

VARVARIA / BREBERIUM / BRIBIR ARCHAEOLOGICAL PROJECT. THE 2015 EXCAVATION SEASON

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UDC: 726.54(497.581.2)

726.822(497.581.2)

Preliminary communication

Manuscript received: 10. 02. 2017.

Revised manuscript accepted: 15. 02. 2017.

DOI: 10.1484/J.HAM.5.113762

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The present paper contains the interim report on the second season of fieldwork carried out at Bribirska Glavica by the Varvaria / Breberium / Bribir Archaeological Project. The text gives an overview of the field operations undertaken, their results and the archaeological finds excavated and studied during this season. This material relates both to the rotunda church and to built structures postdating it.

Key words: Dalmatia, Bribir, rotunda, mausoleum, church of Sts Joachim and Ann

The fieldwork carried out in 2015 as part of the *Varvaria / Breberium / Bribir Archaeological Project* continued the field operations undertaken in 2014 along the following lines²:

- excavation below the floor level of the church of Sts Joachim and Ann (fig. 1) and to the NE of the trench T2 opened last year;



Fig. 1. Church of Sts Joachim and Ann and modern Bribir cemetery; view towards NE (A. Z. Alajbeg).

¹ The present report rests on results reached thanks to the collective effort of the whole excavation team. The text was written by V. Ghica, and A. Milošević, N. Uroda and D. Dzino proofread it, making suggestions and comments. D. Dzino authored the Croatian translation. The article was originally published in *Starohrvatska prosvjeta* 43 (2016) and it is published with permission of the journal editors.

² The fieldwork season took place between 3 and 28 April 2015. Staff members were: Prof. Dr Ante Milošević (project director), Prof. Dr Victor Ghica (field director), Dr Danijel Dzino (project co-director), Nikolina Uroda (MHAS, assistant field director), Dr Ivana Ožanić Roguljić (IARH, ceramicist), Dr Kristina Jelinčić Vučković (IARH, ceramicist), Dr Bartul Šiljeg (IARH, glass specialist), Dr Andrea Di Miceli (ArcheoRes / UDSP, Perugia, topographer and database operator), Dr Tommaso Mattioli (ArcheoRes / UDSP, Perugia, GIS operator), Željko Krnčević (Šibenik City Museum, archaeologist), Yann Béliéz (Archéodoc, Toulouse, archaeologist), Per Rathsmann (Rathsmann ArkitektKontor AB, Karlstad, architect). Labour was supplied by nine students from Macquarie University (Shenali Boange, David Crane, Ashley Keith, Genevieve Le Ban, Joel Mason, Isabella Oldfield, Ashlee Wakefield, Nicola Wesseling and Amy Wood) and two from the University of Zagreb (Merita Dreshaj and Katarina Franušić), as well as by local workers. The archaeological material



Fig. 2. 2014 and 2015 trenches (V. Ghica).

- restoration and conservation of the sub-floor structures and the floor of the church of Sts Joachim and Ann;
- study of the ceramic material unearthed during the season;
- anthropological study of selected human remains found during the season;
- terrestrial laser scanner data acquisition and processing;
- photogrammetric modelling of selected excavated structures;
- 3D modelling of excavated areas of the site;
- setting up and populating a web-based data management system for the Project's field operations;
- collecting and studying the documentation relating to previous excavation seasons;
- sampling of representative soil and organic material for OSL and ¹⁴C dating.

1. EXCAVATION

The results of last year's excavations required expanding the research area, particularly to the NE of, and within, the present church. Three new trenches were opened inside the church (T₁₀, T₁₁, T₁₃) and four sondages dug around it (T₇, T₈, T₉, T₁₂; fig. 2) with the aim of further exposing the underlying rotunda building and the adjacent mausoleum, the relative chronology of which could only be tentatively sketched in 2014. For reasons of excavation strategy, the dig in the four trial trenches was interrupted before reaching the geological substratum. Additionally, small-scale works were carried out in the trench T₁.

In brief, the stratigraphy of the seven newly opened squares showed the following:

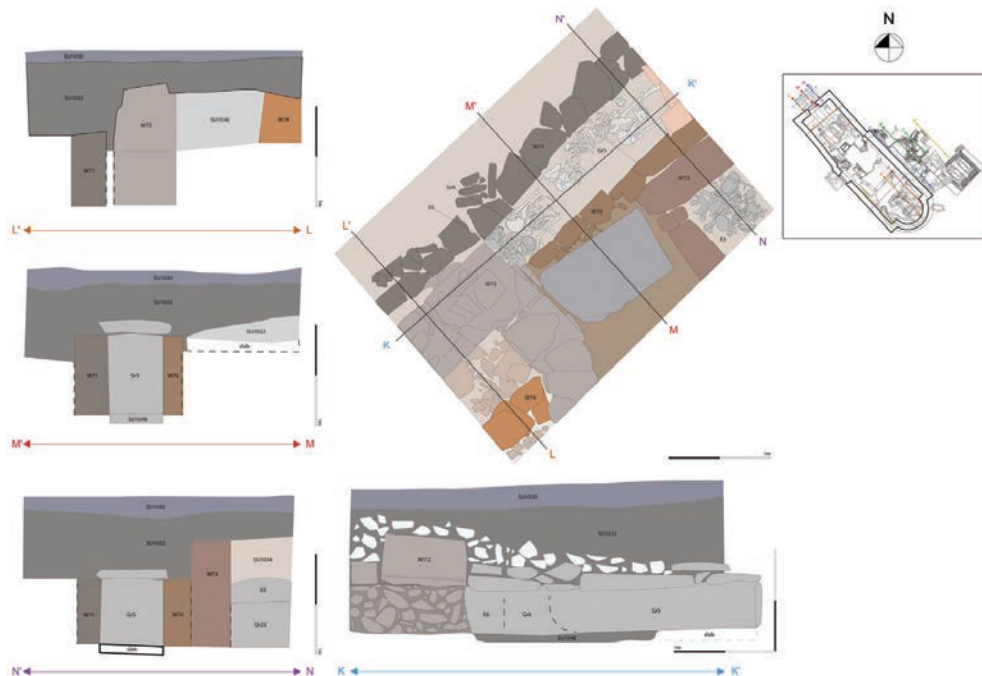


Fig. 3. Plan and stratigraphic cross-section of trench T7 (Y. Béliéz, V. Ghica).

- analysis of the building archaeology of the foundations of the church of Sts Joachim and Ann, the underlying

*T*₇ (fig. 2-4)
The trench revealed a sector of a burial area comprised of several concentrated and overlapping graves and ossuaries,

processing and cataloguing was coordinated by Shenali Boange and Merita Dreshaj, whilst Victor Ghica, Andrea Di Miceli and Nicola Wesseling conducted the designing and populating of the ARK database. From 30 April to 20 May, the excavation was continued by a Croatian team led by A. Milošević, who also supervised, between 30 June and 15 September, the restoration and conservation of the structures lying beneath the floor of the church of Sts Joachim and Ann. Miljenko Žabčić (Geographica d.o.o., Split) carried out a terrestrial laser scanner survey of the trenches excavated in 2014 and 2015 and created several ground, elevation and cross-section plans. Prof. Dr Željko Peković (University of Split) authored the architectural documentation relating to the restoration of the areas excavated inside the church of Sts Joachim and Ann. The numismatic identifications were provided by Dr Tomislav Šeparović (MHAS). The anthropological analysis of skeletal remains was conducted in the laboratory of the Anthropological Centre of the Croatian Academy of Sciences and Arts by a team directed by Prof. Dr Mario Šlaus, composed of Dr Željka Bedić and Dr Vlasta Vyroubal. Both Macquarie University and the Museum of Croatian Archaeological Monuments funded the fieldwork. The Croatian Studies Foundation of Sydney made an additional financial contribution, whilst the Ministry of Culture of the Republic of Croatia financed all the works related to the conservation and presentation of the finds.

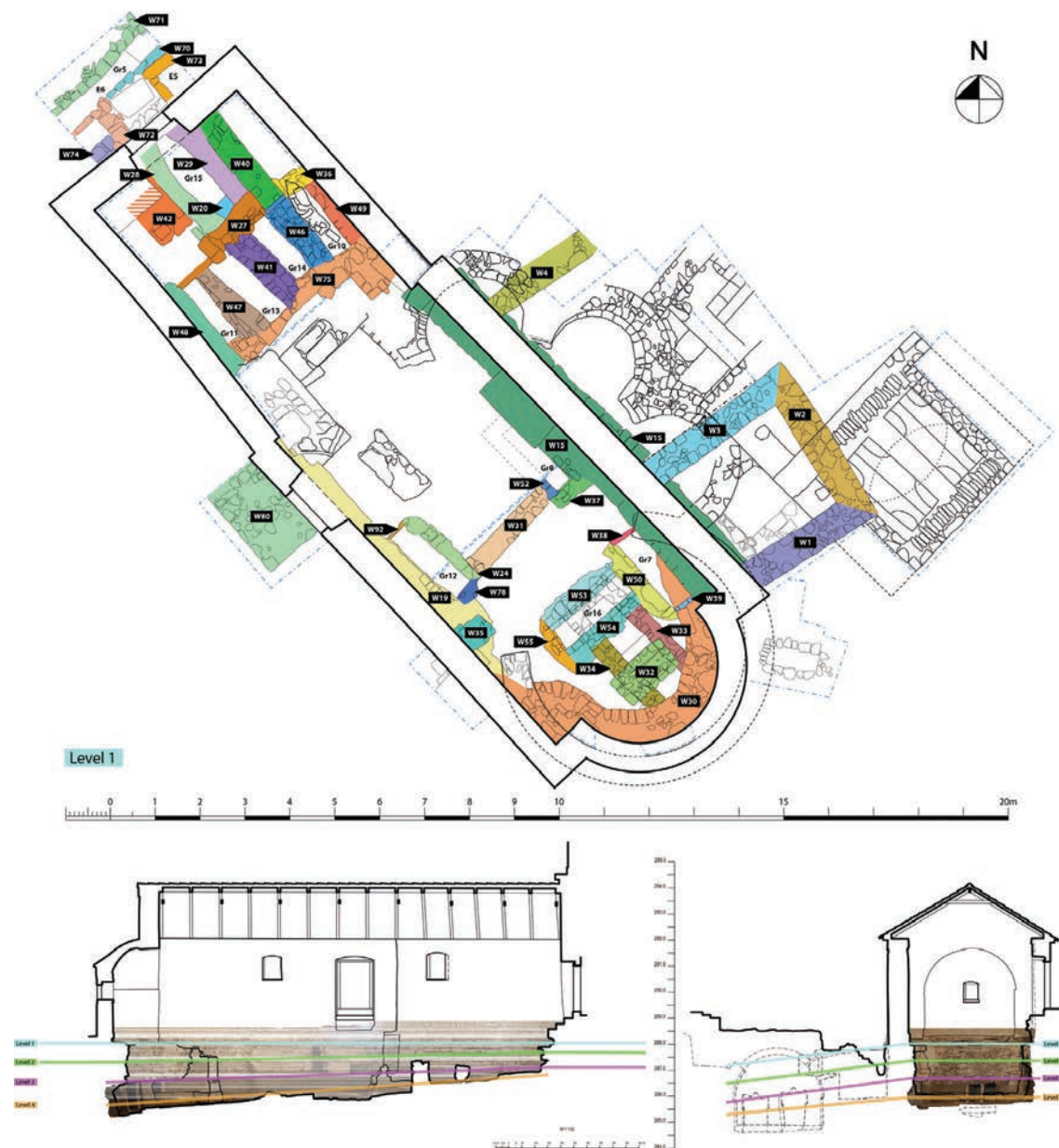


Fig. 4. Walls level 1 (V. Ghica).

featuring various types of dry-laid tomb masonry or simple stone lining. These structures reveal complex taphonomic processes. There is evidence of repeated reorganisations of the primary skeletal deposits during the conversion of certain spaces into ossuaries, which contain remains of several individuals (five for E5, seven for E6). At least one of these built structures (Gr23) can be considered a proper tomb, given its position and masonry technique. Abutting and leaning, in a domino-like arrangement, on the foundation of the façade wall of the present church, this funerary cluster postdates the construction of its *pronaos*. Extremely poor pottery finds coming from this test square point to intrusive ceramic. One shard of seemingly Italian origin, tentatively datable to the 2nd century AD (BR2015680, SU1032) is indicative in this regard.

T8 (fig. 2, 5)

Although this sondage yielded only one grave (Gr4), its position in relation to the present church, as well as the limited excavation depth, suggest that this burial is part of another dense funerary cluster. The grave contained the fragmentary skeletons of an infant, less than six months old, and a foetus.

T9 (fig. 1, 7, 8, 12)

During the 2014 season, only one wall of the *dromos* (W16) was revealed in trench T2. This year, an extension of T2 further to the NE termed T9, made it possible to investigate the stratigraphic record in the inner area of the *dromos*, assumed to be undisturbed in its lower section. The removal of a (sub-)modern grave (Gr3), built atop the remains of the wall W16 with blocks removed very likely from the rotunda building (among which a stone fragment [BR2015724, fig. 6] carved with early medieval 'Croatian' interlace pattern), gave access to two steps belonging to the stairs of the *dromos*. This was made possible by dismantling the slabs belonging to the floor of the larger annexe studied last year (SU1008). This confined space provided very few, undateable, ceramic shards. The new visual access created by the dig in the area of the *dromos* clarified an important aspect for the sequence of constructive phases. The monolithic shaped block embedded in the base of the *dromos* as second step of the stairs – which comes in all likelihood from the ancient wall of *Varvaria* – rests on a pavement made of small slabs cemented together and set directly on the bedrock surface (SU1127; fig. 9). This type of *pavimentum* is

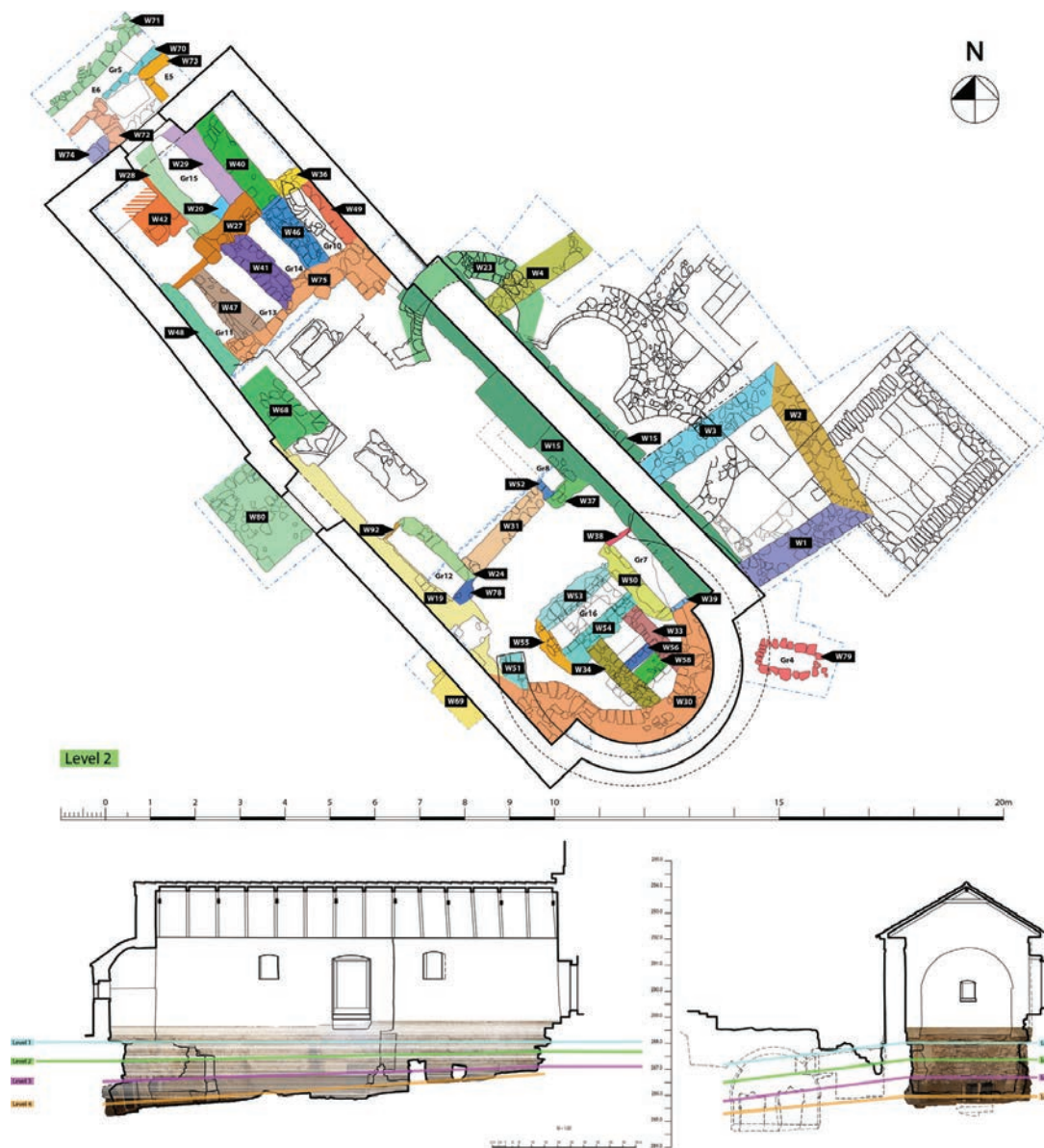


Fig. 5. Walls level 2 (V. Ghica).



Fig. 6. Stone fragment decorated with interlace pattern BR2015724 in situ (V. Ghica).

reminiscent of rehabilitated surfaces of public areas known in Italy, at Ameria, Plestia, Perugia or Tadinum for example, dating from the end of the 3rd century onwards³.

T12 (fig. 2, 4, 5, 12)

We were able to excavate two subsurface layers in this test square, with the subsoil stratum (SU₁₀₅₃) displaying chronologically eclectic material (two late mediaeval earrings and a shard of a Hayes 182 lid dated from the end of the 2nd to the 3rd century AD), a characteristic common to the upper stratigraphy of all the trenches dug to the NE of the present church.

T10 (fig. 2, 4, 5, 7, 8, 12)

This trench was completely cleared during the 2015 season and provided, together with T11, the largest amount of factual and artefactual data in contexts that show no traces of modern disturbance.

The complex mass of stratification exposed in T10 (fig. 10) originates from two major multi-phased building events resulting in the rotunda construction and the *naos* of the present church. Only three layers associated with the rotunda subsist in this trench (SU₁₀₈₇, SU₁₁₀₀, SU₁₁₀₈). Lying beneath the surface generated during the levelling work prior to the erection of the naved church,

with two of them (SU₁₁₀₀, SU₁₁₀₈) below the level of the foundation walls of the *naos*, these strata, although disturbed at a later stage, are related to the collapse of rotunda's walls and altar screen. Whilst the diagnostic pottery shards have little chronostratigraphical relevance (SU₁₀₈₇ features a variety of fragmentary ceramic ware, from a Republican period *orlo bifido* plate to African and Eastern Mediterranean amphorae of the 5th to 6th centuries), an element of altar screen gable decorated with early mediaeval motifs and bearing a dedicatory inscription (I]ERI ROCAVI), complete and in an excellent state of preservation (BR2015723, SU₁₁₀₀; fig. 11), as well as three smaller limestone decorated architectural elements (BR2015284, BR2015720, BR2015721) provide a *terminus a quo* in the 9th century for the collapse of mural elements of the rotunda. However, the early Romanesque decorated limestone fragment, datable to the 11th century and found during the 1959 season in an undocumented, yet likely stratigraphically similar, context⁴, leaves the discussion open about this *terminus*.

³ Cf. A. DI MICELI, *Popolamento, città e campagna nell'Umbria tardo antica*, PhD thesis defended in 2013 at the University of Perugia, p. 168-169, 185-188.

⁴ S. GUNJAČA, *Nalaz srednjovjekovnih arhitektura na Bribiru*, *Starohrvatska prosvjeta* ser. 3, vol. 10, Split 1968, p. 235, pl. 2.

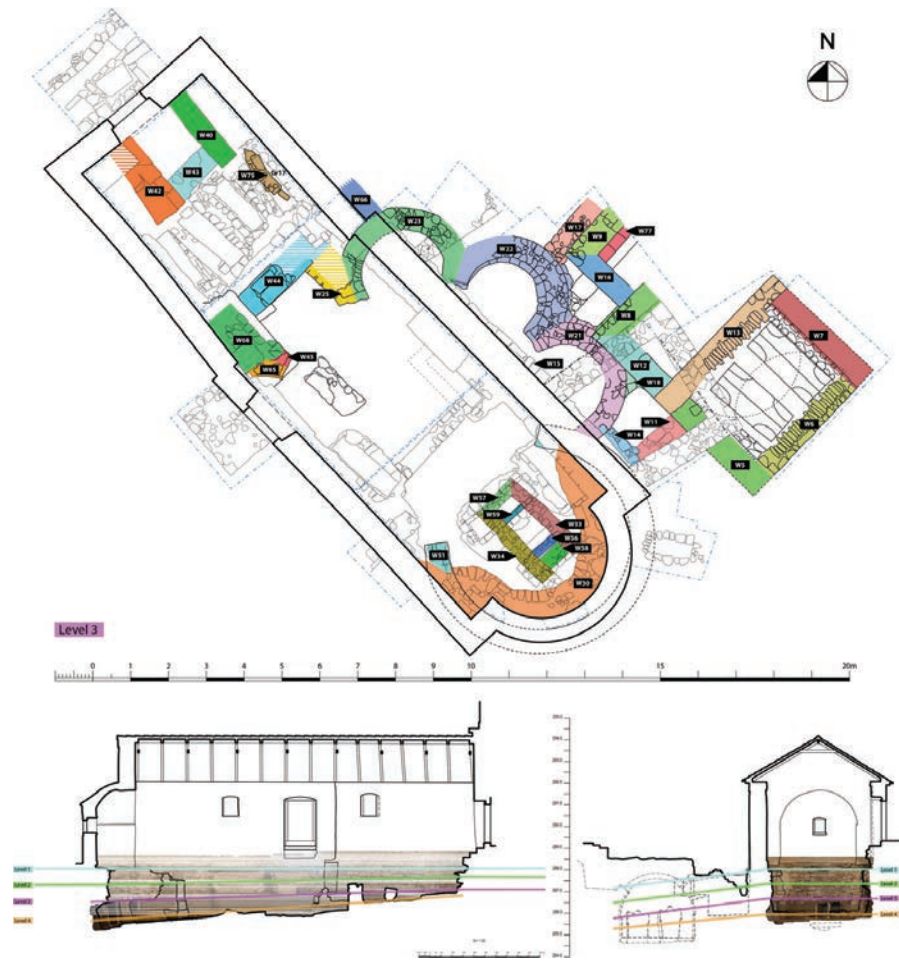


Fig. 7. Walls level 3 (V. Ghica).

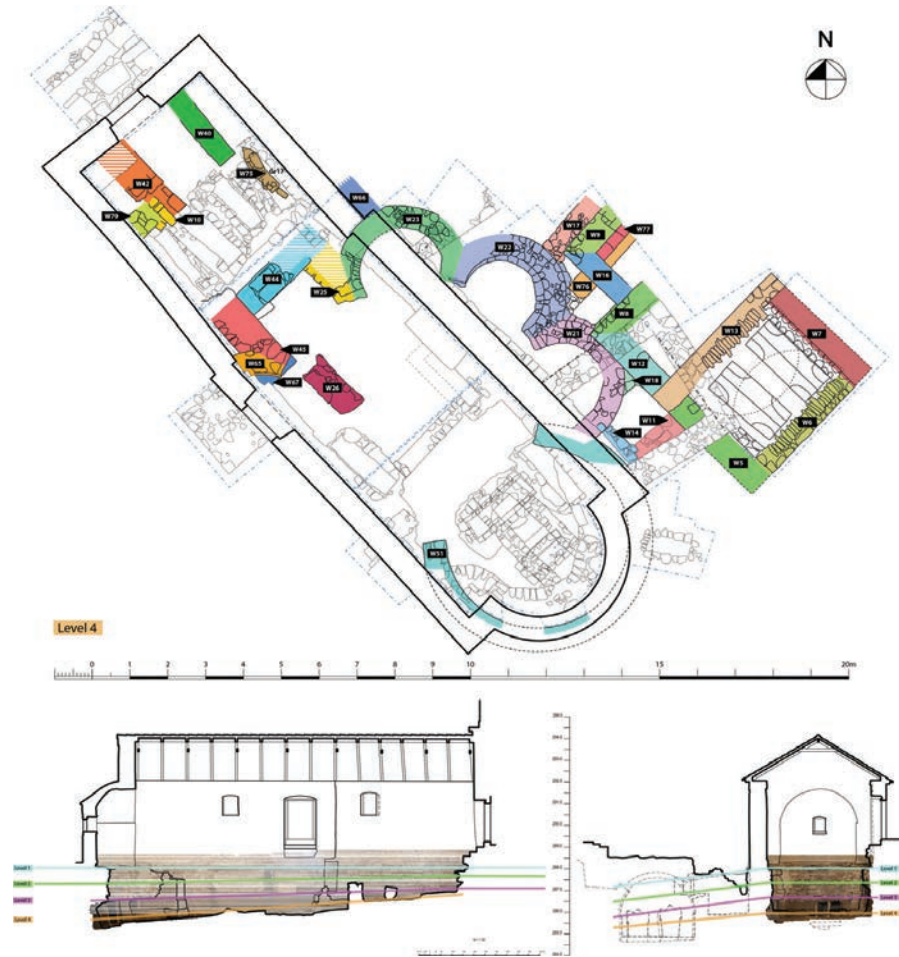


Fig. 8. Walls level 4 (V. Ghica).

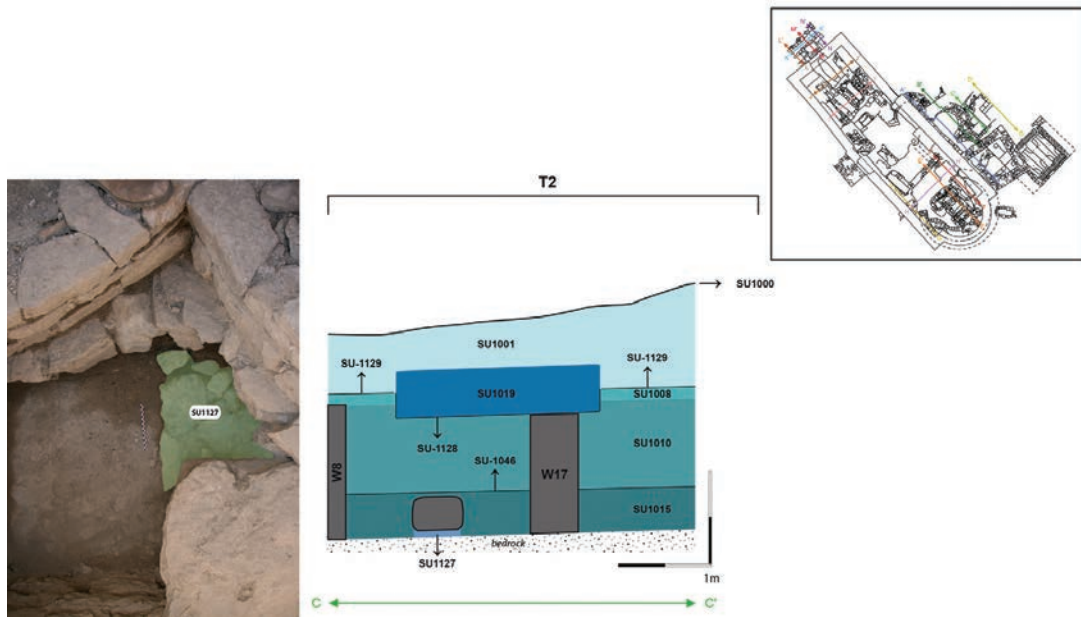


Fig. 9. Situation of SU1127 (V. Ghica).

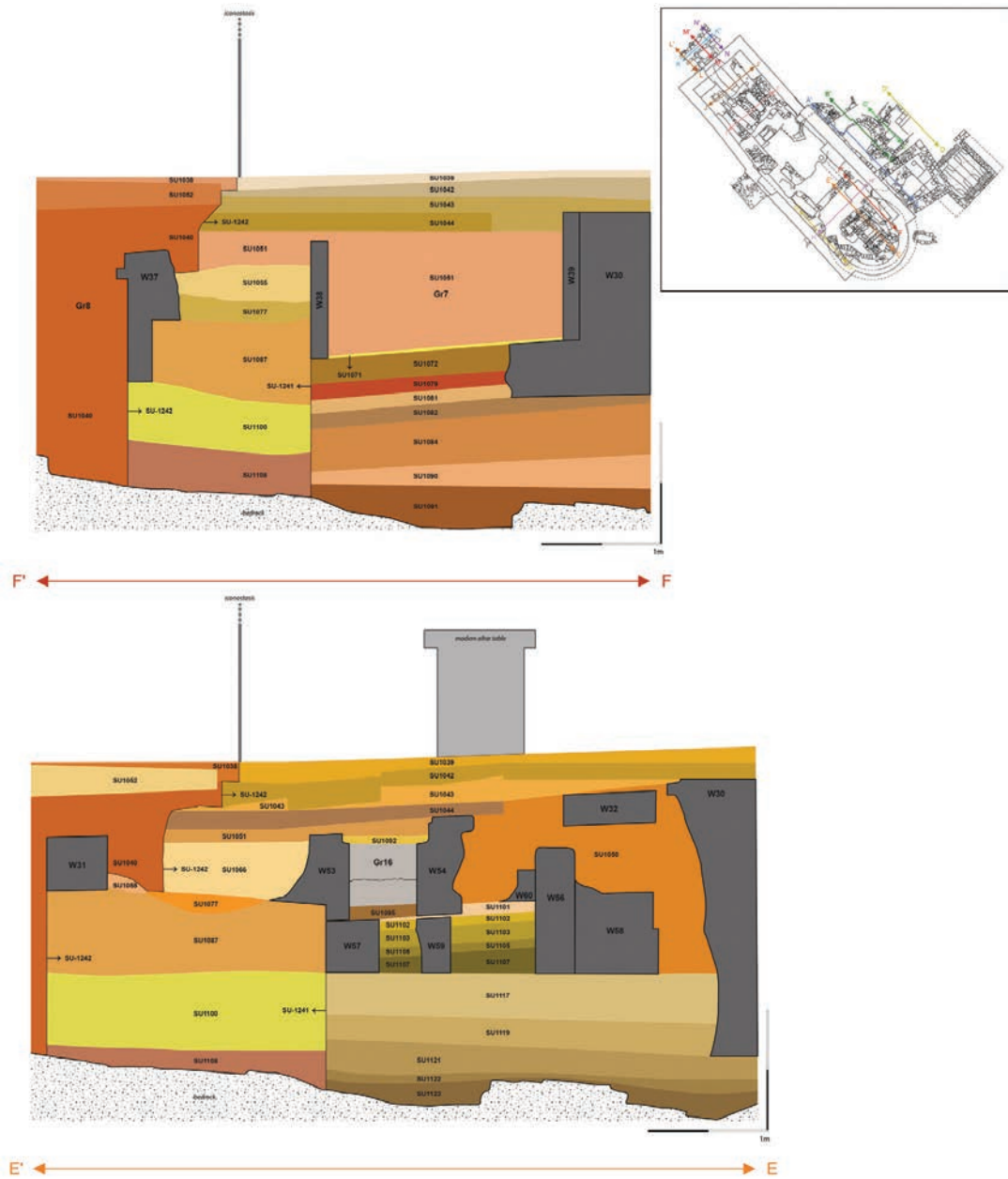


Fig. 10. Stratigraphic cross-sections E-E', F-F' in trench T10 (V. Ghica).



Fig. 11. Fragment of altar screen gable BR2015723 (A. Z. Alajbeg).

The structure that can be assigned to the rotunda monument in this trench is a large circular (three quadrants of a circle) apse built atop the bedrock (W51; fig. 8, 12). Although the inner face of the apsidal wall could not be fully cleared due to the risks inherent in its complete exposure, a test opening made in its central part suggests the absence of a bay. Preserved at a maximum height of 215 cm at its SW end, the inner face of the apse is fitted at its widened base with a 47-70 cm-high ledge (fig. 13), a feature shared by all the

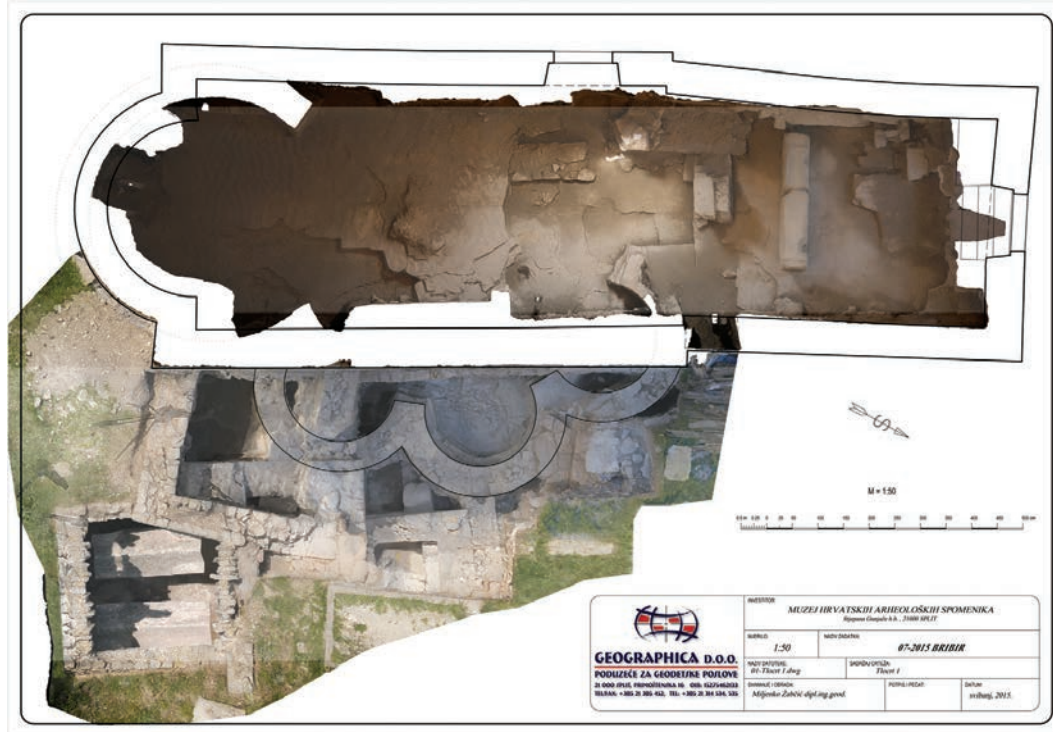


Fig. 12. Lidar-derived vertical orthophoto of the areas excavated in 2014 and 2015 (M. Žabčić).



Fig. 13. Trench T10 after excavation; view SE (A. Milošević).



Fig. 14. Inscribed sarcophagus' wall fragment BR2015727 (A. Z. Alajbeg).



Fig. 15. Pluteus fragments BR2015720 and BR2015721 (A. Z. Alajbeg).



Fig. 16. Fragments of painted plaster on walls W 59 and W 33 (top) and W 34 (bottom) (A. Milošević).



Fig. 17. Confessio during excavation (A. Milošević).

apses revealed so far. This ledge, which runs uninterruptedly along the base of the inner walls and shows in several places traces of a 2-4 cm thick layer of mortar, marks the height of rotunda's mortared floor.

The rest of the stratigraphy in T10 can be divided into three functionally defined groups of both horizontal and vertical strata related to the *naos*: pre-foundation soil, sub-floor and floor-related.

To the first category belong two series of often-equivalent layers bordered by the negative unit SU-1241 (fig. 10), the interface marking out the cut made in the pre-existing deposits (SU1108, SU1100, SU1087) prior to setting the wall foundation of the *naos* as well as the pre-foundation levelled soils on which were constructed the subfloor features associated with the sanctuary. These are non-lenticular, clearly anthropic, layers resulting from a levelling operation. The

large number of strata necessitated by the levelling work is probably explainable by soil mechanics. The ceramic shards identified in these stratigraphic units, datable to the 2nd to 5th centuries, are out of original context.

The second block of stratigraphic units is connected with the subfloor structures of the sanctuary. It consists of a *confessio* and two privileged tombs in the sanctuary (Gr7, Gr16), along with two other tombs located along the sidewalls of the *naos* (Gr8, Gr12). To these should be added the foundations of the *naos*' walls (W15, W19, W30). A feature shared by all these built structures is the use of *spolia* belonging either to the rotunda building and its internal furnishings or to other edifices of Roman period. Embedded in the foundation walls of the present church or scattered in fills, among these reused blocks are a limestone fragment of sarcophagus wall containing two inscriptions, one of which mentions JIMIRO DUCE (BR2015727, SU1051; fig. 14)⁵ and two limestone fragments of latticework belonging to a perforated *pluteus* or *transenna* (BR2015720, W30; BR2015721,

⁵ After the excavations, two other inscribed fragments belonging to the same sarcophagus were identified in the Bribir *lapidarium*.



Fig. 18. Findings from the grave Gr 16: 1 Chalice BR2015783; 2 Paten BR2015993 (A. Z. Alajbeg).

SU1050; fig. 15). The relative chronology of these subfloor structures cannot be entirely clarified. However, the positioning of the altar tomb Gr16 perpendicularly over the *confessio* (fig. 4, 5, 7) determines that this operation involved the reshaping of the latter. W54 belonging to Gr16 is built atop and after the partial demolition of W59 (the painted plaster visible on the sidewalls of the *loculus* – W33 and W34 – could still be observed on a small area of W59, fig. 16). This *sub*



Fig. 19.3. Wall W 40 during dismantling (A. Milošević).
Fig. 19.4. Wall W 42 during dismantling (A. Milošević).

altare installation (fig. 17), including its NW end, on top of which Gr16 had been constructed, was found empty. Unlike Gr7, devoid of human remains but in the fill of which was recovered the abovementioned inscribed block BR2015727, the altar tomb Gr16 was intact, containing skeletal remains belonging to at least six adult individuals, a tin chalice and a paten (BR2015783, BR2015993, HRU1095, fig. 18.1-2)⁶. All the structures located between the foundations of the sanctuary and *naos* walls were eventually dismantled in order to allow the examination of rotunda's walls.

The third group of layers is composed of three successive floors (SU1044, SU1042, SU1039) and correlated fills. Both categories featured a significant content of reused blocks.



Fig. 19.1. Wall W 42 (A. Milošević).
Fig. 19.2. Walls W 40 and W 42 and grave Gr 15 (A. Milošević).



Fig. 19.5. Two fragments of a spoliium recovered from W 40 and reconnected (A. Milošević).

⁶ Another tin chalice was found on Bribirska glavica by Lujo Marun, but it was lost during the Second World War (cf. S. GUNJAČA, *Strateško i historijsko-arheološko značenje Bribira, Starohrvatska prosvjeta* s. 3, vol. 10, Split 1968, p. 211 and pl. 3).

T11 (fig. 2, 4, 5, 7, 8, 12)

The stratigraphic record uncovered in T11 can be distinguished as two groups: one is characterised by a compact subfloor funerary area and the other composed of pre-existing features and deposition layers.

Notwithstanding the difficulty in interpretation, the second, lower, group, represented chiefly by built features set directly on the bedrock surface, shows no direct, physical connection with the rotunda monument. Several massive concrete-bound *spolia* (fig. 19.3, 19.5)⁷, including the late antique, probably early Christian, impost capital

of a square-section mullion (BR2015718, fig. 20), form two parallel walls (W40, W42) of a maximum height of c. 130 cm (fig. 7). Although their delimitation is to some extent problematic, blocks situated to the SW of the wall W42 (fig. 7, 19.1, 19.4) could indicate that these two walls preserve their original east endings. Furthermore, these stone blocks tend to support the hypothesis of a connecting wall joined to W42 running SW-NE. The function of these two parallel walls, whether never completed or destroyed tower or gate, in which a grave (Gr15) was later encased, could only be determined by further excavations in T7 and along the walls of the *pronaos*, outside the modern church.



Fig. 20. Impost capital of a square-section mullion BR2015718 (A. Z. Alajbeg).



Fig. 21. Bronze bowls BR2015687 (A. Z. Alajbeg).



Fig. 22. Antler container BR2015464 (A. Z. Alajbeg).



Fig. 23. Gold earring BR2015996 (A. Z. Alajbeg).

⁷ Amongst these, it is worth mentioning a long marble block (265x50x60 cm) broken into two pieces and damaged in the lower part, which was embedded in W40 (fig. 19.3, 19.5). After the dismantling of this wall, the two fragments were moved in the midst of T11, where they were tentatively reconnected. On the front side of the block there is a simple *tabula ansata* surrounding an inscription of which only the traces of a few letters are still visible (fig. 19.5). The block was narrowed at its longitudinal edges, which could indicate that it was originally built in a wall, probably positioned over the entrance of some monumental building (temple?) that existed at this same place. After the excavations, the block was left on the bedrock, but a plaster imprint of its front side has been taken before the setting of the new floor in the church.

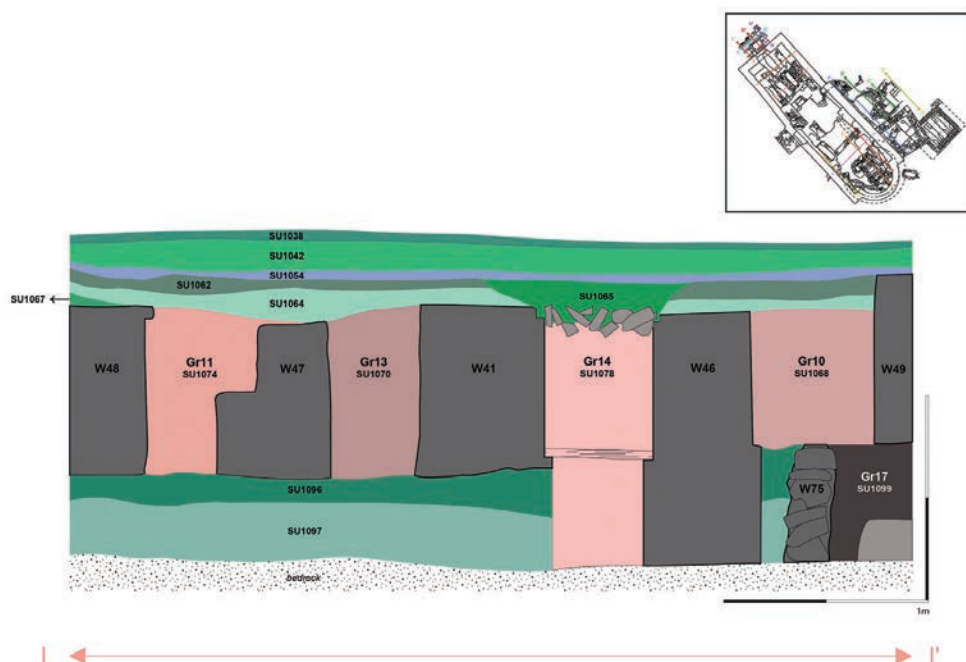


Fig. 24. Stratigraphic cross-sections I-I' in trench T11 (Y. Béliéz, V. Ghica).



Fig. 25. Inscribed slab BR2015703 (A. Z. Alajbeg).

Also set on the bedrock, a grave (Gr17; fig. 8) containing skeletal remains of a minimum of ten individuals was identified below and cut by the foundation of the N sidewall of the *pronaos*. Against the outer face of the only wall of this grave cleared during the dig (W75) were found two triangular bronze bowls (BR2015687; fig. 21), whilst a decorated T-shaped antler object of the type known in specialised literature as “salt container” (BR2015464; fig. 22) was discovered in the fill of the grave, together with a damaged gold early Byzantine earring (BR2015996, SU1099; fig. 23). Worth noting is the location of the grave in relation to the rotunda: Gr17 is situated against and parallel to the wall W66, which, as shown below, is connected to one of the apses of the rotunda (W23). Traces of a lime-mortared floor visible on a large slab embedded horizontally into the base of the S sidewall of the *pronaos* indicate that the area delimited by the walls W68, W44, W23, W66, W40 and W42 was an enclosed space. The level of this floor coincides with the maximum height of the wall W75 belonging to the grave Gr17. Lastly, a second, lower circulation level, made of beaten clay covered with a thin layer of lime mortar, was found in the same area, preserved – to a maximum thickness of 20 cm – only under the walls W42 and W43, on the bedrock surface and covering the remains of the wall W10 (fig. 19.1-19.4).

The other, higher, stratigraphic concentration in T11 is dominated by a group of five graves embedded in a solidary tight structure, made of dry stones and filling the whole width of the *pronaos*. All of them are oriented in the axis of the present church and occupy $\frac{3}{4}$ of the *pronaos*' space. Four of them (Gr10, Gr11, Gr13, Gr14; fig. 4, 5) are aligned in a row, whilst the fifth one (Gr15) occupies the space between the walls W40 and W42. The four parallel graves sit on layers of various composition, 42-56 cm above the geological substrate (fig. 24). These five graves yielded a large amount of osteological remains. The number of individuals varies between 4 (Gr10) and 38 (Gr14). An Austrian imperial *kreuzer* minted in 1887 (in circulation until 1899) recovered in Gr10 (SU1068) provides the only available date



Fig. 26. Inscribed block BR2015715 (A. Z. Alajbeg).

for the intensive reuse of this funerary space. Among the material retrieved in this stratigraphic cluster, we should mention a fragmentary monumental stone slab containing a 1st to 2nd century Latin inscription (BR2015703, found in W41; fig. 25) and a shaped block, possibly part of a frieze, bearing the fragmentary inscription]ATRIBU[(BR2015715, found in W46, fig. 26).

T13 (fig. 4, 5, 7, 8, 12)

This excavation square was cleared almost entirely in 1959 by Stjepan Gunjača⁸, hence the delimitations of T10 and T11 according to the perimeter of this trench. Except for two coins extracted from the main layer of the backfill (SU1040), an Aquileian *denarius* minted under Ludovico II di Teck (1412-1420) and an 18th century *gazetta Dalma et Alban*, and a pedestal featuring a large 22 x 20 cm rectangular slot (probably part of the stone base, embedded in the floor, of the chancel *stipites*), the record of the area exposed in 1959 consists solely of built structures. Of the uncontaminated higher stratigraphy, only one double-layered subfloor grave (Gr12; fig. 4, 5) was not dug in 1959. It contained the skeletal remains of a minimum of 16 individuals.

⁸ S. GUNJAČA, *Nalaz srednjovjekovnih arhitektura*, p. 235.



Fig. 27. Wall W 44; view towards SE (A. Milošević).



Fig. 28. Orientation type C visualised on the rotunda and the neighbouring archaeological area (V. Ghica).

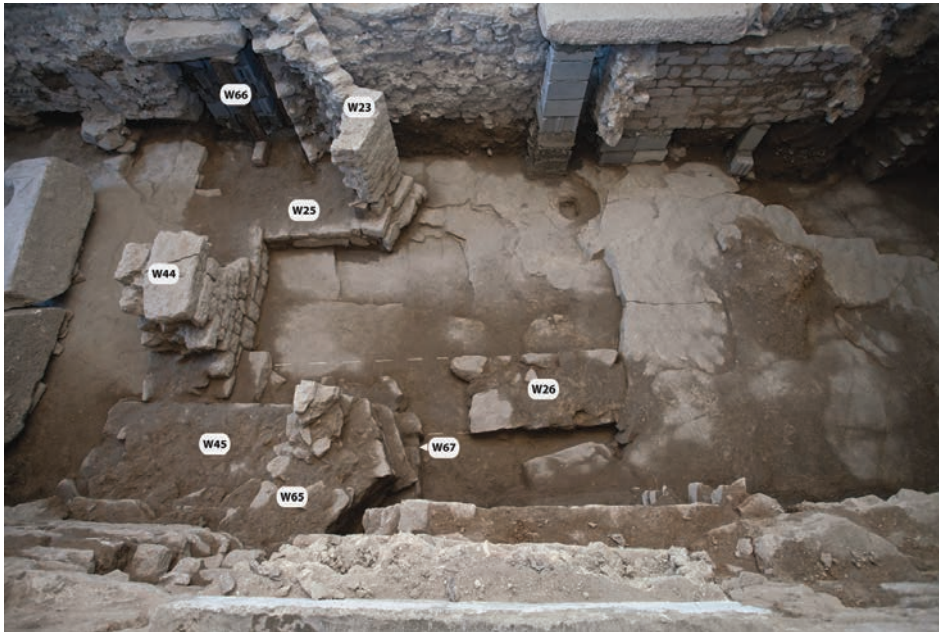


Fig. 29. Built structures laying on the bedrock in trenches T10, T11 and T13; view towards NE (A. Milošević).

On top of the geological substratum lie two groups of built structures, one related to the rotunda and another one pertaining to a pre-existing building.

Belonging to the rotunda, two circular apses were partly uncovered (W65 and W23, half of which had been exposed during the last season) together with a rectangularly planned recess (W25/W44/W45) located to the NW, opposite to the large horseshoe-shaped apse (W51). The maximum height from the bedrock surface level to where these walls are preserved varies from 25 cm (W25, of which only the

ledge subsists) to 207 cm (W23). W44, as possible front wall of the building, is currently preserved very fragmentarily to a maximum height of 116 cm from the bedrock level. From the highest row of stones extant in this wall survives only an ashlar block, whose shape and position (in the very centre of W44) suggest a threshold element (fig. 12, 27). At a certain point after the abandonment of the rotunda, possibly during the construction of the present naos, the three walls of the recess (W44, W25, W45) were subjected to intentional dismantling in such a way that much of W25 is no longer extant, except for the first row of stones forming the ledge of this wall.

Several construction characteristics distinguish this space of rectangular plan and might invite the question of whether the walls W44, W25 and W45 – or the lower section of them – were originally part of an earlier building. As indicated

by W44 (71 cm), these walls are thicker than the apses W21, W22 and W23 (57 cm) and the masonry displays a different quality of binding material as well as larger blocks (in W44). However, such hypothesis remains architecturally questionable and is not necessarily supported by the results of the OSL age of the soil lying beneath W25 (see below).

In addition to this recess, a sondage in the soil layer situated below the foundation of the NE wall of the *pronaos*, in the vicinity of the outer face of W23, revealed the section of a wall (W66) abutting W23 and running approximately



Fig. 30. Hole excavated in the bedrock (V. Ghica).

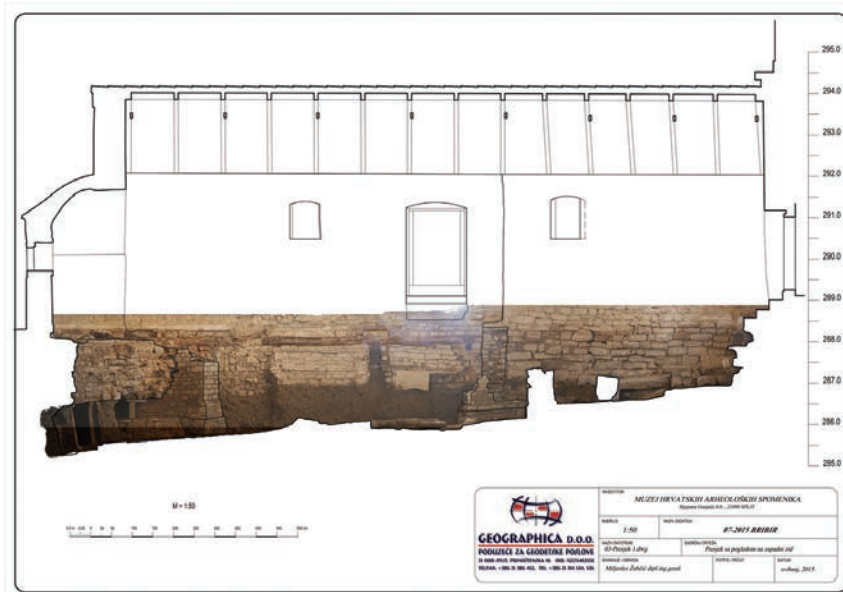


Fig. 31. Lidar-derived horizontal orthophoto of the subfloor structures inside the church of Sts Joachim and Ann after excavation (M. Žabčić).

parallel to the NE wall of the *pronaos* (fig. 7, 8). The masonry joint between W66 and W23 seems to suggest that the former results from a later stage of construction.

The axis of the rotunda displays a 47° deviation from the north, the same orientation as the one of the adjacent buildings excavated in the 1970s to the NE of the modern cemetery (orientation type C mentioned in our previous report⁹; fig. 28). The difference of altitude of the bedrock measured between the centre of the large apse (W51) and the centre of the rectangular 'apse' (W44) is 76 cm (fig. 31). The slope of the floor set inside the rotunda is substantially attenuated by a higher ledge at the base of the large apse W51 (72 cm, fig. 13) and shorter ones on the opposite side (for instance, 30 cm at the base of W44) (the projecting rows of stones situated on the bedrock surface, at the base

of the inner face of the apsidal walls, some of which retain significant traces of mortar, mark the altitude of the floor).

Three features were identified under the floor level of the rotunda. The first is a fragmentary wall, of which only one row of stones survives in a split of the bedrock compensating its difference of level (W26; fig. 8, 12, 29). Then, there is an apron-like large rectangular shaped block lying underneath the joint W45/W65 (W67), and lastly a sub-rectangular hole 20 x 20 cm and c. 10 cm deep excavated in the bedrock (fig. 12, 30). The relationship of these structures to the rotunda building is still under study, but the first two belong in all likelihood to a pre-existing construction.

Finally, the recovery of the large horseshoe-shaped apse in T10 prompted the dismantling, in T1, of W14 and of some adjacent blocks belonging to W15 in order to expose the outer face of W51 to N-NE. The joint between the apses W51 and W21 was thus rendered visible. Both walls retain traces of mortar and plaster in this area.

Building phasing

This season has brought to light features that permit us to refine the outline we gave last year of the building phases in the current excavation area. We limit ourselves here to *addenda et corrigenda*.

The dig in the trench T9 revealed new sections of the slabbed floor (SU1008) of the large annexe excavated in 2014¹⁰. Slabs belonging to it could be identified this year to the E of the corner W2/W3 of the smaller adjoining subsidiary room, determining that the latter was surrounded in this perimeter by the space of the larger annexe. The building phases 4 and 5¹¹ should therefore be interchanged.

This year's excavation did not allow us to further determine the relative chronology of the building phases 6-7, as outlined in our previous report¹². However, examining the inner face of the foundation walls of both the *naos* and the *pronaos* validates the hypothesis of the latter constituting a later addition to the former. Based initially on the different length of the *naos*' sidewalls and on the deviation between the axes of the *naos* and the *pronaos* (2° for the NE and 3.5° for the SW wall of the *pronaos*), this building sequence is further corroborated by the distinct types of masonry discernible in the foundations of the two sections of the modern church (fig. 31) as well as by the position of the *naos*, which lies exactly atop the remains of the rotunda and has the same length and orientation as it. Such phasing could account for the deliberate dismantling of substantial parts of the rotunda walls W25 and W44, located underneath the area where the presumptive front wall of the first nave church would have lain.

⁹ V. GHICA, A. MILOŠEVIĆ, D. DZINO, Arheološki projekt Varvaria / Breberium / Bribir u 2014. godini - Varvaria / Breberium / Bribir Archaeological Project. The 2014 Excavation Season, *Starohrvatska prosvjeta* s. 3, vol. 42, Split 2015, p. 32-33.

¹⁰ V. GHICA, A. MILOŠEVIĆ, D. DZINO, Arheološki projekt Varvaria / Breberium / Bribir u 2014, p. 21-23.

¹¹ Cf. V. GHICA, A. MILOŠEVIĆ, D. DZINO, Arheološki projekt Varvaria / Breberium / Bribir u 2014, p. 21-27.

¹² V. GHICA, A. MILOŠEVIĆ, D. DZINO, Arheološki projekt Varvaria / Breberium / Bribir u 2014, p. 27-29.

Occupation phasing

The 2015 season has made available evidence that contributes substantially to further defining the absolute and the relative chronology of the area under study.

The late antique horizon hypothesised last year¹³ for the erection of the rotunda is now confirmed. The orientation of the monument, identical to that of the Roman period buildings located to the NE of the modern cemetery (47° N – orientation type C¹⁴; fig. 28), points to both the early date of the construction and its incorporation into the Roman urban fabric. Various details of construction technique apparent in the walls of both the mausoleum and the rotunda point in the same direction. These observations are supported by archaeometrical data. Three charcoal samples extracted from two uncontaminated layers situated directly on the bedrock (SU1021, SU1126), below the floor of the rotunda, provide a *terminus a quo* for the erection of the building in the mid-3rd century¹⁵. On the other hand, the radiocarbon date of a bone fragment belonging to one of the skeletons deposited in G17 offers a *terminus ad quem* in mid-6th century¹⁶. Indeed, as its position (against W66, the wall identified below and running parallel to the N sidewall of the *pronaos*; fig. 8) indicates, G17 postdates W66 and, consequently, the age of the bone sampled in this grave constitutes an *ante quem* for the structure to which W66 belongs as well as, obviously, for the rotunda. Whilst not theoretically excluded, a late re-inhumation of the skeletal remains in question is, for many reasons, highly improbable. Ultimately, an OSL age estimate for soil parent material sampled in an interstice present between the bedrock and the first row of stones of W51 (OSL6) corroborates these landmarks. Despite the dispersed luminescence measurements obtained for this sample (1985 ± 470 BP), the depositional age of the C horizon soil below W51 does not postdate the beginning of the 6th century. A second soil sample (OSL4) coming from a similar

context from beneath W25 offers instead a much earlier age range (2380 ± 355 BP), which suggests that this section of the rectangularly-planned recess – or, at least, the soil beneath it trapped in a split of the bedrock, provided that it went undisturbed – appertains to a pre-existing construction. The luminescence measurements for this sample might be interpreted as consistent with a 1st century BC date for the last exposure to sunlight of this soil layer, which is not necessarily the date of the building of W25, probably originally constructed as part of the rotunda. Reconciling this age with the visible architectural elements pertaining to the rectangular recess will be one of the tasks of the future excavation seasons. What is, however, certain is that OSL4 was sampled in a stratigraphic layer that could be contemporaneous with W26, a wall that belongs to a building predating the rotunda. This stratigraphic association allows us to relate the age of OSL4 with the antecedent building of which only the remains of W26 survive.

These observations call for a paradigm shift in the analysis of the Bribir rotunda. For the time being, this monument ought to be studied synchronically, dissociated from the other Dalmatian rotunda-type polyconch churches, at least from the chronotypological and geotypological interpretation they are given in Croatian scholarship¹⁷. Valid *comparanda* to bring into discussion are constructions such as the *cella septichora* of *Sopianae*/Pécs or the baptistery of *Ulpiana*/Gračanica, to name only the most relevant ones. Although their dating raises questions, the foundation of these buildings can be situated in the 4th or 5th century¹⁸.

The rotunda remains in use at least until the 9th, if not the 11th century¹⁹ taking into account the early Romanesque sculpted fragment recovered in 1959²⁰. Indeed, as testified by this season's stone inventory, it is in the 9th century that the apparently lavish refurbishing of the monument takes place. Moreover, the inscribed block BR2015727, which refers to duke Branimirus (879-892) (JIMIRO DUCE EQ[O] – the

¹³ V. GHICA, A. MILOŠEVIĆ, D. DZINO, Arheološki projekt *Varvaria / Breberium / Bribir* u 2014, p. 20-21.

¹⁴ V. GHICA, A. MILOŠEVIĆ, D. DZINO, Arheološki projekt *Varvaria / Breberium / Bribir* u 2014, p. 32-33.

¹⁵ For BR201464 (SU1021, T1): Beta-385371 – 1840 ± 30 BP (δ¹³C –23.8 ‰ PDB), Cal AD 85-240 (Cal BP 1865-1710) (95%, 2σ), Cal AD 130-230 (Cal BP 1820-1720) (68%, 1σ). For BR2015621b (SU1126, T13): Beta-411794 – 1900 ± 30 BP (δ¹³C –24.1 ‰ PDB), Cal AD 55-135 (Cal BP 1895-1815) (95%, 2σ), Cal AD 70-130 (Cal BP 1880-1820) (68%, 1σ). For BR2015622 (SU1126, T13): Beta-411795 – 1850 ± 30 BP (δ¹³C –24.4 ‰ PDB), Cal AD 80-240 (Cal BP 1870-1710) (95%, 2σ), Cal AD 125-220 (Cal BP 1825-1730) (68%, 1σ).

¹⁶ Beta-437577 – 1580 ± 30 BP (δ¹³C –18.5 ‰ PDB), Cal AD 405-550 (Cal BP 1545-1400) (95%, 2σ), Cal AD 420-540 (Cal BP 1530-1410) (68%, 1σ).

¹⁷ M. Jurković is among the very few specialists who envisaged, be it only *en passant*, an earlier date for some of the polyconch Dalmatian churches (M. JURKOVIĆ, La rotonde de Saint-Donat à Zadar et les églises hexaconques préromanes en Croatie, in: *Guillaume de Volpiano et l'architecture des rotondes* [ed. M. Jannet, Chr. Sapin], Dijon 1996, p. 249).

¹⁸ Excavated between 1938 and 1940, the *cella septichora* of *Sopianae* is without proper archaeological documentation. The available data pertaining to these first excavations is summarised in: F. FÜLEP, *Sopianae. The History of Pécs During the Roman Era, and the Problem of the Continuity of the Late Roman Population*, Budapest 1984, p. 57-59. The final digs conducted in 2005-2006 allowed, so it seems, for a clearer assessment of the construction date (cf. Cs. POZSÁRKÓ, I.Zs. TÓTH, Zs. VISY, *Sopianae: a cella septichora és környéke. Beszámoló a 2005-2006. évi régészeti feltárásról*, Ókor 6.3, Budapest 2007, p. 84-90, particularly p. 87b). For the chronology of the Gračanica baptistery, identified in 2011 during a geophysical survey by a team led by Felix Teichner (cf. F. TEICHNER, *Ulpiana/Iustiniana Secunda* bei Gračanica (Kosovo), *Bericht der römisch-germanischen Kommission* 92, Frankfurt 2011, p. 530-536, particularly p. 530, 532; F. TEICHNER, On the Ancient Twin-City of *Ulpiana-Iustiniana Secunda* (Kosovo): Capital of the *Metalla Dardanica*, in: *Actas XVIII congreso internacional arqueología clásica: Centro y periferia en el mundo clásico*, Mérida 2014, p. 271-275, particularly p. 273; F. TEICHNER, Gračanica/Gračanica, Kosovo. *Ulpiana/Iustiniana Secunda, e-Forschungsberichte des Deutschen Archäologischen Instituts* 2016-1, 2016, p. 85-89) and excavated in 2012-2013, only two preliminary and highly questionable publications are currently available: H. ÇETINKAYA, Türkiye'nin Avrupa'daki İlk Arkeolojik Kazısı *Ulpiana*, *Arkeoloji ve Sanat* 150, Istanbul 2015, p. 67-78 (see particularly p. 70); H. ÇETINKAYA, Newly Discovered Early Christian Baptistery and Church at *Ulpiana*, *Kosova archaeologica* 2, Pristina 2015, p. 99-116 (see particularly p. 102-103, 105).

¹⁹ As such, this monument is the natural starting point for the re-examination of the rotunda buildings in pre-Romanesque Dalmatia and early mediaeval Croatia. A review of the scholarship about the early mediaeval Dalmatian multi-apsed churches can be found in P. VEŽIĆ, Dalmatinski šesterolisti – sličnosti i razlike, *Ars Adriatica* 2, Zadar 2012, p. 41-74. The analytical part of this article, which discusses the problems raised by these early mediaeval buildings, requires a thorough revision in the light of the evidence provided by the Bribir rotunda.

²⁰ Cf. S. GUNJAČA, *Nalaz srednjovjekovnih arhitektura na Bribiru*, p. 235, pl. 2.

parallel with the very similar Lepuri inscription²¹ leaves little doubt in this respect – pleads strongly in favour of this revamping being carried out during the last decades of the 9th century, possibly by the already documented abbot Theudebert²². The analogy with the Lepuri *comparandum* leads, furthermore, to believe that the sarcophagus on which the Bribir dedicatory inscription was engraved (the size of the letters demonstrates that this block is only part of a longer text, which necessitated the substantial epigraphic space offered by the rim of a Roman period sarcophagus) was reused, after the removal of its bottom, as a portal embedded in the masonry of the rotunda. If that was the case, the text carved on the other face (the outer face of sarcophagus' wall) of the stone fragment was deliberately concealed through the embedding into the masonry and consequently predates the dedicatory inscription. Written in rustic capitals, this second inscription is preserved fragmentarily, with only four readable lines of up to 15 letters (fig. 14), and is still under study²³.

A smaller fragment of an inscription that belonged to the same sarcophagus was identified in the *lapidarium* of

Bribirska glavica. It was discovered in 1986 and shows the same organisation of the text, although it does not directly relate to the text of the larger fragment. On its edge (the sarcophagus' rim) were several letters that relate to the inscription from the time of the duke Branimir.

With the exception of the stone material, shaped, sculpted or inscribed, only the objects recovered against the wall W75 of the grave G17 are related to the period of activity of the rotunda building. Although of somewhat problematic date, the metal triangular bowls (BR2015687; fig. 21)²⁴, the antler container (BR2015464; fig. 22)²⁵ and the fragmentary gold earring (BR2015996, fig. 23)²⁶ cannot postdate the mid-10th century. Despite their open finding context, they are unquestionably related to this grave, the only one situated at that low altitude in the whole excavation area. Located, as it is, in the front of the rotunda, along W66, a wall that might be part of western hall connected to the rotunda building and functioning together with it, similar to the narthex of the church of St Michael in Pridraga²⁷, G17 is presumably a privileged grave and assuredly a Christian one.

²¹ Cf. N. JAKŠIĆ, Novi natpis s imenom kneza Branimira, in: *Munuscula in honorem Željko Rapanić* (ed. M. Jurković, A. Milošević), *Dissertationes et monographiae* 5, Zagreb–Motovun–Split 2012, p. 213–221.

²² Cf. *Hrvati i Karolinzi. Rasprave i vrela*. vol. I, (ed. A. Milošević), Split 2000, p. 101; N. JAKŠIĆ, Novi natpis s imenom kneza Branimira, p. 218–219 – he reads the Lepuri inscription as: [TEMPORIB]US B(RANI)MIRO DUX EGO TEO[DEBERTUS].

²³ The inscription mentions the name of a province, the interpretation of which will be discussed in a different publication. Whether this toponym relates to the historical province of Skåne, in southern Sweden, or to some other remains to be determined. Whatever the case, the historical context of the document and its finding on Bribirska glavica open a new research horizon.

²⁴ The two objects are still under study. Three hanging bowls of Irish production dated between the 7th and the first half of the 9th century provide relative parallels (see R. BRUCE-MITFORD, Sh. RAVEN, *A Corpus of Late Celtic Hanging-Bowls*, Oxford 2005, p. 330–333 [#120], 335–339 [#123], 416–421 [#173]; to the bibliography mentioned by Bruce-Mitford, we should add: J. GRAHAM-CAMPBELL, National and Regional Identities: The Glittering Prizes, in: *Pattern and Purposes in Insular Art: Proceedings of the Fourth International Conference on Insular Art* [ed. M. Redknap, N. Edwards, S. Youngs, A. Lane, J. Knight], Oxford 2001, p. 29; A. M. HEEN-PETTERSEN, Insular Artefacts from Viking-Age Burials from Mid-Norway. A Review of Contact Between Trøndelag and Britain and Ireland, *Internet Archaeology* 38, 2014, <http://dx.doi.org/10.1141/ia.38.2>). A closer *comparandum* comes from the Viking Age settlement of Haithabu/Hedeby. Although found in a 10th century grave, this triangular bronze bowl is considered to date to the 7th or 8th century because, *inter alia*, of a small *triquetra* carved inside, typical for Hiberno-Saxon art. A short, secondary, inscription in runiform script incised on the outer face of one of the walls complicates even further the interpretation of the object. János Harmatta saw in it an “Orchon-Jenissei-Schrift” and put forward two readings with their respective translations: initially “Erwäge (einen) Rat: trinke – heiss liebe! Befolge!”, revised into “(Ó) barát, (kérlek) fogadj meg egy tanácsot: Igyál, – asszonyt (feleséget) forrón szerez!” (J. HARMATTA, Avar rovásírásos edényfeliratok Haithabuban, *Antik tanulmányok* 31/2, Budapest 1987, p. 262, 266). Together with some of its luxuriant culture-history-driven inferences, Harmatta's reading (the first one of the two mentioned above, although it was not Harmatta's final word) has been unanimously and unquestionably adopted in subsequent literature; see, for example: W. LAUR, Altbulgarische oder chasarische Runen aus Haithabu, *Beiträge zur Schleswiger Stadtgeschichte* 38, Schleswig 1993, p. 57–63, in particular p. 57; H. STEUER, Mittelasiens und der wikingerzeitliche Norden, in: *Die Wikinger und das Frankische Reich* (eds. K. P. Hofmann, H. Kamp, M. Wemhoff), Paderborn 2014, p. 237–238; S. KALMRING, A conical bronze boss and Hedeby's Eastern connection, *Fornvännen* 109, Stockholm 2014, p. 6–7, fig. 4/6b. According to Prof. Marcel Erdal (Freie Universität Berlin), whom we wish to thank here, the runes of this inscription have only weak similarities with the scripts attested in the Old Turkic runiform inscriptions, and J. Harmatta's translations are highly unconvincing (email to V. Ghica of 17 November 2016). If the alphabet in question is not the “Orkhon-Yenisey” one, it is however likely that it should be connected with Proto-Bulgars/Bolgars, Khazars, Avars, Pechenegs or any other Turkic-style nation that migrated from Asia in the first millennium CE.

²⁵ The dating of the antler containers recovered at Ivoševci (or Đevrske; see M. PETRINEC, *By Their Fruit You Will Recognize Them: The Beginnings of Christianity Among the Croats in the Light of Archaeological Evidence*, in: *Tak więc po owocach poznać ich* [ed. W. Dzieduszycki, J. Wrzesiński], *Funeralia Lednickie – Spotkanie* 12, part 2, Poznań 2010, p. 195), Nin-Ždrijac and Vinkovci-Privlaka rests on weak archaeological grounds and no archaeometrical analyses (we shall discuss this matter in detail in a future study; the bibliography related to these containers was gathered by J. BELOŠEVIĆ, *Starohrvatsko groblje na Ždrijacu u Ninu*, Zadar 2007, p. 417–424; see also M. PETRINEC, *Gräberfelder aus dem 8. bis 11. Jahrhundert im Gebiet des frühmittelalterlichen kroatischen Staates*, Split 2009, p. 214–218 and ultimately V. SOKOL, *Medieval Jewelry and Burial Assemblages from in Croatia. A Study of Graves and Grave Goods, ca. 800 to ca. 1450, East Central and Eastern Europe in the Middle Ages, 450–1450* 36, Leiden 2016, p. 91). Regionally centred Croatian studies that address these specimens tend to isolate them from the large corpus to which they typologically belong, ignoring the two comprehensive surveys published of this repertoire (N. PROFANTOVÁ, Awarische Funde aus den Gebieten nördlich der awarischen Siedlungsgrenzen, in: *Awarenforschungen* [ed. F. Daim], vol. 2, *Archaeologia austriaca Monographien* 2, *Studien zur Archäologie der Awaren* 4, Vienna 1992, p. 605–711; M. SCHULZE-DÖRRLAMM, Herkunft und Funktion der dreizipfligen Geweihbehälter des frühen und hohen Mittelalters, *Jahrbuch des römisch-germanischen Zentralmuseums Mainz* 48, Mainz 2001, p. 529–557). An extreme expression of such oriented approach is to be found in the speculations of F. Smiljančić and S. Sambunjak (O besmrtnosti i svjetlosti kazuju kosti, *Domesti* 12, Rijeka 1982, p. 67–76) or V. Sokol (The Archaeological Heritage of the Early Croats, in: *Croatia in the Early Middle Ages. A Cultural Survey* [ed. I. Supičić], London–Zagreb 1999, p. 119). The shape and decoration of the antler from Bribirska glavica is very similar to the find from the hill of Spas, inside the fortress of Knin (grave 99) (cf. D. JELOVINA, Starohrvatska nekropola na brdu Spasu kod Knina, *Starohrvatska prosvjeta* s. 3, vol. 19, Split 1991, p. 137, 218–219, pl. XI). In our opinion, the example from Knin should be dated in the second half of the 7th or in the 8th century.

²⁶ Although the earring is visibly damaged, it is very likely that it belongs to the corpus of early Byzantine jewellery found in Dalmatia on several archaeological sites, see M. PETRINEC, *Gräberfelder aus dem 8. bis 11. Jahrhundert*, ph. 44, 45, 49, 52.

²⁷ For this church, see, with literature, P. VEŽIĆ, *Dalmatinski šesterolisti*, p. 45.



Fig. 32. Slotted stone pedestal BR2015995 (A. Milošević).

Owing to the lacking of early period furnishings²⁸, the original function of the rotunda cannot be securely ascertained as yet, notwithstanding the typological parallels that one might bring into play. It is instead evident that the building served as a church in the early mediaeval era. In this regard, the slotted stone pedestal retrieved in T13 (BR2015995; fig. 32) hints at the existence of early mediaeval *cancelli*.

The first construction phase of the naved church (the *naos* phase – building phase 3 in our previous excavation report²⁹) occurs at a stage where the rotunda building is substantially degraded, covered by soil deposits and collapsed stone blocks, conceivably plundered of its internal furnishings but also used as a dump, as a massive boulder discovered in trench T10 (fig. 33) indicates. The vestigial remains of the rotunda as well as the intramural fill undergo levelling, dismantling and cutting in order to set the foundations of the present *naos* and of the subfloor features associated with it. We do not have for now any other chronological marker available for the construction of the *naos* (building phase 3) except the Aquileian coins found in 2014 and 2015, which give a *terminus ad quem* at the end of the 14th and the beginning of the 15th century.

²⁸ The exceptions are a mullion impost capital (BR2015718, W43; fig. 20) and perhaps the *pluteus* fragments (BR2015720 and BR2015721; fig. 15). To these could hypothetically be added the already known impost decorated with a cross (cf. M. SUIĆ, *Varvarina palæochristiana, Diadora 16-17, Zadar, 1994-1995*, p. 300, 304-305, reprinted in: *Područje Šibenske županije od pretpovijesti do srednjeg vijeka Izd. HAD-a 19*, (ed. B. Čečuk), Zagreb, 1998, p. 181- 189) as well as the fragment of the door-frame with an identical cross, kept in the *lapidarium* of Bribirska glavica. It cannot also be excluded that two of the ashlar found in one of the floors of the modern church (SU1042; fig. 36) belonged to the rotunda.

²⁹ V. GHICA, A. MILOŠEVIĆ, D. DZINO, *Arheološki projekt Varvaria / Breberium / Bribir u 2014*, p. 21 and fig. 8.



Fig. 33. Boulder lying on the bedrock surface next to wall W 51; view towards S (A. Milošević).

An additional point must be raised regarding the internal architecture of this first naved church. A wall fragment (W35) identified this year against the S wall of the *naos*, built on the foundation of the latter (W19), is situated somewhat in the projecting continuation of the wall W3, which belongs to the smaller northern annexe (fig. 4). The role of this wall remains to be clarified since it is rather the transversal wall W31 that can be interpreted as foundation of the choir screen.

2. RESTORATION AND CONSERVATION

The walls of the rotunda exposed in the trenches opened inside the church of Sts Joachim and Ann (fig. 34.1-34.4) underwent reconstruction in order to make their display possible on the floor of the church (fig. 35). To do so, several operations were undertaken. The visible sections of the apsidal walls have been first consolidated and then their missing parts rebuilt to the height of the new floor laid in the church (140 cm for W44, to the NW [fig. 37], and 180 cm for the S end of W51, to the SE), which is lower than the one



Fig. 34. Different stages of the excavation inside the church of Sts Joachim and Ann (A. Milošević).

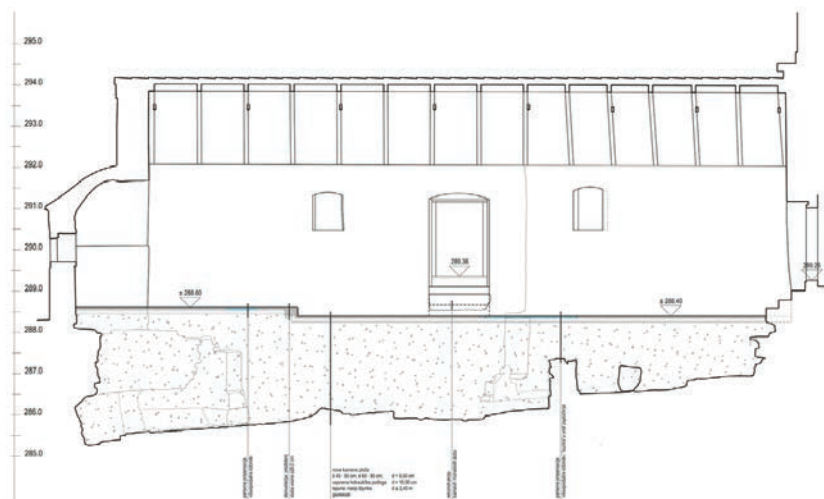


Fig. 36. Stone floor (SU1042) found beneath the cement floor of the modern church (A. Di Miceli).

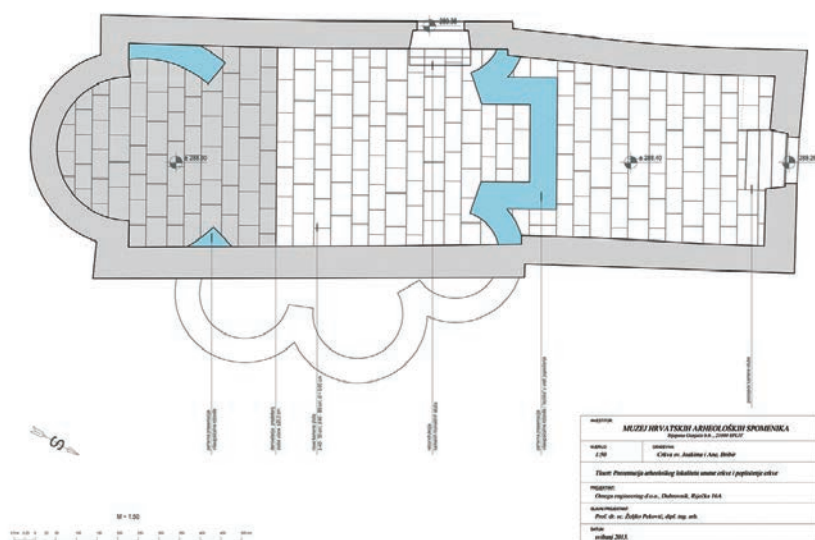


Fig. 35. Plan and cross-section of the church of Sts Joachim and Ann after restoration (Ž. Peković).



Fig. 37. Reconstruction of walls W 25, W 44, W 45 and partly W 65 during the restoration campaign (A. Milošević).

dismantled during the excavation. In order to counter the later earth pressure on the foundation walls, the trenches

Central Gaulish shallow bowls Curle 23. As with the two types of local fabric described last year³⁰, they appear on

were filled with compacted gravel (fig. 38.1). This was later caged under a limestone ground floor, over which was cemented a pavement made of limestone rectangular slabs (fig. 38.2-38.4). The pavement features a raised *solea* at the limit of the sanctuary platform, at the place where the iconostasis should be set in the future. For the needs of the excavation, it was necessary to remove the existing altar that had a *mensa* standing on a massive *stipes*. This was eventually replaced with a new altar supported by four limestone pillars, with a *loculus* for the relics in the centre of the *mensa* (fig. 38.5). Finally, a tabernacle has been arranged in the northern wall of the sanctuary and metal stairs have been installed in front of the main (western) and side (southern) doors.

3. CERAMIC MATERIAL

As it was the case in 2014, this season's ceramic material was found, without exception, in later deposits, out of original context.

African imports dominate again the inventory with frequent African red slip and cooking ware, some with *orlo annerito*, as well as amphorae, many of which too fragmentary to be typologically identified. From Italy come several bowls, thin-walled, with or without barbotine patterns, in *terra sigillata italica* or Italian imitations of African ware. Aegean ware is limited to a few shards of cooking vessels. Likewise, kitchenware and amphorae of Eastern Mediterranean provenance are rare, as are also the Pannonian imports, of which few fragments of red and black-slipped ware were turned up. Five fragments of flat bottom amphorae and possibly a beaker decorated with barbotine represent the Adriatic production. Especially noteworthy are three fragments of

³⁰ V. GHICA, A. MILOŠEVIĆ, D. DŽINO, Arheološki projekt Varvaria / Breberium / Bribir u 2014, p. 41.



Fig. 38. Different stages of the reconstruction of the subfloor and floor levels in the church of Sts Joachim and Ann (A. Milošević).

coarse ware, a pot and a cooking bowl, along with non-diagnostic shards.

The mediaeval repertoire is once more particularly poor. Exceptional cases, such as fragments of tin-glazed pottery, can only confirm, still begging numerous questions, the manifold disturbance processes that the area underwent.

4. PHYSICAL ANTHROPOLOGY

The osteological material recovered during the 2014 and 2015 seasons comes from the following contexts: southern

sarcophagus in the mausoleum (minimum number of individuals [MNI] 8); ossuary E1 (T1; MNI 12); ossuary E2 (T1; MNI 17); ossuary E3 (T1; MNI 4); ossuary E4 (T1; MNI 5); ossuary E5 (T7; MNI 5); ossuary E6 (T7; MNI 7); E11 (T13; MNI 13); grave Gr1 (T3; NI 1); grave Gr3 (T9; NI 1); grave Gr4 (T8; NI 2); grave Gr5 (T7; NI 1); grave Gr6 (T7; NI 1); grave Gr7 (T10; NI 2); grave Gr10 (T11; NI 4); grave Gr11 (T11; MNI 14); grave Gr12 (T10/T13; MNI 16); grave Gr13 (T11; MNI 13); grave Gr14 (T11; MNI 38); grave Gr15 (T11; NI 5); grave Gr16 (T10; MNI 6); grave Gr17 (T11; MNI 10); SU1009 (T1; MNI 4); SU1098 (T11; MNI 10).



Fig. 39. Skull 1 from ossuary E 1: A. showing rounding and widening of the nasal aperture; B. alveolar abscess on right lateral incisor (V. Vyrubal).

For trenches T1, T2 and T3 as well as for the secondary deposit in the southern sarcophagus of the mausoleum, the analysis of skeletons of which the sex could be determined revealed an unusual demographic ratio of 15 sub-adults, 2 females and 14 males, which, if confirmed in adjacent future trenches, remains to be explained. In trenches T7, T8, T9, T10, T11, T13, the ratio remains unbalanced, with 48 sub-adults, 28 females and 55 males.

Nine ante-mortem fractures (in the S mausoleum sarcophagus, ossuary E1 and graves Gr5, Gr11 and Gr12) and a shoulder dislocation (in grave Gr2) were recorded, all of which are consistent with accidental injuries. Eight of these fractures, located in the distal part of the shafts of tibiae and fibulae, suggest accidents caused by the rugged terrain of Bribirska glavica and its surroundings.

Numerous ante-mortem fractures on skulls, mostly on the frontal but also on the parietal bones, are rather clear indicators of interpersonal violence. These appear in the following contexts: Gr10 (skeleton A); Gr12 (skeletons C, D); Gr11 (skeletons B, D); Gr13 (skeleton E); Gr14 (skull B and skeleton sub-adult 2); E5; E6 (2 skulls); E11 (2 skulls); SU1098 (skeleton A). We note among these cases a 2.5-3.5 years old sub-adult with an oblong fracture on the left side of the frontal bone, a triply fractured skull (both in Gr14) and three female cranial fractures (E5, E6, E11).

Interpersonal violence is further evidenced by a series of peri-mortem injuries, largely distributed across the excavated trenches: Gr3 (48 mm long sharp edged fracture on the parietal bone, partly penetrating through the skull vault); Gr7 (skeleton A, displaying seven peri-mortem sharp edged injuries on legs and arms bones); Gr 11 (sharp edged injury

on second cervical vertebra); Gr14-E8 (sharp edged injuries on second, third and fourth cervical vertebrae); Gr16 (sharp edged injuries on the posterior-lateral side of left ulna and radius, resulting likely from a single blow). Particularly noteworthy is the location of the skeleton featuring multiple peri-mortem injuries in the sanctuary grave Gr7.

In addition to these forced traumas, the pathologic inventory includes two infectious diseases, leprosy and tuberculosis. Several probable cases of the former (on skull 2 in S mausoleum sarcophagus and skulls 1, 2, 4 and 5 in E1; fig. 39), visible in the rounding and widening of the nasal aperture and the inflammatory changes in the nasal cavity and on the hard palate, require confirmation through DNA analysis. If these cases are validated as leprotic, the concentration of crania indicative of this pathology in two related deposited assemblages (in the closed southern sarcophagus and the nearby ossuary E1, trapped under the vault of mausoleum's vestibule) is consistent with a collective, yet expeditious to say the least, burial. Tuberculosis is represented by one single individual (Gr11, skeleton D).

Lastly, numerous bones, equally distributed between graves inside and outside the present church, exhibit obvious traces of post-mortem rodent activity, a rare occurrence in Croatian osteological material, but well documented elsewhere³¹. The bones featuring gnawing marks have been either exposed on the ground surface in an open location or shallowly buried prior to their deposition in graves and ossuaries.

5. TERRESTRIAL LASER SCANNING

A 5 mm resolution lidar survey has been carried out on the areas excavated in 2014 and 2015 with a double purpose, archaeological and patrimonial. The full documentation of the backfilled trenches T10, T11 and T13 is thus available for further analysis and cultural heritage applications. The workflow included: point cloud and digital image acquisition with a stationary Leica P20 scanstation and a Nikon D5500 camera; data post-processing in Leica Cyclone 5.1; drawing in AutoCAD environment with Cloud Works 3.

The survey resulted in outputs angled according to the lines of research of our project: geo-referenced high resolution 3D modelling, micro-topography and building mapping, integrable in GIS and exploitable both in 3D reconstructions and outreach deliverables.

6. PHOTOGRAMMETRIC MODELLING

Several contexts, from whole trenches to single structures or stratigraphic sequences, have been photogrammetrically recorded for *ex situ* examination. The selection criterion for the documented contexts was their post-excavation inaccessibility. The processing of the point clouds was realised in Agisoft PhotoScan and MeshLab.

7. 3D MODELLING

Based on a workflow involving mainly ArchiCAD and Artlantis, the digital 3D reconstruction of the excavated monuments continued this year with models of two more

³¹ Cf. T. L. DUPRAS, J. J. SCHULTZ, S. M. WHEELER, L. J. WILLIAMS, *Forensic Recovery of Human Remains: Archaeological Approaches*, Boca Raton (Florida) 2006, p. 33-36.



Fig. 40. 3D reconstructions of the mediaeval church W of the modern graveyard, and the Romanesque church in the NW of Bribirska glavica (P. Rathsman).

mediaeval churches (the Romanesque church at Vratnice, in NW part of the site, and the small gothic church next to the SW wall of the village cemetery) and the reshaping of rotunda's initial model (fig. 40).

8. ARCHAEOLOGICAL DATABASE

Populating the ARK database remained one of the main post-excavation operations. The focus on the large number of items to record made the GIS component see limited progress this year.

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