

The Glass Road

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Ancient Egyptian and Mesopotamian blue glass beads reached Scandinavia

Glass from the Late Bronze Age has for many years been overlooked in the archaeological record in Northern Europe. But new methods for analyzing the composition of the chemical components in the glass has made it possible to trace the origin of the small annular, mostly blue or Turkish blue, glass beads. Most of the glass beads dated between 1450 – 1100 BC origin from unknown workshops in Mesopotamia/Syria and a few from Egypt, probably from workshops in Amarna or Malkata (Thebes). North of the Mediterranean area the glass beads most likely spread along the exchange routes connecting the rich metal sources in the Eastern Alps, Erzgebirge, the Carpathians and South Scandinavia where the semiprecious stone amber was found along the thousands of kilometers' shoreline. A line of glass and amber exchange was created even before the glass making at the Frattesina workshops began.

Until now, it has been possible to attest almost 3000 annular glass beads from 1450-1100 BC found in Denmark, Germany, Poland and Romania. Some of them were made in Mesopotamian/Syrian or Egyptian workshops and many

were made in later workshops in Europe, typically Northern Italy. Such a large material offers a great potential for research into the sources and the distribution of glass.

There have been found 294 glass beads from Danish and North German graves. Early glass was a rare and expensive luxury traded along the coasts of the Mediterranean between Egypt, the Near East and Mycenaean Greece in cargo vessels like the Uluburun shipwreck off the coast of Turkey, dating to the late 13th Century BC. It is now possible to identify beads made of Egyptian and Mesopotamian glass in Danish graves from the second half of the 2nd millennium BC, more than 5000 kilometers from the glass production workshops. As a result, Denmark can be proposed as the most distant area that received such beads, revealing links with the trade systems of the Mediterranean.



Fig. 1. Glass beads from Hesselager and Ølby, Denmark, 14th century BC, both made of Egyptian cobalt-blue glass. Photo: A. Mikkelsen, National Museum of Denmark

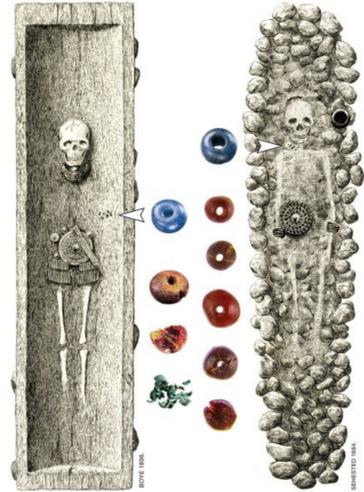


Fig. 2. Drawing of the Ølby grave and the Hesselager Grave. After SKALK Magazine 2014:3.



Fig. 3. Polychrome eye bead of glass with inlay of amber colored glass. Photo: A. Mikkelsen, National Museum of Denmark



Fig. 4. Mesopotamian glass and Nordic amber beads from the Melby grave, Denmark. Photo: A. Mikkelsen, National Museum of Denmark.

Chemical analysis of Danish discoveries extends range of Bronze Age trade

Twenty-four glass beads recovered from different Danish Bronze Age burials, glass from the Cioclovina Cave, Transylvania in Romania and fragments of glass working debris from Amarna, Egypt (Denmark National Museum collections) were analyzed by laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS). The technique requires no special preparation of the samples and is virtually non-destructive. With the exception of one polychrome bead composed of a turquoise blue spherical body decorated with the colors of amber, white and yellow glass eyes, the twenty-three other beads are monochrome and range from light to dark blue. All samples are soda glass, with soda (Na_2O , 14 to 21.5 wt%) as the primary flux, and high magnesia and potash indicating a plant ash

source for the soda. These compositions show that the glass used to make the Danish beads and the Amarna glass working debris was fused from powdered quartz or siliceous sands containing various amounts of alumina and lime, mixed with the ashes of plants high in soda, such as *Salicornia* sp. or *Salsola kali*. By comparing the chemical data, it can be observed that the two Danish cobalt blue glass beads and the Amarna rods and chunks fall within the Egyptian glass group while the twenty two remaining Danish glass beads fall within their Mesopotamian glass group.

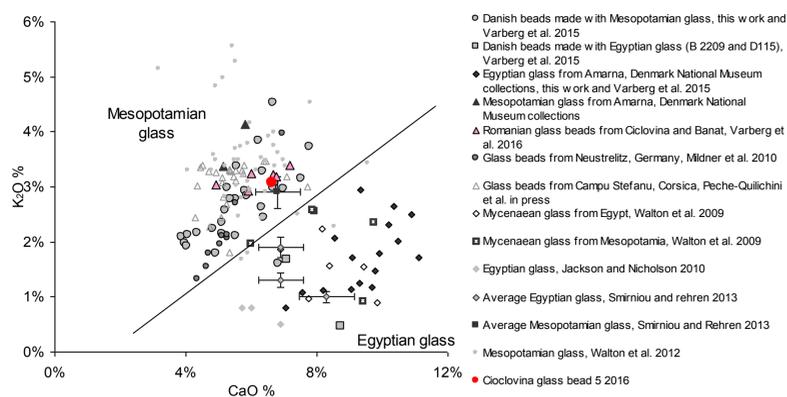


Fig. 5. CaO versus K₂O binary diagram for the Cioclovina glass bead compared with coeval glass from Egypt, Mesopotamia, Denmark, Germany and France. Diagram: Prof. Bernard Gratuze.



Fig. 6. The entrance of the Cioclovina Cave in Transylvania. Photo: Jeanette Varberg



Fig. 7. Glass and amber beads from the Cioclovina Cave treasure. Photo: Dr. Mihai Rotea.

The Bronze Age traveler

Travelers accompanied every piece of trade goods. New strontium isotope analysis shows surprisingly that the famous Egtved girl from an oak-coffin burial in South Jutland, Denmark was a Bronze Age traveler. She was probably born somewhere in Southwest Germany, but travelled to Jutland more than once before she died and was buried here at the age of 18. Tree ring dating has shown that she was buried in 1370 BC. She was part of the same generations as the female graves containing glass beads, such as Ølby, Hesselager and Melby. She is a clear evidence of the dynamic Bronze Age traveler, that moved over long distances in a short time. This underlines the probability of travelers moving through Europe to the Mediterranean coast with trade goods. The con-

tact between the cultures in the Bronze Age World may have been much more elaborate than previous thought. By 1400 BC long distance exchange systems had evolved connecting the shores of the Euphrates and Tigris rivers in Mesopotamia and the Nile in Egypt with the beaches of the Baltic and North Seas. By 1300-1200 BC the amount of glass in Danish Bronze Age finds peaked – before it all stopped again probably because of the changes in the East Mediterranean trade system at the end of 12th century BC.



Fig. 8. Map showing places of production in Egypt and Mesopotamia and the distribution of glass beads in Europe 1400-1100 BC.

Literature:

- Varberg, J., Gratuze, B. & Kaul, F. 2015. Between Egypt, Mesopotamia and Scandinavia: Late Bronze Age glass beads found in Denmark. *Journal of Archaeological Science* 64: 168-181.
- Varberg, J., Gratuze, B., Kaul, F., Haslund Hansen, A., Rotea, M & Wittenberger M. 2016: Mesopotamian glass from Late Bronze Age Egypt, Romania, Germany and Denmark. *Journal of Archaeological Science* 2016.

