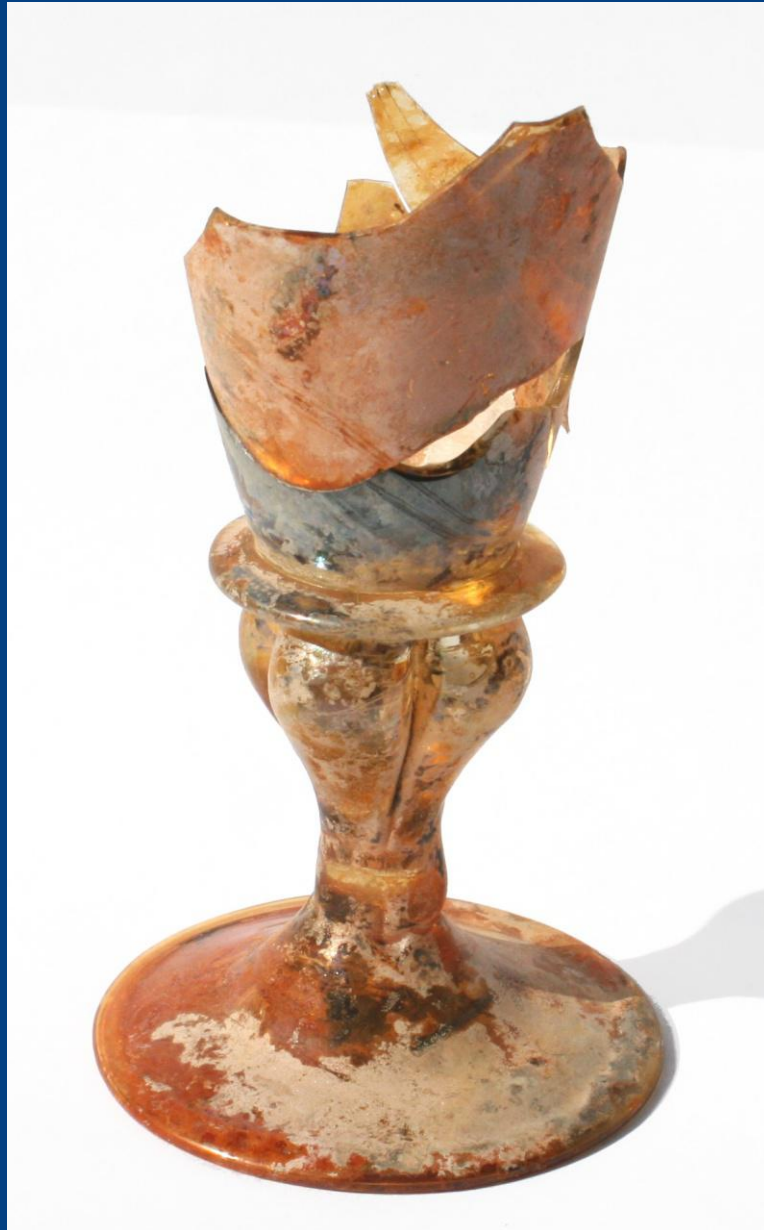


Rathfarnham Castle Glass



GIACOMETTI

10-06-2016

E4468



OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

archaeology plan
HERITAGE SOLUTIONS

SITE NAME

Rathfarnham Castle, Phase 6 renovation works, Rathfarnham Road, Dublin 14

CLIENT

Office of Public Works, 52 St. Stephen's Green Dublin 2

LICENCE

Ministerial Consent E4468 (C562)

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DATE

10 June 2016

RATHFARNHAM CASTLE 2014 EXCAVATIONS REPORT SERIES

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- IV** Rathfarnham Castle Excavations 2014: **Metal**. Giacometti, A. 2016. Archaeology Plan.
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Archaeological work funded by Office of Public Works.

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Introduction

Antoine Giacometti

Glass artefacts from Rathfarnham

This volume presents a detailed analysis of the glass artefacts recovered during the 2014 Rathfarnham Castle Excavations. 2,375 glass artefacts were recovered, 13% of the total of 18,456 artefacts. To my knowledge this is the largest and most significant glass assemblage excavated in Ireland, and mostly dates to 1680-1710.

I was aware of the significance of the Rathfarnham Castle glass assemblage from early in the excavation, when I noticed that one of the wineglasses looked familiar. In 2005 I took over a long-running archaeological project at Templeogue House, where Leo Swan had found a remarkable collection of glass artefacts in 1996. Peter Francis analysed the glass tableware and found it *'...of both national and international significance, for it appears to be the largest, most diverse assemblage of late-seventeenth century table-glass that has yet been excavated anywhere in the world'* (Francis, in Giacometti 2007, 13). Peter Francis demonstrated that the Templeogue House fine glass was probably manufactured in Dublin, and his conclusions (2000) changed accepted views of glass history. I realised that the Rathfarnham Castle glass assemblage had the potential to be very important.

Initially, I did not recognise the importance of the opaque glass vessels - I didn't even realise these were made of glass! Franc Myles, whose archaeological work on post-medieval Dublin paved the way for the Rathfarnham excavation, kindly came to the site during the excavation to look at our finds, and he

immediately recognised that our oddly-heavy and smooth 'porcelain' was actually glass. Franc had excavated a late 17th century glass workshop in Smithfield, Dublin and found a small fragment of opaque glass which had been analysed by glass researchers Colin and Sue Brain.

This led me on a journey to London for parallels for these unique glass vessels. I received enormous assistance from many people. Reino Liefkes, Senior curator at the V&A Museum London, showed me the Victoria and Albert Museum collection of Ravenscroft opaque glass vessels and we compared them to the Rathfarnham ones. Dan Nesbitt, curator at the Museum of London helped me identify a possible unpublished parallel for the blue glass tankard from an excavation at the London Minorities glasshouse. The Association for the History of Glass set up a stand after a conference in London where I had the good fortune to meet Suzanne Higgott, Curator of Glass, Limoges Painted Enamels and Earthenwares at the Wallace Collection, who identified an enamelled glass saucer of

Glass artefacts on site





Locations mentioned in the glass reports

Portuguese or Dutch manufacture from Rathfarnham. Colin Brain, independent researcher on the origins of lead crystal, shared all his findings with me, and was my guide through this world of glass. Colin introduced me to Inês Coutinho of the Research Unit VICARTE (*Vidro e Cerâmica para as Artes*) in Lisbon, who is currently analysing samples of the crystal. Hugh Wilmott, University of Sheffield, helped me identify a repaired 17th century English wineglass.

The trail led back to Dublin, and in 2016 Franc Myles and I went through the glass waste from his Smithfield glasshouse excavation and found the missing piece of the puzzle: fragments of opaque glass vessel waste almost identical to the ones from Rathfarnham, meaning the unique Rathfarnham opaque glass vessels could have been manufactured in Dublin.

David Swift examined the glass bottles and his findings are presented here. A number of the bottles are sealed and marked 'AL 1688', which David identifies as Adam Loftus, who resided at Rathfarnham Castle at that date.

Steven McGlade examined the flat glass. I had assumed that this would comprise late 17th century window glass. However, with the assistance of Nessa Roche from the National Monuments Service, Steven identified many different types of flat glass including evidence

for repair and reuse of window panes from the 16th and 17th century. He also identified at least two mercury-backed glass mirrors. Nessa Roche had previously examined an early casement window in Rathfarnham Castle, and drawing on her research Steven was able to show that some of the excavated glass probably came from the same window, and was likely of 17th century date.

Peter Francis came to view the artefacts and confirmed the parallels with Templeogue House. He also identified one of the most mysterious of our glass artefacts: a tiny glass sword and a glass horse, as part of a Nevers glass diorama. Judith Carroll meticulously researched the Rathfarnham Castle glass miniatures and has found parallels for all these unusual artefacts in late 17th century French dioramas. She also discovered a documentary reference to Adam Loftus in Saumur in the 1670s, and proposes he acquired the dioramas here. The Rathfarnham Castle miniatures have also been examined by Audrey Whitty, Keeper of the Art and Industrial Division (Decorative Arts and History), at the National Museum of Ireland, who recognised a blue and white glass frame fragment from a diorama at the Corning Museum of Glass and raised the intriguing possibility of an Austrian origin for some of the glass.

An important contributor to this report is Alva

Mac Gowan, who has beautifully and accurately illustrated the glass artefacts, and has photographed the glass miniatures, beads and opaque glass.

Organisation of this volume

The 2,376 glass artefacts have been divided up into nine categories. A tenth category was created for unidentified glass artefacts. Approximately half the glass fragments are from broken window panes, and the other half from at least 141 glass vessels. A high proportion of the glass vessels are over 50% complete (as with the ceramic vessels).

Broad categories of glass	No. items
Glass vessels (min 141 vessels)	1455
Flat glass (windows, mirrors, lenses)	863
Glass other (ornamental, unidentified)	58
Total	2376

The gold, silver and glass sleeve buttons (2:189) are not included in this report, and are described under the gold ornaments.

Glass categories	No. items
Lead-crystal stemware (wineglasses)	232
Lead-crystal dessert glasses	25
Opaque glass tableware	70
Other glass tableware (tumblers & bowls)	28
Glass bottles	599
Glass phials and scent bottles	504
Glass miniatures and beads	29
Glass lenses	3
Flat glass (window and mirror)	860
Unidentified glass	26
Total	2376

Context of glass artefacts

The glass comes from three features. 26 glass bottles came from a mixed 18th-20th century rubble layer in the southwest flanker [C1]. 19 glass bottles come from a 16th-18th century deposit near the oven in the southeast flanker [C10]. Five bottles and phial were out-of-context [C12] - the bottles are likely from [C1] and the phial from the washpit [C2-C9].

The remaining 2,325 glass artefacts (99%) came

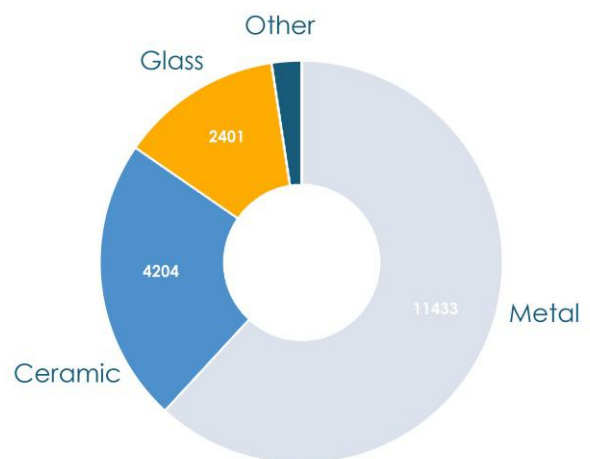


Chart of artefacts by material from Rathfarnham Castle 2014 excavations. This includes c. 9,000 brass pins

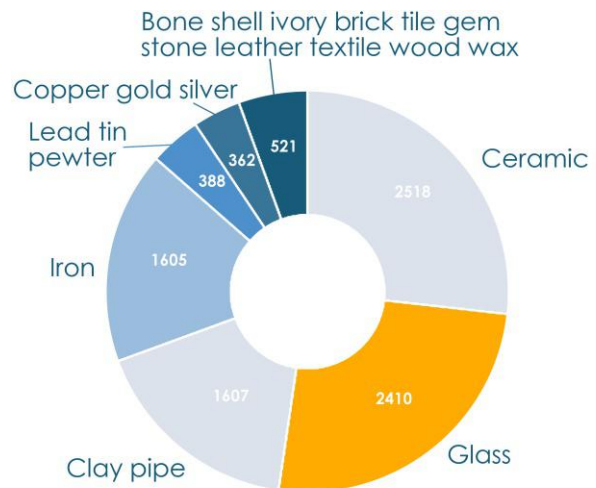
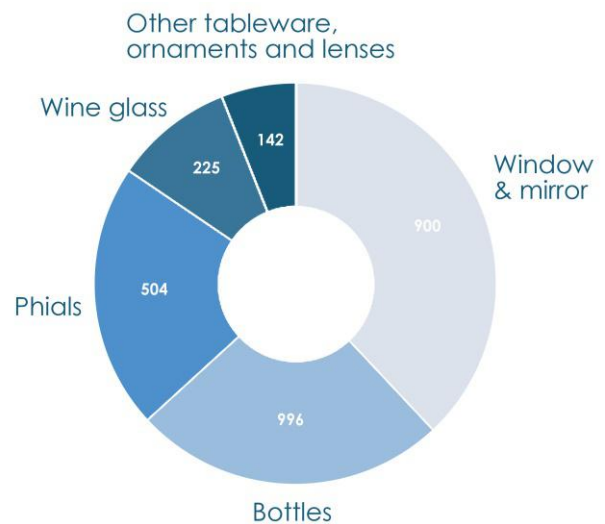


Chart of artefacts by material from Rathfarnham Castle 2014 excavations by material excluding pins



Glass artefacts by category

Context	Description	No. glass artefacts
1	rubble	26
2	washpit	62
3	washpit	58
4	washpit	123
6	washpit	1813
7	washpit	123
8	washpit	83
9	washpit	63
10	oven	19
12	out of context	6
Total		2376

from a single feature, a 16th century washpit in the southwest flanker that was sealed in the early 18th century. The glass assemblage within the washpit is thoroughly mixed with refits between contexts.

Date of glass artefacts

The glass from the washpit dates from the late 16th century to the early 18th century. The earliest glass is represented by diamond-shaped panes from late 16th or early 17th century mullioned windows. The windows may have broken long after their installation. The latest glass is represented by mallet-shaped winebottles dated to 1720-1740, and an engraved German or Bohemian glass tumbler dated to c. 1700-1770.

The majority of the glass is tightly dated to 1670-1710. Adam and Lucy Loftus resided at the castle during this period, and the glass assemblage is likely to belong to them personally. The Loftus family moved out of the castle sometime after the death of Adam in 1691, and the castle was sold in the 1720s. These dates correlate well with the majority of the glass assemblage from the washpit: most of it represents fine glass associated with the Loftus family and discarded soon after 1691; with a smaller amount of slightly later material up to the seal date of c. 1720s.

Function

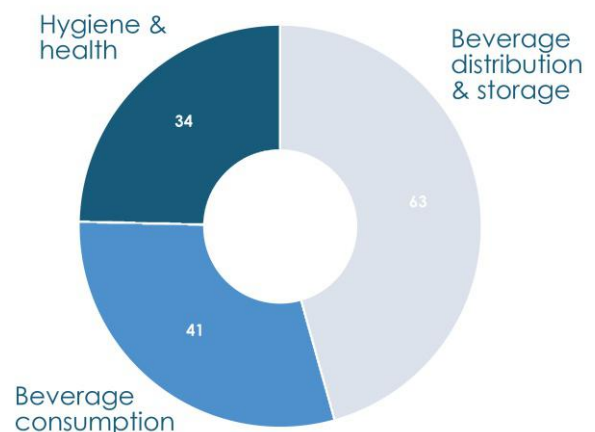
The glass vessels can be categorised by function (following Fryer and Shelly 1997). In the late 17th and early 18th century wine bottles were inefficient for storing wine, because of their

shape, and were more often used as decanters or for drawing small quantities of wine from a larger cask or barrel (Bragdon, 1981). They are classed here as beverage distribution, but might equally be classed as beverage consumption at the table (n=63; 45%). Drinking glasses, tankards, cups, jugs and bowls were used for beverage (or perhaps dessert) consumption at the table (n=43 30%). The phials and scent bottles were used in hygiene and health matters (n=35; 25%).

Glass vessels MNV	No. items	MVV
Lead-crystal stemware	232	25
Lead-crystal dessert glasses	25	6
Opaque glass tableware	70	6
Glass tumblers, beakers & bowls	28	6
Glass bottles	599	63
Glass phials and scent bottles	504	35
Total	1458	141

These proportions can be compared with a contemporary tavern clearance assemblage (1650-1712) at Guildford in England (Fryer and Shelly 1997) where glass vessels were categorised into beverage distribution and storage (18%), beverage consumption (55%) and hygiene/health (27%).

Glass vessels by function



They can also be compared to the Rathfarnham Castle ceramic vessel breakdown by function: tableware 59%, sanitary ware 31% and kitchenware 5%.

Material and manufacture

The majority of the glass is made of standard greenish-hued forest-glass or alkali glass which was produced in glasshouses all over northern Europe in the late 17th and early 18th centuries. The basic ingredients are sand, and ash from burning trees or plants (potash or soda), with little attempt to remove impurities or attain clear transparency. This glass was generally used for bottles, phials and window panes, and represents 77% of the total glass recovered from the site.

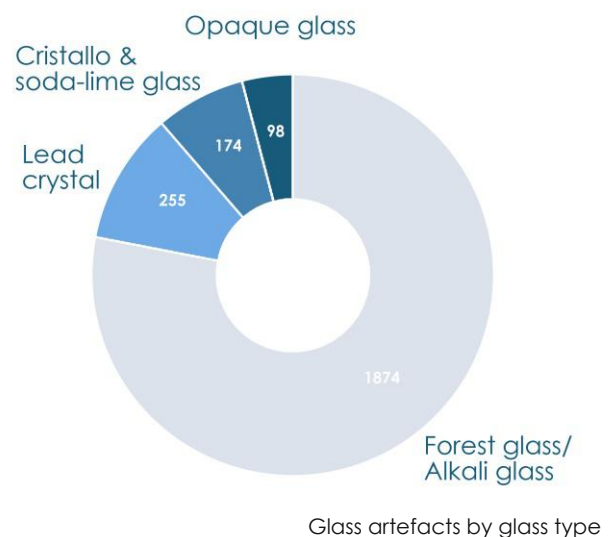
The second type of glass recovered is lead-crystal glass (sometimes called flint glass). Although lead-based glass was made in Europe from medieval times, the particular type of lead-based glass represented at Rathfarnham was developed during the 1670s in London, Dublin and the Netherlands, and serves as a useful dating tool. A more correct term would be potassium-oxide/lead-oxide/silica glass, as the basic ingredients are flint, lead and saltpetre. It is sturdier and more refractive than normal glass, and can be cut (though none of the Rathfarnham crystal is cut). 11% of the glass assemblage is made of lead-glass crystal, mostly wine glasses and dessert glasses and a drinking glass/tumbler, though one unidentified glass (apothecary?) is also made of crystal.

Glass material type	No. items	
Alkali-based greenish glass	1,826	77%
Lead-glass crystal	257	11%
Opaque glass	98	4%
Clear non-lead-based glass	195	8%
Total	2,376	100%

Opaque glass (ie non-transparent glass) represents 4% of the assemblage. This was used in tablewares and in ornamental dioramas. The two basic ways to create opaque glass was to add either calcium/antimony or lead/tin as an

opacifier. The opaque glass from Rathfarnham is either white, blue or green.

The final type of glass is clear transparent glass which is not lead-glass crystal. This was difficult to make as it required removing impurities in the sand and alkali glass ingredients, or else using substances such as manganese to even-out impurity colours. Venetian glassmakers specialised in this kind of glass, which was called *cristallo*, and by the late 17th century soda-lime glass had also been developed in central Europe (Germany and Bohemia). Bowls, beakers, mirrors, some of the phials, an engraved tumbler, the glass lenses, mirrors, and some unidentified glass objects were made from these types of glass representing 8% of the assemblage.



Lead-crystal stemware (wineglasses)

Antoine Giacometti with assistance from Colin Brain

Illustrations by Alva Mac Gowan, Archaeology Plan

Introduction

232 sherds belonging to lead-crystal glass stemware were identified from the Rathfarnham Castle excavation (E4468). These belong to at least 25 stemmed lead-crystal glasses. They were probably all wine glasses, though two (2:178 & 6:4224) may have been stemmed dessert or mead glasses (they are more likely to be Irish proto-baluster wineglasses) and one (7:419) could have been an ale glass. Three further stemware fragments may belong to an ornate *façon de venise* glass goblet (2:84), a hollow-stemmed goblet (8:24) and a possible tazza (6:4342)

Most of the stemmed lead-crystal glasses are likely to have been manufactured between 1685 and 1710 in England or Ireland. One glass

(7:418) may be of continental origin, and three are of indeterminate origin.

The assemblage is significant because it is one of the largest excavated assemblages of early Irish and English lead-glass crystal. This was a new material developed in northern Europe during the 1670s. The Rathfarnham assemblage complements the exceptional (and probably slightly earlier) lead-crystal glass assemblage from Templeogue Castle excavated by Leo Swan (in Giacometti 2007), the excavation at the Smithfield glasshouse by Franc Myles (2010), documentary research by Sue and Peter Francis (2000; 2016) and research and scientific analysis by Colin Brain (2016), which together demonstrate how Dublin played a part in the development of lead-crystal glass in the late 17th century.

Amongst the more interesting finds is a wine

Dublin-made late 17th century crystal glasses



Type of stemmed glass	Approx. date	Min. No. Vessels
Tapering stem glasses	1673-1698	7
Inverted-baluster stem	1685-1700	2
Inverted-baluster stem with basal knop	1685-1710	4
Inverted-baluster stem with quatrefoil molding & merese	1675-1700	5
Wrythen glass	1675-1700	1
Pillar stems (proto-baluster)	1675-1720	2
Complex stem with heavy bowl base and dome-shaped foot	1690-1720	1
Unidentified stems	17th century	3
Other stemmed glass fragments	1670-1720	-

25 (min) stemmed glasses in total

glass which has been repaired (6:4465). This is the smallest and probably the earliest wine glass in the assemblage: an early form of tapering-stem glass possibly made in London in the 1670s or 1680s. It has been repaired by welding a cage made of lead strips, possibly from window lead, around the stem. Surprisingly, it does not seem the repaired glass could have been used as a glass any longer, and instead might have converted it to another use (or for display). This artefact appears to be similar to a fragment from a tapering-stem glass repaired with lead strips found on the Thames foreshore in London. Hugh Wilmott (2001) has identified twenty similar repaired wine glasses from London and southeast England all with these similar style of repair, and he has speculated that a single individual - perhaps a glazier based somewhere in or around London - repaired all of them in the mid-late 17th century. In this regard, it is interesting to note a fragment of window lead from Rathfarnham Castle bearing the mark '1692 e.w', thought to come from the workshop of the most famous late 17th century window lead company working in London at the time. How or why the repaired glass ever arrived in Dublin is an interesting mystery.

Lead-crystal glass - an innovative material

The Rathfarnham stemware is made of crystal, very similar to modern Waterford Crystal. This is a form of glass with a high content of lead (c. 10-40%), which makes it very dense (thus heavy), highly refractive and amenable to being cut and faceted, and gives it a pleasing ring. Lead-crystal glass is not technically a crystal in chemical terms, and the term derives from Venetian glass.

In the 17th century, glass was ordinarily made of sand and an alkali (potash or soda). It contained many impurities and was usually greenish in colour, which was ideal for bottles but less desirable for fancy drinking vessels or lenses. Clear glass was more difficult to make, but the Venetians had developed an expensive (and closely guarded) system for making a completely transparent glass, which was called *cristallo*. Generally this did not contain lead. But the secret spread, and by 1612 when Antonio Neri published the secrets of Venetian glassmaking in the *L'Arte Vetraria*, northern European glasshouses were producing high quality facon de

Type	Fragments	Min. No. Vessels
Stems	31	22
Unidentified vessel stem sherds	3	3
Rim sherds	31	0
Bowl body sherds	129	0
Foot sherds	34	0
Unidentified vessel foot sherds	3	0
Unidentified vessel rim sherds	1	0
Total	232	25 (min) stemmed glasses in total



Glass 6:4226 being washed after discovery

Venise *crystallo* glass vessels and clear lime-potash glass.

A number of related factors drove the demand for a new glass material. The restoration of the English monarchy after 1660 and the end of the civil wars marked the rise of a middle class in Britain, who demanded access to consumer goods previously only available to the very wealthy. The restoration also led to a change in English patent laws and the end of some monopolies (eg. 'The Glass-sellers' Company of London charter 1664) which encouraged innovation and led to public debate about entrepreneurship in England (Brain & Brain 2015, 1-2).

International trade boomed from the 1660s and 1670s between northern Europe and the American colonies and Far East (Francis 2000, note 4). This drove demand for new goods, but also demand for sturdy goods that could survive long ship journeys. Sturdy glasses were also required by the bars and taverns opening throughout northern Europe, and this new demand for sturdy glassware was expressed in letters between English glass seller John Greene and Venetian manufacturers from 1670 to 1672 (Brain & Brain 2015). The Brains suggest (ibid, 7) that the desire for long-lived and sturdy glasses was an aesthetic reaction against rarity and fragility - perfectly expressed in elaborate

Venetian glasses - for something more suitable to a new, rational age. Growing international trade also provided new materials, notably saltpetre from India (Brain 2016). Globalisation encouraged migration, and several Altarian glassmakers from the north of Italy moved to northern Europe at this time (Francis 2000).

Simultaneously, the 1660s marked a time of experimentation with materials in northern Europe. Particularly important for glass were the chemical and alchemical experiments of Johann Rudolf Glauber (1604-1670) at his glasshouse in Amsterdam (von Kressenbrock-Krosigk 2008, 16-17) which attracted followers who went on to disseminate and develop Glauber's alchemical-chemical research into new ways of making glass vessels in the 1670s and 1680s (von Kressenbrock-Krosigk 2012, 75-76). In England, the 'College for the Promoting of Physico-Mathematical Experimental Learning' was established in 1660 and two years later the King signed a royal charter creating the Royal Society of London. Isaac Newton's *Philosophiæ Naturalis Principia Mathematica* was published in 1687, and his theory of optics was itself partially dependent on improvements in glass technology, to make lenses and prisms. Colin Brain (2002b) has also pointed out that significance to glassmaking of the new 'Amsterdam Furnace' at this time.

Together these factors led to a period of pioneering development and innovation in commercial glassware. Colin and Sue Brain (2016) have shown how one strand of experimentation focused on adding lead to the standard glass recipe (lead-woodash glass). This mostly developed on the continent in the 17th century, but was also used in late 17th century English glasshouses (Vauxhall and the Minorities), but the resulting glasses were often tinted either green from the woodash or pinkish from the manganese decolourant and solarisation.

Another strand (ibid) involved using ground flint instead of sand as the main ingredient (silica). Since many of the problematic impurities in glassmaking were introduced by the sand, swapping sand for flint meant much less impurities and clearer glass. The impurities remaining in the woodash element, however, meant the

glass was difficult to consistently get clear. This latter strand culminated in a new kind of glass 'resembling rock crystal' patented by George Ravenscroft in London in 1674, which replaced the woodash by saltpetre. This borate-soda-potash-silica glass rivalled Venetian-style *crystallo* in its clarity but was sturdier, and it was known as 'flint glass', or simply 'crystal'.

Unfortunately, this flint glass crystal crizzled (cracked and corroded) soon after it was made, so early flint glass manufacturers experimented with various ingredients to find a way to stabilise it (Dungworth & Brain 2005). By drawing on the first strand, they discovered that adding lead would slow or halt the decay. Experimentation by adding c. 15% lead into the flint-glass crystal recipe were conducted in Vauxhall and the Savoy glasshouse in London and Smithfield in Dublin, and eventually by 1676 a solution (to add c. 26–30% lead and reduce the salt-petre/potash) to crizzling was found (Brain & Brain 2016). This glass, technically a potassium-oxide/lead-oxide/silica glass, was called 'new flint glass crystal' at the time. It is chemically similar to modern 'crystal' glass, and is termed lead-glass crystal in this report.

The development of lead-crystal glass in Ireland

Prior to 2000 the development of lead-crystal was thought to have occurred in dynamic northern and central European centres such as London and Amsterdam. Peter Francis's seminal article in 2000 'The development of Lead Glass: the European Connections' demonstrated how Dublin was also involved in this process.

Peter Francis (2000) drew on two strands of research: the form of early lead-crystal wine glasses, and historical records. He drew attention to the fact that early Irish lead-crystal glass stemware frequently had a merese (a protruding collar between the bowl and the stem), which is very rare in English-made glasses during this period, and identified a new form he termed 'proto-baluster' based on the Templeogue Castle assemblage (Giacometti 2007). Francis has hypothesised that they represent the earliest type

of Irish-made lead crystal c. 1678-1688. The Rathfarnham Castle excavations add a further seven examples of Irish-type merese stems and proto-balusters.

Nessa Roche identified the site of a late 17th century lead-crystal glassworks in Smithfield (NLI Inchiquin Papers Ref 1190) and this was later excavated by Franc Myles (2010) who identified glass manufacturing waste associated with the Dublin-based Italian glassmaker Odaccio from 1675 to 1696. John Odaccio Formica was originally from Altare in northern Italy and had worked with Glauber and John Baptista Da Costa in Nijmegen in the Netherlands between 1665 and c. 1672 (Francis 2000, 49). Odaccio then moved to London to work with Ravenscroft in his new Savoy glasshouse in 1673-4 (Brain & Brain 2016) before moving to Dublin in c. 1675.

The waste from Odaccio's glasshouse excavation by Franc Myles was analysed by Dungworth and Brain (2009), and in the Brain's recent (2016) conclusions on the development of lead-crystal glass in northern Europe they used it to show that the new material developed in parallel in Dublin and London. Odaccio received a patent for this new material in 1675 'Warrant for a patent for 14 years in Ireland to Sir Philip Lloyd, Richard Hunt, and John Odaccio Formica for their new invention of manufacturing a particular sort of crystalline glasses, resembling rock crystal, which has never

Photograph of a complete late 17th century Irish lead-crystal glass (from Francis 2000, 53, Fig. 10)



been exercised by any in that kingdom' (Stow 207 F 437 [BL]. 1675, cited in Brain & Brain 2016).

Francis (2000, 4) identified a second glasshouse operating at 'Lazy Hill' (modern Townsend Street in Dublin) from 1680, owned by Captain John Nicholls. Records show he sold 'flint glasses' in 1680-1681 to glass merchant 'Black' George Maccartney who set up Ireland's first glass shop in Belfast (ibid 4-5). This might suggest Nicholls was also manufacturing lead-crystal glass. However, the Brains (2016) point out that the delivery might have been of defective English glasses made in the Savoy Glasshouse in London dumped through Nicholls into the Irish market to undercut Odaccio. Brain and Brain (2016) cite a petition by Ravenscroft to the King in 1681, complaining that his attempts to set up a glasshouse in Ireland were being thwarted by Odaccio (CCA-U63/70437 fo.3, Nov 19th 1681).

Lead crystal caught on quickly in Ireland. Roche (2004, 204) notes that a 1684 inventory of the Ormonds, 'foremost peers of the Irish court' records 22 flint glasses, 20 kivers (covers) for the glasses and one large glass bottle kept in the great seller' (NLI MS 2554, 1684, fol 76).

Archaeological finds of early Irish lead-crystal glass

Late 17th century wine glasses of possible Irish manufacture have been excavated on a number of Irish sites in Dublin and Galway.

The largest assemblage is from Templeogue Castle, excavated in 1996 by Leo Swan (96E010, Francis, in Giacometti 2007, Appendix C). The second largest is the collection described herein from Rathfarnham Castle.

One example has been identified at Kevin Street, Dublin, excavated by Linzi Simpson in 2004 (04E0294:41:1, with merese, Scully in Pearse Street Archives DCAA.01.34), two more at Smithfield, Dublin, by Franc Myles (2007) in 2002 (00E0272:1034[11], Dungworth & Brain 2009, Sample 101, with merese, not illustrated; 00E0272:1034[10], Dungworth & Brain 2009,



Locations relating to late 17th century Irish lead-crystal glass

Sample 74, without merese, illustrated *ibid*). At least six have been excavated at Dublin Castle by Conn Manning (E296:9122, 13299 & 30208 with merese, Francis 2000, 53, Note 49; E296:12588, 12518 and 8114, without merese, Brain pers. comm. 2015). Two proto-baluster glasses with merese were identified in Courthouse Lane, Galway (97E82:702:11013 & 97E82:771:10490; Roche 2004, 408, 411, fig 6.4.1d & g). A fragment of an Irish glass with merese was identified at Barrack Lane, Galway (98E21:119; Roche 2004, 407 & note 263). A group of six proto-baluster stems without mereses from Merchants Road, Galway (E400:883, 3782, 3783, 4424, 4845, 6488; Roche 2004, 412-414, ill 6.4.3a & b & c) may also be Irish, as may a similar glass from Courthouse Lane, Galway (97E82:2597; Roche 2004, 411, fig 6.4.1f).

Possible Irish late 17th century lead-crystal glasses with mereses have also been identified in Somerset, England (Wells Mus. 1993.2/1064, 1091, 1094, in Francis 2000, 53, Note 49), from Port Royal, Jamaica (McClanaghan 1998, 2009-2010, Plate 36 RM 66-68. IIIa; Dungworth & Brain 2009 Samples 57 & 58, ref. PR87 584-2 & PR87 533-4), and in an unlocated example from Belfast (photograph in Francis 2000, 53, Fig. 10).

Tapering stem glasses 1673-1698

Seven tapering stem glasses were identified. These have short (40mm-50mm) solid stems that taper from the top to the base. The stems are sharp-shouldered and almost straight-sided. They have round funnel bowls (incomplete), and folded conical feet that measure 70mm-80mm in diameter. None have tears or seals. They are made of clear lead crystal, and none show signs of crisselling.

Sue and Colin Brain (2002) have identified tapering-stem glasses (their 'Type 7B (a) iii f -r.f. '), dating to the last quarter of the 17th century (1673-1698), as representing 'the first 'English' glass designs; introducing the simplicity of form and reliance on proportion which were to be the hallmark of English-made drinking glass for the next century. These designs both resulted from, and exploited, the crystal glass newly introduced by George Ravenscroft and others. They form the root for both the classic inverted-baluster stemmed and plain-stem trumpet glasses which dominated the early Georgian era and their influence can be traced into the early nineteenth century.' Late 17th century sketches of glasses ordered from Venice by John Greene, an English merchant, include this type (Hartshore 1968, 234, fig 160).

The smallest of the Rathfarnham tapering stem glasses (6:4465) is probably the earliest and manufactured in London. It is shorter with straighter sides than the others, and is heavily discoloured. It has also been repaired by a lead cage, and the bowl has been intentionally



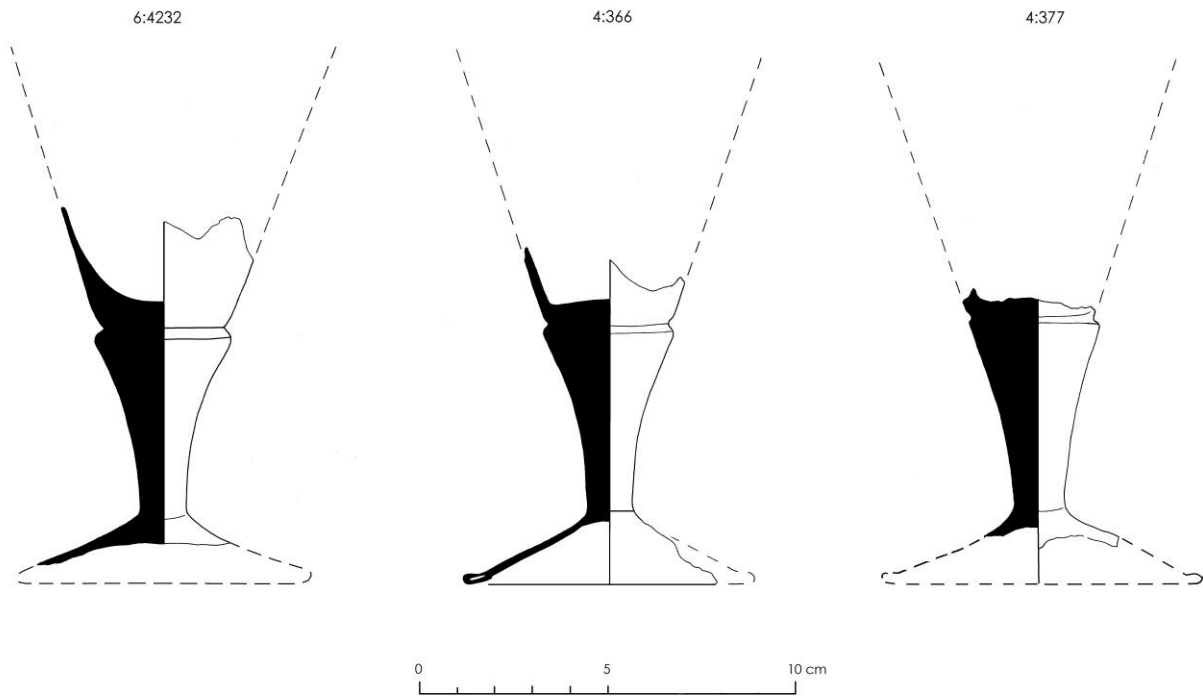
Repaired glass 6:4465

chipped away.

The other six Rathfarnham tapering-stem glasses are taller, have in-curving stems and fol-

left to right: 4:366, 4:377, 6:4220, 6:4221, 6:4228 & 6:4232, and 6:4465 in front.



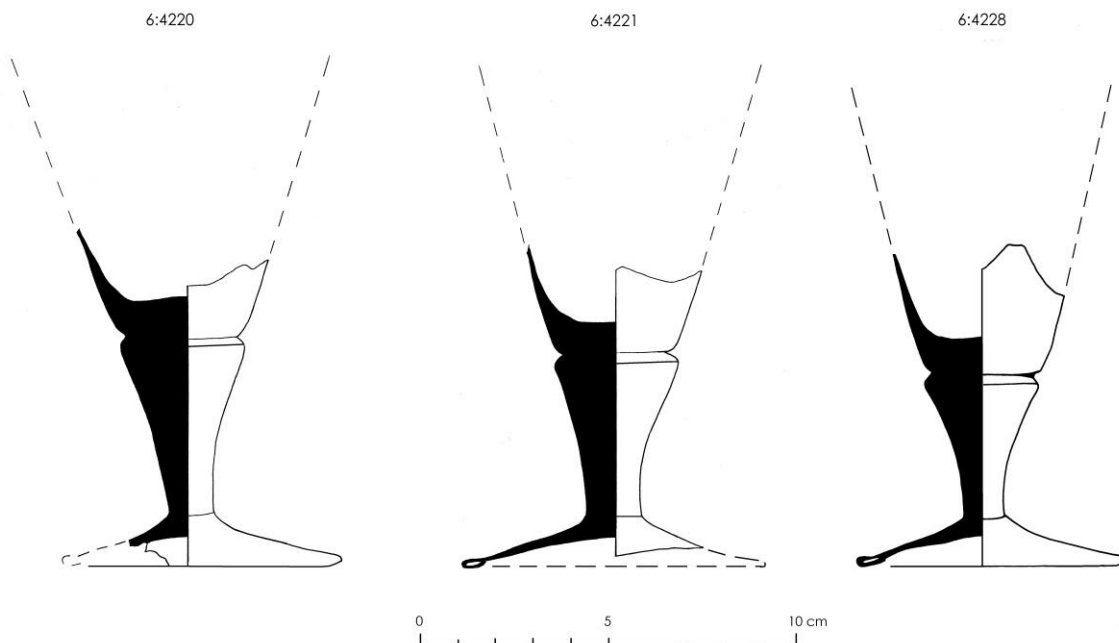


Tapering stem glasses, illustration by Alva Mac Gowan

ded foot rims, and show no sign of crisseling. Crisseling is a characteristic sickness in crystal present in the earliest Ravenscroft-style English crystal glasses. Peter Francis (nd) has noted that crisseling is absent from early Irish glasses from Templeogue Castle, however much of the material excavated from the site of Odaccio's Dublin glasshouse is crisselled (Dungworth & Brain 2009). These glasses may have been made in London or Dublin, and none are sealed. They

were most likely brought together as a set, and Colin Brain (pers. comm 2015) has pointed out that all have the line of the bowl wall notionally following the profile of the stem which might suggest that they are fore-runners of the drawn plain-stem glass. The majority of the Rathfarnham tapering-stem glasses are likely to date to 1685-1698, with the single earlier example (6:4465) possibly dating a decade earlier.

Tapering stem glasses, illustration by Alva Mac Gowan





from left: 6:4220, 6:422 &, 6:4228

4:366 Tapering stem glass

Tapering-stem glass with short (50.55mm) solid stem that curves inwards from a sharp shoulder (36.8mm diameter) to the base (14.50mm diameter). Round funnel bowl with heavy slightly-convex bowl base c. 5.1mm thick max, base of bowl 29.47mm internal diameter, bowl wall thickness 1.4mm. Folded conical foot 80mm diameter. No tear or seal. Fine imperfection mark on stem surface, and several small air bubbles in stem. Clear lead crystal without crisseling, with some yellow-brown patina. Total height of glass fragment: 87.23mm.

4:377 Tapering stem glass (& refit 6:4202)

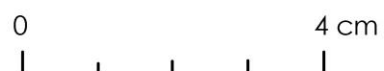
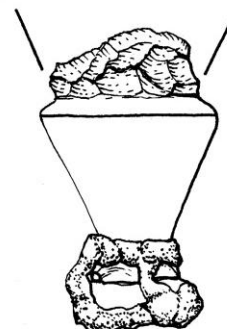
Tapering-stem glass with short (49.94mm) solid stem that curves slightly inwards from a sharp shoulder (35.04mm diameter) to a thick base (14.89mm diameter). Bowl missing, convex bowl base c. 5mm thick max, base of bowl 26.22mm internal diameter. Broken conical foot. No tear or seal. Frequent heavy striations on stem. Clear lead crystal without crisseling, with some white patina. Total height of glass fragment: 66.42mm.

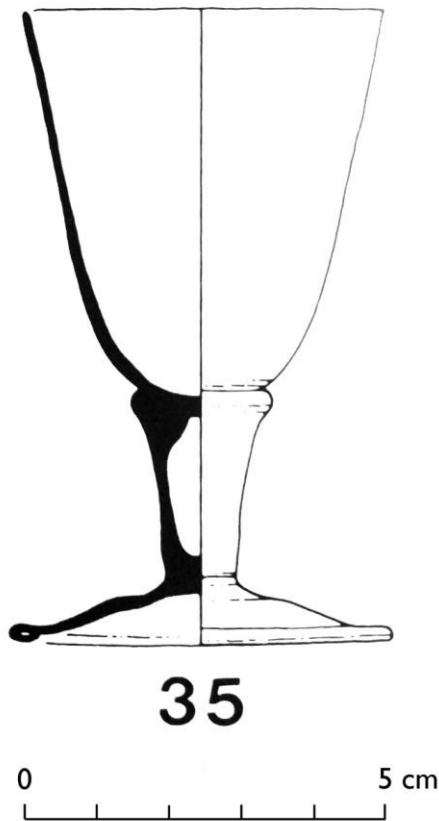
6:4220 Tapering stem glass (& refit 6:4325)

Tapering-stem glass with short (46.68mm) solid stem that curves inwards from a sharp shoulder (33.03mm diameter) to a fine base (13.29mm diameter). Round funnel bowl with heavy convex bowl base c. 8.7mm thick max, base of bowl 26.98mm internal diameter, bowl wall thickness 1.4mm. Folded conical foot 79.54mm diameter. No tear or seal. Frequent fine striations on all surfaces. Clear lead crystal without crisseling, with some yellow-brown patina. Total height of glass fragment: 97.76mm.

6:4465 tapering stem glass with lead repair, illustration by Alva Mac Gowan

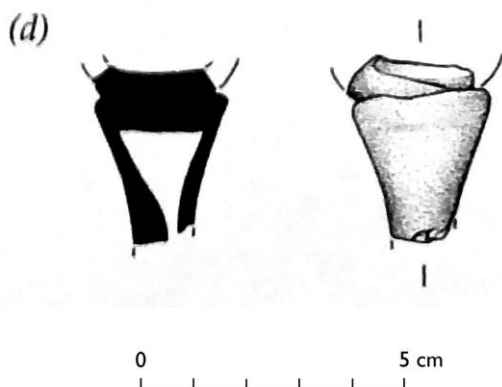
6:4465





Glass cat. 35 from Guildford (drawing from Fryer & Shelly 1997)

Glasses 97E82:744:10172 (e) and 97E82:2304 from Courthouse Lane, Galway (drawing from Roche 2004, 409-410).



6:4221 Tapering stem glass

Tapering-stem glass with short (41.76mm) solid stem that curves inwards from a sharp shoulder (33.51mm diameter) to a fine base (15.66mm diameter). Round funnel bowl with heavy slightly-convex bowl base c. 8.87mm thick max, base of bowl 29.31mm internal diameter, bowl wall thickness 1.07mm. Folded conical foot 79.59mm diameter. No tear or seal. Clear lead crystal without crisseling, with some brown patina on bowl. Total height of glass fragment: 87.33mm. This fluoresced ice-blue under UV light and is probably lead crystal.

6:4228 Tapering stem glass

Small tapering-stem glass with short (35.53mm) solid stem that curves inwards from a sharp shoulder (31.12mm diameter) to a fine base (11.79mm diameter). Round funnel bowl with heavy slightly-convex bowl base c. 6.6mm thick max, base of bowl 25.38mm internal diameter, bowl wall thickness 0.89mm. Folded conical foot 71.41mm diameter. No tear or seal. Frequent fine striations on all surfaces. Clear lead crystal without crisseling, with some brown patina. Total height of glass fragment: 77.74mm.

6:4232 Tapering stem glass

Tapering-stem glass with short (47.46mm) solid stem that curves inwards from a sharp shoulder (37.36mm diameter) to the base (14.72mm diameter). Round funnel bowl with concave bowl base c. 26mm internal diameter, bowl wall thickness 1.18mm. Folded conical foot c. 79.5mm diameter. No seal. All surfaces heavily patinated, and where glass is visible through the patination it is black in colour. Total height of glass fragment: 89.58mm.

6:4465 Tapering stem glass fragment with lead repair

Very small stem fragment with very short (22.24mm) solid stem that curves slightly inwards from a sharp shoulder (23.78mm diameter) to the base (10.71mm diameter). Bowl missing, and appears to have been intentionally chipped away leaving only part of a heavy slightly-convex bowl base c. 8mm thick max. Foot missing and possibly also intentionally chipped away. No seal. Glass in black in colour without crisseling. Total height of glass fragment: 33.67mm. A network or cage of lead strips has been fused around the base of the fragment using two horizontal strips and three vertical strips as part of a repair, through it is likely a third horizontal strip has broken off. Lead cage measures 12.14mm tall and 14.37mm in diameter, is slightly squished, and has three openings c. 7.54mm long and c. 5.42mm high. Thickness of lead c. 2.2mm. Glass fragment has clearly been reused for something other than a drinking glass. This did not fluoresce under UV light, however the opaque black surface corrosion may be indicative of lead crystal (Brain pers. comm. 2015).

This artefact is similar to a repaired wine glass stem in the Museum of London (MoL 84.257/11; web id 512248) described as a 'colourless wine glass shoulder knob, enclosed in lead alloy tripod collar repair'. Hugh Wilmott describes it further (Wilmott 2001, 98-99, Sample 20 and Fig. 2, 20) as a sharp-shouldered inverted baluster of the Ravenscroft style c. 1670-1690 found on the Thames foreshore. Wilmott (2001) has identified twenty similar lead repairs and argues that all are roughly contemporary and manufactured by a single individual – perhaps a glazier – in the mid-late 17th century, The Rathfarnham example is the only Irish example, all the rest are from London and southeast England. Wilmott also notes that the repairs in the examples he studied would have been largely ineffective (2001, 201), as is the case with the Rathfarnham example, and he suggests (ibid 103) that they may have

been primarily symbolic, as a way of displaying an antique, for status, or for sentimental reasons. Unlike Wilmott's other examples, it is difficult to see how the Rathfarnham repaired glass, and arguably it's British Museum twin) could ever have been functional. Although some repaired glasses combine more than one glass (Wilmott 2001, Fig. 2: 2), even this would not have allowed the Rathfarnham stem to be functional. It is more likely that the glass stem was reused for a different function entirely.

Comparative examples for tapering stems

Examples of tapering stem glasses similar to the Rathfarnham Castle examples have been published, usually under the term 'inverted baluster', (e.g. Noel Hume 1968: 190 V; 191, fig 64: V; Charleston 1984, 117 fig 22a) and they are generally dated to 1675-1685. Colin and Sue Brain (ibid) have identified an original design for this type of stem type dating from 1673 (Sloane Manuscripts, 857, in the British Museum).

The smallest of the Rathfarnham Castle tapered stems (6:4465) is comparable in size and shape to the earliest known glasses with tapering stems, dating from 1674-1684. These are illustrated by Dungworth and Brain (2009, Page 116-7 Figs. 1-2, Nos. 18, 21, 22, 32, 100, 43/116, 42/115, 101/102, 110, 113, 114). In particular, stem No. 114 (2009, 117, Fig 2), found during excavations at Nonsuch Palace, Surrey and held by Museum of London (acc. no. 285), is a close match. A sealed lead crystal glass found in Guildford and dated to the 1670s (cat. 35-36; Fryer and Shelly 1997, 194, fig. 34) is also directly comparable. In Ireland, this smallest stem matches two glass stems from Courthouse Lane, Galway dated to c. 1675 (97E82:2302 and 2304; Roche 2004, 411, figs. 6.4.2b & d). Another from Barracks Lane, Galway (98E21:119; Roche 2004, 407 & note 264) c. 1680 is also similar.

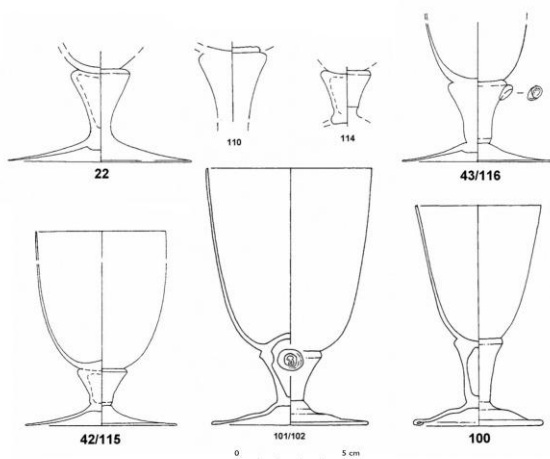
Rathfarnham tapered stem 6:4228 is comparable in size and form to a tapered stem wineglass from Courthouse Lane in Galway (97E82:744:10172; Roche 2004, 408-411, 6.4.1e). It is also comparable to Dungworth and Brain's illustrated stem No. 110 (2009, 117, Fig 2 N. 110). This illustration may be of a Port Royal glass (Brain pers. comm. 2015).

A tapering stem glass was identified at Smithfield in Dublin (Franc Myles, Smithfield, 00E272:1034[11]). This was crissled, with no seal, and had a merese, a feature absent from the Rathfarnham tapering stems. Brain dates it to 1675-1680 (Dungworth & Brain 2009, 122, No. 110).

Two similar glasses with the same bowl-stem continuity (though with a teared stem) were found at Templeogue Castle (96E010:15 & 96E010:07). Examples were also found at Dublin castle: E296: 12588; E296: 12518 and E296: 8114 (Brain pers. comm. 2015).

Tapering-stem glasses were a common type of drinking glass recovered in Port Royal Jamaica, though these were generally smaller and hollow, and with plain feet, unlike the solid folded feet examples from Rathfarnham (McClenaghan 1998, 146-8, Plate 10a-d & 50, Plate 10a; she dates them to 1675-1685).

Tapering stem glasses from Dungworth and Brain 2009



Inverted-baluster stem, 1685-1700

Two inverted-baluster stem glasses were identified (though Brain has suggested 6:4231 could be classified as a tapering stem glass, pers. comm. 2015). These are much more curved than the tapering stems, with rounded shoulders, and are very slightly taller (500mm), but still fairly squat. They have straight funnel bowls and folded conical feet that measure 90mm in diameter. The complete glasses would have measured 180mm in height. These glasses are slightly later than the tapering-stem style and are likely to date to 1685-1700.

6:4226 Inverted-baluster stem glass (& refit rim 4:379)

Inverted-baluster stem glass with short solid stem (Length 43.06mm) that curves from join with bowl (25.45mm diameter) to a wide shoulder (38.32mm diameter) and down to the base (15.61mm diameter). Straight funnel bowl with heavy concave bowl base c. 16mm thick max, base of bowl c. 25mm internal diameter. Conical foot, edge missing. Small oval tear c. 14mm long and c6.5mm wide in widest part of stem. No seal. Frequent fine striations on stem. Clear lead crystal without crisseling with heavy brown patina especially on stem. Total height of glass fragment: 114.24mm.

Refit with rim sherd 4:379 (Length 74.17mm, 21% of diameter), making an almost- straight funnel bowl 114.23mm high, that flares out from 25.45mm where it joins the stem to c. 95mm at rim. Bowl wall thickness varies from 1.12mm at rim, to 1.20mm in centre and 3.6mm near base. Patina on rim refit is orange and white, and markedly different from heavier brown patina on stem fragment, indicating post-depositional factors (the stem was recovered from a dark-coloured liquid, whereas the rim was recovered from an iron-rich dry deposit).

Both fragments fluoresced ice-blue under UV light and are probably lead crystal.

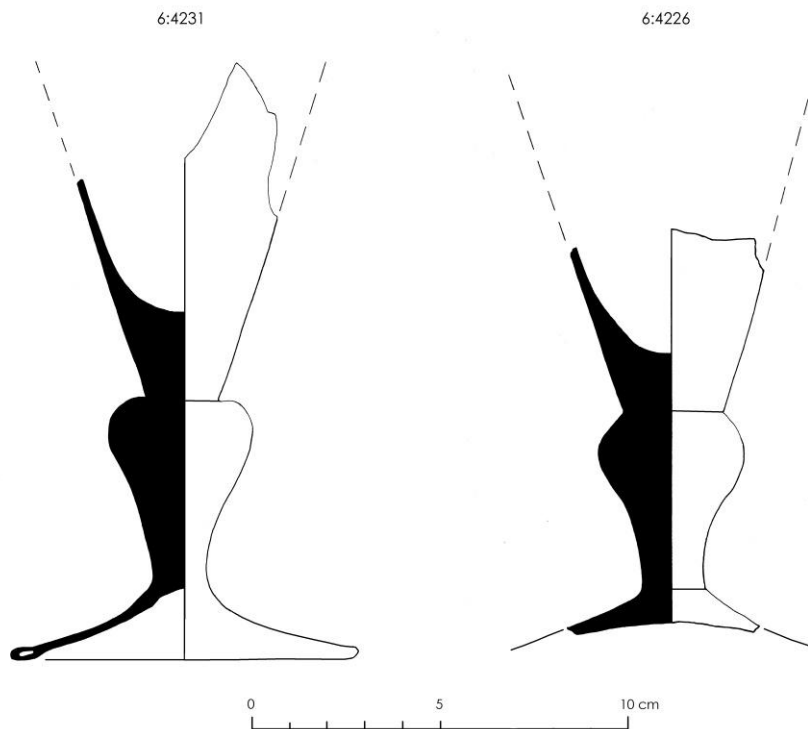
6:4231 Inverted-baluster stem glass

Inverted-baluster stem glass with short teared stem (Length 43.06mm) that curves from join with bowl (25.45mm diameter) to a wide shoulder (38.32mm diameter) and down to the base (15.61mm diameter). Straight funnel bowl with heavy concave bowl base c. 16mm thick max, base of bowl c. 25mm internal diameter. Bowl wall thickness 1.44mm. Folded conical foot 85mm diameter with narrow fold. No tear or seal. Frequent fine striations on stem. Clear lead crystal without crisseling, discoloured orange-yellow colour with some brown patina. Total height of glass fragment: 153.3mm.



top: 6:4226, bottom 6:4231





Inverted baluster glasses, illustration by Alva Mac Gowan. Note 6:4226 has a small stem tear

Comparative examples

This glass type was identified in Port Royal, described by McClenaghan (1998 170-1, Plate 20) as solid inverted baluster stems and dated to 1690-1700. McClenaghan also illustrates a shorter and hollow-blown inverted-baluster stem with a plain foot rim which she dates to 1675-1685 (McClenaghan 1998, 146-9, Plate 10e). They are also illustrated in Charleston (1984, Plate 32a, left and centre) who dates them to 1690-1710, Bickerton (1984, Plate 52) who dates them to c. 1700, and Thorpe (1927, fig 8a) who dates them to 1690. The Museum of London has an example (MoL acc. no. 34.139/366) dated to c. 1730.

Very similar glasses were excavated in Portugal in the 1980s (Type 1, in Valente et al 2016). These were subjected to detailed scientific analysis and suggested to be English and dating to 1685-1700, on the basis of comparison to Eng-

lish glasses with similar content. Valente et al also note a similarity with two glasses found in Holland (Samples 3 and 11 in Dungworth & Brain 2013) dated to 1685-1700.

A similar glass type (though with a more defined upper knob) has been identified in Guildford, where they were dated to 1685-1705 and suggested to have been made in London (cat. 39 & 40, Fryer and Shelly 1997, 194, fig. 35).

A particular good comparison with Rathfarnham Castle is illustrated by Buckley (1925, XII, Nos. 2 & 3), who shows two similar glasses that he dates to the late 17th century. The two glasses he illustrates are slightly different, with No. 2 almost identical to 6:4226, and No. 3 almost identical to 6:4231



Above from left: 6:4219, 6:4227, 6:4229 & 6:4230

Inverted-baluster stem with basal knop 1685-1710

Four inverted-baluster stems with basal knops were identified. The stems are taller than the previously described types (tapering stem and inverted baluster), measuring 60mm-70mm high. These have round funnel bowls, folded conical feet, and no seals. Three of the four glasses have long tears in the stem and basal knop, and the fourth (6:4230) is solid. They are made of clear lead crystal. As with the inverted baluster stems, these are taller and more curved than the tapering stem glasses, and date to c. 1685-1710.

Four glasses of this type excavated in the 1980s in Lisbon ('Type IV' in Valente et al 2016), and have been recently subject to chemical analysis and shown to be composed of c. 28-36% lead. This can be compared to lead content analysis from known English glasses by Dungworth and Brain (2009) that showed lead content below 20% was associated with early crystal production (1674-1685), whereas lead content above 25% was associated with a later phase (1685-1705). Following Valente et al, (2015) it can be suggested that these glasses were likely made in England (or possibly Ireland) sometime between 1685 and the beginning of the 18th

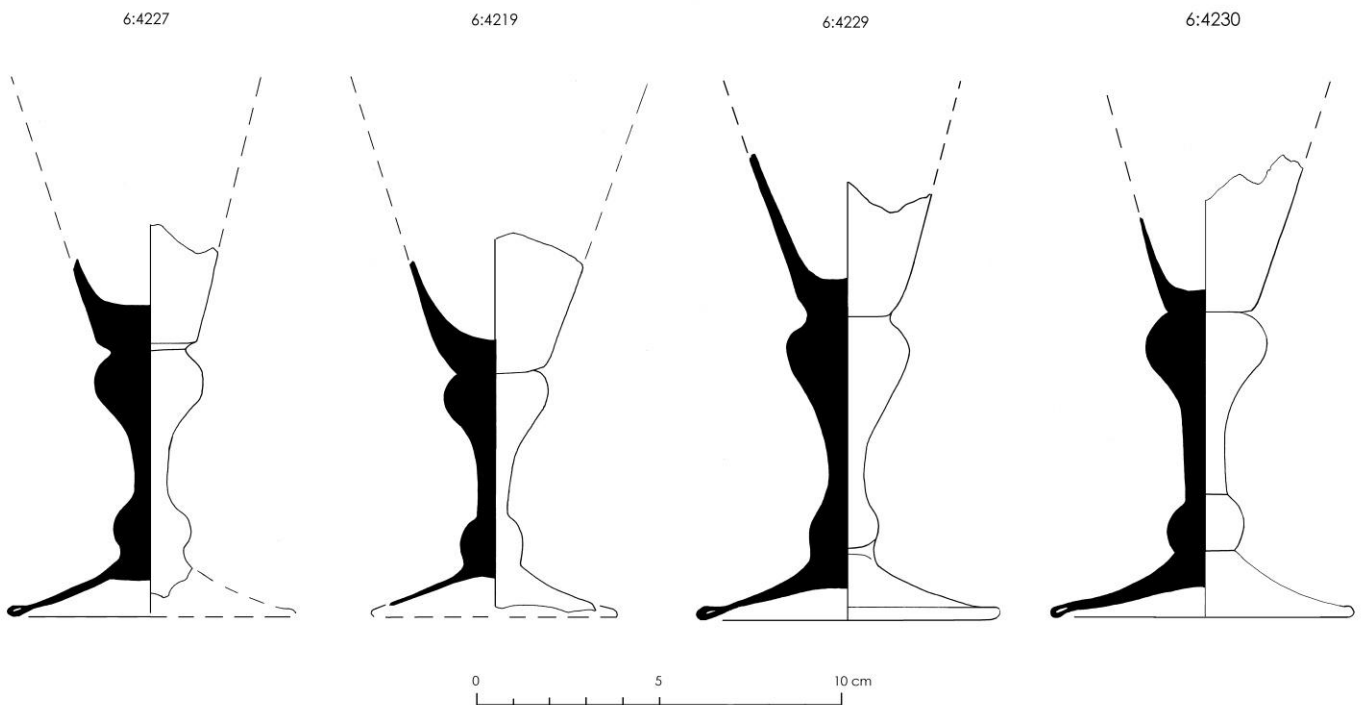
century.

6:4219 Inverted-baluster stem with basal knop (& refit 6:4323)

Inverted-baluster stem glass with basal knop. Stem (Length 51.62mm) curves from join with bowl (25.38mm diameter) to a wide shoulder (30.79mm diameter) and down to the narrowest point (11.02mm) above a basal knop (19.09mm diameter) above the join to the base (16.23mm diameter). Stem has imperfection at join with bowl. Rounded funnel bowl with concave bowl base c. 10mm thick max, base of bowl c. 17.23mm diameter internally. Bowl wall thickness 1.52mm. Broken conical foot. Long hourglass-shaped tear in stem and knop c. 38.5mm long. No seal. Frequent fine striations on all surfaces. Clear lead crystal without crisseling, some orange-brown patina. Total height of glass fragment: 98.28mm. This fluoresced ice-blue under UV light and is probably lead crystal.

6:4227 Inverted-baluster stem with basal knop (& foot refit 4:378)

Inverted-baluster stem glass with basal knop. Stem (Length 53.84mm) curves from join with bowl (23.75mm diameter) to a wide shoulder (33.1mm diameter) and down to the narrowest point (11.03mm) above a basal knop (22.08mm diameter) above the join to the base (19.77mm diameter). Rounded funnel bowl with slightly-convex bowl base c. 10mm thick max, base of bowl c. 22.14mm diameter internally. Bowl wall thickness 1.06mm. Folded conical foot 73mm in diameter. Long hourglass-shaped tear in stem and knop c. 48.9mm long. No seal. Frequent fine striations on all surfaces. Clear lead crystal without crisseling, some orange-brown patina on bowl. Total height of glass fragment: 112.14mm. Refit foot fragment has identical surface and patina.



Inverted baluster glasses, illustration by Alva Mac Gowan

6:4229 Inverted-baluster stem with basal knob (& refit 6:4324)

Inverted-baluster stem glass with basal knob. Stem (Length 64.47mm) curves from join with bowl (25.69mm diameter) to a wide shoulder (34.17mm diameter) and down to the narrowest point (11.29mm) above a basal knob (20.83mm diameter) above the join to the base (17.36mm diameter). Rounded funnel bowl with concave bowl base c. 14mm thick, base of bowl c. 20.55mm diameter internally. Air bubble in base of bowl protrudes through surface. Bowl wall thickness 1.67mm. Folded conical foot (complete) 83.22mm in diameter, with wide (max 8.96mm) underfold. Long hourglass-shaped tear in stem and knob with a break between it (ie two tears) c. 46.53mm long in total. No seal. Frequent fine striations on all surfaces. Clear lead crystal without crisseling, some white patina. Total height of glass fragment: 129.50mm.

6:4230 Inverted-baluster stem with basal knob

Inverted-baluster stem glass with basal knob. Stem (Length 63.93mm) curves from join with bowl (29.68mm diameter) to a wide shoulder (37.19mm diameter) and down to the narrowest point (14.74mm) above a basal knob (22.52mm diameter) above the join to the base (18.90mm diameter). Rounded funnel bowl with flat bowl base c. 5.73mm thick, base of bowl c. 21.78mm diameter internally. Bowl wall thickness 1.01mm. Folded conical foot (complete) 83.21mm in diameter, with wide (max 8.41mm) underfold. Imperfection in foot creates bulge giving a slightly stepped foot profile on one side, however the foot is certainly conical. No tear or seal. Occasional fine striations on all surfaces. Clear lead crystal without crisseling, some brownish-orange patina. Total height of glass fragment: 125.06mm.



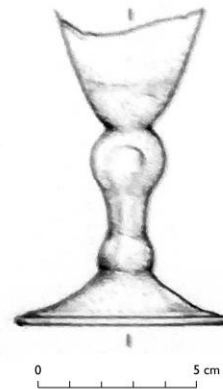
Comparative examples

Fifteen of these glasses were identified at Port Royal, Jamaica. McClenaghan (1998, 184-5, plate 25a) classified them as teared inverted balusters with basal knops and conical folded feet, and dated them to 1695-1700. Tearless variations of these similar to Rathfarnham 6:4230 were also identified at Port Royal (McClenaghan 1998, 178-9), along with other variants with a semi-hollow stem (McClenaghan 1998, 172-173, plate 21) or plain feet (*ibid*, 168-9, plate 19). One of the semi-hollow Port Royal stems (PR87-541-0, sample 54) is also published by Dungworth & Brain (2009) and dated by them to 1685-1692

Other examples of this type are illustrated by Noel Hume (1986b 190 VIII and 191, fig 64 VIII), who dates it to 1695-1710; Bickerton (1984, plate 54) who dates it to c. 1700; Delomosne (1985, 14-15) illustrates this type with a 1708 coin and dates it to 1710-1720; Truman (1984, 22, No. 9); Lanmon (108-109, No. 22); Davis (1971, 8, Fig left) who dates it to 1690-1700; and Dungworth and Brain (2013, 576, Sample 6, note 12) who date it to 1690-1700.

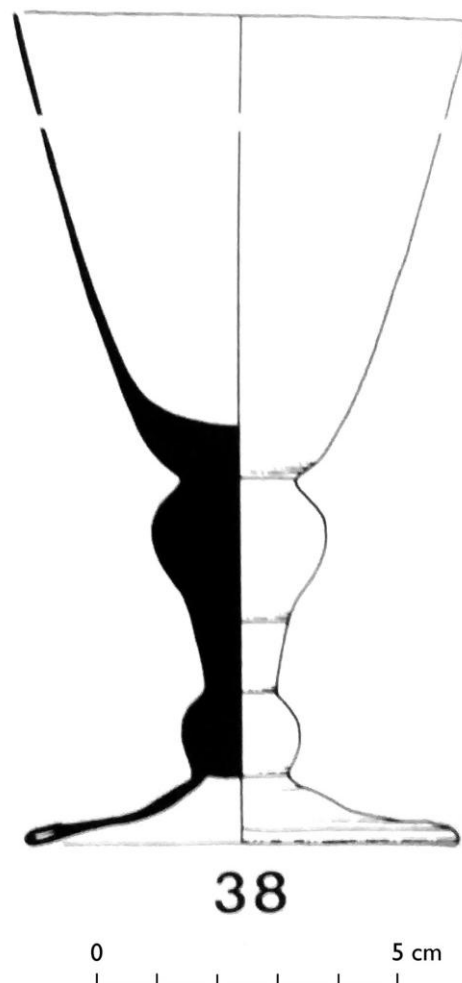
A similar example in the Museum of London (MoL ID 34.139/379) with a straight funnel bowl is dated to 1701-1710, and there is also a similar example at the Fitzwilliam Museum, Cambridge (FITZ 1978, 87, no. 202a). An example was excavated at Guildford (Guildford Museum No. 38, Fryer and Shelly 1997, 194, fig 35, Dungworth & Brain 2009, cat. 103/4) and dated by Dungworth and Brain to 1685-1705. The excavator suggested a London origin for the glass.

A comparable stem with a teared bowl base was identified at Middle Street, Galway and dated to 1685-1725 (E401:[16]:98; Roche 2004, 417, ill 6.4.6a).



Glass E401:[16]:98 from Middle Street, Galway (drawing from Roche 2004, 417, ill 6.4.6a).

Guildford Museum Glass No. 38 (drawing from Fryer & Shelly 1997, 194, fig 35; also illustrated in Dungworth & Brain 2009, cat. 103/4)





left to right: 6:4222, 6:4223, 6:4225

Stems with quatrefoil molding and merese 1675-1700

6:4225

Three inverted-baluster stems with quatrefoil molding and a merese were identified. The stems are taller than in tapering stem and inverted baluster glasses, measuring 60mm-70mm high as in the inverted baluster glasses with basal knops. These have straight or round funnel bowls and folded conical feet. They have no seals or tears. They are made of clear lead crystal, and do not show signs of criselling. Two further stem fragments belonging to similar glasses were also identified.

English tapering-stem glasses frequently have four vertical indentations to give it a quatrefoil-shaped (four-leaved clover) cross-section. Colin and Sue Brain (2002) date these drinking glasses to the last quarter of the 17th century (1673-1698), and type them as a sub-class of the Tapering Stem glasses (7D (a) iiif or ivf).

The key difference between these early English quatrefoil glasses and the Rathfarnham glasses, however, is the presence of a merese. A merese is a sharp-edged protruding collar between the bowl and stem of a glass (Powell 1923, 44). Late



17th century English crystal glasses do not have a merese (Brain 2002; McClenaghan 1998, 58; Charleston 1984; Bickerton 1984; Delomosne 1985; Buckley 1925, 28, fig left). Out of a database of 1,600 17th century glasses excavated in England, Peter Francis (2000, 53, note 49) identified only two with mereses, both from a single pit in Somerset (Wells Mus. 1993.2/1064, 1091, 1094). There is also a possible example from a c. 1690 context in Portsmouth, UK (Fox & Barton 1986, Fig 144 No. 17, 229). Glasses with mereses have also been identified in Port Royal Jamaica, and from Dublin Castle (Francis 2000, 53, Note 49) and Galway (Roche 2004). The largest collection of crystal glasses with mereses, however, were been identified from excavations at Templeogue Castle (96E010), and on this basis Peter Francis has suggested (Francis, in Giacometti 2007, Appendix C) that they were manufactured in Dublin.

The Rathfarnham Castle crystal glasses with mereses add further evidence to support Francis' contention that lead crystal of a distinctive Irish character was being produced in Dublin

and exported across the world.

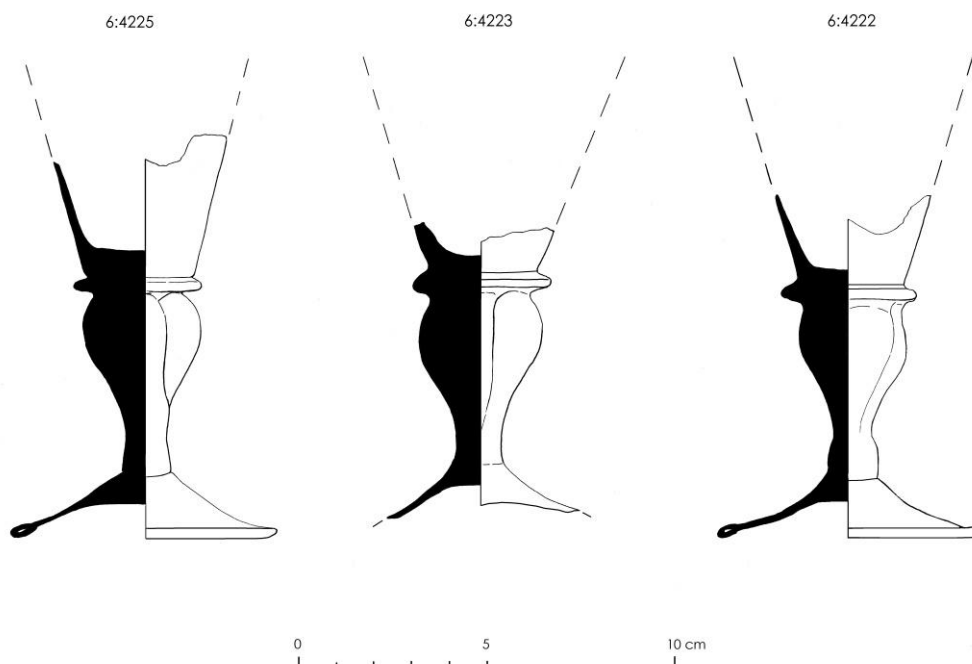
6:4222 Inverted-baluster quatrefoil stem with merese

Inverted-baluster stem glass with short (42.53mm from merese underside to join with foot) solid stem that curves from join with bowl (26.67mm) to shoulder (33.47mm max diameter), narrowing (13.78mm min diameter) before bulging very slightly just before base (14.10mm). Deep quatrefoil moulding on stem ending 6mm short of base and extending up slightly into the underside of the merese, showing slight twisting towards the lower left. Merese (38.51mm diameter, 5mm tall) sits directly below bowl. Bowl fragment with convex bowl base c. 4mm thick max, base of bowl c.18.5mm diameter internally, bowl wall thickness near base 2.57mm. Broken conical foot. No tear or seal. Grey lead crystal without crisseling, with heavy brown patina especially on foot and bowl. Patina makes assessment of fabric clarity and colour difficult. Total height of glass fragment: 74.14mm.

6:4223 Inverted-baluster quatrefoil stem with merese

Inverted-baluster stem glass with short (41.23mm from merese underside to join with foot) solid stem that curves from join with bowl (29.45mm) to shoulder (35.7mm max diameter), narrowing (13.97mm min diameter) before bulging slightly just before base (15.56mm). Deep quatrefoil moulding on stem extending down slightly onto foot and extending up slightly into the underside of the merese, showing slight twisting towards the lower left. Merese (39.55mm diameter, 4.8mm tall) sits directly below bowl.

Quatrefoil Irish-type glasses, illustration by Alva Mac Gowan



Slightly-rounded funnel bowl (2 fragments refitting with stem) with slightly-convex bowl base c. 2mm thick, base of bowl c.22.06mm diameter internally, bowl wall thickness near top of bowl 0.87mm, rim missing. Folded conical foot (complete), very-slightly domed, 68.49mm in diameter. No tear or seal. Clear lead crystal without crisseling, discoloured yellow-orange with some dark brown patina on bowl. Total height of glass fragment: 120.22mm.

6:4225 Inverted-baluster quatrefoil stem with merese

Inverted-baluster stem glass with short (44.9mm from merese underside to join with foot) solid stem that curves from join with bowl (25.7mm) to shoulder (33.26mm max diameter), narrowing (11.92mm min diameter) before bulging slightly just before base (14.41mm). Deep quatrefoil moulding on stem, extending down full length of stem and extending up slightly into the underside of the merese, showing distinct twisting towards the lower right. Merese (36.28mm diameter, 5.2mm tall) sits directly below bowl. Slightly-rounded funnel bowl with convex bowl base c. 7mm thick, base of bowl c. 23.13mm diameter internally, bowl wall thickness 1.17mm. Folded conical foot, very-slightly domed, 72.16mm in diameter. No tear or seal. Grey lead crystal without crisseling, with dark brown patina. Frequent fine striations on all surfaces. Total height of glass fragment: 106.56mm. This fluoresced ice-blue under UV light and is probably lead crystal.

6:4275 Merese fragment

Fragment of merese and base of bowl. Merese 29.51mm in diameter, join with bowl 26.4mm in diameter, merese height 4.73mm. Merese join with lower part of stem c. 20mm, suggesting it attached to an inverted baluster rather than a pillar stem. Fragment of bowl with irregular concave base that fits into the top of the merese, but not as sharply or pointed as 7:419. Base of bowl c. 21mm diameter internally, body thickness near base 2.93mm. Break is just below merese. Clear lead crystal without crisseling.

6:4458 Merese fragment

Fragment of merese and base of bowl. Merese c.38.5mm in diameter, merese height 4.18mm. Merese join with lower part of stem suggests it attached to an inverted baluster rather than a pillar stem. Tiny fragment of bowl. Clear lead crystal without crisseling. Heavy striations on bowl and merese. Fragment does not refit with glass 6:4222 although it was originally thought to, and must be from a different glass.

Comparative examples

The only comparable published example to this type are two glasses from Templeogue Castle (96E010:06 & 96E010:08, Francis, in Giacometti 2007, Appendix C; illustrated in Giacometti 2007, Fig. 15 No. 3 & 9). One of the Templeogue Castle glasses was slightly taller than the Rathfarnham glasses, and the other was slightly smaller and has a double-merese, so they are not identical. Nevertheless they are very similar, and it is interesting that now 7-8 examples of this unique glass type are known



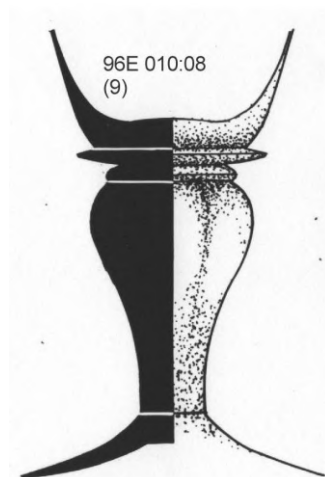
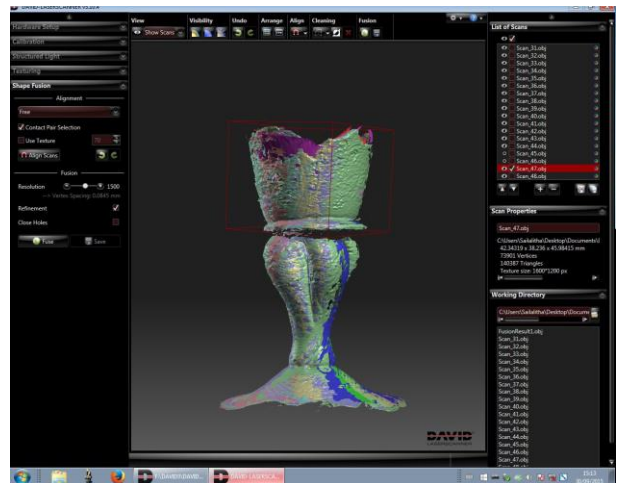
6:4223

from two contemporary elite household sites 2km apart in South County Dublin. Francis dates these glasses to 1670-1690. A similar example but with a double merese was identified in Dublin Castle (E296:9122). Quatrefoil glasses with merese made in a *façon de venise* style, matching Greene's glass designs (Brain & Brain 2015) and using non-lead glass (97E82:2595 is of soda-lime glass) were identified at Courthouse Lane, Galway and dated to c. 1670-1680 (97E82:2595, 2645 & 2650; Roche 2004, 408), and have also been identified in England.

No other comparable examples have been identified. As noted above, Peter Francis has identified a number of other early lead-crystal glasses with mereses. McClanaghan (1998, 2009-

2010, Plate 36 RM 66-68. IIIa) illustrates a multiple-knoped stem with a merese from Port Royal, which although smaller, is not hugely different from 6:4425. It does not have quatrefoil moulding however. Two of the Port Royal glasses with mereses were analysed by Dungworth and Brain (2009 Samples 57 & 58, ref. PR87 584-2 & PR87 533-4). A tapering stem glass with a merese was excavated at Smithfield (Myles 2007, 00E0272:1034[11]). The Smithfield glass has been dated to c. 1675-1680 (*ibid*). Two proto-baluster glasses with merese were identified in Courthouse Lane, Galway (97E82:702:11013 & 97E82:771:10490; Roche 2004, 408, 411, fig 6.4.1d & g). A fragment of an Irish glass with merese was identified at Barrack Lane, Galway (98E21:119; Roche 2004, 407 & note 263). An inverted baluster with a merese is illustrated in Turnbulla & Herron (1970, 7, Ref 1/1) and dated to 1690 (photograph in Francis 2000, 53, Fig. 10).

English tapering-stem glasses frequently have four vertical indentations to give it a quatrefoil-shaped (four-leaved clover) cross-section (e.g. McClenaghan 1998 151-152 Plate 11a-d & 59, Fig 13b; Noel Hume 1968: 190 VI; 191, fig 64: VI; Noel Hume 1969, 15 fig. 3 far right). Colin and Sue Brain (2002) date these drinking glasses to the last quarter of the 17th century (1673-1698), and type them as a sub-class of the tapering stem glasses (7D (a) iiif or ivf). At least one example of a non-merese quatrefoil crystal glass has been identified in Ireland. This was from Smithfield (Myles 2007, 00E0272:1034[10] Dungworth & Brain 2009, Sample 74), and estimated to date to 1675-1680.



Right: creating 3D images and printing glass 6:4225 by Ben McLarny UCD School of Biomolecular and Biomedical Science.

Left: Templeogue Castle glass 96E010:08.





Above: fluted bowl fragments 6:4233-4234 almost certainly part of the wrythen glass

Below: wrythen glass 7:419

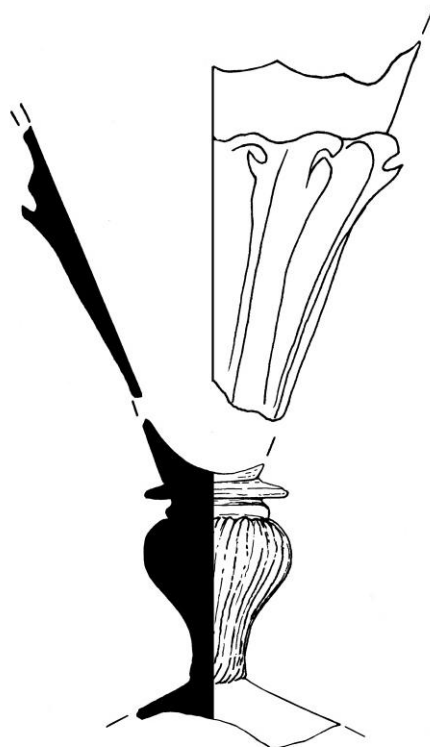


Wrythen glass with merese 1675-1700

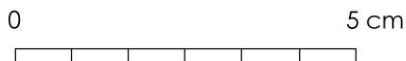
This small stemmed crystal glass has an inverted-baluster stem decorated with wrythen moulding topped with a collar and a merese. The bowl probably associated with the stem is fluted with spiked gadrooning. The bowl is very narrow with a pointed base that is set deep inside the stem, unlike the other glasses. Wrythen ribbing and spiked gadrooning (or flammiform moulding), whereby moulded rib decoration is pulled upwards towards the rim giving the impression of rising flames, is a characteristic feature of late 17th century 'ale glasses' (Trubridge 1972). Trubridge (ibid, 46) explains that during this period 'Strong Ale' was significantly stronger than beer, explaining why such small narrow glasses were used to drink it. Nevertheless these could also be wine glasses.

A similar glass to the Rathfarnham example was identified in Port Royal, Jamaica. This was a short glass with a fluted bowl, an inverted baluster stem, a merese, and the narrow conical bowl with a pointed base fitted deep into the top of the baluster stem (McClenaghan 1998, 102; 158-159 Plate 14). McClenaghan, citing a personal communication from Lanmon, suggests it may have functioned as a cordial or ratafia glass, and been manufactured in England in 1680-1690. Ratafia was a fruity alcoholic drink with almonds, peaches or cherries popular with ladies in the late 17th and early 18th centuries (McClenaghan 1998, 102). On the basis of Peter Francis' research on the merese (see above) an Irish origin should be considered.

A second similar glass with a wrythen knop over inverted baluster is illustrated by Hartshorne (1968), engraved with 'God Bles King Wilyam' (presumably William of Orange, King of Ireland, England and Scotland 1689-1702).



4:233+34



Wrythen glass, illustration by Alva Mac Gowan

A glass with a similar sized bowl was identified from Courthouse Lane, Galway 97E82:771:10490; Roche 2004, 411, fig 6.4.1g) and described as a fluted wineglass with a merese, and dated to c. 1680.

Similar glasses without the merese were produced in England. Trubridge (1972, 47, 52 Figs 2 & 3) illustrates a number of 'Type 1: ribbed and wrythen ale glasses' which resemble the Rathfarnham example. One of these (ibid 52, Fig. 3) appears to have a merese. Bickerton (1984, plates 48-49) illustrates 'ale glasses' with wrythen knops and narrow bowls with flammiform fingers (also 'ale glass' in Hartshorne 303-304, fig 271; 'short ale glass' in Charleston 1984, 155-156; and Buckley 1925, Plate IX, No. 1).

7:419 Wrythen inverted-baluster stem with merese

Small inverted-baluster glass with solid stem, merese at join with bowl and collar below merese. Inverted baluster stem short (31.68mm tall from merese underside to join with foot) curves from shoulder (27.3mm max diameter), narrowing (10.94mm min diameter) before bulging very slightly just before base (11.72mm). Shallow wrythen moulding on baluster composed of twenty ribs. Collar 21.09mm diameter and 3.45m high. Merese (28.74mm diameter, 4.5mm tall) sits directly below bowl. Straight funnel bowl with pointed bowl base that fits into the top of the merese c. 7mm thick, base of bowl c. 8.76mm diameter internally, bowl wall thickness 1.90mm near base. Slight fluting visible on external surface of bowl, suggesting same vessel as rim fragments 6:4233-4234. Broken conical foot. No tear or seal. Clear glass or lead crystal without crisseling, discoloured orange. Total height of glass fragment: 62.93mm. Classed as 'Ale glass' (Trubridge 1972). This fluoresced ice-blue under UV light and is probably lead crystal.

6:4233-4234 Fluted bowl fragments

Two non-refitting body fragments from a very narrow clear glass vessel with flaring straight sides, such as a straight funnel glass bowl. Both have identical spiked gadrooning: moulded fluting with c. 15-20 ribs extending up bowl from base and ending at least 20mm before rim in flammiform fringe. Wall thickness 3.18mm near base and 1.07mm near rim. Clear glass or lead crystal without crisseling, discoloured orange, with heavy dark brown patina. Size of fragments 61.28mm high by 37.77mm (6:4233) and 55.75mm high by 43.30mm. No refit, but possibly same vessel as 7:419. Ale glass? These fluoresced ice-blue under UV light and is probably lead crystal.

Pillar stems (proto-baluster) 1675-1720

Two pillar stemmed glasses were identified, one (2:178) with a merese and the other (6:4224) with a cushion knob. Although simple in form, the glasses are high quality and unlike the crude mid-18th century English pillar-stem tavernwares. Similar glasses with annular knops and mereses were identified from Templeogue Castle (96E010:13 & -14, in Francis 2007), suggesting that these may be an Irish type. These glasses may fit into the early Irish type termed 'proto-balusters' by Francis and Roche (2004).

The pillar stem with merese is identical to a glass found in Port Royal, Jamaica (McClenaghan 160-161, RM 66-68.IId.2, Plate 15) which was interpreted as a stemmed jelly glass dating to c. 1685 (ibid, 102). The similarity between the glasses is illustrated overleaf.

Another similar stem was found on a site at Popes Farm, Hatfield, and has been considered to be part of a lamp (Brain pers. comm. 2015).

Plain pillar stems are unusual in English heavy baluster glasses, though Buckley (1925, 73) notes two examples. They appear on early 18th century mead and sweetmeat glasses (Bickerton 1984, Plate 37, 42, 43).

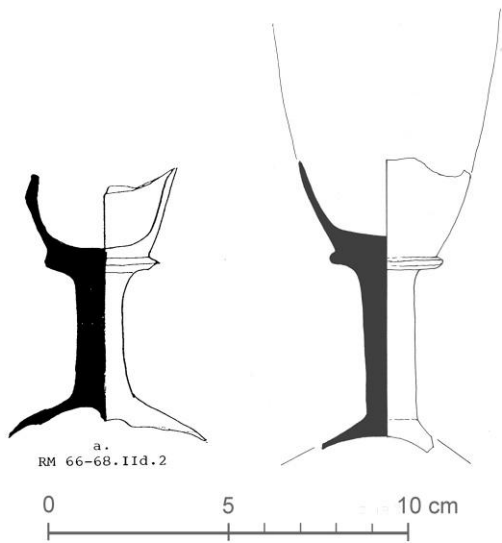
Pillar stem 2:178 is likely to date to 1675-1700, whilst 6:4224 may be slightly later (perhaps 1685-1720). Both may be Irish.

Proto-balusters have also been identified from two sites in Galway. At Courthouse Lane two different styles of proto-baluster one with merese and one without, were identified (97E82:702:11013 Roche 2004, 408 fig 6.4.1d; 97E82:25971 Roche 2004, 411, fig 6.4.1f). Roche dates these to the 1670s-90s and suggests that the ones with mereses are of Dublin origin and the ones without a merese may be English (ibid). Additional proto-balusters of the same type were identified from Merchants Road, Galway (eg. E400:883, 3782, 3783, 4424, 4845, 6488; Roche 2004, 412-413, ill 6.4.3a-c). Roche (ibid, 414) noted surface blackening on the Galway lead-crystal glass, and contrasted it with the absence of discolouration on the Templeogue



pillar stem 6:4224 (below) and 2:178 (above)





Comparison between glass found in Port Royal, Jamaica on left (drawing from McClenaghan 1998, 161) and Rathfarnham Castle glass 2:178 on right.

glass. The Rathfarnham glass, some of which is likely to be of Dublin manufacture, has this discolouration, however.

2:178 Pillar stem with merese

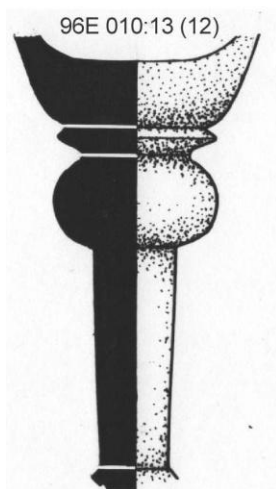
Pillar stem glass with short (37.12mm from merese underside to join with foot) solid straight stem 16.49mm diameter, under a merese (34.24mm diameter, 4.3mm tall). rounded funnel bowl with wide flat bowl base c. 7mm thick, base of bowl c. 23mm internal diameter, bowl wall thickness 1.53mm. Broken conical foot. No tear or seal. Clear lead crystal without crisseling, some orange patina. Total height of glass fragment: 84.11mm. This fluoresced ice-blue under UV light and is probably lead crystal.

6:4224 Pillar stem with cushion knob (& refits 4:362 & 6:4322)

Glass with stem (53.03mm) comprising flattened knob (31.86mm diameter and 16.54mm high) over straight stem (14.33mm diameter and 35.85mm high). Foot missing. Rounded funnel bowl with wide flat bowl base c. 5mm thick, base of bowl c. 30mm internal diameter, bowl wall thickness 2.18mm near base. Broken foot. No tear visible. No seal. Lead crystal without crisseling, discoloured a dark grey colour with very heavy grey patina. Total height of glass fragment: 69.75mm. This fluoresced ice-blue under UV light and is probably lead crystal

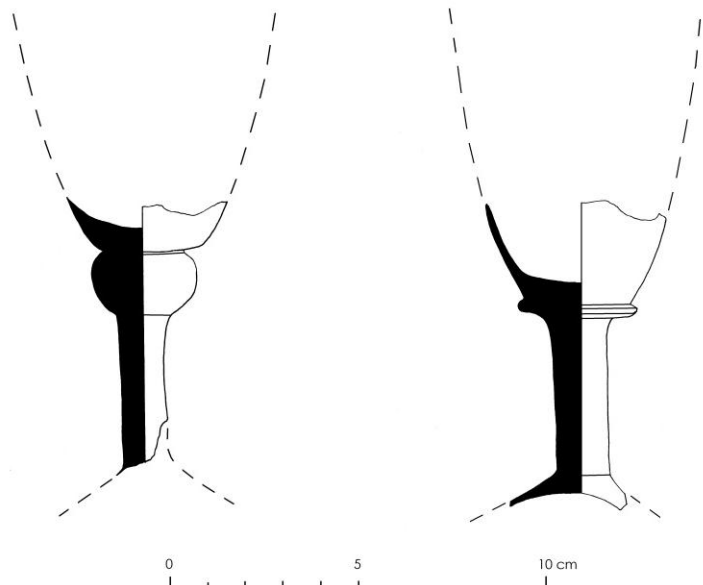
Templeogue Castle 96E010:13 pillar stem

Pillar stem glasses 6:4224 (left) and 2:178 (right), illustration by Alva Mac Gowan



6:4224

2:178



Complex multi-knopped stem with dome-shaped foot 1690-1720

The final type of stemmed glass from Rathfarnham is very different from the others. The thick and teared bowl base and the domed foot are not seen elsewhere in the assemblage. Colin Brain (pers. comm. 2015) has suggested that this vessel form is unknown in England or Ireland, and may not be of English manufacture.

A domed foot is often a later characteristic (i.e. 18th century), however that is not always the case, and domed feet glasses were manufactured on English crystal glasses from the end of the 17th century (Haynes 194-5, cited in McClenaghan 1998, 67, Figure 17c).

Although no exact parallels have been identified, several published glasses are of similar types. A baluster stem dated 1685-1725 from Middle Street, Galway (E401:155, Roche 2004, 417-420, ill 6.4.6b) is broadly similar in stem form and size, though the median knob is less pronounced, the foot is different and the bowl form flares outwards. Roche suggests an English origin.

McClenaghan's illustration (1998, 60, Fig 14c) of a late 17th century Hawely-Bishopp period heavy baluster glass shows a domed foot, a straight stem with two knops, and a thick teared bowl. Two glasses from Port Royal (McClenaghan 1998, 198-199, Plate 31b) termed 'Baluster Stem Variation Ball Knop' dated to 1690-1740 are not dissimilar (also see Noel Hume 1968: 190 XIV; 191, fig 64: XIV, dated early 18th century). Bickerton (1984, 69, plate 71-73) shows a similar glass dated c. 1700. Buckley (1925, Plate XII) shows similar glasses with shorter stems. Davis (1971, 17, 2) shows similar types, and Thorpe (1927, Plate XLIII, No. 1 & Plate XLIV No. 3) may be broadly comparable.

7:418 Multi-knopped stem (& base refit 6:4265)

Multi-knopped glass with stem (53.80mm) comprising narrow collar or straight stem segment below bowl (11.99mm diameter), central ball knop (26.26mm diameter), second straight stem segment (narrowing from top 13.09mm to bottom 11.54mm), on a basal knop (17.46mm diameter). Straight funnel bowl with very thick bowl base (c. 21mm), convex base of bowl c. 20mm internal diameter. Bowl wall thickness 1.76mm. Broken domed foot (refit 6:4265) different from all other glass feet. There is a small round

7:418+6:4265+6:4260

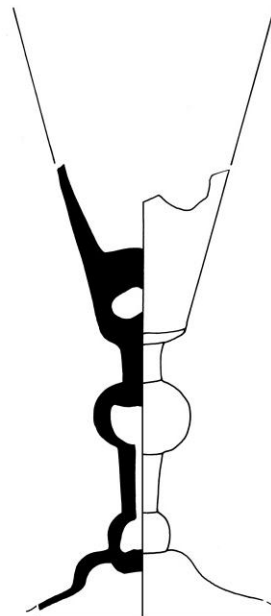


Illustration by Alva Mac Gowan



tear c. 8mm tall in the base of the bowl, and a second elongated hourglass-shaped tear c. 40mm long running between the two knops. No seal. Lead crystal without criseling, with orange and black patina especially around bowl and foot. Total height of glass fragment: 103.47mm (7:418); 23.05mm (6:4265); 115.05mm (combined refit). This fluoresced ice-blue under UV light and is probably lead crystal.

Foot sherd 6:4260

64mm diameter folded domed rim, probably part of 7:418 but no clear refit. This fluoresced ice-blue under UV light and is probably lead crystal.



Unidentified stem fragment 2:84

Unidentified stems

Three fragments of stemware are unidentified. The first (2:84) does not appear to be lead glass, and may predate the rest of the glass assemblage. It may be part of an ornate moulded *façon de venise* wine glass with applied opaque white glass ribbing dating to the 17th century. Such designs were popular on 17th century *façon de venise* glass, however they were also used in late 17th century English lead-glass crystal (eg. 97E82:2:2594, Roche 2004, 408, ill 6.4.1.b).

The second (8:24) may be part of a cigar-shaped wine glass, however the fabric seems to be crystal rather than alkali-glass, suggesting a late 17th century date. Cigar-shaped stems were not usually made from lead-glass crystal, so this would be very unusual. The third (6:432) may be part of a hollow-footed *façon de venise* vessel.

2:84 Unidentified stem (Façon de Venise style moulded stem with applied ribbing?).

Fragment of glass stemware, probably part of a Façon de Venise hollow-moulded stemmed vessel. Possible internal underside of stem is heavily moulded, as if forming part of a complex stem design such as a Lion-mask glass. This glass has been discoloured black, a characteristic decolouration associated in the Rathfarnham glass assemblage with cobalt blue glass (eg. 7:426 in Opaque Glass report). Hollow stem has a small sunken depression in the central underside of similar type to 8:24. An applied hand-pinched milled or ribbed opaque white glass band (diameter 33.25m) encircles the top(?) of the stem, with ten ribs. Fragment: Length 33.25m; 25/17mm; Thickness 11mm.

Similar ribbing is present on a late 16th century Bohemian Façon de Venise glass with a Lion mask stem (Lamnon 1993, 70, No. 22 1975.1.1153). Moulded urn-shaped stems, including Lion mask stems, were produced from 1600-1670 (Brain 2002). Ribbing, particularly in standardised groupings of ten, twelve or forty ribs, is a common decorative motif in Northern European and Italian Façon de Venise wineglasses and bowls during the 17th century (Lamnon 1993, 6), but was also used from the beginning of the 16th century, for example in the form of an applied milled thread around the base of a cobalt-blue glass from Murano dated to c. 1500 (Hess & Husband 1997, 84-86). The combination of cobalt blue and opaque white lattimo is often used in 17th century Façon de Venise wineglasses (e.g. Lamnon 1993, 206). Alternatively, the applied white ribbing could be decorating the underside of a bowl or knop, in a style similar to glasses c. 1685-1695 illustrated by Charleston (1984, 128 & plate 26b).

A similar shaped fragment was identified in a 17th century context from St Paul-in-the-Bail, Lincoln, UK (Henderson 2008, 37-38, see Fig 25, No. 99), interpreted as the basal part of the bowl.

8:24 Unidentified stem (cigar-shaped stem?)

Fragment of clear lead crystal stemware, unidentified vessel type. Fragment too small to identify confidently, but appears to represent part of a hollow stem with small flattened annular knob (18.47mm diameter) either above or below. The join between the two parts of the stem is very narrow (13.74mm diameter). Hollow stem has vertical or straight sides, perhaps forming an inverted baluster or cigar-shape, with a small sunken depression in the central underside of similar type to 2:84. Lead crystal without criseling, with orange and black patina. This fluoresced ice-blue under UV light. Total height of fragment 31.78mm.

Hollow-stemmed crystal glasses have been identified in late 17th century contexts in Port Royal, Jamaica (McClenaghan 1998), but this example is unusual in form as it resembles a cigar-shaped stem, which were manufactured from c. 1600-1667 out of non-lead glass.



6:4342 Hollow footed façon de venise vessel?

Fragment of glass stemware, probably from a hollow-footed vessel. Fragment too small to identify confidently, but appears to represent the top of a tall hollow pedestal foot or hollow stem and the base of a broad shallow bowl. 'Foot' is circular and hollow with thick walls 2.41mm, and flares outwards from where it joins with the bowl (24.14mm diameter) towards the base (29.99mm diameter at break). There is a pontil mark on the underside of bowl. Bowl base is convex c. 47.62mm in internal diameter with thin walls (1.45mm). Glass is discoloured brown-orange and very heavily patinated pale grey and brown. Total height of fragment 26.57mm. This did not fluoresce under UV light and may not be lead crystal. Hollow footed bowls are a known form of 17th century European Façon de Venise glass stemware (eg. Hess & Husband 1997, 79-83).

Clear glass hollow-footed tazzas were manufactured in England in the 1670s, eg. example 111E of the Allaire Collection. The fragment is less likely to be part of a goblet cover (e.g. Buckley 1925, 104; Davis 1971, 11).



Above: 8:24

Below: 6:4342



6:4342

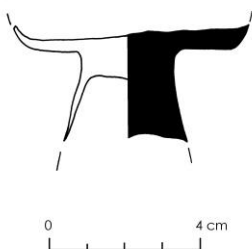


Illustration by Alva Mac Gowan

Other stemmed glass fragments

Most of the glass fragments described below belong to the lead crystal stemware glasses described in the previous sections. The very large diameter feet, however, e.g. 6:4263-4, may belong to tazza or similar stemmed bowls (e.g. Powell, 1923, 50) and are exceptionally fine. These are probably not of lead-glass crystal, and may be from *façon de venise cristallo* vessels.

6:4254 Stemware foot (folded)

Conical folded foot 75mm diameter with fragment of stem at join.

6:4255 Stemware foot (folded)

Conical folded foot 75mm diameter with fragment of stem at join.

4:373-376; 6:4205; 6:4236-4253; 6:4256 (tiny bit of stem); 6:4258-4259; 6:4262 (deformed); 6:4264 (deformed); 8:22 Stemware feet fragments (folded)

29 glass feet fragments. Where enough portion of foot rim survives, all are from conical folded feet 70-90mm diameter

6:4266-4267 & 8:23 29 Stemware foot (plain)

3 plain glass foot fragments from plain foot 75mm diameter, all from same vessel. 8:23 and 6:4266 refit. 6:4266 and 8:23 fluoresced low intensity white under UV light and may not be lead crystal. 6:4267 did not fluoresce under UV light and may not be lead crystal.

6:4263 Stemware foot (folded; not crystal)

Clear glass folded foot fragment, exceptionally large 140mm diameter. This did not fluoresce under UV light and may not be lead crystal.

6:4264 Stemware foot (folded; not crystal)

Clear glass folded foot fragment, exceptionally fine and large 120mm diameter and very fine folding into glass tube almost. This fluoresced low intensity dark yellowish-green under UV light and is almost certainly not lead crystal.

4:363 & 6:4257 Stemware rim (refitted)

75% complete rim of glass in three fragments, diameter 80mm at rim. Thickness at plain rim 1mm, thinning to 0.76mm at 30mm below rim. Clear lead crystal. Two fragments are discol-

oured brown, completely opaque and have heavy orange-brown patina, while third refitting fragment is clear with white patina, indicating that the patina is post-depositional. Size of refitted fragment: 67.44mm high.

4:364-365; 4:368-372; 6:4203-4204; 6:4325-4341; 6:8220; 7:416; 8:25-30 Stemware rims

29 glass rims, plain rims with straight, flared sides. Where measurable, all are c. 80mm diameter. Thickness c. 0.89mm to c. 1.29mm at the rim and 0.58mm-0.90mm in the body. They are distinguished from dessert glass rims on account of their thinness and straighter bodies. Lead crystal, some clear, others patinated.

3:125-129; 4:355-362; 6:3692; 6:3701-3706; 6:4151-4202; 6:4276-4325; 6:8221-8234; 6: 8825; 8:19; 8:31-34; 8:54-55; 9:168-169; 9:252 Stemware bowl fragments

129 glass bowl body fragments from straight or rounded funnel bowls, including probable dessert glass fragments. Lead crystal, some clear, others patinated.

6:4261 Unidentified vessel rim

Rim fragments of clear lead crystal. Rim is everted and folded under itself to be horizontal, rim c. 80mm max external diameter. Fluoresced ice-blue under UV light, indicating a lead-base glass. Heavily discoloured orange-black. Rim from a dessert glass (eg. Buckley 1925, 110), or small glass bowl/tazza, or even an unusually-shaped goblet lid. If part of a bowl or tazza, the rim could be part of the same vessel as hollow unidentified stem 6:4342. It is unlikely to come from an unusually-shaped domed over-folded goblet foot. Fragment L 44mm W 7mm; wall thickness 0.94mm.

9:170 Unidentified vessel rim Clear glass folded rim, 2 folded fragments, similar to other stemmed glass feet except exceptionally large 220mm diameter. This did not fluoresce under UV light and may not be lead crystal.

Rim 4:363



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Lead-crystal dessert glasses

Antoine Giacometti

The lead crystal dessert glasses from Rathfarnham Castle are related to the fashion for elaborate and well-presented desserts and tea from the 16th to the 18th centuries (Charleston 1986, 27). Dessert wares are also likely to be represented by porcelain and European ceramic vessels, and especially the opaque glass vessels which are similar to the clear lead crystal dessert glasses.

Late 17th sources describe dessert glassware. In *The Accomplished Cook* (Robert May 1678, 204) 'little round jelly glasses' are called for (Buckley 1925, 17), and 'Ravenscroft's List' (1677) mentions 'sullibub' and brandy glasses, bowls, jugs and tankards, all of glass. Jelly glasses were used for jelly, fruit-flavoured 'whipt cream', syllabub, and other light sweets from 1678 (Buckley 1925, 109; Charleston 1984, 128; Hartshore 1968, 307).



jelly glass 4:367

Crystal dessert glasses	Sherds 25	MNV 6
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In Rathfarnham Castle 25 sherds of dessert glasses representing at least six different vessels have been identified. These include a complete small round jelly dessert glass (4:367) and a base from a similar jelly glass (8:21), a partially-complete handled dessert glass (2:179), fragments of a two-handled syllabub(?) dessert glass (6:4344), a fluted dessert tumbler (2:165), a handle from a sixth dessert glass (3:144), and various other dessert glass fragments.

These dessert glasses are similar to small jelly glasses, and handled dessert and syllabab glasses made in England dating from c. 1678 (e.g. Charleston 1984, 128; Hartshore 1968, 307). Both flared rims and folded rims are present. Buckley (1925, 109) suggests that dessert glasses with folded rims predate those with flared rims.

The two identical handles (6:4344 & 7:420) probably come from one vessel. Double-handled dessert vessels are usually termed posset or syllabub glasses. None of the Rathfarnham glasses has the elongated spout associated with posset pots (though Buckley 1925, Plate IX, 2 identifies a two handled cup with a flared rim as a posset pot). The two



Above, jelly glass 2:179; below, jelly glass 4:367



handles terminate at the bottom sharply, probably indicating they formed the upper half of a double set of B-handles. Cups and glasses (in glass and ceramic) with this style of handle are well known in 17th century contexts (e.g. Buckley 1925, Plate IV, below, No. 3).

The fluted rib moulded decoration on dessert glass or tumbler 2:165 is similar to decoration used from 1677-1678 in the Savoy Glasshouse in London to decorate dessert glasses (e.g. Ravens head sealed posset glass in Charleston 1984, Plate 23 a & b).

The only comparable published find from an Irish context is a lead crystal jelly glass from Middle Street, Waterford (E401:118; Roche 2004, 420, fig 6.4.7c) of similar form dated to 1750 or later.

4:367 Complete jelly glass

Complete jelly glass of clear lead crystal with heavy striations. Base is a solid short pedestal foot. Bowl has a convex base and straight flaring sides. Rim is everted and folded back over itself to be horizontal. Fluoresced ice-blue under UV light, indicating a lead-base glass. Height 61.96mm. Diameter of pedestal base 35.48mm. Max diameter at rim 61.12mm. Max internal diameter at rim 44.41mm.

2:179 (and refits 6:4345 & 7:496) Handled jelly glass

Base, handle and rim refit (3 sherds) of clear lead crystal jelly glass. Solid pedestal base 52.47mm max diameter. Bowl is concave with straight sides flaring out flared plain rim c. 80mm diameter. Bowl wall thickness 1.5mm near base, 0.99mm min at neck, 2.18mm at rim. Applied handle with outwards scroll curl at base, length 82mm, oval in section max 6.37mm by max 11mm. Protrudes from vessel max 27.5mm. Handle identical in form but slightly bigger than opaque white jug handle 6:4350. Fluoresced ice-blue under UV light, indicating a lead-base glass. Partially discoloured black, clear glass with light striations. Original vessel height 100.48mm.

6:3738, 6:3739, 6:4273 & 6:4200 Handled jelly glass

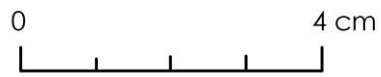
Four non-refitting rim fragments, all from the same jelly glass as 2:179. Clear lead crystal with light striations. Flared plain rim c. 80mm diameter leading to flared vessel walls. Fluoresced ice-blue under UV light, indicating a lead-base glass. 6:3738 and 6:4273 have discoloured orange and have a heavy opaque patina. 6:3739 and 6:4200 are clear. Wall thickness 1.16mm; 2.18mm at rim.

2:165 (& refit 6:4268) Fluted crystal jelly glass or tumbler

Two refitting fragments of partially-complete jelly glass. Plain flat base with pontil scar, convex on upper side. Slightly flaring straight side to a plain slightly-thickened rim. Decorated on exterior with eight ribs, slightly twisted, dividing the vessel into eight panels. Metal is clear with heavy striations. Base is discoloured an orange colour. Fluoresced ice-blue under UV light, indicating a lead-

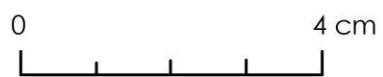
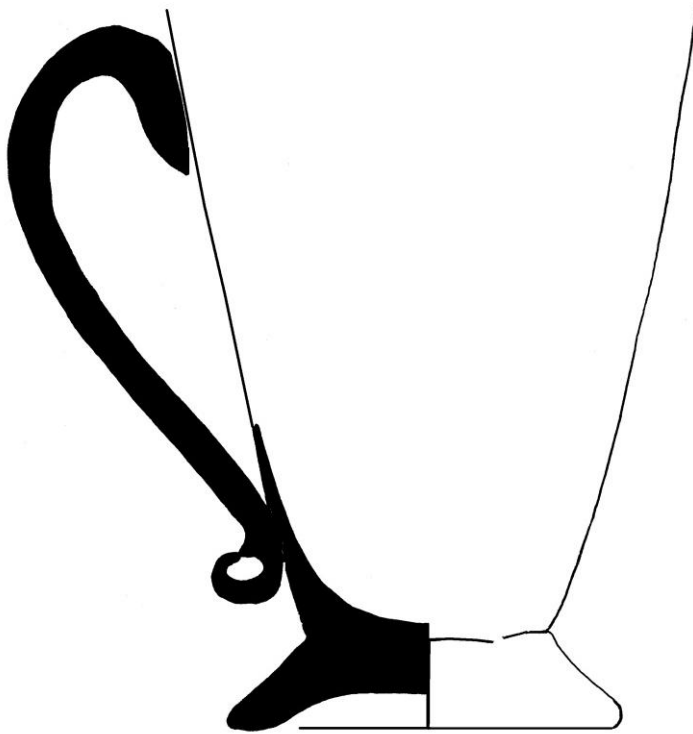


4:367



Jelly glasses, illustration by Alva Mac Gowan

2:179



base glass. Base is 39.72mm external diameter. Rim is c. 48mm-69mm diameter. Height is 83.31mm. Wall thickness is min 0.90mm and 1.24mm at rim.

6:4203, 6:4204, 6:4269, 6:8234 & 8:30 Dessert glass rim

Five fragments, one refitting, of plain flared rim from the same crystal vessel c. 60mm diameter at rim. Clear metal, no crisseling or discolouration, with heavy striations on exterior. Thickness of body is distinctly greater than other jelly glasses. May belong to eg. syllabub glass along with double handles 7:420 and base 6:8046 as proposed in photograph. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment e.g.: L 28.35mm, W 28.83mm; Wall thickness 1.70mm at rim, 1.30 in body.

6:8046 Dessert glass base

Base of clear lead crystal jelly glass. Solid pedestal base 52.41mm max diameter. Bowl is bulbous and concave at the base. Bowl wall thickness 2.16mm near base. Fluoresced ice-blue under UV light, indicating a lead-base glass. Heavy black and orange patina on base, but not on bowl. Fragment height 21.07mm. Illustration proposes base of syllabub glass, however there are no refits.

8:21 Jelly glass base

Small fragment from base of clear lead crystal jelly glass. Solid pedestal base c. 35mm-36mm in max external diameter. No bowl survives. Almost identical to base of complete jelly glass 4:367 and probably from a similar vessel, but size of fragment makes this uncertain. Heavy black patina. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment L 25.87mm W 20.87mm T 7.18mm.

3:144 Dessert glass handle

Lower portion of clear lead crystal applied handle with outwards scroll curl at base. Exterior of handle decorated with trefoil moulded lines. No other similar handles. Oval in section max 7.42mm by max 16.4mm. Metal is discoloured orange. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment L 79.26mm.

7:420 Syllabub glass handle

Upper portion of clear glass applied handle. Handle is thinner and smaller than in jelly glass 2:179, and is circular in section 6.13mm-6.34mm diameter. Protrudes from vessel max 26.88mm. Curve is tighter than in 2:179 and the break at the base is unusually straight and at a point where the handle becomes thinner and wider, probably indicating this is the upper part of a double-handle in the form of a B. Almost identical and probably from same two-handled vessel as 6:4344. Heavy orange-white patina coats almost entire fragment. Fragment length 55.11mm.

6:4344 Syllabub glass handle

Upper portion of clear glass applied handle. Handle is thinner and smaller than in jelly glass 2:179, and is circular in section 5.5mm-7.3mm diameter. Protrudes from vessel max 27.55mm. Curve is tighter than in 2:179 and the break at the base is unusually straight and at a point where the handle becomes thinner and wider, probably indicating this is the upper part of a double-handle in the form of a B. Heavy orange-white patina coats almost entire fragment. Almost identical and probably from same two-handled vessel as 7:420. Fragment length 57.70mm.

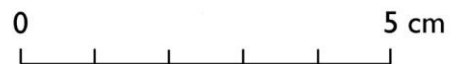
3:129, 6:4199, 6:8233 & 8:34 Dessert glass body sherds

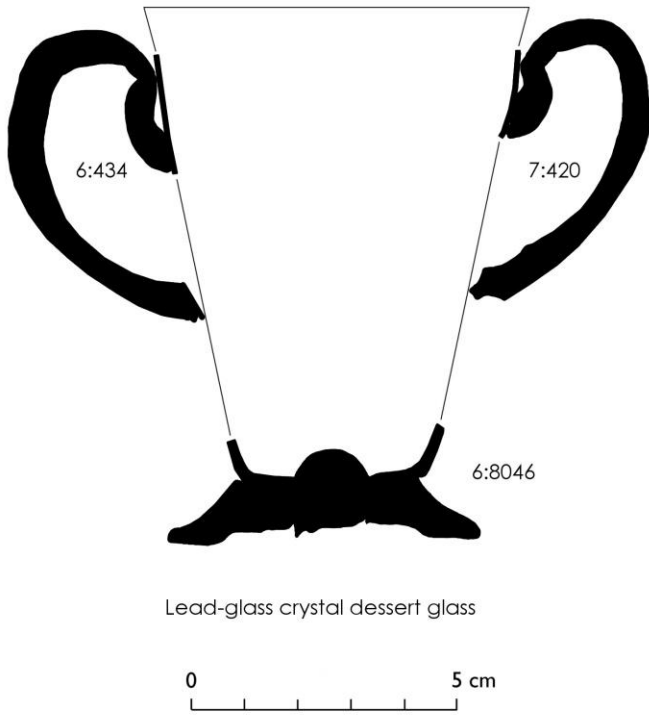
4 non-refitting sherds from clear lead-crystal dessert glasses. These are distinguished from goblet bowl sherds by their thickness. Body thickness is 1.44mm-1.64mm. The largest fragment (8:34) is slightly globular in form, indicat-

2:165



Lead-glass crystal dessert glass





Lead-glass crystal dessert glass



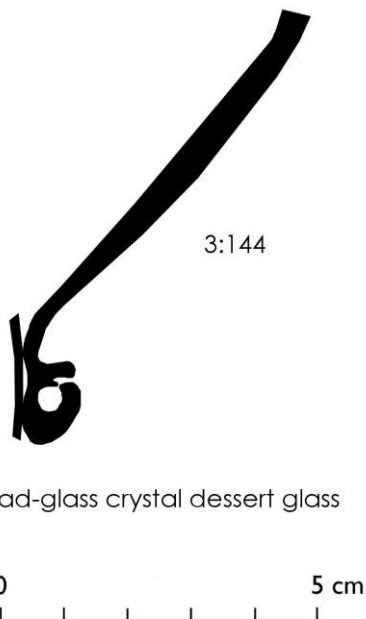
Base 6:8046, handles 6:343 and 7:420 and rim 6:4203

ing it comes from near the base of a dessert glass, and most likely comes from the same vessel as base 6:8046. Largest fragment 8:34 is discoloured orange, the other two are clear with an orange-brown patina. Fragment 8:34: L 40.3mm W 33.7mm.

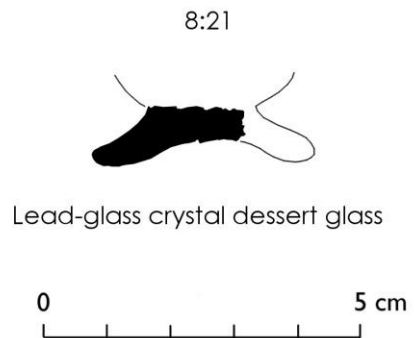
3:1347 Dessert glass body sherd?

Curved glass fragment, appears to be crissled and discoloured yellow. Probably fragment of jelly glass.

For references see page 33.



Lead-glass crystal dessert glass



Lead-glass crystal dessert glass

Opaque glass

Antoine Giacometti with assistance from Colin Brain & Suzanne Higgott

70 sherds of opaque blue or white glass were excavated at Rathfarnham Castle (E4468). The opaque glass sherds represent six vessels. One of the vessels is a pale blue glass tankard. Three of the vessels are small *lattimo* (milky white) globular jugs with applied copper blue rims, and a fourth *lattimo* vessel is a similar jug or a jelly glass. The final vessel is represented by a few sherds from an enamelled glass saucer imitating porcelain.

All of the opaque glass fragments come from Contexts 3, 4, 6, 7 and 9. These contexts are fills from a 16th century washpit in the southwest tower of Rathfarnham Castle. Refits were found between Contexts 4 and 6. Fragments of the *lattimo* jugs were found in all five of these contexts, suggesting that the contexts within the washpit are thoroughly mixed. The absence of opaque glass from Contexts 2 and 8 is unlikely to be significant. Contexts 4, 6 and 7 were completely sealed by an early 18th century stone floor (c. 1720), and Contexts 3 and 9 were partially sealed by the same floor. Over 18,000 artefacts were recovered from this assemblage, generally dating to c. 1660-1720.

This report describes the six vessels and assesses comparable vessels from northern Europe. The discussion explains the significance of their discovery. This opaque glass assemblage is unique in Ireland. These vessels were most likely manufactured in northern Europe in the late 17th century, and may form part of an elaborate dessert or tea set that included clear lead crystal jelly glasses, fine stoneware and porcelain also found during the excavation. Scientific analysis will be required to compare the composition of the vessels to opaque glass-making waste found in Smithfield (Dublin) and the Minories (London).

Opaque glass	No. frags	MNV
Pale blue tankard	42	1
Lattimo jugs	26	4
Enamelled saucer	2	1
Total	70	6

Reino Liefkes, Senior curator at the V&A Museum London; Suzanne Higgott, Curator of Glass, Limoges Painted Enamels and Earthenwares at the Wallace Collection, London; Dan Nesbitt, curator at the Museum of London; and Colin Brain, independent researcher on the origins of lead crystal, have all been of enormous assistance in the identification of these artefacts and finding comparative examples from the UK.

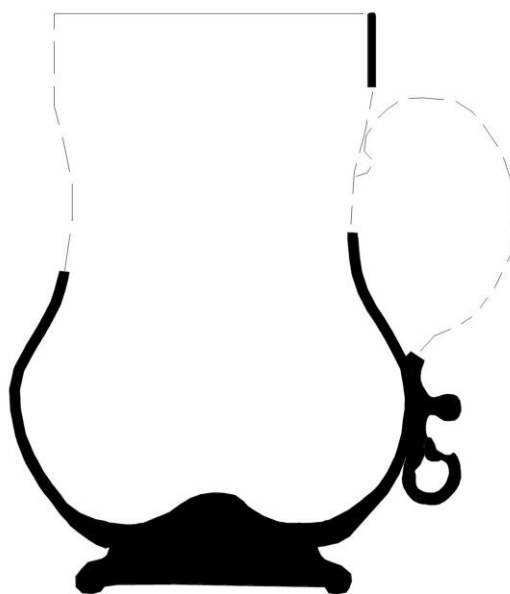
4:382

Pale blue glass tankard

4:382-383
4:386-414
6:4351-4362

42 sherds make up a single small pale blue tankard. This is the largest of the opaque glass vessels, with a globular body, flaring rim, a pedestal foot and one handle. The pale blue colour is present throughout the fabric. The surface is matt. The interior is a single shade of pale blue, and the exterior has a swirling pattern of dark and pale blue, echoing blown striations but clearly intended for decoration.

The overall form of the base, body and handle of the vessel is typical of a small late 17th century tankard or mug, a form known to have been produced in opaque glass in London by Ravenscroft/da Costa.

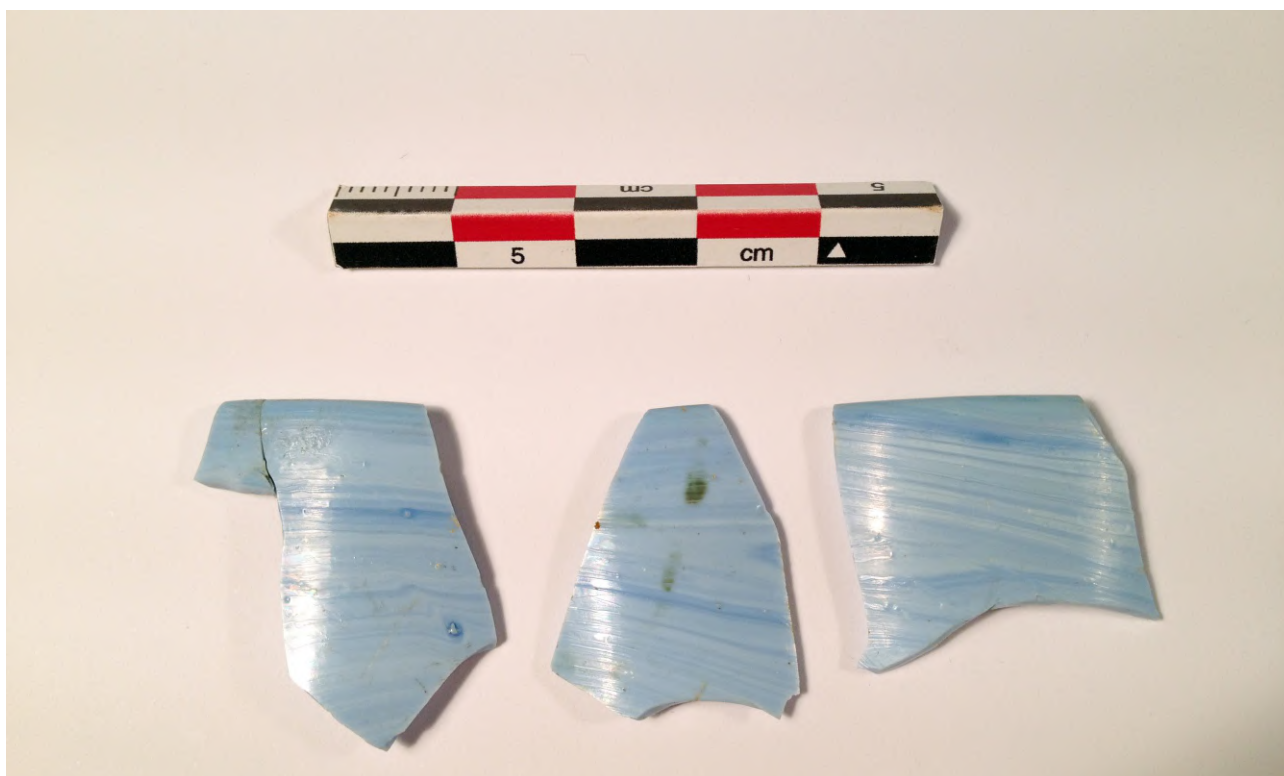


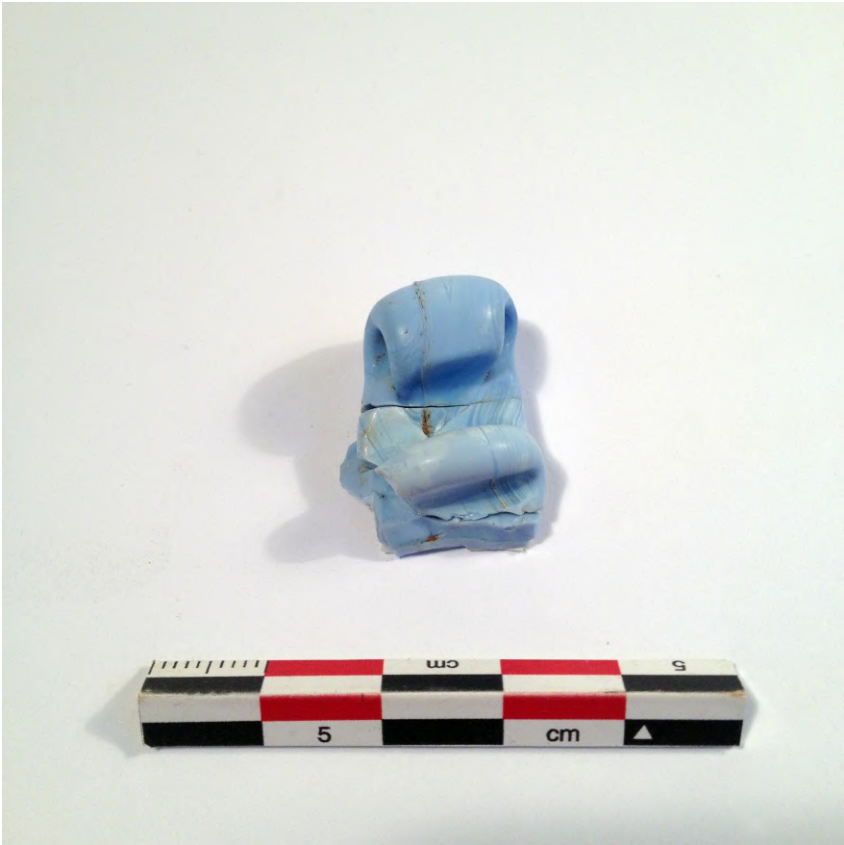
Opaque blue glass mug

4:382 Pale blue glass tankard (with refits 4:383; 4:386-414 & 6:4351-4362)

Pale blue opaque glass vessel (jug, tankard or jelly glass), with thick-footed baluster-shaped body (max 75mm diameter) with at least one handle. The short pedestal foot is flat and solid (base diam 48.01mm; narrowing to 40.53mm where it connects to the body; foot height 7.46mm) with a pontil scar. The base of the vessel is concave. Only the bottom part of the applied, flattened handle survives, curling outwards at its lower end with an additional curl just above the basal curl. Vessel thickness is 2.3mm near the base; 1.94mm-1.3mm in the body; and 2.4mm at the rim. Though incomplete, the plain vertical rim fragments

blue glass tankard rim sherds 4:382

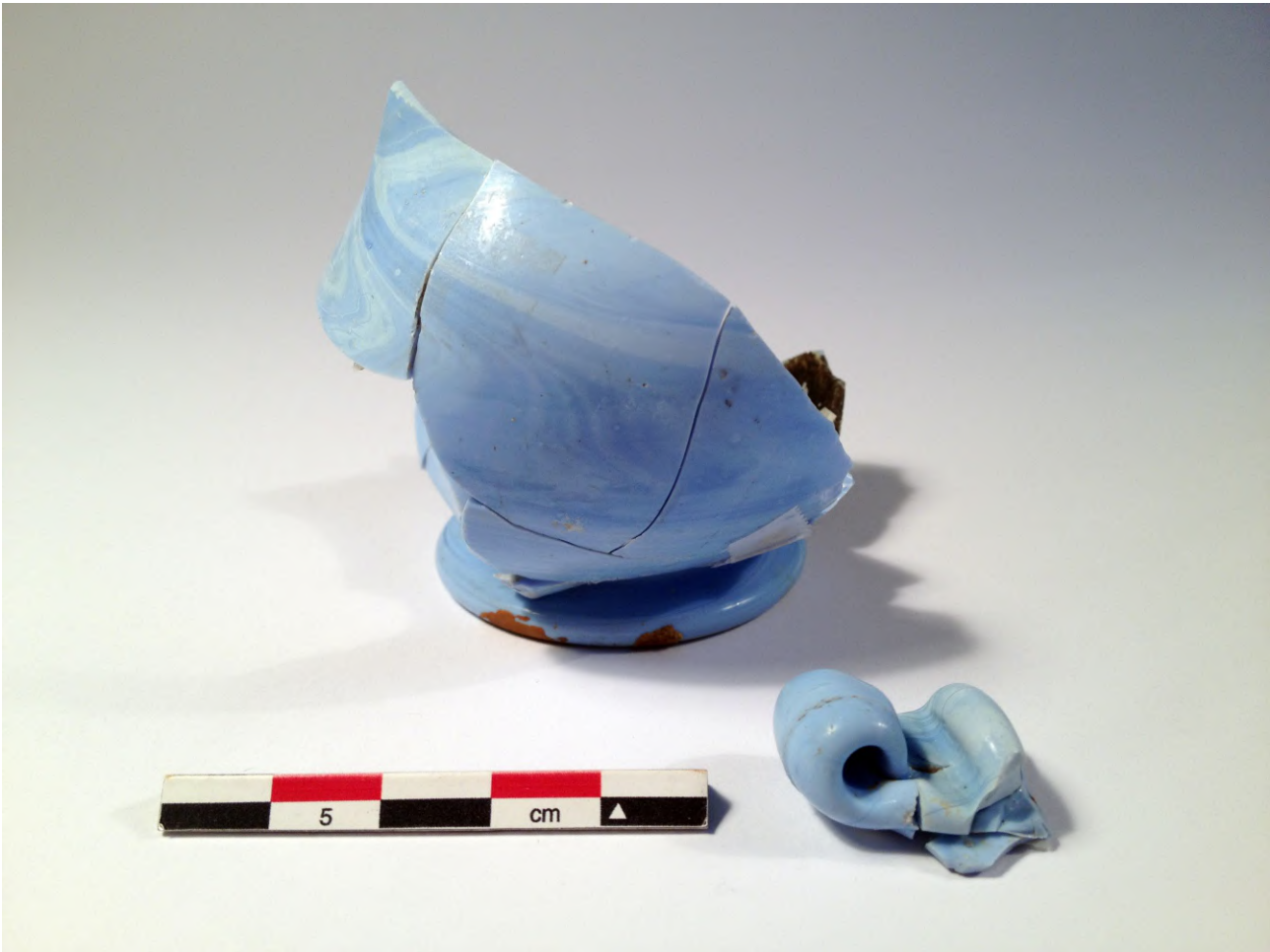




contained no spout fragments. The diameter of the rim fragments (at c. 60mm) is surprisingly large compared to the base and body. The overall form of the vessel would normally be classed as a tankard. The interior and fabric is a single shade of matt pale blue, but the exterior has a swirling pattern of two shades of blue, echoing blowing striations.

blue glass tankard handle 4:382

blue glass tankard base 4:382



Comparative material

The V&A holds three glass tankards: a clear lead crystal tankard with a raven's-head seal attributed to the Savoy glasshouse c. 1677 (Charleston 1984, Plate 25a; Thorpe 1927, Fig. 4; V&A ref. 6291), an opaque white glass tankard (ibid, Plate 31b) and an opaque brown glass tankard (ibid Plate 31a, right). Similar forms were also produced on the continent by the early 18th century (V&A 587-1903).

The best comparison for the form of the tankard is an opaque white mug with a cylindrical neck, handle and globular body excavated at Tunsgate, Guildford (cat. 73, Fryer & Shelley 1997, 195) which is almost identical in form to the Rathfarnham Castle blue opaque tankard. This mug was dated to the late 17th century and the excavators, noting its similarity with a contemporary Ravenscroft mug, attribute it to English manufacture.

No complete opaque blue glass tankards are known, but fragments from similar vessels have appeared on archaeological excavations in England. The Museum of London holds a small blue glass tankard dated to 1666-1700 (MoL 25252 Website id 452547) described as a 'blue glass tankard, body and rim sherds of a vessel with moulded vertical ribbing, and applied handle ... Register speculates it may be English or Dutch. From a cesspit.' The form is similar to the Rathfarnham blue opaque glass tankard, in particular the rim, globular body and handle, however the base from the MoL example is missing. This vessel contains c. 5% lead (Brain pers. comm. 2015) suggesting a tin/lead opacified glass, though it is partially transparent.

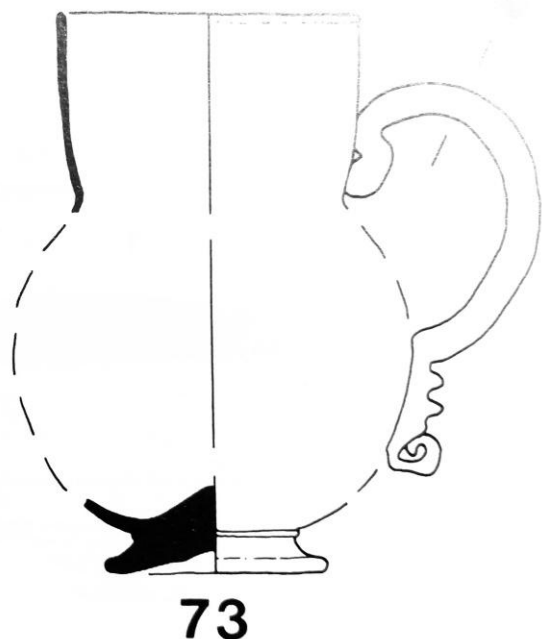
A better comparison is the rim and upper body from a vessel that appears to be a small bowl made in light opaque blue glass found at Southampton French Quarter (site code SOU1382; Cat. 52, Wilmott undated2). This was dated to the late 15th century. The vessel colour appears to be identical to the Rathfarnham Castle example. Other opaque blue glass vessels have been found in England. Rim fragments of blue opaque glass have been excavated found in Abacus House, London (Musum of London ABC 87 161 <790>, ABC87 793 <54>, <56>, & <62>). The glass came from a post-medieval



Fragments of globular glass vessel from Site AL74; MoL <704>; C1207, courtesy of Museum of London archives.

cess pit, containing a fine glass/pottery assemblage, may have been associated with the Embroiderers' Hall which is documented as having occupied the site from 1520. Higgott (undated, 16) records numerous examples of enamelled opaque white and blue glass from here (including ABC87 <56>) which she notes is similar to 16th century French enamelled glass.

Opaque white glass mug with a cylindrical neck, handle and globular body identified at Tunsgate, Guildford (cat. 73, Fryer & Shelley 1997, 195)





Small blue glass tankard dated to 1666-1700, possibly English or Dutch (Museum of London 25252 Website id 452547)

Light opaque blue glass found at Southampton French Quarter 1382 (Artefact GL52, Wilmott, undated2).



(4:1)



Multi-coloured millefiore cane R021-5-234 from Glasshouse De Twee Rozen dated 1657-1689 (Gowronski et al 2010 AAR50, 130). This glassmaking waste has the same colours as the Rathfarnham Castle blue tankard.

Another good comparison is a handled globular blue glass vessel found in a 17th century context in Aldgate, London (Site AL74; MoL <704>; C1207). The vessel is made of clear glass, with applied white and possibly blue opaque glass on the exterior in a swirling designs of pale and dark blue very similar to the Rathfarnham example. Although incomplete, the form of this vessel could be identical to the Rathfarnham example (many thanks to Dan Nesbitt and Colin Brain for identifying this example).

Opaque blue glass waste similar to the Rathfarnham and Aldgate blue tankard glass was found during an excavation at Glasshouse De Twee Rozen in Amsterdam, and dated to 1660-1680 (Gowronski et al 2010; Hulst et al 2012).



Lattimo jugs, from left: 3:145; 7:421; 7423

Lattimo jugs

Several fragments from four similar opaque white *lattimo* (milky-white) glass vessels were identified. These comprised four short pedestal bases, three spouted rim sherds with an applied copper blue glass lip, and two handles. Three of the bases were the same size, and it is likely that these belong to three identical small white jugs. The fourth base is smaller and this could belong to a jelly glass, though it seems more likely that all four were jugs.

Vessel surface, where unstained, is milky and very matt, like the pale blue glass vessel. The jugs have a single applied, flattened handle of a different style to the pale blue vessel, with a single outward curl at the lower end.

There is an applied trail of transparent copper blue glass along the rim and spouts of three of the vessels. This strip is slightly thicker than the rest of the vessel walls, and protrudes externally. The complete rim has a diameter of 44mm, which is similar in diameter to the bases.

3:145 Lattimo jug base

Three refitting sherds of opaque white glass vessel with footed base. Footed circular base 8.64mm tall; diameter at base 44.43mm, diameter where it joins body 33.34mm. Not badly stained.

Lattimo jug rim 7:425





Lattimo jug handles 6:4350 (left) and 6:4349 (right)

7:421 Lattimo jug base and body

Several sherds refitting of opaque white glass vessel with footed base and globular body. Footed circular base 9.86mm tall; diameter at base 42.96mm, diameter where it joins body 36.25mm. Height (incomplete) of reconstructed fragment 58mm, max diameter 56.12mm, then narrowing to c. 33mm. Heavily stained black. Vessel thickness is 0.9mm to 1.1mm.

7:422 Lattimo jug base

Opaque white glass vessel with footed base. Footed circular base 9.86mm tall; diameter at base 43.10mm, diameter where it joins body 35.35mm. Badly stained.

7:423 Lattimo jug/jelly glass base

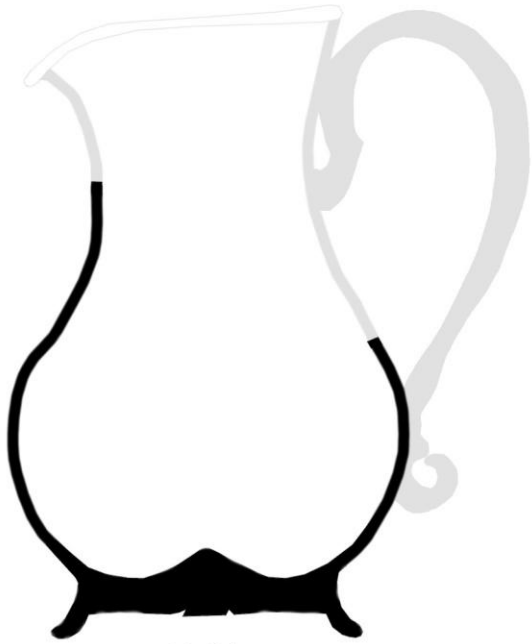
Opaque white glass vessel with footed base. Footed circular base 9.71mm tall; diameter at base 37.25mm, diameter where it joins body 31.11mm. Not stained. Smaller than the other three. Base slightly irregular.

4:381 Lattimo jug rim

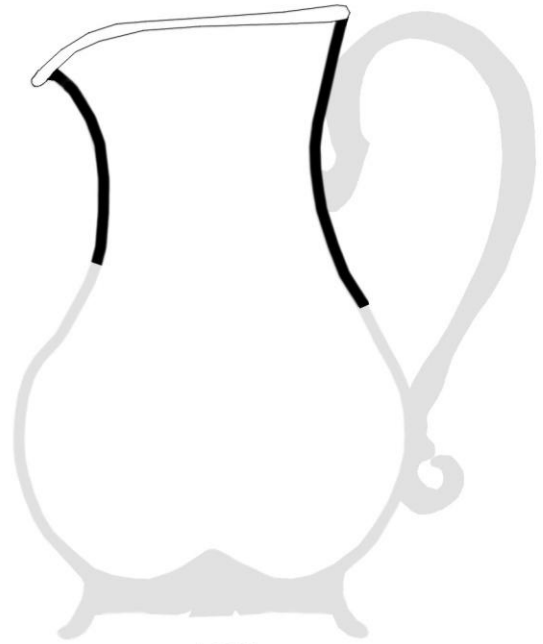
Three refitting sherds of opaque white glass spouted rim, almost complete, Applied clear blue glass lip on rim, c. 2.3mm thick, flush with inner edge and protruding slightly to exterior. Identified as copper blue by Reino Liefkes (V&A Museum, 2015). Diameter of rim is c. 40mm approximately. The rounded spout is very small at 10mm wide and 7mm deep. Vessel thickness is 0.9mm to 1.1mm.

Lattimo jug body, unstained, 4:384 and 4:385





7:431



4:381



3:145



7:422

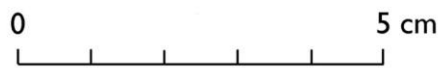


7:423



6:4350

Opaque white glass jugs



7:425 Lattimo jug rim

Five refitting spouted opaque white glass rim fragments. Applied clear blue glass lip on rim, c. 2.3mm thick, flush with inner edge and protruding slightly to exterior. Stained black, in particular the applied clear blue glass has absorbed more of the staining than the white glass. Diameter of rim is 41.38mm externally and c. 38mm internally (approximate due to break and spout). Small spout. 12mm broad at rim, protruding c. 6mm. Neck narrows to 33.44mm before flaring out again into baluster body. No refit with base 7:421, however these two sherds allow a full reconstruction of the vessel shape. Vessel thickness is 0.9mm to 1.1mm.

7:426 Lattimo jug rim

Spouted rim fragment of opaque white glass. Applied clear blue glass lip on rim, 2.73mm thick, flush with inner edge and protruding slightly to exterior. Stained black, in particular applied clear blue glass has absorbed more of the staining than the white glass. Vessel thickness is 0.9mm to 1.1mm.

6:4349 Lattimo jug handle

Handle fragment of opaque white glass, plain shaft. Identical to 6:4350. Heavily stained.

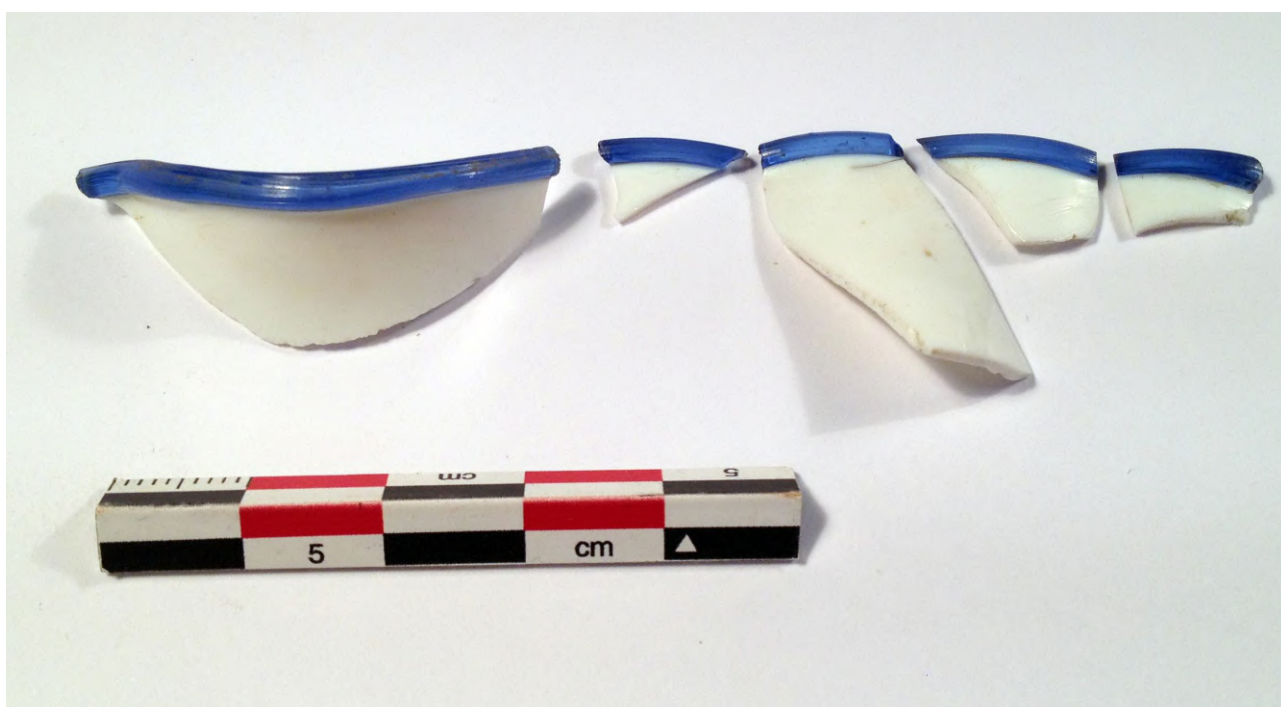
6:4350 Lattimo jug handle

Handle, complete, of opaque white glass, with fragments of body sherd still attached. Curve of body shape allows reconstruction of where handle sits on the vessel: the top of the handle is flush with the rim, one end of the handle is attached to the thinnest part of the neck and the base of the handle is attached to the widest part of the body. Applied handle with outwards scroll curl at base. Length 68.99mm, oval in section max 5.71mm by max 9mm. Protrudes from vessel max 30.55mm.



Lattimo jug base and body 7:431

Lattimo jugrims, unstained, 4:381





Lattimo jug bases showing underside, from left: 3:145; 7:421; 7423

4:384-385, 7:489-498, 9:172-180 Lattimo jug or jelly glass body sherds & others without nos.

The absence of body sherds of white opaque glass from Context 6 is almost certainly due to loss of a bag on site rather than an archaeologically meaningful absence. The author recalls seeing a bag of c. 50 small opaque white body sherds from Context 6 in the temporary site laboratory in Rathfarnham Castle kitchens, but this bag was never located when the material was moved to Archaeology Plan offices. All of the sherds are milky-white lattimo glass from small globular vessels such as the jugs above, with no decoration. Vessel thickness is 0.9mm to 1.1mm.

Comparative material

No comparable vessels from this date have been identified. Small glass spouted jugs such the lattimo Rathfarnham examples are very rare in late 17th century contexts, however they are known on the continent. A small ice-glass pitcher in New York (Robert Lehman Collection 1975.1.1213, Lanmon 1993, 98, ref 31) has a similar form and rim treatment to the Rathfarnham jugs. The small jug has an applied dark blue-green glass rim, an applied, flattened

Lattimo jug base 7:422, showing underside





strap handle that curls outward at its lower end, and a flattened foot ring. It is dated to the early 17th century, Venice or *façon de venise*. The catalogue notes a similar pitcher in the Kunstmuseen der Veste Coburg (HA552; *ibid*).

There is a reference to jugs being produced in late 17th century London. A list of glasses made by Ravenscroft in 1677 includes '...bowls, jugs and tankards' (Buckley 1925, 17). Charleston (1984 121) suggests that Ravenscroft's tankards may have been called 'jugs' in the late 17th century despite their lack of spouts, presumably on account of a lack of actual jugs surviving. The Rathfarnham Castle *lattimo* may provide the evidence that jugs with spouts were indeed being manufactured in London at the time. Opaque glass cream jugs of identical form were certainly being manufactured in the early 18th century, for example in Hopton Wafers in Shropshire

(Maclver 1918, 174) and the same form in clear glass (Buckley 1925, Plate XXXVII, Plate LIV No. 2, Plate LV above, No. 2) and in particular by the late 18th century in Bristol (Buckley 1925, 105). The form carries on through the 19th century.

The rim treatment of the Rathfarnham *lattimo* jugs uses copper blue trailing. The application of blue trailing is known in Italian clear glass from the end of the 14th and the beginning of the 15th century at the Monte Lecco factory (Fossati & Mannoni 1975, 62), and becomes a common Venetian decorative technique thereafter, spreading into north and west Europe *façon de venise* glassware by the late 16th to early 17th century (Doménech 2004), and gaining popularity in the 17th and 18th century.

Opaque white glass vessels are rarely identified in Ireland. Only four other examples are known

to the author: three in the Republic and one in Northern Ireland. The first is a fragment of dichroic opaque white ruby-red glass found in Smithfield and dated to 1675-1696 (Myles 2010, 101). This has been analysed by Sue and Colin Brain and is thought to be of Dublin manufacture. The second is from the same site - two fragments from opalescent opaque whitish-blue glass cups identified in the waste glass by the author (Smithfield C1034). Neither fragment is *lattimo*.

Opaque white *lattimo* glass was identified from an early 17th century deposit at New Row, Coleraine, in Northern Ireland (Nick Brannon 2015, pers. comm.) and interpreted as being of Venetian manufacture. An opaque white teabowl (?) and sherd from a possible second opaque white vessel was excavated from Clancy Barracks in Dublin as this report was being written (Director Franc Myles, 2015; 15E530, Latrine 4 Clancy Barracks). It is very similar to the *lattimo* Rathfarnham jugs, and may also have an applied band of copper blue trailing around the rim (to be confirmed).

In England opaque white glass vessels are more common. For example at Number One Poultry, London, Hugh Willmott (undated1) identified footed cups in opaque white glass which he dates to the second half of the 17th century and of Venetian origin, based on similarities with Green's drawings. A number of unusual opaque white bowls were also present in this assemblage (ibid). An opaque white mug, attributed to late 17th century London, and a plain *lattimo* cup attributed to late 17th century Holland were identified at Tunsgate, Guildford (cat. 71-73, Fryer & Shelley 1997, 187,195). At Coleman Street, London, a fragment from a white opaque glass vessel was identified in an early 18th century assemblage (Sygrave 2009, 104). At Stirling Palace in Scotland the pedestal base of an opaque white glass possible beaker (No. 48; F21015) was found, measured 47mm in diameter (Gallagher, undated). This base is very similar to the Rathfarnham vessels. Gallagher suggests it may date to the early 17th century and be of Venetian manufacture.



Small glass pitcher with applied blue glass rim (Robert Lehman Collection New York 1975.1.1213)

Lattimo cup found at Clancy Barracks, Dublin in late 17th to early 18th century context, courtesy of Franc Myles



Enamelled opaque white glass saucer

These five sherds of opaque white glass are different in texture and surface finish from the lattimo jugs. The fabric is partially translucent with a slight sheen, like mother-of-pearl or opalescent glass, rather than the milky matt finish of the lattimo jugs. The sherds are decorated on the concave inside of the vessel by enamelled blue and black foliate designs. The shadow of a missing third colour can be seen on two of the sherds, most obviously on flower petals. These very fine enamelled sherds are from a small saucer c. 120mm in diameter imitating Chinese porcelain. Under UV light these fluoresced an intense dark green colour with an orange hue, which suggests they were manufactured using calcium antimonate rather than tin or lead (Colin Brain pers. comm. 2015).

6:4848 Enamelled saucer fragment

Fragment of opaque white glass vessel, enamelled in blue and black. Concave in form with decoration on inside. Thickness: 1.42mm.

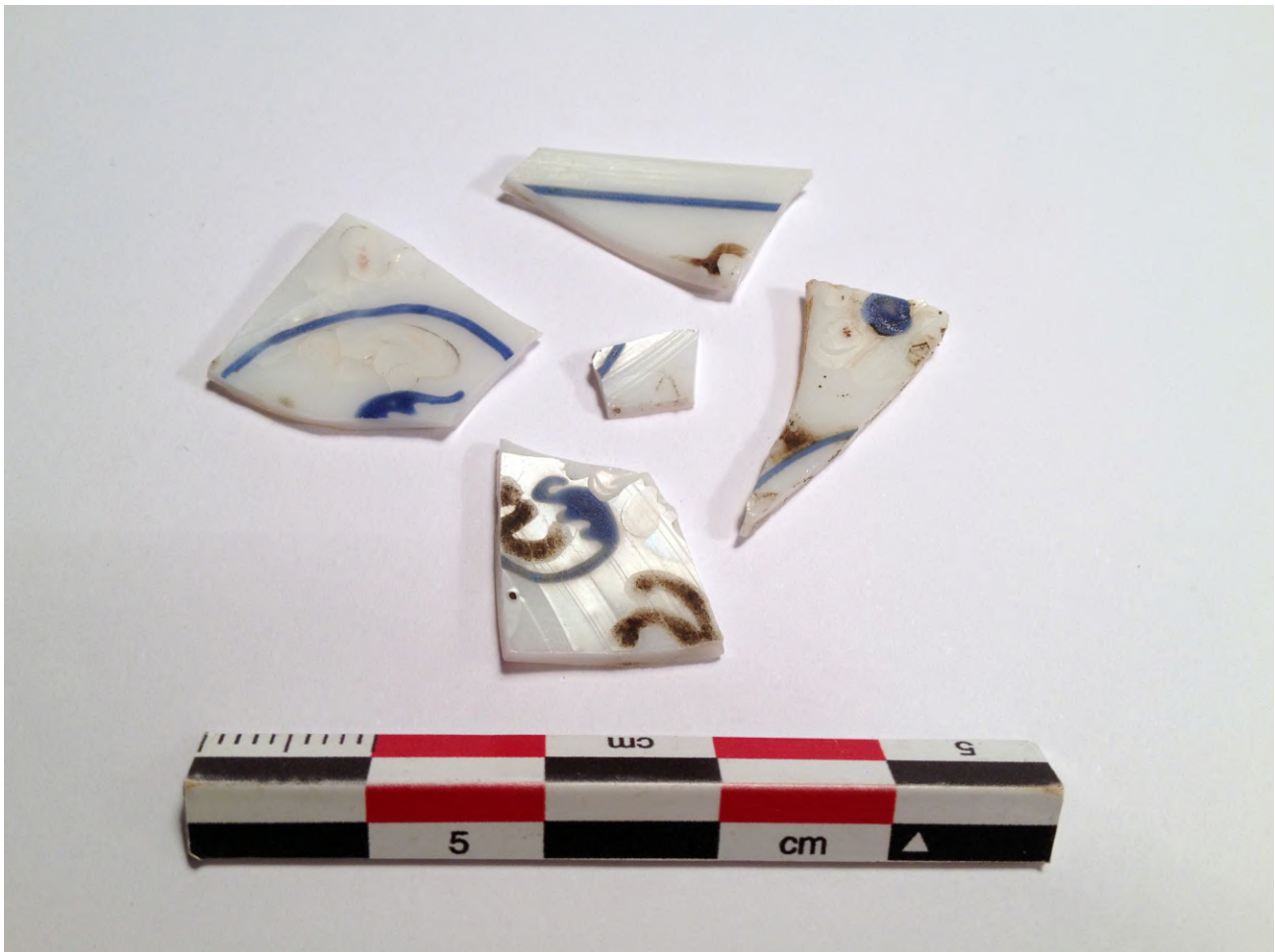
7:424 Enamelled saucer fragments

Four fragment of opaque white glass vessel, enamelled in blue and black. Probably all from the same vessel, and the same vessel as 6:4848. No refits. One fragment is a rim. Concave in form with decoration on inside. Thickness: 1.30-1.57mm. Rim diameter c. 120mm.

Enamelled Glass – comparisons

The enamelled glass saucer from Rathfarnham is similar to continental European enamelled opaque white glassware dating to the early 18th century. The shiny surface of the European/Bohemian enamelled opaque white glass displayed in the V&A Museum glass galleries is identical to the Rathfarnham glass saucer, and very different from both the milkier

enamelled glass saucer 6:4808 (left) and 7:424 (right)



white *lattimo* Rathfarnham jugs and the creamier white Ravenscroft-sealed opaque tankards and mugs in the V&A.

The foliate design on the Rathfarnham saucer, however, is not paralleled by the designs from known continental European enamelled glass. Suzanne Higgott, Curator of Glass, Limoges Painted Enamels and Earthenwares at the Wallace Collection, London, has looked at the Rathfarnham saucer fragments and suggested that the decoration is reminiscent of an enamelled goblet excavated at Nonsuch Palace (Museum of London NON 59 GL1).

The enamelled Nonsuch Palace glass is from a clear glass goblet dating to the very late 15th or early 16th century with enamelled foliate decoration in white, pale blue and brownish iron-red with lines in black (Charleston 2005, Cat. 1; Higgott undated, 14). The glass excavated at Nonsuch was probably deposited between 1665 and the 1680s (Higgott undated, 14). A second example of enamelled glass excavated in the U.K. is from Acton Court and is similarly dated to the Nonsuch fragments, c. mid-16th century (Higgott undated, 13). It is now in the Bristol Museum and Art Gallery.

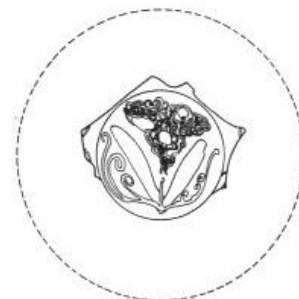
Enamelled glass was produced at the Glasshouse De Twee Rozen in Amsterdam in c. 1667 (Hulst et al 2012, 1). Fragments of enamelled glass from the excavation here (RO21-5-233; 5-41; 5-242; Gowronski et al 2010, 128) dating to 1657-1679 are similar to the Rathfarnham Castle examples.

A more exotic parallel to the Rathfarnham enamelled saucer is illustrated by Baart (2007, 18, Fig. 1) as an enamelled glass vessel c. 1622 of Portuguese manufacture. It is red and blue on white with similar swirling fronds.

One other fragment of enamelled glass is recorded from an Irish excavation. This is from a glass bowl of probable 19th century date found at Spanish Parade/Fish Market, Galway (E402:301, Roche 2004, 425 ill 6.4.10d). Two fragments of opaque (or alabaster) and opaline glass (E402:155, 1580) from the site are also probably 19th century in date (Roche 2004, 426).



Fragment of enamelled and gilded lattimo glass from Acton Court, Iron Acton, Avon. Venice, late 15th-early 16th century (© Bristol Museums, Galleries & Archives, courtesy of Suzanne Higgott)



Enamelled glass vessel c. 1622 of Portuguese manufacture (from Baart 2007, 18, Fig. 1)

Nonsuch palace enamelled glass, courtesy of Museum of London Archives



Venetian opaque glass

Opaque blue and white glass vessels were produced in Venice from at least the late 15th century. Surviving examples of late 15th century Venetian blue and turquoise glass are dissimilar in colour and finish to the Rathfarnham Castle blue glass example (Tait 1991, 163-6). Venetian *lattimo* tended to use a lead/tin calx until the 19th century, which was partially replaced by other opacifiers, such as calcium antimonate from c. 1550s, calcium phosphate from 1450s, and lead arsenate from 1693 (Verità 2014, 59). Northern European opaque glass (see below) was manufactured using similar recipes.

Opaque milky white glass, known as *lattimo*, was used in Venice from 1359 (Verità 2014, 59), and used in glass vessels on Murano from the late 15th century (Tait 1991, 159). *Lattimo* glass was used decoratively on otherwise clear glass vessels, and is typical of the Venetian and *façon de venise* styles, however vessels manufactured entirely of opaque white *lattimo* glass were also produced. The best known of the *lattimo* glasshouses on Murano was At Gesù, a glasshouse established by the Miotti family in the 16th century, which remained active in the 17th and 18th centuries. Miotti *lattimo* resembled porcelain and was sought after by connoisseurs and collectors throughout Europe (Hess & Husband 1997, 18, 191).

In the late 17th century Venetian *lattimo* glass was popular in London. In 1670 glass merchant John Greene ordered vases '...all milk whit', and 'flouer pott glasses ... milke white' from Allesio Morelli in Venice (Charleston 1984, 106-7; Hartshorne 1968, 233). These imported Venetian *lattimo* vessels have been identified from late 17th contexts in excavations in London (Wilmott undated1).

Opaque glass manufacture in northern Europe

Over the course of the 16th and 17th centuries expanding trade with China and the rise of a middle class in Europe led to a strong demand for blue and white tablewares. Glassmakers, often from Murano, were using Venetian

techniques on *façon de venise* glass vessels in central and northern Europe using *lattimo* and transparent blue details from the late 16th century (Hess & Husband 1997, 18, 191; Verità 2014, 62). By 1612 when Antonio Neri published the secrets of Venetian glassmaking in the *L'Arte Vetraria*, northern European glasshouses were producing high quality *façon de venise* glass vessels. The style remained popular during the 17th century (Lanmon 1993, 206). Pale blue opaque glass was also being manufactured in Europe, for example opalescent blue glass from early 17th century France (Tait 1991, 178, Plate 230-231).

This style of northern European glassworking in opaque white and blue glass imitated and developed from Venetian glass. However, in the late 17th century glass experimentation in northern Europe developed novel techniques and glass materials which enabled new types of vessels to be manufactured without Venetian parallels.

The development of opaque glass manufacture in northern Europe has been traced back to the experiments and teachings of Johann Rudolf Glauber (1604-1670). Glauber's work was not intended to produce glass vessels, but rather to show that the true colours of metals could only be seen when melted into glass, thus revealing the secret of the philosophers' stone (von Kressenbrock-Krosigk 2008, 16-17). His chemical and alchemical experiments at his glasshouse in Amsterdam attracted followers who went on to disseminate and develop Glauber's alchemical-chemical research into new ways of making glass vessels in the 1670s and 1680s (von Kressenbrock-Krosigk 2012, 75-76). The glassmakers influenced by Glauber included Johann Joachim Becher who produced glass in Austria and Bohemia; Johan da Costa and Jon Odaccio who moved from Holland to London and Dublin and produced lead crystal vessels; Johann Daniel Crafft who disseminated and developed Glauber's findings on opaque white glass across central Europe and Scandinavia; and Johann Kunckel, who developed lead crystal and gold ruby glass in Germany at an isolated island laboratory.

Opaque glass manufacture dating from 1660 to

1680 has been identified at Glasshouse De Twee Rozen in Amsterdam (Gowronski et al 2010; Hulst et al 2012). Documentary sources in the form of tourist guides from 1664 and glasshouse accounts from 1667 describe the manufacture of multi-coloured opaque glass vessels and orders of hundreds of *lattimo* vessels (Hulst et al 2012, 1). Manufacturing waste from the site included numerous examples of opaque glass vessels, including opaque white pitchers with pedestal bases (ibid, 7), blue-rimmed glass vessels, opaque glass imitating porcelain bowls, enamelled glass, and opaque blue glass waste the same colour as the Rathfarnham example (Gawronski et al 2010).

Opaque glass manufacture in England

Sue and Colin Brain have noted (V&A 2014) that when Gustav Jung visited London from Sweden in 1668-9 he recorded that white glass was being made in both the Minories and the

Opaque white tankard in V&A attributed to Ravenscroft c. 1670s-80s. Courtesy Victoria and Albert Museum, London.



Bear Garden glasshouses. Jung's references to the use of antimony as an opacifying agent in some of his recipe records suggests the white glass made here was opaque (Brain pers. comm. 2015) as well as the clear vitrum blanchum ('white glass', which in Venice referred to decolourised clear glass, e.g. Verità 2014, 59; Brain in press 2016, 7).

In the late 17th century, opaque glass in England was generally manufactured from one of two methods (Brain in press 2016, 7). The traditional recipe achieves opacity by precipitation of calcium antimonate crystals. An alternative method uses a system of tin and lead oxides. Jung's record of the Minories recipe suggests the calcium/antimony was used there, however analysis of opaque glass waste from archaeological contexts in the Minories showed tin/lead was used. Brain (in press 2016, 7) suggests that sometime after 1668 the traditional calcium/antimony system for opaque glass was replaced by the tin/lead recipe as it was superior. Colin Brain has suggested the Rathfarnham samples are more likely to be tin/lead, based on the black staining (Brain pers. comm. 2015).

Watt (2013) and Brain (2016) describe how altarese glassmakers da Costa and Odaccio were producing opaque glass *calcadonio* (agate) glass bijoux in the Savoy Glasshouse in London in the mid-1670s during the development of lead-crystal. By at least 1677, opaque glass vessels were being manufactured in London by Michael Rackett in the Minories glasshouse (Watts 2013, 99, 141; Charleston 1984, 123-4) and by Da Costa/Ravenscroft in the Savoy Glasshouse. The V&A Museum in London holds two opaque white glass mugs attributed to Ravenscroft made in London dating to 1677-1683 (MoL C.534-1936; & C. 894-1935; Colin and Sue Brain 2014, Museum of London notes). Opaque white glassmaking waste dating to c. 1670 probably originating from the Minories has been identified archaeologically (62-64 Aldgate High Street, London EC, London Museum site AL74). Whilst no evidence for the manufacture of pale blue opaque glass vessels has yet been identified (Wilmott undated2), opaque blue canes in glassmaking waste have been identified in more than one site close to the Minories, for example MCF06 where the

glass was calcium/antimony opacified and the blue colouration was a mixture of copper and cobalt oxides (Brain, pers. comm. 2016). By the 1690s opaque glass was being produced outside London, for example at Hopton Wafers in Shropshire (Powell 1923, 40). Opaque glass continued to be produced in England throughout the 18th century.

The opaque white glass mug attributed to the Savoy Glasshouse in London c. 1677-1683 (V&A C.534-1936) was examined and closely compared to the Rathfarnham *lattimo* jugs by the author and V&A senior curator Reino Liefkes. The colour and finish of the London-made vessels is creamier and less white than the Rathfarnham examples, but the overall vessel thickness and treatment of the base and pontil scar are identical. The London-made late 17th century opaque white glass is almost identical in colour (and form) to contemporary Fulham stonewares (attributed to Dwight), however the Rathfarnham jugs are not. The Rathfarnham jugs could still be made in London (or Venice), and the colour differences may not be significant.

Opaque glass manufacture in Ireland

An archaeological excavation at Smithfield, Dublin found a dump of material from the late 17th century glasshouse in a latrine, which Franc Myles (2010) has identified as being from John Odaccio Formica's glasshouse. Myles argues convincingly, supported by analytical work by Sue and Colin Brain, that Odaccio was experimenting with, and manufacturing, very high quality lead glass tablewares at this glasshouse from 1675 to 1696.

The latrine fills, dated to the same period as the use of the glass-house, included blue, white and purple glass cullet and frit, coarse white sand or ground white quartz, fragments of pink, purple, blue, green and white glass, rods of various coloured glass, and a fragment of dichroic opaque white and red glass (Myles 2010, 94-97,101). A sample of opaque glass waste excavated from Odaccio's glasshouse at Smithfield in Dublin showed the calcium/antimony method was used there.

Pedestal foot of opaque/opalescent glass cup from glass waste at Smithfield, Dublin (00E0272:1034), courtesy of Franc Myles.



Rim of pale bluish-white opaque/opalescent glass cup from glass waste at Smithfield, Dublin (00E0272:1034), courtesy of Franc Myles.



The author has examined the Smithfield glass waste from Smithfield context 1034, and identified two fragments from opalescent pale bluish-white opaque cups. The style of the base and rim treatment (with an applied band of different-coloured glass) is reminiscent of the Rathfarnham Castle example, and suggests Odaccio was experimenting with producing these vessels in Dublin in the late 17th century.

Odaccio was working in London in the early 1670s (Brain & Brain 2016) and would have been familiar with, and probably developed an expertise with, a variety of techniques for manufacturing opaque glass. Evidence for Irish based opaque glass manufacture coincides with Odaccio's arrival to Dublin in c. 1675.

The opaque glass archaeological assemblage from Rathfarnham Castle is unique in Ireland. All the vessels are likely to have been produced between 1675 and 1720. Glass waste from Smithfield demonstrates that the *lattimo* jugs and blue glass tankard could have been produced in Dublin. Similar vessels were also being produced in London and Amsterdam at this time. The enamelled saucer is less likely to be Irish, and a continental origin (perhaps Amsterdam or Portugal rather than central Europe) is more likely.

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Other tableware (tumblers, beakers, bowls)

Antoine Giacometti

	Sherds	MNV
Engraved tumbler	8	1
Plain tumbler	7	1
Beakers	5	2
Glass bowls	8	2
Total	28	6

range of 1701-1778 (e.g. Bartels 1999, cat 28, 946; Gawronski et al 2007, 71 cat NJ-9-72).

6:4235 Engraved glass tumbler (refit with 7:417 & 3:130-133; 10:41)

13 refitting fragments of a semi-complete glass beaker. Flat plain base with large rough pontil scar, straight flaring sides to a thickened plain rim. Exterior surface has scratched/engraved design comprising eight panels with alternating foliate motifs with large dots. Design is quite crude. Glass is clear with very few air bubbles. Fluoresced

Engraved Tumbler

Numerous fragments from a mostly-complete flat-bottomed scratch/diamond-point engraved tumbler were identified. The tumbler form dates from the mid-18th century (e.g. Charleston 1984 159, plate 42a) however flat-bottomed tumblers were in use in London from the late 17th century (Trubridge 1972, 49). The glass is not lead-based (or at least not fully lead-based) and may be a good quality clear soda glass, perhaps similar to Bohemian/German soda-chalk glass manufactured from the late 17th century (Hess & Husband 1997, 16-17). Further analysis will need to be conducted.

Scratch/diamond-point engraving was carried out in Venice, the Netherlands, Central Europe and France during the 17th century (eg. Lamnon 1994; Hess & Husband 1997, 192). Holland in particular was a centre for diamond-point engraving of soda glasses in the 17th century. Diamond-point engraving is particularly well suited for use on non-lead soda-based glass, unlike wheel-engraving which from 1725 was frequently used on lead-based glass (Bickerton 1984, 28-30).

The style of engraved decoration on the glass appears to be 18th century in date and central-northern European in style.

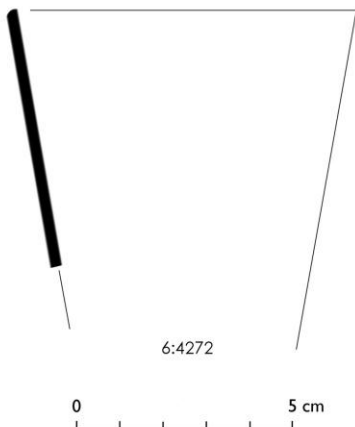
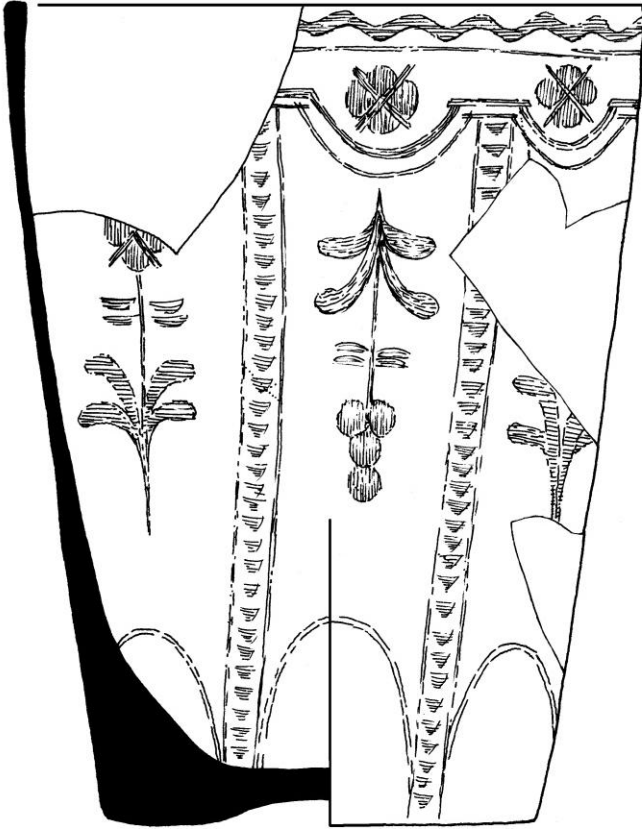
Comparable glass tumblers have been excavated in the Netherlands, with an origin in Bohemia/Germany and a manufacturing date

Engraved tumbler 6:4235



6:4235

Illustration by Alva Mac Gowan

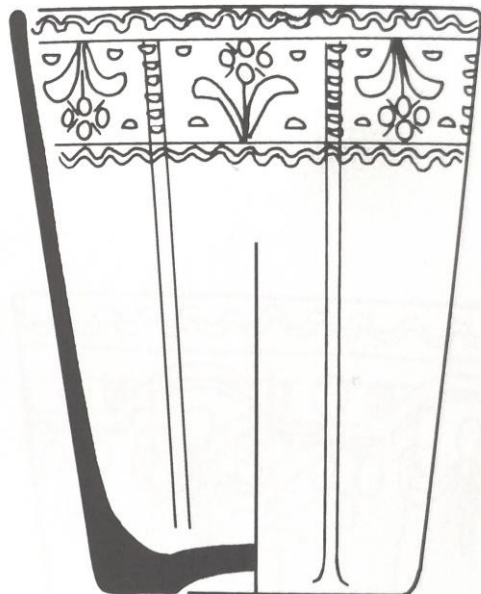


with an intense pale-orange-white reading, which was very unusual, and may indicate made of glass with both soda and lead components. Colin Brain (pers. comm. 2015) has identified late 17th century lead-soda glassware from Holland. More rigorous analysis would be required before suggesting a lead-soda based glass, however. External diameter at rim: 80mm and at base: 58.87mm. Height of vessel 107.71. Wall thickness 1.71mm, thickening to 3.46mm at rim.

Plain tumbler

Fragments of a thick-walled lead glass vessel may be a plain tumbler. The base does not appear to be present, but the thickness suggests a tumbler rather than a beaker. Glass appears to be lead-crystal. Plain tumblers are known from the mid-18th century (Charleston 1984, 159, Plate 42a). The flat-bottomed base of the fluted dessert glass or tumbler described in the dessert glass report (2:165) may be of 1670-1720 date, however, and flat-bottomed plain tumblers are documented in London in the late 1670s and

Engraved tumbler found in Amsterdam, suggested origin Germany or Bohemia 1701-1771 from Gawronski et al 2007, 71 cat NJ-9-72



1680s by John Greene. Greene's drawing of glasses to import from Venice show tumblers that are as high as they are wide (Trubridge 1972, 49). These dimensions are not the same as the Rathfarnham tumblers (2:165 and 6:4235), which have a height of c. 1.5 times the width, a proportion usually associated with later 18th century tumblers. Audrey Whitty has suggested (pers.com 2016) that 6:4270-4271 may be from a globular vessel such as a thick wine glass bowl, rather than a tumbler.

6:4272 Rim sherd

Plain vertical rim of thick-bodied straight-walled crystal vessel c. 80mm diameter at rim. Clear metal, no crisseling or discolouration. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment: L 60mm, W 55mm; Wall thickness 2.06mm-2.17mm, 2.64mm at rim.

6:4270, 6:4271, 6:4319-6:4321 Body sherds

Five sherds of thick-bodied straight-walled crystal vessel (of which 2 refit, and 2 are rims) c. 80mm diameter. Almost certainly same vessel as 6:4272. Clear metal, no crisseling or discolouration. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment 4270: L 36mm, W 31mm; Fragment 4271: L 30.5mm, W 13mm; Wall thickness both sherds 2.2mm-2.6mm, thickening to base.

Glass beakers

Three fragments of glass have been tentatively interpreted as basal fragments belonging to two clear non-lead glass beakers. High-kicked clear glass beakers are a typical central and northern European form, and a possible comparable example is in the Allaire Collection (Ref. 110E; Henkes, Nos. 35.9 & Nos. 35.10). Audrey Whitty notes (pers.com 2016) that the sherds could be consistent with fine clear beakers dat-

ing from c. 1710.

No beaker rim or body fragments were identified, and it is possible that the beaker fragments belong to unusually clear and exceptionally fine phials or apothecary glass vessels.

6:4206 Possible beaker fragment

Fragment of curving clear unidentified glass. Fabric is very fine (0.6mm) and closely resembles e bowl is slightly smaller, perhaps c. 600mm diameter around the base flaring to c. 700mm diameter at the rim. The rim is more everted than in bowl 6:4734. Did not fluoresce under UV light, indicating a non-lead glass. Fragments x3 L 23.92mm-32.75mm; W 15mm-17mm; thickness of body 1.2mm to 1.4mm.

Possibly the base of a high-kicked northern European beaker.

6:4196-4198 & 4209-4210 Possible beaker fragments

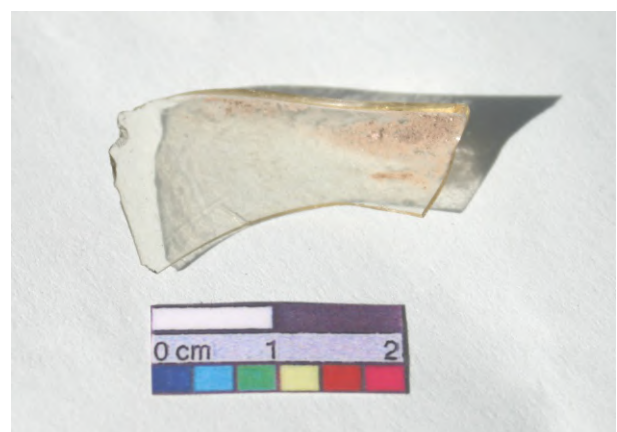
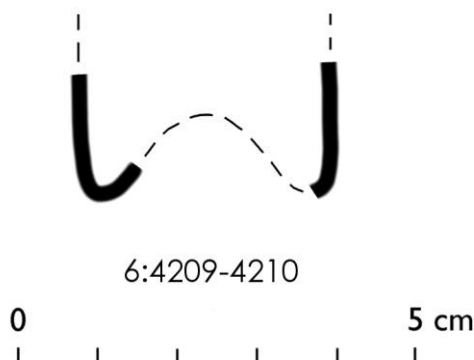
Six fragments of clear glass represent one or more unidentified clear glass vessels. Form is unusual and does not match other vessel types. May be lead crystal. Possible basal sherds suggest small globular vessel with sharp inward basal kick, not unlike phial form.

Glass bowls

A partially-complete glass bowl and a fragment from a second similar glass bowl were identified. The bowl is plain, shallow, with a flat base, a low well and a broad folded rim. The form appears in 17th century contexts in Norwich and London (Wilmott undated Poultry Lane citing Haslam 1993, 117 nos 710-11).

Glass bowls are rare finds in early post-medieval Irish contexts. One dated to 1670s-1690s was identified at Dominick Street Lower, Galway (Roche 2004, 411).

6:4206



Both bowls are made of a smoky-grey non-lead glass, and may originate in continental Europe (for example Germany or Bohemia) in the late 17th century or beginning of 18th century.

6:3734 Glass bowl (refit with 4:58; 6:3735-3736; 6:4207-4208; 8:8235)

4 refitting fragments of glass bowl, and four further non-refitting fragments of the same vessel. Approximately 50% of the vessel is represented here. Transparent smoky-grey glass. Flat base, vertical body and everted rim. Base is slightly convex with a pontil scar on underside. Striations on exterior and underside. Did not fluoresce under UV light, indicating a non-lead glass.

External Rim diameter: 124mm

Vessel internal diameter c. 90mm at base, 100mm at top, Height of vessel 35.13mm

Body Thickness: at base max 4.22 min 1.82mm. In body 1.12mm to 1.27mm.

9:250 Glass bowl

1 sherd of smoky-grey flat glass, probably representing the base of a glass bowl very similar to 6:3734. Part of pontil scar visible on underside. Base is slightly convex. This fragment of glass is very similar to the optical glass fragment 6:4213. Did not fluoresce under UV light, indicating a non-lead glass. Thickness of glass fragment varies from 4.3mm to 1.8mm. Fragment L 41.52mm; W 23.60mm.



6:3734

Roche, Nessa 2004 'Post-medieval Glassware', in Elizabeth Fitzpatrick & Madeline O'Brien & Paul Walsh (eds) *Archaeological Investigations In Galway City, 1987-1998*. Wordwell, Bray. pp 405-426.

Trubridge, P. C. 1972 'The English Ale Glasses, 1685-1830'. *The Glass Circle 1*, ed RJ Charleston, Evans & Polak, p46-57. Oriel Press, Newcastle upon Tyne.

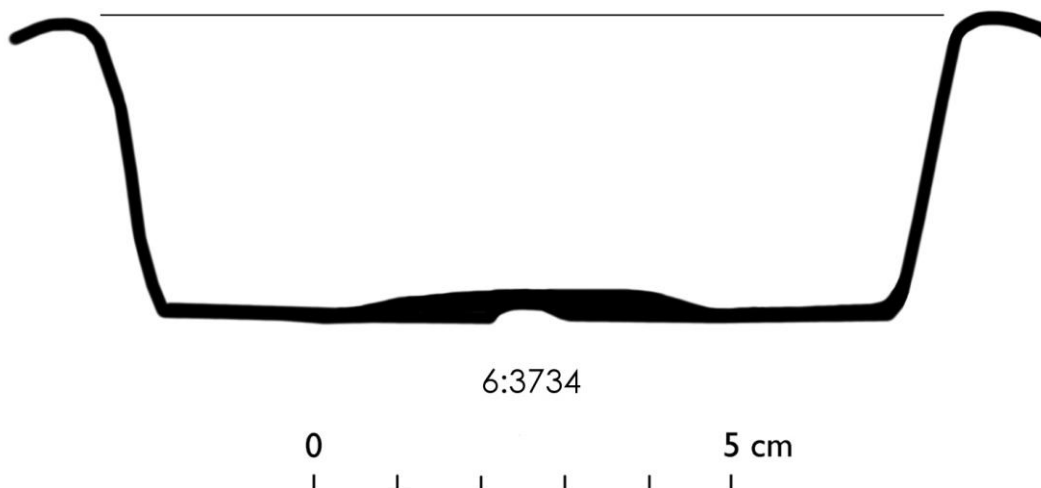
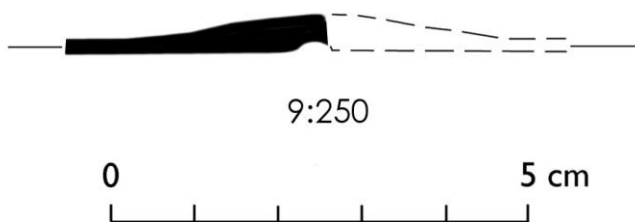
Willmott, Hugh (undated1) *The Post-Medieval Vessel Glass Number One Poultry*, London. Site code: ONE94. Museum of London Archaeology.

References (tumblers and bowls)

Gawronski et al 2007 *Kelderwoningen en een beerput in de Lastage Archeologische opgraving Nieuwe Jonkerstraat* (2007) AAR (Amsterdamse Archeologische Rapporten) 44, 2010. Jerzy Gawronski, Robrecht Vanoverbeke, Ranjith Jayasena. Gemeente Amsterdam, Bureau Monumenten & Archaologie.

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Glass bottles

David Swift

Illustrations by Alva Mac Gowan

A total of 595 shards of wine bottle glass were recovered from the excavation at Rathfarnham Castle. The vast majority of the glass typologically dates from the Early Modern Period and more specifically from the period c. 1630 to 1740 with only 11 shards apparently dating outside of this general range – these latter from the early to mid-19th century c. 1820-60.

The wine glass was identified visually and typologically and the data is presented here in tabular form.

Each plate is numbered (1-31) and corresponds with an entry in the register at the end of this chapter.

Dating

The dating of unsealed bottles can be relatively accurately appraised by visual examination. The width and depth of the kick up, the length of the neck, the proportions of the lips and string rim and the general profile of the vessel are all good indicators. The more of these factors extant in a single piece the more precise the date can be as a general rule.



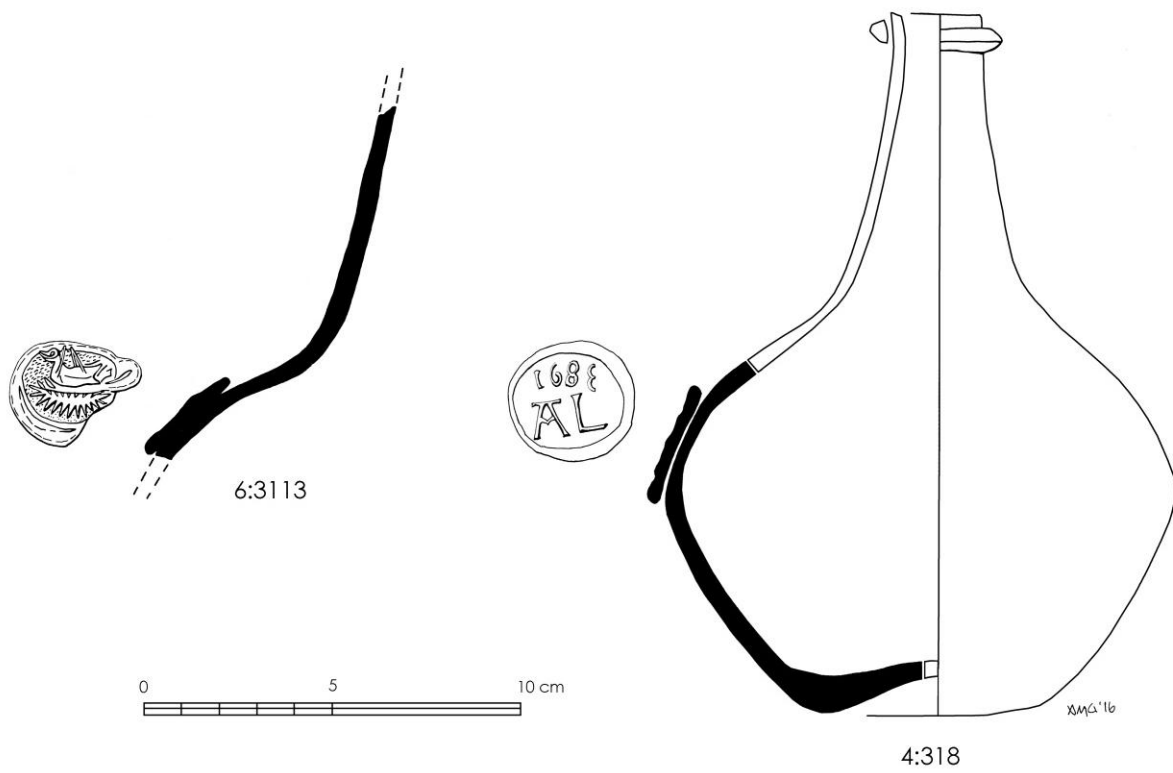
1



2

Context	Diagnostic shards / total shards	MNV	Complete vessels	Provisional dates	Likely earliest deposit date*
1	9/12	5	-	1820-60 (**1690-1710)	1820s +
2	3/20	2	-	1690-1740	1710-1720 +
3	1/8	1	-	1660-1690	1660 +
4	16/37	10	2	1660-1790	1730s-1740 +
6	43/434	27	1	1630-1735	1725-1740 +
7	16/58	14	8	1690-1740	1730-1740 +
8	0/6	1	-	Early Modern	Unknown
9	1/2	1	-	1660-1730	1660 +
10	6/18	2	-	1690-1730	1700 +
Total	95/595	63	11	1630-1860	N/a

* assuming all shards and vessels from one context were deposited at once ** in one case



6:3113
 c.1680-1720
 Dark green glass
 Shoulder sherd
 Glass tavern seal
 Wine bottle

4:318
 c.1688
 Dark green glass
 Semi-complete
 Shoulder sherd
 Glass seal
 line: AL 1688
 Wine bottle



3



5



7



9

95 shards out of a total of 595 were substantial enough to be provisionally given an approximate date. Besides these 95 fairly identifiable shards the remaining 500 shards of wine bottle glass were mainly body shards which appeared to conform to wine bottle glass. Without clear typological features such as the lips and bases of such bottles, it is not possible to ascertain anything further in terms of date and form.

The total minimum number of vessels was 63.

The evidence appears to date the assemblage of wine glass as a whole to between c.1630 and 1860. Each context has been provided with a date range of its own which may prove useful in establishing relationships with the site matrix overall.

Intact bottles

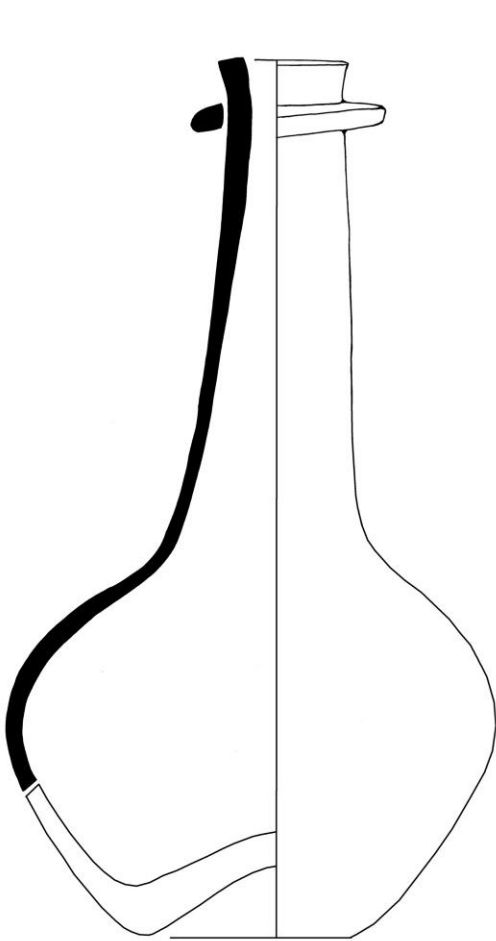
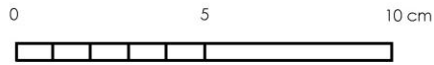
Of the total 95 dateable shards – 11 were considered to be largely intact wine bottles. These latter were yielded from just three archaeological contexts. Of these the one bottle from C6 was dated c.1710 to 1720 and is considered to be of late ‘onion’ type. The two bottles from C4 were of classic ‘mallet’ shape and as such were dated c.1720-40. The remaining 8 intact bottles came from C7 and were generally of mallet type c.1720-40 although one bottle had an earlier onion profile and was dated c.1690-1720.

Origin

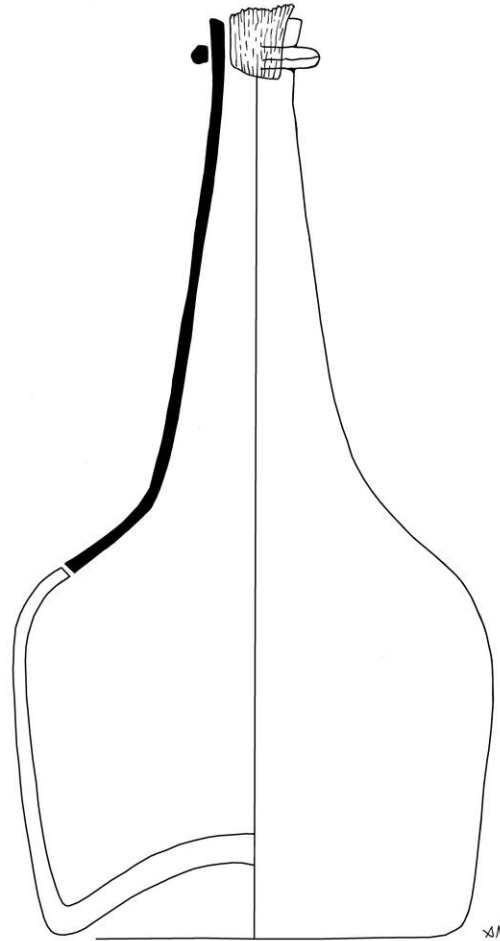
Without direct contemporary historical reference there is no hard and fast way to extrapolate the place of manufacture of an Early Modern glass wine bottle. Certainly there were regional variances across Europe but the bottle glass from Rathfarnham Castle all appears to be of standard English type – the same styles which would have been imported or imitated by Irish producers – whether individual bottles were imported from Britain or copied in Irish glasshouses for the benefit of the Irish higher middle and upper classes.

Seals

Clues for the origin of some of the wine glass may however be guessed at from the evidence of surviving seals from the Rathfarnham Castle



6:3107



4:315

6:3107
c.1650-1660
Dark green colour glass
Semi-complete neck sherd
Shaft and globe shape
Kick base
Wine bottle

4:315
c.1660-1690
Dark green glass
Semi-complete neck sherd
Long neck
Kick base
Wine bottle

assemblage. Among the shards were a total of five seals – four of which bore the initials ‘A. L.’ – most likely standing for ‘Adam Loftus’. All four of these latter appear to have been struck with the same metal die. A seal would have conveyed upon its owner a sense of wealth, prestige and of course would have provided the owner with an identity. The seal was also a signal that the intention was likely that the bottle was to be reused by its owner. Normally these seals were placed on bottles near the end of the manufacturing process when the glass was still warm and viscous (Dumbrell 1983, 152) and this would indicate that there is a strong likelihood that at least these few bottles which bore these seals may have been made in Ireland – if not in Dublin itself – rather than abroad (Roche 2007, 413). Certainly there had been glass vessel production in Ireland from as early as the late sixteenth century and the domestic industry grew throughout the next two centuries (Farrelly 2010, 35). It would have been quite normal for these vessels to be acquired directly from their glasshouse of production but various glass bottle carriers including wine merchants could also have provided the bottle to the prospective client.

The fifth seal in the Rathfarnham assemblage bore no alphabetic mark but a picture of a bird in a nest possibly skewered by an arrow – this could be a representation of a familial coat of arms but could just as easily be symbolic of a tavern or a wine merchant’s mark. Without a date and/or name/initials it is difficult to ascertain.

Function

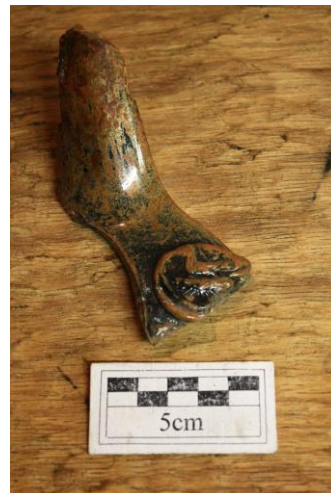
As sturdy and practical receptacles wine bottles such as those from Rathfarnham Castle represent the typical vessels in which not only wine but all varieties of liquid – alcoholic and non-alcoholic were kept in the household (Willmot 2010, 12). The earlier shaft and globe, onion and mallet bottles were designed to hold wine in an upright position – the later parallel straight sided bottles were so designed for the storing of the bottles horizontally so that the liquid therein would keep the cork moist enough to keep it tight and in place. This latter was a more effi-



12



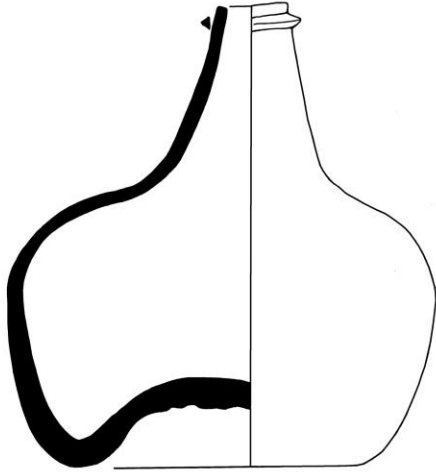
13



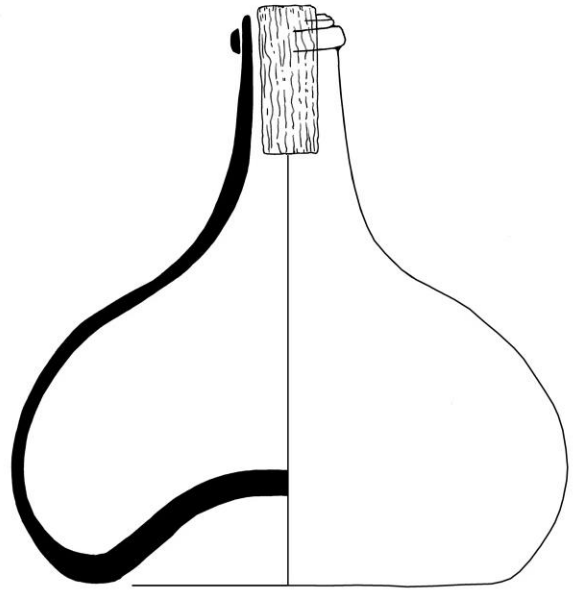
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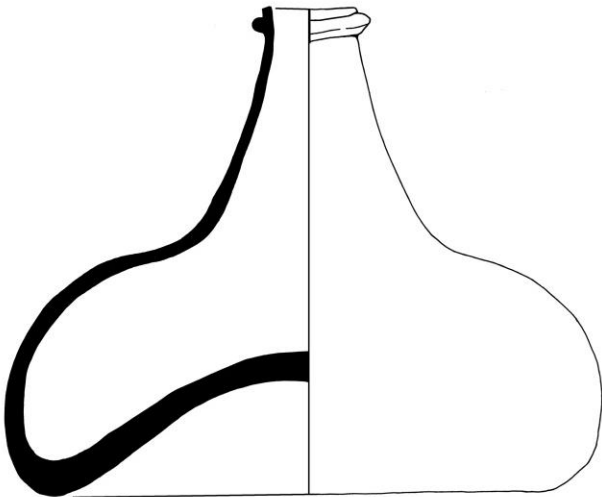
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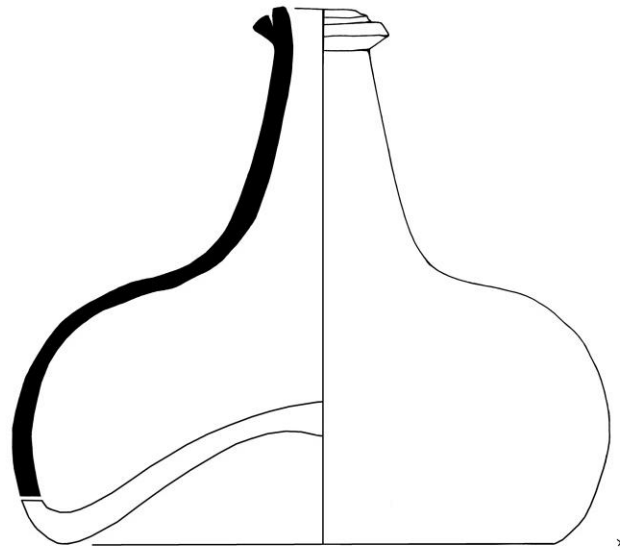
6:3101



2:310



7:348



6:3102

AMG 116

6:3101
c.1710-1720
Dark green glass
Complete
Onion shape
Kick base
Wine bottle

2:310
c.1690-1720
Dark green glass
Semi-complete
Classic onion shape
Wine bottle
Cork intact

7:348
c.1690-1720
Dark green glass
Semi-complete
Classic onion shape
High string rim, stout neck
Wine bottle

6:3102
c.1690-1720
Dark green glass
Semi-complete
Classic onion shape
High string rim, stout neck
Wine bottle



cient way to store bottles *en masse* in an age when the storing of wine in casks was becoming less fashionable. In contrast the earlier upstanding bottles relied on their string rims as leverage to ensure the fit of their respective corks.



22



23

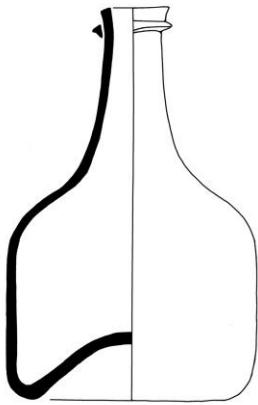


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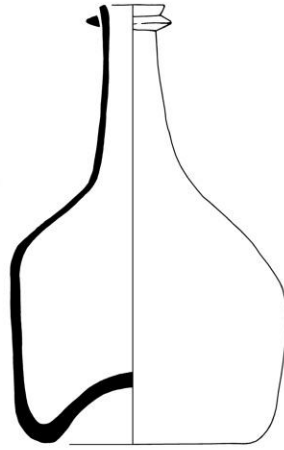


25

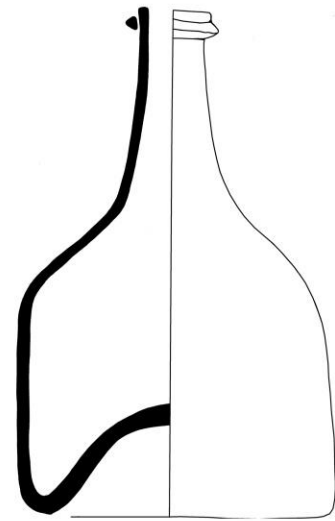
Right from top: 16, 17, 20, 27



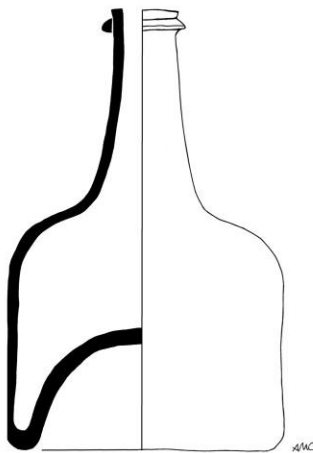
7:353



7:351



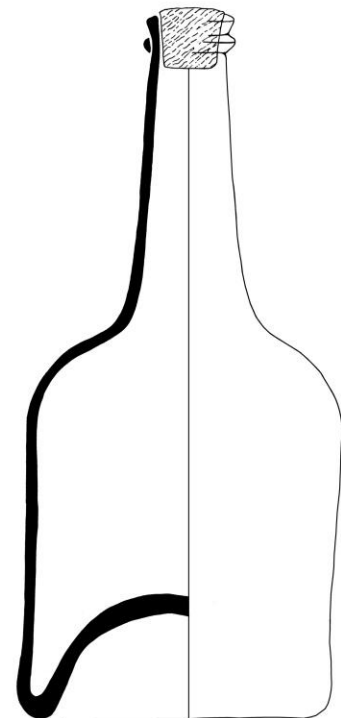
7:352



4:313



7:357



7:356

7:353
c.1720-35
Dark green glass
Complete
Small mallet shape
Kick base
Cork intact
Wine bottle

7:351
c.1720-35
Dark green glass
Complete
Small mallet shape
Kick base
Wine bottle

7:352
c.1720-1730
Dark green colour
Complete
Small mallet
Kick base
Wine bottle

4:313
c.1720-1740
Dark green colour
Complete
Small mallet
Kick base
Wine bottle

7:357
c.1730-1740
Dark green colour
Complete
Mallet shape
Cork intact
Kick base
Wine bottle

7:356
c.1730-1740
Dark green colour
Complete
Mallet shape
Cork intact
Kick base
Wine bottle



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Right from top: 28, 29, 30, 31



32

33

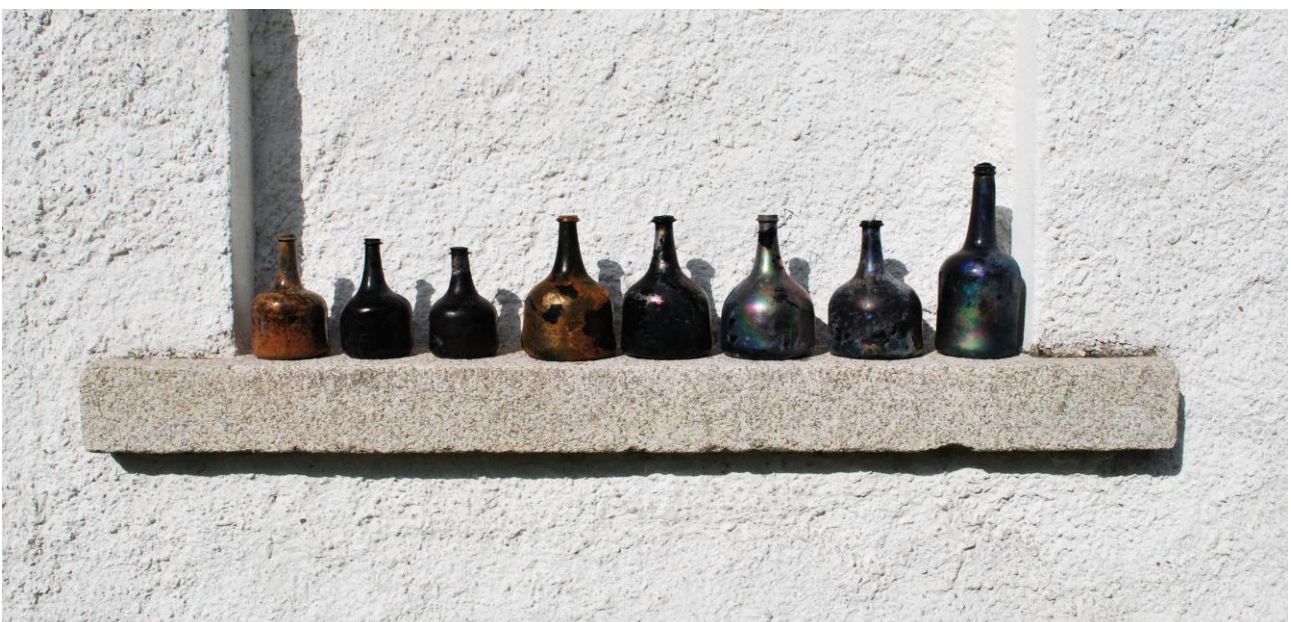
Glass bottles C7 in situ



ExcavNo	Context	ItemNo	Description	Sherds	Photo	Notes
E4468	1	16-27	Dark coloured bottle glass, 18 th or 19 th century straight-sided bottles	12	22	Late bottles c.1820-1860 generally except 1 lips/neck c.1690-1710
E4468	2	130	Semi-complete dark-coloured glass bottle, onion shape	1		Onion c.1690-1720
E4468	2	131-149	Dark-coloured glass bottle sherds	19		1 x neck c.1710-1740, 1 x base c.1710-1730
E4468	3	102-106	Bottle glass fragments	5		1 x base shard c.1660-90
E4468	3	141-143	Bottle glass fragments	3		Too fragmentary to be of any diagnostic value
E4468	4	312	Complete dark-coloured glass bottle, squat with straight sides	1	20	Early mallet c.1720-1740
E4468	4	313	Complete dark-coloured glass bottle, squat with straight sides	1	31,32	Small mallet c.1720-1740
E4468	4	314	Dark-coloured glass bottle, large fragment, stored in soil	1		Small onion type c.1690-1720
E4468	4	315	Dark-coloured glass bottle neck sherd	1		Cork is lodged at string rim flush protruding slightly from lips, neck c.1660-1690
E4468	4	318	Dark-coloured glass bottle shoulder sherd with seal 'AL 1688', in two refitting frags.	1	12	Probably from same AL stamp as others of the type
E4468	4	319	Dark-coloured glass bottle shoulder sherd with seal 'AL 1688', in two refitting frags.	1	7, 9	Typically base indicates a 1660-1690 date range but examples from the 1680's are known (Dumbrell p. 60)
E4468	4	320	Dark-coloured glass bottle base sherd	1		Base c.1700-1720
E4468	4	321-33	Dark-coloured glass bottle sherds	10		Neck c.1690-1720
E4468	4	331-341	Dark-coloured glass bottle sherds	11		3 x base shards c.1660-1690, 1 x neck c.1680-1730, 1 x neck probably c.1660-1690
E4468	4	342-349	Dark-coloured glass bottle sherds	8		1 x onion neck c.1690-1710 with a base of similar date - likely the same vessel
E4468	4	350	Pale thin bottle glass shard	1		Possible part of octagonal bottle - probably mid 18th century
E4468	6	3101	Complete dark-coloured glass bottle, small, onion-shape	1	27	Late onion bottle, quite small at 11.5 cm diameter c.1710-20
E4468	6	3102	Semi-complete dark-coloured glass bottle, small, onion-shape	1		Classic onion with high string rim and short stout neck = c.1690-1720
E4468	6	3103	Dark-coloured glass bottle base sherd	1		Onion base c.1700-1710
E4468	6	3104	Dark-coloured glass bottle base sherd	1		Base c.1690-1710
E4468	6	3105	Dark-coloured glass bottle base sherd	1		Base c.1690-1720
E4468	6	3106	Dark-coloured glass bottle base sherd, several fragments refitting, may also refit with 7:3727-9	1		Base shard is c.1710-20
E4468	6	3107	Semi complete (25%) dark-coloured glass bottle	2		Could be part of a single bottle - but not necessarily - the bottle could be of transitional type - between 'shaft and globe' and 'onion' types - c.1660-1690
E4468	6	3108	Dark-coloured glass bottle base sherd	1		Base c.1700-1720
E4468	6	3109	Dark-coloured glass bottle neck sherd, possibly early type	1		Neck c.1690-1710

ExcavNo	Context	ItemNo	Description	Sherds	Photo	Notes
E4468	6	3110	Dark-coloured glass bottle neck sherd, possibly early type	1		Neck c.1690-1710
E4468	6	3111	Dark-coloured glass bottle shoulder sherd with stamp 'AL 1688', large sherd of onion bottle	1	13	Shaft and globe type body typical of 1660-80 but not unknown in 1680's
E4468	6	3112	Dark-coloured glass bottle small sherd with part of seal 'AL 1688'	1	15	Nothing diagnostic except seal but likely stamped by the same engraved surface which marked the other AL bottles
E4468	6	3113	Dark-coloured glass bottle sherd with part of seal depicting a bird in a nest	1	14	c.1680-1720 shoulder - perhaps a tavern mark/seal?
E4468	6	3114	Dark-coloured glass bottle seal, onion-shape	1		Body/base shard - transitional type c.1660-90?
E4468	6	3115	Dark-coloured glass bottle base sherd	1		BS with shallow wide kick up of prob c.1700-10
E4468	6	3116	Semi-complete (80%) dark-coloured glass bottle, onion-shape	1		Onion body with string rim 5mm below lip c.1690-1720
E4468	6	3117	Semi complete (15%) dark-coloured glass bottle, squat with straight sides	1		A light coloured early mallet c.1725-1735
E4468	6	3118	Dark-coloured glass bottle neck sherd	1		Neck c.1670-1690
E4468	6	3119-3121	Dark-coloured glass bottle base sherds	3		All 3 bases are c.1690-1720,
E4468	6	3122-3126	Dark-coloured glass bottle sherds	5	5	1 x base shard c.1660-90 - another base shard c.1680-90, also present a neck shard of c.1660-1680 type and another c.1690-1720
E4468	6	3127-3259	Dark-coloured glass bottle sherds	133		Nothing diagnostic
E4468	6	3260-3359	Dark-coloured glass bottle sherds	100		Nothing diagnostic
E4468	6	3360-3459	Dark-coloured glass bottle sherds	100		Nothing diagnostic
E4468	6	3460-3482	Dark-coloured glass bottle sherds	23		1 x neck c.1660-1690, 1 x neck c.1680-1730, 1 x base c.1660-90, 1 x base too fragmentary to make a worthwhile reading
E4468	6	3483-3494	Dark-coloured glass bottle sherds	12		3 x necks - all c.1690-1720, 3 x bases c.1680-1710
E4468	6	3495-3500-	Dark-coloured glass bottle sherds	6	3	A base shard here could be as early as c.1630-1660, five pieces other sherds include 2 x necks - one of which bears lips and a string rim typical of onion bottles c. 1690-1720 - another neck and another base being less diagnostic but probably dating to approximately the same latter period
E4468	6	3727-3728	Dark-coloured glass bottle neck sherds	2		Necks x 2 c.1690-1710
E4468	6	3729	Dark-coloured glass bottle neck sherd with cork	1		Onion neck c.1690-1710
E4468	6	N/a	Dark-coloured glass bottle shards	27		2 x base shards c.1680
E4468	6	8202-8204	Pale thin glass	3		Too fragmentary to be of any diagnostic value
E4468	7	348	Complete dark-coloured glass bottle, onion-shape	1	26	Classic onion with high string rim and short stout neck = c.1690-1720
E4468	7	349	Complete dark-coloured glass bottle, squat with straight sides	1	30	Small early mallet 1720-35

ExcavNo	Context	ItemNo	Description	Sherds	Photo	Notes
E4468	7	350	Complete dark-coloured glass bottle, squat with straight sides, metal wire around neck	1	16	Early mallet c.1720-1735
E4468	7	351	Complete dark-coloured glass bottle, squat with straight sides, small	1	28	Small early mallet 1720-35
E4468	7	352	Complete dark-coloured glass bottle, squat with straight sides	1	17	Early mallet c.1720-1730
E4468	7	353	Complete dark-coloured glass bottle, squat with straight sides, small, with cork and liquid	1	29	Small early mallet 1720-35
E4468	7	354	Complete dark-coloured glass bottle, squat with straight sides	1	33, 32	Mallet c.1720-40
E4468	7	355	Shard of dark-coloured glass bottle, squat with straight sides	1		Mallet c.1720-1730
E4468	7	356	Complete dark-coloured glass bottle, squat with straight sides, with cork	1	1, 2	Mallet c.1730-1740
E4468	7	357	Semi-complete dark-coloured glass bottle, squat with straight sides, stored in soil	1		Mallet bottle c.1730-1740
E4468	7	358	Base sherd of dark-coloured glass bottle, squat with straight sides, small	1		Base sherd = late onion or early mallet = c.1710-1730
E4468	7	359-405	Dark-coloured glass bottle sherds	47		1 x neck c.1680-1730, 1 x neck c.1700-1730, 3 x base fragments c.1720-1730
E4468	8	3-4	Bottle glass fragments	2		Nothing diagnostic
E4468	8	5-8	Bottle glass fragments	4		Nothing diagnostic
E4468	9	166-167	Bottle glass fragments	2		Body shard c.1660-1730...
E4468	10	14-31	Bottle glass fragments	18	24	1 x base shard c.1690-1720, another 3 shards fit to make a single base c.1700-30, 2 x neck/lips c.1690-1720



Glass phials and scent bottles

Antoine Giacometti

Illustrations by Alva Mac Gowan

The glass phial assemblage from Rathfarnham Castle comprises 504 sherds of glass representing at least 35 apothecary phials. Most of these are standard blue-green alkali glass cylindrical or globular phials dating to the 17th to 18th centuries. Two phials are more unusual: one is a small faceted clear glass scent bottle, and the other is a clear glass moulded phial or flask, possibly also a scent bottle.

Apothecary phials – dating

Apothecary phials and small medicinal bottles have been produced in England from Roman times. The type of blown alkali glass phials at Rathfarnham were produced in northern Europe from the 15th century onwards. These phials were manufactured from potash or soda glass. Differentiation between these is difficult without chemical testing so the general term alkali glass is used.

Dating apothecary phials is difficult, as the forms and method of manufacture of them did not change significantly from the 15th to the 18th century. 15th and 16th century phials found in England tend to be very similar, though much rarer, than the more common 17th and 18th century phials. These northern



Complete phial 6:4477

European-style phials tend to have flared rims and are sometimes footed.

During the 17th century a distinctive English style of phial emerged: the small cylindrical greenish-hued alkali glass bottles with high pontil kicks, rounded shoulders, short necks and flattened horizontal lips which continued to be mass produced through the 18th century. From the 17th century there is great variety in phial form (flared mouth, cylindrical, globular, globe and shaft, etc.) and in colour (which ranges from pale to dark; olive green to aqua green to

Phials	Number of frags	MNV
Phial – complete	1	1
Phial base – basic	26	26
Phial base – narrower	6	6
Phial rim – flattened (rounded shoulder)	6	6*
Phial rim – flattened (square shoulder)	7	6*
Phial rim – flattened (indeterminate)	6	6*
Phial rim – flared	6	6*
Phial rim – vertical	4	4*
Phial body sherd	436	-
Scent bottle	5	2
Total	504	35*

*MNV Total = 1 complete phial + 2 scent bottles + 32 phial bases 51% min)

blue). By the 18th century clear glass phials become more common, the pontil kick becomes less pointed and lower, and a higher proportion of cylindrical square-shouldered phials are made. 17th century phials are considered to be less standardised and cruder than 18th century phials, however in practice 18th century phial assemblages display little standardisation and have all of the delicateness of their 17th century counterparts (Sygrave 2009). By the end of the 18th century more complex forms emerge (Noel Hume 1969, 74075 & Fig 17).

Dating an individual phial is very difficult, but dating a large assemblage such as this one at Rathfarnham can be assisted by reference to comparable assemblages excavated at other sites. Some good examples are a large assemblage of glass phials from Cannon Street, London, dating to the late 17th century (Schofield & Maloney 1998, 247) and another from a pit at 16 Tunsgate, Guildford, dating to 1650-1714 (Fryer and Shelly 1997, 193), and a large assemblage of apothecary phials from the first half of the 18th century cess pit at 19-31 Moorgate, London (Sygrave 2009). The phials from the late 17th century contexts at Cannon Street and Guildford are all in blue-green or greenish glass and have more rounded bodies with sloping shoulders, whereas the 18th century phials from Moorgate have straight-sided, cylindrical bodies and are mostly clear glass (twice as many clear phials as green phials).

The Rathfarnham assemblage contains twice as many phials with sloping shoulders than with straight shoulders, and most the phial glass is green or blue. They are larger in size and more varied than the Moorgate assemblage. Overall, the Rathfarnham phials are likely to be earlier in date than the 18th century Moorgate assemblage. A date range of mid-17th century to early 18th century seems appropriate.

Apothecary phials – function

Sygrave (2009, 101) describes the varied contents of these medicinal phials. ‘... larger phials and bottles being used for juleps, diluted mixtures and flavoured waters, whilst smaller ones were used for draughts and drops (Crellin &

Scott 1970, 150). Phials were also used for powders and probably for pills too.’

‘A shop in Shrewsbury in 1706-7 is recorded as selling various draughts, mixtures and ointments, but also (amongst other things) oils, gums and resins, cochineal, isinglass, musk, spices, soap, oil of lavender, sago, invalid food, gold and silver leaf, chemicals (arsenic, borax, saltpetre), pigments (vermilion, carmine, umber, Dutch pink), brushes, varnish and pencils (Burnby 1983, 20). Pigments were commonly sold at 18th-century pharmacies as shown by research into the fittings from an 18th-century pharmacy at Winchester (Lewis & Boorman 1990). These pigments were sold as artists’ materials for watercolour or oil paints, for house painting and decorating, as well as being used by the druggists to tint their liquid preparations (ibid). In records of 1711-34, Thomas Bott of Coventry was recorded as selling groceries such as raisins, starch, coffee, jam, biscuits and spices, as well as medicines (ibid, 20-1)’ (Sygrave 2009, 103).

The Rathfarnham glass phials would have been suitable for a wide variety of draughts and drops, but their tight rims means that salves and ointments, pills and dried goods were unlikely to be stored within them. For these items, the small yellow ceramic pots and tin-glazed drug jars would have been more practical, and these should be seen as part of the apothecary assemblage (Sygrave 2009, 99). Seagrave also points out that wine bottles could have held apothecary mixtures (ibid).

Comparable Irish material

61 glass phial fragments from the 17th and 18th century, a complete jar, and a 16th century salve pot were identified from Smithfield in Dublin (Rajic 2006, in Franc Myles 00E272). 17 fragments of apothecary phials dating from the 16th to 18th centuries were identified at New Street, Dublin (Rajic 2006, in Giacometti 04E1286). 21 sherds of Apothecary phials, flasks or pharmaceutical bottles were identified at the Timberyard Dublin 8 (Ni Cheallaigh 2007, in Giacometti 06E710). Seven of these were fragments of small straight-sided vessels

of clear to pale blue glass, with high pointed kick ups, short narrow necks and flattened everted rims similar to the Rathfarnham Castle assemblage. 19 18th century phial fragments were identified from Ardee Street (Forsman 2005, in Franc Myles 03E315).

Catologue of Phials

Complete phial

A single complete phial 6:4477 was recovered. This was a small globular green-glass phial with intact cork, a kicked base, round shoulders, short neck and flattened everted rim, typical of the Rathfarnham Castle phials. This phial contained a liquid residue currently being examined by Jessica Smyth in Bristol University.

Phials base – basic

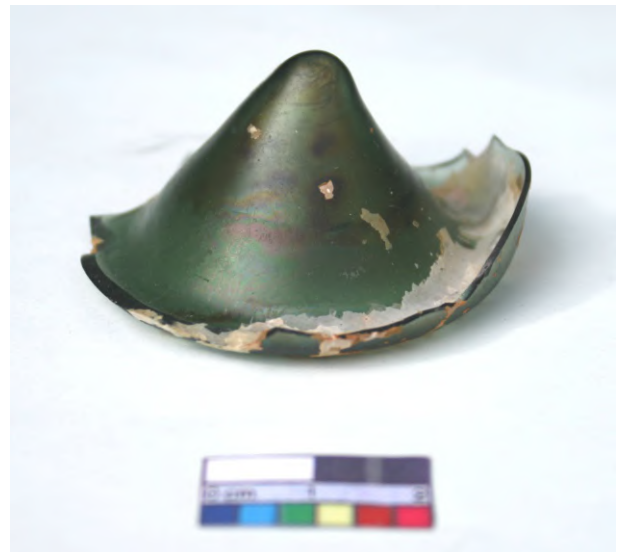
These phial bases are of alkali glass with high pushed-in bases and pointed kicks (except 7:408 which as a rounded kick). The glass of all fragments is very thin with frequent bubbles and green in colour, except for 6:3765 which is blue. Base size ranges from 36.8mm to 84mm in diameter. There is no consistency in kick shape or height, or in base diameter. 26 fragments survive at 51% or more of diameter making them the most common base form in the phial assemblage. In addition the complete phial has a base of this type.

The bases do not have enough body surviving to establish if they are straight-sided or globular, however the small amount of body present on the sherds suggests sides were straight rather than globular in most cases. One sherd, however (6:3765) may belong to the rim sherd 7:412 and be a globular phial. Interestingly this is the only blue glass base of this base type. In phial base 12:23, the pushed-in base appears to have sunk downwards. This may be a manufacturing error.

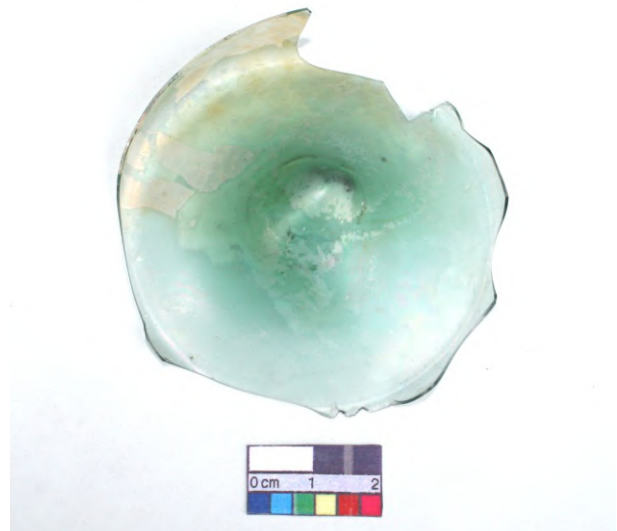
Most of these phials would have been squat with rounded shoulders (some may have had square shoulders), a short neck, and an everted flattened rim, as in the complete example.

Base fragments 51%+ complete

2:166, 2:167, 4:350, 4:351, 6:3760-3766, 6:3769, 6:3772, 6:3773, 6:3774, 6:3776-3779, 6:4214, 7:408, 7:409, 7:414, 7:3085, 8:10, 12:23



Typical basic phial base shape and colour, this is 6:3766



Variation of basic base, 6:3765. This one is slightly bluer, very thin and broad, and may be globular, perhaps part of rim 7:412 (flaring, round shouldered)



Variation on basic base 12:23; kick has sunk downwards

Phial base - basic

6:3765

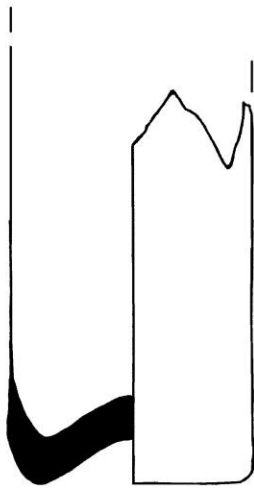


12:23

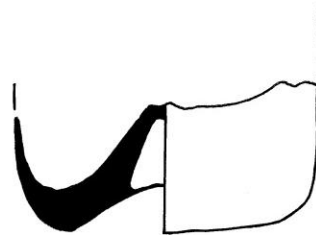


6:3775

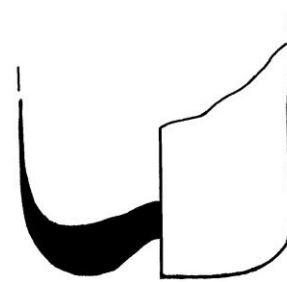
Phial base - narrower



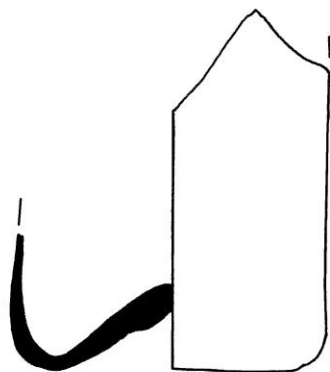
4:353



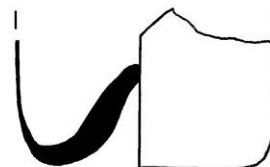
6:771



6:3768



4:352





Top and bottom: narrower bases, from left 4:352, 6:3767, 6:3771, 6:3775, 6:3768 & 4:353

Phial base – narrower

Six of the phial bases were slightly different from the basic form described above. These are of alkali glass but have smaller push-in bases and more rounded kicks than the basic type. The glass is slightly thicker than the basic base type (1.2-1.3mm, but 4:353 is 2.7mm), with frequent bubbles and varies from blue to bluish-green and greenish-blue or or clear in colour. This contrasts with the basic green coloured bases described above. They are also smaller in diameter and more consistent than the basic type, measuring 34-42mm in diameter.

The push-in these base fragments is much smaller than in the basic base type, most likely to provide additional stability to the narrower bottle. The glass on the base also appears slightly thicker. In two cases enough body glass survives to suggest these were taller than the basic base.

The rim shapes of these phial base fragments is not known, as they do not match any of the known rims, with the exception of 6:3768 which may be from a vessel with square shoulder, short neck and flattened everted rim.

4:352

Blue-green alkali glass phial base. Narrow push-in with medium pointed kick. Straight sides. Diam 34.86mm; Thickness 1.24mm

6:3767

Discoloured blue-green alkali glass phial base. Shallow narrow push-in with low pointed kick. Straight sides. Diam 34.03mm; Thickness 1.24mm

6:3771

Discoloured greenish-blue alkali glass phial base. Shallow narrow push-in with low rounded kick. Straight sides. Diam 37.79mm; Thickness 1.23mm

6:3775

Blue alkali glass phial base. Shallow narrow push-in with low pointed kick. Straight sides rising to min 58.75mm. Diam 34.36mm; Thickness 1.25mm





Phial rims with flattened rims and round shoulders, from left: 6: 3740, 6:3741, 6:3744, 6:3780, 7:410

6:3768

Blue alkali glass phial base. Shallow narrow push-in with low pointed kick. Straight sides rising to min 46.30mm. Diam 41.95mm; Thickness 1.25mm. May be from same phial as 3:107 (flattened rim).

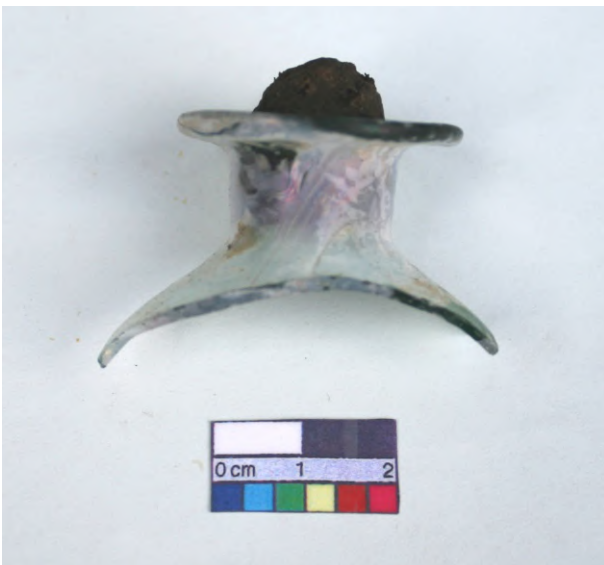
4:353

Clear alkali glass phial base. Shallow narrow push-in with high pointed kick. Glass noticeably thicker than in other phials. Diam 40.80mm; Thickness 2.45mm

Phial rim – flattened; rounded shoulder

These phial rim fragments have rounded shoulders, a short neck (7-13mm), and an everted flattened rim. They are of alkali glass. The glass of all fragments is very thin with frequent bubbles and pale green or dark green in colour. Internal rim size ranges from 11.6mm to 12.6mm in diameter. Phial rim diameters are thus consistently larger than those from square-

Phial with cork stopper 6:3732



shouldered phials. 6 of these rims are present in the assemblage. One of these (6:3732) has an in situ cork stopper measuring L 20mm; D (min) 11mm; D max 14mm. In addition the complete phial has a rim of this type. This sort of phial rim is a common late 17th century type, for example at Newgate Street, London, similar phials were found and dated to 1675-1719 (Watson & Pearce 2010, 193 & Fig. 15:5–7).

Phial rims with flattened rims and round shoulders

3:3732, 6: 3740, 6:3741, 6:3744, 6:3780, 7:410

Phial rim – flattened; squared shoulder

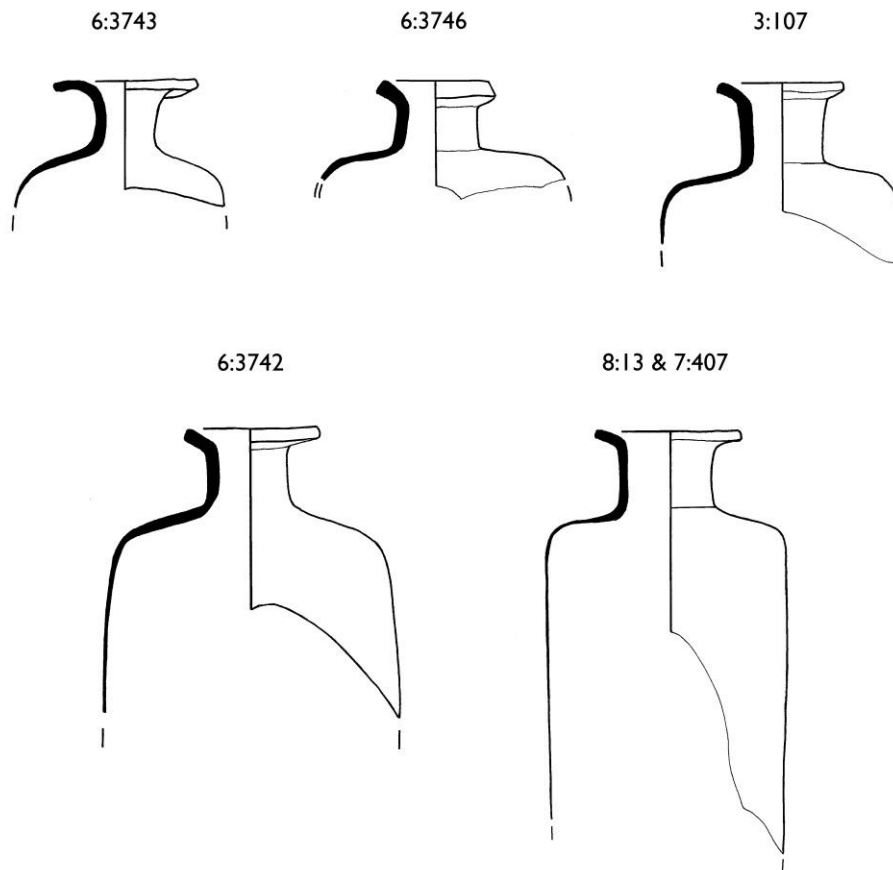
These phial rim fragments have squared shoulders, a short neck, and an everted flattened rim. They are of alkali glass. The glass of all fragments is very thin with frequent bubbles and vary in colour from blue to green (3 of each). Rim diameter ranges from 7.6mm to 11mm in diameter, which is smaller than the round-shouldered phials. 6 of these rims are present in the assemblage.

Phial rims with flattened rims and square shoulders

3:107, 6:3742, 6:3743, 6:3745, 6:3746, 7:407 & 8:13 (refit)

Phial rim – flattened; unidentified shoulder

Six phial rim fragments with flattened everted rims did not have enough shoulder fragment surviving to assign it to one of the above two types. They could probably be assigned based on rim diameter. Overall, phials with flattened



Phial rim - flattened; square shoulder



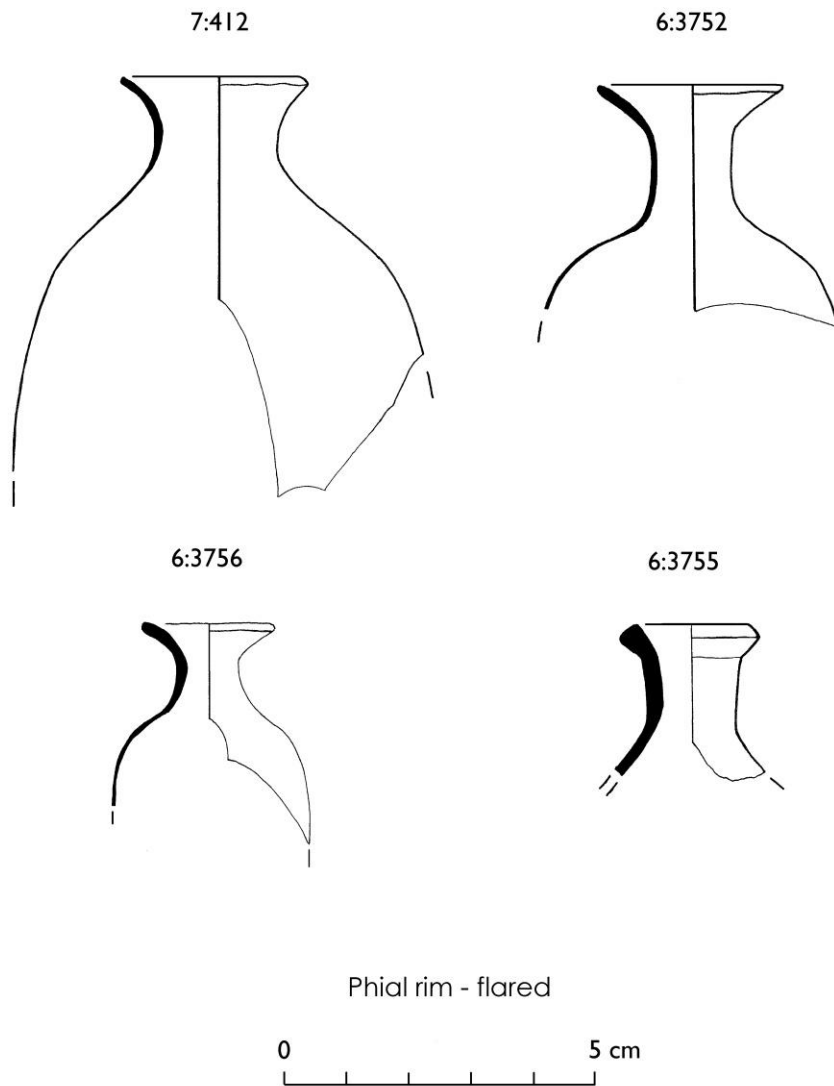
Phials, illustration by Alva Mac Gowan

rim and rounded or squared shoulders are the most common form of rim in the phial assemblage, making up 18 out of 28 phial rim fragments (64%).

Flattened rim
6:3747-3751, 7:411, 8:11



Phial rims with square shoulders. Top row: 3:107, 6:3742, 6:3743. Bottom row: 6:3745, 6:3746, 7:407



Phials, illustration by Alva Mac Gowan

Phial rim – flared

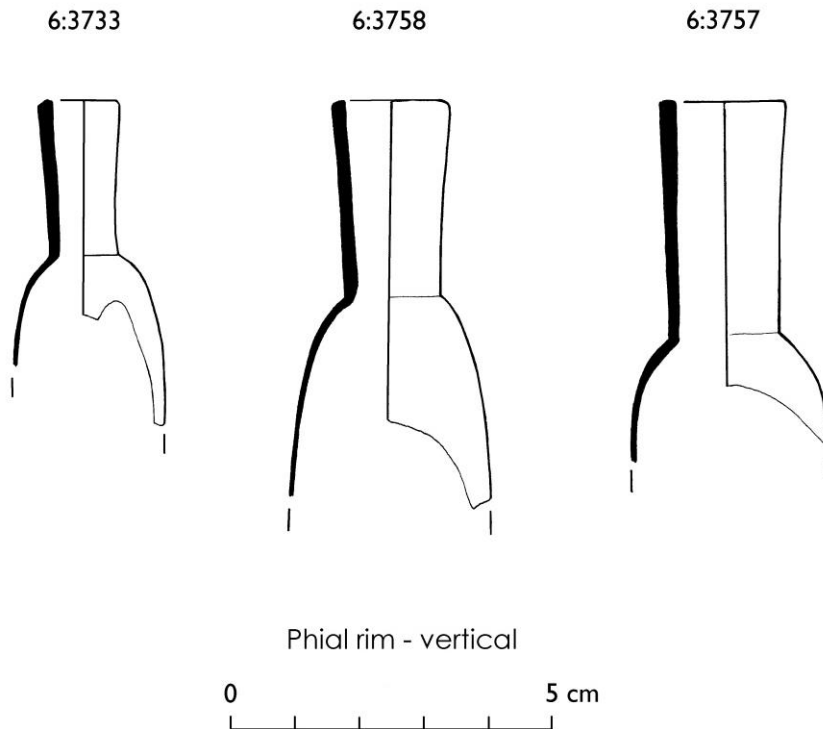
These phial rim fragments have rounded shoulders, a short neck, and an everted flaring rim. They are of alkali glass. The glass of all fragments is very thin with frequent bubbles and are blue in colour or heavily discoloured. Rim diameter ranges from 10mm to 16.5mm in diameter. In terms of rim diameter, this class of rim has a great deal in common with the round-shouldered flattened rims, however they tend towards being blue in glass rather than green. 6 of these rims are present in the assemblage.

Sherd 7:412 is particularly fine, and may be part of the same vessel as phial base 6:3765.

Phial rims with square shoulders
6:3752-3756, 7:412

Phial rims with flaring rims. Top row: 6:3752, 6:3753, 6:3754.
Bottom row: 6:3755, 6:3756, 7:412





Phials, illustration by Alva Mac Gowan

Phial rim - vertical

These phials rims have tall tapering necks ending in a thickened straight rim. They are identical to one found at Newgate Street, London, dated to 1675-1719 (Watson & Pearce 2010, 187 & Fig 14).

6:3757

Blue alkali glass phial rim. Near vertical neck with plain thick rim, rounded shoulders and straight sides. Internal diam at rim 14.94mm; Length of neck: 36.67mm; Thickness (at rim) 3.11mm; Thickness (body) 1.36mm

6:3758

Green alkali glass phial rim. Near vertical neck with plain thick rim, rounded shoulders and straight sides. Internal diam at rim:13.4mm; Length of neck: 29.83mm; Thickness (at rim) 2.42mm; Thickness (body) 1.19mm

6:3758

Discoloured alkali glass phial rim fragment. Thickened rim possibly inwardly folded. Internal diam at rim c. 16.4mm (frag only); Thickness (at rim) 2.61mm

6:3733

Blue alkali glass phial rim. Near vertical neck with plain thick rim, rounded shoulders and straight sides. Internal diam at rim 9.75mm; Length of neck: 25.31mm; Thickness (at rim) 2.55mm; Thickness (body) 0.95mm

Vertical rim phials. From left: 6:3757, 6:3758, 6:3733



Phial Body fragments

436 body sherds of alkali glass, mostly green with many bubbles, from phials. These included numerous small broken sherds of rim and base. No attempt was made to refit the sherds, but undoubtedly additional bases could be refitted bringing up the MNV of the assemblage to c. 40 phials.

Body sherds

2:169-177, 2:654-662, 3:108-124, 4:354, 6:3696-3699; 6:3770, 6:3782-4150, 7:413-415, 8:12, 8:14-18

Scent bottles

The first alcohol-based (as opposed to oil- or fat-based) perfumes are documented in the early 14th century (Attard 2011). Throughout the 16th century Venice was the centre of trade for perfumes, some imported in the form of aromatic gums or spices from the east, others made in Venetian perfumeries such as the Dominican perfumery in Santa Maria Novella (ibid). In the 17th century the fashion for perfume spread through northwest Europe. Henry VIII used perfume and his son Edward VI is known to have created his own scent. Queen Elizabeth too was fond of luxury and fine dress, and appreciated fine perfumes. Perfume making became a hobby amongst the aristocracy and a number of monarchs including Charles II of England, Louis XIII and Louis XIV in France are known to have been great patrons of the art of perfume making (ibid). As well as being used to smell pleasant, perfumes were also valued for their supposed medicinal qualities and for warding off disease and infection (ibid).

During the sixteenth century pomanders and scent boxes were more commonly found than perfume flasks containing liquid scent (Attard 2011). Scent bottles were made in Venice during the 16th and 17th centuries (Roche 2007, 416). From the late 17th century moulded scent bottles were produced in France, and by the 18th century in England (Roche 2007, 416). Although these scent bottles were most commonly made of glass, a wide range of other material were also used and by the 17th century the vessels became as precious as the scent they contained (Attard 2011).

7:406 Scent bottle

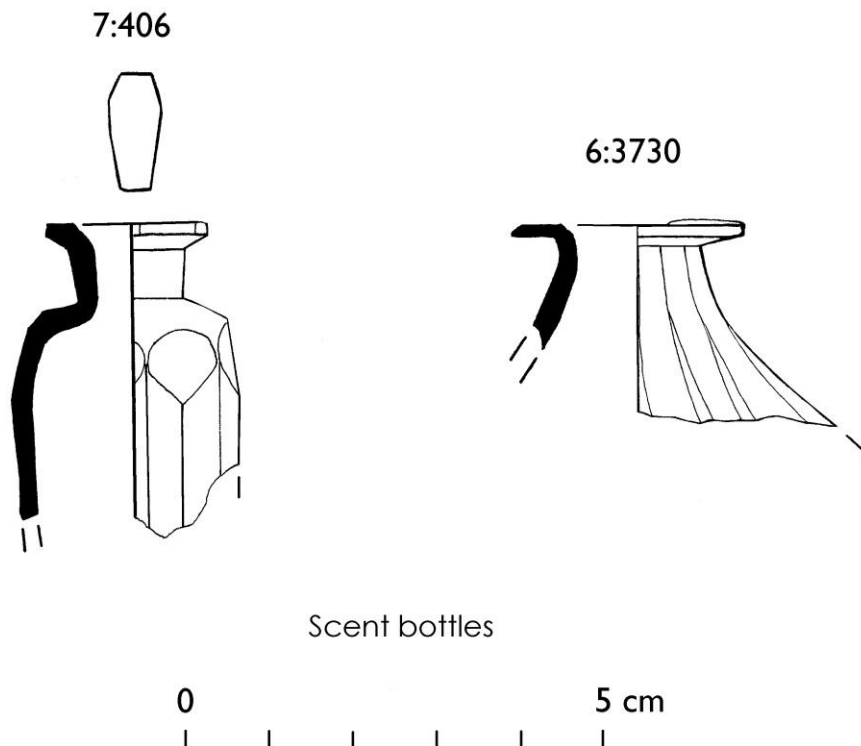
Small whitish clear glass bottle with everted flattened rim, short neck, square shoulder and inwardly tapering body, base missing. Metal is cloudy clear glass without bubbles of a completely different type than any of the rest of the Rathfarnham glass assemblage. It feels almost past-like in consistency, and is very thick (2.56mm). Possibly mold-made rather than blown? Rim in octagon form. Body faceted in complex octagon form. L 33.12m Rim diameter c. 7.3mm (frag). This may be a fancy perfume bottle.

6:3731 scent bottle stopper

Small whitish clear glass bottle-stopper with faceted top. Similar sort of strange cloudy glass as perfume bottle 7:406 and may be from it. Certainly the stopper is the perfect size for this small phial. L 14.25mm Diam (top) 7.58; Diam (base) 5.18mm



7:406 and 6:3731 showing detail of rim and faceting

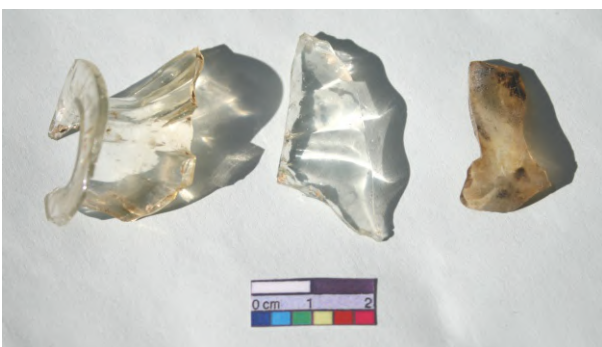


Scent bottles, illustration by Alva Mac Gowan

Scent bottle with vertical ribbing

Three small fragments show similar vertical ribbing on the internal and external parts of the vessel, and may be from the same small vessel. If so, the possible basal sherd (4:380) would appear to indicate a small flask rather than an upright vial. The vessel may have a similar form to a small oval bottle with mould-blown vertical ribbing and narrow rim in the Museum of London (SM.7:100; NN23916) which is dated to 1501-1800.

From left to right: 6:3730, 6:4346, 4:380



6:3730 scent bottle?

Rim sherd of unidentified clear glass with yellowish hue, flattened everted rim (Internal diam 11.8mm), very short neck and gently sloping shoulders, body min 1.85mm thick, moulded with vertical ribbing in both inside and outside.

6:4346 scent bottle?

Body sherd of unidentified clear glass, body min 1.85mm thick, moulded with vertical ribbing in both inside and outside.

4:380 scent bottle?

Curving sherd of unidentified clear glass with yellowish hue, possibly from near the base of a small unidentified vessel, body min 1.87mm thick, moulded with possible vertical ribbing in both inside and outside.

References (phials)

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Watson, Sadie & Pearce, Jacqueline 2010 'Taverns and other entertainments in the City of London? Seventeenth- and 18th-century finds from excavations at Paternoster Square', with Anne Davis, Geoff Egan and Alan Pipe. *Post-Medieval Archaeology* **44/1** 172-208.

Willmott, Hugh (undated) *The Post-Medieval Vessel Glass Number One Poultry, London*. Site code: ONE94. Museum of London Archaeology



glass bottle with vertical ribbing and narrow rim in the Museum of London (SM.7:100; NN23916)

Glass ornaments and beads



JUDITH
CARROLL
& COMPANY

Judith Carroll

Photographs by Alva Mac Gowan, Archaeology Plan

Introduction

This report presents the results of a study of beads and ornamental glass found in Rathfarnham Castle during archaeological excavation by Archaeology Plan during in the basement area of the castle in summer, 2014. The report was requested by Antoine Giacometti, Archaeology Plan.

A large amount of pottery, glass vessels and other artefacts were recovered from a drainage area in the basement that appeared to have been covered over in the 18th century. Among the finds, a substantial quantity of small colourful, decorative, glass finds came to light. There were 29 pieces. Apart from five glass beads, these comprised unidentified fragmentary glass objects which did not seem to relate to each other and could not be compared in the Irish archaeological record. There was a small humanoid torso fragment, a minute headless animal, part of a tiny bird, fragmentary glass rods and clear hollow tubes, a piece of glass that looked like spectacle glass, some small pieces resembling fruit and foliage, thin glass rings and rods, as well as tiny and fragile discs of glass filigree and a perfect miniature glass sword.

Much of the material was taken to be broken glass jewellery or scientific equipment at first, but on investigation, all the glass pieces were found to have been manufactured in the glass lampworking tradition which developed and became popular outside Venice from the 16th century. They were closely comparable to material produced in France in the late 17th and 18th centuries.

Lampworking initially developed in north Italy in the late medieval period from east Mediterranean influences, but became widespread in

Europe between the 16th and 19th centuries. One development of this tradition was the manufacture of glass miniatures, typically either single figures representing characters or groups of figures in dioramas which were particularly popular in France in the 17th and 18th centuries. Apart from the glass beads, several of the pieces were found to have close parallels in *verre de Nevers*, as the glass was termed after the town most famous for the production of the miniatures, Nevers, in the Loire Valley.

Under background, the techniques and origin of lampworking are briefly described, followed by a short general description of Nevers-style glass miniatures. Under description and comparative material, the Rathfarnham glass



7:497

2:183





1 Lampworking in the 18th century

2 Lampworking in the present day



miniatures are described and compared to Continental material. Glass beads are also described in this context. Discussion including relevant historical context and dating follows. Recommendations are given. Each piece is fully described in tabular form in Appendix 1.

Background

Methods of manufacture and origins

Lampworking is the technique of making and manipulating small glass objects by fusing them over lamps, small ovens or other sources of heat. While larger objects such as vessels require to be fused at high temperatures, small objects such as glass rods can be easily worked over a flame where they soften and become pliable like plastic. Chemical components in the glass mix can be used to reduce the temperature needed to fuse glass and to create various colours and opacity.

Rods of glass are typically created by being fused together and twisted round over heat, while delicate filigree is made by drawing out the molten glass and winding it into shapes before it cools. Tubes of glass can be blown into shapes to create small animals or birds, while animals can also be created by winding glass to create forms, with limbs pulled out from molten glass. Techniques of manufacture of Nevers-style glasswork are comprehensively described by Bellanger (2004, 51).

Beads, made by fusing together and drawing out coloured rods of glass, in methods akin to the millefiori technique, were mass-produced in Continental workshops, particularly from the 16th to the 18th century when they were used for trade in the New World.

The techniques of manufacture of colourful glass, using canes of glass and fusing and manipulating glass by hand at relatively low temperatures, originated in the ancient world and may have been used as early as the third millennium BC in the east Mediterranean (Tait 1991, 21).

‘Lampworking’, as it is called today, from its east Mediterranean origins, was used to create many

of the decorated glass beads found in Britain and Ireland in the prehistoric period. It was used extensively in the Roman world in delicate enameled glass vessels and millefiori. It was used into the early medieval period in Ireland, on the decorated cable beads and bangles of the period as well as the millefiori and intricate glass studs used to decorate metalwork. Though the tradition survived late in Ireland, it died out in the rest of Europe after the fall of Rome, though it would appear to have continued on in east Mediterranean regions where it had begun. In the late medieval period, through east Mediterranean trade connections, lampworking became closely associated with Venetian glassworkers who monopolized the luxury glass industry. They further developed the manufacture of soda glass and colourful decorative techniques. Intricate filigree, skillful cable-work and delicate enamel embellished their luxury glass vessels which became famous throughout Europe and were jealously guarded by the Venetians till the 16th century. Glassmaking in the Venetian style had begun to spread to neighboring countries by the 16th century. Elaborately enameled beakers and stemmed drinking glasses were made in the *Façon de Venise* in France by the mid-16th century (Page 2004, 166-169). Glass beads were an important element of the Venetian tradition and the production of lampworked beads for trade became closely associated with the Netherlands from the 16th century when colonization and European trade with the Americas and Africa opened a significant new market for them.

By the 17th century, lampworkers, most of them Italian were working not only in Italy and the Tyrol but in France, the Netherlands and Germany. Small human and animal figurines were probably made everywhere the art was practiced (Lanmon and Whitehouse 1993, 231) but by the 17th century, the glass figurines seem to have been produced in the greatest number in France (ibid, 232). Most surviving work is, however, attributed to workshops in Nevers, the Loire Valley in France and gave rise to the name *verre de Nevers* (ibid).

Nevers glass

Artisans from Altare, the glass producing region in northern Italy emigrated to Nevers in the late



3 Lampworking tools used today

4
Lampworking: shaping the glass object



16th century when Ludovico Gonzaga, Duke of Mantua, married Henrietta of Cleves (daughter of the Duke of Nevers) in 1566. *Emaillleurs*, who specialised in glass lampworking, were active in Nevers by the early 17th century if not before (ibid).

Figures of *verre de Nevers* also called *verre file* were made in many other places besides Nevers, however. Not only were there other glassworks in France as well as other European countries where lampworked objects were produced, but the glassworks at Nevers itself supplied raw materials in the form of glass tubes or rods of glass to glasshouses in many parts of France. Nevers factory account books for 1752-55 and 1762-66 list clients in Nevers, Orleans, Saumur, Paris, Saint Germain en Laye, Lisle, Adam and Clermont (ibid).



6 St. Margaret of Antioch

5 Nevers figurine of Louis XIV



7 Paradis showing a diorama complete with humans, animals, foliage and fruit

The figures are religious, mythological, allegorical, historical or anecdotal. There are two main types of 'product' from the glass workshops of the Loire valley and beyond, though there is much variation among these. The first is the single (or occasionally) double figure on a pedestal, often a saint or a mythological figure. A double figure could be Christ baptizing St. John the Baptist, for example (see Plate 20). The figures are often surrounded by foliage and typically hold objects such as a staff, a cross, a bunch of flowers, etc.

The second main glass product of Nevers and elsewhere in France was the diorama, typically a group of miniature glass figures acting out a religious, theatrical or mythological scene, for example, the story of St. Margaret of Antioch (Plate 6), the biblical 'Samaritan woman at the well' (Plate 19) or the drama of Renaud and Armide (Plate 29). Very often, the figures act out a story or play as in a theatre. Usually, the figures are accompanied by foliage, fruit, animals and birds of glass. Often set theatre-style in a box, the backdrop is very important. In the *Rétable du Théâtre de la Reine à Versailles* and Renaud and Armide theatre, (Plates 9 and 29), there is a focus on a glittering and highly ornamental background. Glass is not the only material used in the dioramas. Stone and shell are often used as well as feathers, while the boxes are constructed of wood or metal.

Description of the finds and comparative material

There were five complete glass beads and 24 pieces of ornamental glass, mainly in fragmentary form, from the 2014 excavations at Rathfarnham Castle. The ornamental glass items are parts of miniatures or decorative glass. In most cases, they can be compared to Nevers-style glass miniatures of the 17th and 18th centuries, mainly those forming parts of dioramas or relating to figurines.

The glass is described below in relation to comparative material by group. A full description of each object, with dimensions, in order of finds number can be found in Appendix 1. To avoid confusion with the comparative images of Nevers glass shown, the images of the Rathfarnham glass objects are outlined in red.

The anthropomorphic figure

E4468:7:506 was a small 'human' torso (Plates 8 & 10). Its head and limbs were broken off, apart from its upper right arm which was broken at the elbow but was flexed at this point. There are broken stumps of wings at the back of the figure (Plate 10). The remains of a band extending from its right shoulder to its left side at the waist shows that the figure wore a 'quiver' string in the classical style of Cupid, god of love, which this figure seems to represent (though such Cupid figures may have been merely decorative rather than relating to the theme/representation of the diorama). A tiny projection and discoloration at the hips also indicates another attachment such as a girdle or loin cloth. The figure (its colour was probably originally white) is very similar to the small white Cupids or ancillary figures, complete with quiver strings and loin cloths, holding torches above the main characters in the 18th century Nevers diorama *Rétable du Théâtre de la Reine à Versailles* (Plate 9), while another small white figure above the saint in the Saint Margaret of Antioch diorama (Plate 6) has the same quiver string and girdle (the Cupid obviously doubling as an angel).

The bow string attachment is very clumsily rendered on the back of the Rathfarnham figure (Plate 10), indicating that it was meant to be



10 & 11 7:506, a probable Cupid figure of dark, probably originally white, glass, is likely to have been displayed in a similar manner to the white glass Cupid-type figures above the balcony in the Nevers diorama below. Front (left) and back (right) views

8 7:504, a probable wing of the 'Cupid'



9 *Rétable du Théâtre de la Reine à Versailles*, Musée Municipal F. Blandin, Nevers, a diorama with glass figurines in a theatrical setting





16 A set of 17th century 'Four Seasons' from Nevers. The black glass 'accessories' may also have been white as indicated on a similar set (see Four Seasons web link in references). The black items from Rathfarnham above may, similarly, have been originally white.



12 An 'Autumn' figure of Nevers glass

13 7:501, a bunch of grapes from Rathfarnham



14 7:502, a black glass ring with probable grapes or berries attached from Rathfarnham

15 9:261, a black glass ring from Rathfarnham



shown on the front side only in a similar manner to the small figures above in Plates 6 and 9, while its size would also indicate that it was an ancillary figure. This suggests it was very probably part of a diorama.

E4468: 7:504, a small elongated object of filigree cable, grey-black in colour, but possibly originally white, wide at one end narrowing to a point, with a slightly concave shape created by a fold (Plate 11), is suggested to be part of the broken-off wing of the 'Cupid' figure (7:506).

The Four Seasons

A small black cluster of round glass shapes, E4468: 7: 501, 23mm in length, 16.5mm in maximum width (Plate 13), can be closely compared to the grapes attached to Four Seasons (Autumn) figures (Plates 12 & 16) from Nevers. To judge by the number of sets of Four Seasons figures of Nevers type found in an internet/literature search for this short study (many from well-known auctioneer's websites), these were an extremely popular product in the 17th/18th centuries. The Autumn figures (Plates 12 and 16) bear similar grapes. E4468: 7: 502, a fragment of similar berries (Fig. 15), attached to a black ring is closely similar to E4468: 7: 501. The object was almost certainly attached to a figure in the same manner as the ring on 'Autumn' on Plate 16. Another fragment of black glass ring E4468: 9: 261 (Plate 14) is very likely to be part of the same object.



19 Nevers diorama featuring the biblical theme of the Samaritan woman at the well



17 7:499

Zoomorphic figures

Tiny animals and birds, mainly in white glass, abound in Nevers style dioramas, e.g., the Samaritan woman at the well (Plate 19). E4468:7:497 is a small zoomorphic figure, 11mm in length by 13mm in height from paw/h hoof to top of neck, with a broken off head (Plate 18). It was made with white cable glass rods of glass which were drawn out when melted and wound around a rod to create the body of the animal which then had its limbs drawn out from fused glass. The animal is unidentified but would seem

to be a horse or a dog, probably a dog by its scale as principal human figures tend to be at least a few centimetres high.

The second zoomorphic figure (E4468:7:499, Plate 17) was a hollow piece of discoloured or off-white glass with two bird-like feet in black. This object was 11mm in length by 4.65mm – 7.5mm and was probably originally white. The figure was created by blowing a globule of glass through a narrow tube and has had its small legs/feet attached by heat fusion. It is most likely to be a bird or fowl of some sort and is

18 7:497





20 Nevers glass miniature diorama of Christ baptising John the Baptist

similar in particular to the blown glass fowl figures in Paradis above (Plate 7).



21 7:503, foliage rod

22 7:500, showing very similar shape of foliage to 7:503



23 7:503, from base of rod

Glass foliage

E4468: 7: 503 from Rathfarnham Castle was a rod of twisted white and brown (discoloured) cable glass with horizontally attached curvilinear filigree cable 'foliage' shapes, brown in colour. Foliage is an essential feature in most Nevers-type dioramas and trees, plants and flowers form a large part of many (see Plates 7, 19, 20). Straight glass rods typically represent trees and branches are very common. In Plate 22, a detail of Plate 19, the Samaritan Woman at the well shows that cable rods are used for trees – ditto in the Christ baptising John the Baptist (Plate 20). A flower shape in black filigree glass, E4468:7:500, is similar in shape to that of E4468:7:503. This may be floral or even belong to one of the Four Seasons (e.g. a headdress) but both pieces would certainly seem to have the same source of origin.

24 Detail of the foliage in the Samaritan woman diorama, showing similar types of rod to 7:503



Glass tubes

Five fragments of small glass tubes were found. Three were of clear glass and two of softer, cloudy glass. The three clear glass tubes appeared at first similar to industrial glass tubes and were thought perhaps to have been part of barometers or other scientific equipment, similar to glass found in a 17th century glasshouse at Goodman's Yard, London (Brain 2014, 7) or De Twee Rosen, Amsterdam (Hulst et al 2012, Fig. 11, 8).

However, the three clear glass tube fragments from Rathfarnham have very thick walls and only narrow interior openings (and thus would be unlikely to be containers of liquid), while one part of the two fragments of E4468: 4: 416 clearly contains white enamel within (Plate 25). E4468: 6:4462 (Plate 26) also contains a white chalky substance which may also have been enamel or could be some other decayed substance, e.g. metal. These glass tubes are very similar to glass tubes which are used as a background in the 17th century Nevers diorama of the story of Renaud and Armide (Plate 29), where the heroine, Renaud, is saved from the clutches of evil magician, Armide, by a Danish knight. The glass tubes in this diorama are filled with small shells, probable tiny glass beads and a metallic substance that we would probably, in the present day, term 'glitter'.

E4468: 6:4462 (above) is very similar to the above tubes. In addition, it has long shallow chip on the back of the tube would be consistent with a sharp knock detaching it from another surface (possibly a metal backing).

The two narrower tubes of cloudy glass, one of which is uneven in diameter and has a slight projection (E4468:6:4461, Plate 27), the other (E4468:4:417, Plate 28) are composed on canes of glass. Very narrow and fragile, they are more typical of stems of foliage and trunks of trees in such dioramas.

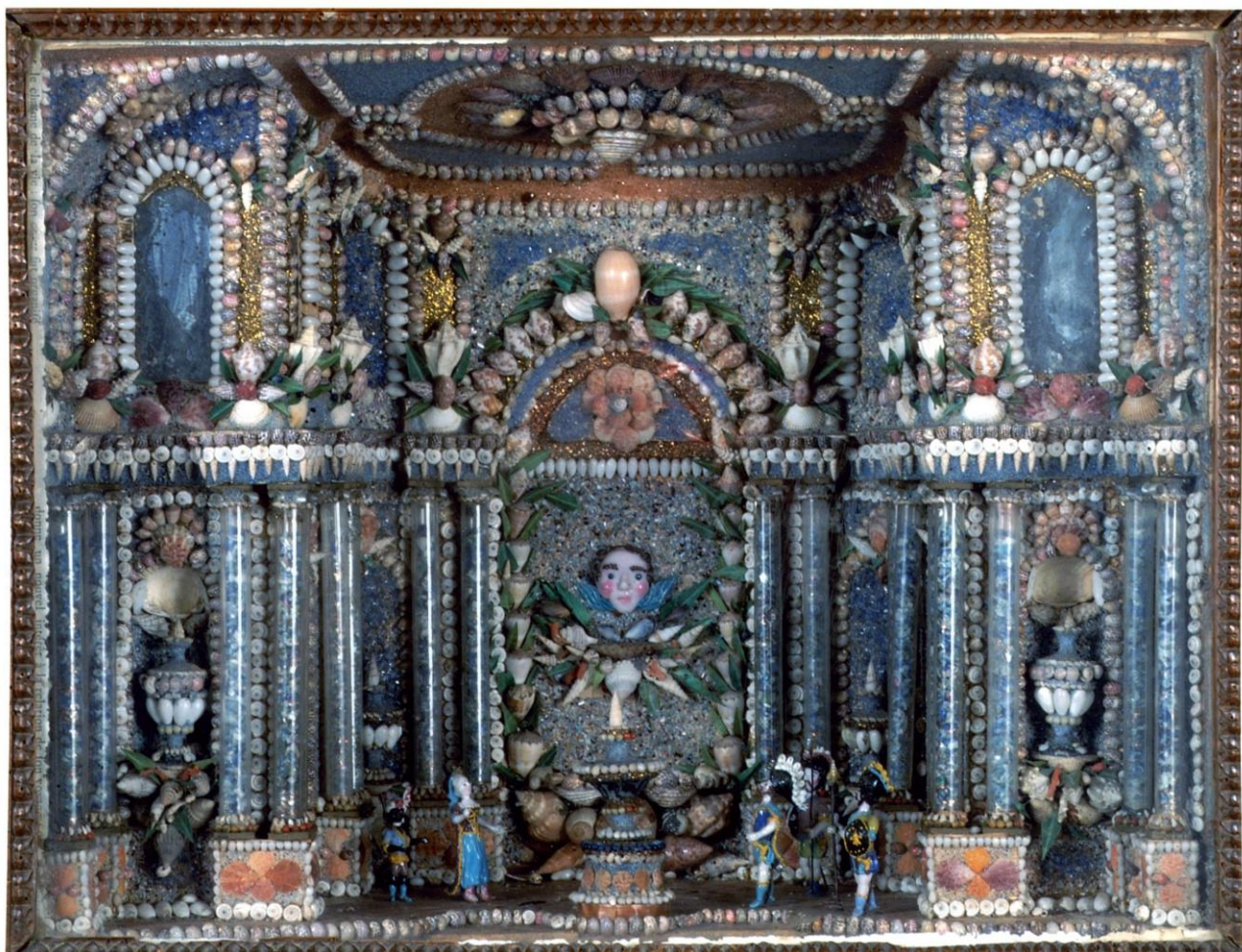


25 4:416



26-28 Above and below: from left to right: twisted cable rod 6:4460, and three glass tubes 4:417, 6:4461 & 6:4462





29 17th century diorama featuring the story of Renaud and Armide

The cable glass rod

E4468:6:4460 is a twisted glass rod of 49mm in length by 3.5mm-4mm in diameter. There is a deliberate cut or groove about 3mm in length from the base of the rod. Such rods, usually clear and twisted with narrow cables of glass of another colour, were very common in 17th and 18th century Venetian glass, and glass in the *Façon de Venise* elsewhere in Europe. They were used, for example, to form the elaborately twisted stems of decorative drinking glasses. They were also used as decorative objects in Nevers dioramas. This straight, very narrow rod is too fragile to be a stem of a drinking glass. It is grooved, while copper alloy, now corroded, adheres in patches, lengthways along one side, suggesting the rod was attached to a metal back. The function of the cable rod is unclear but it may have embellished a decorative diorama box of wood or metal or have been part of a decorative background of some form.



30 6:4460 twisted cable rod

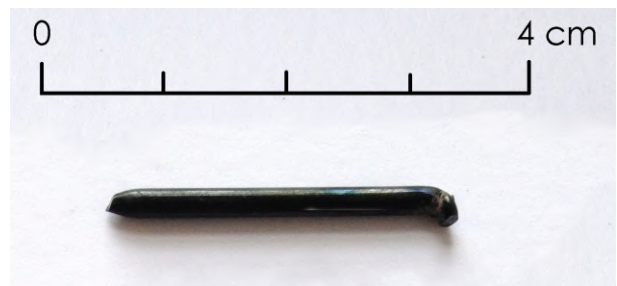


31 2:183, glass rapier

The rapier and other military equipment

Though the Renaud and Armide diorama involves weaponry, military equipment is not typical of Nevers dioramas (topics are more usually religious, mythological or pastoral). Where weapons are found (though it should be noted that this is not based on extensive study by the author), these would seem to be very simply made. Parallels could not be found for a very fine miniature rapier, E4468: 2: 183, from Rathfarnham which does not appear typical.

Though several pieces from Rathfarnham may suggest a theatrical scene not too different in type to Renaud and Armide (Plates 29, 33), the rapier is very different in type. The small oriental soldier (Plate 34) carries a much rougher sword than the skilfully twisted cable hilt of the Rathfarnham rapier, while sword hilts of the knights in Plate 33 are also very simply made. In addition, the Rathfarnham rapier (which was found with broken blade) is likely to have been originally at least 5cm in length, its hilt, 1.5cm, which seems proportionally large for the hand of the typical Nevers figurine (e.g. around 7cm



32 7:508, black glass 'rod'

33 Detail from the Opera of Renaud and Armide (full piece previous page)





35 6:4463



36 7:498

34 Nevers glass oriental soldier (right-hand figure)



high in Plate 33). Though it is possible that the rapier was used in a diorama similar to Renaud and Armide, it could also belong to a larger, more detailed, free-standing Nevers-type figure.

Some other small objects suggest possible military type equipment. The black rod, E4468:7:508 (Plate 32) from Rathfarnham, seems to have been attached to another piece. It could be an object carried by a Four Seasons figure while a military figure in Renaud and Armide appears to be carrying a black rod.

A small, narrow moulded implement 33mm in length, with a flat top (E4468: 6:4463), is possibly an object carried in the hand or clasped to the waist of one of the glass figures. It seems clear that the flat top would have been adhered by heat fusion to another piece, e.g. a hilt or the top of a sceptre, etc. Like the sword of the oriental warrior figure in Plate 33, it could have had some beaded decoration between hilt and blade.

A small object resembling a drop of waste glass (E4468: 7:498), 20mm in length, has a discoloured yellow brown colour and could have been a colour such as opaque yellow. It is quite similar in shape to the sword hilt on the oriental soldier (Plate 33). It could have been fused to such another piece of glass such as the flat headed object below.

Miscellaneous glass fragments

A number of glass items were not exactly paralleled among examples of Nevers glass. However it would seem likely from their filigree cable manufacture, general parallels to Nevers-style glass and unique context that they are part of the Rathfarnham Nevers glass collection.

E4468: 6: 4464 (Plate 38 above) is a decorative strip, broken on one end, with a roughened bevel on the other, suggesting its function is edging. It is composed of tiny horizontal rods of clear/pale green and blue and is 19mm in length by 6mm wide and 1mm in thickness. It is very similar to the decorative edging on the stand of Nevers glass statue of Pomone (Plate 37) and is suggested to represent decoration of a stand or pedestal.

E4468: 3: 156 (Plate 39 above) is a piece of green and white glass in very good condition which appears to represent foliage. It is a very small fragment of moulded glass and appears very similar to the type of foliage shapes in Nevers dioramas. It may have formed part of a decorative panel on a box or stand or background. It would certainly not be out of place in a Nevers diorama and in the context it was found is very likely to relate to the general assemblage.

E4468: 6: 4371, a fragment of decorative glass, 12.5mm in length, is composed of four conjoined bulbs or petals of dark green glass, inlaid with glass of another colour which has decayed to a chalky white. In its context, it is likely to be a fragment of Nevers-type glass.

The function of small filigree discs, E4468: 7: 505 (Plate 41) and 7: 507 (Plate 42) is unknown. They are similar to the black 'mount', E4468: 7:500 (Plate 23 above) which can be seen to have a clear connection in style of filigree decoration to other definite Nevers types (7:503, Plate 24) and their delicate cable is typical of Nevers. They are 14-16mm in diameter and 0.5mm to 1mm in thickness of filigree cable. Both, like 7:500, have slight domed or concave shapes. Great variety in embellishment is typical of Nevers glass dioramas and these objects were probably some kind of decorative mounts.

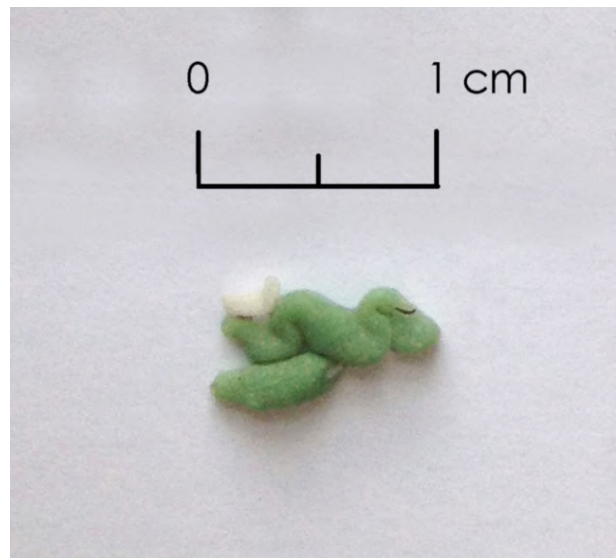


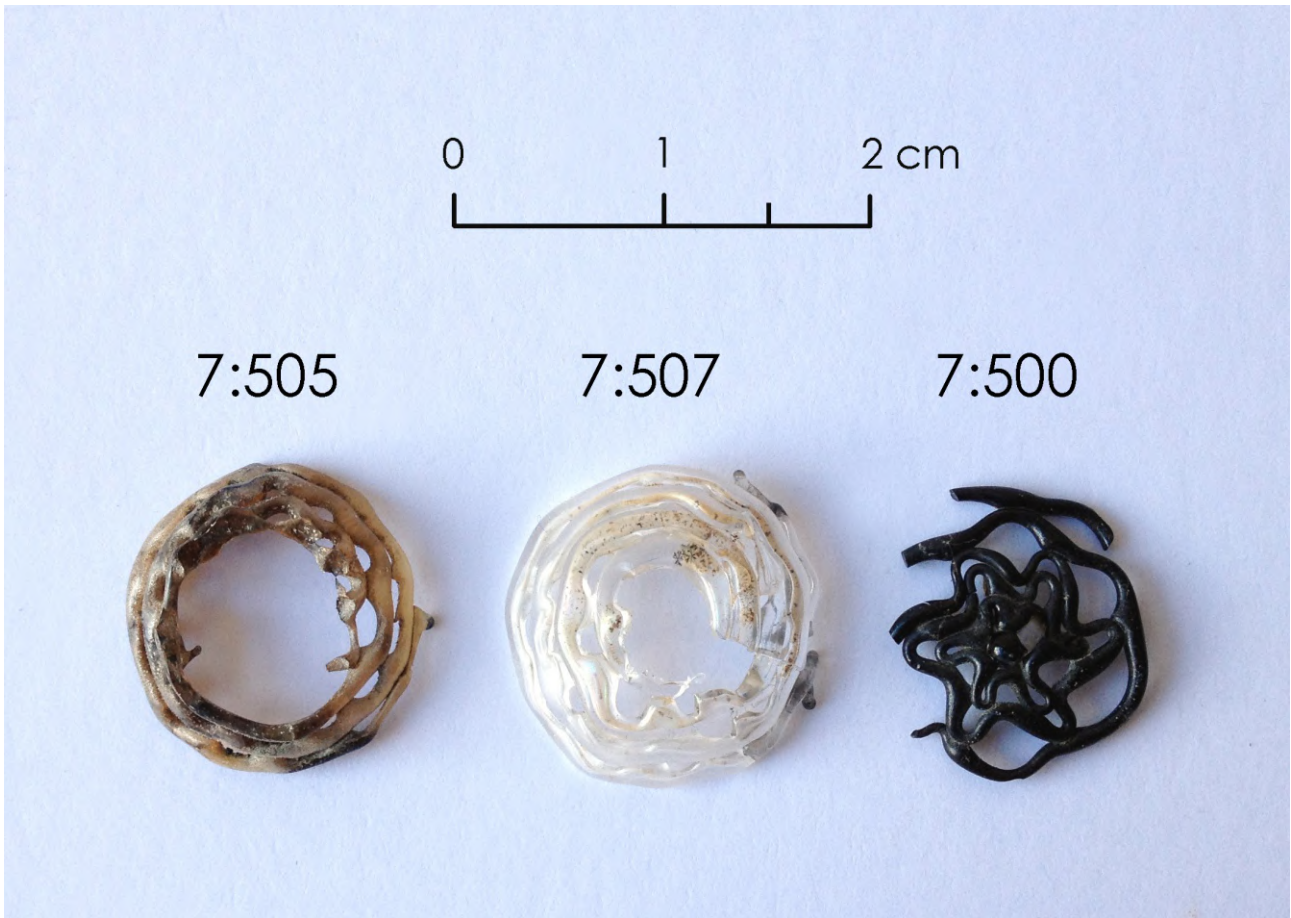
37 Nevers glass statue of Pomone

38 6:4464



39 3:156





41-42 filigree disks 7:505 and 7:507, and glass mount 7:500

E4468: 7: 509, is a glass disc or lens. Though it appears like spectacle glass or a magnifying glass and is very similar to one photographed in Hulst et al (2012, Fig. 10, 8), it is of pale green/blue, rough cloudy glass which would not function as either. Its edges are roughly cut as though to be inserted into other material and it is thus likely to have a decorative function. It is 34mm in diameter and 0.5mm in thickness

40 6:4371



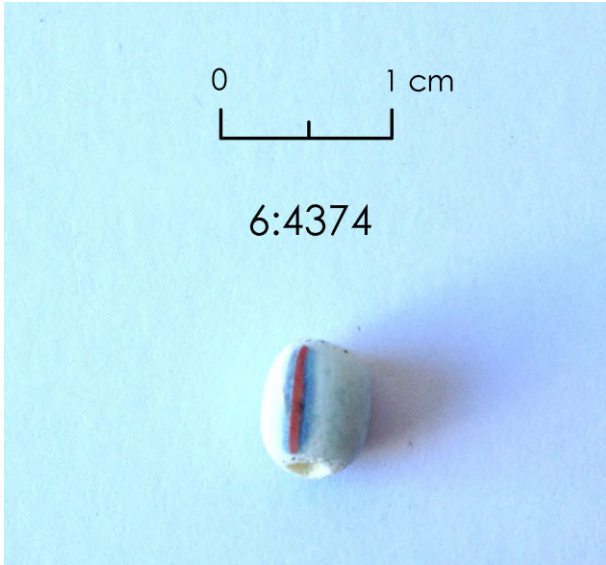
43 7:509, lens

Glass beads

There were five glass beads from the site, including one white oblong bead with blue and red stripes of glass inset (E4468:6: 4374), one plain black bead (E4468:6: 4370), one small white bead (E4468:6: 4376) and two very small green beads (E4468:6: 4372-3).

The oblong bead, E4468:6: 4374, is 7mm-7.5mm in height, 6mm in width with a lengthways perforation, 2 mm in diameter. It is of well preserved, opalescent white opaque glass. The surface is decorated with three inset longitudinal stripes of blue and red glass spaced around the



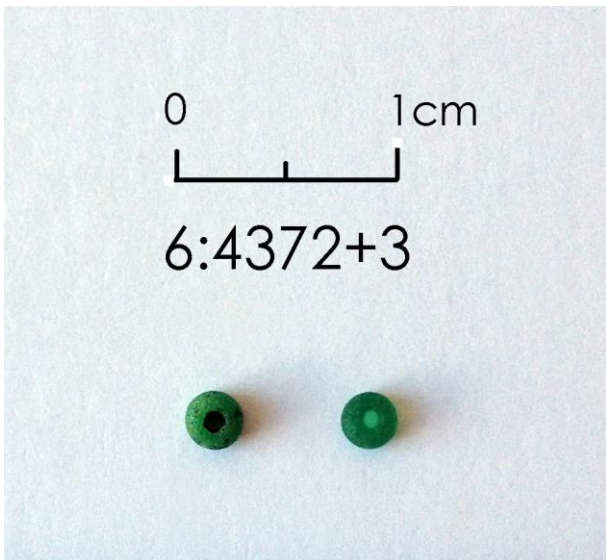


44 6: 4374, white oblong bead with red and blue

45 6:4376, small white bead



46 6:4372-3, two small green beads



outer surface of the bead. At either end of the bead, by the perforation, the surface is shaped to finish the ends.

The bead is one of a number of types with decoration formed by narrow canes of differently coloured glass originating in Venetian glass working factories in the sixteenth century. These lampworked glass beads became very popular in the 17th century where they were made in Germany and the Netherlands (e.g. Hulst et al 2012, Fig. 13, 9). They were mass produced as trade beads as Europe entered the age of colonisation. The main types are identical in Italy and the northern European countries (Sherr 1987, 328).

Sherr illustrates a number of small 'striped' beads, as well as the more elaborately manufactured 'chevron beads' (ibid, 328, nos. 109,117). The main feature of these beads was that they were cane-manufactured in the manner of earlier millefiori, often with the use of moulds. In their viscous or molten state they were pulled out in long thin strands, then cut to form very small, often very elaborately decorated, beads. The 'striped' decoration of the white bead of this report is produced by such glass cane-fused inlay.

At either end of the bead, around the perforation, the surface was finished to shape by grinding or further working by reheating (as shown by Jargstof, 1995, 52-53). Throughout the sixteenth and seventeenth century these beads were traded widely in Europe and the New World (Sherr 1987, 101).

Cane decorated 'trade' beads of similar type have been found in Ireland during the King Johns Castle excavations (Carroll 2015) and on a site in Nicholas Street directly south of King John's Castle (pers. comm. Brian Hodkinson) in 1989-90. Another was found on an excavation at Curraheen (Curraheen 1), Co. Cork during advanced archaeological testing of the route of the N22 Ballincollig Bypass by ACS Ltd (Carroll 2010; Danaher and Cagney 2004).

E4468:6: 4370, a black glass bead, was 9mm in height and 10mm wide with a perforation of 3mm. It was opaque black in colour. Though its

colour may possibly be due to chemical deterioration, black and other monochrome beads of this shape and size are found among the same group of 16th and 17th century trade beads as the inlaid bead above (Sherr 328, Fig. 101a).

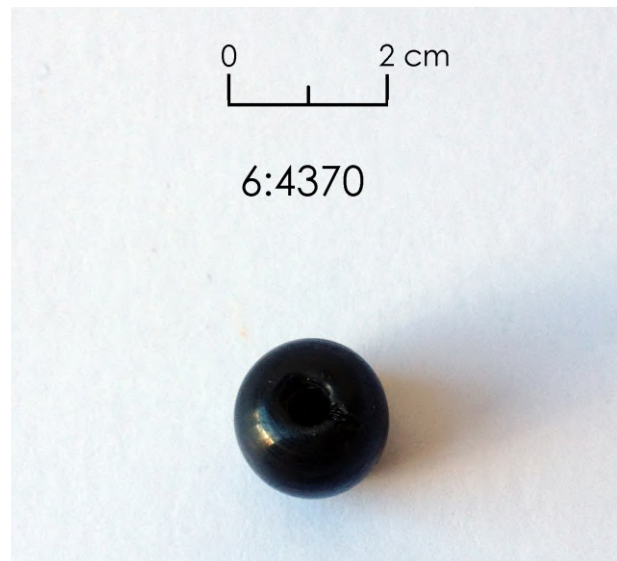
E4468:6: 4370 was a white bead with a chalky, opaque appearance with a metallic striation at one end. It was 4mm in height, 5.5mm in diameter, with a lengthways perforation, 1.5mm wide. It may have been an imitation pearl of a type which became a craze in Europe in the late 16th century but were produced on a wide-spread scale in the 17th century where they were perfected by beadmakers from Nevers in 1686, according to Jarlsdorf (1995, 76). Such glass pearl making was a French monopoly till the late 18th century (ibid). The barely perceptible metallic striations in this bead and its flaky outer surface may be due to chemicals used to make it appear opalescent.

Two very small green beads of identical type (E4468:6:4372 and 4373) were found. These were only 2.2mm-2.5mm in diameter and 1mm-1.5mm in height with lengthways perforations, 0.5mm wide. Monochrome glass beads in a variety of colours, including yellow, green and blue ranging from seed beads (tiny beads) accompanied the other types as trade beads in the 16th and 17th centuries (Sherr, 114). Tiny beads similar in size and shape to E4468:6: 4372-3 are figured by Sherr among Venetian types of this date (ibid, 328, 41, 44a-b). There is an example also of a blue bead of the same size and late 17th century date in Hulst et al (ibid).

Discussion

The glass types

The ornamental glass finds from Rathfarnham Castle can be divided into two types: glass beads of 16th and 17th century date of which there were five, and glass objects of 17th/18th century date which can be associated with *verre de Nevers*, the name given to the tradition of manufacturing miniature glass figures and scenes, typically in dioramas which originated in the Venetian lampworking tradition but developed in France in the 17th century. Here, the manufacture of miniatures formed an important



47 6:4370, black bead



6:4375, amber bead, described in gemstone report

glassworking tradition lasting through to the 19th century. The tradition is named after the Loire Valley town of Nevers, where the craft first developed – though it spread to many other French towns in the 17th century, lasting through to the 19th century.

A study of the fragments from Rathfarnham Castle would indicate that at least one diorama, probably in a theatre box, and at least one Four Seasons figure, probably one of a set of four,



Array of glass miniatures

was present here. The variety of different types of glass fragment suggests there may have been some other items. Certain pieces like the finely worked rapier (4468:2: 183) may have belonged to a slightly larger free standing figure, though it is possible that it could have belonged to a diorama.

Chronology and context

The glass beads are typically 16th/17th century, though pearl beads were perfected in the late 17th century in France, as has been shown by Jarlsdorf, who points to Nevers as a main source, continuing into the 18th century. One of the glass beads (4468: 6: 4376, which has a decayed metallic striation in the deteriorated opalescent white glass) would appear to imitate a pearl and may be of Nevers type dating to the late 17th century.

The glass tubes are very similar to those forming a backdrop to the Nevers diorama featuring

l'Opéra de Armide et Renaud. This is the only example of decoration involving clear glass tubes as backdrops to be found in this short survey, though narrow glass tubes appear to have been used extensively as tree trunks, stems, etc., in Nevers dioramas. The Renaud and Armide theatre is dated by the Museum at Nevers to the late 17th century (Information supplied by Sylviane Revel, Musée de la Faïence et des Beaux-Arts, Nevers)

A narrow, twisted cable rod, E4468: 6: 4460, of a type very common for making stems of drinking glasses in the 17th/18th centuries has the remains of corroded metal along one side, suggesting it was once attached to a metal backing. That it formed part of a similar 'backdrop' to the above diorama is very likely.

That there was probably a set of Four Seasons figures, a theme very popular in the 17th/18th century, is indicated by the moulded bunch of

grapes (E4468: 7: 501), as well as the grapes/berries attached to the ring holder (E4468: 7: 502), along with another piece of a similar black ring (E4468: 9: 261). A Four Seasons figure of the group with the grapes and ring holder has been dated by to the late 17th century. Elsewhere they are dated to the 17th/18th century (Four Seasons, see web reference below).

In general, all the other parallels can be dated to the 17th and 18th centuries. The Cupid parallel in the *Rétable du Théâtre de la Reine à Versailles* would seem to be late 18th century but Cupid with his wings, bow and quiver is extremely popular in all forms of 17th century art.

A very fine glass rapier, 5cm in length (4468:2: 183), was one of the most impressive single finds of the group. Could this have belonged to a central character such as the Danish knight in the Renaud and Armide diorama? Though this is possible, most of the figures in the latter diorama would seem to be less than 7cm in height, while the hilt (1.6cm) of the rapier seems very proportionally large in relation to the typical size of hand of a diorama miniature. The rapier may have belonged to a larger, free standing miniature.

Apart from the rapier, all the miniatures have close parallels in the French context and are suggested to be French rather than, for example, English, as the parallels seem to be quite direct. Their dates ties in well with the general date range of the material from the 2014 excavation at the castle.

Historical context

The historical context of the glass finds for this excavation has been dealt with by the excavators and it is not intended to repeat the information here. However, a historical record of Adam Loftus, owner of the Rathfarnham Castle in the late 17th century, spending time at Saumur may relate to the glass miniatures.

As shown by the licensee, Antoine Giacometti, the general dating of the range of pottery and other finds from the excavation would generally suggest a date in the late 17th century or around 1700. From our knowledge of the history of

the castle, the owner of the castle during the late 17th century was Adam Loftus (1635?-1691), great-great grandson of the first Adam Loftus, Elizabethan archbishop of Dublin who built the castle in 1583-5. The archbishop's great-great grandson succeeded his mother, Lady Dorothy Loftus (widow of Sir Arthur Loftus), who died in 1668, as resident of Rathfarnham Castle (Ball 1903, 128).

Adam Loftus appears to have spent a lot of time at court in London according to Ball but Ball also states that '1672 finds him in Saumur...where he joined a colony of English' (Ball *ibid*, with a source in the Ormond MSS). Adam was next heard of writing from Rathfarnham Castle where illnesses had taken place in 1686 (*ibid*). Five years later, he was killed in the siege of Limerick in 1691. After his death the castle appears to have fallen into disrepair and ceased functioning as a family home until it was revived again in the late 18th century by Henry, Earl of Ely, who carried out massive refurbishments (*ibid*, 129-137).

The circumstances of Adam's sojourn at Saumur, on the western end of the Loire valley, are unknown but interesting. Saumur, as has been seen, is one of the towns in receipt of glass rods from Nevers in the mid-18th century. Glassworkers producing miniatures from Saumur are highly praised in records (Lanmon and Whitehouse, 1993, 266) showing that the town had a long history in lampworking glass miniatures. How the glass miniatures arrived at Rathfarnham is unknown but a direct connection between Adam, the Loire valley and Rathfarnham Castle seems likely.

Conclusions

This report has shown that in the late 17th century, pieces of fine ornamental glass in the form of miniature dioramas and free-standing figures were brought most probably from the Loire region of France where such pieces were created in glass workshops. The date of the material as well as the associated finds would point to Adam Loftus (1635?-1691), great-great grandson of the first Adam Loftus of Rathfarnham Castle. The glass miniatures (as well as the other

finds from the 2014 excavation) therefore form a connection to the lives of the occupants of the castle in the 17th century of which there is very little material evidence.

Lampworked glass beads are known from 17th century sites in Ireland, as has been shown, while lampworked decoration on Venetian glass vessels is a rare though not unfamiliar find on Irish high status sites of the 16th and 17th centuries. However, the Nevers-style miniatures from Rathfarnham Castle form the only collection of its type to be recorded in an archaeological context in Ireland, as far as is known by the author. This report is therefore not based on extensive research of the subject which was very new to those of us working on this project. In the future, others may be able to supply more information on the individual pieces and their parallels. As time goes by, further information may be added to this report.

Recommendations

It is recommended that the pieces are stored in acid free plastic packaging and labelled as extremely delicate.

Particular attention should be given to the storage of the glass rapier. The object is in two pieces which connect by a hair-thin coil of glass. The piece should be positioned in such a way as to prevent breakage. It should also be packaged in an appropriate acid free plastic container and clearly labelled.

Acknowledgements

Thanks are due to Antoine Giacometti for his help in relation to the project and to Sylviane Revel, Musée de la Faïence et des Beaux-Arts, Nevers, for her help in sending me information and images of *l'Opéra de Armide et Renaud*.

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Glass lenses

Antoine Giacometti

Three fragments of three concave glass lenses were identified. One (7:509) is complete and the other two (6:4213 & 6:8824) are fragments from two different lenses. All three fragments are from grozed (i.e. nibbled edges) glass lenses of approximately the same size (34mm diameter circle, c. 2mm in centre tapering to 1-1.5mm at edge).

The glass from all three is different. 7:509 is greenish clear alkali glass, 6:4213 is a smoky-grey clear glass similar to the glass bowls (6:3734 & 9:250) of possible central European manufacture, and 6:8824 is patinated clear glass, similar to the lead-crystal.

6:4213 has distinct magnifying properties, and is almost certainly a lens from a glass optical instrument (magnifying glass/telescope, spectacle). The other two items are too scratched and corroded to assess, but are probably also lenses, perhaps of lower quality, although they may be ornamental glass discs, for example from a diorama (see glass miniatures report by Judith Carroll).

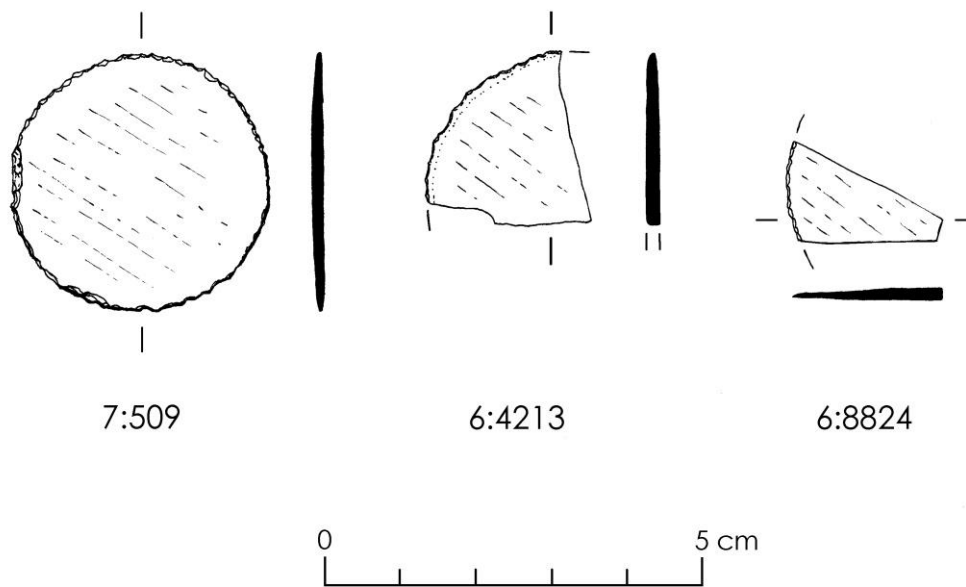
A lens of identical size and form was identified at Clough Oughter in Ireland (Manning 2013, no 525 & Fig. 6.32). Several very similar lenses were also identified at Glasshouse De Twee Rozen in Amsterdam (RO21-5-208, RO21-5-44,



Above: glass lenses from Rathfarnham Castle

Below: glass lenses from from Glasshouse De Twee Rozen in Amsterdam 1660-1680 (Hulst et al 2012, 8, Fig. 12)





RO21-5-43; Gowronski et al 2010 full catalogue; Hulst et al 2012, 8, Fig. 12 discussion in English). These were produced in Amsterdam between 1660 and 1680, and the Rathfarnham lenses could have been produced in a similar contemporary glasshouse. Glass lenses and spectacles of 19th and 20th century date have been excavated from Mount in Clare (02E1149, Kate Taylor, excavs ref 2002:194) and Palmershill 2 in Laois (E2235, Ed Danaher, excavs. ref. 2006:1184).

Optical lenses were in widespread use in Europe through the Renaissance, with manufacture focused on Florence (Ilardi 2007). Pairs of spectacles with glass lenses and frames of bone, wood, leather or metal dating from the 15th century have been excavated from archaeological sites from the Netherlands, England and Italy (Ilardi 2007, 306). The English finds comprise three bone spectacle frames without lenses from the 1974-5 excavations at Trig Lane, Blackfriars, City of London; a 1994 excavation at the Thames foreshore, Swan Stairs, City of London; and a possible third also in the City of London. All of these would have held glass lenses the same size as the Rathfarnham Castle example (Manning

2013). By the 17th century Galileo, Descartes and Newton all used glass lenses in optical experiments (Hess & Husband 1997, 15).

6:4213 Glass lens

Fragment of thin well-polished clear plate glass with a curving nibbled grozed edge (c. 34mm-40mm diameter) Thickness varies from 1.45mm at edge to 2.19mm in centre. The quality of the glass is very high. The metal is smoky grey, similar to glass bowl (6:3734 & 9:250. Lens has distinct magnifying properties, and is probably a lens from a glass optical instrument (magnifying glass/telescope, spectacle).

6:8824 Glass lens

Fragment of thin well-polished glass with a curving nibbled grozed edge (c. 34mm-40mm diameter) Thickness varies from 1.2mm at edge to 2mm in centre. Glass has discoloured a yellowish colour and has a slight patina, but is clear. Fragment has a strong resemblance to the feet of the lead-crystal wine glasses, however the grozed edge marks it as a lens.

7:509 Glass lens

Though it appears like spectacle glass or a magnifying glass and is very similar to one photographed in Hulst et al (2012, Fig. 10, 8), it is of pale green/blue, rough cloudy glass which would not function as either. Heavily scratched. Its edges are roughly grozed as though to be inserted into other material. It is 34mm in diameter and varies in thickness from 1.45mm at edge to 2.19mm in centre.

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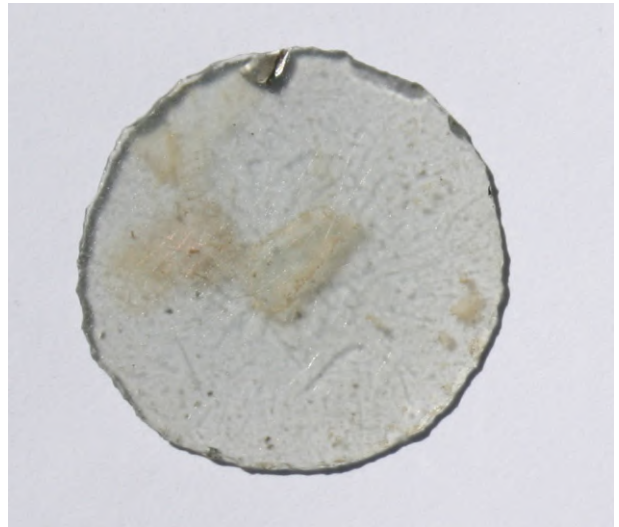
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6:4213



7:509

6:8824



Flat glass (windows and mirrors)

Steve McGlade with assistance from Nessa Roche

Introduction

866 fragments of flat glass (excluding the three lenses discussed in the previous section) weighing 1.86kg were identified from seven contexts [C2-C4, C6-C9] during the 2014 excavations at Rathfarnham Castle. The majority of the glass (82% by sherd count) came from one context, C6, the basal fill in the southern end of the washpit. All of the flat glass analysed came from the excavation of the washpit in the southwest tower. Just over half (50.5%) of the flat glass is window glass made from quarries of broad or cylinder glass. In a number of instances near complete panes are apparent, with triangular and diamond-shaped quarries identifiable. Also present are squared panes of thicker and higher quality crown window glass (17.5%). A smaller number of plate glass fragments with metal adhesions to the rear represent broken mirrors (2.4%).

Most of the window glass comes from diamond-shaped quarries from mullioned windows that would have been fitted with leaded lights. These are most likely the original windows of the castle, constructed in c. 1583. The dated lead came (E4468:7:452) stamped with '1692 E.W.', indicates that at least until that time diamond-shaped quarries were still in use in

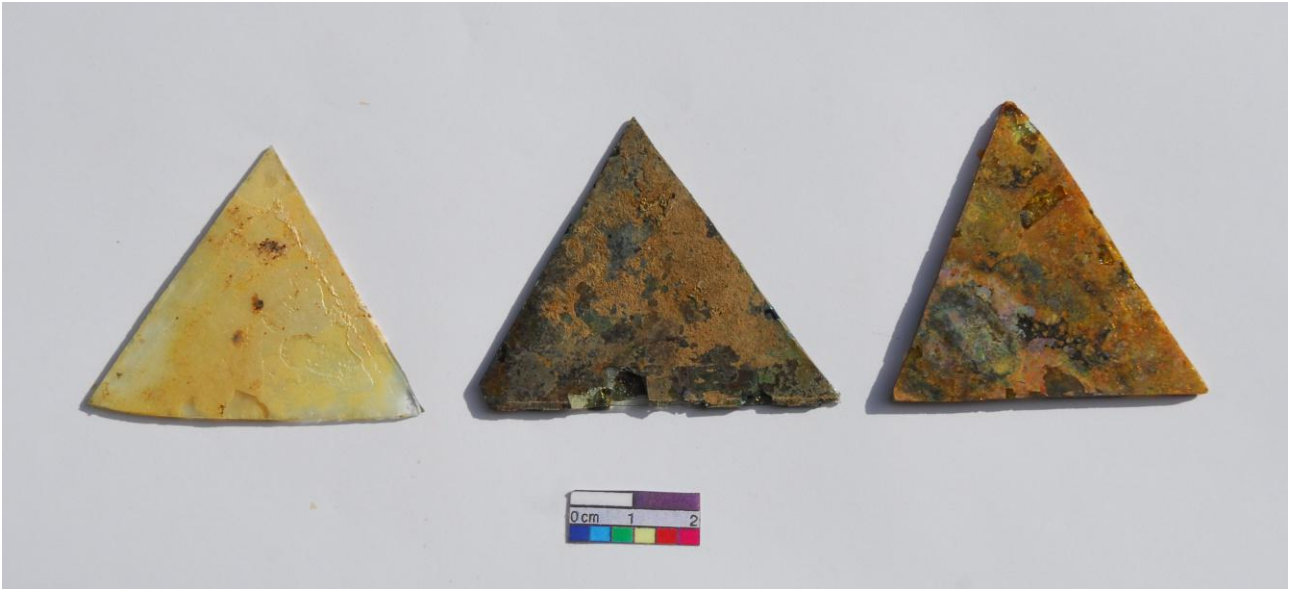
Rathfarnham Castle. This is not surprising given that the move to sash windows did not begin until the end of the 17th century, taking hold in the first half of the 18th century.

A smaller number of fragments come from rectangular quarries, most likely from casement windows. Rectangular and square panes become common from the 17th century, with diamond-panes completely dying out by the 18th century (for example see the Trinity College muniments; see also the Flower Papers (Castle Durrow), and the papers of the Earl of Fingall, Roche 1998, 136).

Two casement windows with rectangular panes were identified at Rathfarnham Castle during the archaeological work in 2014 (Giacometti 2015 stratigraphic report) as probable 17th century features. One of these had previously been examined by Nessa Roche (2008), who identified it as an early type of window and recorded the square glass panes. Early lead-glazed casement windows, predating the arrival of the sash window in the late 17th century, are extremely rare in Ireland (DoEHLG 2004, 161). The presence of these rectangular quarries in the washpit suggests that the casement window had been in place prior to the sealing of the washpit in the early 18th century.

Flat glass by context

Context	Sherd count	% by sherd count	Weight	% by weight
2	16	1.9%	131g	7%
3	14	1.6%	66g	3.5%
4	19	2.2%	81g	4.4%
5	0	0	0	0
6	708	81.8%	1,383g	74.4%
7	21	2.4%	47g	2.5%
8	47	5.4%	57g	3.1%
9	41	4.7%	95g	5.1%



Small triangular window quarries of cylinder glass

Window glass with grozed edges is sometimes taken to indicate glazing predating the 17th century (Mann 2008, 22). However, Nessa Roche (pers. comm. 2015) indicates that it is difficult to date glass by grozing as this method of trimming glass while fitting continued into later periods, particularly in trimming near the corners. There are some pieces from the Rathfarnham assemblage that exhibit grozing along complete sides, suggesting the quarries were altered to fit. This may represent reuse of an existing quarry during re-glazing, or alteration of a new quarry to fit.

The ingredients needed to produce glass were 75% silica (derived from sand), 15% sodium or

potassium oxide, referred to as flux (derived from ash) and 10% lime (Farrelly 2010, 44). The presence of iron oxide in the sand causes the glass to have a green colour. This could be reduced by using beech ash, which naturally contains manganese, a natural decolouriser (ibid.). However this was not readily available in Ireland as beech is not a native species. The mineral cobalt, which had to be imported from Germany, could be added to produce clearer glass (ibid., 45). The flat glass from Rathfarnham was seen to have a range of colours and tones of green and yellow to grey, clear and blue. The latter three were associated with higher quality glass, while the varying shades of green and yellow indicate the presence of im-

Flat glass by type

Glass type	sherd count	% by sherd count	weight	% by weight
Cylinder	437	50.5%	763g	41%
Crown	152	17.5%	675g	36.3%
Plate	21	2.4%	191g	10.3%
Degraded	256	29.6%	231g	12.4%

purities within the glass.

The flat glass from Rathfarnham Castle has been classed into three types: cylinder, crown and plate glass. An additional class was given for degraded glass where it was not possible to identify the glass type.

In addition to this three glass lenses were also retrieved during the Rathfarnham Castle excavation. These are discussed in the preceding section.

Cylinder Glass

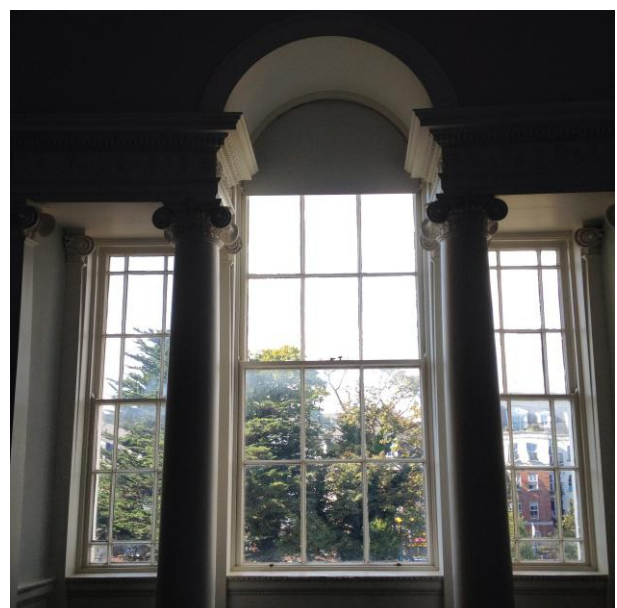
Cylinder Glass (also called Broad Glass) was the most commonly used window glazing glass in Ireland until the late 17th century (Hickey 2012). Cylinder Glass was manufactured in Continental Europe, around the Rhineland and Lorraine, from the medieval period. It was made in Ireland from the late 16th to the late 17th century, with early glasshouses having been identified in Counties Cork, Derry, Laois, Offaly, Waterford and Wicklow (Farrelly 2010, 37). The location of these earlier glasshouses was usually chosen for their proximity to woodlands due to the need for fuel for the furnaces and ash being a component in the manufacture of the glass (ibid., 44). Imported broad glass was still in common use until the late 18th century (Roche 1998, 59). It is unknown whether the cylinder glass from Rathfarnham was of Irish manufacture or imported glass.

Cylinder glass was produced by blowing a bulb of glass and then swinging it to form an elongated cylinder of glass. Both ends were then cut off and the cylinder cut along its length and the glass flattened out to make a sheet on a work surface. This process often damaged the surface of the glass, which became scored and scraped during the flattening.

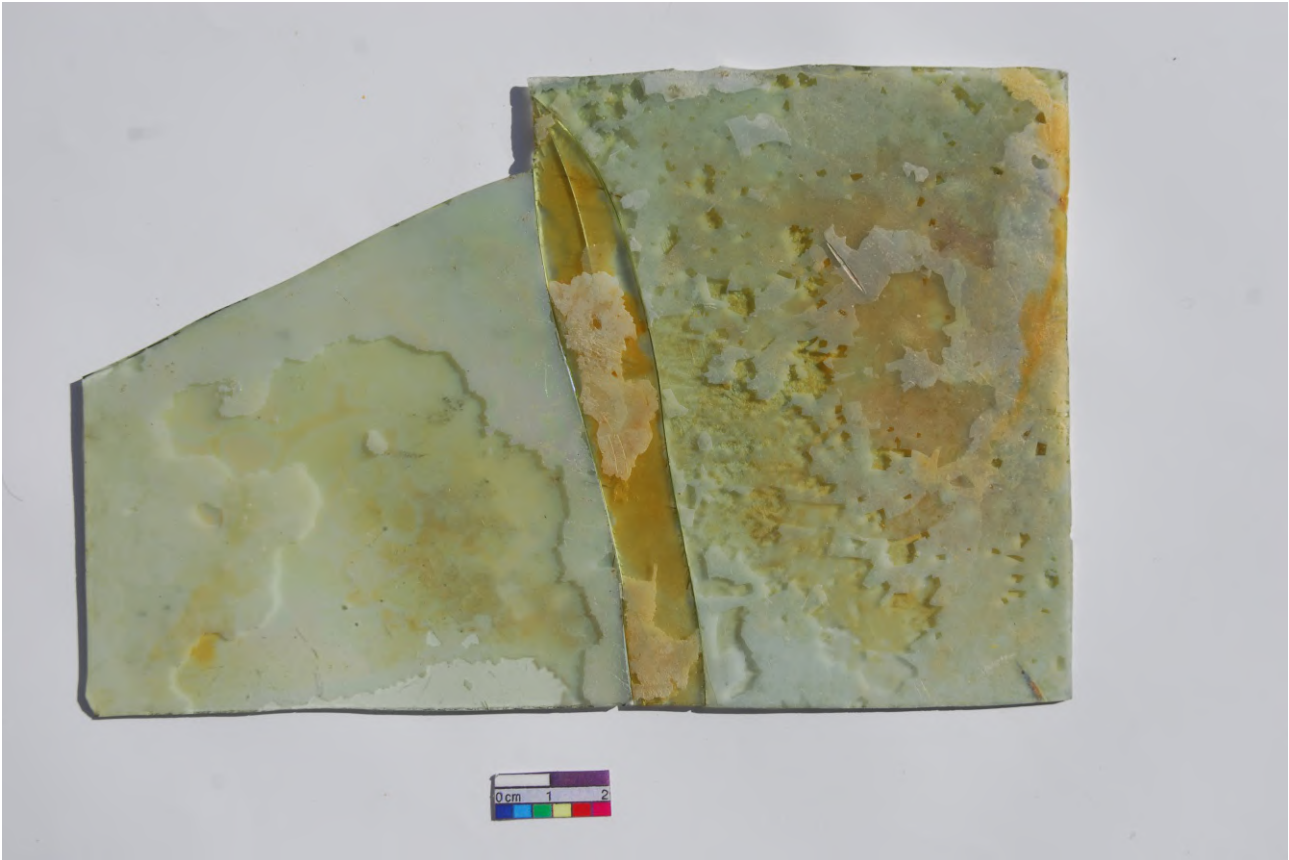
Both cylinder and crown glass were limited in the size of pane that could be produced using these techniques, which is why smaller panes or quarries held in lead window frames were used to glaze windows as producing panes of glass large enough to glaze a full window was not yet possible.



Above, on the left 18th century sash window; on the right sealed 16th century mullioned window



Right, middle: basement casement window
Right, below: 18th century sash window



Rectangular pane of cylinder glass

Crown Glass

Crown glass, known as Normandy Glass in the 16th and 17th centuries, does not appear to have been made in Ireland until the 18th century (Roche 2010, 59). The use of imported crown glass for windows was introduced to Ireland at the end of the 17th century and was in demand up to the mid-19th century (Roche 1998, 60). This was formed by blowing a bulb of glass, then cutting the top off and spinning the bulb so that the glass flattened and thinned out through centrifugal forces. This was a higher quality glass, usually thinner at the edges, thicker in the middle and with a central 'bullseye' or scar from where the glass was initially blown. While better quality and with a better sheen than cylinder glass, it could have a number of defects introduced during blowing and annealing. It is identifiable through a rippling effect over the surface caused by the spinning of the glass and elongated bubbles within the glass, also caused by the spinning process.

Several types of Crown Glass could be used, including Ratcliffe crown glass, originally made at

the Bear Garden on the Bank Side in 1591, before moving to Ratcliffe, which has a distinctive pale sky blue colour (matched by some pieces of Rathfarnham Castle Crown Glass) and was considered the best crown glass available at the time (Neve 1726, 145). Other types available from England include Lambeth Crown Glass, which was slightly darker than the Ratcliffe variety and had a slightly greenish tint (ibid., 146) and Newcastle Glass, which has an ashy colour and was noted as being the most commonly used in England, but also that it was subject to having specks, streaks and blemishes, and was noted as often being warped and crooked (ibid., 147; Roche 1998, 59-60). Crown glass was also produced in Denmark and Germany, Dutch Glass tending to be ashy like Newcastle Glass and German glass being white and green (ibid). As Ireland was not producing crown glass in this period, all the crown glass from Rathfarnham must have been imported.

Thirty-five sherds of crown glass from the assemblage had a distinct blue or greenish blue tint, with some being slightly translucent and

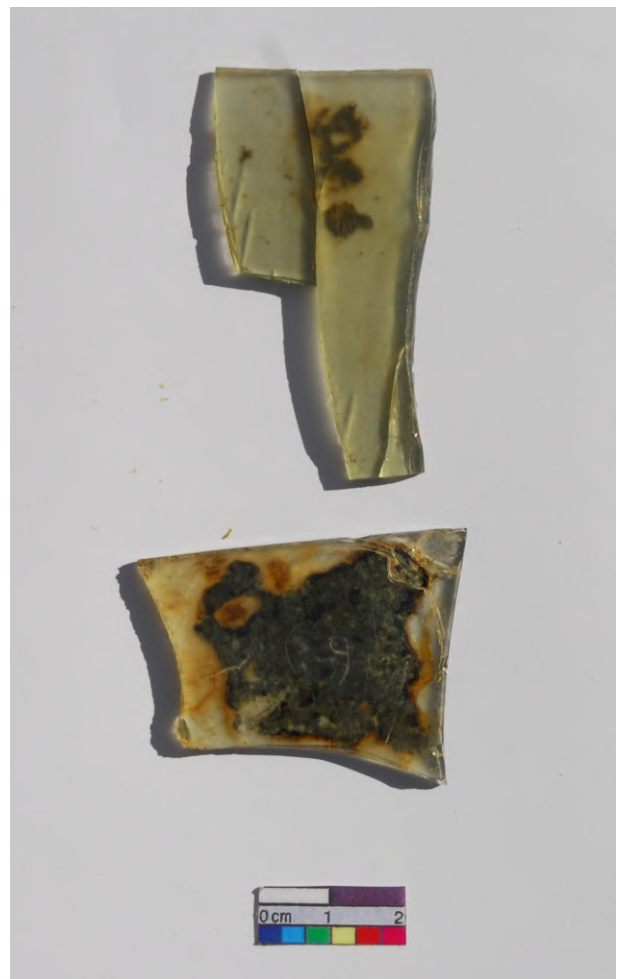


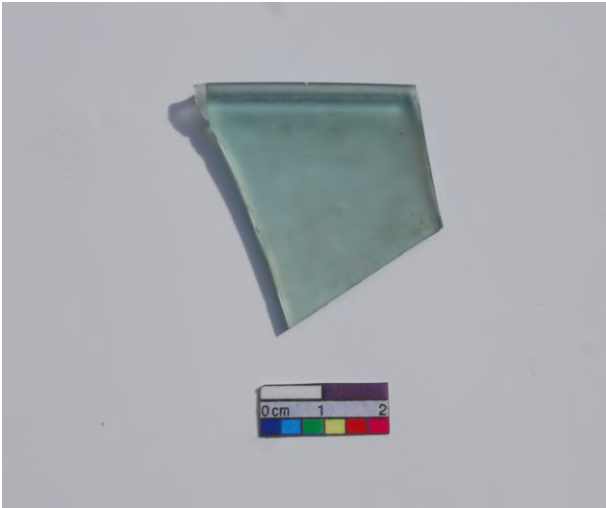
Plate glass fragments, probably from a mirror

others transparent. It is possible that 25 of these are of the high quality Ratcliffe crown glass, which was known for having a distinctive sky blue tone to the glass while the other 10 greenish blue sherds may be Lambeth crown glass, also a high quality crown glass.

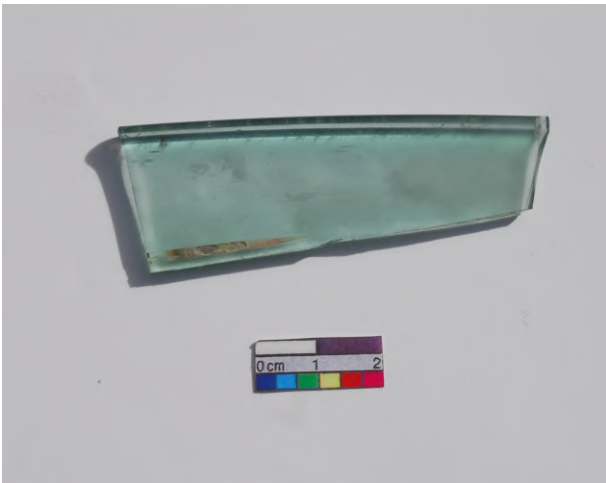
Seventeen sherds of crown glass included a portion of the rim of the crown and may be off-cuts from the on-site trimming and shaping of panes or quarries by a glazier. This suggests that whole crowns of glass were bought into the castle for re-glazing or a new phase of glazing. It also indicates that these off-cuts were retained, possibly for resale as cullet at a later point. These off-cuts can be seen as non-window glass, though they are part of the glazing process. An additional two sherds may be related to the trimming of the central portion or bullseye of the crown as it was much thicker than the rest of the glass identified. One of these sherds had clear scored cut marks along one side. Of the off-cuts identified in the Rathfarnham assemblage only three sherds appeared to be of the high quality Ratcliffe crown glass. The majority (13 sherds) were quite degraded and of a poorer quality, possibly Newcastle glass, while a further 3 sherds were clear or green in colour but of good quality glass.

Plate glass fragments with mercury adhesion to back, from a mirror

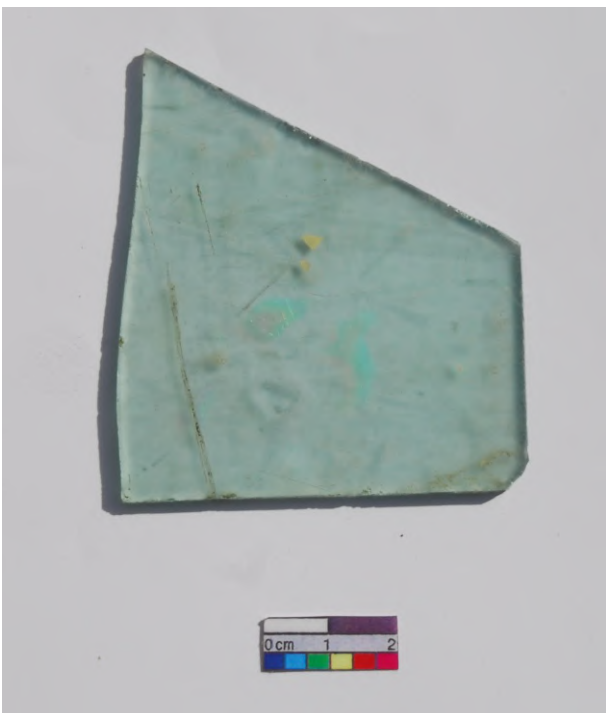




Above and middle, crown glass off-cut fragments from glazing



Below, crown fragment with cut mark



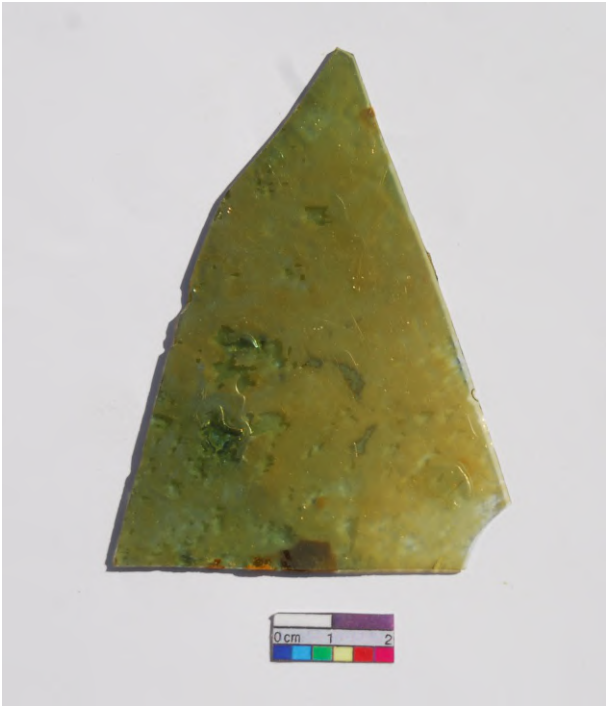
According to Neve, crowns of glass were sold in cases stored upright. They were partially trimmed, with the lower part and sides of the circular tables trimmed to aid storage in the cases and the upper part of the circle left untrimmed, equating to a quarter or fifth of the circular table (Neve 1726, 147). Ratcliffe glass crowns were approximately 3'6" in diameter, or 1.07m, giving an area of 9.58ft² or 0.89m² (ibid.). Tables of Newcastle glass produced between 5 and 7 square foot. A section of rim off-cut from the Rathfarnham assemblage (E4468:6:3679-36780) was from a crown with a diameter of approximately 803mm, giving an area of 5.49 square foot or 0.51m², which fits well with the lower end of the Newcastle crown scales.

Plate Glass

Polished plate glass was used for mirrors and coach glass in the 17th century. Plate glass was made by blowing a thick crown or cylinder in a fine fabric, with cristallo glass being used for looking glass by makers in Venice, France and England, and then manually grinding and polishing the surfaces of the glass to eradicate any flaws and achieve a flat surface (McGrath & Frost 1937). The process of grinding and polishing the glass was time-consuming and frequently led to breakages, making the production of plate glass an expensive one.

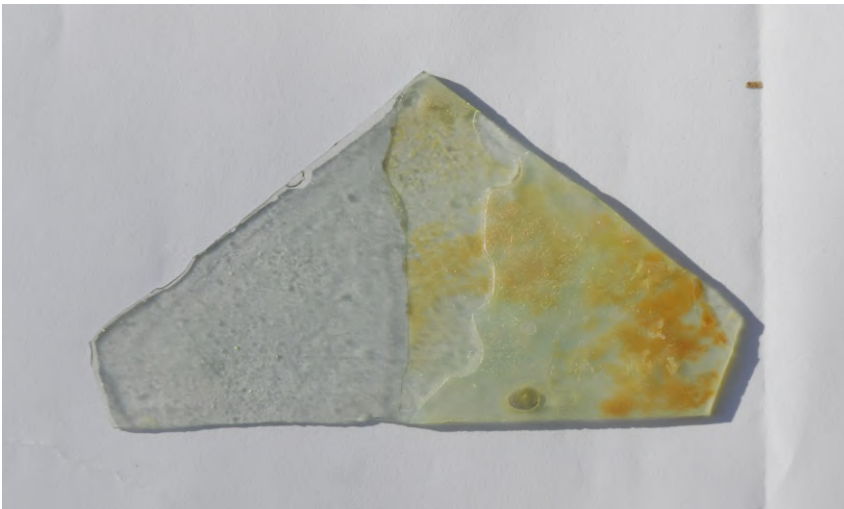
Plate glass was perfected in France in the 1690s, though had been known from Roman times, and was commonly used for mirrors for the very wealthy from the medieval period onwards (Roche 1998, 62). It was produced at the Bear Garden glassworks on the Bank Side in London from at least the early 18th century, with the manufacture of crown glass previously seen there moving to Ratcliffe (Neve 1726, 148). Neve also notes that plate glass was occasionally used for sash windows, however it was a very expensive form of glass due to the amount of processing required to produce it, though was seen as the best quality glass being produced at the time (ibid.).

The majority of the plate glass identified was from mirror and is discussed below. The plate glass from the assemblage was all high quality with very little or no patination, a reflection of



Cylinder glass, triangular window quarry

Cylinder glass, triangular window quarry



the quality of the materials and lack of impurities within the glass.

Mullioned windows (C16th-C17th)

Most of the flat glass from the Rathfarnham Castle 2014 excavations derives from small quarries of cylinder glass from 16th and 17th century windows. Crown glass was also used in the manufacture of the Rathfarnham quarries, possibly replacing the earlier cylinder glass and allowing for more visibility. The mullions would have held leaded lights, panels of quarries held in lead cames. Based on the assemblage of flat glass from Rathfarnham, it would appear that the majority were laid out in the traditional diamond-shaped pattern, though some alternative arrangements were suggested.

Eight late 16th century mullioned window frames were identified in the Castle by Giacometti in 2014 and 2016: seven sealed windows in the front and two open ones in the southwest flanker, and this is the type of window the glass quarries derive from. They would have been fixed – i.e. it would not have been possible to open or close the windows.

The original window layout at Rathfarnham may have been similar to Kilmallock, Co. Limerick, which has early 17th century buildings with square window frames carved in a bold and massive style classically laid out, one over the other, and evenly spaced. Contemporary buildings show arrow- or gun-loop openings on the lower floors, and larger mullioned windows on the top floors. Craig dates the beginnings of larger, more ordered fenestration to about 1550, when ‘square-headed mullion and transom

windows appear, which are not only fairly generous in size but are also regularly arranged' (Craig 1982, Roche 1998, 5, 278). The country seat of the Ormonds at Carrick-on-Suir Castle was so flamboyant in its display of large glazed windows in the 1560s that it was likely to have set a new trend in fortified house design (Hickey 2012).

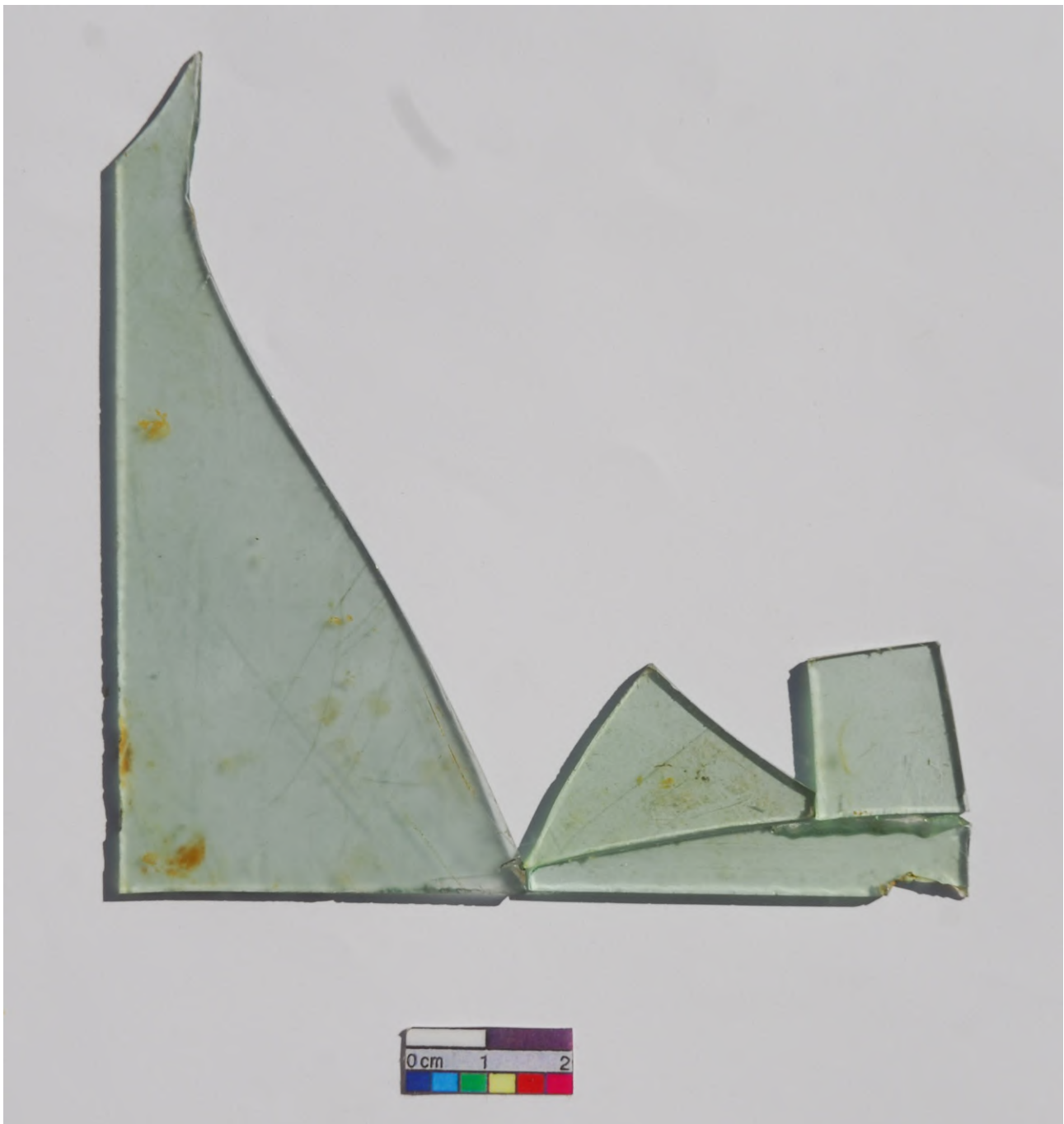
The dated came from Rathfarnham suggests the mullioned windows were in use and being act-

ively repaired up to 1692 at least. This fits with evidence from Blessington House and Burton Hall, c .1670, both specifying the use of quarry glazing into the late 17th century (Roche 1998, 136).

Casement windows (17th century)

The change in window frame material from lead and iron to timber took place in the 17th cen-

Crown glass, rectangular window pane



ture, first noted in France and Holland (Roche 1998, 76). The earliest documented example of a timber-framed leaded casement window in Ireland is found in the 1680s, in the house of a merchant probably of Dutch origin (Roche 2007, 414). A key advantage of casement windows was that they could be opened to provide ventilation (Roche 1998, 21).

Nessa Roche recorded the basement casement window at Rathfarnham Castle in 1998. This was a rectangular paned window, near complete with 4 panes missing, 5 panes per row, 5 panes in height. The leaded light at Rathfarnham Castle was fixed to the outside of a timber casement-frame. It was externally grouted, with a canted inner edge on the frame. The rear of the panel is held by horizontal iron saddle bars tied to each joint with soldered wire (Roche 1998, 137 and Plate 62). The location of the window is currently unknown, but the rectangular window frame (and another identical frame on the first floor) were recorded by Giacometti (2014).

A near-complete rectangular pane from Rathfarnham (E4468:2:670, 7:488) was found in a number of refitting pieces from two different contexts, both at the northern end of the washpit. It measured 168 x 110mm or 6 5/8" x 4 1/3", with grozing apparent along edges and corners slightly protruding from the edge of the pane. The pane appeared to be of low quality crown glass, possibly Newcastle glass. The dimensions of the pane are similar to those recorded by Roche for the casement window identified in north wall of the southwest flanker tower, which she recorded as approximately 6 1/4" high by 3 7/8" wide (1998, 137).

The panes recorded by Nessa are very similar to the rectangular crown glass pane from the washpit situated directly below the window, which would appear to indicate that the casement window recorded by Roche was inserted prior to the sealing of the washpit in c. 1720. It is interesting to note that the glass used for the rectangular glass pane from the washpit was thicker than that used in the diamond-shaped quarries, possibly as it needed to be more robust as it was set in a moveable casement.

Sash windows (18th century)

The existing sash windows at Rathfarnham Castle are mid-late 18th century and later (Roche 1998, 232-3). Roche also identified two pieces of 18th century stained glass surviving in the hall of similar date. Giacometti (2014) identified an earlier phase of sash window in the basement of the southeast flanker inserted in the early 18th century (c. 1720-1740). No glass from these windows was identified in the flat glass assemblage.

Sash windows were becoming popular in England from the 1670s. Window layout was becoming taller and narrower, inspired by a growing interest in Classical architecture (Hickey 2012). Two building projects in Ireland at the time, Dublin Castle in 1675 and The Royal Hospital, both planned to use cross-mullioned windows. The first documented reference to sash windows in Ireland is at Kilkenny Castle in 1680. This is the only pre-Williamite wars reference to sash windows in Ireland, but after 1691 sash windows became more popular (Roche 1998, 13). By this time a more settled political situation allowed for a change in the functionality of buildings, and in turn windows. 'It was as if there was a subtle shift from blind defensiveness to an assured, all-seeing authority' (Roche 1998, 9).

It is likely that the arrival of casement windows did not see a wholesale upgrading of the fenestration of Rathfarnham, rather some windows or gunloops were converted to the more modern style as required. This may be because the benefits offered by casement windows were not as large as those seen on the arrival of sash windows. The latter window style was embraced at Rathfarnham requiring significant structural alterations, however the benefits to both ventilation and lighting offered by sash windows made them highly desirable.

Mirrors

Cristallo glass, a development by Venetian glass-makers in the 15th century, produced a transparent, colourless glass, which was ideal for the production of high-quality mirrors with

clear reflectance (Payne de Chavez 2010, 1). In the early 16th century they developed a mercury-tin amalgam for mirroring the glass plates, revolutionising mirror manufacturing (ibid.), which were highly expensive and desirable commodities in the 17th century. By 1621 Sir Robert Mansell established the first manufactory for plate glass in England, with the pricelist indicating that looking glass plates were valued at eleven shillings per dozen before grinding and polishing, increasing by a factor of about two and a half when finished (Godfrey 1975, 235-7).

A minimum of five mirrors are represented in the Rathfarnham collection, based on the style and thickness of glass used. Three of the mirrors had tapering edges, while one had straight-cut edges. One of the sherds of possible mirror (E4468:3:186) was possibly from where the mirror was attached to a frame as there was an intentional area of damage on one of the faces of glass. The mirrors are all generally of high-quality plate (or *cristallo*) glass, however one sherd (E4468:6:4377) is somewhat unusual having a poorer finish on the rear and is also more patinated than the other sherds which have not patinated at all. The mirrors formed 1.7% of the total flat glass assemblage from Rathfarnham by sherd count, and 8.8% by weight. They formed 71.4% of the plate glass assemblage by sherd count and 85.3% by weight.

Mirror 1

7 sherds (E4468:3:186, 6:3657, 6:3682-3684, 6:8749-8750). Relatively fine, from 1.8-2.75mm in thickness, with a tapering edge, which is neatly rounded and straight-cut. Possible intentionally chipped sections on the rear to assist in mounting the mirror. Some metallic adhesion identified on the rear of two of the sherds. Weight 34g.

Mirror 2

3 sherds (E4468:6:3685, 6:8747-8748). 3mm thick mirror with no edges identified. Metallic adhesion identified on the rear of all sherds. Weight 45g.

Mirror 3

1 sherd (E4468:6:3686). 4mm thick corner of a square-cut mirror. Metallic adhesion identified on the rear of the sherd. Roughly finished edge with no taper. Weight 19g.

Mirror 4

5 sherds (E4468:3:155, 6:3687-3688, 6:8753-8734). 2-3mm thick possible mirror with a tapering edge. There is no curve apparent on the surviving sections of the edge suggesting the mirror may have been square-cut. The edge is not neatly rounded. This may be the same as Mirror 2 based on thickness, however the tone of the glass is dif-

ferent. Weight 43g.

Mirror 5

1 sherd (E4468:6:4377). 3.35-4.85mm thick possible plate glass mirror tapering at one end. Very flat and well finished on one side and thicker further from edge on the other. Poorly finished on the rear with some ripples apparent. Neatly rounded at the tapered edge. Weight 22g.

Polygonal pane?

One of the sherds of glass from Rathfarnham exhibits multiple facets (E4468:6:8751), possibly from a small octagonal or nonagonal panes. The sherd is of high quality plate glass, and appears to form approximately half of the original pane size, being 41mm in width and a minimum of 40mm in length. It is possible that it served as a small viewing pane in the centre of a window otherwise fitted with cylinder glass, offering less visibility. It should be noted however that a second small multi-faceted sherd was found to refit with other sherds and is now interpreted as part of Mirror 4 (E4468:8753-8754). The angles of three of the facets of both sherds match, which may suggest that the possible polygonal pane is in fact part of a mirror. The excavations of the gatehouse at Roscrea Castle identified hexagonal window glass from a 17th century context (Bourke 2003, 84). This indicates that varying window arrangements are known from Irish castle sites of this period. Due to the similarity with the sherd from the mirror assemblage it may be more likely that this sherd comes from a mirror rather than a polygonal viewing pane, however the latter remains a possibility. The window glass assemblage from the castle does suggest some variation in quarry layout, with a number of smaller quarries noted and some unusually shaped pieces with grozed edges indicating they formed complete pieces, combined with variation in the angles of the triangular quarries along the edges of glazing panels indicating that a uniform diamond-shaped lattice was not present at the castle.

Repair and reuse

The flat glass assemblage from Rathfarnham Castle indicates that windows were repaired. A number of the window panes exhibit grozing, possibly from reinstallation or reuse of quarries.

Grozing was apparent on thirteen of the sherds and was present both at corners and along the sides of some quarries. This may have taken place during re-fitting of the quarries after a phase of reglazing. The grozed sherds were divided between crown (10) and cylinder glass (6), and most had been shaped for quarry glazing (10). This suggests that crown glass was being used in repairs to the original quarry glazing and that grozing was being used to clip and shape the quarries. Some of the grozed sherds (3) came from square-cut panes and two clearly came from panes not conforming to a square, rectangular or diamond pattern. Grozing should not be seen as a sign of older glass in this instance, rather an effect of the imperfectly laid out window glazing.

The dated came (1692) belongs to a quarried window light, indicating that quarried glazing was still being used at this time. Square panes had superseded quarry style windows during the early 17th century (Roche 1998, 136), so the continuation of use of quarried glazing would have been old-fashioned by this time, and it is very likely that already by 1692 some of the mullioned windows had been replaced by casement windows (though Giacometti 2014 suggests that the basement casement window replaced a gunloop). Contemporary documents refer to the need to repair window glass, particularly after storms. Casement windows, being hinged, fared badly in windy weather. They were easily smashed against the frame or reveal, particularly as it was hard to secure them effectively when fixed open (Roche 1998, 21). The rate of glass replacement was high, and expensive matter and not always easy due to the general countrywide shortages of skilled glaziers, or material for repair. Outlying castles had to send to the nearest city, or arrange for the importation of glass and lead.

The Rathfarnham lead assemblage also indicated that glazing and re-glazing of the windows was taking place at the castle, with earlier lead having been stripped off the windows and re-used as ties to fix the leaded lights to glazing support bars. The glass quarries would then have been refitted into new lead comes, possibly requiring some grozing or trimming to fit a slightly different layout of the lead.

Glass was saved for reuse by glaziers in the 17th century, not a surprising practice given the high value placed on the material (Roche 2010, 69). There are also references to wealthy customers placing orders for glass greater than the immediate requirements of a project, with the excess stored as replacements (Roche 2010, 69). Giacometti suggested (2014) that some of the material in the washpit may have been derived from a storeroom for holding items intended to be used or recycled in the future. It is possible that the Rathfarnham Castle window glass from the washpit had been stored for this purpose.

The manufacture of glass, which is recorded in Ireland from the 1580s (Roche 2007, 405), relied on cullet, or broken glass, to improve the quality of the finished product (ibid, 406). It is possible that as well as storing window panes for the purposes of repair, households may have also stored broken panes to sell on to glass-makers as cullet.

It is possible that the assemblage of window glass from Rathfarnham represents the remnants of defunct windows, which were being altered, modernised or replaced around the time of the filling of the washpit. Alternatively, it is possible that the glass (and lead) was stored for reuse and repairs, or temporarily collected before being sent back to the glassworks for use as cullet. The presence of what are probably off-cuts from the edges of crown glass suggests that glaziers were preparing the glass on site at Rathfarnham from complete crowns. These would be waste products, but are likely to have been saved for resale as cullet.

Non-window glass

Of the sherds analysed in the assemblage 37 were identified as non-window flat glass. This includes the nineteen sherds relating to off-cuts of crown glass, seventeen mirror fragments, and one unusual sherd of cylinder glass that is unlikely to have been used as window glass due to its thickness in comparison to the remainder of the assemblage.

Quantification of flatglass by function

96%	window glass	
4.3%	non-window glass	
	2% mirror	45.9% of non-window glass
	2.2% off-cuts	51.4% of non-window glass
	0.1% other	2.7% of non-window glass

Only one of the sherds of flat glass identified during the works could not be ascribed to window glass, mirror glass or glazing off-cuts. It was a small clear sherd of cylinder glass, thicker than other sherds of cylinder glass encountered (E4468:6:8729). A function for this piece was not identified.

Measurements

Roche (1998) records typical glass pane sizes and shape, based partially on measurements from Neve (1726). She notes that in leadwork, 'squares' of around 6" by 4" were used (Roche 1998, 67). Squares became larger in the later 17th and early 18th century, a typical size being 8" x 10". Roche cites Neve as stating that 'the acute angle of 'square' quarries is approximately 77 degrees and the acute angle of long quarries is approximately 67 degrees. There are a total of 12 different sizes of quarries, six square and six long, being 8's, 10's, 12's, 15's, 18's and 20's. These names relate to the number of quarries required to make a foot of glass, therefore there would be eight 8's in a foot of glass, and so on (ibid.)' Neve's 'long quarrel' measured 12"sq., height 6", width 4", with 3 2/5" long sides, and his 'square' quarrel measured 14 2/5"sq., height and width 4 4/5", with 3 7/8" long sides.

Roche (1998, 137) also records the size of the leaded light of the casement window in Rathfarnham Castle as approximately 6 1/4 inches high by 3 7/8 inches wide, which is not dissimilar to the rectangular pane identified from the assemblage (E4468:2:670, 7:488), which measured 6 5/8" x 4 1/3".

The quarry glass from Rathfarnham does not conform to these measurements, with a range of sizes apparent for the half-quarries at the sides, tops and bottoms of the windows. The

lack of complete or near-complete quarries is also interesting. The half-quarries from the sides, tops and bottoms of the windows survive better with a number of complete or near-complete examples in the assemblage. This may be due to the central sections of the leaded lights having given way, either in bad weather or through neglect. In such a case the central portion of the window would be more prone to failure with quarries along the edges possibly staying in place until the window is repaired.

There is a possibility that different designs were used in parts of the castle with one much smaller complete diamond-shaped quarry surviving (E4468:6:3645) measuring 2 1/2" x 1 1/2" and parts of two others of a similar scale but slightly different size. The two more complete full-sized quarries would have measured 3 3/4" x 5" (E4468:6:3644) and 3 1/2" x 5 1/8" (E4468:4:700). These variations may have been seen in different rooms of the house based on the status of the room, or on the size of the window being glazed. Neither of the larger quarries from Rathfarnham conforms to Neve's dimensions for quarries, though they are closer to his 'long quarrel' in shape.

There is some suggestion from the surviving quarries at Rathfarnham that at least some may not have been symmetrical diamond shapes, rather they were slightly longer to one end, being more kite-shaped, particularly suggested by non-uniform side quarries forming obtuse scalene triangles. This is somewhat unusual and may be specific to Rathfarnham.

Window layout

A total of 679 sherds of flat glass from the assemblage was categorised as body window glass, where no clear edges or corners were distinguishable. Only nineteen sherds were identifiable as coming from either square or rectangular panes, however this was only apparent when a corner and sides of the pane survived and should not be seen as completely representative. Forty-nine sherds were identifiable as coming from diamond-shaped quarries, with a further 44 coming from the sides, top or bottom of leaded lights. An additional 28

sherds were clearly identifiable as coming from the side of a quarry. One sherd of the plate glass identified had distinctive polygonal angles, with a further three sherds being of a similar glass type and tone, possibly also coming from these panes, but with no clear edges.

One of the interesting findings of the analysis of the Rathfarnham window glass was the lack of uniformity in the surviving quarries. Of the surviving triangular quarries from the top and bottom of leaded lights, as well as those from the sides of the leaded lights a relatively wide range in the angles of the corners was apparent. For the diamond-shaped quarries a range of 60-75-degrees was recorded for the acute angled corners and 105-125-degrees for the obtuse angled corners. The quarries from the top or bottom of the leaded lights were acute-angled triangles ranging from 50-75-degrees, with three examples being approximately equilateral triangles. The quarries from the sides of the leaded lights were obtuse-angled triangles with the obtuse corner ranging from 105-120-degrees and the acute corners from 30-42-degrees. The width of these was also seen to vary greatly. Three corner triangles were also noted, being right-angled triangles with corners approximately at 30-, 60-and 90-degrees.

The majority of diamond-shaped quarries, where identifiable, had approximately 105-110-degree obtuse angles and 70-75-degree acute angles indicating some level of symmetry. However the more outlying angles recorded, combined with the more varying angles seen in the side, top and bottom triangular quarries indicate that the leaded window panels from Rathfarnham Castle were not completely uniform. The varying heights and widths of these top, bottom and side triangular quarries also indicates a level of adaptation, either intentional to accommodate the window dimensions, or through inferiority of the glaziers available at the time. Another possibility is that the slight alterations were made to use all of the glass available, either new glass brought in to the site or the reuse of older quarries. It suggests that some level of alteration and adaptation to the general quarry size was required, indicating the glazing was done on-site custom-made for the castle rather than being bought in as completely

finished glazed leaded lights. This is further evidenced by the presence of off-cuts from the on-site trimming of crowns of glass. The surviving triangular sherds suggest that slightly different angles were taken in places, possibly to fit into awkward spaces when a diamond pattern was not selected.

A near-complete triangular quarry with a large ridged flaw running across its face was identified during the works (E4468:6:8709). A second sherd with a distinct raised flaw running across the glass was also recorded in the assemblage (E4468:6:3501). The use of this obviously poorer quality glass suggests that some of this glazing is from less important parts of the castle or windows that would have been out of sight. As seen with the window lead, there is a possibility that the glazing at Rathfarnham Castle was functional rather than exceptional. This could be a reflection of the specific window glass and lead forming part of this assemblage, possibly coming from a less imposing part of the house. It could also reflect the difficulty in acquiring quality glass at the time, though the varying sizes and angles of the quarries suggest more a need to adapt to the building than anything else. The poor finish on some of the connected window leads also points to a perhaps *laissez faire* attitude of the glazier involved. Interestingly however, there are no surviving bullseyes of crown glass from the assemblage. This was seen as the poorest part of the glass and it would have been used in less important rooms. The lack of this glass at Rathfarnham suggests it was not used in the castle, possibly being sold off for use in other buildings or as cullet.

Comparative material in Ireland

Window glass has been retrieved from numerous excavations in Ireland. The unsettled nature of Ireland during the 16th and 17th centuries has meant that no known complete surviving windows prior to that period survive prior to the period of the restoration of Charles II (Roche 1998, 5).

Some sherds of window glass from a 17th century context were retrieved from the excavations of the gatehouse at Roscrea Castle, including

two sherds from hexagonal panes (Bourke 2003, 84). Only one of the sherds recovered were found to have a grozed edge, and it is described as coming from a dubious context (ibid).

Catalogue

The flat glass retrieved from the washpit at Rathfarnham Castle was separated into a number of groupings based on the type of glass used, i.e. cylinder, crown or plate; thickness of the glass; colour and completeness of the quarry pane. Where evident, sides and corners were identified and described. These were identifiable through scored edges, cut marks and grozing, and impressions or variations of the patination on the glass.

Three types of glass were identified in the assemblage, cylinder, crown and plate glass, while an additional category was given for glass that was too degraded to identify. Differentiation between poorer quality crown glass and cylinder glass was difficult in some cases, with tell-tale signs such as the elongated bubbles and ripples within the glass, formed through the spinning process of crown glass, aiding differentiation. It is possible that some misidentification may have taken place, particularly in smaller sherds and where the surface of the glass was degraded. Plate glass was identifiable through the quality of the glass and was also generally found to have little or no patination, presumably due to the quality of the materials used in its production.

The sherds were measured with maximum and minimum quantities given for each grouping. Initially weights were also taken for each grouping, however this process was not continued for the entire assemblage as upon analysis many sherds were degraded or patinated, altering the original weight of the sherds. A general weight of the various glass types per context was recorded instead. Where weight was recorded for individual groupings the measurement has been left in.

Context 2

Cylinder: 7 sherds E4468:2:663-669

Yellow 3 sherds 1-1.3mm 33 x 31mm to 22 x 26mm 1 from edge of quarry. Patinated (663-5)

Green 1 sherd 1.8mm 25 x 23mm Body window pane sherd (666)

Clear 3 sherds 0.6-1.2mm 36 x 28mm to 17 x 29mm Degraded, body window pane sherds (667-9)

Crown: 9 sherds E4468:2:670-678

Clear 1 pane 2-2.5mm 110 x 92mm Near-complete rectangular pane; grozing apparent along edges** refits with sherd E4468:7:488. Some patination. Possibly related to the casement window identified in north wall of the southwest flanker tower. (670)

Translucent blue 2 sherds 1.5-2mm 21 x 23mm to 28 x 37mm 1 from edge of crown 3.3mm thick at edge. No patination. (671-2)

Clear blue 2 sherds 1.65-2.6mm 65 x 23mm to 40 x 27mm 1 from edge of crown with a raised and rounded edge, possible off-cut from on-site preparation of a crown of glass. Second is a window body sherd. No clear cut edges. No patination. (673-4)

Clear 4 sherds 1.5-2.8mm 40 x 12mm to 60 x 49mm 1 from edge of crown, rounded. Possible off-cuts from on-site preparation of a crown of glass. Little patination. (675-8)

Context 3

Cylinder: 5 sherds E4468:328-332

Clear 5 sherds 0.46-1.45mm 56 x 19mm to 17 x 17mm Degraded, window body sherds. 7g weight (328-332)

Crown: 7 sherds E4468:3:326-327, 1336-1340

Yellow 2 sherds 1.75-2mm 68 x 46mm to 62 x 37mm both obtuse corners of diamond-shaped quarries with 110-degree angled corners. Some patination (326-7)

Clear 4 sherds 1.25-1.7mm 54 x 19mm to 25 x 23mm No clear edges. Little patination, window body sherds. Weight 7g (1336-9)

Translucent blue 1 sherd 2.25-2.4mm 61 x 59mm Corner and two cut sides of square/rectangular pane. No patination (1340)

Plate: 2 sherds E4468:3:155, 186

Clear 1 sherd 2.65mm 63 x 14mm Mirror 4. Possible mirror fragment, though no metallic adhesion survives. No patination. Greyish tint to the glass (155)

Greyish green 1 sherd 1.85-2.3mm 27 x 26mm Mirror 1. Sherd of possible plate glass with intentional surface alteration on one side, possibly to mount the glass. No patination (186)

Context 4

Cylinder: 14 sherds E4468:4:700-711

Yellowish green 14 sherds 1-2mm 85 x 85mm to 20 x

20mm 8 sherds degraded body window sherds, likely from quarries. 2 sherds better surviving and large (re-fit), possibly from rectangular pane with one side apparent, minimum size 113 x 54mm. 1 half-complete diamond-shaped quarry (in three pieces) 1.2mm thick measuring 85mm in width and 85mm in height minimum with a 67-degree acute angled corner and a 110-degree obtuse angled corner. One corner of a triangular quarry with a 42-degree angled corner. One sherd acute corner of diamond-shaped quarry with a 67-degree angled corner. One sherd obtuse corner of a diamond-shaped quarry with a 110-degree angled corner. One sherd part of side of a diamond-shaped quarry. Heavily patinated (700-711)

Crown: 5 sherds E4468:4:59-60, 415, 712-713

Yellowish 2 sherds 1.3-2.7mm 65 x 29mm to 37 x 30mm Edge of crown sherds, degraded. Rounded edges. Possible off-cuts from on-site preparation of a crown of glass. Heavy patination. 7g weight (59-60)

Clear blue 1 sherd 1.5mm 79 x 25mm No edges, body window sherd. No patination (415)

Various 2 sherds 1.5-2mm 91 x 58mm to 55 x 44mm One sherd obtuse corner of a diamond-shaped quarry with a 110-degree angled corner. One sherd part of a triangular-shaped quarry with a 55-degree corner. Little patination (712-713).

Context 6

Cylinder: 347 sherds E4468:6:3459, 3501-3629, 3676-3678, 8471-8578, 8593-8641, 8653-8680, 8685-8708, 8729, 8760, 8807

Clear 1 sherd 0.75mm 32 x 26mm 1 body window sherd, no edges apparent, degraded (3459)

Various 98 sherds 0.4-2mm 69 x 35mm to 15 x 13mm body window sherds with no clear cut edges. Heavy patination and some of the sherds are degraded. 1 of the sherds has a thin raised band or flaw running across one face (3501-3598)

Various 28 sherds 0.7-2mm 114 x 57mm to 25 x 25mm 10 sherds from the sides of panes, 2 sherds from the acute corners of triangular quarries with 32-degree angled corners, 8 sherds from the obtuse corner of diamond or triangular quarries with corners at approximately 112- to 135-degrees. 4 corners from triangular quarries from the top or bottom of leaded lights with corners at 55-, 60-, 76- and 80-degrees, two of which exhibited grozing and one had a rounded corner. 5 sherds from the obtuse corner of side triangular quarries, one with a re-fitting acute corner with some grozing apparent, with angles from 120- to 130-degrees. 1 near complete quarry with two corners and part of 3 sides surviving, with corners at 105- and 75-degrees and a minimum height of 115mm, and would have formed a quarry c. 5" x 3 3/4". Some patination (3599-3629)

Various 3 sherds 1-2mm 74 x 37mm to 25 x 21mm 2 body window sherds and one corner sherd from a square-cut pane. Heavy patination (3676-3678)

Yellow and clear 80 sherds 0.55-1mm 57 x 45mm to 17 x

10mm 80 body window sherds with no clear cut edges, probably from quarries. Very degraded with little patination remaining. 75g weight. (8471-8550)

Yellow and clear 28 sherds 1.3-1.9mm 72 x 48mm to 32 x 9mm 28 sherds of thicker window body sherds with no clear cut edges. These are similar to the rectangular pane in E4468:2. Some patination (8551-8578)

Green 49 sherds 0.55-2.05mm 61 x 43mm to 20 x 5mm 38 body window sherds with no clear edges, 1 sherd from the side of a pane one of which has a cut mark along one side where an attempt has been made to trim the glass. One sherd (E4468:6:8593) of rectangular glass possibly from a narrow pane that refits with sherd E4688:9:3552. 1 obtuse corner sherd from a diamond or triangular shaped quarry, 2 acute corner sherds from a diamond-shaped quarry with 70-degree angled corner, 3 acute corner sherds from quarries at the side of a leaded light with 35-degree angled corner, 1 near complete quarry from the corner of a leaded light with corners at 90-, 58- and 32-degrees, 2 sherds from triangular quarries from the top or bottom of leaded lights with corners at 60- and 58-degrees. Some patination (8593-8641)

Green 18 sherds 1-2.2mm 85 x 36mm to 23 x 19mm 6 sherds from the edge of quarry panes. 5 sherds from obtuse corners of quarries, three with a 110-degree angled corner suggestive of a diamond-shaped quarry and two with 120-degree angled corners, possibly from triangular-shaped quarries. One sherd of a triangular quarry with two corners surviving with corners at 38-degrees and 94-degrees; some grozing visible along one edge. Two sherds of the acute corner of diamond-shaped quarries with 73-degree angled corners. Two refitting sherds of the corner of a triangular-shaped quarry with a 38-degree corner. Two complete triangular quarries from the top or bottom of the window, almost equilateral triangles with sides measuring c. 50mm and corners of c. 60-degrees. Some patination. (8653-8670)

Various 10 sherds 0.95-2.05mm 84 x 42mm to 28 x 20mm 6 sherds from the edge of panes. One sherd from the acute corner of a diamond-shaped quarry with a 74-degree angled corner. Three sherds from obtuse corners of diamond-shaped quarries with 110-degree angled corners. One near complete triangular quarry from the top or bottom of a window with two sides measuring c. 52mm and the third measuring 45mm and corners at 52-, 60- and 68-degrees. All are degraded with heavy patination (8671-8680)

Clear and yellow 28 sherds 1.2-1.6mm 86 x 70mm to 22 x 10mm 6 sherds from the edge of panes, two of which re-fit. Two sherds from the acute corner of a diamond-shaped quarry with 75-degree angled corners. Seven sherds from obtuse corners of diamond- or triangular-shaped quarries with 110-degree angled corners. Six sherds from side corners of triangular quarries from the side of a window with 35-45-degree angled corners, one of which is a refit and another with clear grozing along one side. Two near complete triangular quarries with corner angles of 105-, 40-, and 35-degrees with the tips of the acute corners broken off and some evidence of grozing; the panes are not the exact same size with one being 3mm higher than the other. One smaller triangular quarry from the top or bottom of a window with c. 60-degree angled corners. Some patination. (8685-8708)

Clear 1 sherd 2.85mm 34 x 21mm 1 sherd of thick cylinder glass with no clear cut edges and bubbles present.

No patination at present but surface of the glass is quite damaged from the patination previously falling off. Not likely to be window glass. (8729)

Clear 1 sherd 1.5-1.8mm 48.5 x 38.5mm to 39 x 39mm
Two sherds of cylinder glass from a triangular quarry were found within triangular lead light E4468:6:4378. The pieces fit into the lead comes but are not connected to each other, and form the base corners of the triangle. The angles of the surviving corners of the quarry were 60- and 40-degrees. Score lines from where the glass was cut are visible in places. The light created by the lead comes measures 80mm in length and 50mm in height. Two or the soldered corners are somewhat uneven and would have required that the corners of the quarry be clipped and one corner of the surviving sherds was trimmed off to fit into the comes. Some patination. (8760)

Various 1 sherd 2.75mm 36 x 32mm One acute corner sherd from a triangular-shaped quarry, with a 55-degree corner, tip of the corner is missing. Some patination. (8807)

Crown: 95 sherds E4468:6:3630-3637, 3652-3656, 3661-3675, 3679-3681, 3690-3691, 8579-8592, 8642-8652, 8709-8728, 8730-8747

Various 8 sherds 1-2mm 86 x 25mm to 28 x 18mm 3 sherds from the sides of panes, 1 sherd has part of two sides of a triangular-shaped quarry, 1 sherd has the obtuse corner of a triangular quarry and the opposite side with the corner at a 105-degree angle. A complete diamond-shaped quarry of reduced size was also present measuring 2 1/2" x 1 1/2" and with corner angles of 60-, 60-, 115- and 125-degrees. The sides of this sherd were not perfectly straight and the piece is likely to have been made to measure on site. Two additional sherds are from broken small diamond-shaped quarries of slightly different dimensions with two surviving corners, the first at 80- and 102-degrees and the second at 70- and 105-degrees. Some patination (3630-3637)

Degraded 4 sherds 0.75-2mm 46 x 26mm to 11mm x 11mm 3 degraded sherds with rounded rim, probable off-cuts from the edge of a crown of glass, one of which has a distinct rounded ridge before the edge. 1 sherd of light green-coloured glass with part of a rounded rim surviving, probable off-cut from the edge of a crown of glass and similar to 6:8711-8716. Heavy patination (3652-3655)

Clear 1 sherd 1mm 32 x 10mm 1 body window sherd, light patination, slight warping apparent (3656)

Clear 10 sherds 1.2-2mm 41 x 19mm to 27 x 17mm 9 sherds of body window glass, some with evidence of trimming and one from the side of a pane, little patination. 1 sherd with slight warping visible along its length (3661-3670)

Light green 2 sherds 1.5-2.2mm 91 x 44mm to 57 x 22mm 2 body window sherds of crown glass, one with a possible straight edge. Slight warping visible along larger sherd, little patination (3671-3672)

Blue 3 sherds 1.3-2mm 103 x 88mm to 17 x 12mm 1 larger sherd from a square cut pane, 1 small sherd with a cut mark along one side and one smaller sherd from a square-cut corner with grozing visible (3673-3675)

Degraded 3 sherds 1.2-2.5mm 117 x 11mm to 46 x 23mm 3 sherds of glass, 2 refitting with rim or rounded edge, possibly off-cuts from the edge of a crown of glass.

Degraded with heavy patination (3679-3681)

Clear 2 sherds 2.2mm 65 x 50mm to 37 x 16mm 2 body window sherds of crown glass, slightly warped. Very pale green tone, little patination (3690-3691)

Yellow and clear 14 sherds 1-1.75mm 56 x 55mm to 37 x 6mm 9 body window sherds with no clear cut edges, 1 possible triangular sherd from the top or bottom of a leaded light with corner angles of 73- and 60-degrees and the third corner damaged. 4 sherds with evidence of grozing, 1 from a 90-degree corner and one from the side of a pane, 2 with unusual curving edges suggesting they come from panes not conforming to the diamond or triangular window pattern. This could also have occurred during repair work. Some patination (8579-8592)

Green 11 sherds 0.55-1.75mm 48 x 28mm to 24 x 9mm 9 body window sherds with no edges apparent, 1 sherd from the side of a pane and one sherd from the obtuse corner of a diamond or triangular shaped quarry, corner at 110-degrees. Some patination (8642-8652)

Clear 2 sherds 1.2-1.75mm 87 x 57mm to 81 x 54mm Two larger triangular quarries from the top or bottom of a window with corner angles of 75-, 55- and 50-degrees. One near-complete with the tip of one corner missing and marks from where it was cut along one side and a row of small bumps from impurities within the glass, and one near complete with one corner and parts of three sides surviving, made unusual as a large ridged flaw is apparent running across the pane – possibly used in a less important part of the castle (8709-8710)

Light green 6 sherds 0.85-1.9mm 74 x 56mm to 23 x 17mm 6 sherds of glass with rim or rounded edge, three of which refit, possibly from the edge of a cylinder or crown. If it originally formed a pane it could not have been diamond or triangular-shaped, possibly forming a rectangular pane. No edges asides from the rounded edge are apparent. Some patination. (8711-8716)

Green 1 sherd 2.45-4mm 57 x 35mm 1 sherd of thick crown glass with no clear cut edges. Thicker than all the other glass recovered. Possible off-cut from near central bullseye of crown. Little patination though surface of the glass is puck-marked and uneven from degradation (8717)

Blue 5 sherds 0.5-1mm 51 x 36 to 23 x 15mm Two body window sherds with no clear cut edges. One sherd from a triangular-shaped quarry from the side of a window with two sides apparent, with grozing along both and a corner that would have been c. 42-degrees. Two sherds from the corners of larger triangular-shaped quarries from the top or bottom of a window with some grozing apparent and corners of 50-degrees. Degraded with puck-marked surface making identification difficult, however the colour of the glass is very similar to the translucent blue crown glass. Some patination. (8718-8722)

Blue green 6 sherds 0.75-1.45mm 51 x 31mm to 29 x 25mm Six body window sherds, two refitting with a trimmed edge. Three of the sherds are degraded with poorer preservation, however are likely to be similar crown glass. Three of the sherds have visible ripple from the spinning of the crown. Little patination. (8723-8728)

Blue translucent 5 sherds 1.3-2.3mm 84 x 75mm to 30 x 20mm Three body window sherds with no clear cut edges. One sherd with a square-cut corner apparent.

One larger triangular sherd with two possible corners apparent at 55- and 68-degrees, with grozing apparent near both surviving corners. This sherd does not match the other triangular quarries from the top or base of windows in size. No patination. (8730-8734)

Clear 9 sherds 1.6-2mm 42 x 40mm to 27 x 6mm 7 body window sherds with no clear cut edges. One sherd with one side apparent. One sherd with part of the side apparent and scoring from trimming apparent. Little patination. (8735-8743)

Yellow 3 sherds 1.7-2.85mm 29 x 19mm to 25 x 19mm 3 sherds of body window glass, one from the edge of a crown with scoring from where it was to be trimmed apparent. Moderate patination but stable. (8744-8746)

Green 1 sherd 3.35-5mm 43 x 31mm 1 sherd of high quality glass, possibly crown from near central bullseye, thick, with scoring along one side from where it was to be trimmed. No patination. Uncertain whether this is window glass, possibly off-cut from trimming of crown on site (8747)

Plate: 19 sherds E4468:6:3657, 3682-3689; 4377, 8747-8754, 8759

Clear 1 sherd 2mm 25 x 12mm 1 sherd of plate glass, no edges apparent. Slight greyish tint to glass. Similar to Mirror 1 glass. No patination (3657)

Mirror 3 sherds 1.8-2.75mm 53 x 19mm to 19 x 15mm Mirror 1. 1 sherd of plate glass tapering slightly to a rounded edge at one end. No adhesion present but possibly part of same mirror as E4468:6:8749-8750 based on comparable tapering and thickness. 1 body mirror sherd of plate glass with metallic adhesion on the back, of similar thickness to the first sherd. 1 small body sherd of plate glass of similar type, quality and thickness with no metallic adhesion. Slightly grey to green tone to the glass. No patination (3682-3684)

Mirror 1 sherd 3mm 55 x 35mm Mirror 2. 1 body mirror sherd of plate glass with metallic adhesion on the back, possibly part of same mirror as E4468:6:8747-8748 based on glass thickness. Greyish tone to the glass. No patination (3685)

Mirror 1 sherd 4mm 60 x 31mm Mirror 3. 1 sherd of plate glass mirror with a right-angled corner apparent and with metallic adhesion on the back. Possibly from a square cut mirror. Greyish tone to the glass. No patination (3686)

Mirror 2 sherds 2-3mm 70 x 30mm to 76 x 27mm Mirror 4. 1 sherd of plate tapering to a trimmed edge at one end. Likely to be from a mirror. No metallic adhesion present. Greyish tone to the glass. No patination. 1 sherd of plate glass, possible mirror fragment, though no metallic adhesion survives. No patination. Greyish tint to the glass, similar to E4468:3:155. (3687-3688)

Uncertain 1 sherd 2.75-3mm 64 x 29mm 1 sherd plate glass with no metallic adhesion. Light blue to clear tone to glass. No patination (3689)

Mirror 1 sherd 3.35-4.85mm 97 x 30mm Mirror 5. 1 sherd of thick possible plate glass tapering at one end. Very flat and well finished on one side and thicker further from edge on the other. Striations along sides of sherds suggesting it was formed by multiple thin layers of glass, the

method used to form plate glass. Poorly finished on one side with some ripples apparent. Thicker than other mirrors in assemblage but tapered edge suggests it may be part of a mirror. Does not match with any other glass in the assemblage. Not window glass. (4377)

Mirror 2 sherds 3mm 85 x 48mm Mirror 2. 2 refitting pieces of plate glass with metallic adhesion attached to rear. Adhesion contains mercury. One additional body sherd of a similar glass and thickness, though no adhesion is present. No clear cut edges though some of the sides suggest the sides may have been hexagonal or something similar. Mirror fragments with a greyish tone to the glass. No patination. 31g weight. (8747-8748)

Mirror 2 sherds 1.8-2.75mm 53 x 14mm to 28 x 12mm Mirror 1. 2 refitting pieces of plate glass tapering to a rounded edge at one end, with some metallic adhesion to rear. Adhesion contains mercury. One body sherd likely to be from the same mirror with the same thickness and also with adhesion on one side. Mirror fragments with an olive tone to the glass. No patination. 15g weight. (8749-8750)

Uncertain 2 sherds 2.3-3mm 44 x 33mm to 41 x 28mm 2 sherds of plate glass with a greyish tone. The edges of one of the sherds are somewhat multi-faceted, possibly octagonal, and appear intentional. Possibly intentionally cut in a multi-faceted shape, similar to the hexagonally cut example found at Roscrea Castle. Edges also similar to E4468:6:8753, part of Mirror 4, though thickness of glass is different. No patination. (8751-8752)

Mirror 2 sherds 2-3mm 55 x 36mm 3 re-fitting sherds of probable mirror from the tapering edge of the mirror, tapers slightly to a relatively straight edge. Similar to E4468:6:3687. No metallic adhesion present. Greyish tone to the glass. No patination (8753-8754)

Uncertain 1 sherd 3mm 47 x 30mm 1 sherd of possible plate glass with one 90-degree corner evident. The edges are slightly shaped. Different to other possible mirror sherds as there is some patination. The surface is the glass if very smooth and of good quality. (8759)

Degraded: 247 sherds E4468:6:3638-3651, 8248-8470, 8755-8758, 8681-8684, 8822-8823

Various 14 sherds 1-2mm 43 x 35mm to 15 x 14mm 7 sherds from the sides of panes, 1 obtuse-angled corner of a diamond-shaped quarry with a 110-degree angled corner, one corner of a triangular quarry from the top or bottom of a leaded light with a 52-degree angled corner, one corner from a triangular quarry from the side of a leaded light with a 38-degree angled corner and 4 acute angled corners from diamond-shaped quarries with 65-degree angled corners (3638-3651)

Various 223 sherds 1-1.45mm 43 x 35mm to 12 x 6mm 233 body window sherds with no clear cut edges, probably from quarries. Degraded with heavy patination. 129g weight. (8248-8470)

Various 4 sherds 1-1.2mm 63 x 38mm to 16 x 13mm 2 sherds from the side of a quarry pane, one body window sherd and one sherd from the obtuse corner of a diamond or triangular-shaped quarry, with an angle at 110-degrees. To degraded to identify (8755-8758)

Various 4 sherds 1.2-2mm 98 x 36mm to 35 x 30mm One sherd from the obtuse corner of a diamond or triangular-

shaped quarry, one sherd from the edge of a pane. Three refitting sherds of a triangular quarry from the side of a window with two corners surviving, one at 90-degrees and the other at 40-degrees and measuring 44mm in height. One complete triangular quarry from the corner of a window with corner angles of 90-, 60- and 30-degrees, with the tip of the pane slightly clipped at the two acute corners. Very degraded (8681-8684)

Various 2 sherds 1.75mm 14 x 9mm to 10 x 10mm Two small body window sherds of cylinder glass with no clear cut edges. Heavy patination, very degraded (8822-8823)

Context 7

Cylinder: 7 sherds E4468:7:3092-3099

Various colours 7 sherds 0.7-2mm 47 x 45mm to 21 x 11mm 4 body window sherds, likely from quarries. 1 small sherd from edge of pane. One acute corner of a diamond-shaped quarry with a 70-degree corner. One obtuse corner of a diamond-shaped quarry with a 110-degree angled corner. Heavy patination (3092-3098)

Crown: 14 sherds E4468:7:405, 488, 3099-3110

Degraded 1 sherd 2-4mm 52 x 21mm 1 sherd of glass with rim or rounded edge, possibly from the edge of a crown of glass. Degraded with heavy patination. (405)

Clear 1 sherd 1.55-2.1mm 92 x 92mm 1 sherd of corner of rectangular pane. Refits with rest of pane in E4468:2:670 giving a total size of 168 x 110mm for the pane. The corners of the pane are present. The corners are very slightly protruding from the edge of the pane and the edges are roughly but not completely straight. The pane itself is not completely flat. The slightly warped form of the pane suggests it is a low quality crown glass, such as Newcastle glass, however this is unclear. Some patination. (488)

Yellow 1 sherd 2mm 66 x 36mm One acute corner of a diamond-shaped quarry with a 67-degree angled corner. Some patination (3099)

Clear 7 sherds 1.4-1.8mm 52 x 47mm to 28 x 13mm 3 refitting sherds of clear pane with no edges, ripple apparent on larger sherd. Three sherds of green tinted crown glass, two refitting from edge with cut mark along edge apparent. 1 body window sherd. No patination. 8g weight (3100-3106)

Clear blue 2 sherds 1.7-2mm 25 x 35mm to 55 x 3mm 2 body window sherds. Bands apparent on larger sherd. No clear edges. No patination. 5g weight (3107-3108)

Translucent blue 2 sherds 1.5-2.3mm 50 x 48mm Refit together, one sherd from near edge of crown or bullseye. Rim 3mm thick. No clear edges. No patination. Possible off-cut from on-site trimming of crown of glass. 4g weight (3109-3110)

Context 8

Cylinder: 34 sherds E4468:8:58-85, 95-100

Clear and yellow 28 sherds 0.33-1.75mm 50 x 36mm to 13 x 10mm 24 body window pane sherds, probably from

quarries, with no clear edges, degrading badly. Two sherds from the edge of panes, one with cut along edge apparent, both degraded. Two obtuse corners of diamond-shaped quarries with 110-degree angled corners. Moderate to heavy patination (58-85)

Green 6 sherds 1-1.25mm 69 x 20mm to 27 x 22mm All body window pane sherds with no clear edges, dark green to olive green in colour. Some patination. 12g weight. (95-100)

Crown: 5 sherds E4468:8:37, 86-89

Clear 1 sherd 1.5mm 30 x 10mm 1 sherd of clear pane with no clear cut edges. >1g weight (37)

Clear 4 sherds 1.75mm 70 x 27mm to 22 x 15mm Two refitting sherds of thicker window glass, similar to rectangular pane (E4468:2:670), no clear edges. Moderate to heavy patination. Two small sherds with no clear cut edges and no patination (86-89)

Degraded: 5 sherds E4468:8:90-94

Various 5 sherds 0.33-1.75mm 15 x 15mm to 11 x 11mm 5 body window sherds, too degraded to identify (90-94)

Context 9

Cylinder: 21 sherds E4468:9:3531-3542, 3551-3559

Clear and yellow 12 sherds 0.75-1.45mm 49 x 45mm to 16 x 15mm 19 body window pane sherds, probably from quarries with no clear edges. One obtuse corner sherd of a diamond-shaped quarry with a 110-degree angled corner. Moderate to heavy patination. 27g weight (3531-3542)

Green 9 sherds 1-1.45mm 92 x 65mm to 20 x 16mm 8 body window sherds, one large sherd (E4468:9:3551), with no clear edges, probably from quarries. One rectangular sherd (E4468:9:3552) that refits with a sherd in C6 (E4468:6:8593), possibly from a narrow rectangular pane 15mm in width, though is more likely to be part of a larger pane. Moderate to heavy patination (3551-3559)

Crown: 16 sherds E4468:9:423-426, 3547-3550, 3560-3567

Clear 4 sherds 1.4-2mm 55 x 28mm to 20 x 14mm 2 refitting body window sherds with no clear cut edges. Two body sherds with no clear cut edges, one of which was from the edge of the crown and may have been an off-cut from the trimming of the crown. No patination. (E4468:9:423-426)

Various 4 sherds 0.75-1.45mm 39 x 23mm to 49 x 11mm 4 body window sherds with no edges apparent. Moderate to heavy patination (3547-3550)

Yellowish green 2 sherds 2-2.4mm 35 x 26mm to 36 x 18mm 2 sherds from the edge of crown with rounded edge, some tool marks apparent on edge, possibly cylinder at point where cylinder was cut, however the glass looks to be too high quality. Some patination. (3560-1)

Clear blue 2 sherds 1.75mm 35 x 31mm 2 refitting body window pane sherds with no clear cut edges. No patination. (3562-3)

Greenish blue 4 sherds 1.55-1.75mm 98 x 48mm to 20 x 16mm 4 refitting sherds of rectangular window pane

measuring a minimum of 100 x 98mm. Two sides and squared corner apparent. No patination. (3564-7)

Degraded: 4 sherds E4468:9:3543-3546

Various 4 sherds 0.75-1.45mm 35 x 27mm to 26 x 12mm 4 body window sherds, too degraded to identify (3543-3546)

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Unidentified glass

Antoine Giacometti

2:168 Crystal unidentified object, apothecary? tableware? Ornament?

Unidentified crystal item. Comprises a tube of crystal tapering to a closed point at one end, and broken at the other end. A thick band of glass circles the tube 25mm from the point, and may have served to hold the object upright when placed in a hole of 15mm-18mm diameter size. Object may be an apothecary glass, a urinal, a candle holder, a bud vase, a measurer, or similar. Metal is clear with linear striations, no crisseling. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment L 70mm; Internal Diam max (at break) 16mm; External Diam at ridge 18.5mm; Glass thickness 1.4mm.



2:168

3:134 Clear glass unidentified fine object rim/edge fragment, tableware?

Extremely fine fragment of clear glass. Plain slightly-thickened rim is curved as if part of a very broadly flaring rim from a shallow bowl or saucer c. 70mm in diameter. Fragment is probably too fine to be from such a vessel, however. Resembles plain stemware foot, however it is not crystal and is too fine to be a foot. Metal is discoloured and pearly, and slightly opaque. Did not fluoresce under UV light, indicating a non-lead glass. May be related to 3:185. Fragment L 22mm W 19mm T 0.7mm



3:134



3:135

3:135 Clear glass rim or handle from unidentified vessel?

Small fragment of clear glass, either a rim or a handle fragment. Exterior has moulded linear decoration. Fluoresced under UV with strong dark greenish-orange colour, indicating a non-lead glass. No refit with any other vessel. Fragment L 14mm W 9mm T 3.2mm (max, at rim) & 1mm (min).

3:136 Clear glass rim of unidentified vessel, apothecary? Tableware?

Rim fragment of clear glass from an unusually-shaped vessel. Rolled-in rim c. 8mm internal diameter leads to 22mm length straight neck c. 12mm internal diameter, flaring out at the shoulder which is broken. Possibly an unusual form of phial, or apothecary glass such as a urinal. Not same as apothecary crystal vessels 2:168 or 6:4211. Rolled-in rims are not noted elsewhere in the glass assemblage. Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 23mm W 16.5mm T 1mm



3:136



3:185

3:185 Green flat glass fragment, window pane? phial? Tableware?

Fragment of green-hued clear flat glass, slightly distorted. May be part of a pharmaceutical phial or a cylinder glass window pane/pane offcut. The latter is more likely as glass is too flat to be a phial. Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 34mm W 20mm T 1mm.



6:3737

6:3737 Clear glass rim of unidentified vessel, apothecary? Tableware?

Small fragment of clear glass from the rim of a glass bowl or globular glass vessel. Rim is plain and flared. Did not fluoresce under UV light, indicating a non-lead glass. Metal full of air bubbles and has a greenish tint. Heavily eroded and surface shows damage in the form of tiny cracking. No refit with any other vessel. Fragment L 38mm W 21mm T 1.2mm.



6:3781

6:3781 Green glass unidentified object, decorative fitting or flaring bottle?

Body fragment of thick-walled green glass vessel that is heavily discoloured orange/yellow. Possibly part of the decorative fitting or flaring bottle 8:36 & 9:251. Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 62mm W 13mm T 3mm.

6:4201 & 6:4211 Crystal unidentified narrow vessel, apothecary? tableware? Ornament?

Two non-refitting fragments of clear crystal from unidentified very narrow vessel, such as a very fine crystal champagne flute. Very few crystal vessels from the assemblage are this narrow. Refits have been checked with unidentified item 2:168 and with the small fluted wrythen glass 7:419 - the only crystal vessels with bodies this narrow - but this fragment is too thin to belong to either of them. Metal is clear with linear striations, no crisseling. Fluoresced ice-blue under UV light, indicating a lead-base glass. Fragment 4211: L 36mm W 12mm T 0.8mm.



6:4211



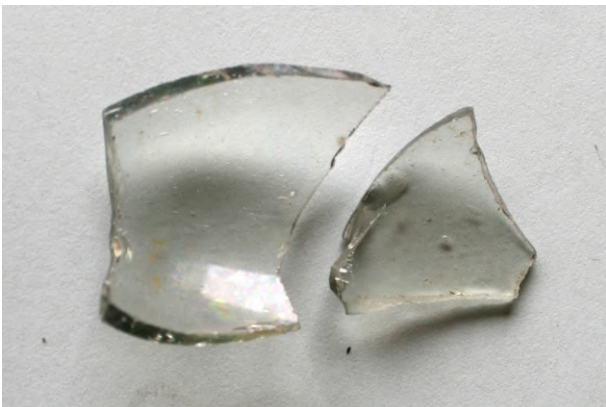
6:4212

6:4212 Partially-opaque 'glass' unidentified object

Extremely fine body fragment of partially-opaque whiteish glass. Material is not certain, and may not be glass. At 0.3mm thickness, material appears too sturdy to possibly be made of glass, and a natural material such as shell is a possibility. Audrey Whitty is confident that fragment is glass (pers. comm. 2016) and has suggested it is not dissimilar to Islamic glass. Body curves in an S-shape very similar to 8:20, but is quite different in thickness and colour. One possibility is that it has flaked off from vessel 8:20. Layered glass and sandwiching metals between thin layers of glass was known in the late 17th century, but this fragment does not appear to come from such a vessel. Fluoresced dark green with low intensity under UV light. Fragment L 31mm W 10.5mm T 0.3mm.

6:4274 & 6:4343 Clear glass unidentified vessel, apothecary? Tableware?

Two fragments of non-refitting clear glass, probably from the same vessel. Vessel is small and globular, with a maximum diameter of c. 32mm. Both fragments are body shards. Metal is thick, clear and slightly grey. Both fragments fluoresced with an intense pale-orange-white reading, which was very unusual, and may indicate made of glass with both soda and lead components. Colin Brain (pers.comm. 2015) has identified late 17th century lead-soda glassware from Holland. More rigorous analysis would be required before suggesting a lead-soda based glass, however. Audrey Whitty has suggested (pers. com. 2016) this may belong to a decorative glass object rather than a vessel. Fragment 4274 L 32mm W 25mm T 12mm. Fragment 4343 L 31mm W 31mm T 3mm.



6:4274 & 6:4343

6:4459 Green-blue glass unidentified object, large jar/bottle base?

Thick fragment of flat glass, Much thicker at one end than the other. Possibly an offcut from a disk of crown window glass discarded by the glazer as an offcut. Similar in colour to apothecary glass vessel 9:171, and could be part of the base. Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 60mm W 56mm T (max) 12mm T (min) 4.1mm.



6:4459

6:4641 Glass diormama decorative item

Small glass prunt (ie blob of glass applied to a glass object as a decoration, and sometimes drawn to a point or impressed with a pattern or mask) or part of glass diorama (see Judith Carroll report). Discoloured black, and original colour not visible. Hemispherical in shape 12.5mm diameter, 5mm max thickness.



6:4641 front and back

6:8230-8232 Green flat glass fragments, window pane? phial?

Smaller fragments of same type as 3:185. Probable window glass or phial glass. Not photographed.

7:427 Clear glass unidentified fine object, modern?

Extremely fine fragment of clear glass. Contains numerous air bubbles and does not appear to be crystal despite its thinness. At 0.3mm thickness, material appears too sturdy to be historic glass and may be a modern intrusion. Curves on all sides indicating a globular form, eg. some form of lightbulb? Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 21mm W 12mm T 0.3mm.



7:427

8:20 Clear glass unidentified vessel, bowl?

Extremely fine body fragment of clear glass vessel. At 0.4mm thickness, this is one of the thinnest fragment of glass in the assemblage. Contains numerous air bubbles and does not appear to be crystal despite its thinness. Body curves in an S-shape. Possibly part of the glass bowl. Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 34mm W 19mm T 0.4mm.



8:20



8:36



9:251

8:36 & 9:251 Green glass unidentified object, decorative fitting or flaring bottle?

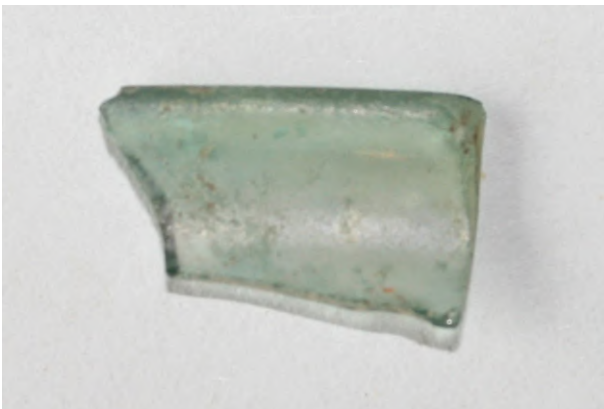
Two fragments of non-refitting thick-walled green glass that are heavily discoloured orange/yellow. 8:36 is a rim fragment with flaring rim 125mm diameter, narrowing to short neck then flaring to wide body. A ridge of glass on the interior surface and smaller adjacent ridges represent either a manufacturing imperfection, or part of a leaf-like design. If the latter, the object may be part of a light fitting and the rim may be a foot. The second smaller fragment 9:251 is a body sherd with part of the ridge visible. Did not fluoresce under UV light, indicating a non-lead glass. Fragment 8:36 L 900mm W 470mm T (max at rim) 50mm T (min in body) 1.5mm. Fragment 9:251 L43mm W 18mm T 1mm-3mm.



9:171

9:171 Green-blue glass unidentified vessel, apothecary? Phial?

Thick-walled green-blue glass fragment of vessel with very unusual form. Thickened plain vertical rim of c. 45mm diameter with long straight neck 80mm length leading to sharp shoulder, broken. Possibly a globular apothecary flask. Metal contains numerous air bubbles. Did not fluoresce under UV light, indicating a non-lead glass. Fragment L 83mm W 49mm T (max, rim) 4.5mm T (min) 1.9mm.



9:253

9:253 Green glass unidentified rim, windowpane offcut?

Small rim fragment of green glass. Slightly flared and thickened rim. Curve very slight, indicating a very large diameter. This suggests fragment comes from a distorted and very fine pane of cylinder glass or crown glass, possibly cut off during glazing. Did not fluoresce under UV light, indicating a non-lead glass. No refit with any other vessel. Fragment L 17mm W 10mm T 2mm (max, at rim) & 1.4mm (min).



6:339

9:260 glass blob, glass-making waste? Prunt/seal?

Plain glass blob, appears to be of glass-making waste but context makes this unlikely. Perhaps a prunt or seal fragment from a vessel similar to 6:4641. Clear glass. L 17mm W 11mm T 7mm. Not photographed.

9:339 Clear glass unidentified vessel, apothecary? Phial?

Rim fragment of small clear glass vessel, perhaps a scent bottle. Rim is everted and flat, and the break is directly below the rim. Glass is discoloured dark brown. Internal rim diameter of vessel would have been 10mm. Fragment 15mm by 4mm by 2mm.