

Late Antique window glass from the hilltop settlement of Tonovcov grad near Kobarid

Poznoantično okensko steklo z višinske naselbine Tonovcov grad pri Kobaridu

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Izvleček

Na utrjeni poznoantični višinski naselbini Tonovcov grad pri Kobaridu v zahodni Sloveniji je bilo okensko steklo najdeno v plasteh uporabe in propada poznoantične hiše in cerkvenega kompleksa. Zastopano je steklo dveh barv, rumenkasto in zeleno. Steklo kaže običajne značilnosti izdelave s pihanjem v cilinder, nekateri kosi stekla imajo robove preoblikovane z drobljenjem.

Najbolj zanimivo odkritje je velika količina steklenih ploščic natančno oblikovanih geometrijskih oblik (trikotniki in paralelogrami), ki so sestavljale eno ali več oken v ladji osrednje cerkve na Tonovcovem gradu.

Kratek pregled sočasnih najdišč pokaže, da zastekljena okna niso redek pojav v poznoantičnih naselbinah jugovzhodnih Alp, temveč da so bila prisotna v skoraj vseh cerkvah in večini bivalnih hiš.

Ključne besede: pozna antika, jugovzhodne Alpe, Tonovcov grad pri Kobaridu, okensko steklo, oprema hiš, cerkvena oprema

Abstract

At the fortified hilltop settlement of Tonovcov grad near Kobarid in western Slovenia, window glass was found in the layers of use and destruction of a late antique house and church complex. Two natural colour types (yellowish and green) are represented. The glass shows the usual characteristics of the cylinder-blowing process; some of the panes were shaped by grozing.

The most interesting discovery was a large number of carefully cut and grozed geometrical shapes (triangles and parallelograms), which must have formed one or more windows in the nave of the main church at Tonovcov grad. They represent a predecessor of stained (painted) glass windows.

A brief review of a selection of contemporary sites shows that glazed windows were not a rare occurrence in the Late Antique south-eastern Alpine settlements but that they appeared in probably all the churches and in most houses.

Keywords: Late Antiquity, southeastern Alpine area, Tonovcov grad near Kobarid, window glass, equipment of houses, equipment of churches

INTRODUCTION

Window glass is a topic that has been quite ignored in the Slovenian research of the Roman and post-Roman periods. It is sometimes mentioned in comprehensive publications of individual sites (Petru, Ulbert 1975, 28, 39, 48) but very rarely

drawn or photographed (Knific, Sagadin 1991, 52, cat. no. 11; Bitenc, Knific 2001, cat. no. 152). In the first attempt to present window glass from Late Antique hilltop settlements (Milavec 2011) it did not fare much better, as it was only briefly mentioned and represented in distribution maps. Furthermore, in wider Mediterranean glass research,

it was seriously taken into consideration rather late (Foy, Fontaine 2008).

However, it did represent a part of the equipment and decoration of Late Antique churches. Given the different shapes and colours, the glass was not there only for the congregation to see through the windows or perhaps not even simply to allow the light to penetrate the building but to add colour and atmosphere to the events within the building. Without the glass, our impression of those churches can be dark and austere, especially in view of the virtual absence of other known decoration in most ecclesiastical buildings in the territory of present-day Slovenia, such as mosaics and frescoes. We have no idea about the wooden architecture or textiles, but the small, everyday magic of glass can be considered.

Therefore, I would like to dedicate this paper to the quite fascinating topic of Late Antique window glass from the hilltop settlement of Tonovcov grad in western Slovenia. This site and early Christian churches, in general, have been among the foci in the career of Slavko Ciglenečki, so I hope he finds this small offering, another piece of the puzzle, as interesting as I do.

LATE ANTIQUE WINDOW GLASS – A FEW GENERAL REMARKS

Window glass was a part of the architectural furnishings of late Roman and Late Antique churches and also appeared in secular architecture. Its presence was, of course, influenced by the wealth of the proprietor, but it appeared significantly more frequently than previously thought. One of the reasons that it is not commonly found during excavations, especially of the Roman period, is that it was recycled if possible. It is mostly from buildings that were abandoned or destroyed in a singular, possibly catastrophic event that larger quantities of this material are found. It seems to appear as early as the 3rd c. and was common by the 4th c. in ecclesiastical and secular buildings. In the west, there were two main production techniques for making plate glass: mould-casting and cylinder-blowing. Cylinder blowing appeared slightly later and largely, but not entirely, substituted cast glass by the late 4th c. Much has been written regarding the possibilities of separating the products of these two methods, but after much discussion there is still no certain way of telling how a pane was really made. Thicker panes with different upper and lower surfaces (one shiny or

glossy and one matte or rough), larger quantities of round air bubbles and possible tool marks on the edges are usually seen as traces of the casting technique. Thinner panes with two smooth surfaces and a smaller quantity of often elongated bubbles and rounded edges are more likely the evidence of cylinder-blowing. Even if it is usually impossible to distinguish the techniques with a high degree of certainty, it is often believed that most of the Late Antique glass in the western Mediterranean was produced by blowing (Foy, Fontaine 2008; Schibille, Marii, Rehren 2008; Kanyak 2009).

Much research has recently been devoted to the provenance of glass, including window glass (Freestone 2005; Wolf et al. 2005; Schibille, Marii, Rehren 2008; Arletti et al. 2010; Drauschke, Greiff 2010a; 2010b; Gliozzo et al. 2012). It is shown to be made of the same glass mass types as the vessels of mainly Levantine and Egyptian production. The panes are usually naturally coloured, so they are in shades of blue, green, yellow and brown. At some sites coloured window glass also appears in intense greens and blues, sometimes reds and violets (Kessler, Wolf, Trümpler 2005, Pl. 1; Zucchiatti et al. 2007, 311; Drauschke, Greiff 2010a, Fig. 4). Perfectly colourless glass is rare, but the most important thing was probably that it appeared more transparent the thinner it was blown, regardless of the basic natural colour. Some very thin panes (under 1 mm) appear quite colourless even if the thicker edges of the same pane are greenish or yellowish.

One of the open questions is the places of production of the panes. There is little evidence that they were produced in the workshops that made contemporary vessels (Foy, Fontaine 2008, 428–430), and some authors believe they were made on the construction site where they were needed, especially in the case of larger buildings. The proofs for this are lacking for the Late Antique period but are more abundant for the Early Medieval monasteries, such as Jarrow (Cramp 2006, 56), San Vincenzo al Volturno (Dell'Acqua 1997) and San Lorenzo in Pallacinis (Crypta Balbi exedra assemblages; Mirti et al. 2000; 2001). There are also hints that the panes could have been imported, from as far away as the eastern Mediterranean, but the evidence from shipwrecks is dated either much earlier (Foy, Fontaine 2008, 429–430) or much later (11th c. Serçe Limanı shipwreck – Bass et al. 2009, 385–389). As mentioned above, recycling was important in the Roman economy, and old window panes were not only collected as cullet

to be remelted but also reshaped if necessary and reused if they were of appropriate size.

Probably the least explained part of the research into late antique windows is the reconstruction of the windows and window panes themselves, as they are usually found broken into very small fragments. The finished panes were not large; the blown ones average at about 20 × 20 cm but some were also larger (Foy, Fontaine 2008, 433–435).

The first appearance of the early 'vitrail mosaïque' (not-yet-stained glass), glass panes cut into simple geometric shapes and assembled into a pattern, is now dated as early as the 4th century, but it was more commonly used from the 6th c. onward. The 'vitrails' were inserted into window openings in various ways, either directly or into wooden frames. Sometimes they were fastened with lead comes, strips of malleable lead which held them in place and stopped them from rattling in their frames (Foy, Fontaine 2008, 442–443). The shapes of window apertures in large public buildings such as the Aula Palatina in Trier or the Ravenna basilicas indicate what the more luxurious spaces looked like (Foy, Fontaine 2008, Figs. 27–30). The windows are usually arched, with a latticed frame into which square panes are inserted. There are fewer examples of existing windows in more modest buildings. They can be imagined as simple rectangular openings, arched, mullioned (cemetery church at Teurnia, Glaser 1991, Fig. 139) or mushroom-shaped (e.g. Caričin grad, basilica C: Milinković 2010, Fig. 227, Pl. IV: 4) sometimes with wooden frameworks for smaller glass shapes.

From the 7th century onward, colouring was intentionally added to the glass, and curvilinear shapes of 'vitrail' pieces started to appear. In the 8th c., painting on glass, known as stained glass, was present (Foy, Fontaine 2008, 443).

WINDOW GLASS FROM TONOVCOV GRAD¹

I was able to gather approximately 300 pieces (900 g) of window pane shards, half of them from the nave of the main church (150 pieces, 444 g).

¹ While preparing the monographs on Tonovcov grad, window glass was noticed and briefly plotted (Milavec 2011, 94–95, 110–111, Figs. 3.3 and 3.4) but not seriously taken into consideration. Therefore, some of the conclusions in the 2011 books are inconsistent with the results of the present research, but such is the happy fate of research. It advances.

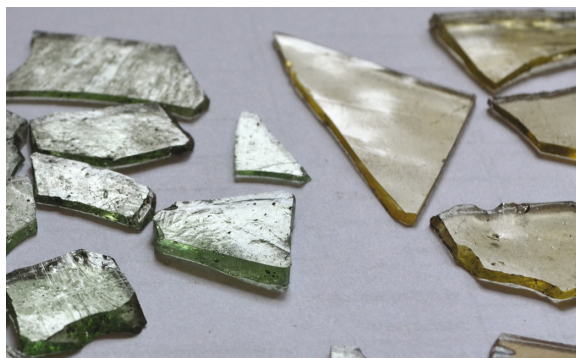


Fig. 1: Tonovcov grad. Surfaces of green and yellowish window glass.

Sl. 1: Tonovcov grad. Površine zelenega in rumenkastega okenskega stekla.

Two different colours of panes could be found. The largest percentage of glass, prevalent in the north and main church, is well preserved, with hardly any weathering and of good quality with almost no visible impurities and few elongated air bubbles. The thickness of most fragments is between 1 and 2 mm; the rounded edges, if they are thickened, can reach up to 3 mm, exceptionally up to 4 mm. The colour of the glass is yellowish to greenish, often streaked reddish-brown (natural colour). Smaller fragments can appear quite different in colour but in larger pieces it is obvious that one pane can contain all three hues. When the sections of individual fragments are examined, sometimes even the two surfaces of the same piece are of different hues. The thinnest middle parts of larger pieces achieve almost complete colourlessness and transparency. The surfaces of the fragments are both very smooth, but often one is also glossy while the other side is slightly matte (Fig. 1).

The other colour is represented in House no. 1 and in the south church. The panes are of similar thickness as the yellowish ones, also with almost no visible impurities; the main differences are the colour, which is a very uniform light green (natural colour), and a much larger number of elongated air bubbles. One surface is usually smooth and glossy, while the other can still be quite smooth but sometimes striated or covered in swirls (on smaller fragments seen as grooves) (Fig. 2). These striations are interpreted differently by glass scholars. Some take them to be the result of the casting method, being either traces of a smoothing tool which flattened out the viscous glass mass or imprints of the wooden surface on which the molten glass had been poured (e.g. Kessler, Wolf,



Fig. 2: Tonovcov grad. Visible difference in the smoothness of both surfaces of a green window glass fragment from the southern church. Not to scale.

Sl. 2: Tonovcov grad. Vidna razlika v gladkosti obeh površin zelenega odlomka okenskega stekla. Ni v merilu.

Trümppler 2005, 7). Others argue they are traces of flattening out the blown cylinder and the annealing of the pane (e.g. Cramp 2006, 62; Schibille, Marii, Rehren 2008, 639–640; Foy, Fontaine 2008, 431).

House no. 1

The window glass from House no. 1 originated from the layers of use (the walking surface) and decay of the building, which is dated between the late 5th and early 7th c. (Ciglencečki, Modrijan, Milavec 2011, chapter 3.1). In contrast to the churches (see below), it was preserved in very small fragments that had partly smoothed and partly ragged edges, as if they had been abraded in the sediment. Consequently, they could not be assembled into larger pieces. Among the approximately 130 pieces (380 g), there is only one small yellowish fragment with one grozed edge. This shows that the windows of House no. 1 were most probably of plain rectangular shapes.

The walls of the house were not preserved to a height that would show window openings, so we know nothing about those. Some idea about the possible location of windows can be gained by plotting the glass fragments on the structure ground plan (Fig. 3; walls 13, 14 and 15 belong to an earlier structure).

Most concentrations of window glass from House no. 1 are of the bubbly green glass type with some yellowish fragments among them. The clearest concentration is around Wall no. 2, and it could be the remains of a green-glazed window (Fig. 4). The house was originally built as a single-room building, the annex was added some time

later (not precisely dated). This is visible from the construction of the walls (Walls nos. 8 and 11 are leaning on Wall no. 2) and from the fact that the outer face of Wall 2 was plastered while other walls of the annex were not; therefore, the plaster is the result of the earlier construction phase, while the added room was not treated the same way. The window in Wall no. 2 is an additional argument that the building existed for some time as a single-space house.

Some slightly stronger concentrations of green glass shards along the outer side of Wall no. 3 may indicate two more small windows in the back wall of the house, while the fragments along Wall no. 4 are probably too few to indicate another glazed aperture.

The situation in front of the house is more complicated. There is a large scattering of yellowish glass with a large part of a thickened edge in quadrant 716 (Fig. 5) and a smaller one of green glass closer to Walls 1 and 8 of the building (Fig. 6). The fragments were discovered in layers of use and decay of the house and in the humus. Perhaps a window in Wall no. 1 was composed of different glass panes, as was typical in buildings (Foy, Fontaine 2008, 432). Also possible is that one scattering represents the remains of an earlier, broken window pane that had been substituted by a green one at a later time.

The scattering in quadrant 666 is small and as the quadrant is already at quite a distance to the house and was literally packed with small finds. I do not think it represents more than the remains of everyday life in front of the house (Fig. 7).

An interesting point where the situation in House no. 1 again differs from that in the churches

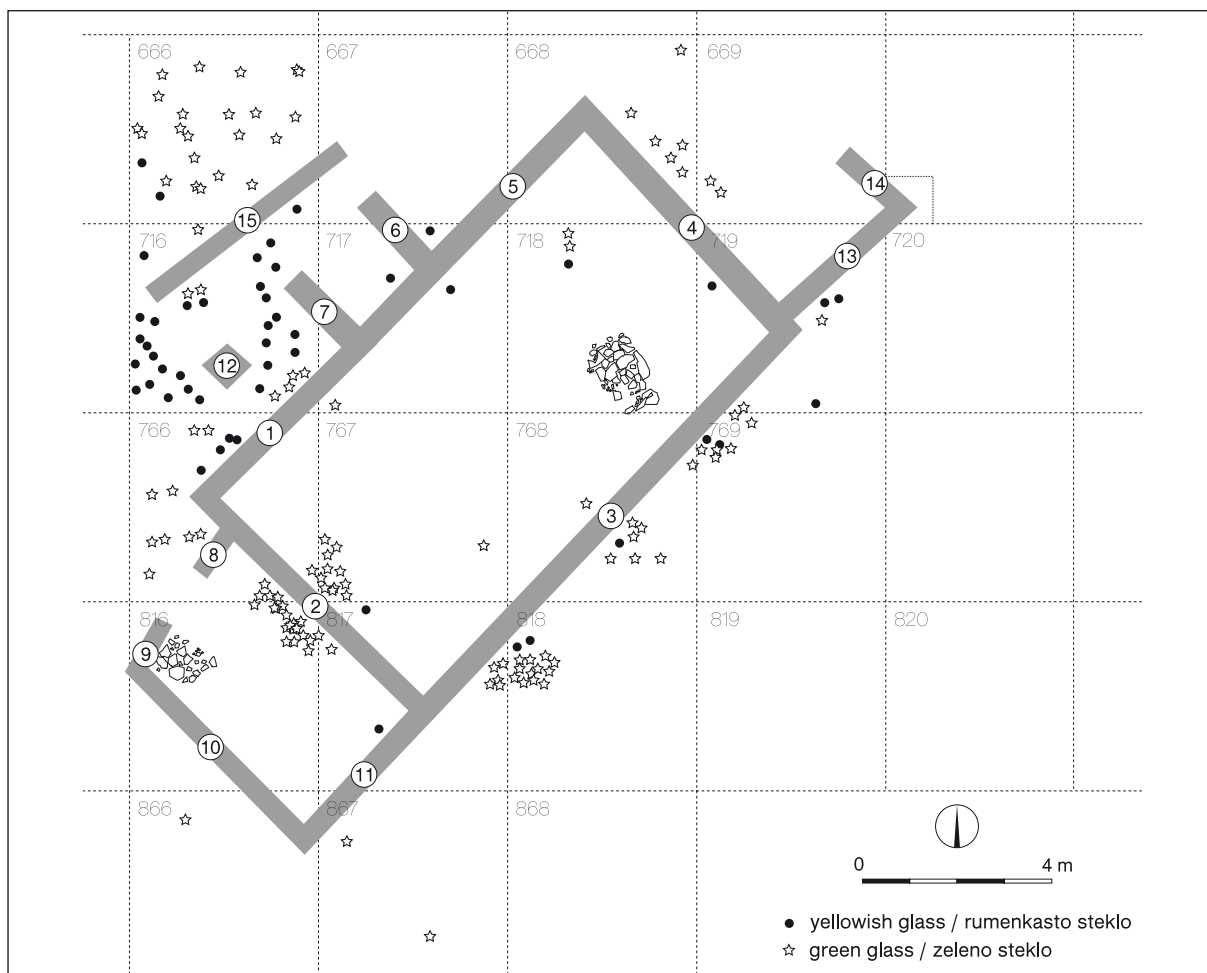


Fig. 3: Tonovcov grad. Distribution of window glass of House no. 1.
Sl. 3: Tonovcov grad. Razprostranjenost okenskega stekla v izkopnem polju hiše 1.

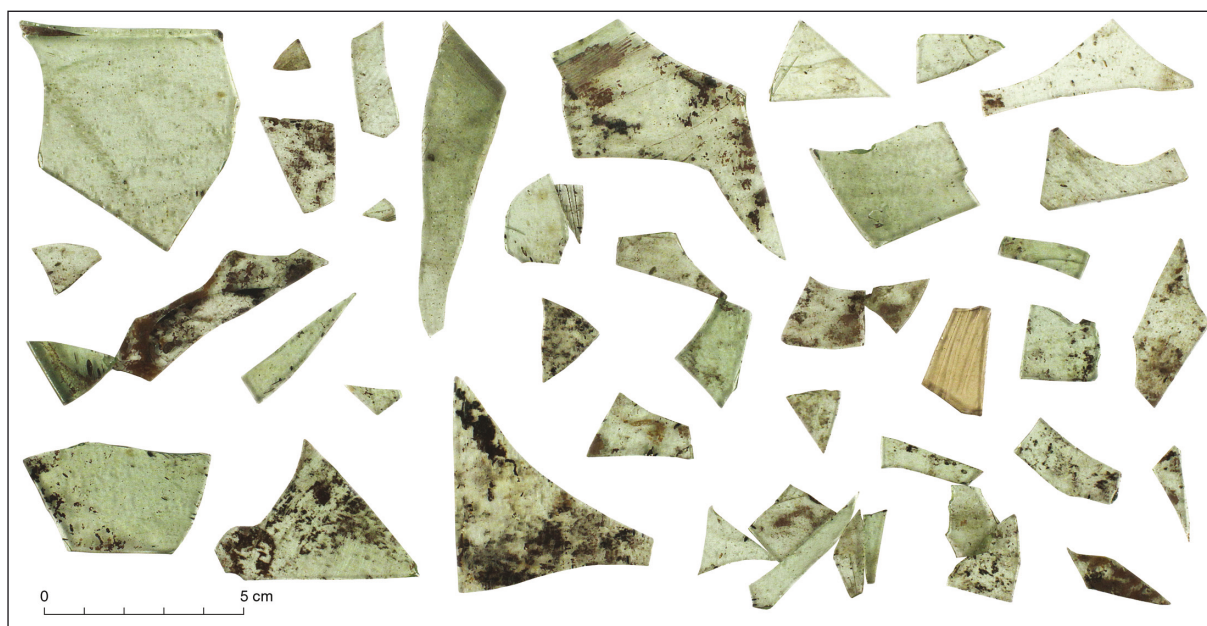


Fig. 4: Tonovcov grad. Window glass from House no. 1, Wall no. 2. (photo M. Zaplatil)
Sl. 4: Tonovcov grad. Okensko steklo iz hiše 1, zid št. 2. (foto M. Zaplatil)



Fig. 5: Tonovcov grad. Window glass from House no. 1, quadrant 716. (photo M. Zaplatil)
Sl. 5: Tonovcov grad. Okensko steklo iz hiše 1, kvadrant 716. (foto M. Zaplatil)



Fig. 6: Tonovcov grad. Window glass from House no. 1, Walls nos. 1 and 8. (photo M. Zaplatil)
Sl. 6: Tonovcov grad. Okensko steklo iz hiše 1, zidova št. 1 in 8. (foto M. Zaplatil)

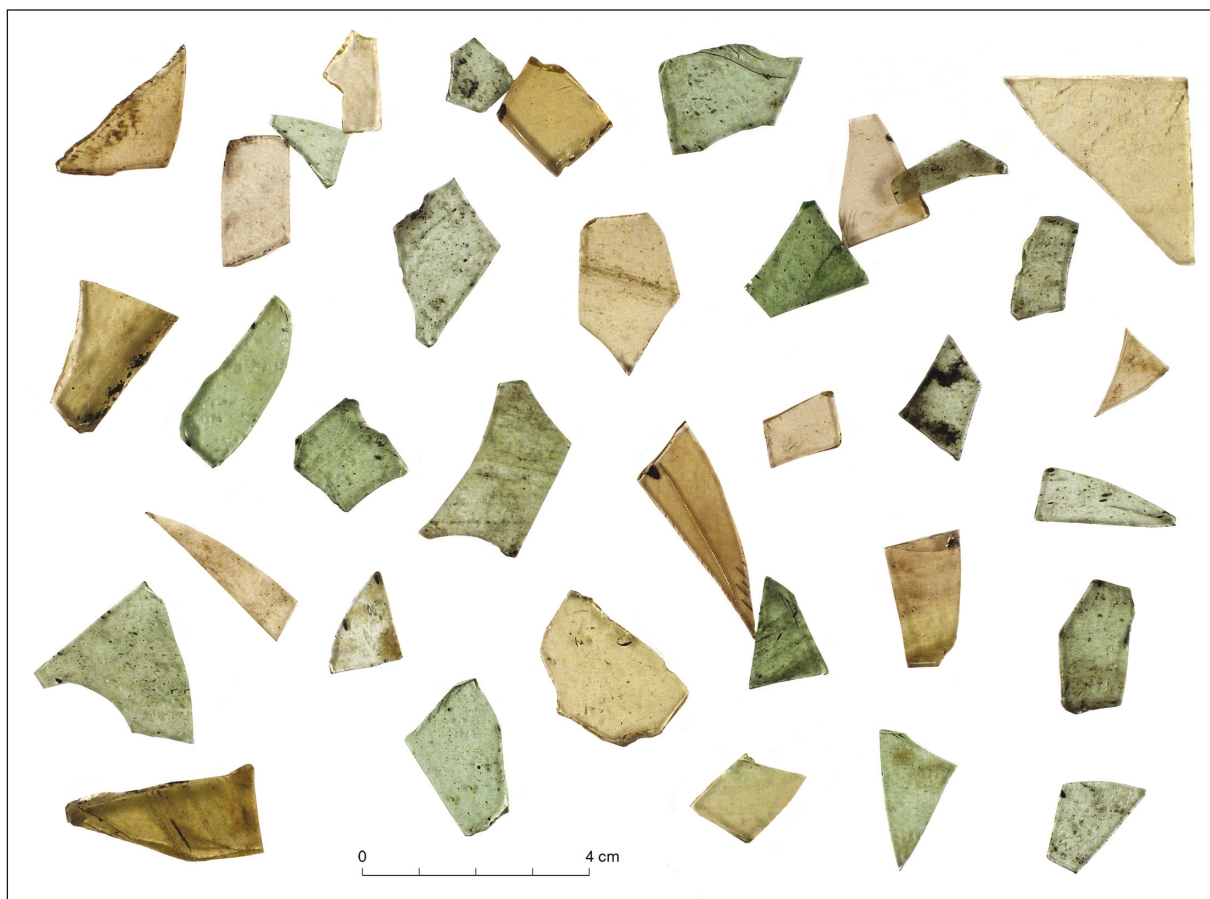


Fig. 7: Tonovcov grad. Window glass from House no. 1, quadrant 666. (photo M. Zaplatil)
 Sl. 7: Tonovcov grad. Okensko steklo iz hiše 1, kvadrant 666. (foto M. Zaplatil)

in that most of the glass was found on the outer side of the walls. Some pieces come from inside as well, but significantly fewer than from outside. The house was reused in the Early Medieval period, but the occupation layer from that period is situated on top of the fallen-off plaster and of a charred layer from a fire, which marked the end of use of the Late Antique building. Therefore, it is possible that the Early Medieval occupants removed the broken window glass from the inside of the house they were using, but the majority of the shards would probably have been under the layers of plaster.

Some pieces were found in a layer that represented the Early Medieval use of the structure (SU 10), but they are very few and compatible with the Late Antique majority, so they are probably residual in the later layer (for the Early Medieval occupation, see Milavec, Modrijan 2014, 262–263).

More questionably, three fragments of yellowish and green plate glass were found in a layer belonging to an earlier occupation of the area

where House no. 1 was built (SU 36; 4th–early 5th c.; see Ciglencečki, Modrijan, Milavec 2011, 168–178). The top of this layer represented the walking surface during the construction and use of the Late Antique house, and the shards could have been lost then. Alternatively, they could also be evidence of Late Roman glazing at the site, which would have used the same kind of glass as was in circulation later.

One fragment from this house was included in the samples to be analysed for provenance. It was a fragment of the yellowish glass and proved to have been made of un-recycled Levantine I glass mass (Šmit et al. 2013). It is highly likely that all of the yellowish panes in House 1 and the contemporary churches, which are highly uniform, are made of this glass type. The so-called Levantine I glass mass was produced with the sand of the Syro-Palestinian coast between the 4th and 9th centuries but was most popular and circulated very throughout the Mediterranean between the 5th and 7th centuries (Freestone 2005).

The ecclesiastical complex

The glass from the north and main church was of the yellowish type (*Fig. 8; 13*) while the south church only contained fragments of the green bubbly glass (*Fig. 9*). The window remains were mostly found on the mortar floors of the churches, together with a charred layer and the tegulae with

which the roof had been covered (*Fig. 8*). The pieces were large, with clear broken edges and could to a large extent be reassembled into their original shapes, which shows that there was little or no post-depositional activity. The largest part of glass from the main church had grozed edges and was shaped into geometrical forms, but that was not the case in the other two churches.

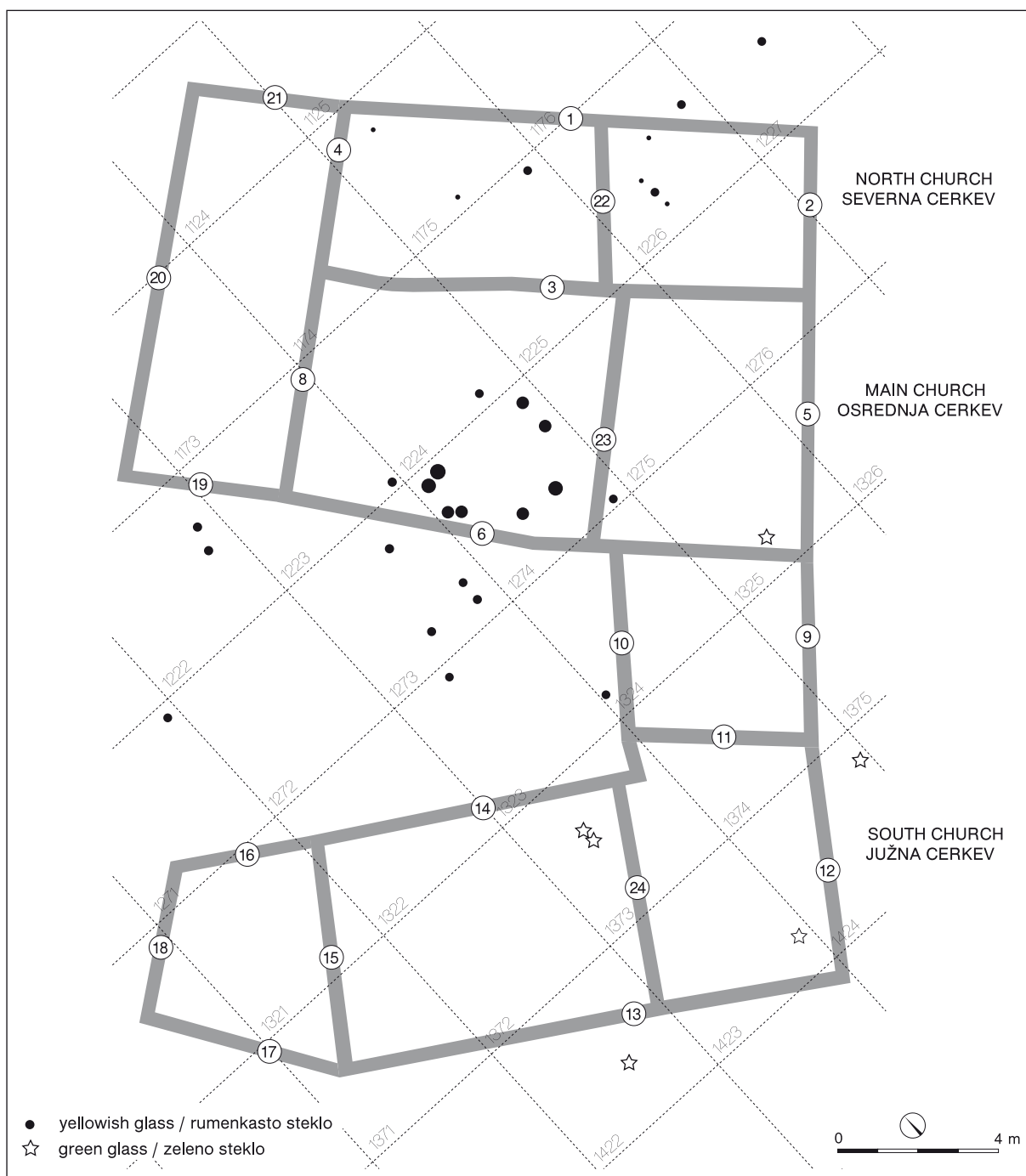


Fig. 8: Tonovcov grad. Distribution of window glass in the church complex.
Sl. 8: Tonovcov grad. Razprostranjenost okenskega stekla v sklopu cerkva.

The small room (possibly a memorial chapel) between the presbyteries of the main and the south church yielded no window glass fragments.²

Most of the glass was found inside the buildings in small quantities among the rubble that filled the deep space cut into the bedrock between the naves of the main and south church and in the destruction layer, which covered the entire complex.

A few fragments of window glass were also found in destruction layers of Structure no. 2, situated to the north of the complex. Structure no. 2 was not interpreted as a dwelling house but a shed or possibly a workshop, and only eight yellowish fragments were found in total; therefore, so it is probably safe to assume they came from the collapse of the churches that are situated on a plateau above Structure no. 2.

It remains unclear how the panes were fastened into the apertures. No traces of plaster, which could have held them, were found on the window pane fragments, and only a few lead strips (perhaps came) were discovered in the destruction layers in the space cut into bedrock between the main and south churches (Fig. 10; Modrijan, Milavec 2011, Pl. 47: 12). They are very thin and have no profiles, so their function is not clear. The panes were probably inserted into wooden frames or directly into stone openings.

The north church

Yellowish window pane fragments were discovered in and outside the north church (Fig. 8). Some were found in the destruction layer outside the building (20 fragments, 57 g), and some lay on the mortar floor of the church (7 pieces), in the nave and in the presbytery that were separated only by a low stone wall. The pieces from the presbytery include a part of the edge of a pane, 13 cm long (Fig. 11). None of the fragments were grozed. It is probably safe to assume that one or perhaps two small windows with rectangular yellowish panes were inserted into the north church wall.

One fragment in the nave was discovered under the niveau of the mortar floor. Additionally, in two test trenches that were dug under the well-preserved mortar floors of the church to establish the stratigraphy underneath, three fragments of



Fig. 9: Tonovcov grad. Window glass from the south church.
Sl. 9: Tonovcov grad. Okensko steklo iz južne cerkve.
(photo / foto M. Zaplatil)



Fig. 10: Tonovcov grad. Lead strips from the church complex.
Sl. 10: Tonovcov grad. Svinčeni trakovi iz sklopa cerkva.

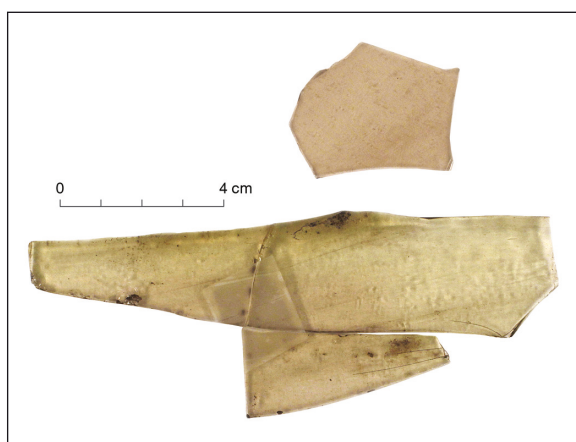


Fig. 11: Tonovcov grad. Window glass from the north church.
Sl. 11: Tonovcov grad. Okensko steklo iz severne cerkve.
(photo / foto M. Zaplatil)

² In contrast to the plot in the first publication (Milavec 2011, Fig. 3.3).

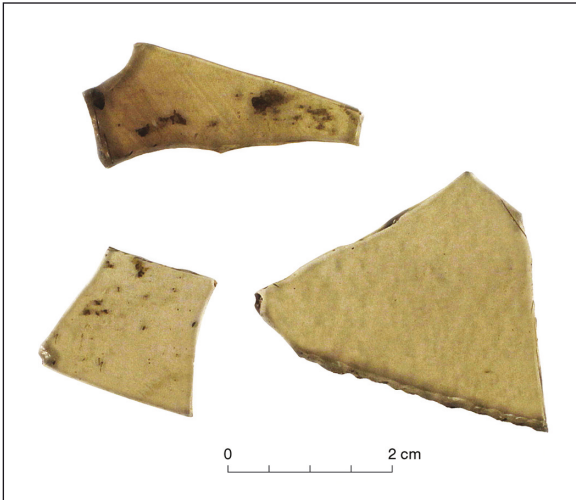


Fig. 12: Tonovcov grad. Window glass from under the mortar floor of the north church. (photo M. Zaplatil)
 Sl. 12: Tonovcov grad. Okensko steklo izpod estriha severne cerkve. (foto M. Zaplatil)

yellowish plate glass were found (Fig. 12). They are similar to the rest of the yellowish glass found in the church and were found in a layer under the base of the mortar floor. Mortar floors were added to the church complex in a later reconstruction phase, most probably around the middle of the 6th c. (see Ciglenečki, Modrijan, Milavec 2011, chapter 3.3); therefore, it seems these finds confirm that glazing was a part of the original construction of the buildings.

The main church

The largest quantity of glass (444 g), all yellowish, was found in this building, in the charred destruction layer mixed with a large quantity of tegulae on the mortar floor in the middle of the nave. The glass lay closer to the south wall (Fig. 8: Wall no. 6).

The largest part of glass from the nave could be reassembled, and a number of shapes were recognized (Fig. 13). Not all are complete, so only the more reliably reconstructed ones were photographed. There are 10 or 11 triangles (Fig. 13: 1–4, 6–7, 10–11, 13?, 14–16), one parallelogram (Fig. 13: 12) and two parts that could have represented a parallelogram (Fig. 13: 5, 8). There is also a large, very thin and clear piece without any edges (Fig. 13: 9) and a number of fragments that could not be assembled, but some of them look like parts of three further triangles.

The dimensions of the parallelogram are $12 \times 12.5 \times 12 \times 12.5$ cm. The dimensions of the reasonably complete triangles are $11 \times 9 \times 7.5$ cm (Fig. 13: 1), $11.5 \times 6 \times 8$ (Fig. 13: 2), $12 \times 11.5 \times 10.5$ cm (Fig. 13: 4), $10.5 \times 10 \times 9.5$ cm (Fig. 13: 7), and $15 \times 10 \times 9.5$ cm (Fig. 13: 10).³

Some edges are thickened; some are only rounded, and some are cut but not rounded. Most of the shapes were achieved using grozing, a technique by which small pieces of the glass edge are broken off to form the desired shape. The result looks like retouch on stone tools with often an additional trace of the grozing tool (pliers) above the grozed edge (Fig. 14).

How the shapes were assembled into a pattern, or more patterns, is not possible to determine. For the windows at the church at Sion, Sous-les-Scex in Switzerland, interesting propositions were made as to the compositions of differently coloured triangles into blue hexagons among yellow triangles in the manner of cloisonné-decorated contemporary fibulae (the windows are dated to the 5th and 6th c.; Kessler, Wolf, Trümpler 2005, Figs. 10, 11). Those are probably Late Antique beginnings of stained windows. At Sion, the triangles are smaller and the glass mass was intentionally coloured. At Tonovcov grad, the single analysed fragment of window glass (from House no. 1, but of the same yellowish type) showed no added colouring agents.

As pointed out above, there were no plaster remains on the glass and no leaden comes were recovered from inside the church, so it is not possible to say how the panes were held in place.

Surprisingly perhaps, no window glass was found in the presbytery, except for a minuscule sliver of the green glass. This does not necessarily mean that there were no windows, but between the eastern wall and the clergy bank in the presbytery remains of glass lamps and beakers were found (Milavec 2011, 91, Fig. 3.2). Perhaps the presbytery was intentionally left dark(er) to be illuminated in a different way by glass lamps. The quantity of light that could have reached presbytery would have depended on the height of the altar screen. The preserved height of the wall separating the nave and the presbytery is only 10–20 cm above the presbytery floor (and about 60 cm above the floor of the nave) with no indication that it was ever higher or that a wooden construction was built on top of it.

³ The measurements were taken only approximately since the edges are uneven and usually the tips are chipped off.

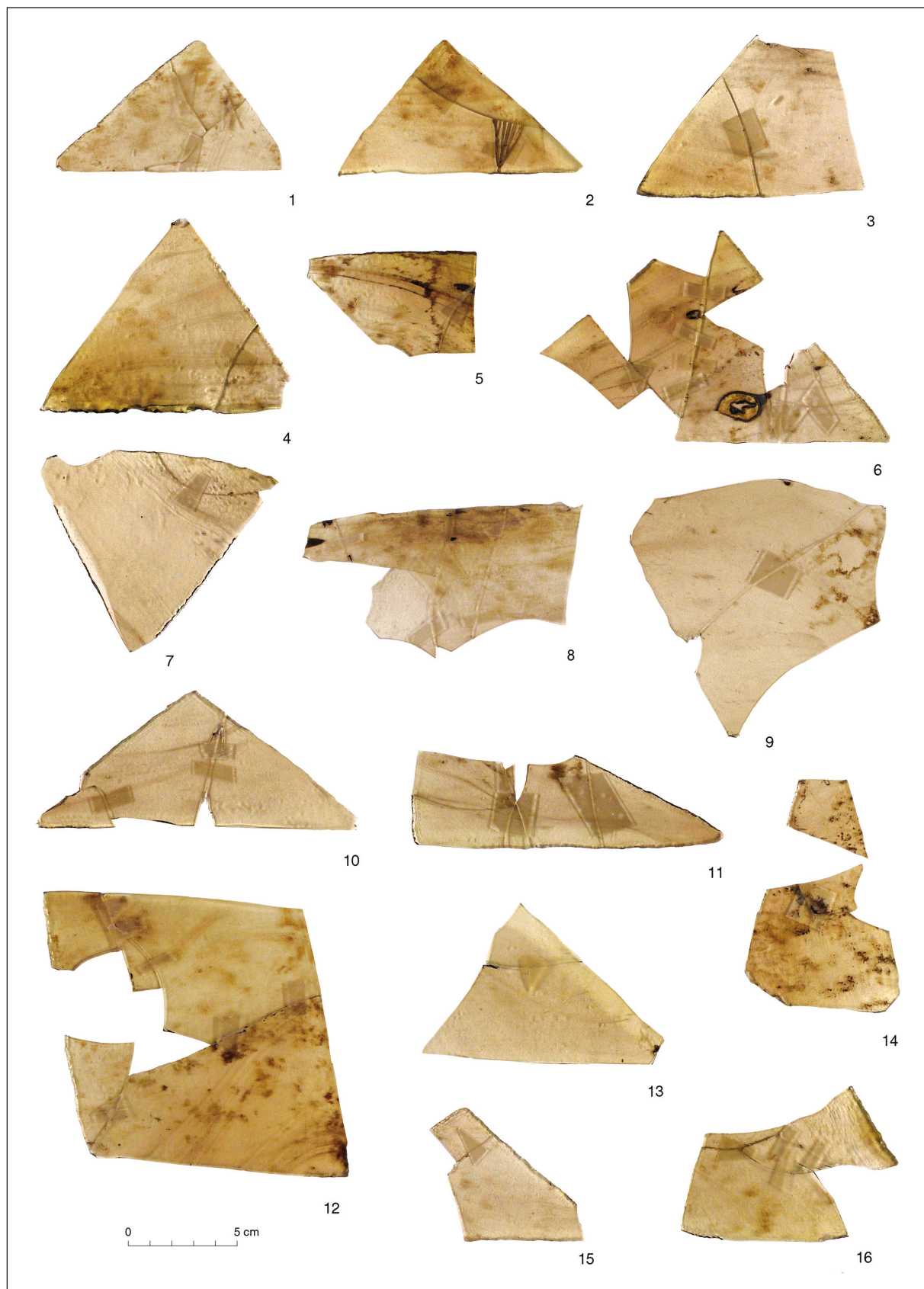


Fig. 13: Tonovcov grad. Window glass from the main church. (photo M. Zaplatil)
 Sl. 13: Tonovcov grad. Okensko steklo iz osrednje cerkve. (foto M. Zaplatil)

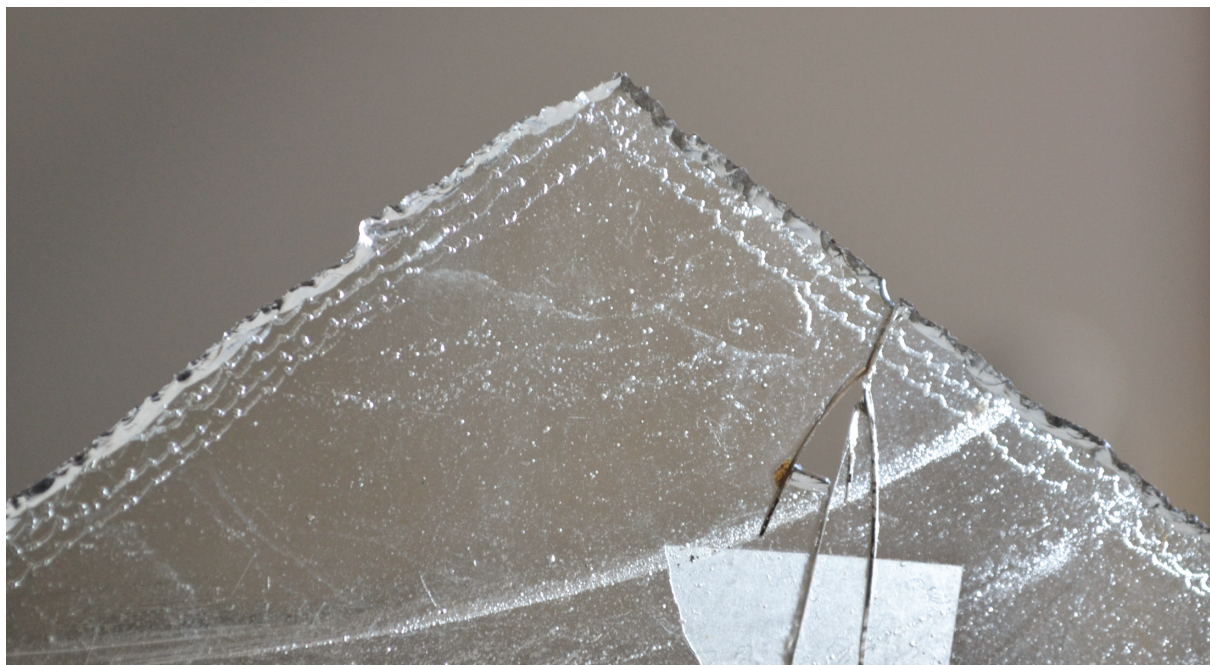


Fig. 14: Tonovcov grad. Tool marks on grozed edge of window glass fragment from the main church. Enlarged.
Sl. 14: Tonovcov grad. Sledi orodja na oddrobljenem robu odlomka okenskega stekla iz osrednje cerkve. Povečano.

The south church

The smallest amount of glass was found in this final addition to the complex (6 fragments, 16 g). The fragments from inside and outside the church are all made of green glass, and none of them are grozed. The glass appears identical to the green fragments from House no. 1.

Apparently, there was a window in one of the walls but it is not possible to say where it was. The pieces in the outer destruction layer were found to the east and south, but beyond the south wall of this church, the bedrock falls steeply into a ravine with a small torrent stream and most of the rubble of the building must have slid down the rock face.

Conclusion

The north and main church had windows made of yellowish glass; the nave of the main church was decorated with at least one window with geometrical shapes. The later addition of the south church was equipped with different, green glass. Unless most of it had collapsed down the southern rock face of the settlement plateau together with the walls, there must have been only a small window in this church, probably in the nave. According to similar

cases, it was not unusual that the same building, especially churches, had windows made of differently coloured glass (Foy, Fontaine 2008, 432) so this change in colour is perhaps not caused by the difference in the time of construction. It is interesting that the south church window(s) was made of the same type of glass as most of the presumed windows in House no. 1, which we assume was built more or less contemporarily as the first two churches. As already said, the difference in material does not necessarily mean different construction periods but it is nevertheless interesting.

The presbytery of the main church, where no window glass was found, probably had no windows. It is unlikely that any existing windows in this space would have remained unglazed. It is more probable that it was illuminated by glass lamps. Four typical handles of lamps were discovered behind the semi-circular clergy bank, together with some beaker fragments. The small room next to it contained neither glass windows nor hanging lamps. Small flasks and beakers were deposited there; any of the beakers or goblets could have been used as lamps.

Most of the glass was probably made of the same mass as the analysed piece from the lower-lying House no. 1, unrecycled Levantine I, which is the same raw glass as was used for the hanging lamps in the churches (Šmit et al. 2013, Fig. 3).

WINDOW GLASS FROM SOME CONTEMPORARY SITES

In the following is a short review of some of the Late Antique (mostly 5th–7th c. AD) sites in Slovenia and the nearby countries. Looking at a selection of the published churches and settlements, I wished to establish how often window glass is at least mentioned in publications and to obtain an impression of how often it may have been used.

From the church at Korinjski hrib above Veliki Korinj, window glass is mentioned by Ciglenečki (1985, 265) while more details are given in excavation reports and diaries. One fragment of yellowish glass from the destruction layer inside the church,



Fig. 15: Korinjski hrib. Window glass from outside Tower no. 1.
Sl. 15: Korinjski hrib. Okensko steklo z zunanje strani stolpa 1.

very similar to the yellowish glass from Tonovcov grad, was found among the small finds from the site.⁴ Outside Tower no. 1, one fragment of quite clear and transparent yellowish glass and one greenish piece with many air bubbles were found (Fig. 15). Outside Tower no. 3, a greenish bubbly fragment was discovered. The quality and colours are very similar to both Tonovcov grad glass types. Other fragments were not preserved among the finds from this site. Probably more glass was found, but it was either not kept or was lost later. Judging by the preserved pieces, a similar situation to Tonovcov grad can be expected: two types of window panes that were used both in the church and in (at least some of the) the towers.

At Ajdovski gradec, above Vranje near Sevnica, greenish-yellowish window glass is reported from the narthex of the upper church and from the lower church in the space to the south of the rectangular apse of the baptistery (Petru, Ulbert 1975, 28, 39,

48, Pl. 19a; – Knific, Sagadin 1991, 52, cat. no. 11; – Bitenc, Knific 2001, cat. no. 152). The published fragments are not grozed, and one of the panes was partially reassembled into a rectangle with one edge measuring approximately 20 cm.⁵ One fragment from House A (yellowish) and one from Trench 1 (greenish) were also published (Knific 1979, cat. nos. 42, 167). During the excavations of House D, greenish, blue-green and yellowish window pane shards were found in the destruction layer (Mirnik 1984, 23; Pl. 1: 17,18,21,23–27). Again, window panes in similar colours were apparently used both in churches and houses in Ajdovski gradec.

From the settlement of Rifnik near Šentjur, window glass was mentioned by Schmidt (1944, 79). Bausovac additionally reports fragments from the apse of the larger church and from Houses no. 6 and 7 (Bausovac 2011, 18, 22).

Fragments of window glass lay in the apse of the church at Gradec above Mihovo (Ciglenečki 1987, 143).

In the north-western corner of the presbytery of the upper church at Kučar near Podzemelj, some pieces of glass were found on the mortar floor (Dular, Ciglenečki, Dular 1995, 75). It is not clear from the publication whether window panes are indicated, but it is very probable. If they were pieces of vessels, they would have been shown in the plates and discussed in the chapter on small finds. A few glass fragments were also discovered in the baptistery; some of them are possibly window glass (Dular, Ciglenečki, Dular 1995, 100).

From Kranj, only a few pieces of window glass have been published thus far, but the extensive recent excavations in the city centre will doubtlessly bring new data. Sagadin published two fragments of window glass, of which one shows signs of grozing, from the Khieselstein courtyard (Sagadin 2004, Fig. 6: 19,20) and additional yellowish and greenish fragments from the same site and from the Late Antique tower (site Tomšičeva 38) in his unpublished PhD thesis (Sagadin 2008, Pls. 39: 22; 52: 17–21).

From the excavations of the Late Antique and Early Medieval settlement remains at the site of Kapucinski vrt in Koper, Cunja reported three yellowish pieces and one green fragment of window glass (Cunja 1996, 82–83, Pl. 5: 82–85), but it is not possible to determine from the publication to which phase they belong.

⁴ The excavation documentation and finds are kept temporarily at the Institute of Archaeology (IZA ZRC SAZU) in Ljubljana.

⁵ Estimated from the photograph in Bitenc, Knific 2001, cat. no. 152.

At Hemmaberg in Carinthia, yellowish to greenish window glass with a thickness of 0.8–2 mm⁶ from the fourth and fifth churches (the western complex) is discussed in the publication. The author mentions that it was found in the layers of use in the northern transept and apse of the fourth church and in the sacristy and apse of the fifth church. She also mentions remains of window panes from the levelling strata underneath the churches, but writes that no window glass was found in other buildings except churches (Ladstätter 2000, 184–185, Fig. 69). For the eastern church complex at Hemmaberg, yellow-green window glass is mentioned by Glaser (1991, 73).

The window glass from the Teurnia (Sankt Peter im Holz) cemeterial church was mentioned by Egger (1916, 25). Ladstätter mentioned an oral communication by Glaser for the presence of window panes in the Teurnia episcopal church (Ladstätter 2000, 185 fn. 1244).

Window glass was recovered from the apse of the church at Laubendorf (Dolenz 1962, 49, 52) and from the eastern clergy bank at the Lavant church (Miltner 1953, 48).

At Duell, window panes were discovered in Church I (Egger 1929, 198, 201), and 23 pieces of yellow, brownish and green 0.9–4.0 mm thick panes were found in the nearby 'Pfarrhaus' (Steinklauber 2013, 48; Pl. 140: D 375).

At Invillino in the Tagliamento valley, partially melted yellowish and greenish window glass was found in the charred layer that marked the end of use of the church nave on Colle di Zuca. Bierbrauer notes that there were no apparent concentrations of the scattered fragments and that no conclusions as to the location of windows could be made (Bierbrauer 1988, 41, 44). On the settlement plateau on Colle Santino, 70 fragments of brownish, light green or light yellow and colourless glass were found, mostly in the humus or in and around Roman structure complexes A–B (Bierbrauer 1987, 285).

During the excavations of the large church at San Martino di Ovaro in Carnia, window glass of different colours was observed and later analysed and published. In the church nave and baptistery, clear panes were used, while in the reliquary room (intentionally coloured) blue window glass was found. The analyses showed that both window panes and vessels found in the church were made of Levantine I glass mass (Zucchiatti et al. 2007, 308, 311).

A limited amount of window glass was found in the destruction layers of the large building

at Monte Barro, of which three types could be recognized: thin greenish panes, less transparent thicker ones and some very thick yellowish glass (Ubaldi 1991, 92–93).

Large quantities of yellowish and greenish window glass (ca. 1100 fragments) were discovered in most buildings at Gradina near Jelica in Serbia. It was found in Houses I–IV, VI and in all the basilicas (A–E), but the largest quantity was recovered from the so-called representative House VI (20%) and Basilica C (35%). The panes are reconstructed as rectangular, but signs of grozing are also reported (Križanac 2009, 276–277, Fig. 14; Milinković 2010, 152–153, Fig. 189). In the eastern wall of the northern annexe of Basilica D, a 'mushroom-shaped' window (ca 45 × 75 cm: Milinković 2010, Fig. 227; Pl. IV: 4) was discovered which can indicate the shape and size of an actual window. Križanac also mentions remains of plaster on some fragments so this is probably how they were set into the apertures (Križanac 2009, 276).

Similarly window glass mostly in yellowish and greenish hues with clear cut, rounded and grozed edges was found both in houses and in the church at Vrsenice, Serbia (Stamenković 2009, 192–194; Pl. II).

Window glass was found in large quantities at Caričin grad. Apart from the more common light colour, some deep blue fragments were also found (Drauschke, Greiff 2010a, 57–58; Fig. 4).

Even though window glass is given very different levels of attention in different publications, it is clear from the above that it was widely used, especially in the churches, but also other structures. Most often the yellowish to greenish tones are mentioned in publications, but sometimes there are other colours as well. In rare cases, even parts of window apertures are preserved, or plaster is mentioned as means of fastening the panes into frames. Grozed edges are not frequently reported but that does not mean that they are nor present. Usually, they are noticed during the detailed analyses of the glass, which were not always performed. Even this small set of data seems enough to conclude that window glass was not a luxury commodity but a usual part of furnishings of Late Antique buildings in the discussed area.

CONCLUSION

At the fortified hilltop settlement of Tonovcov grad near Kobarid in western Slovenia, window glass was found in the layers of use and destruction

⁶ 0.8 to 2 cm in the publication, but that is most likely a mistake.

of the Late Antique house and church complex. Two different colour types are represented, both natural and not achieved by adding colorants. The first is mostly yellowish, sometimes veering into greenish or brownish tones, and the second is of a uniform light green hue. The glass pane fragments show the usual characteristics of the cylinder-blowing process; some of the panes were shaped by grozing.

In and around House no. 1, the shards of mostly green glass indicate the presence of a number of probably small windows. The panes were apparently set directly into the openings or into wooden frames since plaster remains or lead came were not found with the glass.

In the north and main church, yellowish glass was found while the south church was glazed with the green glass, completely similar to the glass from House no. 1. The small room between the presbyteries of the main and south church (presumably memorial chapel) yielded no remains of plate glass. The most interesting discovery was the large number of carefully cut and grozed geometrical shapes (triangles and parallelograms) that must have formed one or more windows in the nave of the main church at Tonovcov grad. They represent the early predecessor of the stained (painted) glass windows, production of which began a few centuries later.

A short review of a selection of contemporary sites showed that glazed windows were not a rare occurrence in the south-eastern Alpine settle-

ments, and that we can expect it in the churches and probably in most houses. The shaped and patterned window(s) from the main church at Tonovcov grad was nevertheless a surprise. Even though the window(s) cannot be reconstructed, the remains indicate that special attention was paid to the lighting of the interior and that a particular effect was desired. The yellowish panes were very probably made from the same glass mass (Levantine I) used for the vessels, which suggests a common supply or a local workshop. Yellowish and green glass was used simultaneously; both types seem to have been available during the construction of House no. 1 and the churches.

Not enough 'vitrail mosaïque' windows have been discovered in general to be able to say whether the case of the main church at Tonovcov grad was the norm or an exception at the time. It is an attractive idea to see it as something special, since Tonovcov grad is considered to be an ecclesiastical centre, but more sites should be analysed before such a conclusion can be reached. In any case, the established supply of Mediterranean oil and wine and later the glass evidence with the Levantine and Egyptian glass for vessels and lamps were among the first signs that slowly started to change the image of the hilltop settlements from mere refuges to remote autarkic villages and finally to something closer to small towns (Ciglencečki 2011). Window panes continue to shed light onto the living culture of Late Antiquity.

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Poznoantično okensko steklo z višinske naselbine Tonovcov grad pri Kobaridu

UVOD

Okensko steklo je ena od tem, ki so bile precej zapostavljene v raziskavah rimskega in porimskega obdobja v Sloveniji. Včasih je omenjeno v zaokroženih objavah posameznih najdišč (Petru, Ulbert 1975, 28, 39, 48) in le redko narisano ali fotografirano (Knific, Sagadin 1991, 52, kat. št. 11; Bitenc, Knific 2001, kat. št. 152). V prvem poskusu predstavitve okenskega stekla s poznoantičnih naselbin (Milavec 2011) se mu ni godilo dosti bolje, saj je bilo le omenjeno in prikazano na kartah razprostranjenosti. Tudi v širših sredozemskih raziskavah stekla je bilo resno upoštevano precej pozno (zbrano pri Foy, Fontaine 2008).

Kljub temu pa je bilo okensko steklo različnih barv in oblik del opreme in okrasa predvsem poznoantičnih cerkva. Ni omogočalo le, da je zbrana skupnost videla ven ali da je svetloba lahko vstopila v stavbo. Dodalo je barve in vzdušje dogajanja v zgradbah. Brez tega je naš vtis cerkva lahko temačen in asketski, še posebno ob skoraj popolnem pomanjkanju drugega okrasa (mozaikov ali fresk) v večini znanih cerkvenih objektov na ozemlju današnje Slovenije. Ničesar ne vemo o možni uporabi lesenega pohištva ali tkanin, lahko pa posežemo po vsakdanji čarobnosti stekla.

Zato bi rada posvetila ta članek izjemni temi poznoantičnega okenskega stekla z višinske naselbine Tonovcov grad pri Kobaridu. To najdišče

in zgodnjekrščanske cerkve na splošno so med osrednjimi temami raziskav Slavka Ciglenceškega, in upam, da mu bo ta mali prispevek, še en košček sestavljanke, tako zanimiv, kot je meni.

POZNOANTIČNO OKENSKO STEKLO – NEKAJ SPLOŠNIH NAVEDB

Okensko steklo je bilo del opreme poznorimskih in poznoantičnih cerkva, uporabljali pa so ga tudi v profani arhitekturi. Njegova prisotnost je seveda odvisna od premoženja lastnika, vendar se pojavlja precej bolj pogosto, kot je veljalo doslej. Eden od vzrokov za to, da ga včasih med izkopavanji ne najdemo, posebej v rimskodobnih kontekstih, je, da so ga, če je bilo le mogoče, reciklirali. Večje količine so se ohranile v stavbah, ki so bile opuščene ali uničene v enkratnem ali katastrofalnem dogodku.

Pojavilo se je že v 3. st., splošno pa je bilo v uporabi od 4. st. v cerkvenih in profanih stavbah. Na zahodu so poznali dve glavni tehniki izdelave ravnih steklenih plošč, ulivanje v kalup in pihanje v cilinder. Pihanje v cilinder se pojavi nekoliko kasneje in večinoma, ne pa povsem, zamenja ulivanje do 4. st. Precej črnila je bilo prelitega o ločevanju med izdelki obeh tehnik, vendar po dolgih diskusijah še vedno ni zanesljivega načina določevanja, kako je bilo okensko steklo narejeno. Debelejša stekla z različnima zgornjo in spodnjo površino (ena

gladka ali svetleča in ena mat ali hrapava), večja količina okroglih zračnih mehurčkov in včasih sledovi orodja na robovih so večinoma videni kot znaki ulivanja. Po drugi strani so tanjša stekla z dvema glatkima površinama in manjšo količino razpotegnjenih mehurčkov ter zaglajenimi robovi bolj verjetno znaki pihanja v cilinder. Čeprav je največkrat težko ločiti obe tehniki, velja prepričanje, da je bila večina poznoantičnega stekla v zahodnem Sredozemlju izdelanega s pihanjem, enako kot velja za posodje (Foy, Fontaine 2008; Schibille, Marii, Rehren 2008; Kanyak 2009).

Zadnje čase je bilo veliko raziskav posvečenih provenienci stekla, tudi okenskega (Freestone 2005; Wolf et al. 2005; Schibille, Marii, Rehren 2008; Arletti et al. 2010; Drauschke, Greiff 2010a; 2010b; Gliozzo et al. 2012). Pokazalo se je, da je bilo – podobno kot posodje – narejeno iz istih vrst surovega stekla večinoma levantinske in egipčanske proizvodnje. Stekla so običajno naravne barve, torej v odtenkih modre, rumene, in rjave. Na nekaterih najdiščih se pojavljajo obarvana stekla intenzivnih zelenih in modrih, včasih rdečih in vijoličastih odtenkov (Kessler, Wolf, Trümpler 2005, t. 1; Zucchiatti et al. 2007, 311; Drauschke, Greiff 2010a, sl. 4). Popolnoma brezbarvno steklo je redko, a pomembno je to, da je bilo ne glede na osnovno barvo steklo toliko bolj prozorno, kot je bilo tanko napihano. Nekateri zelo tanki kosi (pod 1 mm) delujejo povsem brezbarvni, tudi če je debelejši rob istega kosa v resnici zelenkast ali rumenkast.

Eno od odprtih vprašanj so lokacije delavnic okenskih stekel. Za to, da bi bila izdelana v istih delavnicah, ki so izdelovale sočasno posodje, ni veliko argumentov (Foy, Fontaine 2008, 428–430) in nekateri avtorji verjamejo, da so okensko steklo izdelovali na gradbiščih, kjer so ga potrebovali, še posebno pri večjih gradnjah. Dokazi za to manjkajo za pozno antiko, so pa pogostejši za zgodnjeresnjevške samostane, na primer Jarrow (Cramp 2006, 56), San Vincenzo al Volturno (Dell'Acqua 1997) in San Lorenzo in Pallacinis (najdbe iz eksedre Crypte Balbi; Mirti et al. 2000; 2001). Pojavljajo se namigi, da bi bila okenska stekla lahko uvožena, celo iz vzhodnega Sredozemlja, vendar so primeri s potopljenih ladij datirani ali precej bolj zgodaj (Foy, Fontaine 2008, 429–430) ali pa precej pozneje (11. st., brodolom Serçe Limanı – Bass et al. 2009, 385–389). Kot sem že omenila, je bilo recikliranje pomemben del rimske ekonomije in stara okenska stekla so ne le zbirali in pretapljali, temveč so jih lahko tudi predelali in znova uporabili, če so bila primernih dimenzij.

Verjetno najmanj pojasnjen del raziskav poznoantičnih oken je rekonstrukcija videza oken in okenskih stekel, saj so največkrat najdena razbita na zelo majhne koščke. Stekla tudi sicer niso bila velika, napihana so merila večinoma okrog 20 × 20 cm, nekatera pa so bila večja (Foy, Fontaine 2008, 433–435).

Prvi pojav zgodnjih vitrajev (ne še slikanih), stekel, razrezanih v preproste geometrijske oblike in sestavljenih v vzorec, je sedaj datiran v 4. st., bolj pogosti so bili od 6. st. naprej. V okenske odprtine so bili vstavljeni na različne načine, neposredno ali v lesenih okvirjih. Včasih so bili pritrjeni s svinčnimi trakovi, ki so jih držali na mestu (Foy, Fontaine 2008, 442–443). Okna v velikih javnih zgradbah, na primer Aula Palatina v Trieru ali ravenske bazilike, omogočijo predstavo o tem, kakšni so bili bolj luksuzni prostori (Foy, Fontaine 2008, sl. 27–30). Ta okna so pravokotna s polkrožnim zgornjim delom in leseno rešetko, v katero so vstavljena kvadratna stekla. Manj je primerov ohranjenih oken v bolj skromnih zgradbah. Predstavljamo si jih lahko kot preproste pravokotne odprtine, s polkrožnim zgornjim delom, predeljene v bifore (npr. pokopališka cerkev v Teurniji, Glaser 1991, sl. 139), ali v obliki gobe (npr. Caričin grad, bazilika C, Milinković 2010, sl. 227, t. IV/4). Včasih imajo lahko lesene okvirje za manjše kose stekel.

Od 7. st. so namenoma barvali maso za okenska stekla, začnejo se pojavljati tudi manjše, krožno izrezane oblike vzorcev. V 8. st. se že pojavi slikano steklo, torej pravi vitraji (Foy, Fontaine 2008, 443).

OKENSKO STEKLO S TONOVCOVEGA GRADU¹

Zbrala sem približno 300 kosov (900 g) odlomkov okenskih stekel, polovica jih izvira iz osrednje cerkve (150 odlomkov, 444 g). Zastopani sta dve barvi. Največji del stekla, predvsem v severni in osrednji cerkvi, je dobro ohranjen, kvaliteten, skoraj brez nečistoč in z majhnim številom razpotegnjenih zračnih mehurčkov. Debelina večine odlomkov je od 1 do 2 mm, pri debelejših zaobljenih robovih do

¹ Med pripravo monografij o Tonovcovem gradu smo okensko steklo omenili in kratko kartirali (Milavec 2011, 94–95, 110–111, sl. 3.3 in 3.4), ni pa bilo celovito obravnavano. Zato se nekateri zaključki iz leta 2011 objavljenih knjig ne ujemajo z rezultati te analize, a to je vesela usoda raziskav – napredujejo.

3 mm, izjemoma 4 mm. Barva stekla je rumenkasta do zelenkasta, pogosto preprejena z rdečkastorjavo (naravna barva stekla). Manjši odlomki so si med seboj v barvi lahko precej različni, večji kosi pa kažejo, da se vse tri barve lahko pojavijo skupaj na enem kosu. Če pogledamo preseke nekaterih kosov, sta včasih celo površini različnih odtenkov. Najtanjši, srednji deli večjih kosov so skoraj popolnoma brezbarvni in prosojni. Obe površini sta zelo gladki, pogosto je ena svetleča, druga pa rahlo mat (*sl. 1*).

Druga barva je zastopana v hiši 1 in v južni cerkvi. Stekla so podobnih debelin kot rumenkasto steklo, prav tako skoraj nimajo vidnih nečistoč. Glavna razlika je v barvi, ki je tukaj zelo enotno svetlo zelena, in v večjem številu razpotegnjenih zračnih mehurčkov. Ena površina je večinoma gladka in svetleča, druga pa je lahko precej gladka, a je včasih drobno razbrazdana (*sl. 2*). Ti razbrazdani vzorci so med raziskovalci, ki se ukvarjajo s steklom, interpretirani različno. Za nekatere predstavljajo rezultat ulivanja, bodisi kot sledovi orodja, s katerim so razmazali viskozno stekleno maso, ali pa kot odtis lesene površine, kamor so nalili staljeno steklo (npr. Kessler, Wolf, Trümpler 2005, 7). Drugi zagovarjajo tezo, da so brazde sledovi ravnanja in hlajenja napihanega kosa stekla (npr. Cramp 2006, 62; Schibille, Marii, Rehren 2008, 639–640; Foy, Fontaine 2008, 431).

Hiša 1

Okensko steklo iz hiše 1 je bilo najdeno v plasteh uporabe (hodna površina) in propada stavbe, ki je datirana med pozno 5. in zgodnje 7. st. (Ciglencečki, Modrijan, Milavec 2011, poglavje 3.1). V nasprotju s steklom iz cerkva (glej spodaj) je bilo ohranjeno v zelo majhnih koščkih, ki so imeli delno oglajene in deloma skrhone robove, kot da so bili obrušeni v sedimentu. Zato jih ni bilo mogoče sestaviti v večje kose. Med približno 130 kosi (380 g) je bil le en majhen odlomek z robom, ki je imel sledove krušenja z orodjem. To kaže, da so bila okna hiše 1 verjetno preprostih pravokotnih oblik.

Zidovi hiše niso bilo ohranjeni do višine, pri kateri bi pričakovali okenske odprtine, zato o njih ne vemo ničesar. Predstavo o možnih lokacijah oken lahko dobimo s kartiranjem odlomkov na tloris hiše (*sl. 3*; zidovi 13, 14 in 15 pripadajo starejšemu objektu).

Večino koncentracij okenskega stekla iz hiše 1 sestavlja zeleno steklo, z nekaj rumenkastimi od-

lomki. Najbolj jasna koncentracija je okrog zidu 2 in bi lahko predstavljala ostanke zeleno zastekljenega okna (*sl. 4*). Hiša je bila prvotno zgrajena kot enoprostorska stavba, prizidek je bil dodan kasneje, ne vemo natančno, kdaj. To je vidno iz gradnje zidov, zidova 8 in 11 sta dograjena na zid 2, in iz dejstva, da je zunanje lice zidu 2 ometano, medtem ko preostali zidovi (8–11) prizidka niso bili ometani. Okno v zidu 2 se zdi dodaten argument za to, da je bila hiša nekaj časa brez prizidka.

Nekaj koncentracij zelenih odlomkov na zunanji strani zidu 3 lahko kaže na dve manjši okni v zadnjem zidu hiše, fragmentov zunaj zidu 4 pa je verjetno premalo za še eno okno.

Situacija pred hišo je manj jasna. Veliko število odlomkov rumenkastega stekla je ležalo v kvadrantu 716 (*sl. 5*), manjše število zelenih pa bližje pri zidovih 1 in 8 (*sl. 6*). Fragmenti so bili odkriti v plasteh uporabe in propada hiše in v humusu. Morda je bilo okno v zidu 1 sestavljeno iz stekel različnih barv, kar ne bi bilo nenavadno (Foy, Fontaine 2008, 432). Lahko tudi, da je bilo eno okno še za časa uporabe razbito in nadomeščeno z drugim, zelenim.

Količina fragmentov v kvadrantu 666 ni velika in ker je bil ta kvadrant že precej oddaljen od hiše ter izredno bogat z najdbami, mislim, da je tu najdeno steklo le ostanek vsakodnevnega življenja pred hišo (*sl. 7*).

Zanimiva točka, v kateri se situacija v hiši 1 razlikuje od tiste iz cerkva, je, da je večina stekla najdenega zunaj hiše. Nekaj odlomkov je ležalo tudi v stavbi, vendar precej manj kot zunaj. Hiša je bila znova uporabljena v zgodnjem srednjem veku, a plast iz tega obdobja leži nad plastjo z zidov odpadlega ometa in nad žganino, ki je zaznamovala konec uporabe poznoantične stavbe. Tako je sicer mogoče, da so zgodnjersrednjeveški uporabniki očistili notranjost hiše, vendar se zdi verjetno, da je večina črepinj ležala pod plastjo ometa.

Nekaj odlomkov je ležalo v plasti, ki predstavlja zgodnjersrednjeveško uporabo stavbe 1 (SE 10), vendar jih je zelo malo in se ujemajo s poznoantično večino, tako gre verjetno za rezidualne najdbe (za zgodnjersrednjeveško fazo glej Milavec, Modrijan 2014, 262–263).

Bolj vprašljivi so trije fragmenti rumenkastega in zelenega stekla iz plasti, ki pripada zgodnejši uporabi prostora, kjer je bila kasneje zgrajena hiša 1 (SE 36; 4. do zgodnje 5. st.; glej Ciglencečki, Modrijan, Milavec 2011, 168–178). Vrh te plasti je predstavljal hodno površino med gradnjo in uporabo poznoantične stavbe in črepinje so bile

lahko izgubljene takrat. Po drugi strani pa so lahko tudi znaki poznorimske zasteklitve, ki bi uporabljala enako steklo kot kasneje.

En odlomek rumenkastega stekla iz hiše je bil vključen v analizo provenience stekla. Izkazalo se je, da gre za nerekicirano steklo tipa Levantine I (Šmit et al. 2013). Zelo verjetno je, da je vse rumenkasto steklo iz hiše in cerkva, ki je zelo enotno na pogled, izdelano iz te mase. Tako imenovano steklo Levantine I so izdelovali na sirsko-palestinski obali med 4. in 9. st., najbolj priljubljeno pa je bilo med 5. in 7. st., ko je krožilo daleč po celotnem Sredozemlju (Freestone 2005).

Sklop cerkva

Steklo iz severne in osrednje cerkve je rumenkasto (sl. 8; 13), medtem ko je bilo v južni cerkvi najdeno samo zeleno steklo (sl. 9). Odlomki okenskih stekel so bili najdeni večinoma na estrihih v cerkvah, v plasti žganine in strešnih opek (sl. 8). Kosi so bili veliki, z gladko odlomljenimi robovi, in se jih je dalo v precejšnjem obsegu sestaviti v izvirne oblike, kar ne kaže na močne postdepozicijske procese. Večji del stekla iz osrednje cerkve je imel z drobljenjem obdelane robove in je bil oblikovan v geometrijske oblike, kar pa ne velja za drugi dve cerkvi.

V majhnem prostoru (memorija?) med prezbitelijema osrednje in južne cerkve ni bilo najdenega okenskega stekla.²

Večina stekla je bila najdenega v stavbah, manjša količina tudi med ruševino, ki je zapolnjevala globok, v skalo vsekani prostor med ladjama osrednje in južne cerkve, in v ruševini, ki je prekrivala celoten sklop cerkva.

Nekaj odlomkov okenskega stekla je bilo najdenih tudi v ruševinskih plasteh hiše 2, ki leži severno od cerkva. Ta stavba ni interpretirana kot bivalna, temveč kot lopa ali gospodarski objekt. Najdenih je bilo le 8 rumenkastih odlomkov, zato lahko sklepamo, da so prišli iz ruševin cerkva, ki stojijo na platoju nad stavbo 2.

Ni jasno, kako so bila stekla vpeta v okenske odprtine. Na odlomkih ni bilo najdenih sledov mavca, s katerim bi bila lahko pritrjena. V ruševinskih plasteh v prostoru med osrednjo in južno cerkvijo je sicer ležalo nekaj svinčenih trakov (sl. 10; Modrijan, Milavec 2011, t. 47: 12), ki bi jih

morda lahko interpretirali kot pripomočke za pritrjevanje stekel, vendar so trakovi zelo tanki in nimajo profilov, zato njihova uporaba ni jasna. Najverjetneje so bila okenska stekla vstavljena v lesene okvirje ali neposredno v zidane odprtine.

Severna cerkev

Odlomki rumenkastega stekla so bili najdeni v severni cerkvi in zunaj nje (sl. 8). Nekaj jih je iz ruševinske plasti zunaj stavbe (20 odlomkov, 57 g), nekateri pa so ležali na estrihu v notranjosti (7 odlomkov) v ladji in prezbiteriju, ki sta bila ločena z nizkim kamnitim zidcem. V prezbiteriju je bil najden kos roba ene plošče, dolg 13 cm (sl. 11). Noben odlomek nima roba preoblikovanega z drobljenjem. Lahko sklepamo, da sta bili v severni steni eno ali dve okni s pravokotnimi rumenimi stekli.

V ladji severne cerkve je bil en fragment najden pod nivojem estriha. Poleg tega so bili v dveh sondah, izkopanih zato, da bi ugotovili, kakšne plasti so pod dobro ohranjenim estrihom, najdeni še trije odlomki ravnega rumenkastega stekla (sl. 12). Podobni so drugemu rumenkastemu steklu iz cerkve in so ležali v plasti pod podlago za estrih. Estrihi so bili dodani v cerkvenem sklopu med obnovo, verjetno okrog sredine 6. st. (glej Ciglencečki, Modrijan, Milavec 2011, poglavje 3.3), zato te najdbe najverjetneje potrjujejo, da je bila zasteklitev del prvotne gradnje stavbe.

Osrednja cerkev

Največja količina stekla (444 g), vse rumenkasto, je bila najdena v tej stavbi, v žganinski in ruševinski plasti s strešno opeko, ki je ležala na estrihu v sredini cerkve. Stekla so bila najdena bližje južnemu zidu (sl. 8: zid 6).

Večino stekla iz ladje je bilo mogoče sestaviti in prepoznanih je bilo nekaj oblik (sl. 13). Vse oblike niso cele, tako so bili fotografirani le zanesljivo sestavljeni kosi. Med njimi je 10 ali 11 trikotnikov (sl. 13: 1–4, 6–7, 10–11, 13?, 14–16), en paralelogram (sl. 13: 12) in dva kosa, ki bi lahko predstavljala paralelogram (sl. 13: 5, 8). En kos je velik in zelo tanek, brez robov (sl. 13: 9), nekaterih odlomkov pa ni bilo mogoče sestaviti do konca, vendar se zdi, da gre za kose še treh trikotnikov.

Dimenzije paralelograma so 12 × 12,5 × 12 × 12,5 cm. Dimenzije razmeroma celih trikotnikov

² V nasprotju s karto razprostranjenosti okenskega stekla v prvi objavi (Milavec 2011, sl. 3.3).

so $11 \times 9 \times 7,5$ cm (sl. 13: 1), $11,5 \times 6 \times 8$ (sl. 13: 2), $12 \times 11,5 \times 10,5$ cm (sl. 13: 4), $10,5 \times 10 \times 9,5$ cm (sl. 13: 7), $15 \times 10 \times 9,5$ cm (sl. 13: 10).³

Nekateri robovi so odebeljeni, nekateri le zaobljeni, drugi pa odrezani in nezaobljeni. Večina oblik je bila pridobljena tako, da so bili robovi oddrobljeni s steklarskimi kleščami. Rezultat je videti kot retuša na kamnitih orodjih, pogosto so vidni dodatni sledovi orodja nad oddrobljenim robom (sl. 14).

Ni mogoče ugotoviti, kako so bile oblike sestavljene v vzorec ali več vzorcev. Za okna iz cerkve v Sionu, Sous-les-Scex v Švici, so bili narejeni zanimivi predlogi, kako bi trikotniki različnih oblik lahko bili sestavljeni v modre šesterokotnike med rumenimi trikotniki, podobno kot vzorci na sočasnih fibulah, okrašenih s celičnim okrasom (tehnika cloisonné; okna so datirana v 5. in 6. st.: Kessler, Wolf, Trümpler 2005, sl. 10, 11). To so verjetno poznoantični začetki vitrajev. V Sionu so trikotniki manjši in steklena masa je namenoma obarvana. Na Tonovcovem gradu edini analizirani kos okenskega stekla (iz hiše 1, vendar enakega rumenkastega stekla) ni pokazal prisotnosti barvil.

Kot sem že poudarila, na odlomkih ni bilo sledov mavca in v cerkvah ni bilo najdenih svinčenih trakov, zato ni mogoče z gotovostjo trditi, kako so bila stekla pritrjena.

Morda je presenetljivo, da okensko steklo ni bilo najdeno v prezbiteriju osrednje cerkve, z izjemo čisto majhnega koščka zelenega stekla. To ne pomeni nujno, da tu ni bilo oken, a med vzhodnim zidom in klopjo za duhovščino so ležali odlomki steklenih svetilk in čaš (Milavec 2011, 91, sl. 3.2). Morda je bil prezbiterij namenoma temnejši ter razsvetljen na drugačen način s steklenimi svetilkami. Količina svetlobe, ki bi lahko dosegla prezbiterij iz ladje, je bila odvisna od oltarne pregrade. Ohranjena višina zidca, ki ločuje ladjo od prezbiterija, je le 10–20 cm nad tlemi prezbiterija (in približno 60 cm nad nivojem ladje). Ni znakov, da je bil zidec kdaj višji ali nadzidan v lesu.

Južna cerkev

Najmanjša količina stekla je bila najdena v tej cerkvi, ki je bila prizidana najkasneje (6 odlomkov, 16 g). Fragmenti iz zunanosti in notranosti so vsi iz zelenega stekla in nobeden od njih ni dodatno

³ Meritve so le približne, saj robovi niso ravni, konice pa so v večini primerov odlomljene.

obdelan z drobljenjem. Steklo je na pogled povsem enako kot zeleno steklo iz hiše 1.

Videti je, da je bilo v enem od zidov okno, vendar ni mogoče reči, kje. Kosi iz zunanje ruševine so ležali na vzhodni in južni strani, vendar je treba poudariti, da pod južnim zidom cerkve skala pade strmo v manjšo sotesko s hudournikom, tako da je večina ruševine cerkve verjetno zdrsula po skalni steni.

Zaključek

Severna in osrednja cerkev sta imeli okna iz rumenkastega stekla, ladja osrednje cerkve pa je bila okrašena z vsaj enim oknom, sestavljenim iz geometrijskih oblik. Kasneje dodana južna cerkev je bila opremljena z drugačnim, zelenim steklom. Če ga večina ni zdrsula po južnem pobočju, je južna cerkev imela le eno okno, verjetno v ladji. V primerjavi s podobnimi primeri ni nenavadno, da so stavbe, posebno cerkve, imele okna različnih barv (Foy, Fontaine 2008, 432), tako da razlika v barvi verjetno ni rezultat kasnejše gradnje. Zanimivo je, da so okna južne cerkve narejena iz enakega stekla kot okna v hiši 1, za katero predvidevamo, da je bila zgrajena bolj ali manj sočasno s prvima dvema cerkvama. Kot rečeno, razlika v materialu ne pomeni nujno različnih obdobij gradnje, je pa zanimiva.

Prezbiterij osrednje cerkve, kjer okensko steklo ni bilo najdeno, verjetno ni imel oken. Ni zelo verjetno, da bi prav tu okna ne bila zastekljena. Bolj smiselna se zdi razlaga, da je bil osvetljen s steklenimi svetilkami. Štirje značilni ročajji svetilk so bili odkriti za polkrožno klopjo za duhovščino, skupaj z odlomki čaš. V malem prostoru zraven prezbiterija – domnevni memoriji – ni bilo najdenega ne okenskega stekla ne steklenih svetilk. Tu so ležale stekleničke in čaše, od katerih so bile čaše lahko uporabljene tudi kot svetilke.

Večina stekla je bila verjetno narejenega iz iste mase kot analizirani kos iz hiše 1, torej nericiklirane Levantine I, iz katere so bile izdelane tudi svetilke v cerkvah (Šmit et al. 2013, sl. 3).

OKENSKO STEKLO Z NEKATERIH SOČASNIH NAJDIŠČ

Sledi kratek pregled nekaterih poznoantičnih (večinoma 5.–7. st.) najdišč v Sloveniji in bližnjih deželah. S pregledom izbranih objavljenih cerkva in naselbin sem želela ugotoviti, kako pogosto

se okensko steklo v objavah vsaj omenja in kako pogosto so ga najverjetneje uporabljali.

Okensko steklo iz cerkve na Korinjskem hribu nad Velikim Korinjem je omenjeno že v prvi objavi (Ciglenečki 1985, 265), več podatkov pa je v izkopavalnih poročilih in terenskih dnevnikih. En odlomek rumenkastega stekla iz ruševinske plasti v cerkvi, zelo podoben rumenkastemu steklu s Tonovcovega gradu, je bil med najdbami s tega najdišča.⁴ Zunaj stolpa 1 sta ležala kos precej prozornega rumenkastega stekla in zelenkast kos s precej zračnimi mehurčki (*sl.* 15). Zunaj stolpa 3 je bil odkrit zelenkast odlomek z mehurčki. Kvaliteta in barve so zelo podobne steklu s Tonovcovega gradu, drugih odlomkov pa med najdbami ni bilo. Če lahko sodimo iz ohranjenih kosov, je bila situacija podobna kot na Tonovcovem gradu, dva tipa okenskega stekla, ki sta bila uporabljena tako v cerkvi kot v (vsaj nekaterih) stolpih.

Na Ajdovskem gradu nad Vranjem pri Sevnici je bilo najdeno zelenkasto-rumenkasto okensko steklo v narleksu zgornje cerkve in v spodnji cerkvi v prostoru južno od pravokotne apside krstilnice (Petru, Ulbert 1975, 28, 39, 48, t. 19a; – Knific, Sagadin 1991, 52, kat. št. 11; – Bitenc, Knific 2001, kat. št. 152). Objavljeni kosi niso preoblikovani z drobljenjem, eno od stekel je delno sestavljeno v pravokotnik s stranico, ki meri približno 20 cm.⁵ Objavljena sta bila tudi odlomek iz hiše A (rumenkast) in eden iz sonde 1 (zelenkast) (Knific 1979, kat. št. 42, 167). Med izkopavanji hiše D so v ruševinski plasti odkrili zelenkaste, modro-zelene in rumenkaste odlomke okenskega stekla (Mirnik 1984, 23, t. 1: 17,18,21,23–27). Ponovno lahko rečemo, da so bile na Ajdovskem gradu uporabljene Tonovcovemu gradu podobne barve stekla, tako v cerkvah kot v bivalnih stavbah.

Za naselbino na Rifniku pri Šentjurju okensko steklo omenja že W. Schmidt (1944, 79). M. Bausovac dodatno omenja odlomke iz apside večje cerkve ter iz hiš 6 in 7 (Bausovac 2011, 18, 22).

S. Ciglenečki kratko omenja tudi ostanke okenskega stekla iz apside cerkve na Gradcu nad Mihovim (Ciglenečki 1987, 143).

V severozahodnem vogalu prezbiterija zgornje cerkve na Kučarju pri Podzemlju je na maltnem tlaku ležalo nekaj koščkov stekla (Dular, Ciglenečki, Dular 1995, 75). Iz objave sicer ni nedvoumno, da

gre za okensko steklo, vendar je to zelo verjetno. Če bi šlo za posodje, bi bile najdbe skupaj z drugimi prikazane na tablah in obravnavane v poglavju o drobnem gradivu. Nekaj koščkov stekla je bilo najdenih tudi v baptisteriju, lahko je bilo vmes tudi okensko steklo (Dular, Ciglenečki, Dular 1995, 100).

Iz Kranja je bilo do sedaj objavljenih le nekaj fragmentov, vendar bodo obsežne raziskave zadnjih let gotovo prinesle nove podatke. M. Sagadin je objavil dva odlomka okenskega stekla z dvorišča Kieselsteina, od katerih eden kaže sledove preoblikovanja z drobljenjem (Sagadin 2004, sl. 6: 19,20), in še rumenkaste in zelenkaste kose z istega najdišča in iz poznoantičnega stolpa (najdišče Tomšičeva 38) v svojem doktorskem delu (Sagadin 2008, t. 39: 22; 52: 17–21).

Z izkopavanj poznoantične in zgodnj srednjeveške naselbine v Kopru na Kapucinskem vrtu je R. Cunja objavil tri kose rumenkastega in en kos zelenega okenskega stekla (Cunja 1996, 82–83, t. 5: 82–85), vendar ni mogoče ugotoviti, kateri fazi naj bi pripadalo.

Na Sv. Hemi na avstrijskem Koroškem je rumenkasto do zelenkasto steklo debeline 0,8–2,0 mm⁶ iz četrte in pete cerkve (zahodni kompleks) omenjeno v objavi. Avtorica navaja, da je bilo najdeno v plasteh uporabe v severni prečni ladji in apsidi četrte ter v zakristiji in apsidi pete cerkve. Omenja tudi ostanke okenskega stekla iz plasti nasutih pod cerkvami, vendar pravi, da ni bilo najdeno v drugih stavbah kot v cerkvah (Ladstätter 2000, 184–185, sl. 69). Okensko steklo v vzhodnem cerkvenem kompleksu na Sv. Hemi omenja F. Glaser (Glaser 1991, 73).

Okensko steklo iz pokopališke cerkve iz Teurnije (Sankt Peter im Holz) je omenjal že R. Egger (1916, 25). S. Ladstätter navaja ustno informacijo F. Glaserja o prisotnosti odlomkov tudi v škofovski cerkvi Teurnije (Ladstätter 2000, 185 op. 1244).

Okensko steklo je bilo najdeno tudi v apsidi cerkve v Laubendorfu (Dolenz 1962, 49, 52) in pri vzhodni klopi za duhovščino v cerkvi v Lavantu (Miltner 1953, 48).

Na Duelu so bili fragmenti najdeni v cerkvi I (Egger 1929, 198, 201), 23 kosov svetlo rumenega in rjavkastega ter zelenega, 0,9–4,0 mm debelega okenskega stekla pa je bilo najdenih v bližnjem "župnišču" (Steinklauber 2013, 48, t. 140: D 375).

Na Invillinu v dolini Tilmenta je bilo delno staljeno rumenkasto in zelenkasto okensko steklo

⁴ Izkopavalno dokumentacijo in najdbe začasno hrani Inštitut za arheologijo ZRC SAZU v Ljubljani.

⁵ Ocenjeno iz fotografije v Bitenc, Knific 2001, kat. št. 152.

⁶ V objavi 0,8 do 2 cm, kar pa je verjetno napaka.

najdeno v žganini, ki je označevala konec uporabe cerkvene ladje na Colle di Zuca. V. Bierbrauer omenja, da ni bilo opaziti nobene koncentracije fragmentov in da ni bilo mogoče sklepati o lokaciji oken (Bierbrauer 1988, 41, 44). Na naselbinskem platoju na Colle Santino je bilo odkritih 70 odlomkov rjavkastega, svetlo zelenega ali svetlo rumenega in brezbarvnega stekla, večinoma v humusu ter okrog rimskih stavbnih kompleksov A–B (Bierbrauer 1987, 285).

Med izkopavanji velike cerkve pri San Martino di Ovaro v Karniji je bilo odkrito in analizirano okensko steklo različnih barv. V cerkveni ladji in krstilnici je bilo uporabljeno svetlo steklo, v sobi z relikvijami pa namenoma obarvano modro steklo. Analize so pokazale, da je bilo okensko steklo in posodje izdelano iz mase Levantine I (Zucchiatti et al. 2007, 308, 311).

Omejena količina fragmentov izvira iz plasti propada velike stavbe na Monte Barru, med katerimi so prepoznali tri vrste: tanki zelenkasti odlomki, manj prosojni debelejši kosi in nekaj zelo debelih rumenkastih primerkov (Uboldi 1991, 92–93).

Velika količina rumenkastega in zelenkastega stekla (približno 1.100 kosov) je bila odkrita v večini stavb na Gradini na Jelici v Srbiji. Izvira iz hiš I–IV, VI in iz vseh bazilik (A–E), največ pa iz tako imenovane reprezentativne stavbe VI (20 %) in iz bazilike C (35 %). Stekla so rekonstruirana kot pravokotna, omenjeno pa je tudi preoblikovanje z drobljenjem (Križanac 2009, 276–277, sl. 14; Milinković 2010, 152–153, sl. 189). V vzhodnem zidu severnega prizidka bazilike D je bilo odkrito okno v obliki gobe, ki nam omogoča predstavo velikosti in oblike dejanskega okna (pribl. 45 × 75 cm: Milinković 2010, sl. 227, t. IV: 4). M. Križanac omenja tudi ostanke mavca na nekaterih kosih stekla, ki kažejo na tehniko vstavljanja stekla (Križanac 2009, 276).

Podobno je bilo okensko steklo večinoma v rumenkastih in zelenkastih tonih z ravno odrezanimi, zaobljenimi in oddrobljenimi robovi najdeno v hišah in cerkvi na Vrsenicah v Srbiji (Stamenković 2009, 192–194, t. II).

Okensko steklo je bilo odkrito v velikih količinah na Caričinem gradu. Poleg bolj običajnih svetlih barv so našli tudi temno modre odlomke (Drauschke, Greiff 2010a, 57–58, sl. 4).

Čeprav je okenskemu steklu posvečena zelo različna količina pozornosti v različnih objavah, je iz navedenega jasno, da je bilo široko uporabljano, posebno v cerkvah, pa tudi v drugih stavbah. Najpogosteje so omenjeni rumenkasti in zelen-

kasti odtenci, včasih tudi druge barve. Redko so ohranjeni deli okenskih odprtín ali ostanke mavca kot sredstva za pritrjevanje stekel v odprtine. Oddrobljeni robovi niso pogosto omenjeni, kar pa ne pomeni, da jih ni. Večinoma so opaženi pri podrobnejših analizah, ki pa niso bile vedno izvedene. Tudi ta majhna količina zbranih podatkov kaže, da okensko steklo ni bilo luksuzna dobrina, temveč del običajne opreme poznoantičnih zgradb na obravnavanem prostoru.

ZAKLJUČEK

Na utrjeni višinski naselbini Tonovcov grad pri Kobaridu v zahodni Sloveniji je bilo okensko steklo najdeno v plasteh uporabe in propada poznoantične hiše in cerkvenega sklopa. Zastopani sta dve različni barvi stekla, obe sta naravni barvi stekla in ne rezultat dodajanja barvil. Prva je večinoma rumenkasta, včasih zaide proti zelenkastim ali rjavkastim tonom, druga pa je enotna svetlo zelena. Odlomki kažejo običajne znake tehnike pihanja v cilindar, nekateri kosi so preoblikovani z drobljenjem s steklarskimi kleščami.

V hiši 1 in okrog nje večinoma zeleni fragmenti kažejo na obstoj nekaj verjetno majhnih oken. Steklo je so bilo očitno vstavljeno neposredno v odprtine ali lesene okvirje, saj svinčenih trakov za pritrjevanje niso našli.

V severni in osrednji cerkvi je bilo najdeno rumenkasto steklo, južna cerkev pa je bila zastekljena zeleno, podobno kot večina stekla v hiši 1. V majhnem prostoru med prezbiterijema osrednje in južne cerkve (domnevna memorija) okenskega stekla ni bilo. Najbolj zanimivo odkritje je velika količina razrezanih in oblikovanih geometrijskih oblik (trikotniki in paralelogrami), ki so oblikovali eno ali več oken v ladji osrednje cerkve na Tonovcovem gradu. Predstavljajo zgodnjega prednika vitrajev, ki so jih začeli izdelovati nekaj stoletij kasneje.

Kratek izbor sočasnih najdišč je pokazal, da zastekljena okna niso bila redek pojav v jugovzhodnih Alpah, lahko jih pričakujemo v cerkvah in večini drugih stavb. Kljub temu je bilo eno ali več oken z oblikovanimi vzorci presenečenje. Čeprav vzorca ne moremo rekonstruirati, nam govori o tem, da so osvetlitvi notranjosti posvetili posebno pozornost in da so iskali določen učinek. Rumenkasta stekla so bila verjetno narejena iz enake steklene mase Levantine I, kot je bila uporabljena za posodje, kar govori o skupni oskrbi ali lokalni delavnici.

Rumenkasto in zeleno steklo sta bili uporabljani sočasno, videti je, da sta bili obe masi dosegljivi za časa gradnje hiše 1 in cerkva.

Zgodnjih prednikov vitrajev ni bilo najdenih dovolj, da bi lahko presodili, ali je takšno okno na Tonovcovem gradu posebnost ali je bilo običajno za ta čas. Privlačna je ideja, da bi v tem videli nekaj posebnega, saj Tonovcov grad vidimo kot cerkveni center, vendar bo treba analizirati več najdišč, preden bomo lahko naredili tak zaključek. Kakor koli že, sredozemska oskrba z oljem in vinom ter podatki o levantskem in egipčanskem steklu za posodje in svetilke so bili med prvimi znaki, ki so začeli spreminjati podobo višinskih naselbin

od pribežališč do samooskrbnih vasi ter končno do nečesa že blizu majhnim mestom (Ciglenečki 2011). Okensko steklo še naprej osvetljuje bivalno kulturo pozne antike.

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