

THIRTEEN-HUNDRED-YEAR-OLD BEAD ADORNMENTS FROM BAAR, CANTON ZUG, SWITZERLAND¹

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Translated by Sandy Hämmerle

I am not a person.
I am a succession of persons
Held together by memory.

When the string breaks,
The beads scatter. —Lindley Williams Hubbell

In the year 2000, an Early Medieval (7th-century) cemetery containing more than 200 burials with rich grave goods was discovered in Baar, Canton Zug, Switzerland. Thanks to the painstaking methods used in the excavation and recording of the 2,985 glass, amber, coral, and amethyst beads found with the female burials, it was possible to reconstruct the necklaces and sewn-on appliquéés they were part of. Comparisons with mosaic depictions of famous women—such as the Empress Theodora in San Vitale in Ravenna, Italy—suggest that the people of Baar imitated southern Alpine Byzantine bead jewelry fashion.

INTRODUCTION

In the year 2000, the Archaeology Department of Canton Zug carried out a rescue excavation at Früebergstrasse in Baar, which uncovered an Early Medieval cemetery containing more than 200 burials (Hochuli and Müller 2003:29-33; Hochuli and Röder 2001; Müller 2003, 2005, n.d.). Men, women, and children had been interred there over the course of approximately 100 years, from the late 6th century to the late 7th or early 8th century. It was the custom at the time to place offerings in the graves with the deceased. With few exceptions, these grave goods were gender-specific. Women and girls were mainly accompanied by adornments, while men and boys primarily had weapons interred with them. Besides ear, arm, and finger rings, the adornments placed with the women and girls included beads.

The Baar-Früebergstrasse cemetery produced 3,024 beads made of glass, amber, and coral, as well as a single

amethyst bead. Of these, 2,985 beads were found in the graves themselves, while the remainder were stray finds from disturbed or robbed burials. Despite the fact that grave robbing was punishable by law with the imposition of fines (Nehlsen 1978:127-129)—as documented, for instance, in the *Pactus Alamannorum* and the *Lex Alamannorum*—it was widespread in Early Medieval times, and also took place at Baar-Früebergstrasse.

METHODS OF EXCAVATION AND RECORDING

The Baar-Früebergstrasse cemetery was meticulously excavated and the findings were recorded to a very high standard. Contrary to what had been the norm for a long time in Early Medieval archaeological research, the features and finds assemblages and not the individual finds were at the center of the investigation. This focal point was also maintained during the post-excavation work in the finds laboratory and in subsequent conservation/restoration work. Consequently, it is the context details from the Baar-Früebergstrasse cemetery that hold the greatest potential for research. The beads, found in assemblages and clusters of individual beads, especially bear this out.

In order to gain as much information as possible, the beads were carefully exposed (Pl. IIIA). Where necessary, this was done in several stages. In addition, the soil from the area around the skeleton was wet-sieved using a series of sieves down to a mesh size of 1 mm. The exposed bead assemblages were then photographed in overview and in detail.

The location and shape of the beads within each assemblage were recorded on transparent film at a scale of 1:1. After being pre-cleaned, each bead was given an excavation, burial, bead assemblage, and find number (Fig. 1). The latter was also recorded on the assemblage plan. The beads were subsequently properly cleaned in the laboratory and, where necessary, strengthened, and then inventoried.



Figure 1. Baar-Früebergstrasse cemetery, Burial 41. Each bead is cleaned before it is given its specific find number and packed in a plastic bag. The bead assemblage is drawn at a scale of 1:1 (Photo: Markus Bolli, Archaeology Department of Canton Zug).

BEADS – SMALL BUT MIGHTY!

Even a single bead can provide information about trade, and production procedures and techniques. Chemical analyses² carried out on three, small, yellow glass beads from Burial 40 at Baar-Früebergstrasse revealed that they were made of soda-lime glass, also called lime-natron glass, which has as its main components sand (SiO_2), lime (CaO), and soda (Na_2O).³ This was the predominant type of glass throughout Europe from around 900 B.C. into the Middle Ages (Heck 2000:3-6, 13-15, 89-92). To date, no evidence has come to light that would point to the production of soda-lime glass in Early Medieval Europe. It is assumed, therefore, that production took place in the Near East, probably in what is now Israel and Egypt, and that the raw glass was exported to Europe (Heck 2000:150; Sasse and Theune 2003:578).

The raw material for the amber beads found at Baar-Früebergstrasse was also imported, in this case from the Baltic area.⁴ The origin of the amethyst bead found with female Burial 86 cannot be determined through scientific analysis. There are amethyst deposits in almost every country

and because it is not an expensive gem—and therefore does not warrant provenancing in the eyes of the gem-working industry—provenance data are lacking.⁵ Based on texts by Early Medieval authors such as Isidore of Sevilla or Cosmas Indicopleustes, there are many potential regions of origin, including India, Arabia, Lesser Armenia, Egypt, Galatia, Thasos, and Cyprus (Lennartz 2001:272).

It will probably never be determined where the coral for the beads in five of the burials came from. This is because the two morphological characteristics that are most important in identifying corals (concentric growth rings and polyp indentations [Zwicky-Sobczyk 2002:225]) were largely destroyed when the perforations were drilled followed by deterioration in the soil. One may reasonably assume, however, that the corals were imported from the Mediterranean region.

The analyses conducted on the yellow glass beads from Burial 40 also revealed the metallic oxides used to color the glass.⁶ The yellow pigment was created using tin oxide (SnO_2) and lead stannate (PbSnO_3) extracted from lead oxide (PbO).⁷ Lead oxide is a waste product resulting

from silver production, which suggests close links between metal processing and glass-bead production (Matthes et al. 2004:133-134).⁸ The closest evidence geographically for the production of lead/tin-yellow has been provided by a crucible fragment with yellow glass paste adhering to it that was discovered in the Early Medieval settlement of Schleithem-Brüel in Canton Schaffhausen. This site also yielded evidence for the production of yellow glass beads (Heck, Rehren, and Hoffmann 2002). A planned analysis may reveal whether the small yellow glass beads from Burial 40 at Baar-Früebergstrasse—or at least the yellow glass paste used to make them—were produced in the glassworks at Schleithem-Brüel.

Visible traces on the glass beads and investigations carried out using experimental archaeology (Gam 1992; Gam Aschenbrenner 1997) allowed us to reconstruct the manufacturing process. Viscous glass was wound around a conical, sometimes square-sectioned, iron rod. This is revealed by the shape of the perforation and the blackish coating on its surface that consists of iron oxide, probably magnetite (Fe₃O₄).⁹ The separating agent used may have been salt,¹⁰ which leaches out when the beads are buried in the ground and, therefore, can no longer be detected. While still hot, the bead was then shaped and decorated with one or more differently colored glass strands. In many cases, the wound glass thread can still be seen very clearly and overlapping decorative elements allow us to reconstruct the various steps in the application of the decoration. This basic process is still used in glass bead production today and can be observed, for example, in glass bead workshops in Turkey (Gebhard 1996:21; Sode 1997).

À LA MODE

The Baar-Früebergstrasse cemetery produced 161 different types of glass beads: monochrome, opaque and transparent, and multi-colored opaque in various shapes and colors (Müller 2003).¹¹ While some glass bead types were used over a long period of time and by several generations, the composition of bead assemblages changed continuously over time. New fashionable beads were added, while old-fashioned types were discarded. Presently, Early Medieval bead fashion can be dated with an accuracy of approximately 30 years (Reich 2002; Siegmann 2003; Theune 1999), which roughly corresponds to one generation. Due to the fact that bead assemblages were placed in the graves at one particular moment in time, these assemblages are time capsules and as such are well suited for dating purposes. Bead assemblages are often the only feature in Early

Medieval burials of women and girls that are suitable for detailed chronological analyses.

Bead assemblages were found in 48 women's and 9 girls' graves at Baar-Früebergstrasse. Four of these assemblages are described here. The excavation photographs show the *in situ* context and the location of the beads in relation to the skeleton (e.g., Fig. 2; Pl. IIIA). The reference numbers of the beads have been added to the drawings (e.g., Pl. IIIB). The drawn reconstruction reflects the location of the beads in the grave and as such shows how the beads were placed on the body of the deceased. This does not necessarily correspond with the way the woman wore the beads when she was still alive.

The threads of the beaded adornments and the textiles to which beads were sewn have decayed over the course of the past 1,300 years in the seasonally flooded Baar soil. In these conditions, organic substances are usually only preserved in conjunction with metal objects; when metals corrode in the ground, they release metal salt solutions which coat and permeate the organic material and thus preserve it in a mineralized state. Bead threads made of linen and wool have been found at other Early Medieval cemeteries where there were better preservation conditions (Lehmann 2003; Siegmann 2005:853).¹²

NECKLACE COLOR SEQUENCE AND SYMMETRY

Burial 10

The girl designated Burial 10 was four and a half to five and a half years old when she died between A.D. 600/610 and 630/640. The accompanying grave goods included a belt with an iron buckle, a broken iron knife with an ash-wood handle, and a toilet set with an ear scoop and a fingernail cleaner. She wore a broken bronze ring on her left ring finger. Twelve glass and six amber beads were located in the area of her chest (Figs. 2-3).

Despite the fact that some of the beads had shifted slightly, their original pattern could still be reconstructed conclusively (Pl. IIIB). The beads were threaded at a distance of approximately 0.5 cm from each other and formed a semicircle. No beads were found in the area of the neck. The location suggests that it represents a single-strand necklace, on which the beads were probably secured by a knot on either side of each bead. Thus only a single bead would be lost if the thread broke.¹³ It is, however, possible that beads made of organic materials such as wood or leather were placed between the glass and amber beads, but have not survived.¹⁴ The color sequence of the beads



Figure 2. Baar-Früebergstrasse cemetery, Burial 10. The glass and amber beads *in situ* (Photo: Christine Allisson, Archaeology Department of Canton Zug).

is not coincidental; one can identify a repeated pattern of color: amber/red/blue. The composition of the necklace also shows that the color of the beads was more important than their shape. One probably did not have too many beads of the same type at one's disposal.

Burial 40

Burial 40 was a woman between 60 and 69 years of age when she died between A.D. 600/610 and 630/640. Her grave was robbed in Early Medieval times. Nevertheless, it still contained an iron belt buckle with preserved leather remains, an iron knife with an ash-wood handle, a small iron bar, 54 glass beads, and one amber bead. The beads were located close together between the collar bone and the lower jaw in two clearly visible rows on either side of a central amber spacer bead (Fig. 4; Pls. IVA-IVB). It is remarkable that the beads had not shifted and that the two strands were found in the grave in an almost horizontal position. The necklace shows color symmetry. The green beads in the

upper row and the sequence of colors (red/red/white/red/red) in the bottom row are mirrored in the two halves.

How the beads were worn remains problematic. Had these beads been worn as a necklace¹⁵ (Fig. 5), it is likely that they would have shifted when placed in a horizontal position; i.e., when the deceased was laid to rest (Fig. 6). Assuming, however, that the bead necklace was attached to a garment with a few stitches (Fig. 7), the location of the beads would correspond very well with the situation found in the excavation¹⁶ (Fig. 8). This would suggest that the bead strands were sewn to a dress or some other garment, but this is by no means certain.

Burial 134

The woman designated as Burial 134 also died between A.D. 600/610 and 630/640. She lived to be between 34 and 40 years of age. The burial was already disturbed in Early Medieval times and the grave goods removed. This



Figure 3. Drawing showing the placement of the beads in Burial 10 (Drawing: Eva Kläui, Archaeology Department of Canton Zug).

probably took place when the grave was opened in order to bury another woman (Burial 110) above Burial 134. Was this done by the woman's own relatives who were retrieving grave offerings? The iron belt buckle with remains of a leather belt and 89 glass and 11 amber beads were the only goods that remained.

The 100 beads lay in the area encompassed by the sternum, the lower jaw, and the right and left shoulders (Fig. 9; Pl. VA). As in Burial 40, two rows of beads are situated to the right and left of a central glass bead. The distance between the beads measures approximately 0.5 cm. In addition, there is a single row of beads in close proximity. It is believed that two necklaces are represented: a two-strand example of glass beads with a red double-bead in the center serving as a spacer, and another composed of a single strand of glass and amber beads (Pl. VB). The beads of the double-strand necklace seem to have been secured on the thread by knots on either side of each bead, as in Burial 10. While the composition of the necklace is based on color symmetry, there is a small mistake as the color in beads nos. 9 and 37 does not correspond. Is it that glass beads were too hard to obtain or very expensive? The glass and amber necklace also shows a more-or-less symmetrical design. Two color sequences can be distinguished: amber/orange and amber/orange/red.

As with Burial 40, the two rows of beads of the double-row necklace and the central portion of the glass and amber bead necklace are placed almost horizontally. Here too, the bead necklaces seem to have been arranged very carefully in the chest area and were probably secured to the dress with



Figure 4. The disposition of the glass and amber beads in Burial 40 (Drawing: Eva Kläui, Archaeology Department of Canton Zug).

a few stitches. This would have meant that the necklaces could easily be seen when the body was laid out and maybe also when it was placed in the grave.

BYZANTINE BEAD ADORNMENTS IN EARLY MEDIEVAL BAAR?

The woman in Burial 76 was 20 to 25 years old when she died sometime between A.D. 630/640 and 660/670. With the exception of the area around the head, the entire grave was robbed in Early Medieval times. The remaining grave goods suggest that it was a lucrative enterprise for grave robbers. Besides two fragments of an iron belt buckle, a fragmented iron ring, and 126 glass beads, two silver basket earrings remained in the grave. The earrings are northern Alpine imitations of Byzantine basket earrings (Fingerlin 1974).¹⁷

The 126 glass beads were located in the area encompassed by the lower jaw, the sternum, and the right and left shoulders (Fig. 10; Pl. VIA). In the left chest area, the beads were almost in their original position. Here, the larger beads formed a net-like pattern. The distance between the beads measured approximately 2 cm. The spaces in between were filled with small green and yellow glass beads, some of which had already decayed. Based on the location of each bead and its relation to the other beads, it was possible to reconstruct a netted weave of beads, which is based on principles of color symmetry (Pl. VIB). The beads could either have been strung on threads or they could have been sewn onto the textile base or applied in sections. Either way,



Figure 5. Simulation of the double-strand necklace with Burial 40 worn as a necklace in life (Photo: Katharina Müller, Archaeology Department of Canton Zug).

the reconstruction results in some kind of beaded collar. Similar beaded collars, so-called superhumeral or jewelled collars, are found in Early Medieval depictions of famous women from the 5th to the 10th century (Reich 2002:262-265; Schulze 1976). For example, Mary at the Annunciation and the Pharaoh's Daughter on the Occasion of Moses' Adoption depicted on the triumphal arch and in the nave of the Santa Maria Maggiore Basilica in Rome (A.D. 432-440) are both shown wearing such a collar (Karpp 1966:Color Pls. 6, 85). The Byzantine Empress Theodora is also adorned with a jewelled collar on the mosaic in San Vitale in Ravenna dated to around A.D. 547 (Bertelli 1989:80-81). The beaded collar from Burial 76 at Baar-Früebergstrasse and the jewelled collar worn by St. Agnes (Fig. 11) in the apse mosaic in the Sant'Agnese fuori le mura church in Rome (A.D. 625-638) are contemporaneous, so to speak. Of course, the beaded collar of the woman interred in Burial 76 at Baar-Früebergstrasse was not fitted with gemstones and precious metals.¹⁸ It may, nonetheless, be an attempt at imitating Byzantine fashion, not only in relation to the earrings mentioned earlier but also in regards to beaded adornments.

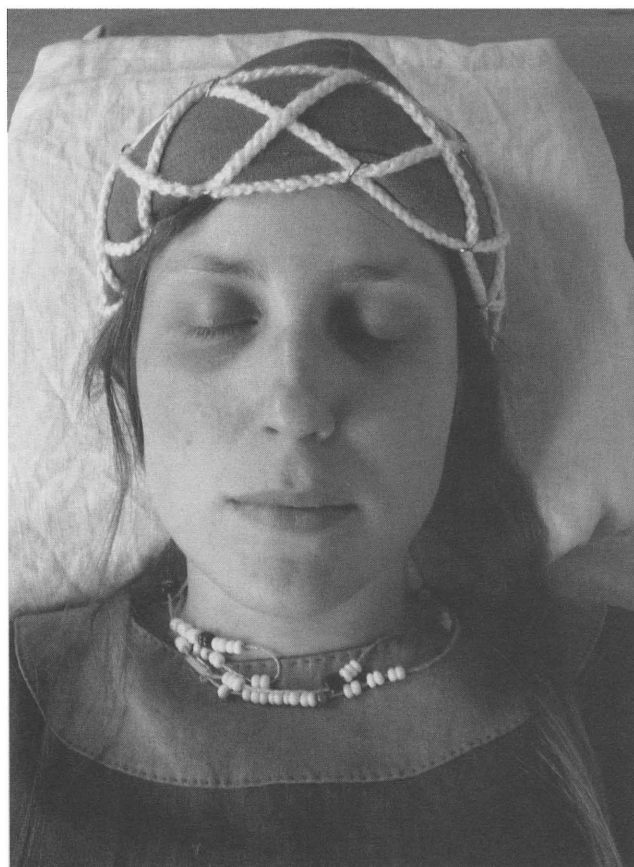


Figure 6. The simulated necklace in Burial 40 as it would appear when the body was placed in the grave (Photo: Katharina Müller, Archaeology Department of Canton Zug).

CONCLUSION

The four examples of Early Medieval beaded adornment described above reveal that there was quite a variation in the beaded ornaments of the period, provided one looks closely. As adornment is always a means of nonverbal communication, it seems an obvious conclusion to assume social differences to have been behind these variations. In order to support this, a large body of evidence is needed. Bead assemblages are rarely excavated, recorded, and published in a manner that would allow one to take the work a step further.¹⁹ This is unfortunate, as the decipherment of detailed evidence is very rewarding and, even after 1,300 years, it can still provide insight into the lives of the people of yesteryear.

ENDNOTES

1. A German version of this article will be published in *Tugium* 23 (2007). *Tugium* comprises the annual reviews



Figure 7. The bead strands from Burial 40 as they would appear if sewn to a garment in life (Photo: Katharina Müller, Archaeology Department of Canton Zug).

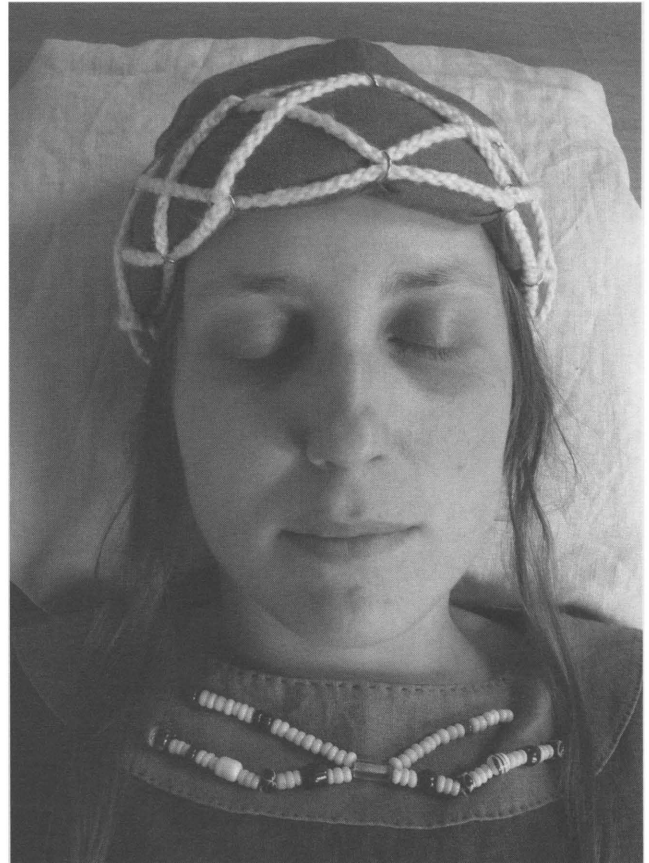


Figure 8. The bead strands from Burial 40 as they would appear in the grave if sewn to a garment (Photo: Katharina Müller, Archaeology Department of Canton Zug).

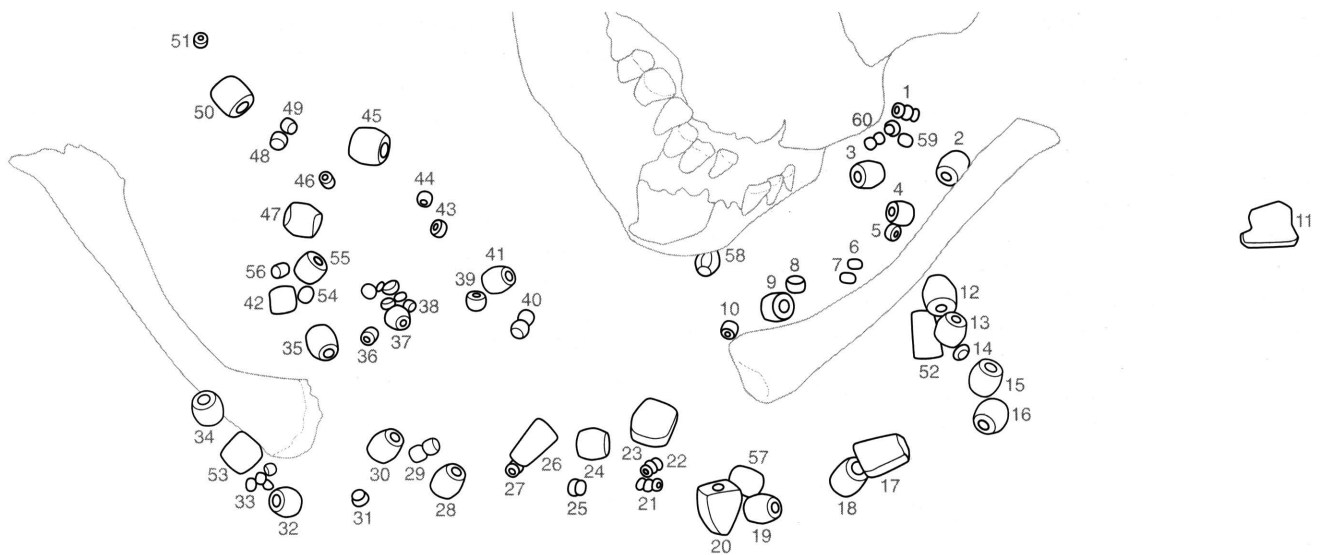


Figure 9. The disposition of the glass and amber beads in Burial 134 (Drawing: Eva Kläui, Archaeology Department of Canton Zug).

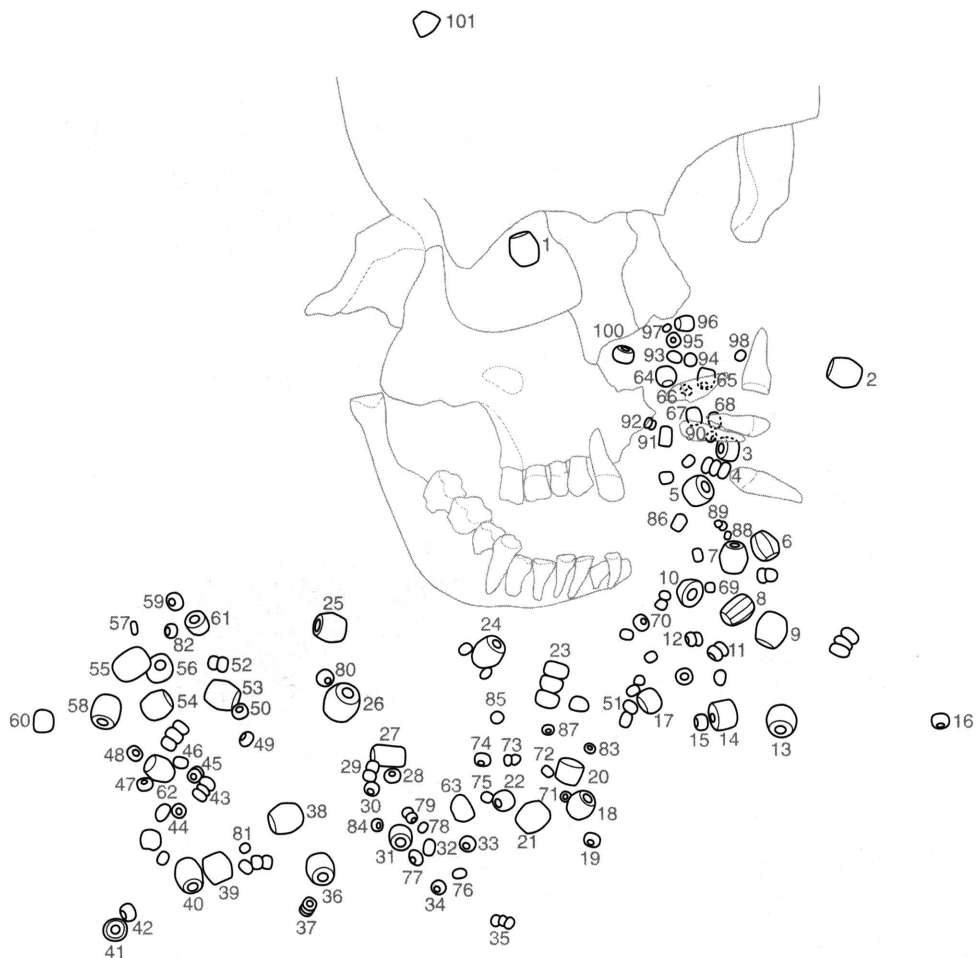


Figure 10. The disposition of the glass and amber beads in Burial 76 (Drawing: Eva Kläui, Archaeology Department of Canton Zug).

2. I would like to extend my gratitude to Peter Hoffmann of the Technical University Darmstadt, Material- and Geo-Sciences, Chemical Analytics, for his interest and for the glass analyses.
3. The composition of the glass is $73\pm 5\%$ SiO_2 , $6\pm 2\%$ CaO , and $14.5\pm 2\%$ Na_2O .
4. I would like to extend my gratitude to Gerhard Heck from the Rathgen Research Laboratory at the Berlin State Museums for sourcing the material. Contrary to the results published in Horisberger, Müller, Cueni, and Rast-Eicher (2004:186), an amber bead from Burial 59 at Baar-Zugerstrasse was also identified as Baltic amber when it was re-analyzed by Gerhard Heck.
5. Personal communication from Henry A. Hänni, Swiss Gemmological Institute, Gemstone Testing, Basel.
6. The analyses were carried out by Peter Hoffmann, Technical University Darmstadt, Material- and Geo-Sciences, Chemical Analytics.
7. The composition of the pigmenting agents is $8\pm 2\%$ SnO_2 and $92\pm 2\%$ PbO .
8. The Early Medieval settlement of Schleithem-Brüel SH yielded a silver ingot and a fragment of a crucible with yellow glass paste and a silver granule (Höneisen 2002:29-30, Figs. 16 and 30; Heck, Rehren, and Hoffmann 2002:Figs. 23 and 37).
9. Personal communication from Peter Hoffmann, Technical University Darmstadt, Material- and Geo-Sciences, Chemical Analytics.



Figure 11. St. Agnes depicted wearing the garments of a Byzantine princess. Detail of the apse mosaic in the Sant' Agnese fuori le mura church in Rome, A.D. 625–638 (Bertelli 1989:88).

10. At Görece Köy and Kemalpaşa, located outside Izmir, Turkey, rock salt is used in glass bead manufacture as a separating agent (Sode 1997:321).
11. The forthcoming monograph on the Early Medieval cemetery of Baar-Früebergstrasse (Müller n.d.) will list descriptions and contain watercolor illustrations at

a scale of 1:1 of all the bead types, sorted according to typology.

12. Personal communication from Antoinette Rast-Eicher, Organic Materials Specialist, ArcheoTex, Ennenda GL.
13. I am grateful to Trix Schmid Voney, cultural anthropologist and staff member of the Archaeology Department of Canton Zug, for this suggestion.
14. I am grateful to Gishan F. Schaeren, archaeologist and staff member of the Archaeology Department of Canton Zug, for this suggestion.
15. The dress, bonnet, and bead necklace were made with Early Medieval examples in mind as a commissioned work by the Museum for Prehistory Zug as part of its clothes project "Didactic Module for Pre- and Protohistoric Clothes" (working title). The model is Emanuela Jochum Zimmermann.
16. My thanks to Kathrin Schächli Andelfingen and Emanuela Jochum Zimmermann of Zurich for the stimulating discussions as to how the beads may have been worn.
17. See the catalogue of "genuine" basket earrings in Italy published by E. Possenti (1994).
18. Yvonne Reich (2002:264-265) mentions several examples of northern Alpine necklaces with gold pendants which could be seen as imitations of neck ornaments, the jewelled collars worn by the ladies at the Byzantine court in particular.
19. Some exceptions are Siegmund (2005), Reich (2002), Amrein, Rast-Eicher, and Windler (1999), and Geisler (1998).

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