cattle, M. Teichert for pig[16] and sheep[17] and Z. Schramm[18] for goat. The widths and depths of long bones are considered as more reliable parameters for the estimation of weights of animals[19] and this suggestion might be related to meat quantities available in the past. In order to check whether there are any differences between relative quantities of meat within the assumed period and areas of Viminacium, we have analyzed and mutually compared wither heights and also the distal breadths and depths of long bones of cattle, pigs, sheep and goats individually and by applying the log ratio technique[20] which was also used to increase the data sets. For the purpose of log ratio calculations, the following standard measurements have been used: the mean values of measurements from AMPH I assemblage for cattle[21], the mean values of measurements of Neolithic pigs from Durrington Walls[22] and the mean values of measurements of contemporary Shetland female sheep for sheep and goats[23]. Statistical Student's T-test was applied to test difference in biometric data between periods/assemblages for the variables of sample count of 10 or more, and the statistical significance for p-values was lower than 0.05 (Table 2). All the graphs and statistical tests were done in MS Excel 2016.

15 Matolcsi 1970.

16 Teichert 1969.

17 Teichert 1975.

18 Schramm 1967.

19 Albarella 2002, 55-56; Davis 1996, 604.

20 Simpson 1941; Meadow 1999.

21 Large sample of cattle measurements enabled the building of the standard representative sample, while for sheep, goats and pigs it was not possible, so the standards from United Kingdom, often used for log ratio calculations in other publications have been used.

22 Albarella, Payne 2005.

23 Davis 1996.

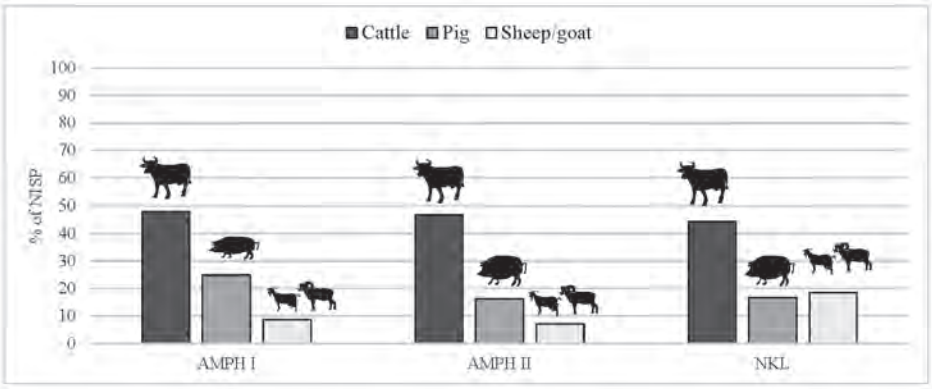


Figure 2 - The frequency of main domestic animals from Viminacium within the studied assembladges

THE MOST SIGNIFICANT MEAT IN VIMINACIUM: BEEF, PORK, LAMB AND CHEVON

Ratio and age profiles of most significant meat animals

The ratio (Fig. 2) of the three most frequent taxonomic categories, cattle, pigs and sheep/goats does not differ significantly, but it does slightly between the studied assemblages. Cattle, that is the most common one, is represented slightly more in the city area in both of the studied periods (AMPH I – 48%, AMPH II – 46.8 %) in comparison to the economic-industrial zone of Viminacium (NKL - 44%). A high proportion of cattle in relation to other species is also reported within other studied Roman faunal assemblages in Serbia, especially in urban areas, such as Sirmium[24], while in smaller settlements and villas, cattle are mostly represented with ca. 30%[25]. Within pre-Roman (Celtic) assemblages cattle is also the dominant species[26] that probably points to the continuum of meat preferences in the region.

According to mandibular wear stages, cattle were mostly bred until adulthood (Fig. 3a), which indicates that meat of adult cattle was eaten, while calves were rarely butchered. The enormous number of adult cattle remains suggests that these animals were kept for dairy products and as working animals (this is also testified by the pathologies on metapodial bones and phalanges). There is a higher percentage

24 Nedeljković 1997; 2009.

25 Blažić 1995; 2006; 1993.

26 Radišić 2016; Blažić 2006; 1992.

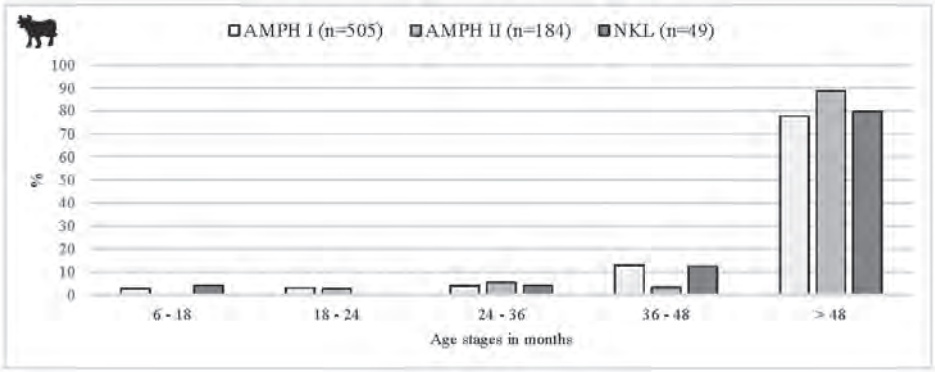


Fig. 3a – Cattle mandibular wear stages (Silver 1969, Hillson 2005) by studied assemblages

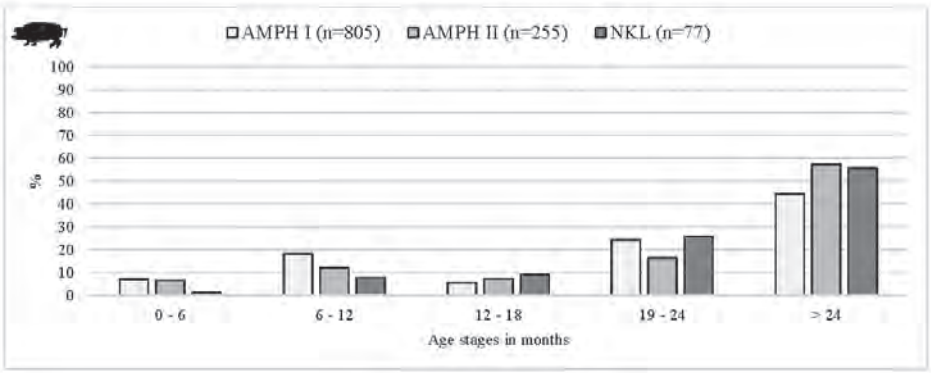


Fig. 3b – Pig mandibular wear stages (Silver 1969, Bull&Payne 1982) by studied assemblages

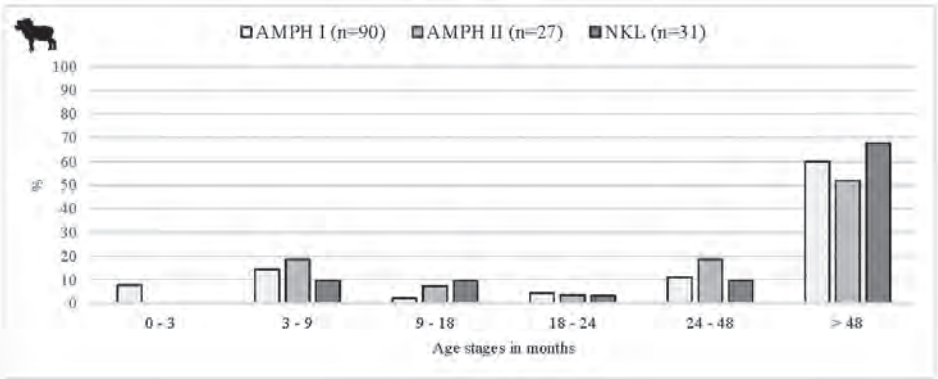


Fig. 3c – Sheep mandibular wear stages (Silver 1969, Habermehl 1975) by studied assemblages

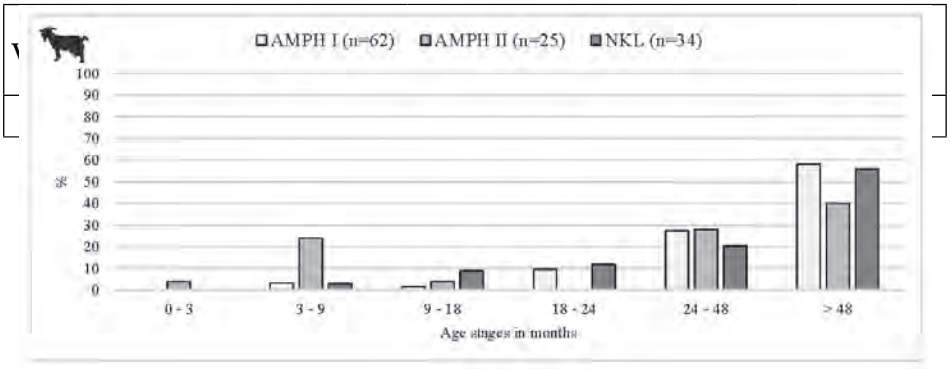


Fig. 3d – Goat mandibular wear stages (Silver 1969, Habermehl 1975) by studied assemblages

of subadult cattle (3-4 years old) in AMPH I and NKL assemblages than in AMPH II assemblage and consequently a smaller percentage of adult cattle in AMPH I and NKL assemblages than in AMPH II assemblage, that may indicate a dietary and also economic change on a smaller scale between the Roman and late Roman period in the city and nearby areas of Viminacium. The cattle reach optimum weight at subadult age, while in modern times it is believed that the "highest quality beef comes from animals that are under 36 months of age"[27], so if an economy is mostly meat oriented, one would expect a higher percentage of subadult cattle remains. However, as "old cows produce highly acceptable beef if properly fattened and processed"[28], it is reasonable to suggest that the meat of older cattle was adequate enough and that the cattle were first bred for secondary products and later butchered.

The second most common species in Viminacium is the pig, with a higher rate in AMPH I assemblage (24.8 %) than in both the contemporary settlement outside of the city (NKL) and also in late Roman layers of the amphitheater (AMPH II - 16.3%). The ratio of pig remains suggests that pork was more important in the diet during the 2nd and 3rd century within the city itself than in the later period of the city and within the industrial zone outside of the city. Different age groups of pigs, according to mandibular wear stages (Fig. 3b), are represented in more or less similar percentages between sites, with slight differences. The group of piglets under the age of 1 has higher contribution in AMPH I assemblage than in the other two assemblages, while older swine have the biggest share in AMPH II assemblage. The higher contribution of pigs and the significant share of young-

27 FAO Animal production and health paper 1991.

28 Ibid.

er animals partly resemble the typical Roman meat pattern, characterized by the domination of pig remains, especially of piglets as defined by the study of Roman assemblages in Italy[29].

The third taxonomic group, sheep and goats, has a twice higher ratio outside the city (16%) than in both phases of the Viminacium amphitheater (AMPH I – 8.6%, AMPH II – 7.1%), that suggests that probably both sheep and goats have been kept outside the city and that their meat was less important in the city within both periods, in comparison with both cattle and pork. Unlike piglets, groups of younger sheep and goats have a higher share in AMPH II assemblage then in others (Fig. 3c, 3d). The domination of older animals within all of the assemblages resembles the cattle age pattern and suggests that young animals were rarely culled, while full grown sheep and goats, whose secondary products (milk, wool) could have been in use before animals were slaughtered for meat.

HOW DID THEY PORTION THE BODIES? BUTCHERY PRACTICES AND MEAT USAGE EVIDENCES

Comparisons of percentages of butchery marks on cattle, pig and sheep/goat bones (Fig. 4) illustrate greater butchery activities within city assemblages and also that there was not any significant diachronic change between them. The butchery marks include those traces made during slaughtering, skinning, dismembering, but also during the preparation and consumption of meat.

Majority of the cuts on cattle and pig remains from the city (AMPH I and AMPH II) were actually chopping marks made by cleaver. As similar marks were noticed on similar skeletal parts, it can be suggested that specialized butchers skillfully processed cattle and pig carcasses. Some of those typical butchery marks – such as cutting of the cattle spina scapulae and perforation of scapula's blade (Fig. 5) – that point out to meat preservation techniques[30] or cutting of the long bone epiphysis, have been noticed in a large number of Roman settlements[31]. Splitting and breaking of long bones after disarticulation (Fig. 6) – because of

29 King 1999, 189.

30 Dobney et al. 1996.

31 e.g. Maltby 2010.

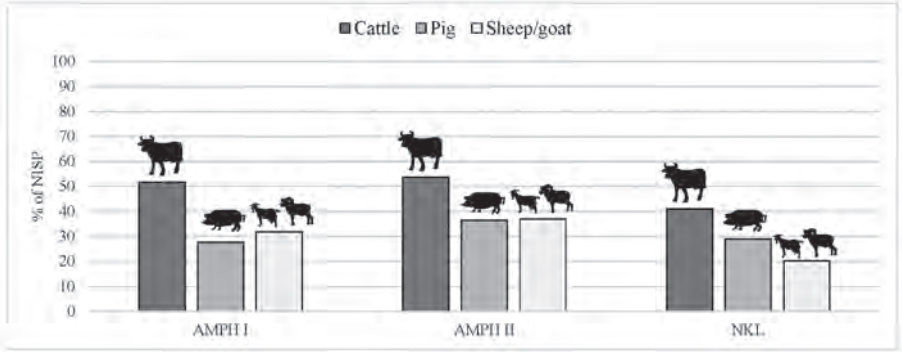


Fig. 4 – Butchery marks proportions of main domestic mammals (cattle, pig, sheep/goat) within the studied assemblages

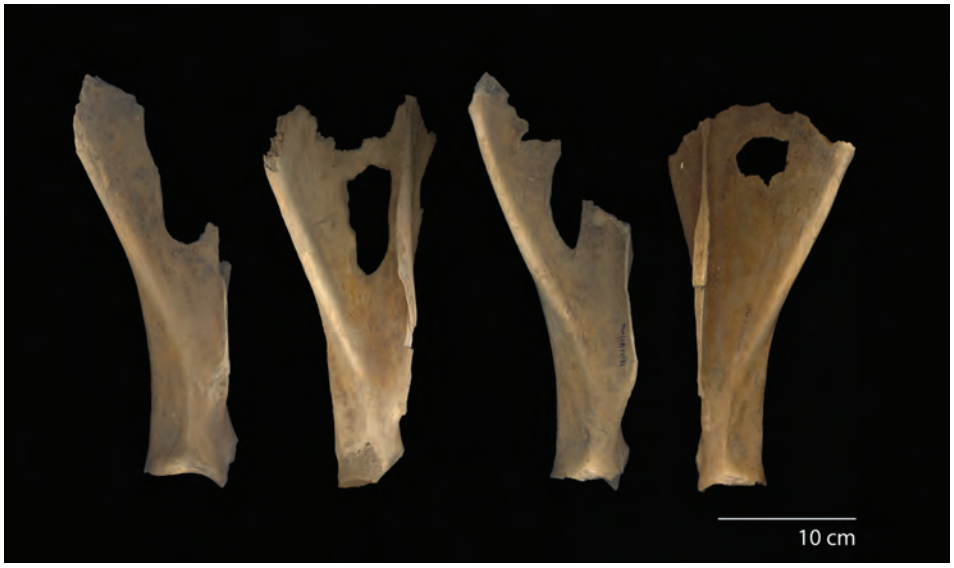


Fig. 5 – Typical butchery marks on cattle scapulae from Viminacium that point to meat preservation techniques

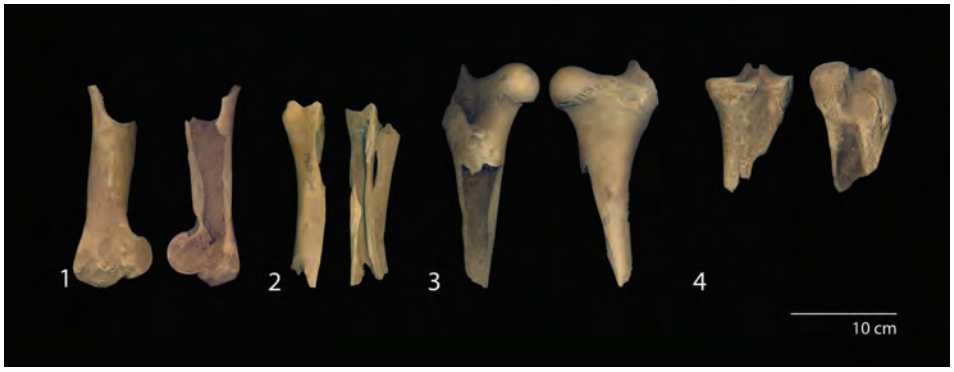


Fig. 6 – Broken/split cattle long bones with dismembering and fileting marks (1 – distal humerus, 2 – proximal radius & ulna, 3 – proximal femur, 4 – proximal tibia)

Fig. 7 – Marble relief depicting the shop of a pork butcher, house in Trastevere, 2nd century AD (Skulpturensammlung, Dresden) (Moore 1943, 81)

bone marrow exploitation has been noticed on cattle long bones – this pattern has been explained as commercial[32] and has also been noticed at other urban sites, not only in the surrounding provinces, but also in western provinces, such as Roman Britain[33]. Unlike for pig and cattle, majority of the marks on sheep and goat bones are made by knife, that suggests that those animals were butchered by ordinary people, not just by specialized butchers. Lesser contribution of butchery marks outside the city probably implies that the meat that has been eaten in the city mostly came from organized butcheries, which would not be said for the nearby settlement. There are written and also visual data that testify about the usage of other animal edibles, such as bacon and entrails, usually made of pig trunks, as illustrated on the tomb relief of a butcher (Fig. 7)[34], so it can be just speculated that those animal foodstuffs the evidence of which could scarcely ever have been preserved at archaeological sites, have been also consumed in Viminacium.

32 Seetah 2007.

33 Maltby 2016; Maltby 2010.

34 Moore 1943, 81.

Table 2 – T tests results on biometric data of cattle, pig, sheep and goats remains within studied assembladges

Variable	Species	Comparisons beween assembladges	T value	Probability
Wither height	Cattle	AMPH I and AMPH II	-0.286	0.775
		AMPH I and NKL	-3.018	0.003
		AMPH II and NKL	-2.985	0.004
Log ratio breadths	Cattle	AMPH I and AMPH II	-0.616	0.538
		AMPH I and NKL	-3.725	0.000
		AMPH II and NKL	-3.010	0.003
Log ratio depths	Cattle	AMPH I and AMPH II	-1.530	0.126
		AMPH I and NKL	-2.994	0.003
		AMPH II and NKL	-1.291	0.197
Astragalus distal breadth	Cattle	AMPH I and AMPH II	-1.784	0.079
Wither height	Sheep	AMPH I and AMPH II	1.813	0.076
		AMPH I and NKL	-1.280	0.206
		AMPH II and NKL	-3.509	0.002
Log ratio breadths	Sheep	AMPH I and AMPH II	0.476	0.635
		AMPH I and NKL	0.133	0.895
		AMPH II and NKL	-0.355	0.724
Log ratio depths	Sheep	AMPH I and AMPH II	1.476	0.146
		AMPH I and NKL	-0.956	0.343
		AMPH II and NKL	-2.484	0.018
Wither height	Goat	AMPH I and AMPH II	-0.625	0.538
		AMPH I and NKL	0.510	0.616
		AMPH II and NKL	1.326	0.212
Log ratio breadths	Goat	AMPH I and AMPH II	0.533	0.596
		AMPH I and NKL	-0.256	0.799
		AMPH II and NKL	-0.793	0.432
Log ratio (all measurements)	Pig	AMPH I and AMPH II	0.919	0.359
		AMPH I and NKL	0.310	0.757

THE MEAT QUANTITIES: BIOMETRIC DATA

The appearance of large domestic stock, especially cattle, as opposed to small animals in the periods that preceded the Roman invasion, has been archaeozoologicaly testified throughout the Roman world[35], and also in Balkan provinces of the Empire[36]. This phenomenon is explained by the introduction of large animals throughout the provinces and their interbreeding with autochthonous animals and also by the introduction of new forage[37]. One of the reasons for improved breeding practices is of commercial nature, as the number of cities and the citizens increased and military camps were founded, that caused requisite for larger quantities of food supplies, i.e. meat. The increase of animals is archaeologically visible by metric data of animal remains. According to wither height estimations, it is possible to assume the size of animals. However, as the wither heights are calculated according to the length of complete bones which are usually scarce due to fragmentation, the inclusion of measurements other than lengths gives a broader and more complete impression of ranges of animal sizes in the past.

Cattle biometry

Cattle wither heights (Fig. 8) point to the presence of both smaller, probably autochthonous animals and also improved cattle breeds (with wither height exceeding 120 cm) in all of the Viminacium periods. There is no significant statistical difference between wither heights of AMPH I and AMPH II cattle, showing that the size of cattle throughout the Roman and late Roman period did not significantly change, in respect to long bone length and consequently wither height estimations. However, although no significant difference has been observed between two periods, smaller animals are more frequent in the earlier period, which might imply that fewer autochthonous animals were bred and consumed in later periods. There is a statistical difference between both city assemblages and NKL

35 Bökönyi 1974; De Grossi Mazzorin 2004; Mackinnon 2008; Audoin-Rouzeau 1993; Chevallier 1995; Maltby 2016; Peters 1998; Lauwerier 1988.

36 Vuković - Bogdanović 2017; Blažić 2006; 1995; 1993; Nedeljković 2009; 1997; Vuković 2015.

37 Bökönyi 1974; Albarella et al. 2008; Grau-Sologestoa 2015; Mackinnon 2010; Valenzuela-Lamas, Albarella 2017.

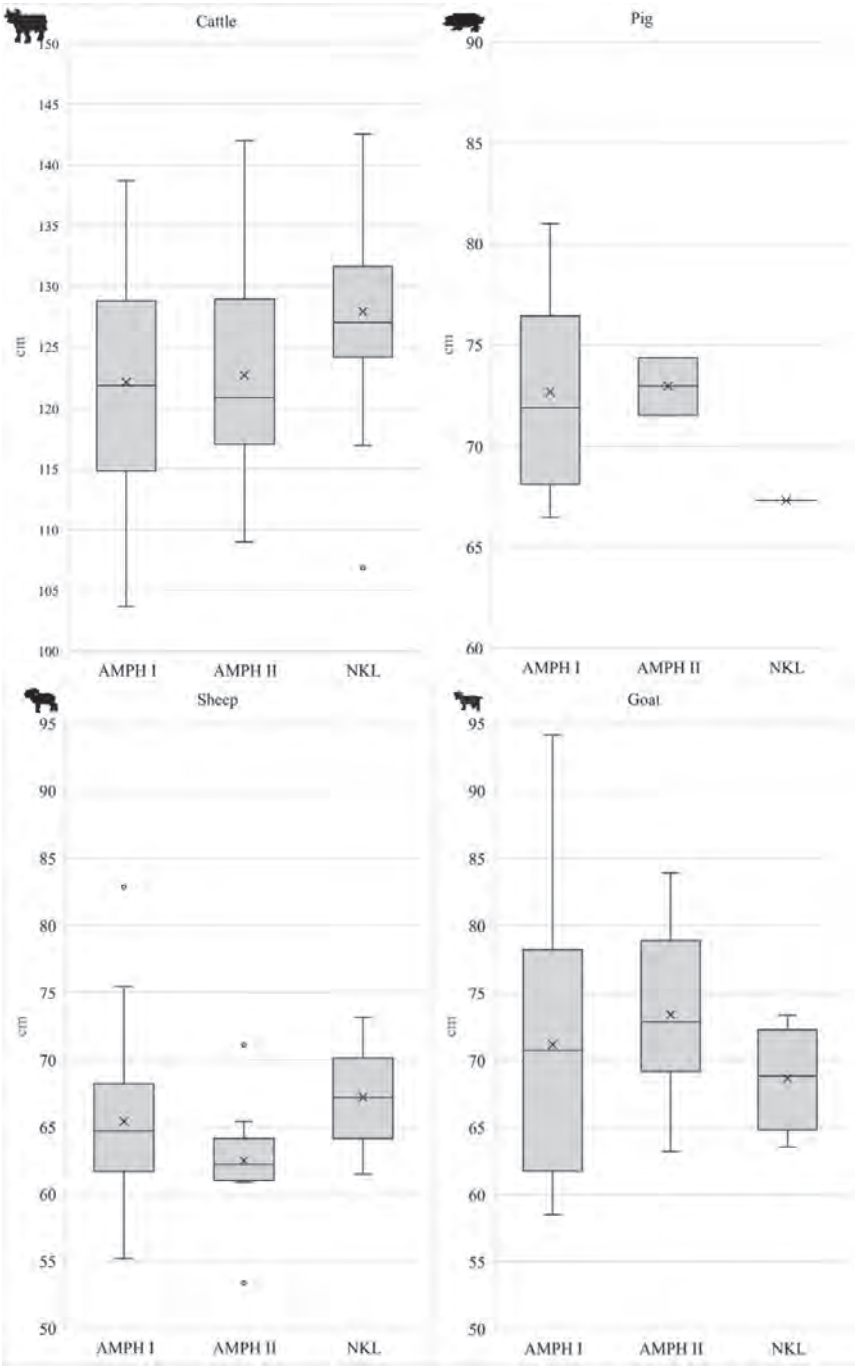


Fig. 8 – Box plots of cattle (Matolcshi 1970) (n(AMPH I)=102, n(AMPH II)=64, n(NKL=36)), pig (Teichert 1969) (n(AMPH I)=8, n(AMPH II)=2, n(NKL)=1)), sheep (Teichert 1975) (n(AMPH I)=37, n(AMPH II)=13, n(NKL)=17)) and goat (Schramm 1967) (n(AMPH I)=16, n(AMPH II)=9, n(NKL)=4)) wither height estimations within the studied assemblages (box = distance 25th–75th quartile with median (black line), whiskers = distance 10th–90th percentile, grey dots = outliers, x = mean value).

assemblage caused by higher mean values of NKL cattle wither heights and also by almost complete lack of small cattle breeds within the NKL assemblage.

Astragalus distal breadths that are considered to be directly related to the weight of animals[38], which have been compared between the assemblages (Fig. 9), point to a slight improvement of cattle from the 2nd/3rd to the 4th century AD within the city of Viminacium, while in the area outside the city (NKL) they are on the average of even bigger size. Log ratio diagrams of both long bone distal breadths (Fig. 10) and depths (Fig. 11) illustrate that cattle size within the city of Viminacium between the periods of Roman domination did not change, while the depths from the area outside the city point out to (as astragali distal breadths) slightly bigger animals and absence of smaller, probably autochthonous breeds. Statistical difference in log ratio distal breadths was discovered between the city's (AMPH I and AMPH II) and NKL assemblages, while for log ratio distal depths it exists only between AMPH II and NKL assemblage. Bimodal distributions of log ratio diagrams within the AMPH I assemblage and also of astragalus distal breadths express two groups of animals that differ according to size, which is the consequence of either sexual dimorphism or most likely of the presence of autochthonous and improved breeds. It seems that there is a lack of autochthonous breeds in the NKL assemblage and that they are less present in later AMPH II assemblage.

Sheep biometry

The comparisons of wither height estimations of sheep between the assemblages point to a decrease of (size of) sheep in the late Roman period (Fig. 8). However, a statistical difference is observed only between AMPH II and NKL assemblages. Log ratios of distal breadths (Fig. 12) and depths (Fig. 13) of long bones are consistent with wither height estimations and with the presence of slightly smaller animals in AMPH II assemblage, while the statistical difference is again noticeable between AMPH II and NKL assemblages.

38 Johnstone, Albarella 2015, 23.

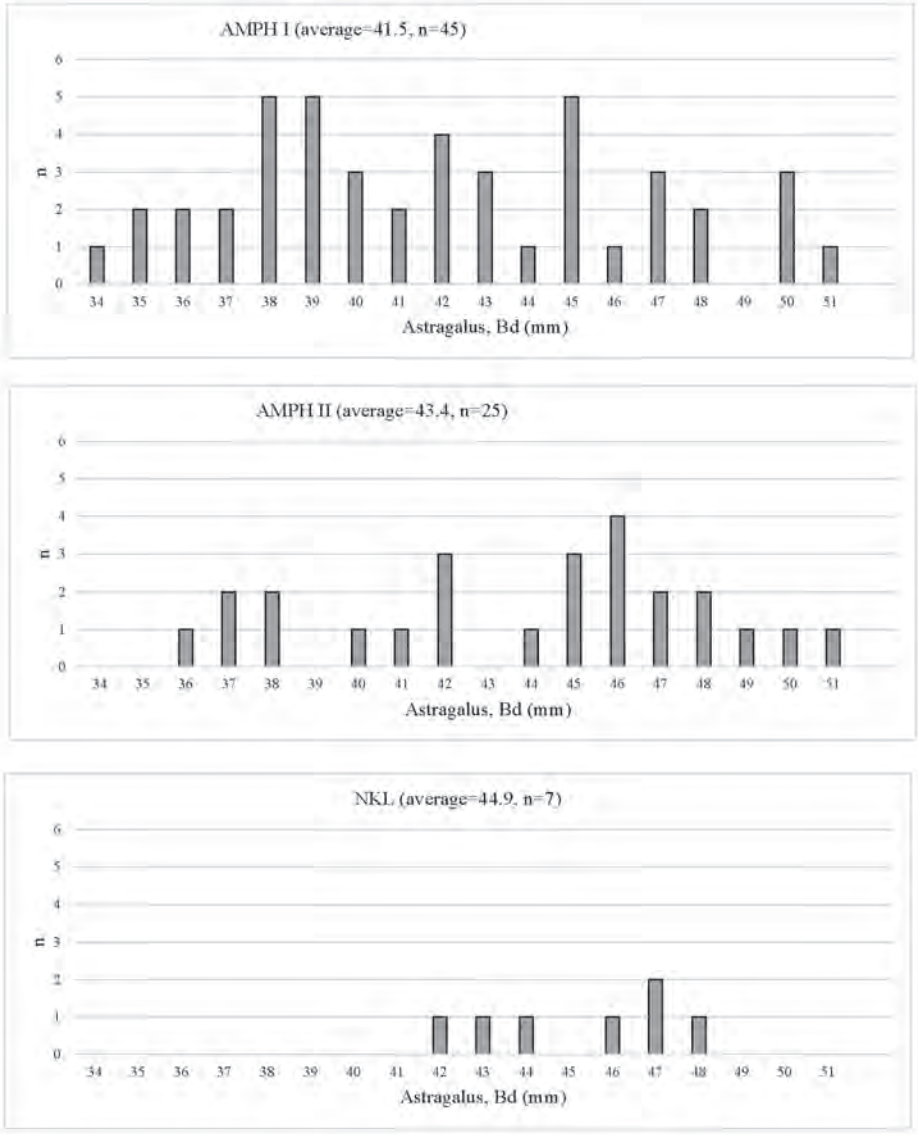


Fig. 9 – Histograms of cattle astragali distal breadths (Bd) by assemblages

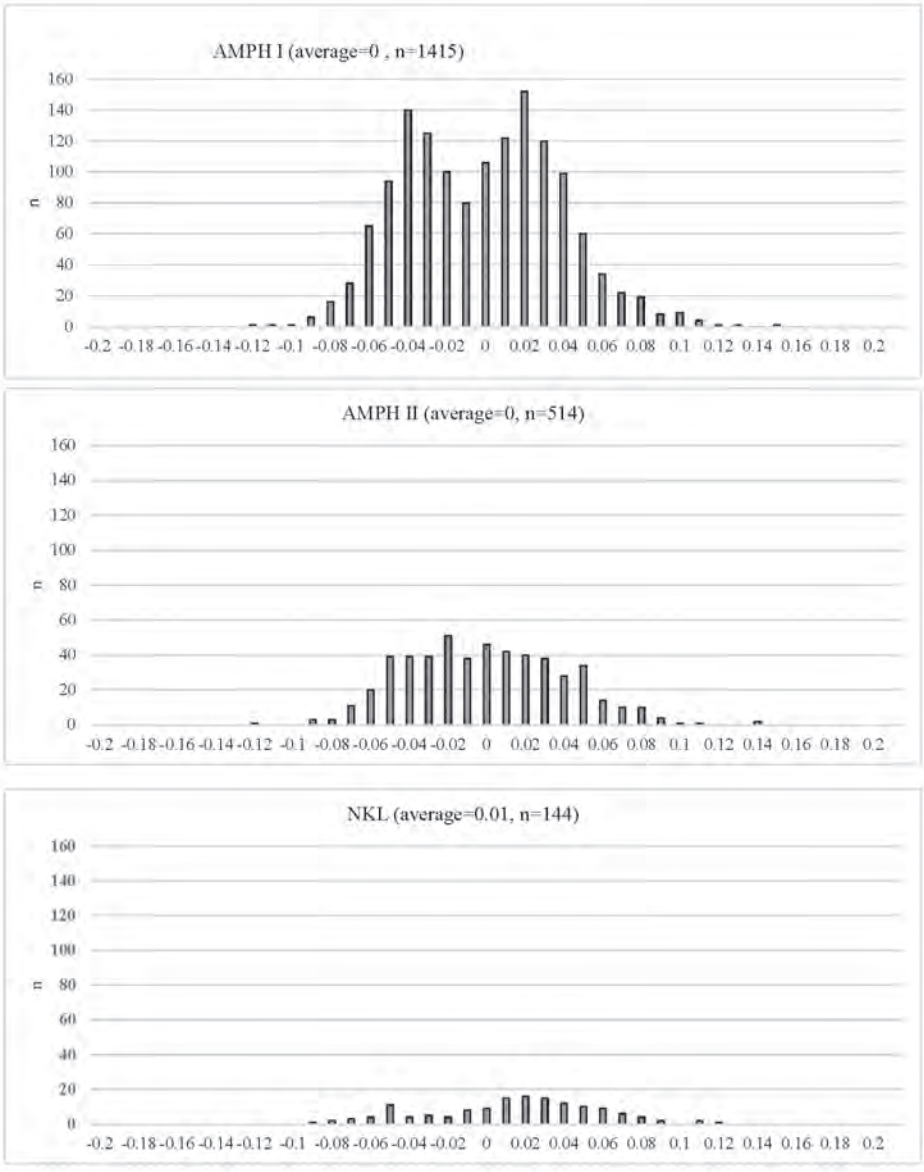
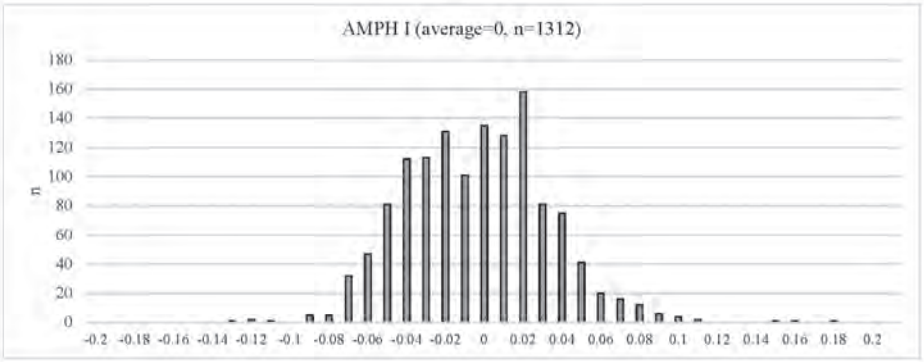
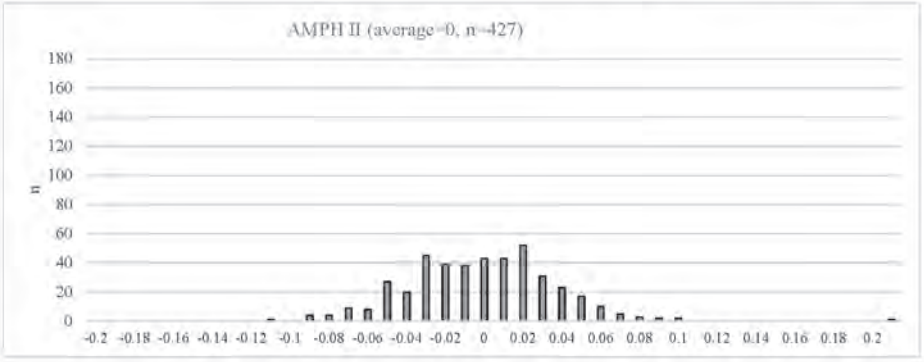


Fig. 10 – Log ratio diagrams of cattle postcranial distal breadths by assemblages





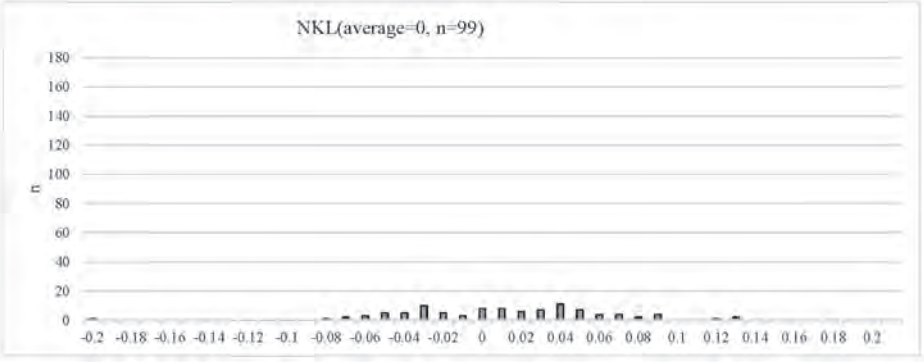


Fig. 11 – Log ratio diagrams of cattle postcranial distal depths by assemblages.

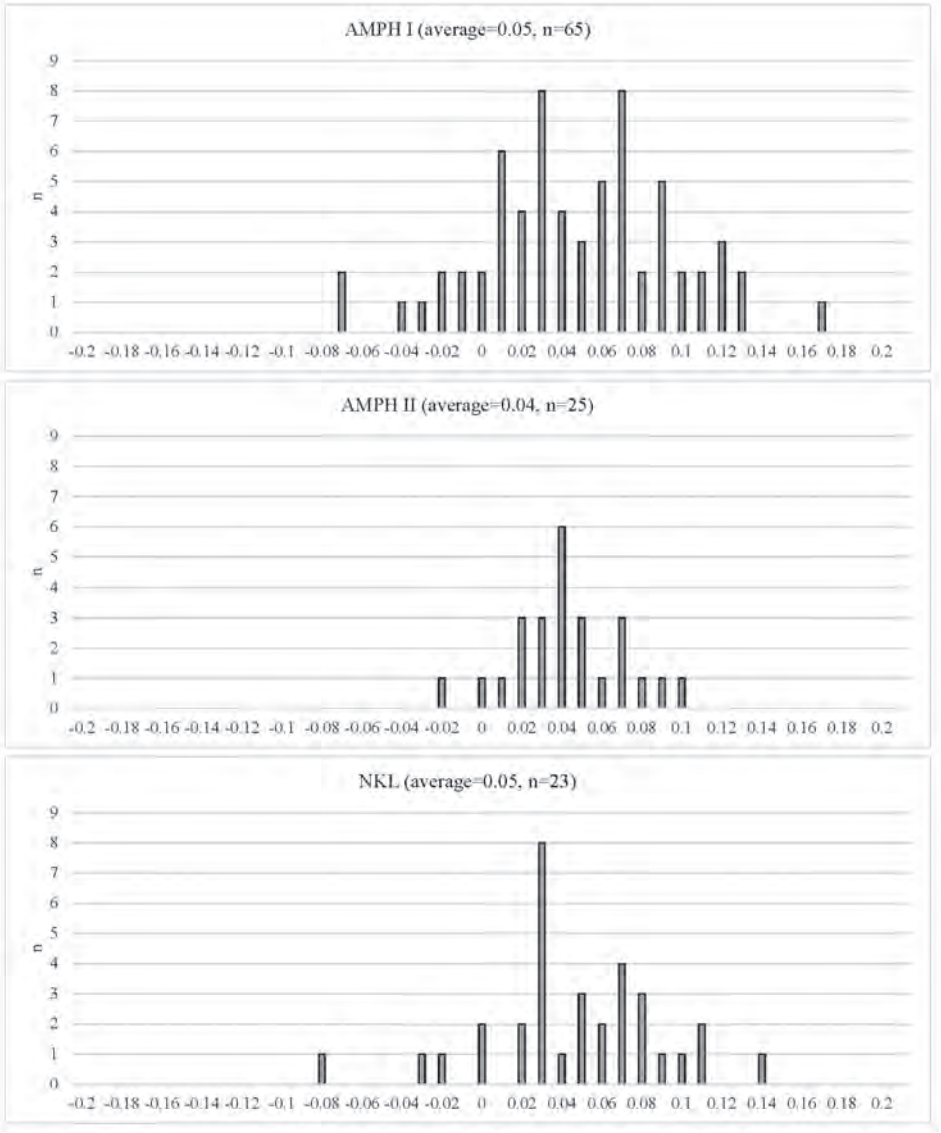


Fig. 12 – Log ratio diagrams of sheep postcranial distal breadths by assemblages.

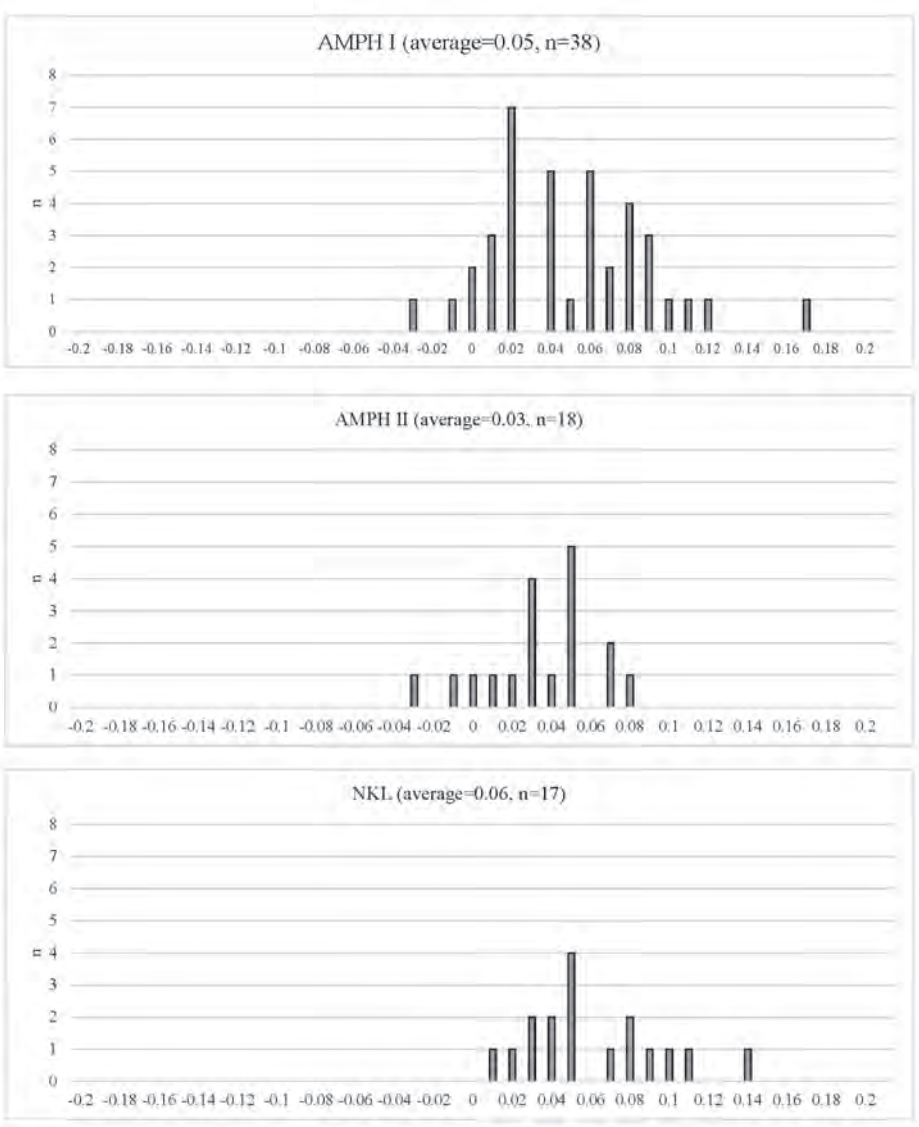


Fig. 13 – Log ratio diagrams of sheep postcranial distal depths by assemblages

Goat biometry

Although, there is not any clear difference between the goat wither height estimations (Fig. 8) and log ratios of long bone depths (Fig. 15), and also no significant difference between log ratios of long bone breadths (Fig. 14) within different periods and collections, it seems that, like in cattle, goats tend to be more coherent in size and slightly bigger within the late Roman period.

Pig biometry

Completely fused pig bones are rare, as often juvenile animals have been butchered, so wither height estimations were possible only in a few instances (Fig. 8). In order to maximize the sample, log ratios of all of the pig postcranial bone measurements were calculated and merged (Fig. 16). The difference between the samples is neither visible nor significant, so it can be concluded that the size of the pig did not change throughout the Roman and late Roman period in Viminacium.

Game, fowl and fish on the menu

As the consequence of improved husbandry and subsistence strategies that were not oriented towards hunting in the Roman period, wild animals contribute moderately in Viminacium faunal assemblages. However, there are certain differences among sites in the contribution of game remains. Wild mammal remains are significantly more represented in both town assemblages (AMPH I – 3%, AMPH II – 2.3%) than in the NKL assemblage (0.3%), so one can speculate that the game was consumed in the city in a greater quantity than in the surrounding areas.

The most common wild animals are red deer, roe deer, wild boar and hare, and also brown bears, whose significant remains within amphitheater faunal remains are probably connected to spectacles in the amphitheaters[39]. Some of the butchery marks on bear remains point to skinning, i.e. fur exploitation, but also to dismembering and portioning of their corpses and fileting, i.e. meat consumption. The question arises who ate the meat of animals used in spectacles – was it eaten by spectators who shared it after the games, or did it end up as a dish of the

39 Vuković 2011; 2015.

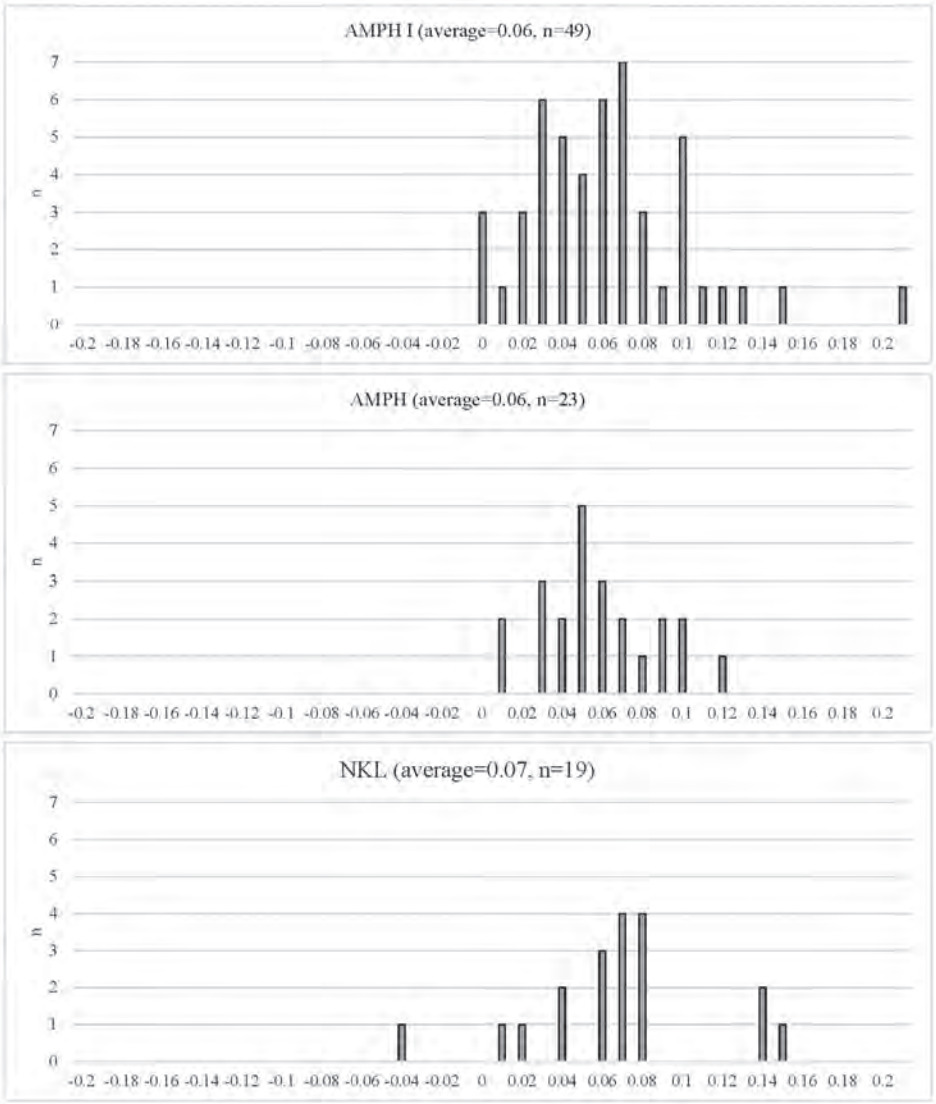


Fig. 14 – Log ratio diagrams of goat postcranial distal breadths by assemblages

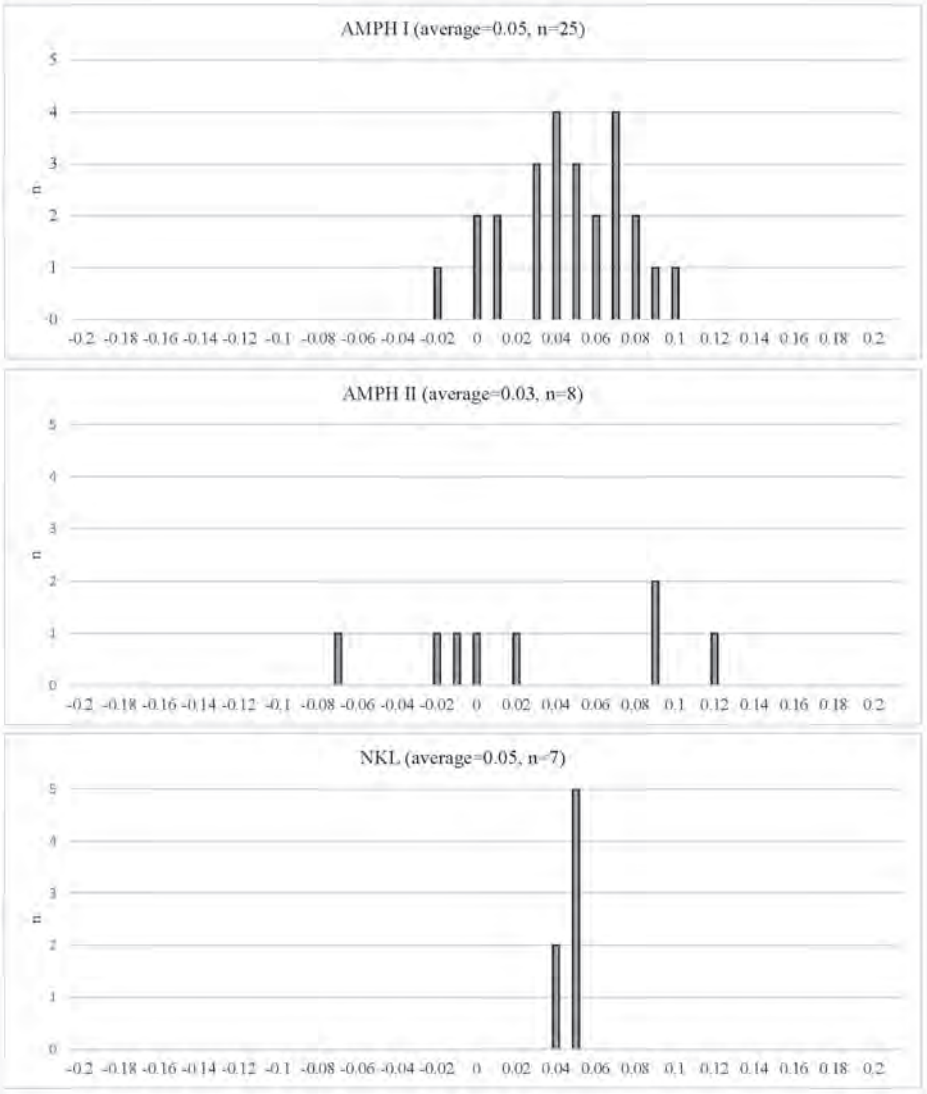


Fig. 15 – Log ratio diagrams of goat postcranial distal depths by assemblages

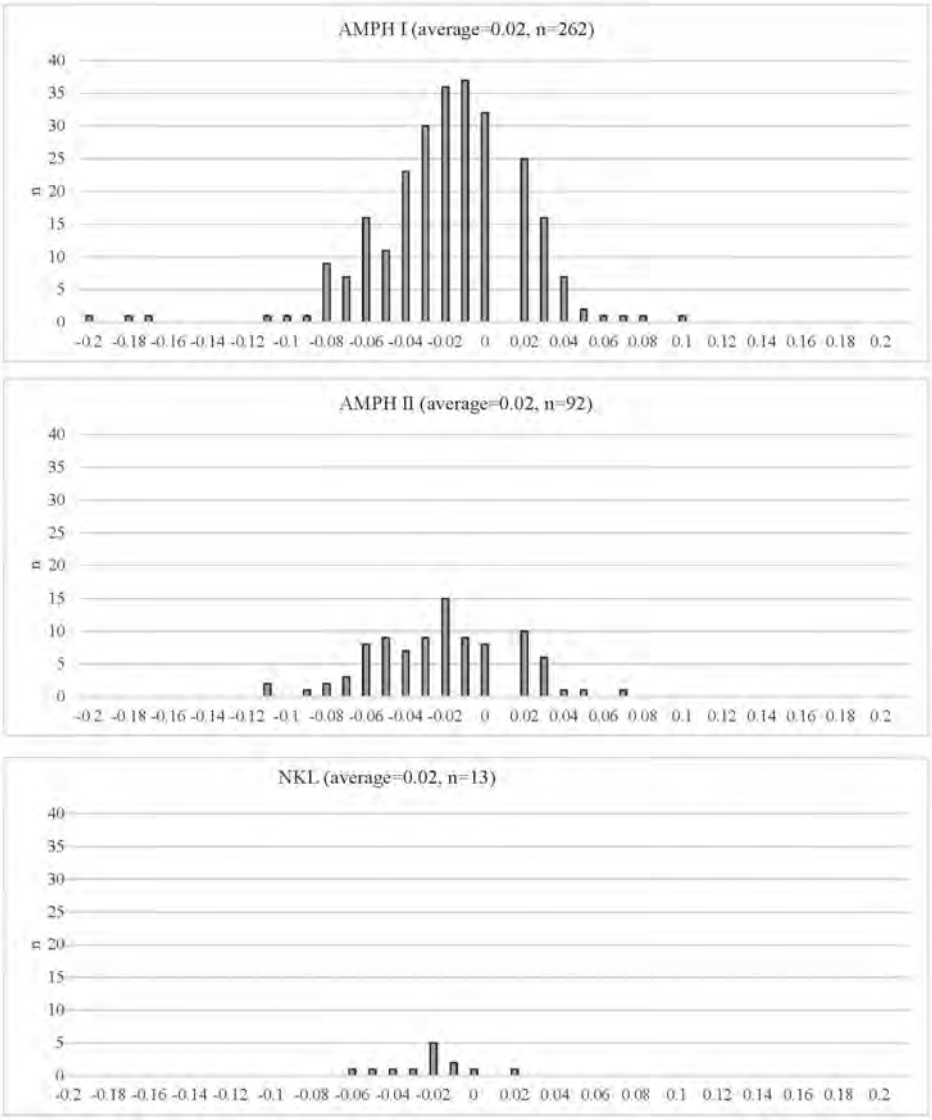


Fig. 16 – Log ratio diagrams of pig postcranial measurements by assemblages

Fig. 17 – Venison remains from Viminacium with dismembering/fileting marks (1 – red deer scapula, 2 – red deer humerus, 3 – red deer distal femur, 4 – hare proximal tibia, 5 – wild boar pelvis, 6 – brown bear ulna, 7 – brown bear proximal femur)

elite who had the privilege to eat the animal killed by gladiators, or by a hunter? Dismembering and fileting marks are also present on red deer, roe deer, wild boar and hare remains (Fig. 17), which suggests that other game had been eaten, too.

The contribution of bird remains in regard to mammal remains is almost negligible, as it falls between 1 and 2 percent of NISP and is certainly biased by hand collecting of animal remains. Among birds there are remains of chicken, while occasionally bones of domestic geese and domestic ducks are also found, so it can be suggested that the fowl contributed to the diet of Viminacium citizens, but in smaller quantities.

There is just a small number of fish remains recovered in Viminacium. Given that Viminacium was situated at the bank of the river Mlava, near its confluence with the Danube, one would assume that freshwater fish might have contributed to the diet in the city. The results are certainly biased by the hand collecting recovery technique of animal remains. Although the assemblage is small and biased, it can at least give a probable general impression of fish that was consumed. The fish assemblage consists of the remains of freshwater fish: Wels catfish, carp, pike, zander, sterlet and also anadromous Stellate sturgeon, Russian sturgeon, while beluga sturgeons prevail[40]. The meat and caviar of that remarkable fish (beluga sturgeons) which migrated from the Black Sea to the Danube were highly valued in the region since prehistory[41] and presumably in the Roman period as well. Martialis in his Epigrams wrote that sturgeons were convenient for Emperor's dishes[42], so it can be just speculated that Viminacium elite might have eaten it. The ideal location for their catchment was probably at the Iron Gates (ca. 100 km to the east from Viminacium), because of the large vortexes, suitable for their easier catch[43], so that there is a possibility that beluga sturgeons were supplied from that part of the Limes, where auxiliary units were settled. As it is known from Roman cookbooks[44] and archaeological and archaeozoological finds[45], the marine fish and fish sauces were part of the common diet in Roman world. Although there is no di-

40 Živaljević et al. in-press.

41 Živaljević 2017.

42 Toynbee 1973, 211.

43 Živaljević 2017.

44 Milinković 2005.

45 Van Neer et al. 2010.

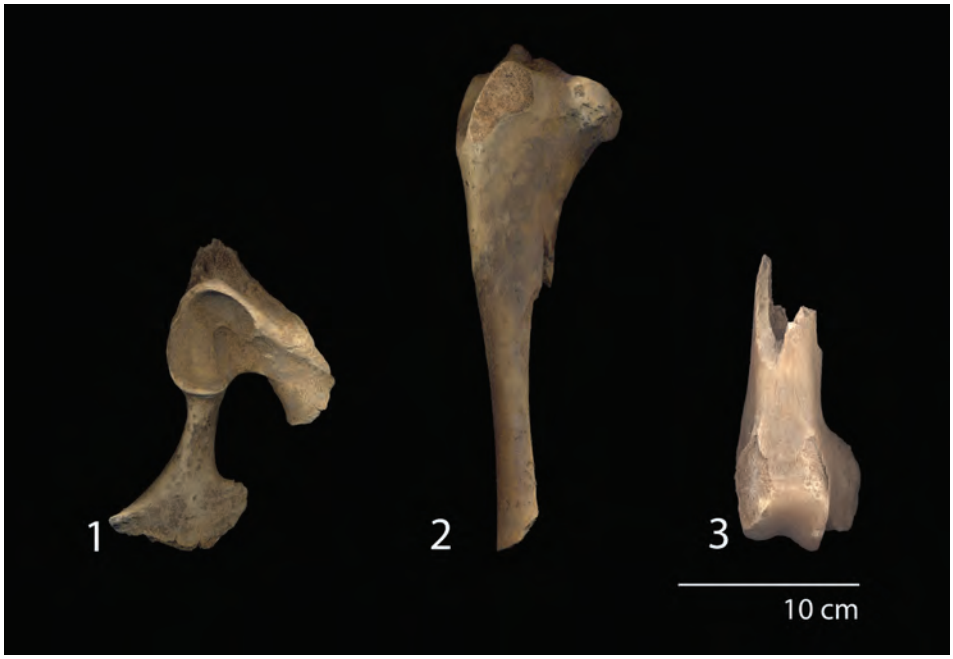


Fig. 18 – Equid bones from Viminacium with dismembering/fileting marks (1 – pelvis, 2 – proximal tibia, 3 – distal femur)

rect evidence of fish consuming in Upper Moesian limes, fish sauses and salted fish must have been shipped and arrived to Viminacium along trade roots in amphorae. There are finds of imported terracotta amphorae from Viminacium that mostly originate from the Mediterranean area and are considered to have been used as storage of fish sauces[46].

UNUSUAL AND EXOTIC FOOD: HORSES, CAMELS AND OYSTERS

Aside from the most common animals used as food and discussed previously in the paper, there are evidences that meat of horses, camels and Mediterranean mollusks was also used, but in smaller quantities.

Butchery marks and fragmentation of bones of horses (Fig.18), mules and donkeys point mostly to skinning, the practice that was common in the Roman world, as horse skin was widely used, while horse tails or mane were part of decorative

46 Bjelajac 1996, 29 – 32, 87 – 91, 109 – 114

or utilitarian objects[47]. However, there are dismembering and filleting marks on bones that suggest the consumption of equid meat, and also breakages that point to the marrow extraction. According to ancient texts[48], meat of horses was considered to be impure and there was a certain taboo against its consumption. Evidences of horse meat consumption are usually interpreted as testimonies of scarceness of other foodstuffs[49]. Considering the extensive usage of products of domestic animals from Viminacium – from power to meat - as suggested in this paper, the consumption of equid meat, after the animal could not have fulfilled its primary role (as riding animal or beast of burden), can be speculated on. However, as no butchery repetitive pattern was observed on equid remains, these animals were probably not slaughtered in specialized butcheries like other domesticates and, for sure, their meat was not part of everyday meals.

Within the 4th century context of Viminacium amphitheater (AMPH II), in the layer that buried the object itself, several camel bones[50] and fragmented camel skeleton[51] have been unearthed (Fig. 19). It is suggested that camels were introduced in Roman provinces as beasts of burden, for carrying loads of both the army and civilians. Since dismembering and fileting marks are present on their bones, it is suggested that meat and other products of those animals have been used when the animals were too old to serve their primary purpose. Long bones of fragmented camel skeleton were broken due to marrow extraction, while their meat bearing parts were taken away, probably for an unusual dish.

Among Mediterranean mollusk remains, there is a prevalence of oyster shells (Fig. 20), which sometimes bear marks made during the extraction of shellfish, so we can suppose that salted oysters were brought to Viminacium for consumption on rare and probably special occasions.

47 Toynbee 1973, 185.

48 Tacitus 1931, Annals, II, 24.

49 Lauwerier 1999.

50 Vuković- Bogdanović, Blažić 2014.

51 Vuković, Bogdanović 2013.

Fig. 19 – Camel bones from Viminacium with dismembering/fileting/ impact marks (1 – scapula, 2 – proximal humerus, 3 – distal tibia)

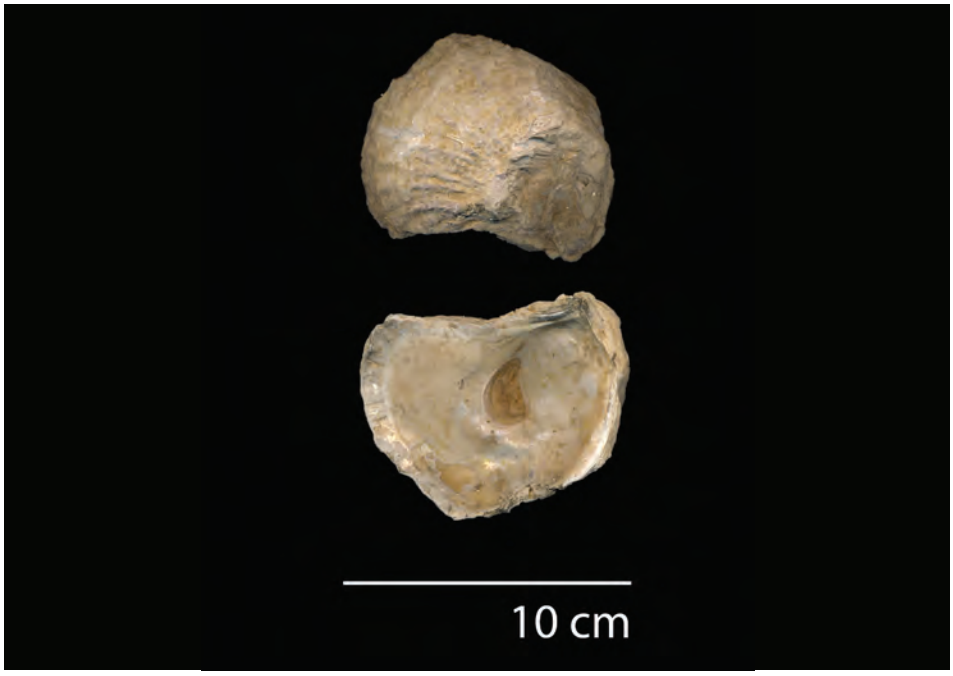


Fig. 20 – Oyster shell from Viminacium with a mark made during the extraction of the shellfish

CONCLUSIONS

This study reveals the evidences of meat diet in the city of Viminacium based on preliminary archaeozoological finds from the area of the amphitheater and from the settlement situated outside of the city. It seems that cattle-dominant food pattern prevailed in Viminacium and it can be concluded that beef was the most usually eaten meat within the Upper Moesian limes. The prevalence of adult cattle is striking and it suggests that the people of Viminacium exploited everything they could from cattle, from dairy products and strength, for as long as they could, and finally they butchered them for meat and other meat and non-meat products (marrow, horn cores, skin, etc.). A more "typical Roman"[52] food pattern was present in the course of the 2nd and 3rd centuries, as in AMPH I assemblage, since there were more pigs and also piglets then in the later period. Changes from the Roman to late Roman period include a slight increase of mean values of cattle sizes as the result of a lesser number of smaller, probably autochthonous breeds in the later period and not the increase of actual size of those animals. The requisite of large cattle that is related to the necessity for larger amounts of meat obviously did not change throughout the Roman and late Roman period in the city. Furthermore, the breeding of improved cattle breeds developed over time, which resulted in the scarcity of autochthonous breeds in the late Roman period. A slight difference in age structure of cattle – a somewhat larger number of older animals in the late Roman period - could have been related to the change in economic practices, i.e. the development of arable farming. Goats, like cattle, are slightly bigger in the later period, while, on the contrary, sheep decrease in size. Except for being smaller, there is also a shift in culling of younger sheep in the late Roman period, so it can be suggested that in Viminacium wooly sheep, which are considered to be bigger and which are mostly bred until adulthood, were bred to a greater extent in the 2nd and 3rd centuries than in the later, 4th century. Diachronic changes of the diet in Viminacium, although not outstanding and significant, reveal that in the course towards greater prosperity of the city, in the 2nd/3rd century AD, except for older cattle meat that prevailed in the city, there was more piglets and calves available to the citizens than in the later, more troubles times, in which the citizens relied mostly on adult cattle meat and, definitely, on cattle secondary products. Butchery

52 King 1999.

patterns on cattle remains point to the developed butchery and meat production within the city of Viminacium.

The difference in faunal composition and biometric data between the city and city surroundings is striking and might point to the difference between the production and consumption sites: the improved cattle, sheep and goats were probably bred in city surroundings for the market of the city of Viminacium.

Horses and other equids were sometimes eaten too, and there is also evidence of occasional usage of exotic species in the diet, such as camels and oysters. As expected, venison and fish were more rarely eaten in comparison to domestic animals.

The obtained data on the meat diet in the city of Viminacium are generally consistent with the results from other urban sites along the frontier in the Northern and Western provinces of the Empire[53]. This is reflected in the cattle dominant food pattern, the presence of improved domestic breeds and also in butchery patterns that are more or less uniform in the Roman world. Archaeozoological studies from the vast area of the Empire and consequently frontiers, although consistent, showed some regional and also site category (urban/rural/military) particularities in dietary habits and preferences. Although the attributes of animal remains from Viminacium are clear signs of Romanization processes, further micro regional traits must be explored by the analyses of more assemblages within the Upper Moesian frontier and the inland of Roman provinces situated in Central Balkans. Faunal analysis of Viminacium legionary camp which is being excavated at the moment, but also of other smaller fortifications within the Upper Moesian frontier, should provide testimonies on military diet in this part of the Roman world.

Translated by Sonja Vuković Bogdanović

53 King 1999; Albarella et al. 2008; Peters 1998; Groot 2017; Deschler-Erb 2017; Pigière 2017; Rizzetto et al. 2017.

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ARCHITECTURAL FEATURES OF ROMAN HORREA IN THE AREA OF MODERN-DAY SERBIA*

BOJAN POPOVIĆ, *Institute of Archaeology, Belgrade*
E-mail: pop984@hotmail.com

ABSTRACT

The expansion of the Roman Empire and the formation of new provinces brought about the establishment of a serious system of collecting, storing and distributing food and other goods. Food storage facilities (horrea) were built throughout the empire both for the needs of the army and for the needs of the civilian population. The subject of this paper is the analysis of the features of these specific facilities, their size, shape, constructive characteristics, in the area of Upper Moesia and Lower Pannonia.

Key words. – Horrea, late antiquity, architecture, Upper Moesia, Lower Pannonia.

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The foundation of Roman provinces in the newly conquered territories and the formation and development of military camps and settlements along the Limes and in the midlands of the provinces inevitably lead to population growth. Vast numbers of ordinary people, merchants, craftsmen, artists and their families, inhabited the immediate vicinity of the military camps, the ager publicus of the colonies, territories of the municipia or the veteran's estates, while the army was lodged in forts. With the growth of the population, the demand for larger quantities of food and facilities for food storage and distribution rose, since the areas surrounding military camps were not always suitable for agricultural use.

The problem with grain storage and food storage in general appeared as early as in prehistory, when man started gathering food from nature. The emergence of the first food storage facilities is also known from the Hellenistic period, i.e. from Pergamon (3rd century BC). Roman agronomists and architects also dealt with these problems and devoted much attention to them. Horrea, thus, came into existence out of this necessity, and their function was the storage of foodstuffs of different kinds and origins, but also the storage of other goods necessary for daily life. These were mostly massive buildings of simple construction, regular geometry, and an elongated base, whose main function was to provide a safe, dry and isolated place for storage.[1]

The remains of horrea are found throughout the Empire, in urban centres as well as in rural areas, but also within fortified military camps. Their role in providing food for the army and population in general was indispensable so, as a rule, they were ubiquitous. There is virtually no settlement or military camp without horrea. It has been established that huge public horrea existed in cities, from where grain was further distributed. Thus, in Rome alone, in the final period of the Empire, there were almost 300 granaries which could provide the city with enough grain to operate normally for several years.[2] The largest one, *Horrea Galbae*, consisted of about 140 compartments on the ground floor and occupied an area of 21,000 m², which testifies to the importance and size of these buildings, and *Horrea Antoniniani* in Ostia[3] was much the same size.

1 As G. Milošević notes (Milošević 2014, 31) in bibliography, the term horreum is related to the objects for grain storage, the granaries, which is inadequate and a simplification; we agree with this view.

2 Marteaux 1998, 14-15.

3 Rickman 1971, 5.

The specific function of the horrea imposed certain propositions concerning their size, position, orientation and the form of their architecture, which are also mentioned by Vitruvius.[4] Most often, these were massive objects, with an elongated rectangular base, double pitched roof and oftentimes multi-storied. Customarily, they were positioned near the main communications- in the vicinity of the forts' gates, so as to be easily accessible. Safety measures which included fire and theft protection were taken in their design and construction, the windows were extremely narrow, positioned high on the external walls, and the doors were secured by firm locks and bolts. A free standing position in the built environment, massively wide walls (0.90- 1.80m) and a high roof which could not be reached by flame provided fire protection. Also, the entrances often had ramps to provide easy access for carts, making loading and unloading faster and easier.[5]

Horrea can generally be classified as massive or light wooden constructions according to the materials they were built of. The massive ones can be further divided according to their spatial organisation into those whose interior was divided by one or more rows of columns and those with partition walls.[6] The classification according to the intended users differentiates civilian and military horrea, and within this classification horrea can be further divided into public and private ones.

Thus, Pliny makes a difference between two types of buildings intended for the storage of agricultural produce, and these are massive structures (made of brick, stone or their combination) - *horr*ea and light wooden structures - gr*anaria*.[7] The wooden granaries were temporary structures, and typical of the early periods of the Roman Empire and temporary military camps. However, the remains of this type of buildings have not been discovered in the area of Moesia Superior and Pannonia Inferior. There are speculations that the first earthworks had temporary structures made of wood, and thus also the wooden horrea, as is possibly the case with the wooden horreum in Donji Milanovac - *Taliata*.[8] In a later period, solid built structures appeared in provinces throughout the Empire. Structures of this

4 Vitruv. VI/vi/4.

5 No remains of this type of ramps were discovered in Moesia Superior, except for the horreum in Mediana, where this type of structure could have existed

6 Rickman 1971. 2-3.

7 Plin. 18/73.

8 Milošević 2014, 47.

type, intended for the storage of foodstuffs, had to meet very specific requirements. For example, a dry, cool and dark space is necessary for grain storage. The level of humidity should be between 10 and 15%, depending on the climate and the type of grains stored, and the temperature about 15°C.[9] Brick was used as an ideal material for the regulation of humidity, since it acts as an absorber in an atmosphere of high humidity, i.e. it absorbs water vapour while, when the humidity is low, it releases the absorbed moisture, thus securing optimal air saturation. This characteristic of brick is possible because of its structure created while it is being dried and fired, when water evaporates from the brick and micro-sized air bubbles remain in its place, and the humidity is absorbed into and released from them through the porous structure of the brick. Also, its thermal characteristics provide a constant optimal temperature of the interior, without major oscillations, while its constructional characteristics meet all the standards for this type of building. Stone, as the second most common material, is not as suitable as brick, regarding humidity regulation of the interior, but it was also widely used in construction for its thermal insulation and constructional properties, its affordability and its availability in the immediate surroundings. An important part of the construction of these buildings was the plastering of walls, primarily the interior ones, to obtain a smooth surface without holes and dents, which facilitated cleaning and the manipulation of the stored goods. Proper ventilation was an important factor in the preservation of the foodstuffs, and was provided by the windows on the facade. The windows also had the function of air conditioning, since grains release heat and there existed a danger of spontaneous combustion.[10] Also, it was necessary to secure the space from pests, such as rodents and various insects, but also birds. Structures for grain storage provided ideal conditions for pest invasion (primarily insect), which was extremely difficult to eliminate once started.[11] The only solution was to plaster the walls, which minimised the danger of pests laying their eggs and cocoons developing in joints and crevices, followed by frequent, seasonal cleaning and the use of various pest repellent coatings.

When it comes to construction, horrea were not challenging structures, but certain principles of construction had to be followed because of the specific purpose of

9 Rickman 1971, 1.

10 Milošević 2014, 33.

11 Smith, Kenward 2011, 252

these buildings. Above all, this refers to the massiveness of the structure and floor solutions. Numerous preserved horrea remains show the floor laid on dead walls or piers to reduce or avoid the capillary action of humidity from the ground. An important factor in determining wall size was the fact that grain was stored both in bulk and in sacks. Thus, the walls had to be strong enough to bear both the vertical and the horizontal pressure, which were considerable, unlike in ordinary structures where such pressure could not occur. If grain was stored in bulk, this horizontal pressure was immense, even up to 2/3 the vertical pressure, which would mean, if the vertical pressure gradient were $3t/m^2$, the horizontal, side pressure, could be as much as $2t/m^2$.[12] This imposed several constructional characteristics of the horrea structures. The first one was a large wall thickness, and they usually had pilasters, in some places against the exterior walls, in others against the interior ones, and in some cases on both sides. These served to reinforce the walls and acted against the pressure forces to a large degree. The pilasters were occasionally raised from the wall surface by up to 0.60m, depending on the wall thickness and the type of load; this also leads to the conclusion that these buildings could have had a multi-storey construction, which was not unusual. Naturally, if the structure was leaning against the fort's thick rampart, thus meeting the engineering statics requirements, there was no need for the pilasters.[13] Another important characteristic was that the space had to be dry, i.e. to prevent the penetration of humidity from the outside. For this purpose, horrea had double-pitched[14] or mono-pitched[15] roofs with long steep slopes and, if they had a courtyard, they always contained swales (canals) across the middle of the yard to capture and divert the surface runoff away from the structure. Yet another important feature were the raised floors of the horrea, which prevented the drawing up of moisture from the ground by capillary action. This was achieved by the construction of the so-called dead walls built of brick, or stone and hydrostatic mortar, laid on the ground in rows inside the structures or with evenly distributed piers onto which a massive, solid floor, resistant to high pressure, was constructed. In a very small number of cases, the space between the ground and the floor could be accessed through small openings used for cleaning and ventilation.

12 Rickman 1971, 2.

13 As was the case with the horreum leaning against the south city rampart in Sirmium.

14 This was the most common type of roof structure.

15 Very rare, but still occasionally identified due to the specific characteristics of their location.

The main classification of the type of horrea recognises a difference between *the civilian granaries (horrea publica*), located in big cities and towns from where the distribution of goods was carried out, and military granaries (*horea militaris*) which supplied the army.[16]

The civilian granaries, which, according to their ownership, can be further divided into public and private ones, were by far the most common type of these structures, built both in urban and rural environments. Public horrea were owned by emperors, i.e. by the state of Rome, and had a well-developed system of management and control. Since an important resource - food- was in question, the state had to supervise the import and distribution of grain. On the other hand, private granaries begin to emerge, owned by rich Roman families, merchants or retailers. It is common knowledge that the price of grain before and after the harvest differed, so private owners used these differences to their advantage and, having stored large quantities of grain, waited for the increase in prices and a larger profit.[17] The conclusion reached by contemporary researchers of economic history is that in the Roman imperial economy mostly relied on the private market.[18]

Military horrea were typically found in military forts, and served to supply the army with grain. As structures of great importance, they played a significant role in the design of the organisational scheme of military forts. Thus, this type of structure was typically located near the principia building, in the central part of the fort, or near the gate leading to the port, if the fortification was located by a river.[19]

In the territory of modern-day Serbia, whose central part used to be the province of Moesia Superior,[20] while the area of Vojvodina belonged to the southern part of the province of Pannonia Inferior, both types of horrea were found, both civilian and military granaries. (Fig. 1) A great number of the remains of Roman buildings which could be identified as civilian granaries has been discovered and registered in Sirmium, Municipium DD, Maskar, in the suburbs of Peć, in Mediana, Justiniana Prima and Gamzigrad (Felix Romuliana). The other type of buildings whose

16 Popović 1988, 202.

17 The same situation is observed even today, when large companies store grain in silos after the harvest, when it is cheapest, and sell it later, when its price on the market increases.

18 Kessler, Temin 2007, 313-332.

19 Rickman 1971, 234.

20 Modern-day Serbia occupies territory of the provinces of Pannonia and Moesia.

remains have been discovered in Serbia, can be classified as military granaries, and they were typically found in military forts. This type of horrea was identified in the castra along the Limes, namely in the military camps on the Čezava, in Boljetin, Pontes, Veliki Gradac, Karataš, Sapaja, Konopište, Kurvingrad, Taliata castrum, the mouth of the Porečka river, and in the castrum in Singidunum. The horreum in Ravna, the fort outside of the Limes, should also be mentioned here.

PUBLIC HORREA

Sirmium, as an imperial city, had several granaries, whose remains were discovered on sites 31 and 30. Two structures of the same type, but with a different spatial and constructional arrangement, discovered on site 31 next to the south rampart most likely belong to the complex of the imperial palace, for which reason they were named royal horrea. They were of an internal character. However, by their spatial organisation, concept and system of construction, as well as the materials, they are equal to other similar structures of this type and do not differ from them in any aspect. The research of these two structures, building 1 and building 2, has not been completed, but their graphic reconstruction can easily be performed since their bases were formed by the simple laying of the same elements of approximately the same dimensions (plan 1). These two buildings represent two separate units, both spatially and chronologically. It is clear that they were intended for grain storage, of simple construction and erected at different times and locations.[21]

Building 1 has a rectangular base, its interior dimensions being 40.00 x 10.50 m, and it corresponds to the dimensional ratios of most horrea. The interior is partitioned by a row of seven columns[22] and probably had wooden partitions between the columns and the walls. This structure was leaning against the old south rampart (which at one point started slanting towards the south due to the pressure of the stored goods and the settling of the underwater surface) while it was still functional. Building 2 was erected at the end of the 3rd century, along the new route of the south ramparts, determined by the new urban concept of the Imperial palace.

21 Jeremić 1998, 241.

22 Partitioning with piers emerged from the constructional requirements that had to be met when building a double pitched roof structure.

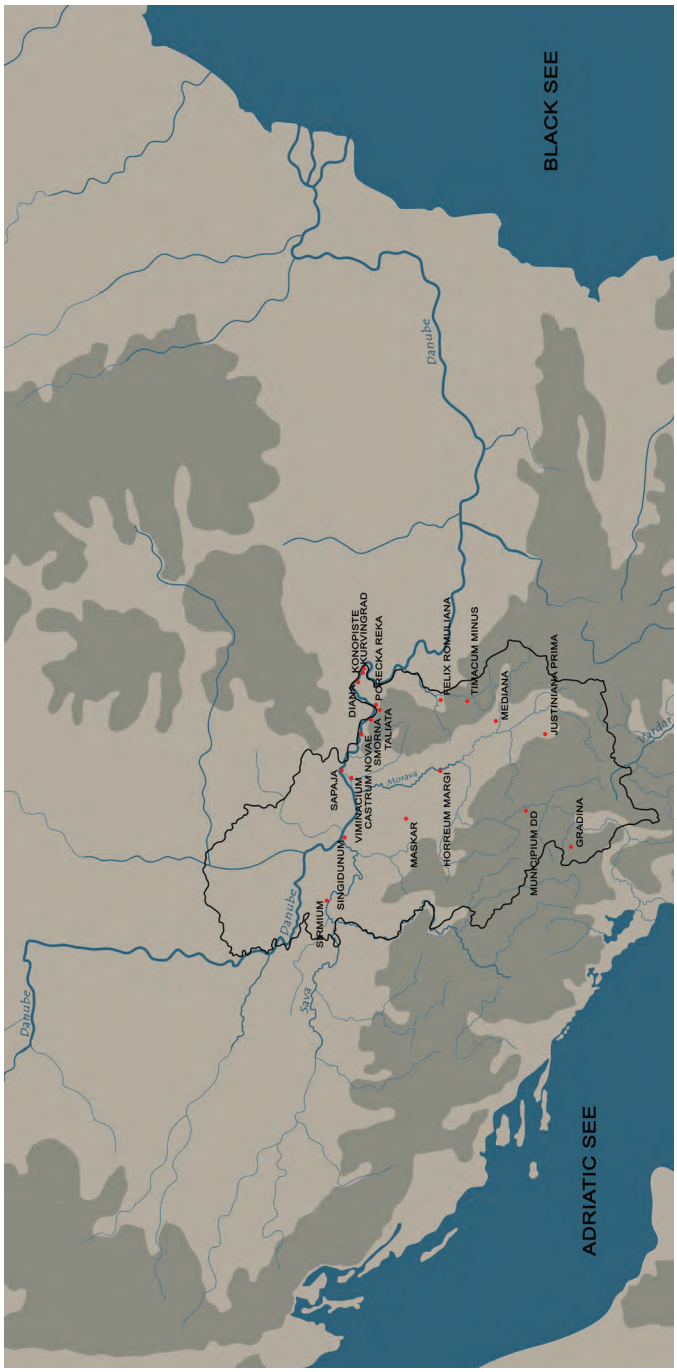
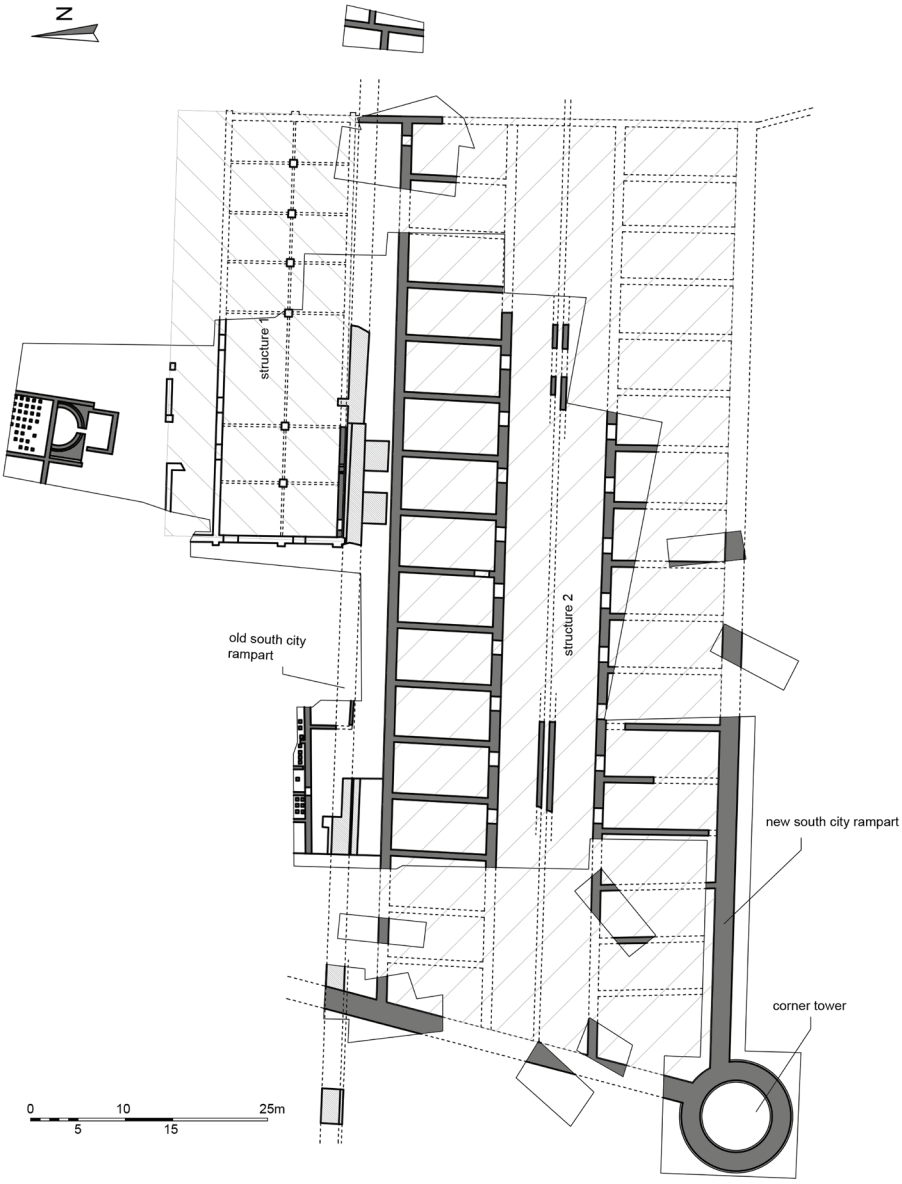


Fig. 1 – Position of horrea in the area of modern-day Serbia

Plan 1 – Sirmium horreum - site 31, after: M. Jeremić 1998.



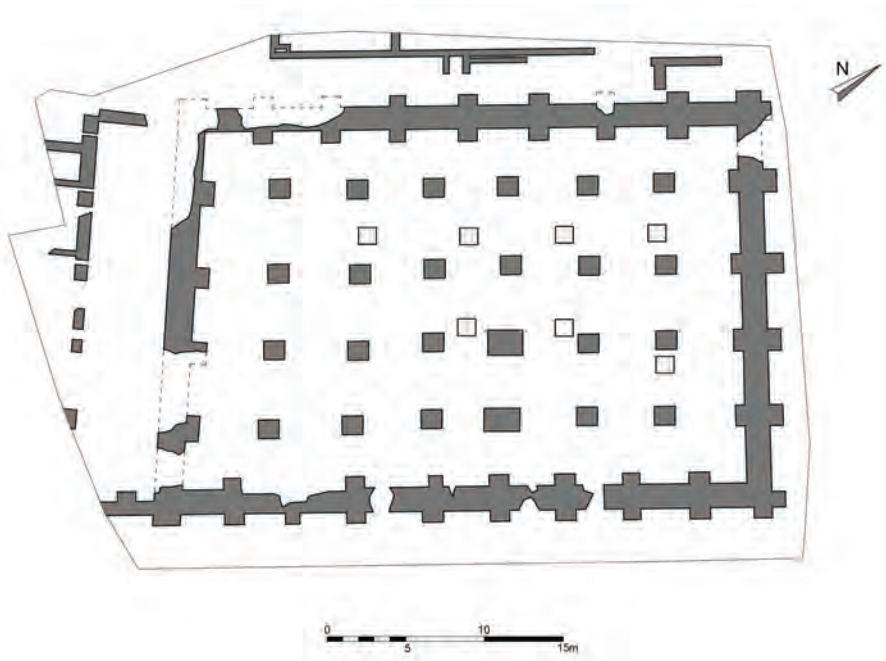
The south rampart was moved 35 m towards the south, taking into account the width of the future building. Thus, the south rampart embraced the horreum and, at the same time, represented its exterior walls. Building 2, 85.0 m long and 33.0 m wide,[23] was comprised of two sections divided by the courtyard with a rigole (canal) for capturing surface runoff. Both sections, each 10 m wide, consisted of rows of cells of approximately the same dimensions. The north section consisted of 16, while the south one consisted of 17 compartments. The main entrance could have been located only on the east side,[24] which confirms the speculation that the new horreum was located within the palace complex.[25]

A structure of utility architecture, which probably belongs to the granaries of the public type, was discovered on site 30 in Sirmium (plan 2). The horrea were located in the central zone of the Roman city, more to the south than the Licinian Baths. The building on site 30 was bordered by streets and, during the excavation, a deep portico was discovered on its south side, so it can be presumed that the entrance to the building was on this side, which also opens towards the port. It was erected at the end of the 3rd or at the beginning of 4th century on the location of the previous settlement since, under the floor gradient, a richly decorated residential building dated to the 2nd century was discovered. Two phases were identified, the younger building was erected over the levelled remains of the older one, of which about ten piers remained in the foundation zone, while the exterior walls were not registered. The younger building has been completely unearthed; it is a structure of a trapezoidal base, its outer dimensions being 44.0 x 22.0 m, with a 5.0 m wide portico. The interior is divided by four rows of six piers, forming regular 5.0 x 5.0 m fields. The exterior walls are fortified by pilasters whose position corresponds to the position of the interior piers only on the narrower sides. Because of the massive walls (1.8 m) with pilasters and the interior piers (1.30 m), it can be assumed that the structure had a story supported by arches lengthwise, and by wooden beams along its width. The first floor was covered with thick wooden slabs which were also on the second floor, raised from the ground for isolation and mois-

23 This is, at the same time, the largest fully researched horreum in Serbia.

24 The rampart was located on the south and west side and the northern wing of the building on the north side.

25 Jeremić 1998, 243.



Plan 2 – Sirmium horreum - site 30, after: M. Jeremić 1998.

ture control.[26] Several millstones were discovered inside the building, which also points to its purpose.

At both sites, the granaries are oriented towards the city's port, i.e. towards the gate on the south city rampart which leads to the port, which also represented one of the tenets of horrea construction, since supply was mostly carried out by ships. Also, apart from the difference in the interior design, which depended on the large dimensions of these buildings, there is a difference between the city and palace horrea, whereby each had different users. If we compare the size of both structures to the number of potential users, at least two more large structures of this type necessary to provide food for the residents can be expected to have existed on the territory of Sirmium. Since Sirmium was surrounded by a multitude of streams and swamps, on the shore of the Sava, it can be deduced that this area was not used for cultivation and that grain was probably shipped from other regions of the Empire, so the existence of the horrea was vital for the city to function normally.

A larger group of granaries is comprised of public horrea on the mainland of Moesia Superior. Structures of similar dimensions, construction type, spatial or-

26 Jeremić 1998, 246.

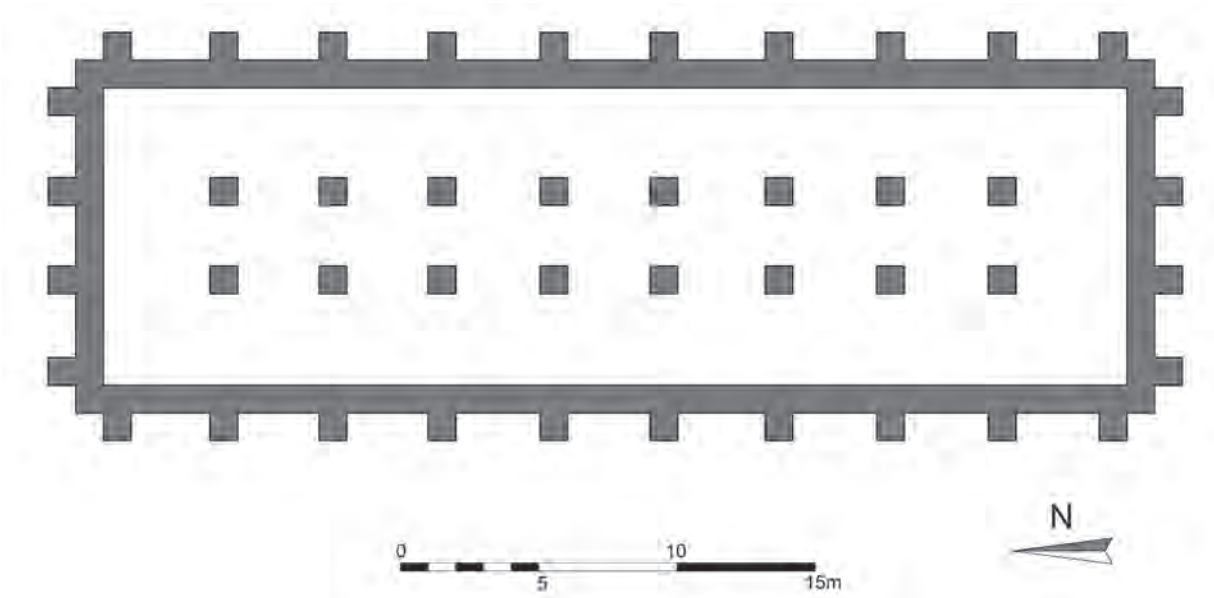
ganisation and materials have been discovered on several sites, and they can all be dated to the same short span of time during which they were erected.

The Late Roman granary in Maskar, near Topola, belongs to this group. It is a structure registered during the archaeological research carried out by the National Museum in Kragujevac, on the site of Crkvine. According to discovered coins, it can be dated to the 4th century. During the archaeological research, a large building from the period of Late Antiquity was researched and it can be classified as a granary according to numerous analogies with other structures across the Empire with almost identical bases. This is confirmed by the thick walls fortified by pilasters. The depth and massiveness of the foundations point to a multi-story construction. The structure has a rectangular base, its dimensions being 38.20 x 11.00 m, and consists of one large room divided into three naves with two rows of eight columns in each (plan 3).[27] Since the columns are placed towards the centre, the central nave is narrower and it can be assumed that it served as a passageway, while between the columns and lateral walls there were wooden partitions. The position of the entrance cannot be identified with certainty, since only the remains of the foundations are preserved, but it can be assumed that it was located in the middle of the frontal part of the structure because of the passageway across its central part. The capacity of this horreum with a 380 m^2 base, if we suppose that one kind of grain was stored and the structure was fully loaded, could be about 540 m^3 of grain.

Sočanica (Municipum DD) is an important site, on which an elaborate structure interpreted as a horreum was discovered. This structure consists of two triple-naved segments, 1 and 2, divided by two rows of seven piers, with a central courtyard, 3, between segments 1 and 2, with deep porticos along the facades of these segments and a segment with an exedra, 4 (plan 4). Facing the frontal side of the object, a row of columns was discovered, so it is maintained that there was a porch on that side. The interior of segments 1 and 2 is divided into three naves by a double row of seven columns, and the distance between the columns corresponds to that between the interior pilasters and the pilasters on the exterior. In order to build this monumental architectural complex, all older buildings had to be pulled down, the ground levelled and the temple which was located here negated.[28] The

27 Srejović 1982-83, 35-38.

28 Čerškov 1970, 15-21.

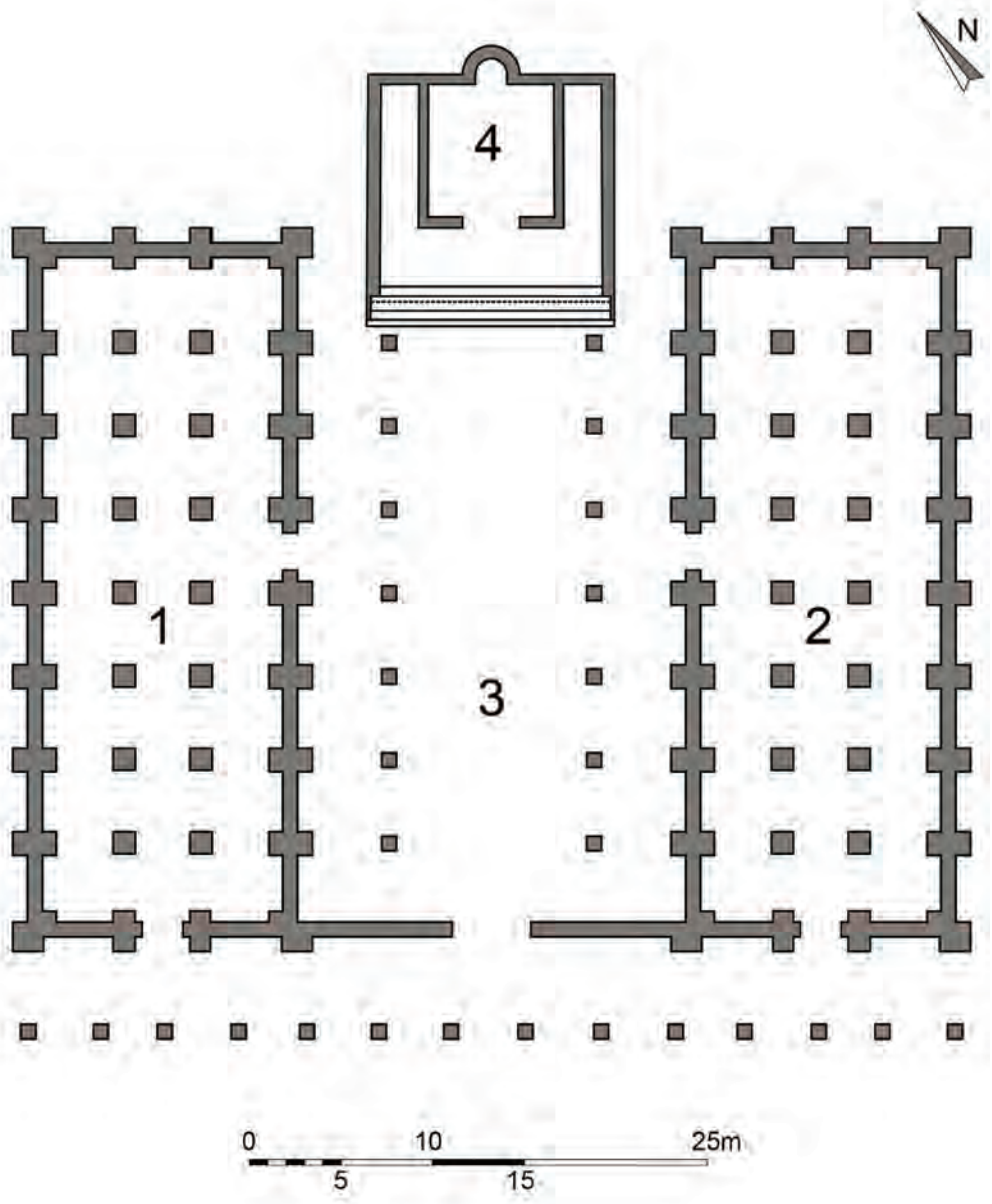


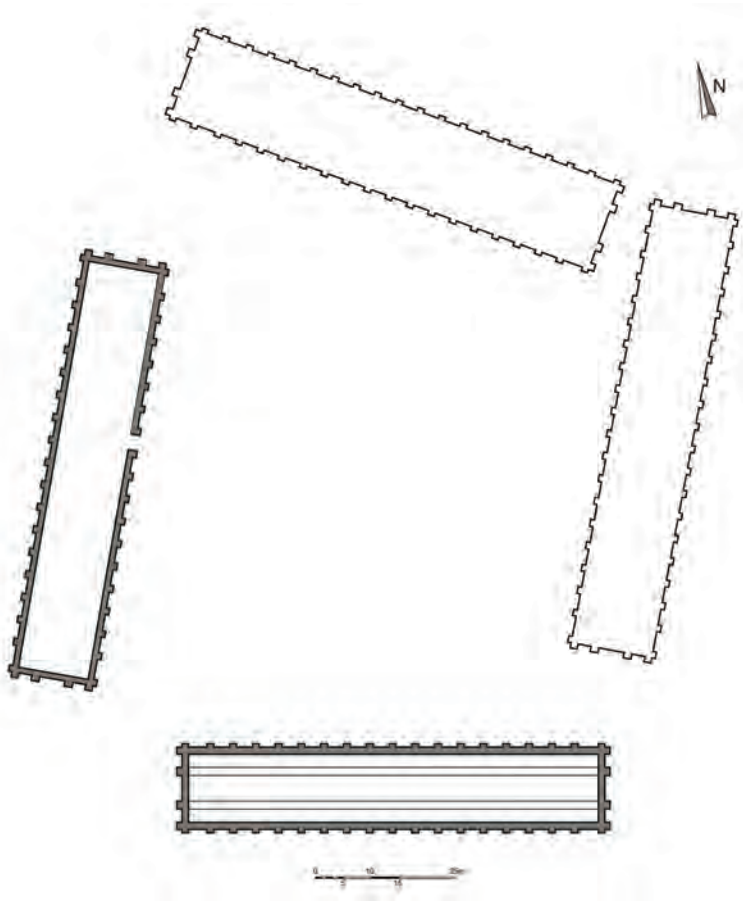
Plan 3 – Maskar horreum, after: D. Srejović 1982-83.

dimensions of the triple-naved segments are similar to those of the granary in Maskar (43.30 x 16.00 and 42.70 x 15.50 m), the only difference being the occurrence of the massive pilasters on both sides of the exterior walls, which could point to a multi-story structure. The position of the entrances, oriented towards both the outer space and the inner courtyard, i.e. both on the longer and shorter side of the base, is also of great importance. The periods of construction of these buildings also coincide. For a settlement like Municipium DD, the volume of this horreum of about 1,800 m^3 was sufficient to secure the supply of grain for an entire year.

The site of Gradina near Peć, with a whole complex of buildings, represents the most important food distribution centre in Moesia Superior. Archaeological research has shown that there were four buildings of the same form which were placed around a large trapezoidal courtyard. Each of these buildings was actually a large room whose dimensions were 75.00 x 12.00 m with 1.2 m thick walls fortified by pilasters on the exterior walls (plan 5). The entrance was on the longer side, turned towards the courtyard. According to the content and structure of this cultural layer it can be deduced that the complex was erected at the end of the 3rd or the beginning of 4th century, and that it was erected on an uninhabited area. The discovered ceramic vessels, coins and decorative objects show that this

Plan 4 – Sočanica horreum,
after: D. Srejović 1982-83.





Plan 5 – Gradina horreum, after: D. Srejović 1982-83.

was the food distribution centre of this region until the end of the 4th century.[29] Srejović mentions an unexpected premise- that these buildings were partitioned into three segments of equal width by lengthwise walls. Since the entrance was on the lateral side, it would be impossible to use the other two parts of the horreum, and the lighting of the central space would be questionable. The only logical explanation of these walls (that were not very thick) is that they were dead walls and served to support the substructure of the raised floor. Another problem is the roof construction solution, which is only possible as a tie-beam truss, with beams of a large cross section because of their length of 12 m and roof trusses which create a double-pitched roof. The assumption that this was the distribution centre of the

29 Srejović 1982-83, 39.

whole region is supported by the total volume of the four buildings, which was 5,250 m³, much more than the sum of the volumes of the horrea discovered on the Danubian Limes, which was about 3,350 m³.

A rectangular building oriented northeast-southwest, whose dimensions were 92.0 x 27.0 m, was discovered in Brzi Brod, near Niš *(Mediana)*, 150 m west of the villa with a peristyle. This structure was more elaborate than others discovered in Serbia (plan 6). It consisted of one large room whose dimensions were 80.0 x 18.0 m, divided into three naves of equal width by two rows of 11 piers, and an open passageway in its central part turned into a portico. On the west side, there were several smaller rooms of different sizes and unknown function. This structure was used until the second half of the 4th century.[30] What makes this building different from others with the same function is the absence of pilasters on the exterior walls. The discovery of 37 large pithoi partially sunk into the ground is of great importance. Also, pools up to 1.40 m deep were identified by the west wall of the structure. The pools were plastered with hydrostatic plaster, which indicates that a large quantity of liquid was stored in them. The assumption that wine was produced and stored in this building[31] partly explains the absence of pilasters on the exterior walls[32] and points to a specific type of horrea. It should be noted that another structure which corresponds to the unearthed horreum in its form and characteristics[33] was detected east of the villa with a peristyle during the geomagnetic exploration in 2010, so the data about this horeum is as expected.

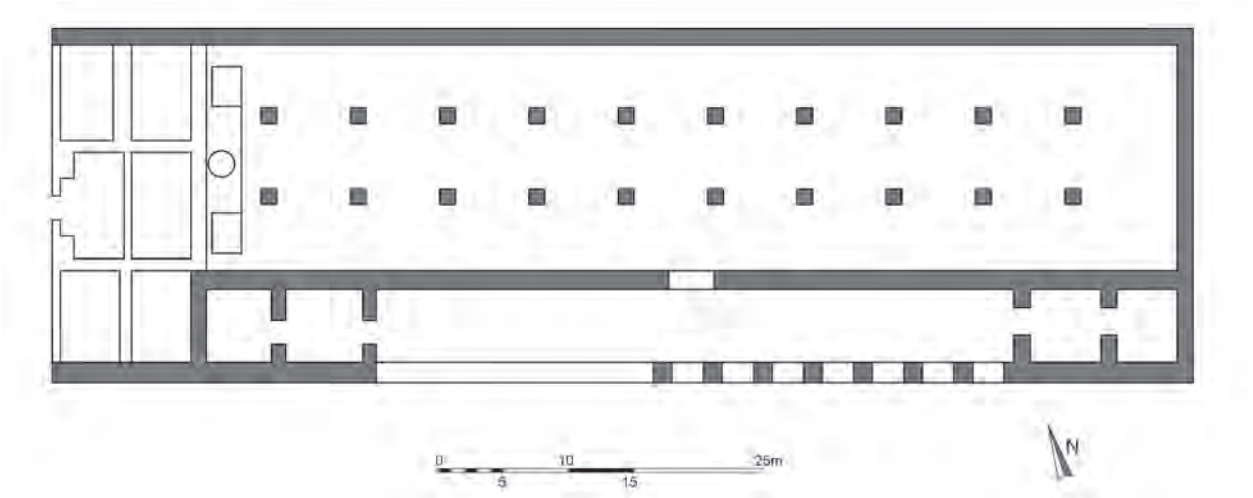
A five-naved structure of a rectangular base of 51.20 x 19.40 m (plan 7) was discovered in the southwest part of the imperial palace fortification in Gamzigrad (Felix Romuliana). The entrance hall (4.0 x 18.0 m) was on the north side of the structure and it could be assumed that it was added subsequently, since its wall was simply attached to the northeast corner of the structure. The hall actually had two entrances, the main one on the north side, and the side entrance on the south side. The interior of the structure was divided into five compartments of different sizes by four rows of six piers (1.20 x 1.20 m). Facing these pilasters, on the north

30 Vasić et all. 2015, 43.

31 Ibid. 42.

32 There was no lateral pressure so, in terms of the construction requirements, pilasters were unnecessary.

33 Milošević et all. 2011, 278.



Plan 6 – Mediana horreum, after: D. Srejović 1982-83.

and south wall, there are interior piers, which indicates the existence of arches in the lengthwise direction, and by that fact itself, some sort of multi-story structure. On the exterior, pilasters divided the lengthwise facade into ten segments and the narrower one into seven, ending in blind arches.[34] According to the shape of the base, the dimensions, the constructive structure and the position within the fortification, it can be assumed that it is a granary, however, discovered wall decorations that are no less than those in the palace and the pillars of the columns question this claim. For the time being, it is only speculation that this was a horreum.

What can be said with certainty is that the remains of a horreum erected in about 310 were discovered during archaeological research at the site of Malo Gradište, 250 m from the west rampart of the fortified palace. This granary is almost identical to the one in Maskari, the only difference being its slightly larger dimensions (plan 8). A rectangular room with a 44.0 x 16.0 m base was partitioned by two rows of eight piers. The exterior walls were fortified by pilasters which most likely ended in blind arches. The positions of the piers and pilasters are correspondent, while the remains of the imposts on the interior side of the walls (in the direction of the pilasters) and massive foundations point to a structure which had a second level, which is assumed to have been a cross vault. With minor reconstructions in the 5th century, this horreum was functioning until the

34 Čanak-Medić, Pavelka 2010, 99-100.

7th century.[35] If we assume that this horreum, with a 1,000m³ capacity, was sufficient to supply the imperial palace with grain and foodstuffs, the demand for another horreum is highly questionable. On the other hand, recent geophysical scanning revealed the existence of a settlement north of Romuliana, where another object with the function of a horreum may be discovered.

The remains of a settlement and a public building were discovered during excavations in 2012 and 2013 in Caričin Grad (*Justiniana Prima*), on the area of the north slope of Gornji grad[36]. This large structure of a simple 25.0 x 12.50 m base consisted of a central room and a smaller vestibule on the west side (plan 9). The larger room was divided into two naves with a row of piers, but, surprisingly, pilasters do not exist on the exterior walls. This structure is interpreted as a horreum, and several segments of millstones have been discovered in its immediate vicinity, which confirms this assumption.[37] This represents an important discovery, which contributes to the already acquired knowledge about the urbanism and functioning of the city and, according to the size of the structure and its capacity of about 300 m³, it can be deduced that there existed several more granaries like this that supplied *Justiniana Prima* with food and other consumables.

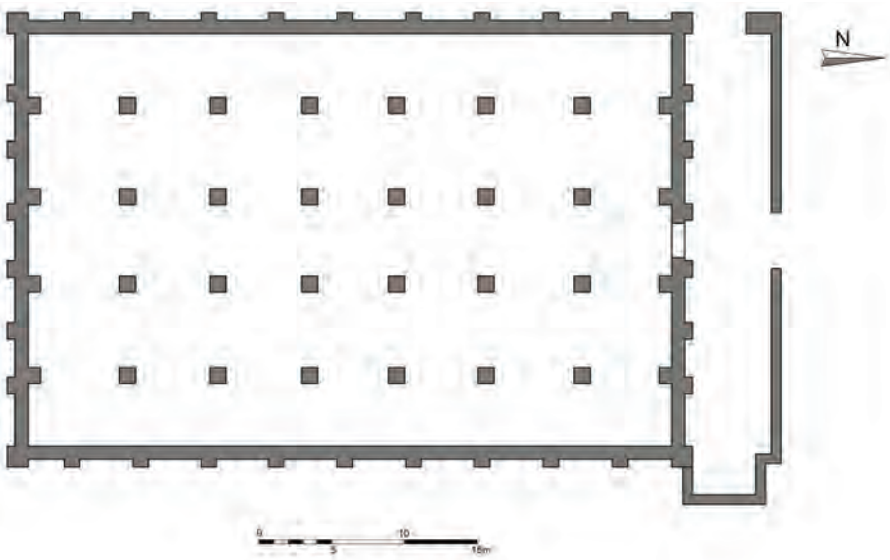
MILITARY HORREA

The huge army deployed across the Empire had its own demands when it came to food supply. Thus, in Moesia Superior, i.e. along the Limes, fortifications with a specific mode of operation began to emerge. This primarily refers to the procurement and storage of grain. Since the area around the Djerdap section of the Limes was not suitable for the cultivation of grain, it was necessary to provide the supplies of grain from more remote parts of the Empire or from the population of the immediate or more remote surroundings. Land and water transport played an important role here. An extensive road network secured a good connection and easy access to all the important centres that constituted the distribution network, but wa-

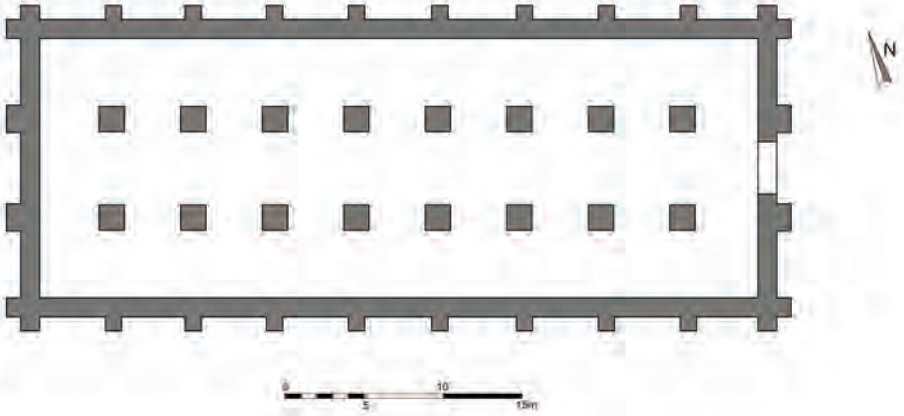
35 Srejović 1982-83, 42.

36 Building no. 20.

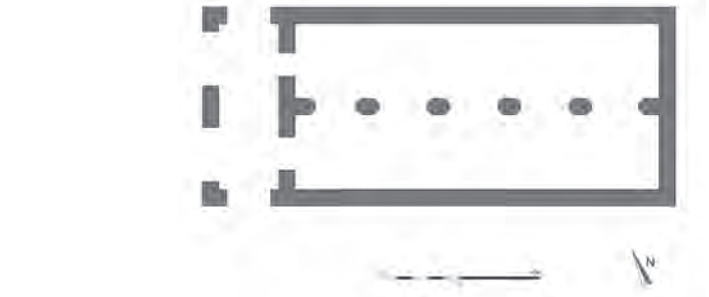
37 Ivanišević et al. 2017, 130.



Plan 7 – Gamzigrad horreum, after: Čanak-Medić, Stojković-Pavelka 2010.



Plan 8 – Malo gradište horreum, after: D. Srejović 1982-83.



Plan 9 – Justiniana Prima horreum, after: V. Ivanišević 2014.

ter transport was more economical. Thus, the fortifications had to possess ports, as mentioned in Singidunum, Viminacium, Diana, Margum and Egeta. Certainly, supplying the forts along the Limes was carried out using both water and land transport.

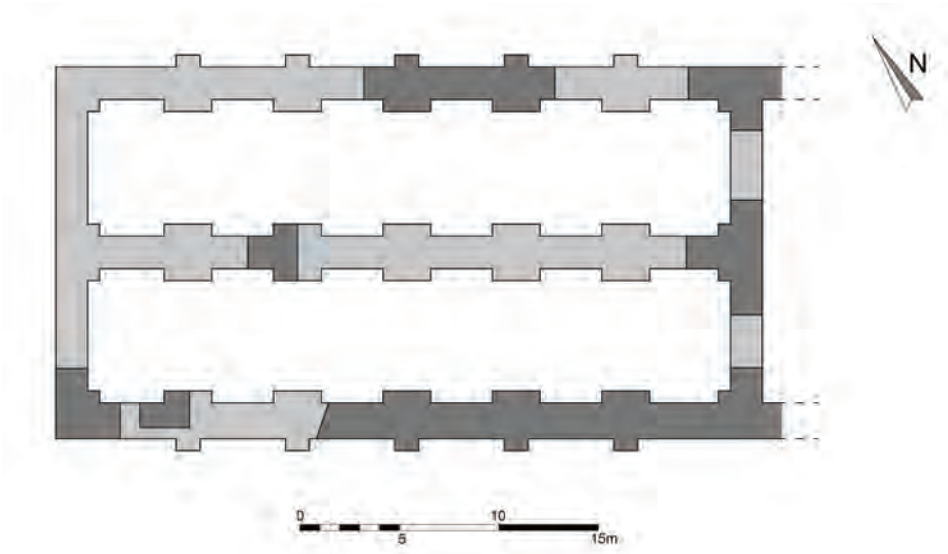
Along the Limes of Moesia Superior, two large castra appeared: *Singidunum,* in which the *Legio IV Flavia Felix* was lodged, and *Viminacium,* with the *Legio VII Claudia*, and, beside these, several smaller ones for the lodging of auxiliary troops, such as Veliki Gradac and Karataš (between 500 and 750 soldiers) and Livadice, Sapaja, Čezava, Saldum, Boljetin, Pontes, Porečka reka, Konopište, Kurvingrad, Golubinje and Hajdučka vodenica (40 to 80 soldiers).[38] The fort in Ravna, near Knjaževac, on the bank of the Beli Timok, was also researched. Only a few of these have been researched thoroughly enough to provide us with clear information.

Singidunum, as the castrum of the *IV Flavia* legion, was founded around the beginning of the 2nd century AD, and around the castrum, a civilian settlement soon emerged and acquired the status of a Municipium during the time of Emperor Hadrian.[39] On the territory of Gornji grad, where the existence of a castrum was confirmed, in the park in front of the modern-day Sahat gate, the remains of a horreum were discovered immediately below the ground surface level. Only the foundation zone of this structure is preserved, since it was levelled in the later periods. It was a structure with two naves (divided by five piers) and a 34.90 x 17.80 m rectangular base (plan 10). The lateral walls and the foundations of the horreum were fortified by massive pilasters on the interior side, and on the exterior side there were pilasters in the same positions, only narrower. The pilasters on the exterior walls correspond to the arrangement of the partition piers across the middle part of the structure.[40] The aboveground part is not preserved, so the exact position of the entrance cannot be determined, but according to the base, it can be assumed that it was on the east side. The manner of construction cannot be determined either, so a reconstruction of the building is not possible. The coin finds indicate that the structure was erected in the

38 Petrović 1980, 53-54.

39 Popović 1997, 14.

40 Bikić, Ivanišević 1996, 257-262.



Plan 10 – Singidunum horreum, after: V. Bikić, V. Ivanišević 1996.

second half of the 4th century. This is the largest military horreum that has been researched so far. With its potential capacity of about 880m³, it could store an amount of grain sufficient to feed 2,200 soldiers[41] for a year, which leads to the conclusion that there was another similar or even larger structure for food storage in the castrum.

No horrea have been found so far during the archaeological research of Viminacium. The geomagnetic prospection registered the forms of important structures in the vicinity of the main communications.[42] One of these massive structures probably had the function of a horreum. Interestingly, a monument devoted to Mitra was also discovered here, erected by a *nauclerus,* a citizen whose occupation was maritime transport and trade.[43] This shows that trade and transport of grains were prevailing activities on the territory of Viminacium.

41 The estimate is made according to the data given by Campbell (Campbell, 1994, 18-185), where the allowance of one legionary was 3 pounds of grain, 2 pounds of meat, 2 pints of wine and 1/8 pint of oil. Hence, each soldier's daily allowance of grain was, in contemporary measures, 650 g of grain, which totals 240 kg per year. The volume of 240 kg of grain is 0.4 m³.

42 MIletić and Miletić 2012, 13.

43 Petrović 1991, 207-216.

The *Taliata* fortification in Veliki Gradac had three horizons of horrea near the north gate (plan 11). The oldest horreum (first phase) can be attributed to the castrum which was originally located there, but it is impossible to give any detailed information about it since the research has not been completed. It was discovered that the walls were 0.90 m thick and fortified by pilasters. Rows of piers (four rows with five piers in each) were positioned in the direction of the pilasters, which leads to the premise that the building had arches and a cross vault, i.e. that the structure had an upper story. Only the east wall, 21.00 m long (which corresponds to the length of the later horrea), was unearthed, while the west wall has not yet been discovered, so it is impossible to determine the width of this structure. The artefacts make it possible to date the building to the second half of the first century.[44]

The major part of the younger horreum (second phase) was erected over the first granary, whose walls had been levelled. This structure with a rectangular (18.80 m x 12.85 m) base was divided lengthwise into two segments of different dimensions. It is assumed that there was a barrel vault above these rooms or that the ceiling was flat. It has been concluded that the entrance was located on the south wall, which was attached. It is difficult to say when this structure was erected, but according to the artefacts it can be approximately dated to the 4th century.[45]

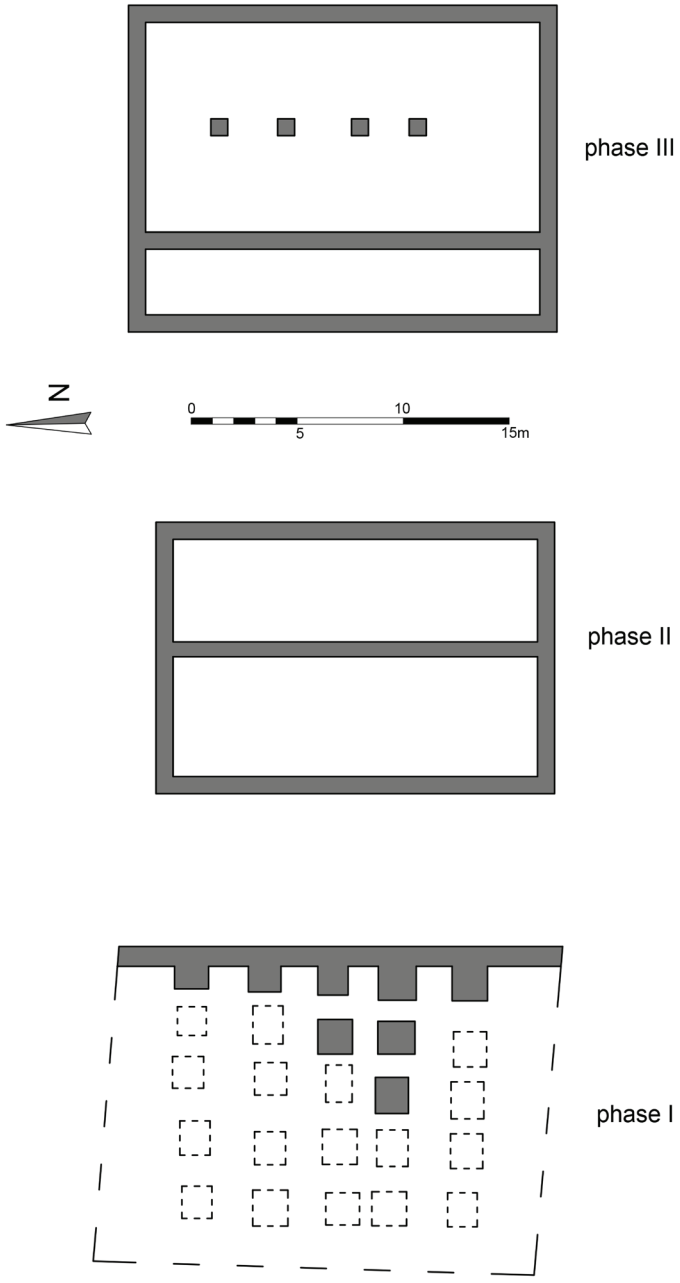
The time of construction of the youngest horreum (third phase) is difficult to determine. The building with a porch towards the street can be dated to the period of the Early Byzantium fort, i.e. the 6th century, with relative certainty. The preserved parts of the walls, i.e. the layer of brickwork of the Early Byzantine format (37 x 30 x 6 cm) and 5 to 7 cm thick mortar joints clearly indicate it was built during that period. The structure had a 20.20 x 10.70 m rectangular base, with 1.0 m thick walls and massive foundations made of cut rubble and lime mortar. A 20.20 x 3.10 m porch with a well-preserved mortar floor was subsequently attached. The large room was partitioned into two naves by five identical piers, which indicates a multi-story structure. A large number of millstones indicates that grain was also ground here, most likely under the wide porch.

All three phases of the horrea were erected on the same location, by the north gate of the fort, indicating the possible existence of a port in that area and the connection of the horrea with it, since the main access for carts was on the south

44 Popović 1982-83, 268-269.

45 Ibid. 272.

Plan 11 – Taliata horreum, after: V. Popović 1982-83.



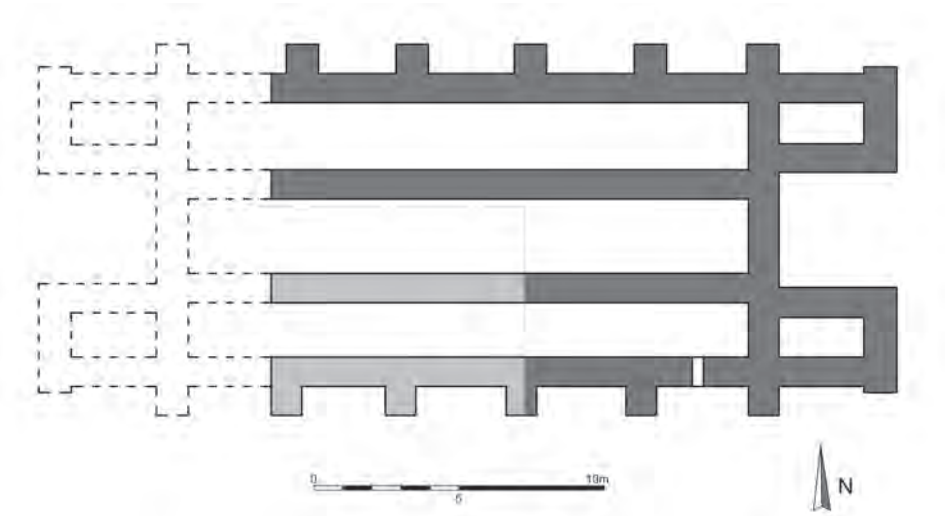
side. Furthermore, this leads to the conclusion that foodstuffs reached the horrea via water transport. The capacity of the horreum of the last phase of about 280 m^3 of grain was enough to provide a yearly supply of grain for about 700 soldiers, which corresponds to the premise that 500 to 750 soldiers were lodged in this fort.

A military fort that had several phases of construction was discovered at the site of Karataš (*Diana*), lying 8 km upstream from Kladovo and 2 km downstream from Djerdap I (Iron Gate) Hydropower Plant. The phase of solid stone walls and ramparts, which begins with Trajan's and Hadrian's reconstruction, continues throughout the phases of the Antonine dynasty and lasts until the end of the Severus dynasty,[46] is of relevance to this paper. The interior of the fort had a typical three partition spatial arrangement, parts of which were discovered during the research carried out so far. A large rectangular building of a characteristic floor plan, made of stone and located in the north part of the fort, next to the north gate, is one of them. This building was identified as a horreum[47] (plan 12). The structure is 9 m wide, while its researched length is 18 m. However, this is not the final measurement, since the research of the building has not been completed. Massive, 0.9 m thick exterior walls, were fortified with pilasters on the outside, while the interior was longitudinally partitioned into three sections by walls. The interior walls were probably dead walls which supported the floor structure. The entrance was most likely on the east, frontal wall, on which two rectangular rooms were formed. The floor plan reconstructions of J. Rankov-Kondić presuppose the existence of three identical rooms on the west, frontal wall. However, there are no analogies which could account for the existence of these rooms on the opposite side nor do they hold up in terms of functionality. Another principle is observed here, the position of the horreum in the immediate vicinity of the gate facing the river. Bearing in mind that Diana had a large port,[48] it could be deduced that the transport of grain was carried out by ships. It could even be presumed that there were other similar structures for the temporary storage of various goods during the transhipment. The speculated size of the horreum (20.0 m x 9.0 m) could accommodate 225 m^3 of grain, which is enough to meet the yearly demands of about 550 soldiers which, in turn, corresponds to the premise that 500 to 750 were lodged in this fort.

46 Rankov-Kondić 2009, 379.

47 Ibid. 382.

48 Ibid. 374.



Plan 12 – Diana horreum, after: J. Rankov-Kondić 2009.

The site of Porečka reka, at the mouth of the Danube's tributary of the same name, is one of the most important centres in Djerdap. Its geographic location and fertile, vast plain create an open passageway to the midlands of the province. This is the location of the crossroads of the most important ancient and modern-day roads, an important interchange. During archaeological research, several different structures were discovered here. They are mostly the remains of ramparts, towers, thermae, horrea, etc.

Two of these structures relevant for this paper have rectangular bases of similar dimensions (16.0 x 9.0 m and 15.0 x 9.0 m). In all likelihood, they are horrea (plan 13). According to the artefacts, they can be dated to the 4th century.[49] Both structures are positioned by the rampart near the river and fort. The massive walls (1.50-1.80 m) and foundations built of stone and lime mortar, as well as the substructure of the floor made of canted brick courses indicate that the space had to be dry and stored heavy goods. The charred traces of beams on the mortar floor and the fragments of deformed tegola tiles and ceramics indicate that the building had a wooden roof structure which was destroyed in a fire. One of the buildings has a brick pier (1.0 x 1.0 m) on the south side, on its lengthwise axis, and it is presumed that an identical pier existed on the north side. The existence of an upper story can also be presumed, however, a mezzanine structure type has not been registered. The size of these horrea is small in comparison to the rest of the horrea along the

49 Petrović 1982-83, 288-290.

Limes, which calls the claim that this was a distribution centre for the whole Djerdap area (P. Petrović) into question; G. Milošević also disputes this statement[50]. Both structures identified as the horrea could store about 300 m³ of grain, an amount too small to make the claim that this was a distribution centre plausible.

Boljetin (*Smorna*) military camp is located upstream from the junction of Porečka reka and the Danube. This military camp had four construction phases, from the stage of earthworks to a solid built castrum. Several structures within the rampart have been researched so far. One of them was a horreum, dated to the beginning of the 3rd century,[51] with a 11.70 x 4.80 m rectangular base (plan 14). The interior of the structure was divided into eight compartments of varying width by transverse partition walls (0.50 m thick). The exterior walls were not very thick (0.60 m) because of the small size of the entire structure. It was built of cut rubble and lime mortar, and constructed on a widened footing of an older cultural layer. The walls were coarsely rendered on the outside and plastered on the inside.[52] As noted by Lj. Zotović, the interior was partitioned by numerous partition walls and, thus, divided into a large number of miniature compartments, 0.60 to 1.30 m wide. We do not support this thesis, and consider it more likely that the partition walls were elements of the floor substructure. The illogicality of the said thesis lies in the lack of functionality of a room which is only 0.60 m wide. Such a room is not even large enough for a human being to move about, let alone load it with goods. Another fact which supports our claim is that the structure of such a concept would have had eight doors, for which there are neither analogies nor any logical reason.

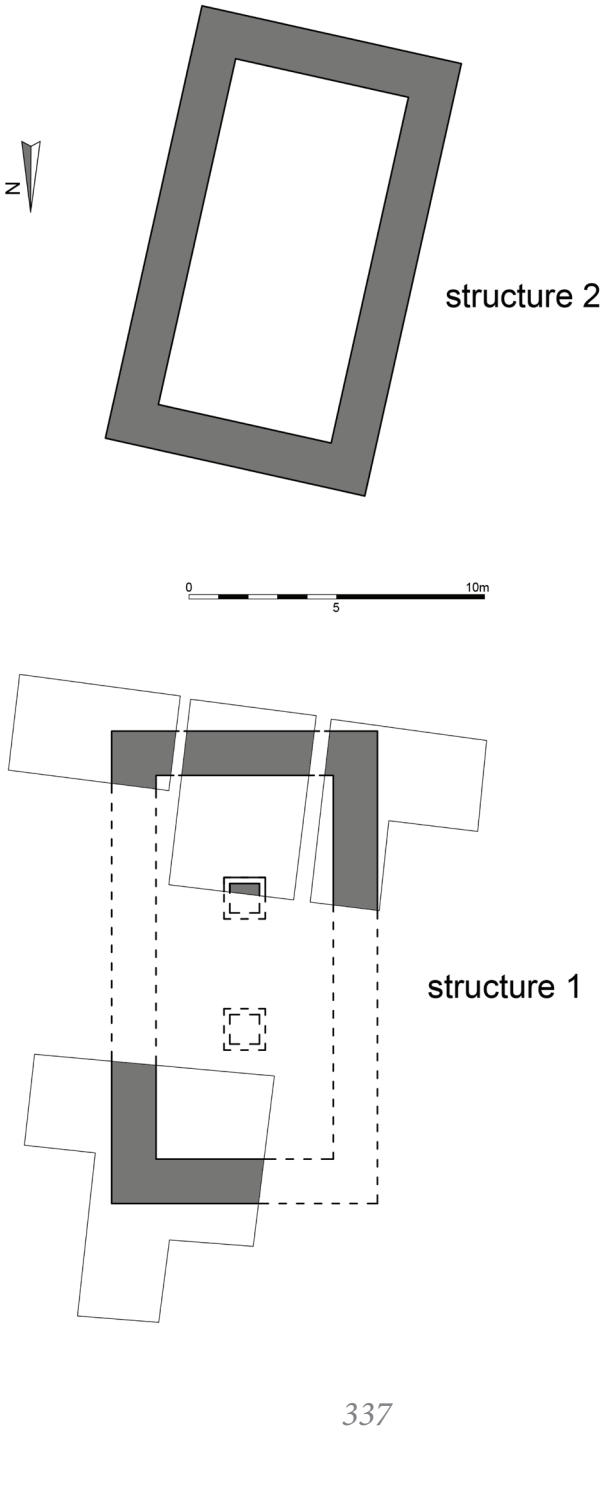
The premise that 80 soldiers were lodged in this castrum makes sense, taking into account the capacity of this horreum of about 36 m³.

Parts of a military fortification which went through several phases of construction during its long existence were discovered on the site of Pontes, downstream from the Iron Gate (Djerdap I) Power Station and the military fort of Diana. The remains of the abutments of Trajan's bridge across the Danube were also discovered in its immediate vicinity. In the course of the research carried out so far, parts of gates and ramparts have also been discovered, as well as a couple of buildings within the fort itself. One of these buildings, discovered right next to the east gate

50 Milošević 2014, 43.

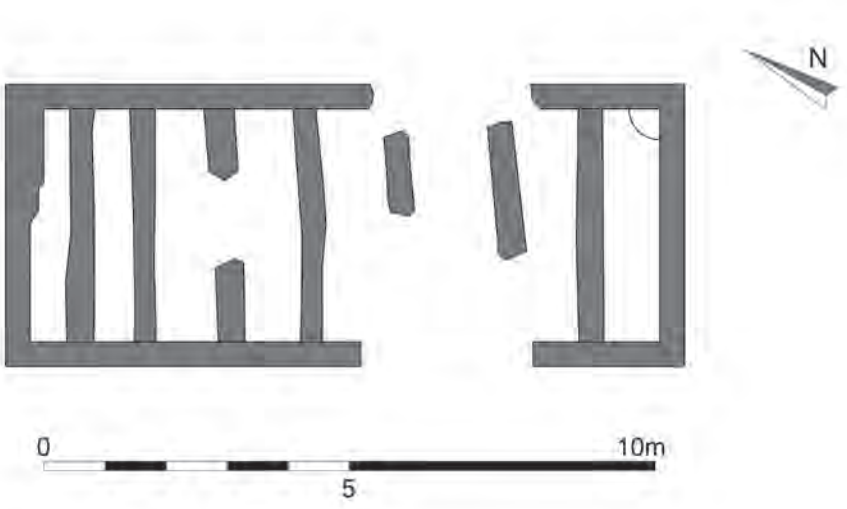
51 Zotović 1982-83, 216

52 Ibid. 217.



Plan 13 – Porečka reka horreum, after: P. Petrović 1980.

Plan 14 – Smorna horreum, after: Lj. Zotović 1982-83.



and identified as a horreum, is of relevance for this paper. The research unearthed a part of a horreum built on the route of the former *via principalis*, towards the east gate. The remains of the walls and a part of the east facade were discovered too. (plan 15) The walls are solid, built of crushed stone bound by lime mortar. There were pilasters on the exterior of the facade wall. A mortar floor, made of lime mortar and powdered brick, was discovered inside the horreum. The structure is dated to the end of the 3rd - beginning of the 4th century.[53] The remains of the walls point to an orthogonal base of the building, oriented north-south but, due to incomplete research, the definite dimensions, as well as its capacity, remain unknown.[54]

The fort on the site of Čezava (*Castrum Novae*) is located downstream from Golubac. Within the researched section of the castrum, a rampart and a small number of structures have been discovered inside the fort. The largest one among them, located in the central part, was the principia building, and north of it, towards the west gate, a horreum dated to the end of the 2nd or the beginning of the 3rd century.[55] This structure with an irregular, trapezoidal base (11.50 x 12.60 m), had a west entrance (plan 16). The 1.0 m thick walls, built of stone, were not forti-

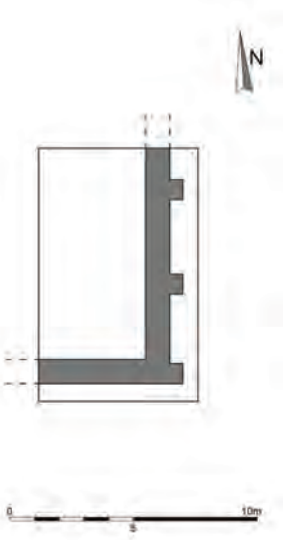
53 Гарашанин, Васић 1987, 82.

54 It is noteworthy that in spatial and organisational terms the fort of Pontes bears a striking resemblance to the one in Drobeta, on the opposite side of the Danube. Thus, the assumption that there existed another horreum within the fort of Pontes, as was the case in Drobeta, proves tenable.

55 Vasić 1987, 99.

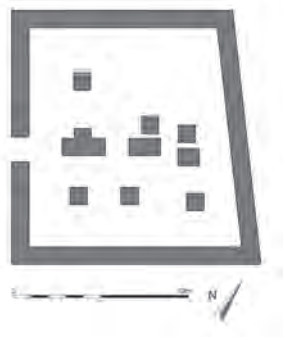
fied by pilasters. Ten massive columns which divided the base into three sections have been discovered inside of the structure. The capacity of about 180 m³ was enough to store grain for about 400 to 450 soldiers, which leads to the conclusion that this was the actual number of soldiers lodged here, but also suggests the possibility of the existence of another structure of similar function in the fort itself or in its immediate vicinity.

Sapaja, a river island on the Danube between Ram and Stara Palanka, disappeared during the construction of a dam on the Danube. It can be seen occasionally, when the water is low. The archaeological research conducted prior to the construction of the dam confirmed the existence of a fort (93.0 x 93.0 m). There was a small horreum in front of the west rampart. It had a rectangular base of 9.50 x 5.90 m, and can be dated to the end of the 2nd century.[56] (plan 17) The building was made of crushed stone bound by mortar, while the roof was probably double-pitched and with a tegoula covering. The interior was divided into three compartments by two transverse walls. It remains unclear whether the interior walls ended at the floor level and served as dead walls, or they continued up to the ceiling of the first story. Most likely, they were dead walls. This horreum can be connected to the one in Boljetin, which has a similar form of base, partitioned by transverse walls, and we can presume that both horrea had dead walls as moisture insulation. The capacity of the horreum can be deduced from its dimensions, and would have been about 70 m³, which is not enough to meet the demands of the inhabitants of the fort, leading to the conclusion that there was another, larger horreum, probably inside the fort.



Plan 15 – Pontes horreum, after: P. Petrović, M. Vasić 1996.

The sites of Konopište and Kurvingrad, downstream from Pontes, have been researched only partially. On the site of Konopište, a complex of structures with compartmentalised bases, whose two wings were at right angles to each other, has only been partially researched. (plan 18) It is presumed that a section of this structure was used for lodging the army and for food storage.[57] On the site of Kurvingrad, a structure presumably used for food storage, army lodging and other purposes[58] was researched to a degree. (plan 19) Since the research of these sites has not been completed, neither the dimensions nor the exact function of the two

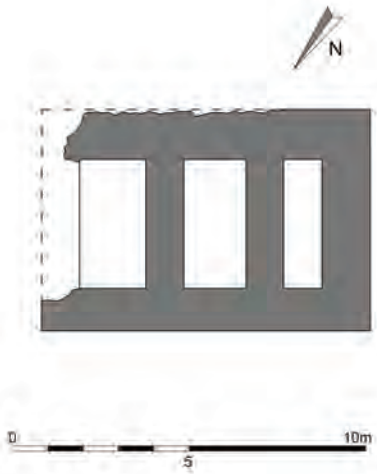


Plan 16 – Castrum Novae horreum, after: M. Garašanin, M. Vasić 1987.

56 Dimitrijević 1984, 29-71.

57 Milošević 2014, 44.

58 Ibid. 45.



Plan 17 – Sapaja horreum, after: D. Dimitrijević 1984.

structures can be determined.

A fort discovered on the Roman site of Ravna (*Timacum Minus*) near Knjaževac, in the east of Serbia, testifies to an early presence of Romans in this region. A large building measuring 30.0 x 15.0 m[59] was discovered inside the fortified castrum, north of the *via principalis* (plan 20). In the period of Late Antiquity, this building performed the function of a granary, which is confirmed by finds of pithoi and carbonated remains of grain in the structure, on the floor level.[60] Judging by its capacity of about 600 m^3, the building could provide a yearly supply of grain for about 1,500 soldiers. The figure significantly exceeds the presumed number of soldiers which comprised one cohort (480 soldiers). [61]

***

The construction of buildings intended for food storage across the Empire illustrates the methodical approach of the State of Rome to the problem of grain storage and distribution. Thus, on the area of the newly founded province of Moesia Superior and in southern parts of Pannonia Inferior, construction of horrea was conditioned by the formation of a new organisational system of operation of the army and civilians.

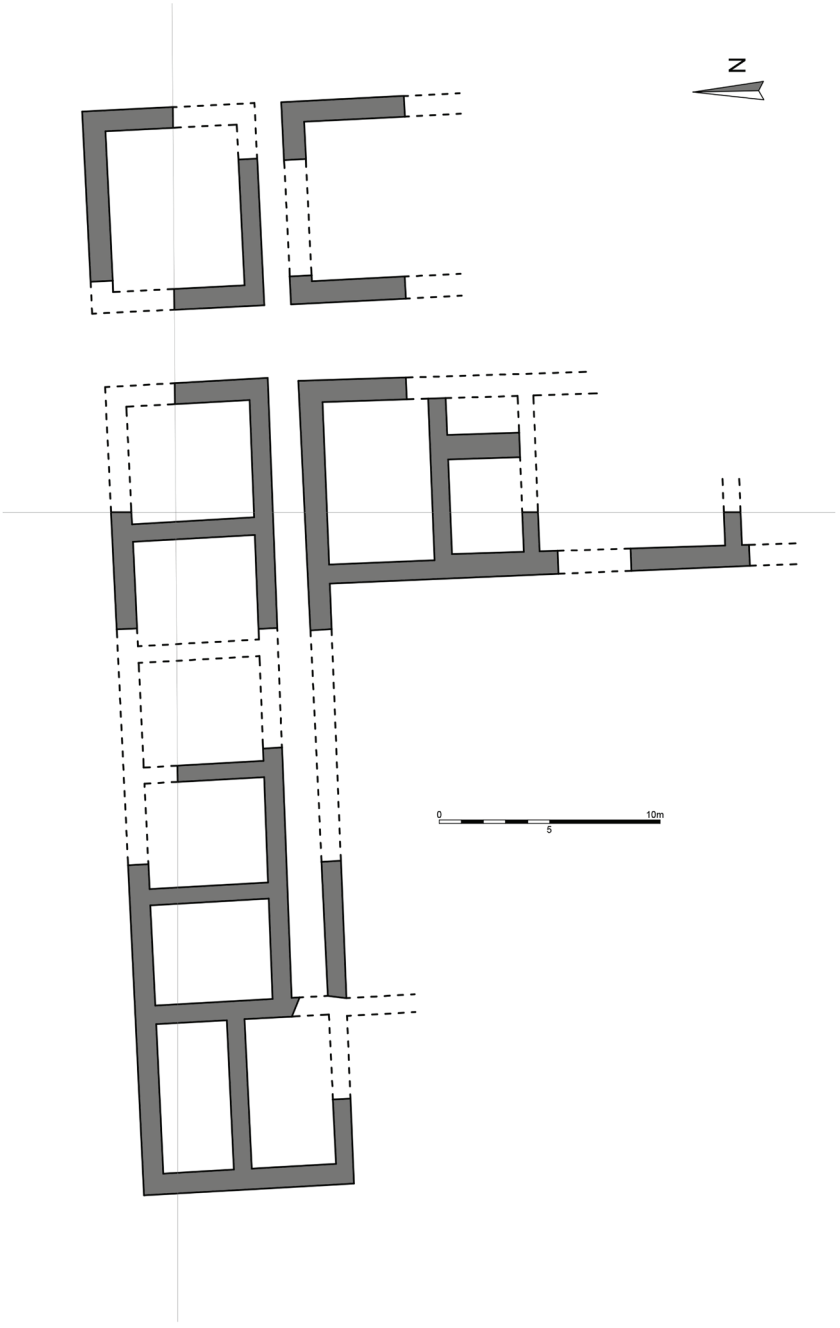
According to the researched remains of the horrea erected on the territory of the modern-day Republic of Serbia, certain conclusions concerning the time of their construction can be reached. All of the abovementioned horrea were erected during the period from the end of the 1st until the end of the 4th century, where the military horrea were mostly built during earlier periods, and the civilian ones during later periods. The construction of monumental horrea must have been conditioned by a new system of organisation of food collection and distribution in the midlands of the province to meet the needs of the civilian settlements and castra along the Limes. The corresponding periods of construction of the civilian granaries could be connected to the new economic measures taken by the supreme state authorities around the end of the 3rd century.

In the case of the civilian horrea, the time of construction can be traced from the earliest ones in Sirmium to the horreum erected in Caričin grad (Justiniana

59 Petrović 1997, 115-131.

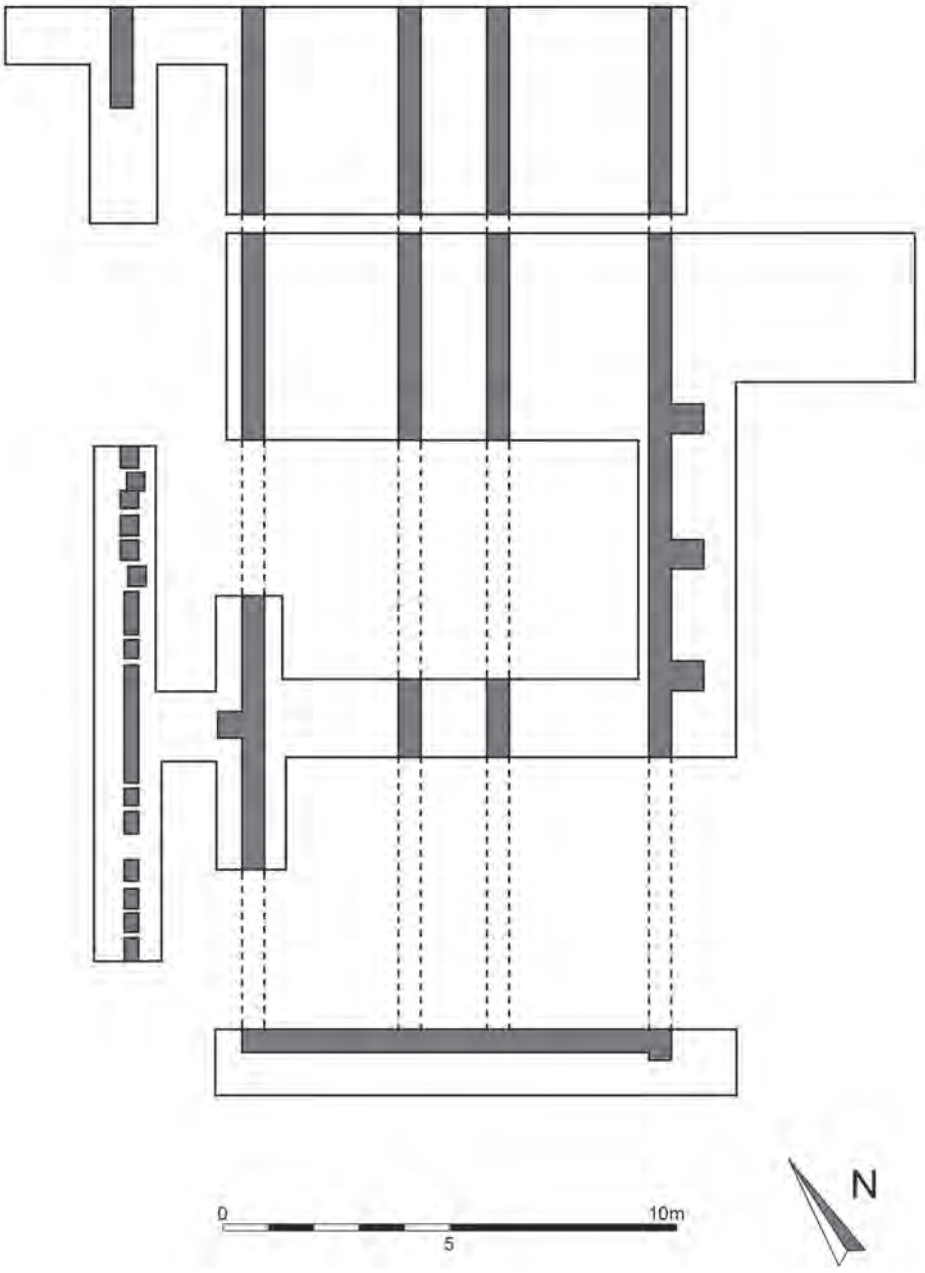
60 Petrović 1995, 42.

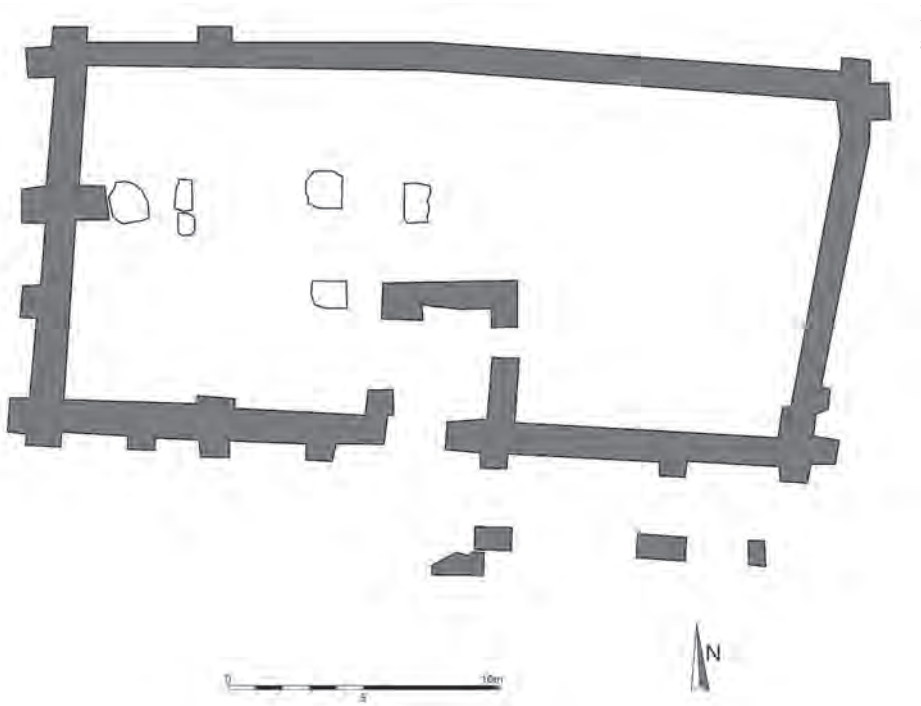
61 *Cohors II Aurelia Dardanorum* had been located here since 169. AD



Plan 18 – Konopište horreum, after: P. Popović 1996.

Plan 19 – Kurvingrad horreum, after: L. Trbuhović 1986.





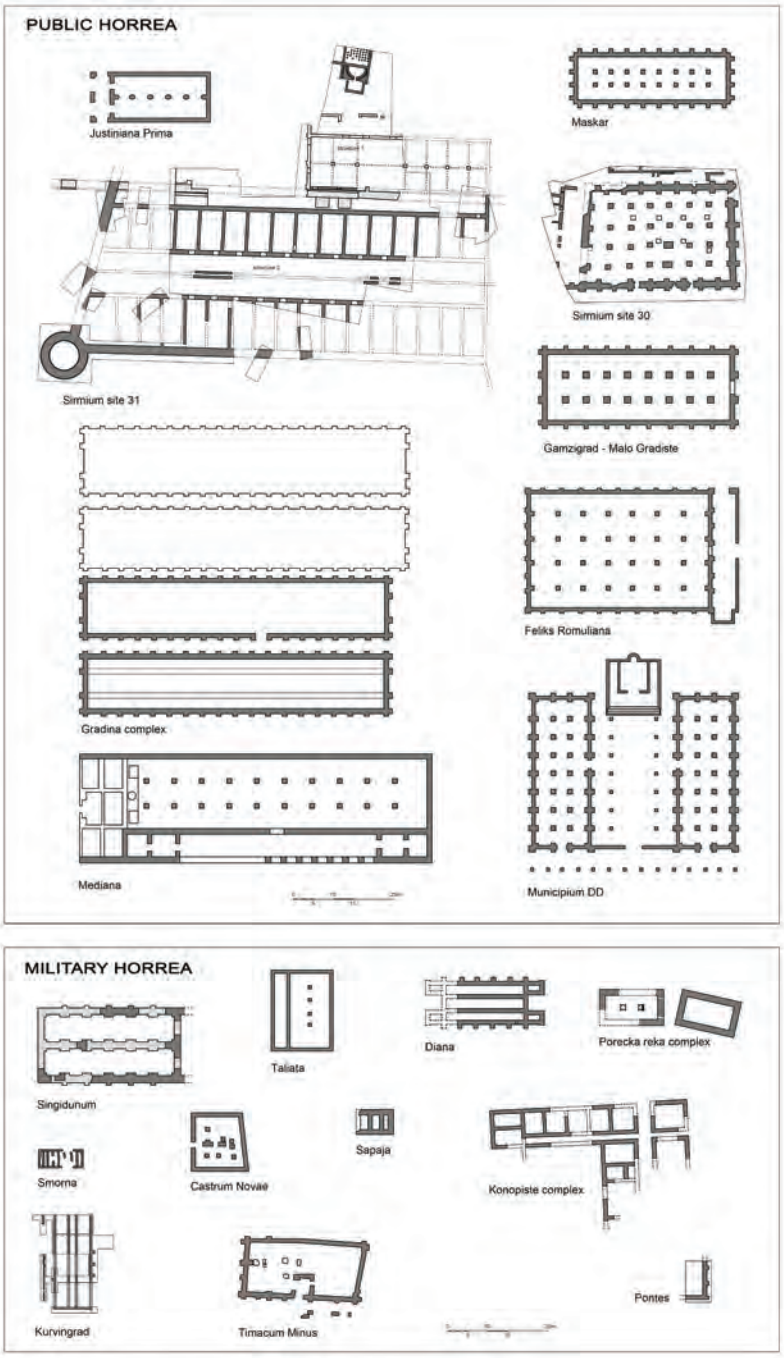
Plan 20 – Timacum Minus, after: S. Petković 2013.

Prima). It is even possible to draw a parallel among the horrea erected within several consecutive years, in Maskar, Sočanica and Malo Gradište, near Gamzigrad (Felix Romuliana), which are, according to their size, appearance, manner of construction and types of materials used in their construction, presumed to have been built by the same masons, which cannot be said of the military horrea. The military horrea differ from one another, as if they were built by masons from different parts of the Empire. What is common to all of the horrea is that they were built of solid material, primarily stone and brick, that they had double- or single-pitched roofs covered by roof tiles, and that they had raised floors for moisture control.

Considering the position of these buildings, it can be concluded that the military horrea were, without exception, freestanding structures. Generally, they occupied a position in the vicinity of the forts' gates or in the central part, next to the principia building. There are, additionally, a few cases in which they were located outside the rampart. The civilian horrea were built both inside and outside the forts. They were mostly freestanding but, in Sirmium, the structure of

the older horreum was leaning against the south rampart, and when the rampart was moved towards the south, a younger horreum was leaned against it. This is the only case in which the horreum building was leaning against another structure. Such constructional solutions were usually avoided for the purposes of fire protection. From an organisational standpoint, horrea in Moesia Superior can be divided into those whose interior was partitioned by walls or piers, and those without partitions. The predominant type of civilian horrea is one with piers and partitions, while the military horrea appear both with and without partitions. This mostly depends on the size of the structure, but also the requirements for keeping the stored goods unimpaired. Larger structures could not be built without partitions to support them since the roof structure, being made of wood, could not bridge the large distance between the walls.

One of the main differences between military and civilian horrea is in their size, i.e. the capacity. Taking all of the researched horrea into account, the difference in size is significant. (plan 21) Civilian horrea were much larger, usually comprised of several units, which is not the case with the military horrea. The structure on the site of Konopište is an exception to this rule, since it was made of several structures considered to have belonged to the horreum. The horreum from Singidunum stands out among the other military horrea by its size, but it is, in turn, much smaller than the civilian ones. It is speculated that the military horrea could have been loaded more often than once a year, that is, at least twice a year, meaning that the storage space could be smaller. In that case, the positions of the distribution centres should be considered. Konopište, Kurvingrad and Porečka reka are the potential locations of these centres. It is less likely that Porečka reka used to be a distribution centre, since its horrea are too small. We maintain that the main distribution centre for military horrea was in modern-day Ćuprija (Horreum Margi), which is actually the very meaning of its name. This is also a strategic position, which is connected to all the important points from the production to the end-users both by land and by water. The size of the horreum on the site of Gradina, near Peć, testifies to an exceptionally well-developed cultivation of grain, and this was an important repository centre from which grain was further distributed. Contemporary researchers are in a dilemma as to whether the province could have produced a sufficient amount of grain to meet the demands



Plan 21 – Plans of civil and military horrea in the area of modern-day Serbia

of its population and the army or not.[62] Our opinion, based on the size and position of the horrea discovered so far, is that the province could produce a sufficient amount of grain, but this is still no more than speculation, since climate slightly varies yearly so, in times of drought, it was probably necessary to import grain from other provinces of the Empire.

It could also be deduced that different levels of state administration (supreme, province and military) and civilians alike (merchants, ship owners etc, mentioned on tombstones) took part in the elaborate system of the procurement and distribution of grain.

Translated by Jelena Mitić
English language editing Dave Calcutt

62 O.Ilić claims that the quantities of grain were not sufficient (Ilić 2012, 202.) while J. Živanović concludes that they were still sufficient (Живановић 2013, 146.) for the needs of the army and the population.

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