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New Evidence about Roman Glass Production in *Celeia* (Noricum)

by IRENA LAZAR

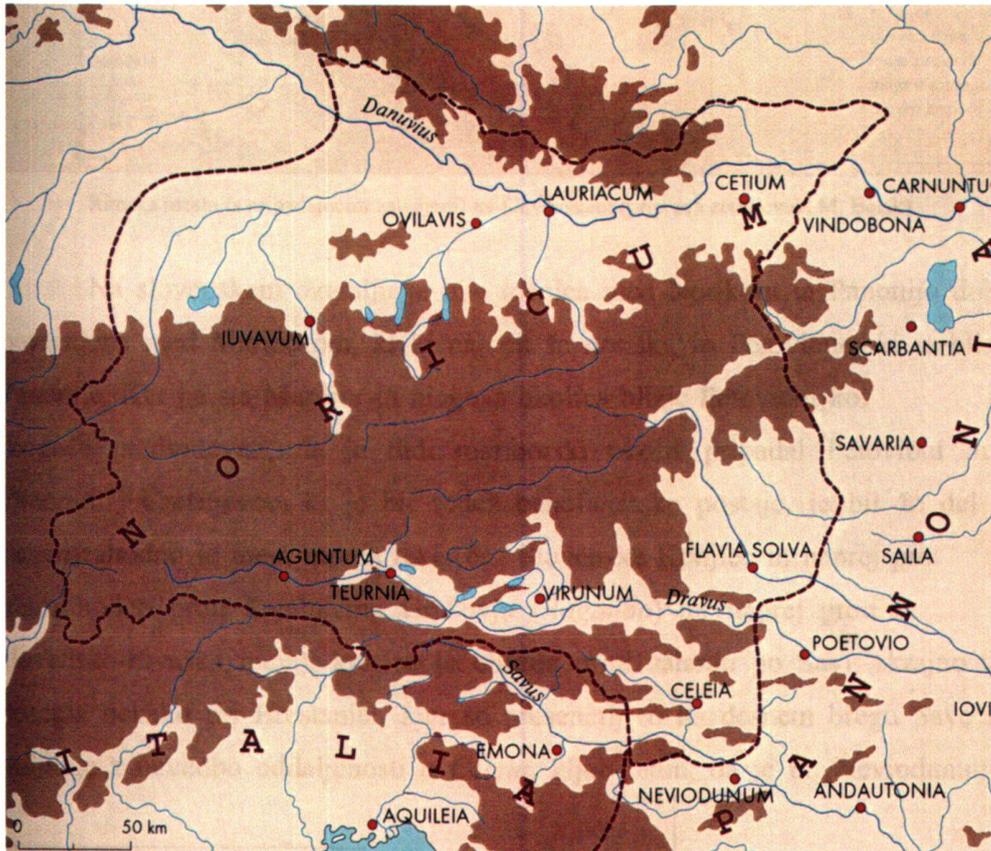


Fig. 1 Map of Slovenia and neighbouring areas in the Roman period.

Proof of the production of glass in Celeia was first discovered during excavations in Levstikova Street in 1991–92.¹ A major concentration of fragments of raw amorphous glass and a large quantity of glass waste and broken vessels were found in an area of some 30 square meters just along the northern edge of the late Roman town wall.

Despite careful work, no elements were discovered in the excavated area that could be determined as the remains of

glass furnaces. Only few fragments of clay or brick with thick layer of melted glass gave evidence about the existence of a glass furnace. As these were rescue excavations, where the size of the excavated area was limited to the dimensions of the construction pit, it is considered that it will be possible to excavate the site completely in the future.

The study of the excavated material confirmed that glass workers were active in this part of the city. The quantity of

the excavated glass material was considerable, and the remains of raw glass and glass waste weighed several kilograms. The discovered pieces of raw glass were blue-green and decolourised. The amount of blue-green raw glass predominates and the largest were from 2 to 3 cm thick, which confirms that in the workshop larger pieces of raw glass or glass ingots were used for melting and blowing. The pieces of decolourised raw glass were smaller and some of them

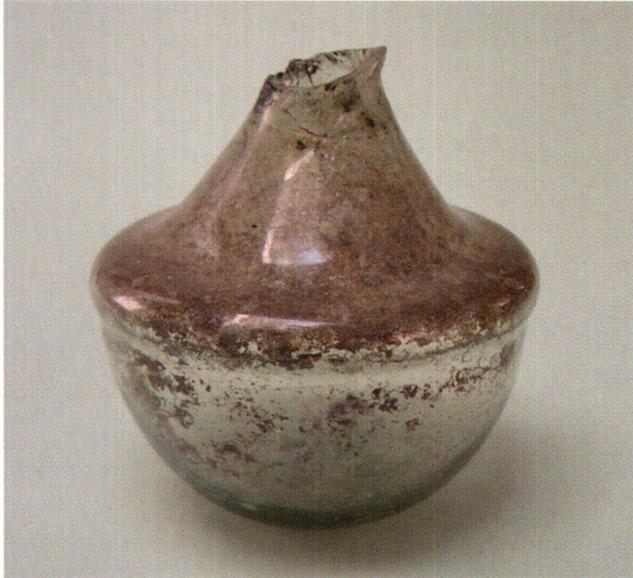


Fig. 2 Unfinished bowl, added in a late Roman grave.

tacts of the glass makers from Celeia spread all over the municipal territory of the town.

Fragments of violet coloured vessels are also very interesting (PMC, inv. no. R 21562–65). This colour is created by adding manganese oxides to the glass. Roman glass workers also used manganese for decolouring glass, neutralizing the iron oxides to acquire an entirely decolourised glass.⁵ Is it possible that a mistake was made in the process of

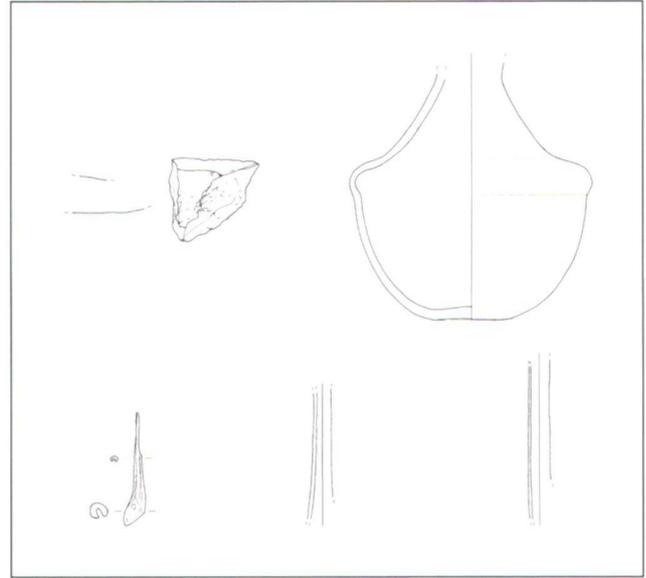


Fig. 3 Drawing of the unfinished bowl (3.1) and two glass tubes (3.2, 3).

had the remains of a clay on the surface which led us to the conclusion that this are the rests of the melting pots.

Various waste in the form of drops, threads, and chips of melted glass show that at this site glass was melted, its viscosity was tested, and it was worked. Direct evidence for blowing and the manufacture of glass vessels are the remains of poorly worked and rejected vessels, handles, and rods of bent glass,² from which the handles of vessels were formed. Pontil marks on the bases of balsamaria and several beakers confirm the use of metal rods – pontils – in addition to the blowing pipe.

The rejected glass products on the site included many fragments of cylindrical beakers of decolourised glass,³ which were almost certainly produced in this workshop. Comparative material was excavated in 1995 at the site of a Roman tile factory operating in the second half of the 2nd century.⁴ Numerous cylindrical beakers made of decolourised glass, with the same form of a rim and base were found there and we may assume that the market and trade con-

decolourising, and that they had to manufacture few products in a violet colour in order not to discard the already melted and prepared glass?

The other fragments of glass vessels that were discovered in Levstikova Street belonged to various forms, including pieces of mosaic glass, ribbed bowls, square bottles with base marks, and glass with applied snake-thread decoration,⁶ so far rather rare amongst our glass material. If the earliest forms are considered to represent glass for recycling, production at this workshop can be assigned to the 2nd as well as to the 3rd century. Such a dating is also based on the depth of the stratum in which the remains were discovered, as it lay beneath the level of the late Roman walls, dated about the end of the 3rd century.

New excavations in 2003–2004, somewhat to the north of the area excavated in 1992, brought to light new elements, that confirm the existence of a glassworking site in this part of the town. An unfinished glass bowl in a late Roman grave (Fig. 2 and 3.1), glass rods (Fig. 3.2, 3) and fragments

of waste should be singled out. Two glass rods are particularly intriguing, because they don't belong to a glass vessel. They are straight, small and quite thinly blown. Similar glass rods are known from two other sites in Slovenia. One was excavated in Ptuj / *Poetovio*⁷ where the glass workshops operated in the 2nd and 3rd century⁸ and the second one in Slovenj Gradec / *Colatio*.⁹ Is it possible that this glass tubes are part of a glassworking process or even of a glassblowing?

The unfinished bowl was added in a grave dated to the 3rd or beginning of the 4th century. The upper part of the vessel, a hemispherical bowl, was not yet cut off. The product is rather thick and we may assume that it was part of a vessel form Isings 96b.¹⁰ The base of the vessel is flat and slightly concave in the center, rim was probably slightly stepped.

The form is dated to the 3rd century onward although some individual finds are known also from the end of the 2nd century.¹¹ In Slovenia this vessels appear in the 3rd and the 4th centuries.¹² The product prove that the glassworkshops in Celeia operated in the 3rd century but perhaps also at the beginning of the 4th century.

The position of the Celje glass workshop should be mentioned in conclusion. In Roman towns, all crafts that involved the use of fires and kilns or furnaces were usually located on the outskirts, as far as possible from the residential buildings. The glass workers of Celeia also sought their space on the northern edge of the town, somewhat away from the densely settled center, and near both the roads and the river, which then represented an important transportation route.

NOTES

- ¹ IRENA LAZAR, *Sledovi rimske steklarske proizvodnje i Celeji* in: Celjski zbornik 1993, p. 7.
- ² IRENA LAZAR, *Rimsko steklo Slovenije / The Roman Glass of Slovenia* (= Opera Instituti Archaeologici Sloveniae 7), Ljubljana 2003, fig. 57: 4, 5, 7.
- ³ IRENA LAZAR (cf. note 2), form 3.6.1.; 3.6.2.
- ⁴ IRENA LAZAR, *Ilovica pri Vranskem* (= Arheologija na avtocestah Slovenije 1), Ljubljana 2006, p. 70, 75, no. 8–11.
- ⁵ BRUCE VELDE / ANNE HOCHULI GYSEL, *Correlations between Antimony, Manganese and Iron content in Gallo-roman glass* (= Annales du 13e Congrès de l'AIHV 1995), Lochem 1996, p. 185.
- ⁶ IRENA LAZAR (cf. note 1), pl. 1–3.
- ⁷ PAOLA KOROŠEC, *The remains of a glassworkshop at Rabelčja vas in Ptuj*, in: IRENA LAZAR (ed.) *Fragments of ancient glass* (= Annales Mediterranea), Koper 2004, p. 68, fig. 1.
- ⁸ IRENA LAZAR, *Roman Glass production in Slovenia* (= Annales de l'Association Internationale pour l'Histoire du Verre 2001), Nottingham 2003, S.79.
- ⁹ SAŠA DJURA JELENKO, *Dr. Hans Winkler in njegov prispevek k arheologiji Mislinjske doline* (= Koroški pokrajinski muzej Slovenj Gradec), Slovenj Gradec 2004, p. 106, pl. 38: 286.
- ¹⁰ CLASINA ISINGS, *Roman Glass from Dated Finds* (= Archaeologica Traiectina 2), Groningen 1957, p. 113. – BEAT RÜTTI, *Die römischen Gläser aus Augst und Kaiseraugst* (= Forschungen in Augst 13/1–2), Augst 1991, p. 95, AR 6. – IRENA LAZAR (cf. note 2), p. 83, form 2. 6. 2.
- ¹¹ BEAT RÜTTI (cf. note 10), p. 95.
- ¹² IRENA LAZAR (cf. note 2), p. 84.

PHOTO CREDIT

Fig. 1: After Visočnik 2007.

Fig. 2: Andreja Izlakar.

SUMMARY

Evidence of glass production in *Celeia* was first discovered during excavations in 1991–92. The quantity of the glass material was considerable. Raw blue-green glass predominated and the largest pieces were 2 to 3 cm thick. Various waste in the form of drops, threads, chips of melted glass and poorly worked vessels shows that glass was melted, tested and worked. The waste of cylindrical beakers of decolourised glass prove they were produced in this workshop. Comparative material was excavated in 1995 at the site of a tile factory from the 2nd century. The market of the glass makers from *Celeia* thus extended all over the municipal territory. New excavations in 2003–2004 confirmed the existence of a glass workshop, in particular findings of an unfinished glass bowl (Fig. 2), glass rods (Fig. 3: 2, 3) and fragments of waste. Similar glass rods are known from other sites in Slovenia: Ptuj / *Poetovio* and Slovenj Gradec / *Colatio*. Is it possible that these glass tubes are part of a glass making process or even of glass blowing? The unfinished bowl was added to a grave dated to the 3rd or beginning of the 4th century. It is rather thick and it was part of a vessel form Isings 96b. The product proves that the glass workshops in *Celeia* were still in operation in the 3rd and perhaps even at the beginning of the 4th century.

ZUSAMMENFASSUNG

Erste Hinweise auf die Glasproduktion in *Celeia* ergaben sich anlässlich der Grabungen von 1991–92, bei denen bedeutende Mengen von Glas gefunden wurden, vorwiegend blau-grünes Rohglas, dessen grösste Stücke Stärken zwischen 2 und 3 cm aufwiesen. Verschiedene Abfallstücke in Form von Tropfen, Fäden, Plättchen und fehlerhaft verarbeiteten Gefässen deuten darauf hin, dass in den Schmelzöfen Glas geprüft und bearbeitet wurde. Der Ausschuss von zylindrischen Bechern und unkoloriertem Glas beweist, dass die Objekte in dieser Werkstatt hergestellt wurde. Vergleichsmaterial wurde 1995 am Ort einer Ziegelei aus dem 2. Jahrhundert n. Chr. gefunden. Das Absatzgebiet der Glaser von *Celeia* erstreckte sich über das ganze Territorium der Stadt. Neue Grabungen in den Jahren 2003–2004 bestätigten das Vorhandensein einer Glashütte anhand der Funde einer unvollendeten Glasschale, von Glasstäben und Teilstücken von Ausschussware. Ähnliche Glasstäbe sind aus anderen Fundorten von Slowenien bekannt: Ptuj / *Poetovio* und Slovenj Gradec / *Colatio*. Ist es möglich, dass diese Glasröhren Bestandteil eines Herstellungsprozesses oder gar Fragmente von Glasbläserrohren sind? Die nicht fertig bearbeitete Schale fand sich als Beigabe in einem Grab, das ins 3. oder frühe 4. Jahrhundert zu datieren ist. Eher dickwandig war sie Teil einer Gefässform Isings 96b. Mit diesem Werkstück lässt sich nachweisen, dass die Glashütten in *Celeia* noch im 3., vielleicht auch am Anfang des 4. Jahrhunderts tätig waren.

RÉSUMÉ

Les premières traces certaines du travail du verre à *Celeia* ont été découvertes lors de fouilles menées en 1991–1992, qui ont livré une quantité considérable d'objets en verre. Le verre brut bleu-vert prédomine et les pièces les plus grandes présentent une épaisseur de 2 à 3 cm. Plusieurs déchets de fabrication sous forme de gouttes, filaments, éclats de verre fondu et récipients de moindre qualité montrent que le verre était fondu, contrôlé et travaillé. Les déchets de fabrication provenant de gobelets cylindriques en verre décoloré démontrent que ces derniers avaient été produits dans cet atelier. Du matériel comparable a été mis au jour lors de fouilles menées en 1995 à l'emplacement d'une tuilerie datant du II^e siècle. Les verriers de *Celeia* vendaient donc leurs produits dans tout le territoire du municipe. De nouvelles fouilles, réalisées en 2003–2004, ont confirmé l'existence d'un atelier de verrier. Une coupe en verre inachevée (fig. 2), des baguettes en verre (fig. 3: 2, 3) et des fragments de déchets se distinguent tout particulièrement. D'autres sites de Slovénie, tels que Ptuj (*Poetovio*) et Slovenj Gradec (*Colatio*), ont livré des baguettes en verre semblables. Peut-on envisager que ces baguettes soient le résultat d'un mode de fabrication, voire de soufflage du verre? La coupe inachevée avait été déposée dans une tombe datant du III^e ou du début du IV^e siècle. Elle présente des parois plutôt épaisses et appartient à la forme Isings 96b. Ce récipient prouve que les ateliers de verriers ont continué à exercer leur activité à *Celeia* au III^e, mais peut-être aussi au début du IV^e siècle.

RIASSUNTO

Le prove della produzione di vetro a *Celeia* furono rinvenute per la prima volta durante gli scavi eseguiti nel biennio 1991–92. In tale ambito è stata recuperata una considerevole quantità di materiale in vetro. I frammenti predominanti sono quelli in vetro grezzo verde blu, di cui i pezzi più grandi hanno uno spessore da 2 a 3 cm. Diversi frammenti a forma di goccia, schegge di vetro fuso o recipienti lavorati male provano la presenza di una struttura in cui il vetro veniva fuso, testato e lavorato. Che il sito servisse alla lavorazione del vetro è provato anche dal ritrovamento di residui di bicchieri cilindrici di vetro incolore. Materiale analogo è stato portato alla luce nel 1995 sul sito di una fabbrica di laterizi risalente al II secolo. I vetrai di *Celia* vendevano i loro prodotti sull'intero territorio della municipalità. Nuovi scavi condotti nel 2003–2004 hanno poi confermato l'esistenza di una vetreria. Fra i reperti ritrovati vanno citati una coppa di vetro non completata (fig. 2), alcune bacchette di vetro (fig. 3: 2, 3) e frammenti di vetro residuo. Bacchette di vetro simili sono state ritrovate anche in altri siti sloveni: Ptuj / *Poetovio* e Slovenj Gradec / *Colatio*. È possibile che questi elementi di vetro siano il prodotto di un processo di lavorazione o costituiscano addirittura degli elementi di vetro soffiato? La coppa di vetro non completata è stata collocata in una tomba risalente al III o all'inizio del IV secolo. Detta coppa, di vetro alquanto grosso, per la sua forma può essere classificata secondo Isings 96b. Il prodotto prova che la vetreria di *Celeia* era ancora attiva nel III secolo e, forse, anche all'inizio del IV secolo.