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Research Project: Glass in the Duchy of Brabant from the Late Middle Ages and early modern times

Danielle Caluwé

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In January 2002, an interdisciplinairy project started at the Free University of Brussels on Glass in the Duchy of Brabant from the late Middle Ages and early modern times in collaboration with the Foundation for Scientific Research of Flanders and the University of Antwerp.

The subject is the archaeological glass from the Late Middle Ages and early modern times of several important cities of Brabant such as Antwerp, Mechelen, Brussels, Breda and 's-Hertogenbosch. The archaeological remains are selected, in collaboration with the archaeological departments, under aspects of their scientific, archaeological, stratigraphical, chronological, historical and socio-economical information. The direct aim is to create a typo-chronological instrument in order to facilate the study and the knowledge of the archaeological artefacts in hollow glass. It is furthermore also planned to formulate a synthesis and an interpretation, as well as to formulate insights in related phenomena such as production, distribution, use and consumption, and to place the artefacts in glass within the context of the material culture of the studied period. The direct aim is to illustrate and to proove the interaction of the three traditional glass production centers and the mediating role of the Low Countries, especially of Brabant, in the transfer of technology, production practices and distribution.

The applied method for this study on the glass as an aspect of the material culture, is a deepened and detailled techno-morphological and typo-chronological research of the archaeological artefacts. The resulting data are assembled in quantifications and overviews, and studied in contrast with the results of the scientific analyses on the composition and the use of the raw materials. The aim is to formulate a preliminary working hypothesis in order to compare it with the local, regional, interregional, international, archaeological, historical and iconographical material. In a second phase, these results are set against the contextual information from the excavation, the stratigraphical layers and the chronological data as well as the archaeological artefacts in other materials. The result of this confrontation of the hypothesis with the comparitive material is critically studied and worked out in an interpretative synthesis.

The archaeological glass remains can be arranged in four main categories according to function – table ware and drinking vessels; bottles and containers; glassware for alchemists, pharmacists, surgeons and physicians – and miscellaneous glassware for the households and the workshops. The use of this kind of artefacts in glass became more popular in North-Western Europe from the 13th century on. Glass artefacts used daily in social contexts such as eating, drinking, personal and hygienic care, reflect their times and places of origin as well as the influence of fashion, culture and social milieus and social relations and networks. The use of glass in convivial surroundings makes it a sensitive indicator for symbolic meanings.

The economic implications of the wider use of glass artefacts cause changes in the production techniques and practices, the most important being the transfer of technological knowledge and morphological and decorative design, via migrating glassblowers from Italian to French and German traditions and vice versa. This results, from the early-16th century onward, in

the development of a Brabantine and more specific an Antwerp production. The role and importance of these new urban glass production centers remains unclear and has to be prooven in relation to the existing rural production and distribution networks. From the mid-15th century on, Antwerp plays an important role as an international port, distribution, economical and financial centre in the European trade and distribution of goods.

The applied methodology is developed during the research on the archaeological glass of the Antwerp Steen. The use of a detailled techno-morphological and typo-chronological method made the interaction and transfer of the different glass blowing traditions and their practices visible and measurable. The confrontation with the scientific analysis gives a broadend insight in the use and application of raw materials, both imported and local.

To illustrate the project as a work in progress, two case studies will be highlighted, the glass remains of the Antwerp Steen and the glass finds of the fishing village of Raversijde on the Belgian coast.

Case 1: Preliminary report on the glass from a cesspit in the Antwerp *Steen*

In 1978, a rescue excavation, conducted by Tony Oost and assisted by J. Ackermans for the fieldwork, was carried out in the *Steen*, the citadel of Antwerp. This is considered a multifunctional building with probably both residential and penitential functions varying trough time, partly private and partly public.

The relation between the cesspit and the rooms above can no longer be established. As it was used by a rather broad group of socially differentiated inhabitants or users, we assume the social reception functions of this official residential building to be reflected in the amount and the richness of the finds.

The cesspit yielded archaeological remains, muck, kitchen waste and food remains and thousands of ceramic sherds, including greyware, whiteware, stoneware and majolica. No full report of the excavation has been published yet. Only some preliminary results and a golden button were published by the excavator, as well as the 96 majolica vessels by Veeckman and Dumortier (1999), and the major element and trace analysis, a research project on the composition of Antwerp 15th–17th century glass vessels by De Raedt (1998; 1999), from the Antwerp University.

The chronology is based on the typology and covers a rather long period ranging from the late 15th up to the first quarter of the 17th century.

The glass accounted for a small percentage of the total finds; approximately 3000 glass sherds, mainly of drinking glasses and a dozen fragments of stained window glass were found. The 396MNI glass vessels can be divided into four functional groups: drinking vessels: 355MNI; bottles 35MNI; medicinal vessels: 8MNI and various objects: 10MNI.

The dominant green *Waldglas* group, 59% of the total glass remains, include 205MNI mostly more current, everyday use types followed by the colourless glass, 26,9% or 98MNI, and 13.6% or 55MNI *façon de Venise* vessels.

The cylindrical beaker in green, colourless or *façon* glass with or without decoration is the most dominant type (more than 80%), this is totally comparable with a number of French and Amsterdam assemblages of the same period (Velde 1999; Baart 1999), but a significant number of one-posted beakers on folded foot, 30 vessels, and three posted façon vessels, 20MNI, also occur (fig. 1).

The majority of the beakers has a similar base diameter, irrespective of the colour, type, dec-

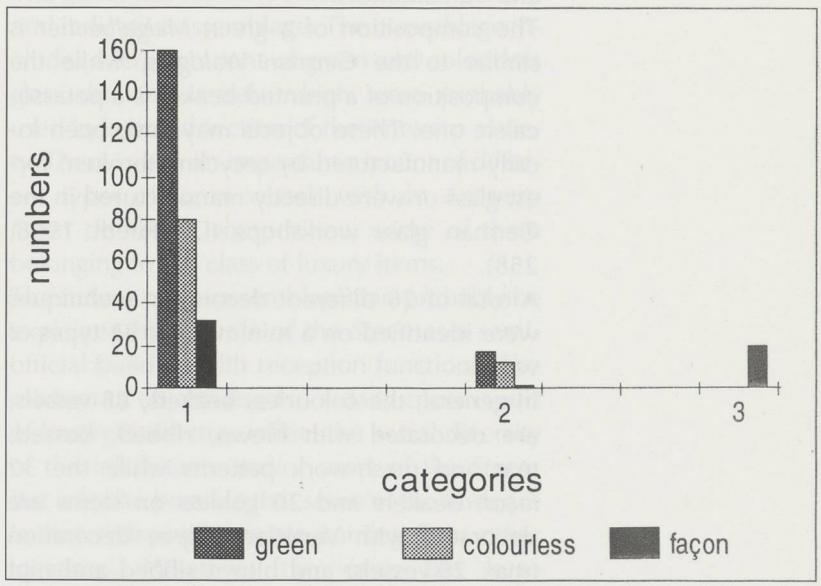

Fig. 1: The relation between technology, categories and the types of glass from the Steen assemblage. Main types: 1 The number of ciylindrical beakers in the three glass categories; 2 The number of beakers on folded foot in green, colourless and façon glass; 3 The goblets on stems.

Blown in patterned moulds	applied decoration	façon- and filigree techniques	special techniques
rib-pattern, straight, wrought and crossed	prunted beakers	*vetro a fili*	octagonal and angular beakers
ribbed: straight, wrought, explicit relief	applied glass threads	*vetro a retorti*	beakers on foolded foot
tear pattern	threading	*vetro a reticello*	ice glass
bossed pattern	spun glass thread	*mezza stampaura*	
mesh-work pattern	applied coloured threads	*gilded knobs*	
waffle pattern	*Fadenrippen*		
diamond pattern			
nipt diamond waies			

Fig. 2: The range of decoration and morphological techniques as applied on the glass from the Steen, in Antwerp.

oration or technique. They can be grouped in three formats, each differing by 15 mm, ranging in base diameters from 35 mm to more than 65 mm. The dominant format group, F2, (50 mm to 65 mm), accounts for 153 of the 235 measured beakers, while format group F1 (35 mm to 50 mm) and F3 (with a base diameter of more than 65 mm) are less important in quantitative terms.

A large number of rigged *Waldglas* types were identified: *Maigelein* and *Maigel-* beakers, octagonal *Maigel-* beakers, *Berkemeiers*, *Krautstrunk*, *Bandwurm* beakers, *Schaffhausen* beakers, club beakers (*Keulenbecher*), cylindrical beakers (*Stangengläser),* prunted beakers, and also 57 plain beakers, of which 39 are green and 18 colourless.

The composition of a green *Maigelbecher* is similar to the German *Waldglas*, while the composition of a prunted beaker is a potasso-calcic one. These objects may have been locally manufactured by recycling (broken) forest glass or were directly manufactured in the German glass workshops (De Raedt 1998, 258).

A total of 26 different decoration techniques were identified on a minimum of 31 types of vessels.

In general, the colourless beakers, 88 vessels, are decorated with blown, ribbed, bossed, tear and mesh-work patterns while the 32 *façon* beakers and 20 goblets on stems are decorated with Venetian filigree decoration (max. 20 vessels) and blown ribbed and nipt diamond waies patterns applied in a *façon* manner (fig. 2).

It was possible to identify a minimum of 31 types and subtypes, several of which are important indicators of change in techniques or forms of production.

The beaker on a folded foot (which includes the diabolo type) accounts for 30MAI in green and colourless glass with and without a blown pattern. This number contradicts with 16th-century France, where 68% of the finds are of the folded foot type (Barerra 1988, 360). So far, this type of beaker has been found only on two other Antwerp sites. A small number of beakers on foot in colourless *façon* glass also occur. The beaker on foot replaced the beaker on folded foot and seems to be the more *façon* or higher quality version of the former type. The phase of transition cannot be precisely identified, but other Antwerp finds and the iconographical evidence suggest that the beaker on folded foot occured throughout the 16th century and up to 1620 or probably even 1650. The suggested transitional period would be the second quarter of the 17th century.

The moulded beakers number 88MNI, which accounts for one quarter of the beakers, with a minimum of 4 types of relief-patterns of which two are blown in a mould whith a closed base. All these beakers are strongly corroded, the walls of some of them are nearly desintegrating, others show signs of crizzling. Such forms of degradation possibly indicate the use of soda and/or manganese. Further research on the composition has to be carried out to back up this hypothesis.

For three types of beakers two different ways of using moulds could be identified. The first is a traditional one, a *paraison* being blown into a mould with a negative pattern. The second one seems influenced by the Venetian filigree technique and combines the use of applied

threads and a mould. We feel these differentiated uses of the mould to be an indication for the transition from a traditional production to a more *façon*-like production. This is confirmed by the fact that traditional patterns are translated into *façon* versions. The following patterns are produced using both techniques: the ribbed beakers, the meshwork and the nipt diamond beakers, and the *Bandwurm* and the checkered spiral trail beakers. Possibly, the filligree beaker with the broadly spread threads, a technique which ressembles that used on the ribbed beakers, is also an example of the changed production mode. These findings suggest that the Antwerp glass finds should be looked at systematically with special reference to production technology.

The prunted beakers, 100MNI – subdivided into 4 types and 14 subtypes – constitute an equally large amount of this assemblage. We have identified several techno-morphological subgroups in the group of *Berkemeiers*. Within this *Berkemeier* group, format F1 (35 mm to 50 mm base diameter) dominates, differing the group from the rest of the assemblage in which F2 dominates. This format is often combined with a pinched footring which has been made in a very specific way and may well be a regional or even a workshop indicator. All *Berkemeiers* are of a very high glass quality, and the majority is well conserved. The absence of *Roemers* (with exception of the three small typologically uncertain beakers) and raspberry prunts remains to be explained.

Apart from the cylindrical beakers, 55MNI *façon* vessels survived, although in a very fragmentary way, and only two archaeologically complete beakers on foot remain. The remainder consists mainly of gilded stem knots and feet- and stem fragments of goblets.

The chemical analysis of the composition of 22 *façon* vessels of the *Steen* demonstrated the diversity of the compositions and the wide variation in soda percentages of these vessels. Six of them have a *cristallo* or *vitrum blanchum* composition which suggests that they were probably imported. Thirteen vessels have a typical Antwerp *façon de Venise* composition, of these, six vessels show a composition similar to the production waste found in Antwerp (De Raedt 1998, 261). The *Steen* finds hereby represent the hitherto most important set of Antwerp *façon de Venise* glass vessels, indicating the differentiated use of raw materials and the probable innovative local imitation of *façon* qualities.

Through chemical analysis, a moulded lionmask stem is identified as an Antwerp *façon de Venise* object (De Raedt 1999, 496), its composition is different from the Brussels finds (Wouters 1999).

Further research is needed to define more clearly the chrono-morphology and typology of the different stem and lionmask stem types in the Antwerp region. We do feel, however, that this component can be an indicator for production changes.

Apart from the drinking vessels various other items occur, including storage bottles and small bottles with blown patterns, medical vessels such as urinals, cupping glasses, and an inkpot. Others are small household vessels such as oil-lamps, a candlestick, a small decorated box and a lid decorated with *vetro a retorti*.

The *Steen* glass finds constitutes quantitavely as the third most important find of glass vessels in the Antwerp region, with a great variety of types offerering the broadest range of decorations forms combined with the most important number of filigree and *façon* artefacts found in one complex.

Preliminary conclusions

The glass finds from the *Steen* are an important and indicative assemblage. The assemblage includes a large amount of green and colourless glass drinking vessels which were probably used by a broad section of the Antwerp society. There is also an important amount of different types of *façon* vessels with an Antwerp *façon de Venise* composition, some of them belonging to the class of luxury items.

The nature of the assemblage can probably be explained by the role of the *Steen* as a semi-official building with reception functions. The mixture of objects used in a daily context and of luxury items may reflect the social diversity of the inhabitants and/or users of the *Steen*. But is is also possible that some of the finds are in fact redeposited waste coming from other locations. Whatever the case, the large number of *façon* objects is indicative not only of the wealth and diversity of the Antwerp glass in the 16th to early 17th century, but also of the technical changes which are character-

istic for the end of the 16th century. On the whole, the assemblage seems to reflect several phases in the technical and morphological evolution towards a more *façon*-like production. In addition, the assemblage seems to document the technical changes related to the manufacturing of the beakers with folded foot and the beakers on foot. As such, it may also provide indications for the growing, more widely adapted and more diversified use of moulds for several types of vessels and for several parts of beakers or goblets.

Equally interesting is the fact that the domination of the F2 format may point to a degree or form of standardisation in the production itself. As has been shown for France (Velde 1999), the glass finds from the *Steen* cesspit are partly the result of a changing production which moved from a diversified range of object types, material composition and decorations to a more unified range of goods. We believe that at least part of the *Steen* finds to belong to the period of transition between the first and the second phase. Several indicators of change can be pointed out, amongst them the emergence of the beaker with folded foot, the *Berkemeiers*, the relief beakers and the goblets with lionmask stem. The chemical analysis work confirms the diversity and abundance of the Antwerp *façon de Venise* glass compositions.

However, further archaeological, chemical, historical and iconographical research on the Antwerp finds and evidence is required and the data should be set against information from other sites in the region and abroad if we are to refine our understanding of the Antwerp production and consumption of glass vessels in the 16th and 17th centuries.

Walraversijde 1465: A rural fishing community on the Belgian North Sea Coast

In April 1992 a major archaeological investigation was begun by a team from the Institute for the Archaeological Heritage of the Flemish Community to rediscover the medieval village of Walraversijde which disappeared during the Siege of Ostend (1601–1604).

The Walraversijde museum project, opened to the public in June 2000, includes a site museum, the reconstruction of 4 houses and of an excavation site. The archaeological reconstruction of part of the village is the result of 9 years of large-scale archaeological study. More than thirty buildings were recorded and photographed and a great variety of archaeological, botanical and zoological material has been excavated and is now under examination. A huge variety of remains resulted out of these campaigns such as: English stone cobbles, bricks, building and roofing materials, 70 barrel wells, several sewage barrels and cesspits, sea- and fresh-water fish, shellfish, mammal and bird remains as well as fruits, vegetables, herbs, grains, and spices such as pepper, fishing gear, coins, dice, stone cannon-balls, bollock knives, kidney daggers, bone tumblers for crossbows, wooden and ivory combs, earthenware, ceramics, stoneware, glass and some majolica finds, heather brooms, leather footwear, textile remains and accessories such as cloak and decorative clasps, buckles, pilgrim badges, pipeclay images and colffsloffen. A total amount of 780 glass sherds were counted, 372 hollow glass fragments, including 117 drinking vessels and 7 beads, and 308 window-pane sherds.

A minimum of 45% of the glass finds at Raversijde consist of window glass, divided into 124MNI green, 26MNI colourless, 148MNI heavily weathered, undefinable sherds and 10 fragments with various colours such as blue, yellow or brownish red. A very fragmented sherd of glass with a very weathered lead layer on the back is a small mirror fragment.

The use of window glass is also attested trough the find of 21 lead strip fragments, all have an I-profile and their spatial distribution indicates the probable use of glass-in-lead windows in at least some houses located in an area of the overall excavated surface. Only one lead fragment was found in the vicinity of the chapel, although the majority of the painted window glass sherds was found here. The functional recuperation of lead as a weight for fishing nets may explain both the scarcity of the lead strips and the abundance of fishing net weights in the excavated area.

The diversified use of window glass is proven by three fragments of crown glass. Two are round sherds of thick green glass and one is a thin round sherd of colourless glass with a rim. Their spatial distribution indicates the possible use of crown glass in at least one profane building in the second half of the 15th century.

The painted glass fragments are a second indicator for the variety of the window panes. The majority of the 26 painted glass fragments were found in the vicinity of the chapel. Unlike the several painted glass fragments, only one lead fragment was found there. The presence of painted glass panels of the Raversijde Chapel is attested by a contemporary 16th-century historical source. The finds are very fragmentary, but some details, such as a hand, a face and geometrical patterns, can be deciphered. The finds also indicate the possibility of two other buildings with at least one painted window panel. The combination of the data of the distribution map and the dendrochronological dating of the barrel wells indicates the use of painted window glass in at least one building from the mid of the 15th century, possibly even slightly earlier.

The remaining 160 plain glass fragments are organised in clusters in the vicinity of certain buildings. Four of these locations can be dated stratigraphically and through dendrochronological analysis of the barrel pits to the second half, as well as the end of the 15th century.

The remaining 148 heavily weathered glass fragments are concentrated in a late-medieval layer near the surface, which may suggest a 16th-century dating.

Samples are taken from all types of window glass, and the preliminary results indicate a calco-potassic main composition, further quantification can give more detailled information and, if possible, the provenance. A proposal for a conservational treatement and an iconographical study, possibly combined with a restoration project of the painted panels is under decision.

Painted glass fragments, found in the nearby fishing village of Heist are under study and may situate the Raversijde fragments in a broader regional contex.

The hollow glass fragments also indicate a diversified use of glass artefacts with a wide typological and technological variety.The majority of the blown glass fragments consits of green, forest-glass beakers with a ridged decoration blown from one glass-bell in a mould with a negative pattern. These drinking glasses are used in several social milieus in the southern and the northern Netherlands between the end of the 14th and the beginning of the 16th century. The *maigelein* (14MNI) is a low bowl-shaped, cross-ridged beaker with a round pushed-in bottom. The *maigeleins* from Raversijde are in general a bit smaller and seem to be more weathered than *maigeleins* from other sites in Belgium and abroad. The spatial distribution of most of the fragments indicates an early 16th century dating rather than a late 15th century dating. The *Maigelbecher* (48MNI) is a taller, slightly conical beaker with an extremely high kick, sometimes octagonal in shape (20MNI). They represent the most important group and are found all over the excavated area. These beakers are techno-morphologically of superior quality to the *maigeleins*; they are made out of a higher quality, less weathered glass and have a more refined design. The octagonal beakers are of similar size but have lower kicks, simpler decorations and are less weathered than the ordinary *Maigelbecher*. The ridged beakers (24MNI) sometimes have an abrupt vertical ribbing down the edge of the foot (3MNI). These beakers have a high degree of fragmentation and weathering; no archaeologically complete profile has yet been found. The thinness of the walls, often less than 1 mm for the surviving sherds, may explain the high degree of fragmentation. The ridged beakers occur everywhere, except in the zones excavated in 1994 and 1995. The three beakers with abrupt vertical ribbing on the foot were excavated during the same campaign in nearby layers in the same barrel well and show interesting differences in weathering.

The group with the cylindrical and slightly conical beakers with a foot rim is numerically far less important (7MNI) but typologically and technologically interesting. The colorless, relief-blown beakers with a notched foot rim occur in the southern Netherlands, possibly from 1500 on.These two beakers are blown in a closed mould and have the same drop-pattern on the bottom. They are blown into a thicker glass that weathers opaquely, a possible indication of a higher potassium-calcium degree in the original glass composition. The green prunted, conical beaker is a new type of the late-medieval German forest-glass production, created prior to 1500. The occurrence of the prunted beaker at Raversijde is only proven by the excavation of several prunts (8MNI) and three green rimmed bottoms, fragmentarilly preserved without prunts. The filigree beakers of the *vetro a fili* type with vertical or wrythen, alternating threads of white or coloured glass

were blown in Antwerp shortly after 1560. Only two small wall fragments were excavated during the campaigns of 1995 and 1996. The results of the scientific analysis of the composition may prove their Antwerp provenance. These luxury vessels were possibly brought to Raversijde by military noblemen during the siege of Ostend.

Preliminary conclusions of the archaeological study of the Raversijde glass finds

Almost half of the glass remains consits of window glass sherds with a great diversity and variety of contemporary techno-morphological categories, with a spatial and stratigraphical distribution which indicates the use of plain and painted glass in lead in religious and profane contexts from the middle of the 15th century on. The use of crown glass is also attested in at least one profane building.

The predominance of the painted glass fragments in the vicinity of the chapel (probable founding date between 1421 and 1438) is a possible indication of the proliferation of window panes at Raversijde in the second half of the 15th century.

The overall dominance of the green forest glass for the hollow and the window glass fragments has to be taken into account as a chronological indicator, and possibly also as an indicator for the distribution and use of green glass in the 15th century Low Countries. The results of the scientific analysis on the composition will give a better knowledge of the provenance of these green glass fragments.

Late 15th- and early 16th-century drinking vessels dominate the chrono-typological classification, 85% consist of a similar techno-morphological type: the ridged beaker blown from one glass-post in a mould with a negative pattern, *maigelein*, *Maigelbecher*, and the octagonal variant and the ridged beaker with an abrupt vertical ribbing down the edge of the foot. The spatial and stratigraphical distribution indicates the use of this type throughout the whole of the 15th century and evenly spread over the inhabited zones. The occurance of the *maigelein* mainly only in early 16th century layers is interesting.

The beakers with a footed rim are numerically less important but show an interesting typological and technological diversity with prunted, filigree and moulded beakers.

The few goblets on foot and the filigree beakers are stratigraphically situated in later layers and were probably introduced by the military noble men during the siege of Ostend.

Meanwhile, the scarcity of bottles and the lack of medicinal ustensils should be remarked as well as the presence of 7 beads, of which one lead ringshaped bead was used as a textile accessory.

The interdisciplinary approach, the long term period and the open, large scale character of the excavation in combination with the excellent stratigraphical data have provided a lot of information. The combination of these preliminary conclusions on glass with the studies on other materials such as earthenware, ceramics, stoneware and majoliques will possibly result in a better insight and comprehension of the material culture of the rural fishing village of Raversijde during the late Middle Ages.

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Address

Danielle Caluwé
Vrije Universiteit Brussel
Danielle.Caluwe@vub.ac.be