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Unreviewed Mixed Matters Article:

Glass Lamps, a Few Points

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Funnel-shaped glasses have been found in several places, for example in Birka (graves 577, 526, 551, 850, 854, 464, 849 and 433), Sweden and in the Netherlands (De Heul, Utrecht collection PUG). They are often used by reenactors as drinking cups, but could that be their only possible function?

> In Viking and Medieval markets, you

In Medieval illuminations you occasionally see funnel-shaped lamps hanging down from the ceiling. These lamps are depicted with a clear flame in the middle. From the UK there

often see oil lamps with metal wick holders, but as far as I know there is no evidence for these holders. One can well imagine that they could have been used...

are household accounts from the Middle Ages which show that oils were purchased for use in lamps (Fouquet & Pearson, 2006). In the Domesday book, Ælfric, abbot of Eynshamn writes in the year 1000 that merchants import oil, https://www.domesdaybook.co.uk/. These lamps could be made of clay, but when purchasing more expensive oils such as olive oil it can be assumed that these richer households could even afford glass lamps. The idea is not entirely without evidence, as whole chandeliers with hanging glass goblets, even up to six goblets, have been found in Byzantium. I set out to try to use glass cups as lamps and in doing so investigate problems and answer some of the questions that I had about the process. These are the questions that the project aimed to address:

1. Which oils could be burned and is there a difference between the oils?
2. How could a wick have been made?
3. How does the wick sit?
4. How should the cup be hung?

The oil

I assumed that if you could afford expensive imported glass, then you could also afford to use imported oils. Oils that could be produced in Scandinavia would be cod liver oil and fish oil, as well as hazelnut, walnut, and linseed oil. Imported oils included olive oil, but also grape seed oil. Grape seed oil is known, among other things, as a medicine from Greece from 4000 BC. One can well imagine that some of the imported oil was not intended for human consumption but was of an inferior quality that can be used for lamps.

I tried three oil; grape seed oil, linseed oil and olive oil. All three oils burn incredibly well, but olive oil gives the best light and the quietest flame. The oil can be difficult to light, but once it burns, it does not go out. None of my three oils over-ignited, although you could feel them getting hotter, at no point did it get so hot that there was a danger of over-ignition.

In future experiments I will try the cheaper oils; fish oil, hazelnut, and walnut oil.

The wick

The wick is absolutely the most important factor in achieving a successful result. I tried with rolled linen fabric, woollen fabric, blue and 4 mm hemp rope. None of these were ideal wicks, the oil burns fine, but the wick absorbs the oil too slowly, and the oil burns faster than it is absorbed, thereby burning the wick away. However, I managed to make a working wick from hemp fibres. The fibres must be laid evenly and relatively tightly. Next, I rolled the wick in soft

beeswax to make it stay stiff and stand up in the oil. I made the wicks in different thicknesses, but 8 mm was the optimum.

The wick holder

In Viking and Medieval markets, you often see oil lamps with metal wick holders, but as far as I know there is no evidence for these holders. One can well imagine that they could have been used, but there may also be other solutions to the wick holder problem.

Another way the wick could be held is to stiffen the wick by dipping it in liquid beeswax, and then fixing it in the middle of the glass with wax at the bottom. This works extremely effectively. The wax holds the wick upright in the centre of the glass while the oil burns. However, the wax layer must be thin so that the oil can still be absorbed into the wick effectively. I discovered that it did not matter if the flame comes down and touches the oil surface, the oil does not get so hot that it ignites.

Lighting the lamp

The whole wick should be soaked in the oil, so I dipped the whole wick in and let it sit for a few minutes, until I was sure the oil had penetrated the core of the wick. The ignition is slow because the oil first ignites at a relatively high temperature (225°C), but once it burns, the new oil is absorbed. As the lamp burns, it heats up the oil, which then flows more easily and is more easily absorbed into the wick.

The chain suspension

In illuminations, you see the lamps hanging down from the ceiling, and often you can also see that they are held up by chains. Many types of chain links have been found from the Viking Age and the early Middle Ages. Among other finds examples include: from Viborg Søndersø, Denmark, an iron chain of thinly wound iron wire, a similar chain has also been found at Møllestrømmen near Haderslev, Denmark. It is with this technique I chose to make my suspensions. This proved to be quite an effective suspension and the heat from the flame did not affect the suspension in any way.

Conclusion

The lamps work incredibly well. The glass means that the lamp has no shaded areas but provides a clear light that spread throughout the historic house in which I hung them. When I experimented, the lamp burned for five hours without being refilled. Such a lamp would certainly be an impressive sight that would turn the neighbours green with envy.

Keywords glass

Country the Netherlands
United Kingdom

Bibliography

Fouquet, R.P. and Pearson, J.G., 2006. Seven Centuries of Energy Services: The Price and Use of Light in the United Kingdom (1300-2000). *The Energy Journal*, 27(1): pp.138-178, < http://dx.doi.org/10.2307/23296980 >

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Gallery Image

Fig. 91. *Palm cup from the cemetery at De Heul. Utrecht, Collection PUG, inv.no. 6867. Photo: RMO/Peter Jan Bomhof.*

Fig. 92. *Fragmentary deep palm-cup, end 7th-early 8th century, WD 498.2.?. Photo: RMO/Peter Jan Bomhof.*

FIG 1 (91). PALM CUP FROM THE CEMETRY AT DE HEUL, UTRECHT, COLLECTION PUG, INV.NO. 6867. PHOTO: RMO/PETER JAN BOMHOF. (92). FRAGMENTARY DEEP PALM-CUP, END 7TH - EARLY 8TH CENTURY, WD 498.2?. PHOTO: RMO/PETER JAN BOMHOF.

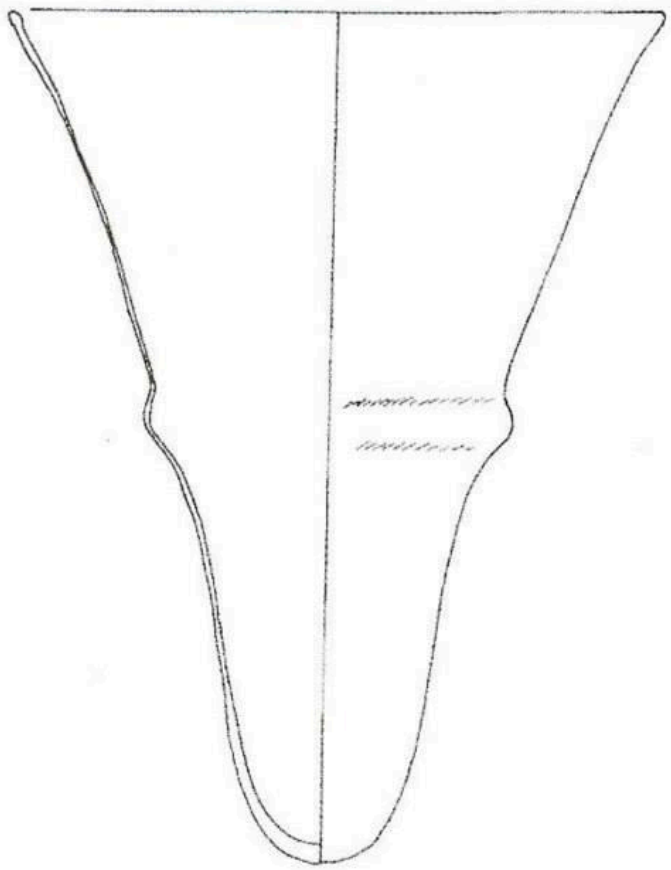

Fig. 94. *Funnel beaker with horizontal moulding, WD 385.2.9, from Van Es & Verwers 2009:261.*

2. (FIG 94) FUNNEL BEAKER WITH HORIZONTAL MOUDLING, WD 385.2.9, FROM VAN ES & VERWERS 2009:261.

FIG 3. LAMPS HANGING IN THE VIKING MAIN HOUSE IN VIKINGELANDSBYEN ALBERTSLUND, DENMARK. PHOTO BY KARL JAKOB LAMBERTH.

FIG 4. WICK ATTACHED TO THE BOTTOM OF THE GLASS WITH BEESWAX. PHOTO BY KARL JAKOB LAMBERTH.

FIG 5. FLAME BURNING BRIGHT WITH OLIVE OIL. PHOTO BY KARL JAKOB LAMBERTH.

FIG 6. THE LAMPS GIVE A CLEAR LIGHT IN THE HOUSE. PHOTO BY KARL JAKOB LAMBERTH.

FIG 7. REPLICA GLASS, ORIGINAL FROM BIRKA. PHOTO BY KARL JAKOB LAMBERTH.

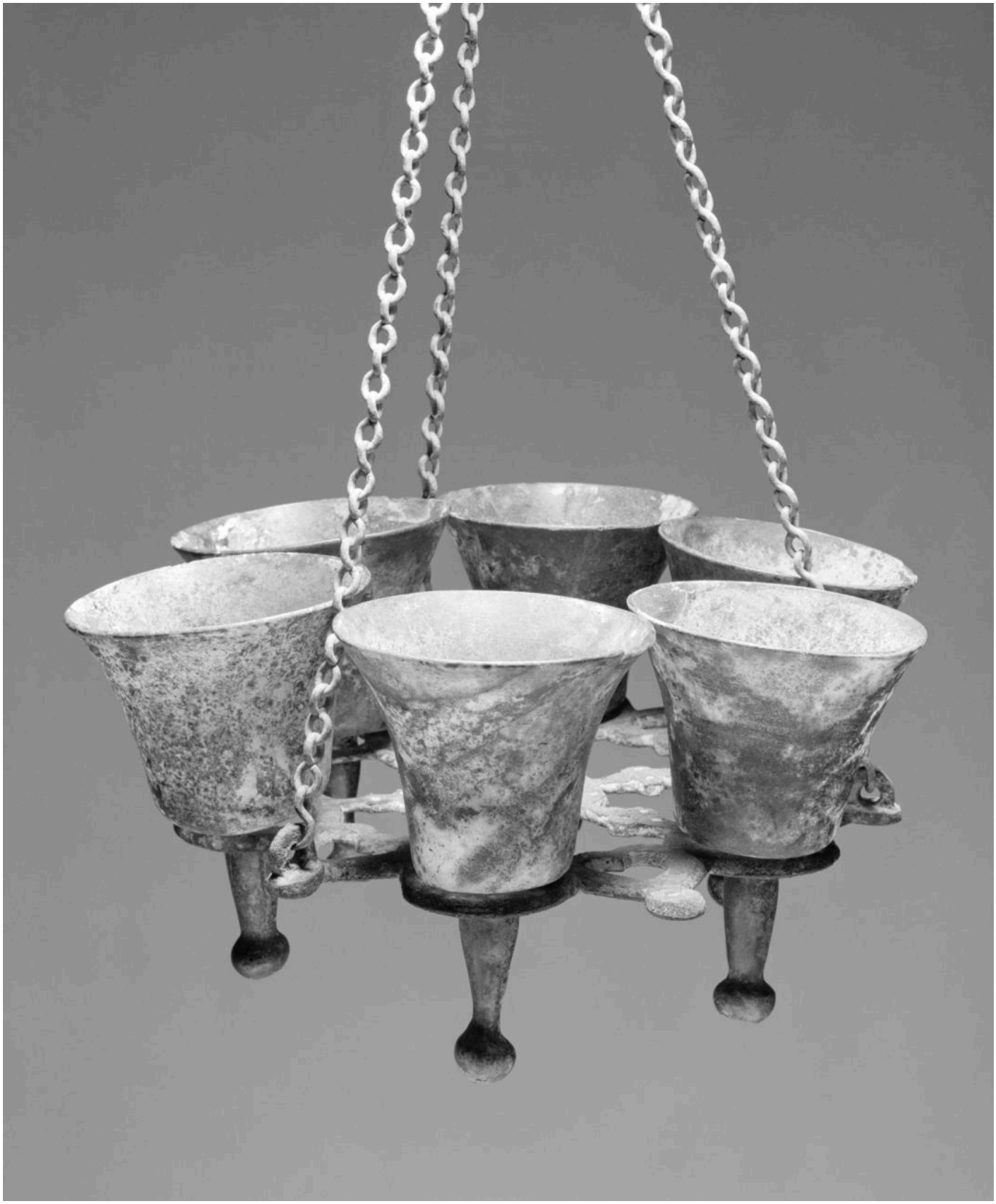

FIG 8. POLYCANDELION EASTERN MEDITERRANIAN 6TH CENTURY. WALTERS ART MUSEUM

FIG 9. UNIVERSITÄTS-BIBLIOTHEK HEIDELBERG (COD. PAL. GERM. 848)

FIG 10. LIVES OF THE SAINTS (BNF FR. 185, FOL. 3), SECOND QUARTER OF THE 14TH CENTURY

FIG 11. KARL JAKOB LAMBERTH.