

Bronze Age glass between the Alps and the Baltic Sea. Studies on manufacture and distribution of the oldest glass in Central Europe.

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Blue glass beads from graves, hoardings and settlements of the middle to late Bronze Age (14th-9th century BC) are the oldest glass finds in central Europe. Compared to other European regions, e.g. Italy, France or Great Britain, these finds are only deficiently explored. The current project archaeologically and archaeometrically investigates such finds to identify their technological and cultural-historical position in the central European Bronze Age.

The studies include analysis by electron microprobe for major and minor elements and laser ablation ICP mass spectrometry for trace and rare earth elements. The methods are working poorly destructive, requiring on a very small scale the removal of the corrosion layer and polishing of the surface.

Until now almost 100 glass beads from different excavation places in northern and southern Germany and in Tyrol/Austria have been analyzed, covering chronologically the middle and late Bronze Age. These are mainly small annular beads, larger spherical beads and the so-called "Pfahlbauperlen", barrel-shaped beads with a white thread of glass inlay. The colour spectrum of the translucent glass beads range from light blue to bright turquoise and dark blue. From their major and minor element contents the middle Bronze Age samples can be assigned to the group of high-magnesium soda-lime glass (HMG), while the late Bronze Age beads were produced from low-magnesium high-potassium glass (LMHK; Henderson 1988, 1989). In addition, a third and previously unknown group of glass is suggested, with significantly higher contents of potassium compared to the LMHK glass, but still low magnesium and particularly low sodium contents.

Trace elements and rare earth elements bear information about the sands and the colouring agents used. Normalized trace element patterns show some striking differences in the contents of the colouring components, i.e. copper or cobalt, and their accompanying elements. Further trace elements and the rare earths may distinguish between different sands on the basis of their heavy mineral contents. This allows the definition of various sub-groups and therefore gives detailed knowledge about central European Bronze Age glass types and their regional and age distribution.

J. Henderson (1988) Glass production and Bronze Age Europe. – *Antiquity* 62, 435–451.

J. Henderson (1989) The scientific analysis of ancient glass and its archaeological interpretation. In: J. Henderson (Hrsg.), *Scientific analysis in archaeology and its interpretation*, 30–62. Oxford.

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