

CERAMIC KILNS IN THE LATE ANTIQUE TOWN ON SVETI ATANAS CAPE (MODERN DAY BYALA, BULGARIA)

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Cuvinte-cheie: *cuptoare ceramice, oraș antic târziu, Byala, coasta Mării Negre, Bulgaria.*

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Rezumat: *Așezarea antică târzie de la capul Sveti Atanas, lângă orașul modern Byala, regiunea Varna, a fost înființată la sfârșitul secolului al IV-lea și începutul secolului al V-lea p. Chr. și a dăinuit până la începutul secolului al VII-lea p. Chr. Săpăturile arheologice sistematice, efectuate în ultimul deceniu, au adus dovezi pentru recunoașterea diferitelor activități artisanale, care au avut loc în zona intra muros a orașului. Unul dintre cel mai bine atestate meșteșuguri a fost producția de ceramică.*

Cele cinci cuptoare, care au fost descoperite în trei puncte diferite în zona fortificată a așezării, au fost folosite pentru producția de ceramică de uz casnic, opaițe, greutăți pentru pescuit și probabil tubuli din ceramică.

Cel puțin o parte din producția de materiale de construcție din ceramică a orașului a provenit dintr-un loc de producție separat, situat la capătul sudic al golfului Sveti Atanas, unde în timpul secolului al VI-lea p. Chr. a funcționat un cuptor de mari dimensiuni.

Cuptoarele din zona intra muros a orașului antic târziu au fost construite în tehnici și cu materiale care vădesc influențe tipic grecești. Pe de altă parte, cuptorul de ars materiale de construcții situat în golful Sveti Atanas este o dovadă a introducerii specificului roman în practicarea acestui meșteșug, atestat de-a lungul coastei Mării Negre mult mai târziu decât în alte părți ale Balcanilor.

Abstract: *The Late Antique town on the Sveti Atanas cape, near the modern day town of Byala, Varna region, was established in the late 4th or the early 5th c. and existed until the beginning of the 7th c. AD. The regular archaeological excavations, conducted over the last decade, produced evidence for various artisanal activities, which took place in*

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the intramural area of the town. One of the most securely attested crafts was ceramic production.

The five kilns, which were discovered on three different locations within the fortified zone of the settlement, were used for the production of domestic pottery, oil lamps, fishnet weights and probably ceramic pipes.

At least part of the town's supply of building ceramics came from a separately located production site, situated on the south end of the Sveti Atanas bay, where a large tile kiln was in operation during the 6th century AD.

The kilns from the intramural area of the Late Antique town were built in techniques and with materials common for the Greek derived traditions in this craft. The tile kiln from the bay of Sveti Atanas on the other hand was a representation of the Roman brought practices in ceramic technology, which were attested along the Western Black Sea coast much later than in other parts of the Balkans.

The fortified settlement (later a small port town), situated on the Sveti Atanas cape, near the modern day town of Byala, Varna region, was established in the late 4th or the early 5th century AD and existed until the beginning of the 7th century AD (**Fig. 1**). Several large areas inside the fortified zone of the Late Antique settlement were uncovered during regular archaeological excavations over the last decade. The most impressive part of the town was the Christian complex, comprising a large three aisled basilica (with two phases), a bishop's residence and an external baptistery (also with two phases), located in the central eastern part of the site¹.

Ceramic kilns were excavated on three different locations within the settlement – immediately to the north of the external baptistery, in the central part of the fortified area and in its south-eastern part, to the south of the bishop's residence (**Fig. 2**).

Kilns 1 and 2

The first two kilns were excavated immediately to the north of the external baptistery. They had a common working platform, with a “bean” shaped plan (**Fig. 3**).

Kiln 1

Kiln 1 was the first one discovered within the Late Antique town. Apart from the firing chamber, most of the other kiln components were found *in situ* (**Fig. 4**). The combustion chamber had an oval plan and walls built of mud bricks and fragments of building ceramics, bonded and plastered with clay. An oval shaped pillar was found in the centre of the chamber. It was erected of mud bricks and tile fragments, bonded and plastered with clay. It had suffered at least one repair, judging by the two layers of fired clay plaster, preserved on its eastern side.

The perforated floor of the kiln wasn't found *in situ*. However, the several pre-fabricated ceramic bars, discovered during the excavation of the combustion chamber, provided sufficient data for a reconstruction of the floor of the firing

¹ YOTOV & MINCHEV 2013.

chamber. The pre-fabricated bars were probably set radially, overlying both the supporting pillar and the wall of the combustion chamber, where specially designed "beds" for those elements were found (Fig. 5). The gaps among the bars were probably covered with fragments of tiles (Fig. 6), which would have allowed for a larger number of vessels to be stacked and fired at once.

The stoking channel was situated on the south-east side of the combustion chamber. It had an elongated slightly trapezoid plan, wider near the stoke pit. Its walls were erected using mud bricks, fragments of tiles, deformed prefabricated ceramic bars and stones, again bonded and plastered with clay.

The stoke pit was located to the south-east of the stoking channel. It was discovered filled with several thin layers of ash and charcoal, together with a large number of discarded ceramic vessels.

Kiln 2

Kiln 2 was found to the south-east of kiln 1. Only parts of the combustion chamber, the stoking channel and the support for the perforated floor were found *in situ* (Fig. 7).

The combustion chamber had a quadrangular (slightly trapezoid) plan, while its walls were built of mud bricks and deformed fragments of pre-fabricated ceramic bars, bonded with clay. A single fragment of identical ceramic bar, which was discovered placed in vertical position in the centre of the chamber, served as support for the perforated floor.

The stoking channel was placed on the north-western side of the combustion chamber, where only two stones of its walls were preserved.

The deformed ceramic bars found in the walls of the kiln indicate that it was probably built later than kiln 1, but in time when the other structure was still in use.

The two kilns were used for the firing of kitchen wares, small amphorae and oil lamps, which was proven by the discovery of discarded pottery inside the stoke pit.

Kilns 3 and 4

The second pair of ceramic kilns was excavated near the central part of the fortified area of the settlement, next to a stonewall building with two construction periods. In contrast to the first two, these structures were not used simultaneously. The second kiln was built on top of the first one, after the latter was demolished during the erection of the above-mentioned building (Fig. 8).

The combustion chamber of kiln 3 (the earliest one) was dug into the route of a street and had a rectangular plan (Fig. 9). Its walls were shaped into the virgin soil and were plastered with clay from the inside. The tongue wall used as support of the perforated floor was made the same way, and was placed with its short side against the *praefurnium*. The latter was situated on the south-east side of the structure, following the natural slope of the terrain.

Kiln 4 was built on top of the previous one, after the latter was abandoned. The position of the second firing structure was moved a little to the north-east, where part of the kiln was erected on a clear ground surface. The other part of the

new kiln, built above the north-east quarter of the first one, had a layer of debris, used as a foundation for its bottom (**Fig. 10**). The new kiln had a round central pillar and most probably a rectangular plan of the combustion chamber. The stoking channel was placed either on the south-east or the east side of the kiln.

The stratigraphic situation with the two kilns and the building with two construction periods next to them presented two possibilities. Kiln 3 was surely demolished before or during the erection of the first stone wall. Kiln 4 on the other hand was used either before or simultaneously with the first construction period of the stone wall building. The kiln went out of use before the erection of the second stone wall.

Kiln 3 was used for the firing of ceramic tubes or pipes, which was attested by the finding of wasters inside the combustion chamber (**Fig. 11**). However, some of the discovered broken tubes were probably part of the construction of the perforated floor of the structure. The main purpose of kilns 3 and 4 was most likely similar to that of kilns 1 and 2 - firing of domestic pottery.

Kiln 5

Kiln 5 was discovered to the south of the bishop's house, dug near a stonewall building, and below the remains of another stone wall, built in the second half of the 6th century. The perforated floor of the kiln was found partly preserved (**Fig. 12**). Similar to that of kiln 1, it was constructed of pre-fabricated ceramic bars, radially arranged around a central pillar. Remains of these bars were discovered inside the combustion chamber. The latter had a hexagonal, close to oval planning and larger diameter in its upper part. The walls were shaped into the virgin soil and plastered with clay. A central pillar was situated close to the centre of the chamber. A large stone served as a base, while the upper part of the pillar was built of clay (**Fig. 14**). The stoking channel was dug between the combustion chamber and the stoke pit, while its walls were plastered with clay. Its bottom was settled on a lower level than that of the combustion chamber.

The kiln was certainly used for the firing of fishnet weights, which was attested by the discovery of a large number of such objects. It was most probably also used for the production of domestic pottery.

One partly preserved amphora was found inside the stoking channel, but it was probably part of a layer, which had filled the remains of the kiln, once it was abandoned. The other possibility is that the fragment was reused as some kind of a tool (a shovel?) during the period of kiln use.

A tile kiln at Sveti Atanas bay

While most of the local domestic pottery and small storage vessels were produced in the intramural area of the settlement, at least part of its supply of building ceramics came from a separately located production site, situated on the south end of Sveti Atanas bay, where a large tile kiln was in operation during the 6th century AD².

² YOTOV & HARIZANOV 2017, p. 487-496.

The kiln in question was discovered almost entirely preserved, missing only the superstructure of the firing chamber (Fig. 13). It was built on a terrain slopping towards the sea shore.

The combustion chamber had a rectangular plan. The outer part of its wall were built of mud bricks and stones, with clay bonding, while the inner part was joined with the substructure of the perforated floor and was erected of bricks, bonded and plastered with clay (Fig. 15B).

The lower part of the support of the perforated floor was designed as a tongue wall, projecting from the rear end of the combustion chamber towards the opening of the *praeurnium*. Four pairs of arches, which were holding the oven floor, were projecting from the side walls and were stepping atop the tongue wall. The entire supporting structure was made of bricks with clay bonding. The perforated floor was formed by the upper parts of these arches, with the gaps among them filled with tile fragments, bonded and plastered with clay. They were arranged vertically around the rows of vents, in a checkmate pattern.

The lower part of the walls of the firing chamber were built of mud bricks and fragments of tiles, bonded and plastered with clay (Fig. 15A). Five layers of clay plaster were preserved on its inner walls, which indicated a relatively long period of kiln use.

The *praeurnium* was located on the south side of the combustion chamber. It had a trapezoid plan and was built of fragments of building ceramics, bonded and plastered with clay. Two pilasters, built of horizontal layers of building ceramics and clay, were supporting the outer parts of the construction.

The kiln was certainly used for the firing of bricks and tiles, and most probably also for the production of ceramic lids.

Discussion

Typological observations

The five kilns from the Late Antique town and the tile kiln from Sveti Atanas bay were all two-chambered structures with vertical draught and could be classified according to the newly established typology for the ceramic kilns from the 1st to the 6th century AD, discovered in the territory of modern Bulgaria³.

Kilns 1 and 5 belong to type "I", subtype "a", designated for structures with circular or oval plan of the combustion chamber and a central pillar. This subtype was popular in the territory of Bulgaria since the Late Iron Age and was the most widely spread variety of construction during the Roman and Late Antique periods, especially between the 2nd and the 5th centuries⁴.

Kilns 2 and 4 belong to type "II", subtype "a", comprising structures with rectangular plan of the combustion chamber and one central pillar. This particular type of construction appeared in the modern Bulgarian lands after the Roman conquest in the first half of the 1st century AD and was in use only in the time period between the 2nd and the 6th centuries⁵.

³ See HARIZANOV 2015.

⁴ HARIZANOV 2015, p. 25.

⁵ HARIZANOV 2015, p. 26.

Kiln 3 belongs to type "II", subtype "b", variant "1", designated for the structures with rectangular plan of the combustion chamber and one tongue-shaped supporting wall, situated in front of the *prae-furnium*. Apart from a single Hellenistic example, this kiln type also became popular after the establishment of the Roman provinces of Moesia and Thrace. It was common for the Late Antique period, but, in contrast to subtype II/a, a modified variety of the construction remained in use during the Medieval period⁶.

Although different in size and used building material, the tile kiln from the bay of Sveti Atanas belongs to the same class of production facilities (II/b/1), as kiln 3. It could serve as an example of the variety of kilns, in which the tongue wall is formed in the conjunction point of parallel double brick arches.

Construction of the perforated floor

Taking a close look of the used construction techniques, the five kilns from the Late Antique town and the tile kiln from the bay of Sveti Atanas could be organised in two groups, in accordance with the preserved types of perforated floors. The first one was the so-called "movable" type of oven floor⁷, made of pre-fabricated ceramic bars, with or without an additional layer of tile fragments, covering the remaining gaps. This type of perforated floor was certainly used in the construction of kilns 1 and 5, and most probably also in that of kilns 2, 4 and 3. Its use was attested in both Pre-Roman and Roman sites along the Black Sea coast⁸.

The second type of perforated oven floor comprised several rows of double brick arches, which form a tongue wall in the centre of the combustion chamber. The gaps among the arches were filled with vertically arranged fragments of tiles, bonded and plastered with clay. The upper part of this type of perforated floor was additionally plastered with clay. This variety of construction was used in the erection of the tile kiln from the bay of Sveti Atanas.

The use of architectural elements like arches and vaults in the kiln design was a Roman innovation, which appeared in the territory of Bulgaria after the Roman conquest⁹.

Dating

The lack of coins from the excavation of most of the kilns impedes their secure dating.

Kilns 1 and 2 were found immediately to the north of an external baptistery, built around the mid-5th century. For now, as *terminus post quem* of their use could serve the establishment of the settlement in the last decades of the 4th or the beginning of the 5th century. They probably functioned either before the

⁶ HARIZANOV 2015, p. 26.

⁷ See CORDER 1957; SWAN 1984, p. 29-32.

⁸ See for example the Pre-Roman kilns from *Chersonesus* (BORISOVA 1958, p. 144-153) or the Late Antique structures from *Sinope* (KASSAB TEZGÖR 2010) and *Archaepolis* (LOMITASHVILI & COLVIN 2010, p. 35-38).

⁹ See HARIZANOV 2015, p. 26.

baptistery's erection, or after the settlement went into decay during the second half of the 6th century¹⁰.

The excavation of kilns 3 and 4 produced very little datable material. The stratigraphic situation in this part of the settlement, together with the dating of the buildings nearby, provide a possible date in the second half of the 5th or the first half of the 6th century for the time of their operation.

Kiln 5 was discovered beneath a stone wall from the second half of the 6th century. The amphora fragment discovered inside the stoking channel could be most probably dated to the late 4th or the 5th century¹¹, so it is very likely that this kiln was in use at some point in the 5th century.

The most precisely dated of the six kilns was the one from the bay of Sveti Atanas, where the discovered coins and fragments of Phocaeen red slip ware indicated that it was in operation during the 6th century¹².

Conclusion

The preserved parts of the five kilns from the ancient town in nowadays Byala were built using techniques and materials common for the Greek derived traditions in the craft. The tile kiln from the bay of Sveti Atanas on the other hand was a representation of the Roman brought practises in ceramic technology. The latter could be considered as an indication that kiln building along this section of the Black Sea coast experienced Roman influence much later than other parts of the Balkan Peninsula, probably due to the strong presence of Greek potters. Interestingly, the last period in question coincides to a certain extent with the establishment of the *quaestura exercitus* in the time of Justinian¹³.

Catalogue (kiln's dimensions)

Kiln 1

Internal dimensions (meters):	Combustion chamber	Support	Perforated floor (for each prefabricated ceramic bar)	Firing chamber	Stoking channel	Stoke pit
Diameter	1.74-2.00	-	-	-	-	-
Width	-	0.50* (0.60)	0.14-0.20	-	0.60-0.74	4.00
Length	-	0.66* (0.70)	0.80-0.86?	-	1.50	2.80
Height / depth	0.90	0.78*	-	-	0.60* (0.80?)	1.00-1.10
Thickness	0.35-0.40	-	0.08-0.13?	-	0.20-0.25	-

¹⁰ The ceramic material found during the excavation of the kiln is still under examination.

¹¹ See OPAIT 2004, p. 18.

¹² YOTOV & HARIZANOV 2017, p. 492-494.

¹³ See TORBATOV 1997, p. 78-87.

Kiln 2

Internal dimensions (meters):	Combustion chamber	Support	Perforated floor	Firing chamber	Stoking channel	Stoke pit
Diameter	-	-	-	-	-	-
Width	0.60-0.65	0.12	-	-	0.25-0.30?	4.00
Length	0.90	0.20	-	-	0.20*	2.80
Height / depth	0.26*	0.20	-	-	0.10*	1.00-1.10
Thickness	0.12-0.18	-	-	-	0.10	-

Kiln 3

Internal dimensions (meters):	Combustion chamber	Support	Perforated floor	Firing chamber	Stoking channel	Stoke pit
Diameter	-	-	-	-	-	-
Width	0.95* (1.40?)	0.20	-	-	0.60*-0.40*	-
Length	1.05	0.40	-	-	0.55	-
Height / depth	0.55*	0.20*	-	-	0.25*	-
Thickness	0.20	-	-	-	0.15	-

Kiln 4

Internal dimensions (meters):	Combustion chamber	Support	Perforated floor	Firing chamber	Stoking channel	Stoke pit
Diameter	-	0.28	-	-	-	-
Width	0.85* (1.30?)	-	?	?	?	?
Length	0.70* (1.10?)	-	?	?	?	?
Height / depth	0.16*	0.06*	-	?	?	?
Thickness	0.20	-	?	?	?	-

Kiln 5

Internal dimensions (meters):	Combustion chamber	Support	Perforated floor (for each pre-fabricated ceramic bar)	Firing chamber	Stoking channel	Stoke pit
Diameter	1.40-1.60	0.45-0.55	-	?	-	?
Width	-	-	0.10-0.13	-	0.40-0.50	-
Length	-	-	0.30* (0.60-0.65?)	-	0.35-0.40	-
Height / depth	0.90	0.90	-	?	0.70	?
Thickness	0.20-0.35	-	0.08-0.10	?	-	-

Tile kiln, St. Atanas bay

Internal dimensions (meters):	Combustion chamber	Support	Perforated floor	Firing chamber	Stoking channel	Stoke pit
Diameter	-	-	-	-	-	-
Width	3.10	0.70	2.70-2.80	2.70-2.80	0.80	?
Length	3.20	2.40	2.90-3.00	2.90-3.00	1.40	?
Height / depth	1.20-1.40	1.20-1.40	-	1.20*	0.85-0.90	?
Thickness	0.60-0.70	-	0.22-0.54	0.40-0.45	0.70-0.80	-

* – preserved size

(..) – original size

(..?) – supposed original size

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Fig. 1 - View of the fortified port-town at cape Sv. Atanas and the bay where the tile kiln is located (after YOTOV & MINCHEV 2013).



Fig. 2 - Plan of the intramural area of the Late Antique town with the locations of the five kilns (after V. Yotov & M. Valchev).

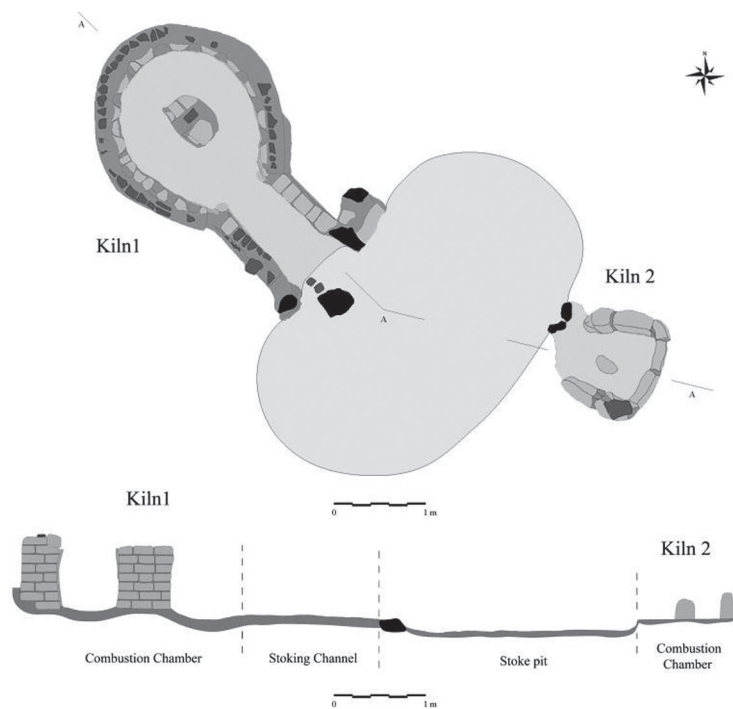


Fig. 3 - Kilns 1 & 2 – plan and section (after A. Harizanov).

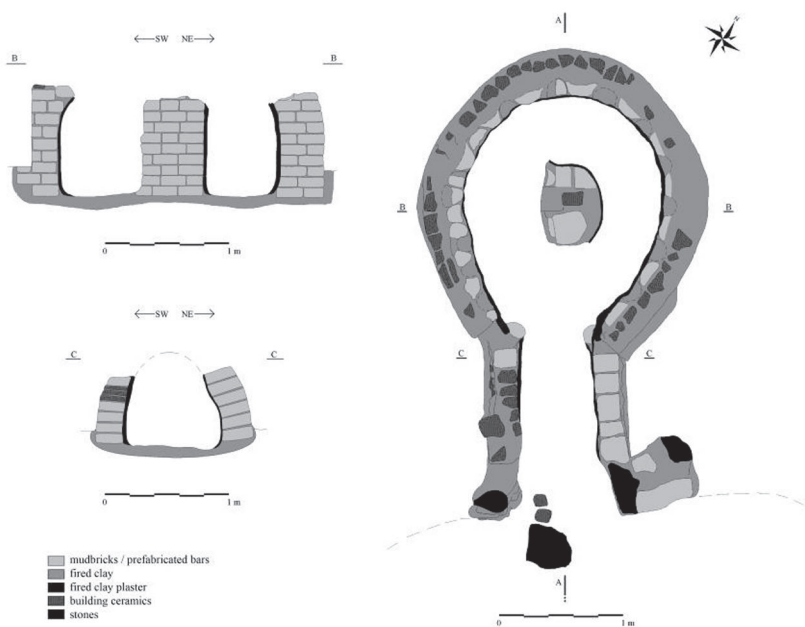


Fig. 4 - Kiln 1 – plan and sections (after A. Harizanov).

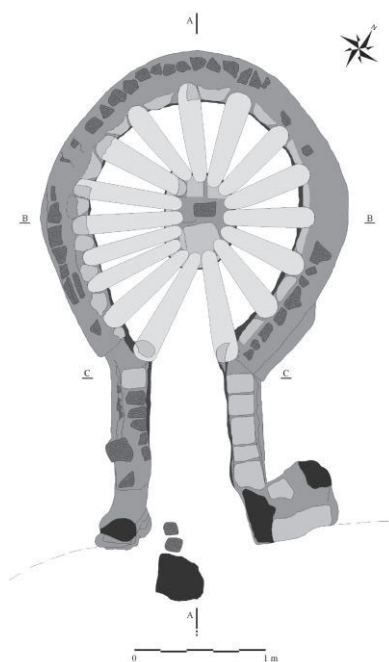


Fig. 5 - Kiln 1 - Reconstruction of the lower part of the perforated floor (author A. Harizanov).

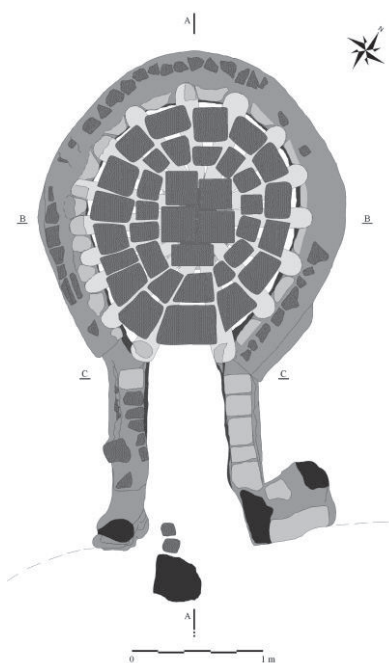


Fig. 6 - Kiln 1 - Reconstruction of the upper part of the perforated floor (author A. Harizanov).

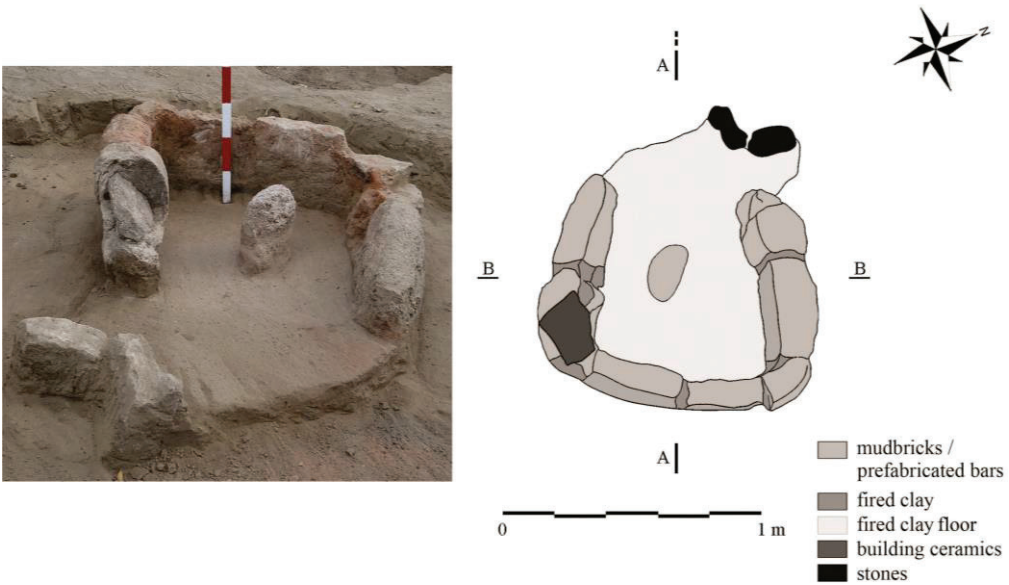


Fig. 7 - Kiln 2 (photo V. Yotov, plan after A. Harizanov).

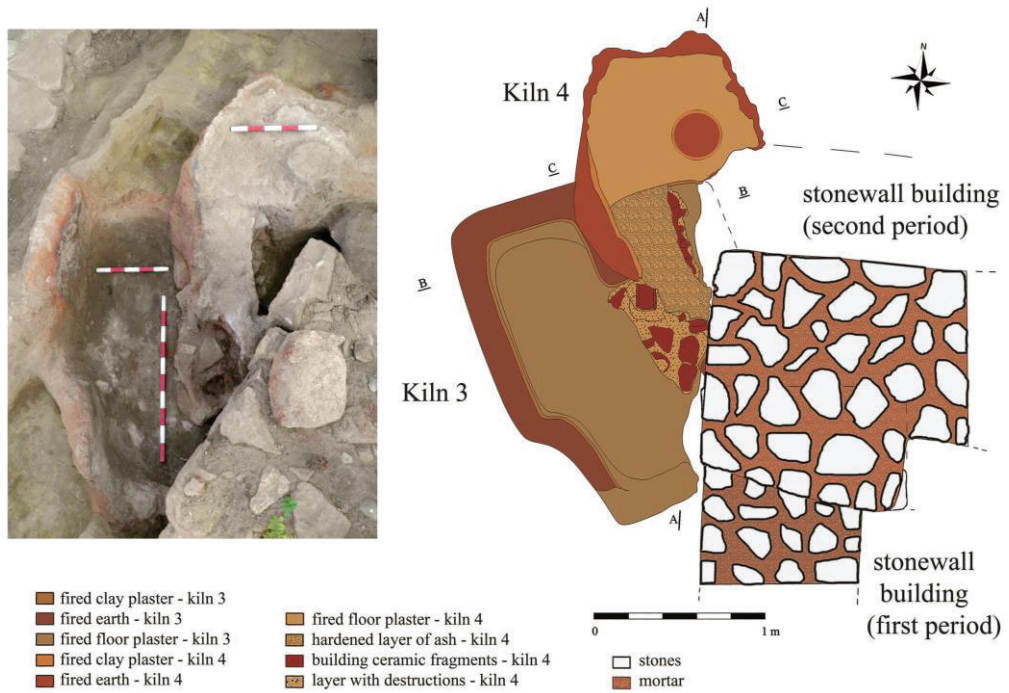


Fig. 8 - Kilns 3 & 4 (photo and plan after A. Harizanov).

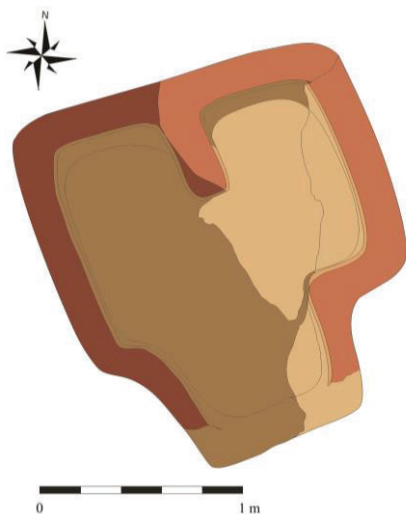


Fig. 9 - Kiln 3 – Reconstruction (author A. Harizanov).

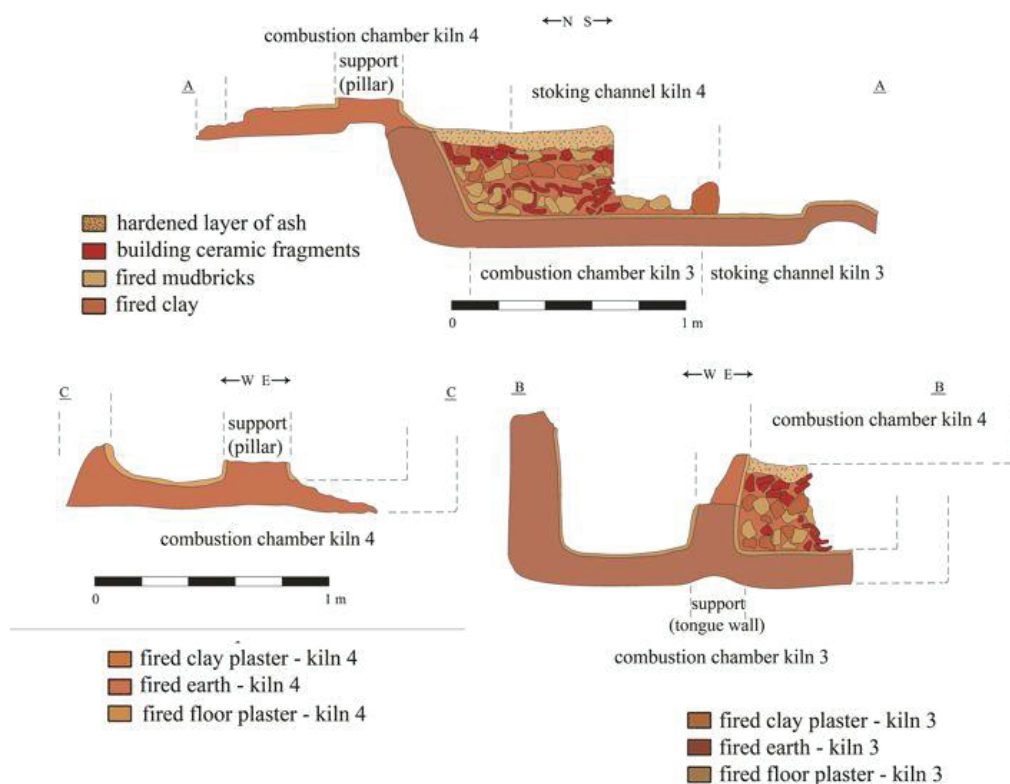


Fig. 10 - Kilns 3 & 4 – Sections (after A. Harizanov).

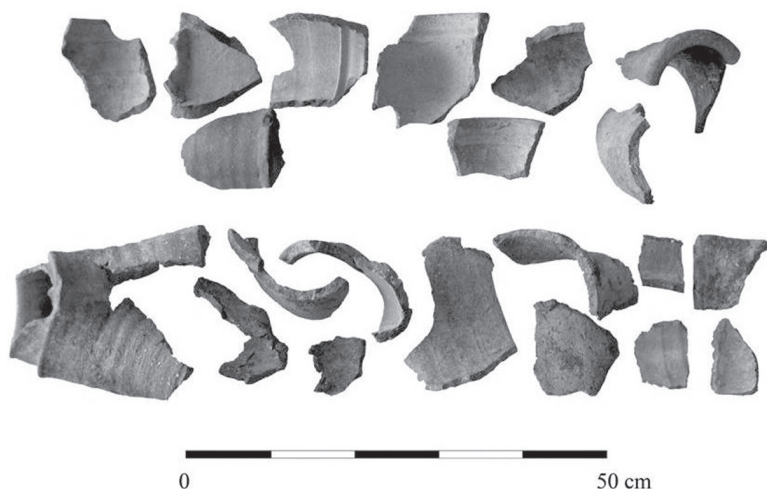


Fig. 11 - Ceramic pipes found inside kiln 3 – discarded production or remains of the perforated floor (photo A. Harizanov).



Fig. 12 - Kiln 5 – Photos of the perforated floor, the combustion chamber, the stoking channel and the pre-fabricated ceramic bars (after V. Yotov).

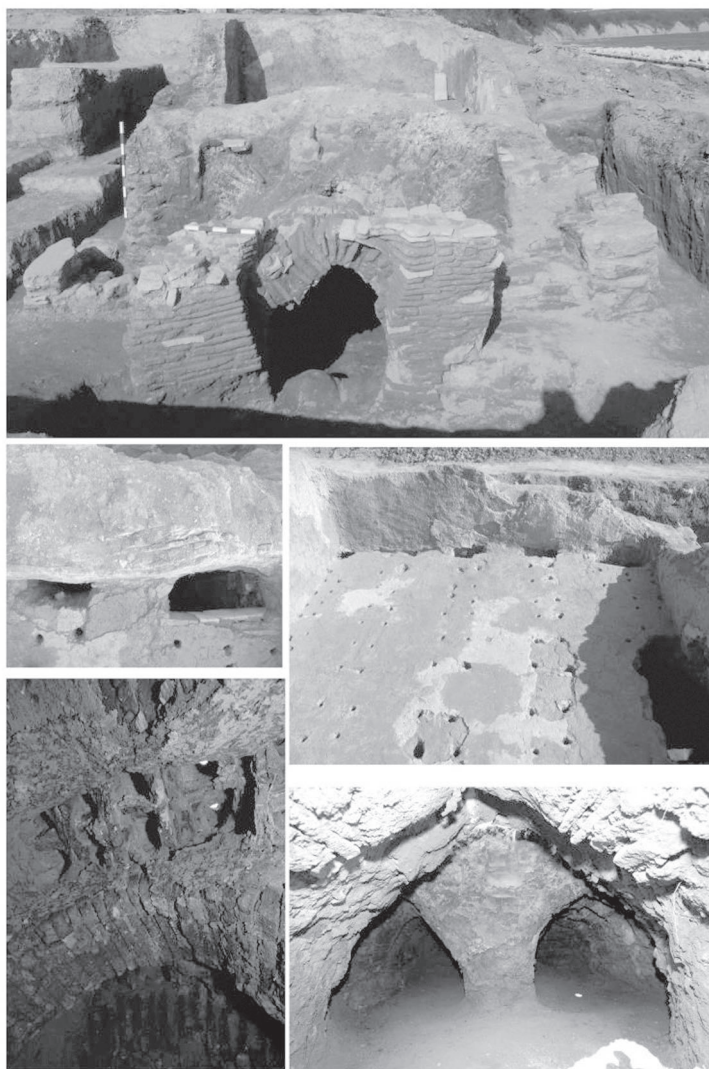


Fig. 13 - The tile kiln at the Sveti Atanas bay (photos V. Yotov & A. Harizanov).

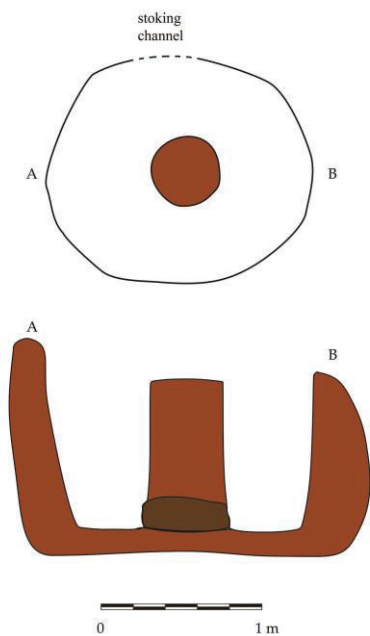


Fig. 14 - Kiln 5 – Plan and section (after V. Yotov & A. Harizanov).

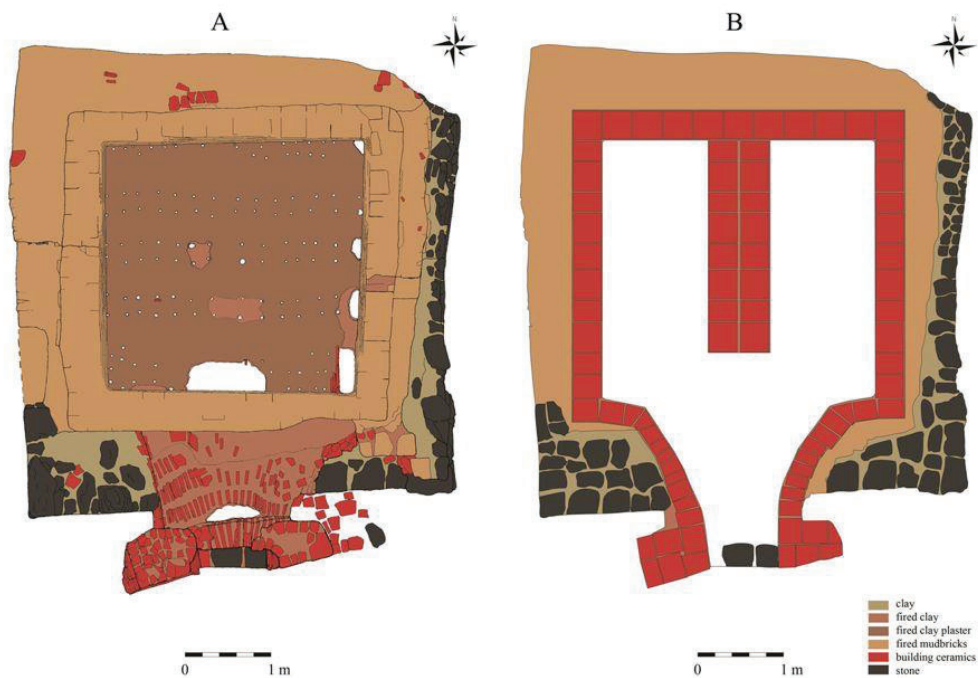


Fig. 15 - The tile kiln at the Sveti Atanas bay, plan of the firing (A) and the combustion (B) chamber (after A. Harizanov).