

LIMEKILNS FROM MEDIEVAL PHILIPPOPOLIS (PRESENT-DAY PLOVDIV, BULGARIA)

*Kamen Stanev**, *Elena Bozhinova***

*** Cyrillo-Methodian Research Center, Bulgarian Academy of Sciences, 25 Acad. G. Bonchev Str.,
1113 Sofia, Bulgaria; kamen_stratiot@abv.bg*

*** Regional Archaeological Museum – Plovdiv, 1 Saedinie Sqr., 4000 Plovdiv, Bulgaria; elena.bozhinova@gmail.com*

ABSTRACT

During the Middle Ages, lime was the main building material used in the construction of fortifications, churches, representative buildings, water cisterns, etc. Lime manufacturing has been insufficiently studied in present-day Bulgarian lands. In 2022, parts of two kilns were studied in Plovdiv that date to the late 10th – 11th c. The article presents both the kilns themselves and their context in the city's topography. They are located outside but close to its fortified part, in an area loosely inhabited during this period. Therefore, this air-polluting and fire-hazardous production was located away from residential districts but was still in immediate proximity. This location helped to facilitate the supply of raw materials, marble architectural details removed from the ruins of Roman and Late antique buildings, and the delivery of finished products to sites under construction. The kilns' location was chosen following the specifics for their construction: on a slope where the wind, usually blowing from the west, could ensure natural air intake into the kilns to maintain a strong fire.

Keywords: Philippopolis, Plovdiv, Middle Ages, kilns, lime

Introduction

Lime is a basic building material that has been known for millennia. It is used in combination with inert materials such as sand, gravel, and crushed brick to make mortar for masonry and plastering. When combined with crushed brick, a hydrophobic mortar is obtained that was used for plastering water facilities such as cisterns and canals. In combination with sand and chopped straw, flax or hemp, it is used to make plaster on which wall-paintings are made. Pure lime diluted with water is used for whitewashing, which has a decorative effect (especially after being colored by adding various pigments) but also serves as a disinfectant. The technology for producing lime has not changed since its discovery until modern days. Initially, crushed limestone or marble was heated in a kiln, which produced calcium oxide (CaO) or quicklime. When quicklime is hydrated by pouring water over it, heat is released and calcium dihydroxide Ca(OH)₂, known as slaked lime, is produced for use in new constructions. Lime is produced in large kilns, and the act of slaking is usually made in large wide pits where the lime can be stored for a long time as long as it is sufficiently hydrated.

Lime had limited use until the Roman period, although it had been known for millennia by that time. The golden age of lime production began during the Roman period in connection with large-scale construction activities in which mortar was widely used as a binder. It is described in

Roman texts and has been studied in detail (Камишева 2016, 287 – 288; Bonnie 2016, 194 – 196; DeLaine 2021, 4 – 6).

From then until the industrial age, lime production technology and, more specifically, the kilns for lime production have not changed. They are cylindrical or have a similar shape (conical or barrel-shaped). They are usually built of stones, coated with clay, and have large dimensions. The kilns are dug into the ground, preferably on a slope, and have an opening at the bottom, which has a channel on the outside, a prefurnium. Digging into the ground helps to retain heat and makes it easier to load raw materials and remove the lime. The opening at the bottom serves not only to light and keep the fire but also to let air in. The wood is piled up in the bottom, and raw materials (limestone or marble) are placed on top of it, after which the wood is ignited. Sometimes a socle is made at the bottom of the kiln, which allows the stones intended for firing to be arranged in a vaulted heap (Bonnie 2016, 195, fig. 10: 1). The firing proceeds better this way, and the stacked stones are more stable. Experiments have shown that it takes 6 – 7 days to burn lime in such a kiln, which includes the cooling of the kiln and another three days to load it with wood and raw material and remove the finished product; to obtain 1 m³ of lime, 1.5 to 3 tons of wood are needed (DeLaine 2021, 6).

Such lime kilns have been studied in Byzantium. A lime kiln with a diameter of 7 m and dated to the 7th – 9th c. was discovered in Limyra, Asia Minor (Seyer et al. 2019, 234 – 235), and another dated to the 11th c. was found in Butrint in present-day Albania (Hernandez 2017, 166). The data for Kievan Rus' is also interesting since culturally it is very strongly connected with both Byzantium and Medieval Bulgaria. In Kiev, numerous kilns have been discovered dating to the first half of the 11th c. They are built of bricks and have a smaller diameter of 2.5 to 2.7 m (Килиевич 1981, 343 – 348).

Lime kilns from Bulgaria

Lime kilns from the Roman, Late Antique, and Medieval periods have also been discovered in Bulgaria. Near the village of Krivina, Ruse region, seven kilns from the 1st c. have been studied, and another three kilns have been identified but not studied (Vagalinski 2011, 46 – 57). Their diameter is 3.4 – 4 m, and the best preserved one is 4.5 m high, although it was originally taller. The kilns are dug into a slope, and their openings are oriented toward the west so the wind can enter them and intensify their fires.

Another kiln dated to the end of the 2nd c. was studied near the village of Poletto, Simitli municipality. Its height is 3.6 m, and its diameter 3 m (Vagalinski 2011, 46). A lime kiln was discovered near the village of Ostra Mogila, Stara Zagora region and was dated after the middle of the 3rd c. It is dug into sloping terrain and has a diameter of 2.92 x 2.52 m (Камишева 2016, 287 – 288). The kiln next to the Chatalka dam, Stara Zagora region (Николов 1984, 45 – 47, обр. 55) dates from the same period. It has a diameter of 3 m and a depth of 4 m; it is not lined with stones. A small kiln dated to the end of the 3rd – end of the 4th c. was discovered in the village of Starozagorski Mineralni Vani, Stara Zagora region (Камишева 2020, 988). Three lime kilns have been partially studied in Plovdiv (Миткова 2017, 337 – 338)¹. Their use was most likely related to the need for lime for the construction of the aqueduct that passed just next to them.

Lime kilns dated to the Middle Ages were discovered in Veliki Preslav, Shumen region, which date to the 13th c. (Майсторски, Славов 2015, 626 – 628), and in Sozopol, Burgas region, without a specified chronology (Кънев 2013, 502). Three very well-preserved kilns from the 13th – 14th c. were studied in Kaliakra, Dobrich region (Бобчева 1981, 118 – 120). They are 3 to 3.9 m

¹ The kilns' diameters are published as 1.3 m in the upper part and 1 m in the lower part, but these are actually the chords of the parts studied in the excavation area, i.e. the real diameter is much larger (observation by K. Stanev, a participant in the excavations).

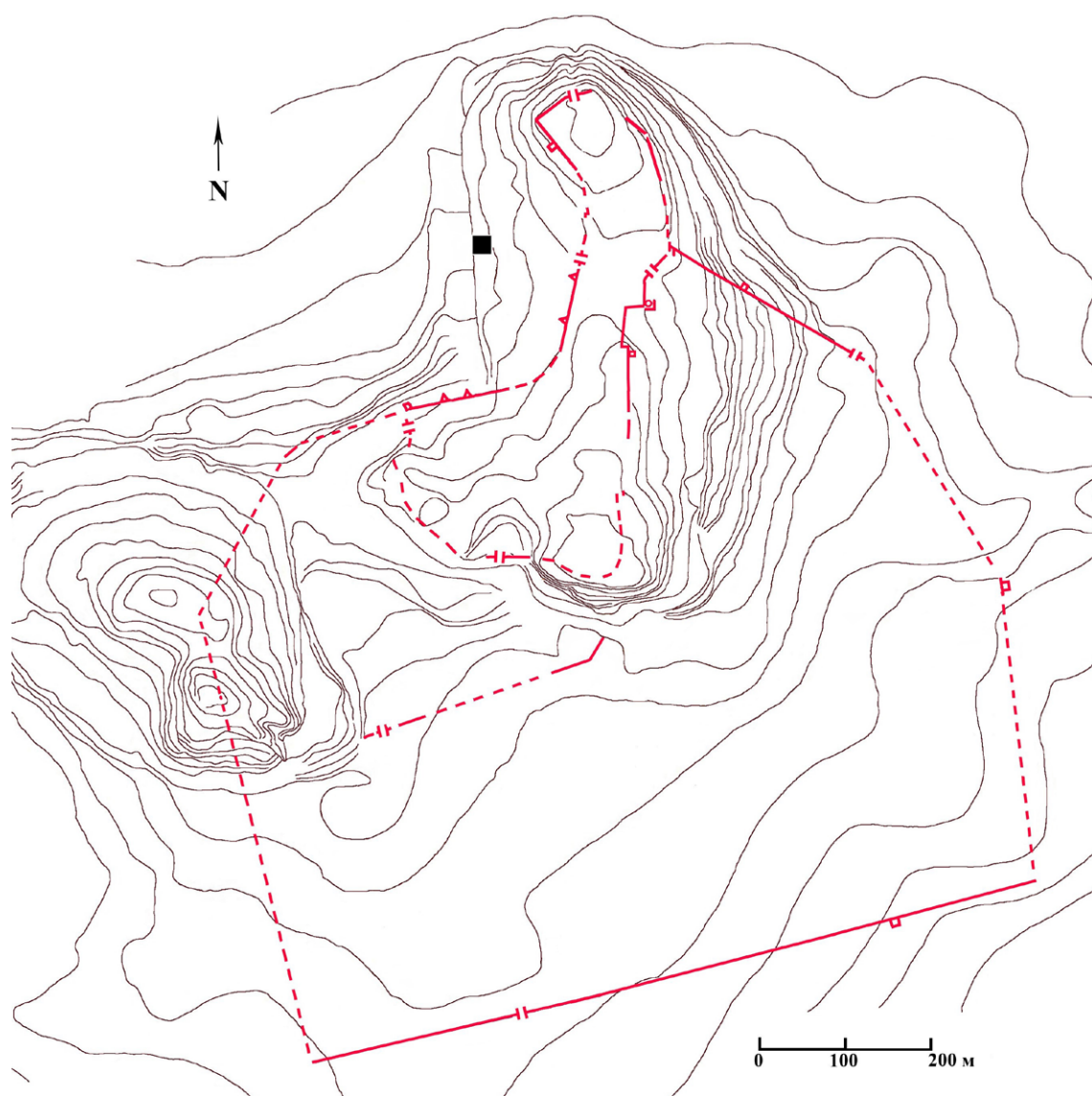


Fig. 1. Philippopolis, topographic situation (Authors: K. Stanev, E. Bozhinova)
 Обр. 1. Филиппопол, топографска ситуация (Автори: К. Станев, Е. Божинова)

in diameter, have a protruding socle on the inside, and one of them is preserved at a height of 3 m. A cylindrical lime kiln from the Ottoman period was discovered in the Karaach Teke monastery near Varna. It is 3.5 m deep, and in its lower part there is a protruding socle on the interior (Попконстантинов и др. 2011, 498 – 499). Kilns from this period were also discovered in Veliki Preslav, Shumen region (Тотев 1976, 43 – 44), and an undated kiln was found in Novae, Veliko Tarnovo region (Генчева 2014, 313 – 314).

Excavation site of the kilns

The kilns presented here were discovered at the western foot of the Trihalmie (the Three hills) and more precisely on Nebet Tepe, outside the fortified part of ancient and medieval Philippopolis (fig. 1). Administratively, it is located at 9 Artin Gidikov Str., but it is actually located immediately east of Tsar Boris III Obedinitel Blvd., as this boulevard separates these hills from the plains to the

west. Excavations of the kilns were carried out in 2022. A large house was built at the site in the 19th c. and was demolished in the late 1980s; a reconstruction was attempted but subsequently abandoned². No archaeological excavations were carried out when the house's foundations were installed, so the archaeological layers and structures were severely damaged, as was discovered during the excavations in 2022. The studied area is 260 m², and it was found that it was inhabited during the Early Bronze Age, the Early Iron Age, the Late Hellenistic period, the Roman period, the Late Antiquity, the Middle Ages (11th – 14th c.), and the Ottoman period (Божинова, Иванов (под печат)).

During the Roman period, a massive building was built here that was probably a *horreum* (grain storehouse). This building was purposefully dismantled³, and a necropolis developed over it in Late Antiquity. The terrain was re-inhabited at the end of the 10th or the 11th c., and the earliest structures of this resettlement were the lime kilns presented here. Initially the 19th c. house's interior was studied, which is divided into three rooms: one large one in the center and two smaller ones to the north and south. Then there was the outside area west of the house. The medieval layers and structures were examined in all parts of the site.

Right at the beginning of the excavations, in Grid sq. P3 (fig. 2) a characteristic layer consisting of burnt to red soil and a huge amount of marble flakes was encountered. The presence of marble flakes was initially suggested to indicate waste material of a workshop for making marble architectural details. However, the huge amount of evenly burnt soil remained a mystery. This layer was discovered in one of the trenches left after the removal of the stones from the Roman *horreum* (fig. 2: 6) and in negative features from the 11th – early 13th c. Subsequently, layers of burnt soil and marble flakes were also discovered in different pits or other diggings in the northern and central part of the 19th c. house's central room. This soil obviously originated from a thick layer formed no later than the 11th c., that was subsequently repeatedly overfilled during the numerous digging activities in the 11th – early 13th c. Due to its nature, it was clearly traceable.

The origin of this burnt soil was clarified after further excavations in the western sector of the central part of the 19th c. house's central room (Grid sq. Q3), where part of a lime kiln was discovered (fig. 2: 1). Part of a second kiln was subsequently discovered in the sector outside (west) of the 19th c. house (fig. 2: 2). In both of these areas, the burnt soil was used as part of the kilns' constructions. It served to solder the stones with which the kilns were built and to plaster their interior walls. Since the kilns are very large structures, a large amount of clay was used in their construction, more precisely clay soil that, due to the strong fire, became burnt. Repeatedly used, they were often repaired, during which times the unnecessary burnt soil was thrown away as waste. After the kilns were abandoned, some of the stones from their construction were taken out for reuse, leaving only a thick layer of burnt soil behind. Marble architectural details brought from the city were used for the production of lime. Before being placed in the kiln, they were crushed, which produced the marble flakes. Thus, both the marble flakes and burnt clay found throughout the site can be considered waste from the lime kilns' operation.

Chronology

Lime production is an activity that leaves practically no datable traces⁴. The kilns undoubtedly had a work area where the raw materials (wood and stones) were stored, sheds for storing the fin-

² The survey was carried out in connection with a private investment project to continue the restoration of the house to convert it into a hotel. The larger part of the studied area, including kiln No. 1, falls within the building where light was limited, which made most of the photographs low quality.

³ Only the building's foundations remained, the dismantling of which continued in the 11th – 12th c.

⁴ Unfortunately, a limited budget and short deadlines for the rescue excavations did not allow an opportunity to test the kilns for archaeomagnetic dating.

ished product, rooms for workers, etc. As mentioned above, loading a kiln, producing the lime, and removing it took about 10 days, a time during which there were constantly people around the kiln. It is logical, then, that traces of these people would remain in forms such as broken clay vessels for food and liquids and dropped coins and small objects. Unfortunately, subsequent digging activities have completely destroyed the kilns' surroundings as well as the larger part of the kilns themselves, so defining their chronology is based on their stratigraphic position.

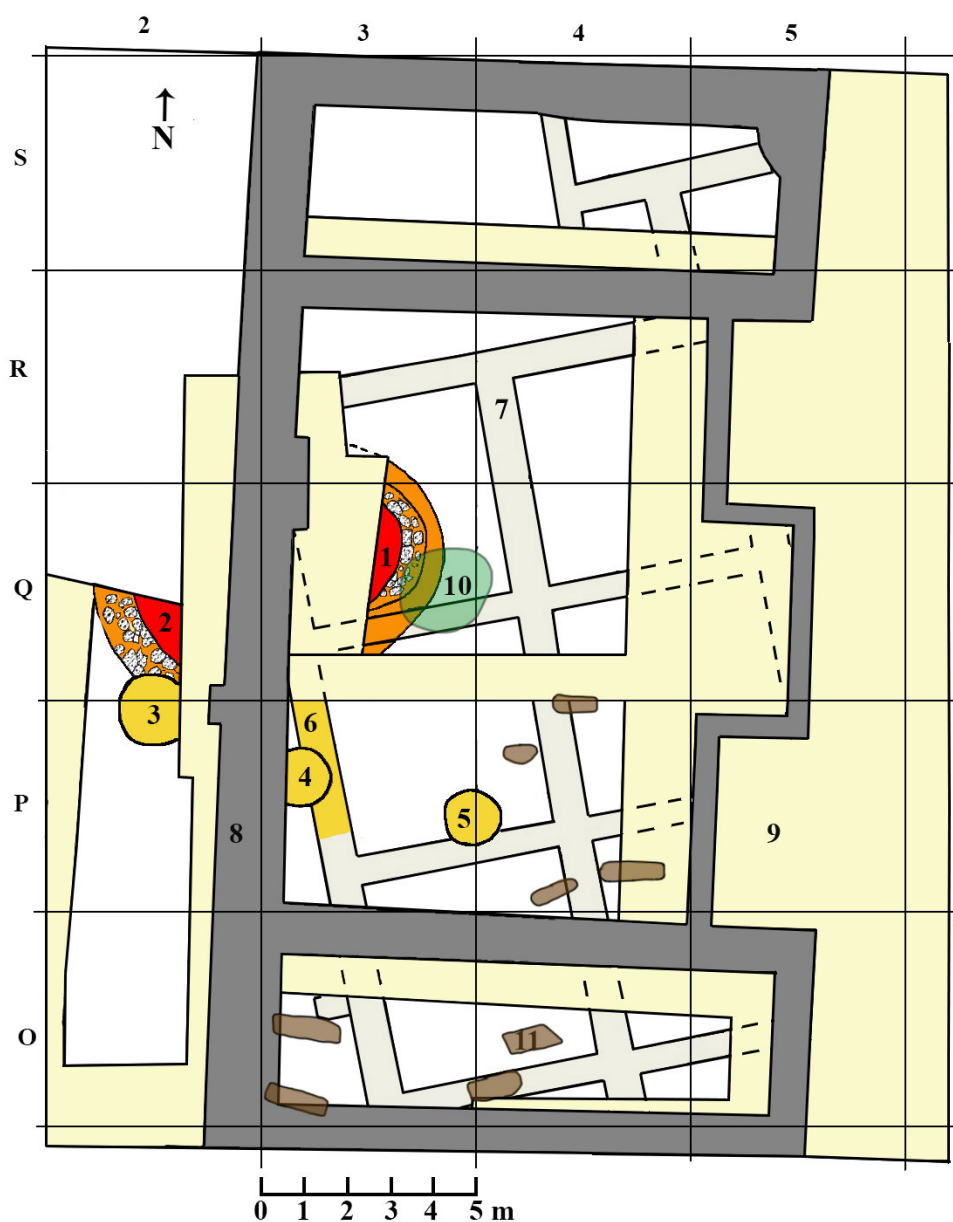


Fig. 2. Site plan: 1. Kiln No. 1; 2. Kiln No. 2; 3 – 5. 11th c. pits; 6. Trench from the dismantling of the Roman horreum filled with waste from the kilns; 7. Foundations of the Roman horreum; 8. 19th c. house; 9. Unexplored part; 10. Pit from the first half of the 12th c.; 11. Late antique graves (Authors: S. Ivanov, K. Stanev, E. Bozhinova)

Обр. 2. План на обекта: 1. Пещ № 1; 2. Пещ № 2; 3 – 5. Ями от XI в.; 6. Траншея от демонтирането на римския хореум, запълнена с отпадъци от пещите; 7. Основи на римския хореум; 8. Къща от XIX в.; 9. Непроучени сектори; 10. Яма от първата половина на XII в.; 11. Късноантични гробове (Автори: С. Иванов, К. Станев, Е. Божинова)

The kilns overlap the foundations of the Roman *horreum*, which provides a *terminus post quem* for their chronology. In the southern part of the site, eight Late antique graves were discovered that belong to a necropolis situated over the western slope of the Nebet Tepe hill (fig. 2: 11). There are no graves dug into the remains of the kilns, nor are there any graves cut by the kilns. Although the kilns are most likely located immediately north of the necropolis, it is difficult to assume that they are synchronous. The functioning of the lime workshop required a larger space than the kilns themselves for storing raw materials and various production activities, and this area would have overlapped the territory of the necropolis. Still, marble flakes and pieces of burnt clay are completely missing in the embankments of the burial pits. They are found, though, in large quantities in 11th – 12th c. features. This point indirectly indicates a later date for the kilns compared to the necropolis. A small sherd of an 11th – 12th c. ceramic vessel with burnished decoration was found inside kiln No. 1.

Much more significant for the kilns' chronology is a pit overlapping kiln No. 2 (fig. 2: 3). The pit is dated to the 11th c. based on the pottery from its fill. There are three groups of sherds: 1) thrown on a kick wheel and dusted with mica, such as the upper part of an oinochoe (fig. 3: 1) and a small pot (fig. 3: 2); 2) also thrown on a kick wheel – small pots with a single handle and an upturned profiled rim (fig. 3: 3 – 4) and pieces of the upper part of a jar decorated with straight and wavy incised lines (fig. 3: 5); 3) pots made on a tournette with thickened profiled rims (fig. 3: 6). The pottery from the pit is quite characteristic for medieval Philippopolis and finds an exact match with other 11th c. sherds from excavations around the city (Станев, Божинова 2024, 253 – 256, обр. 3: 2, обр. 4: 1, обр. 5: 9, обр. 6: 6).

Another 11th c. pit with few pottery sherds in it (fig. 2: 4) was dug in a trench left after the stones were removed from the base of the Roman *horreum*, and the trench itself was filled with a layer of burnt soil and marble flakes, or waste from the kilns (fig. 2: 6). A third 11th c. pit (fig. 2: 5) was covered by a layer of burnt soil, most likely also from the kilns. The pottery from this pit (fig. 3: 7 – 16) is identical to the one from the pit overlapping kiln No. 2, and there is also a sherd with an olive green glaze.

An almost completely preserved pot (fig. 4) was found inside a pit dug over the eastern part of kiln No. 1 (fig. 2: 10, fig. 6: 3). Pots with the same shape and decoration, dated to the late 11th – first half of the 12th c., originate from other sites in Plovdiv (Станев, Божинова 2014, 348, обр. 11: 12; Станев, Божинова 2019, 55, обр. 17: 12 – 13).

The available data thus shows that the kilns functioned after Late Antiquity and no later than the 11th c. The lack of any materials in the area of the presented site dated between Late Antiquity and the end of the 10th c. also provides indirect evidence for the dating of the kilns to the end of the 10th – 11th c.⁵

Kiln No. 1

Only the eastern third of the first kiln was studied (fig. 2: 1, fig. 5: 1, fig. 6: 1). It is dug into Hellenistic layers, and its southern part overlaps the foundations of the Roman *horreum* (fig. 6: 2). The kiln is overlapped by a pit from the east that dates to the end of the 11th – first half of the 12th c. (fig. 2: 10, fig. 6: 3). The digging for the kiln is round or rather slightly elliptical in shape and oriented north – south. It narrows in depth in steps (fig. 7). The first step is 0.10 – 0.28 m wide. The second step is 0.20 – 0.28 m wide. The base of the kiln's wall has a width of 0.35 – 0.50 m. It is made of stones and pieces of bricks and tiles bonded with soil that has been burnt red. The stones vary in origin and

⁵ Artifacts dated to the 7th – 10th c. are also missing in the neighboring studied area (Божинова, Станев 2018, 149 – 166).

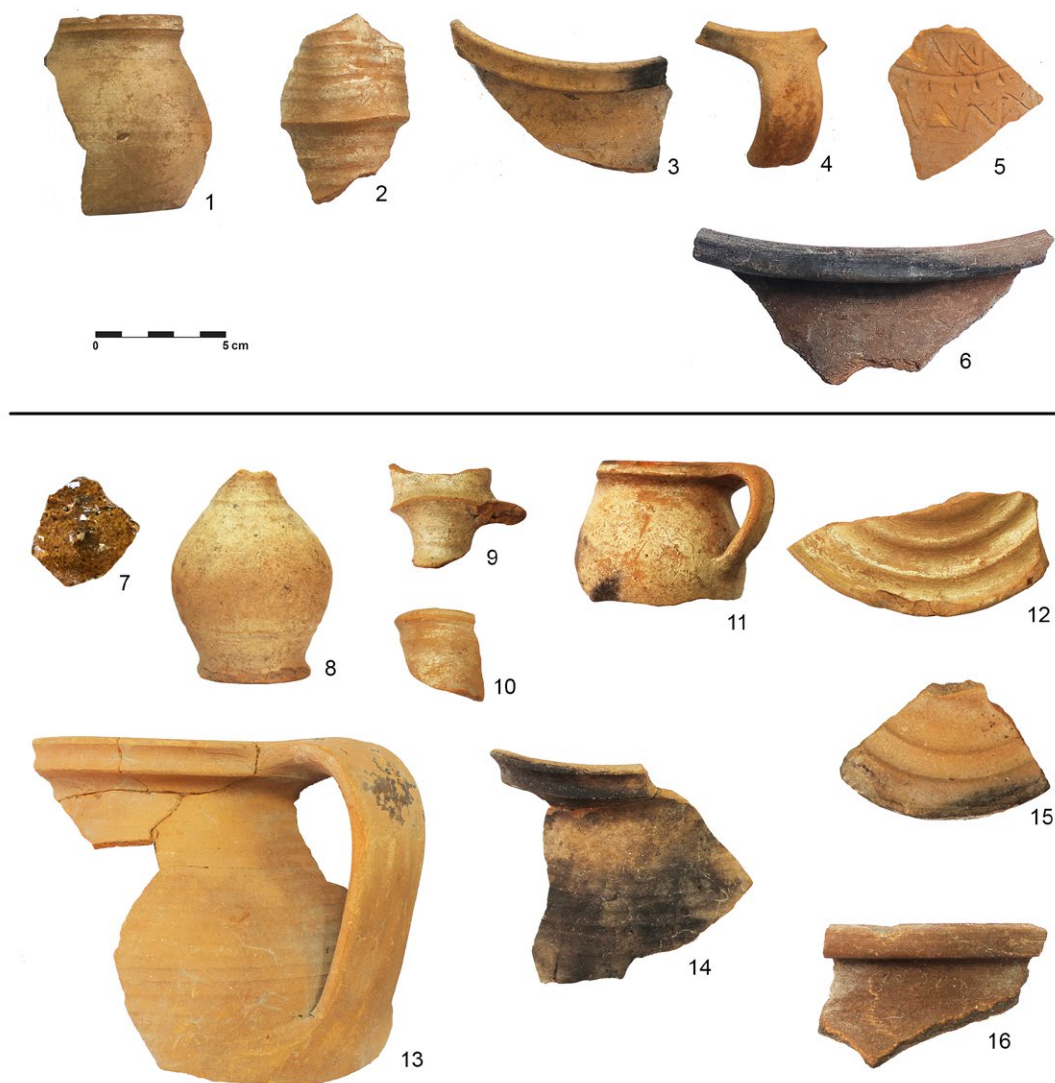


Fig. 3. 1 – 6. Pottery found in a pit overlapping kiln No. 2; 7 – 16. Pottery found in a pit sealed with waste from the kilns (Authors: K. Stanev, E. Vozhinova)

Обр. 3. 1 – 6. Керамика от яма, застъпваща пещ № 2; 7 – 16. Керамика от яма, запечатана с отпадъци от пещите (Автори: К. Станев, Е. Божинова)

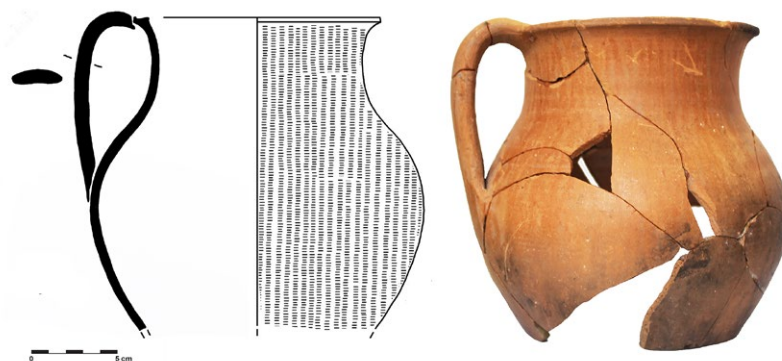


Fig. 4. Ceramic vessel found in a pit intersecting kiln No. 1 (Authors: K. Stanev, E. Vozhinova)

Обр. 4. Керамичен съд от яма, пресичаща пещ № 1 (Автори: К. Станев, Е. Божинова)

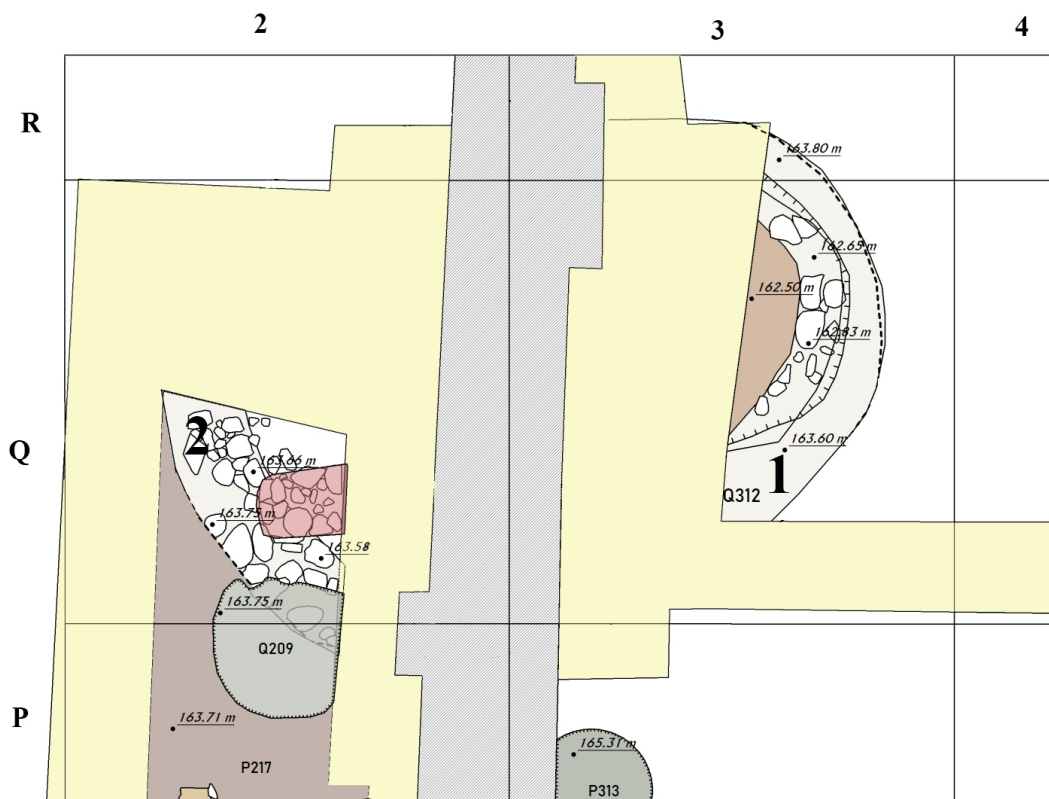


Fig. 5. Detailed plan: 1. Kiln No. 1; 2. Kiln No. 2 (Authors: S. Ivanov, K. Stanev, E. Bozhinova)
 Обр. 5. Детайлен план: 1. Пещ № 1; 2. Пещ № 2 (Автори: С. Иванов, К. Станев, Е. Божинова)



Fig. 6. Kiln No. 1, exploration stage: 1. Kiln No. 1;
 2. Roman horreum; 3. Pit from the first half of the 12th c.
 (Authors: K. Stanev, E. Bozhinova)

Обр. 6. Пещ № 1, етап от проучването: 1. Пещ № 1;
 2. Римски хореум; 3. Яма от първата половина на XII в.
 (Автори: К. Станев, Е. Божинова)



Fig. 7. Kiln No. 1. Stepped excavation layout (Authors: K. Stanev, E. Bozhinova)

Обр. 7. Пещ № 1. Стъпаловидно оформление на изкопа за пещта (Автори: К. Станев, Е. Божинова)

shape. All the bricks and tiles are reused and date to the Roman period. The study inside the kiln (fig. 8) ended at a depth of 3 m, without reaching the bottom, due to a danger of collapse because of the unstable layers of its fill. The central and western parts of the kiln were not studied, as they were destroyed during the reconstruction of the 19th c. house in the late 1980s.

Despite the kiln's incomplete study, given its dimensions, characteristic shape, the heavy burning of the soil in it, as well as the large amount of marble flakes in this soil, we can assume that this kiln produced lime. It was dug into the west slope of the hill, and the opening with the channel for lighting and keeping the fire was most likely from the west, i.e. in the destroyed part of the kiln. The kiln's diameter is 3.3 m. The preserved part of the wall inclines inward, and the layer to it consists of burnt red soil and a large number of stones and pieces of ancient bricks and tiles.

The layer above the preserved part of the kiln's walls consists entirely of burnt soil, and above it in the northern part there is a fallen mudbrick wall (fig. 9). The bricks are 0.08 – 0.15 m thick, made of gray clay, and bonded



Fig. 8. Kiln No. 1. The explored part of the kiln (Authors: K. Stanev, E. Bozhinova)

Обр. 8. Пещ № 1. Проучена част (Автори: К. Станев, Е. Божинова)



Fig. 9. Kiln No. 1. Destructions (Authors: K. Stanev, E. Bozhinova)
Обр. 9. Пещ № 1. Деструкции (Автори: К. Станев, Е. Божинова)



Fig. 10. Kiln No. 1. Layers filling the kiln (Authors: K. Stanev, E. Bozhinova)

Обр. 10. Пещ № 1. Пластове, запълващи обема на пещта (Автори: К. Станев, Е. Божинова)

with light brown sandy mud. The brick destructions are not burnt, which indicates that they were not exposed to fire and were most likely a lining of the protruding portion of the kiln or belonged to another structure. A layer of brown heterogeneous soil, with individual lumps of burnt clay, some stones, and antique bricks and tiles, covers the mudbrick destructions. Several sherds of Hellenistic and Late antique pottery and a small fragment of an 11th c. ceramic pitcher were found in this layer. Its upper border is inclined from north to south, and in the southern part it is covered by a layer containing mainly marble rubble and lumps of burnt clay (fig. 10).

The fact that the kiln wall is inclined inward and the presence of numerous stones in its lower part indicate that the kiln most likely collapsed. A thick layer of burnt soil above the preserved part of the kiln wall was most likely formed after the removal of stones and bricks from the collapsed upper parts for secondary use. After or during the process of removing this reusable building material, the mudbrick wall was thrown into the kiln since it was no longer needed, and the terrain had to be leveled for new use. Since these destructions were not enough to fill the kiln and so to level the



Fig. 11. Kiln No. 2. Layers filling the kiln (Authors: K. Stanev, E. Bozhinova)

Обр. 11. Пещ № 2. Пластове, запълващи обема на пещта (Автори: К. Станев, Е. Божинова)

ground around it, the layer of brown soil was used to fill in the kiln. The waste from crushing marble for raw material and from kiln repair activities were added.

Kiln No. 2

Only a small part of kiln No. 2 has been revealed, the southwestern segment (fig. 2: 2, fig. 11). The kiln was almost completely destroyed by a 14th c. necropolis, a 19th c. well, foundations of a building of uncertain date, and digging activities for the reconstruction of the 19th c. house. The arched wall, the burnt red soil binder, and the presence of a layer of burnt clay northeast of the wall, however, indicate that this facility is identical to kiln No. 1. In diggings in this sector later, a huge amount of burnt clay was also found southwest of the kiln, which again indicates that the kiln functioned in this area. The restored inner diameter of the kiln is 5 m, and the thickness of the wall is 0.85 m.

As seen in the general plan, the projected diameters of the two kilns intersect. Since this particular section was completely destroyed during the construction of the 19th c. house and its subsequent restoration, however, it is not possible to determine which kiln is earlier. As for the possibility that the two excavated features are parts of one kiln, the plan presents not only an excessively elongated structure but also differences in both diameters and wall thickness of the two separate parts. This makes it unlikely that the two features belong to one and the same kiln, although this interpretation should not be excluded.

Location of the lime kilns in Philippopolis during the 10th – 11th c.

The studied kilns are outside the city's fortified area in a location that, according to available data, at the time of the kilns' operation at the end of the 10th – 11th c. was very sparsely settled. Despite the large extent of the excavated area, only three small pits dated to that period were registered. The earliest dwelling structure situated 5 m south of kiln No. 2 dates to the first half of the 12th c. Burnt soil taken from the kilns' destruction was used as backfill for the dwelling's walls. In

the second half of the 12th c., the terrain was already densely occupied with three massive buildings and numerous pits and cellars.

Interesting data comes also from neighboring excavated areas on the western slope of Nebet Tepe. Six pits were studied in the plot immediately south of the kilns, one from the 11th c. and five others dated from the middle of the 12th until the beginning of the 13th c. (Божинова, Станев 2018, 149 – 166)⁶. Materials from the 11th c. are missing in a studied plot 50 m to the south, where only a street pavement and a pit from the second half of the 12th – beginning of the 13th c. were found (Христева, Драганов 2017, 343)⁷. In the neighboring plot to the south, a probable necropolis from the 11th – 12th c. is mentioned (Мартинова-Кютова 2016, 579), and habitation in the second half of the 12th c. is evidenced by sgraffito ceramics and Middle Eastern imports (Иванов и др. 2017, 19).

Three pits from the 12th – 14th c. were published from an excavated plot 50 m to the east of the kilns (Колева 1997, 8). Medieval materials are not mentioned in the preliminary publication of the excavations at another studied plot 60 m northeast of the kilns (Топалилов, Станев 2008, 401 – 403), but small number of domestic pottery sherds from the end of the 10th – 11th c. as well as some from the 12th – beginning of the 13th c. were found. This last site is in the immediate vicinity of the Armenian church of Surp Kevork, which was first mentioned in sources for 1147 AD (Данчева-Василева 2009, 378 – 379).

In general, available data shows that the entire western slope of Nebet Tepe at the end of the 10th – 11th c. can be defined as a suburban periphery with occasional habitation most likely related to economic activities⁸. In the second half of the 12th – beginning of the 13th c., this area was already densely populated. From this point of view, the location of the lime kilns here seems logical. Since for lime preparation it was necessary to keep a fire going for several days without interruption, lime production was dirty and poses a fire hazard, especially considering that the main dwellings in Philippopolis at that time had straw or reed roofs that are easily flammable. By situating the kilns in the immediate vicinity of, but outside the inhabited area, the risk of fires and smoke pollution is avoided. At the same time, this location is convenient for easy transportation of the prepared lime to construction sites. Immediate proximity to the city also means an easy supply of raw materials. The huge amount of marble flakes suppose that marble architectural details taken from Roman and Late antique buildings were used as raw materials. One such building is the Roman stadium, which according to Anna Komnene was visible at the beginning of the 12th c. (ГИБИ 1981, 135). A huge amount of marble was used in the stadium's construction, and the kilns are situated at a distance of only 350 m from it.

Conclusion

The location of the kilns on a slope is a common choice for these kinds of facilities since being dug into the terrain allows a constant temperature to be maintained, kiln walls to be thinner so they are made faster with less material, and the kilns themselves to be loaded more easily with material and then unloaded afterwards. A sloped location also facilitates construction of the kilns' opening channel since it is not necessary to dig a deep pit that has to be lined with masonry. The construction of the kilns at the foot of the western slope of Nebet Tepe has one more advantage. In Plovdiv,

⁶ It should be noted, however, that at this site the medieval layers were completely destroyed before the beginning of the excavations and only the lower part of deep negative features was preserved and studied, i.e. the data from that excavation site cannot be considered representative.

⁷ The medieval materials were processed by K. Stanev.

⁸ For comparison, active habitation inside the city itself during this period is evidenced by numerous dwellings, pits and various artifacts (domestic pottery, coins, glass bracelets, etc.).

the wind usually blows from the west. Thus, the location of the kilns on a western slope with an opening from the west means that the wind helped to strengthen the kilns' fire.

The discovery of lime kilns in medieval Philippopolis is rather logical. Limestone is the main ingredient of the mortar used to construct churches and fortifications. It should be noted that at the end of the 10th – 11th c., Plovdiv was a base for Byzantine campaigns against the Bulgarians, which were followed by Pecheneg raids in the Empire that also affected the Upper Thracian Lowland. This means that the fortress facilities had to be maintained, especially since they were probably damaged when the city was taken over by the Rus' in 970 AD. Fortification repairs, however, were rather random events, and churches were rarely built. Furthermore, dwellings in the city during this period were mainly partially dug into the ground. The smaller number of massive residential or economic buildings had walls made of stones and bricks bonded with mud.

This situation shows that while crafts such as pottery production, woodworking, and blacksmithing satisfied the daily needs of the city's inhabitants, the production of lime was rather incidental and related to the implementation of specific large-scale construction projects or repairs of church or fortress facilities. On the other hand, produced lime can be stored for an unlimited period of time without deteriorating in quality, i.e. a large batch of produced lime could be stored for years for sporadic use afterwards. In this case, it can be assumed that there were no permanent lime workshops in the city but that traveling craftsmen satisfied specific construction needs. Still, the kilns presented here provide insight into economic activity in Philippopolis during the Middle Ages and also help to clarify this insufficiently studied craft in Bulgarian lands.

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ПЕЩИ ЗА ИЗПИЧАНЕ НА ВАР ОТ СРЕДНОВЕКОВНИЯ ФИЛИПОПОЛ (ДН. ПЛОВДИВ)

Камен Станев, Елена Божинова***

* Кирило-Методиевски научен център, Българска академия на науките, ул. „Акад. Г. Бончев“ № 25, София 1113, България; kamen_stratiot@abv.bg

** Регионален археологически музей – Пловдив, пл. „Съединение“ № 1, Пловдив 4000, България; elena.bozhinova@gmail.com

РЕЗЮМЕ

Местонамиране на пещите

През 2022 г., при спасителни археологически проучвания в Пловдив, са разкрити частично две средновековни пещи за вар (Божинова, Иванов (под печат)). Обектът се намира извън укрепената част на средновековния Филипопол, в западното подножие на Небет тепе (обр. 1). Тук през Възраждането е построена много голяма къща, която в края на 80-те години на XX в. е съборена и е започнало нейното преизграждане. Въпреки че попада на територията на ААР „Старинен Пловдив“, при изкопните дейности, свързани с преизграждането, не са правени проучвания и археологическите пластове и структури са силно нарушени, съответно източната половина на пещ № 1 и западната на пещ № 2 са разрушени (обр. 2, обр. 5).

През римския период на това място е съществувал хореум, а върху него през Късната античност се е развил некропол. Обитаването на терена е подновено в края на X или XI в., като най-ранните структури са именно представените пещи за вар. В резултат на дейността на пещите в централната и западна част на обекта са отложени огромно количество мраморни люспи, образувани при трошенето на използваните за суровина мраморни архитектурни детайли и бучки отухлена до червено глинеста пръст – спойка, използвана при изграждането на пещите. Тъй като пещите са много големи съоръжения, то при техния ремонт или демонтиране се е отложило огромно количество отухлената спойка.

Пещ № 1

Пещта (обр. 2: 1, обр. 5: 1, обр. 6: 1) е вкопана в елинистически пластове, като от юг застъпва основите на римския хорейум (обр. 6: 2). Проучена е източната част, като приблизително по средата е оставен профил, за да се види запълнителят на обема ѝ (обр. 10). В дълбочина съоръжението е проучено до 3 м, но работата е спряна поради опасност от срутване на оставения профил⁹ и дъното не е достигнато. Пещта е вкопана в склона, който е с наклон на запад. Отворът с канала за палене и поддържане на огъня е бил най-вероятно от запад, т.е. откъм унищожената част. Изкопът за пещта е с кръгла или по-скоро леко елипсовидна форма, с диаметър 3,30 м. В дълбочина стъпаловидно се стеснява (обр. 7). Първото стъпало е широко 0,10 – 0,28 м, второто: 0,20 – 0,28 м. В най-долната част е достигнат запазеният зид на пещта, който се проследява в дълбочина до 0,75 м (обр. 8). Зидът е дебел 0,35 – 0,50 м и е изграден от разнородни и разноформатни камъни, антични тухли и керемиди, споени с отухлена до червено пръст. Запазената стена на пещта е наклонена навътре, като пластът към нея се състои от отухлена до червено пръст и голямо количество камъни и антични тухли. Пластът над запазената част от стената е изцяло от отухлена пръст, а над него в северната част има паднала кирпичена стена (обр. 9). Кирпичите са от сива глинеста пръст, дебели са 0,08 – 0,15 м и са споени със светлокафява песъчлива кал. Кирпичените деструкции не са отухлени, което показва, че не са били изложени на огън и най-вероятно са били кожух, облицоващ издаващата се над терена част на пещта или някаква друга конструкция. Над деструкциите следва пласт от кафява разнородна пръст, с отделни бучки отухлена глина, малко камъни, антични тухли и керемиди. Тук се откриха няколко фрагмента от тракийска и късноантична керамика и един дребен фрагмент от стена на стомна от XI в. В горната си част този пласт е с денивелация от север на юг, като в южната част е застъпен от пласт, съдържащ основно мраморен трошляк и бучки отухлена глина (обр. 10).

Фактът, че стената на пещта е с наклон навътре и наличието на множество камъни в долната част показват, че пещта най-вероятно се е срутила. След това от деструкциите са били извадени част от камъните и тухлите, за да се преизползват и така се е образувал дебелият пласт отухлена пръст над нивото на запазения зид от пещта. След изваждането на годния за преизползване строителен материал кирпичената стена е била бутната в пещта, тъй като тя вече е била ненужна, а теренът е трябвало да се заравни за ново ползване. Деструкциите не са били достатъчни, за да запълнят обема на пещта и съответно теренът да се заравни. Затова е бил насипан пластът с кафява пръст, а над него – отпадъци от трошенето на мрамори като суровина и от ремонтни дейности на тази или друга пещ.

Пещ № 2

От нея се разкри само югозападният сегмент (обр. 2: 2, обр. 11). Пещта е почти напълно унищожена от некропол от XIV в., възрожденски кладенец, основи на сграда с неясна дата и изкопни дейности във връзка с преизграждането на възрожденската къща в края на 80-те години на XX в. Въпреки това дъговидният зид, отухлената до червено глинеста спойка и наличието на пласт от отухлена глина североизточно от зида показват, че става въпрос за идентично на пещ № 1 съоръжение. Вътрешният диаметър на пещта е 5 м, а дебелината на зида – 0,85 м.

При наслагване на плана на диаметрите на двете пещи се вижда, че те се засичат, но тъй като именно този участък е напълно унищожен при изграждането на възрожденската къща и последвалото нейно възстановяване, то не може да се каже коя е по-ранна. Би могло дори да се допусне че става въпрос за една и съща пещ, но това е малко вероятно предвид прекалено издължената форма, която се получава, а също значителната разлика в диаметрите и дебелината на зидовете.

⁹ Изкопът за направата на бетонните основи при възстановяването на сградата в края на 80-те години на XX в. е много по-широк от самата стена на основата и е запълнен с рохка пръст със строителни отпадъци и камъни. Запълнителят на пещта се състои от нейните деструкции и също е много рохък.

Датировка

Производството на вар е дейност, при която практически не остават следи, които могат да послужат за датиране¹⁰. Без съмнение към пещите е имало работна площадка, където е била складирана суровината (дърва и камъни), навеси за съхранение на готовата продукция, помещения за работниците. Следователно би трябвало да се е отложила поне малко битова керамика, но по-късните вкопавания¹¹ напълно са разрушили средата, в която се намират пещите, както и самите тях. Пещите застъпват основите на римския хорейм (обр. 6: 2). В южната част на обекта се разкриха осем късноантични гроба, принадлежащи на некропол, който се разкрива навсякъде по западния склон на Небет тепе. Няма гробове, които да са вкопани в останките на пещите, нито има гробове пресечени от пещите, т.е. най-вероятно пещите са разположени непосредствено северно от северния край на некропола. Трудно, обаче, може да се приеме, че са синхронни, още повече, че за функционирането на пещите е било нужно широко пространство за складиране на суровина, продукция и т.н., т.е. пространството, заето от самата работилница, е било много по-голямо от самите пещи. От друга страна, в насипите на гробните ями не се откриват мраморни люспи и буци отухлена глина, каквито се откриват в огромно количество във вкопаванията от XI – XII в., което е косвена индикация, че пещите са функционирали след изоставянето на некропола. В пласта, запълващ пещ № 1, се откри един дребен фрагмент битова керамика от XI в. Много по-съществена за датировката е една яма, застъпваща пещ № 2 (обр. 2: 3), която според откритата керамика (обр. 3) се датира в XI в. Друга яма от XI в. (обр. 2: 4) е вкопана в траншея, останала след изваждането на камъните от основата на римския хорейм, като самата траншея е запълнена с пласт от отухлена пръст и мраморни люспи – отпадъци от пещите (обр. 2: 6). Трета яма от XI в. (обр. 2: 5) в горната си част е засипана с отухлена пръст, най-вероятно също от пещи, а пещ № 1 е застъпена от изток от яма, в която се откри почти цяло гърне от края на XI – първата половина на XII в. (обр. 4, обр. 6: 3). Така наличните данни показват, че пещите са функционирали след Късната античност и не по-късно от XI в., включително. Липсата на абсолютно каквито и да е материали в района на представения обект между Късната античност и края на X в. е също косвено свидетелство за датирането им в края на X – XI в.¹²

Заклучение

Изборът на мястото за направа на пещите едва ли е случаен. Към момента на функционирането им на обекта няма данни за активно обитаване. Такова не е регистрирано и на останалите обекти, проучени в района. Пещите са разположени на 120 м от крепостните стени, т.е. това мръсно и пожароопасно производство е било изнесено извън жилищните квартали. Вкопаването им в склона е характерно за този тип пещи. В Пловдив преобладава западният вятър и предвид това изборът на западния склон е съобразен с вятъра, който е спомагал за разпалването и поддържането на огъня. Непосредствената близост до града е спомагала за лесното снабдяване със суровина. Огромното количество мраморни люспи показват, че са били използвани мраморни архитектури детайли, извадени от римските и късноантични сгради. Една такава сграда е например римският стадион, който по сведения на Ана Комнина е бил видим дори в началото на XII в. (ГИБИ 1981, 135) и е разположен на 350 м от пещите.

Макар и да няма писмени и археологически данни, може да се допусне, че крепостните стени са били ремонтирани в края на X – XI в., когато градът първо е бил база за византийските походи срещу българите, а след това и срещу печенегите, чиито набези засягали и Горнотракийската низина. Други сгради от периода, за чисто изграждане или ремонт е била нужна вар, са църквите, а

¹⁰ Има методи, които показват кога е била опалвана дадена пещ. В конкретния случай, подобно изследване не бе възможно да се направи поради ограничените бюджет и време, резултат от спасителния характер на разкопките.

¹¹ Теренът е обитаван без прекъсване от XI в. до съвременността и са налице съответно огромен брой разнородни вкопавания.

¹² Такива няма, както на конкретния обект, така и в съседния парцел (Божинова, Станев 2018, 149 – 166).

вероятно и жилищата на най-богатите. Масовите жилища през периода са били полуземлянки, а по-масивните градежи са от камъни и тухли, споени с кал. Това означава, че рядко е възниквала нужда от огромно количество вар и тя е била свързана с мащабни строежи или ремонти на крепостните стени или църкви, т.е. производството на вар не е бил занаят, който се е практикувал ежедневно, а инцидентно. Следователно представените тук пещи едва ли са функционирали дълго време.

Ключови думи: Филипопол, Средновековие, пещи, вар