

Report on the metal- and glassworking  
remains from South City, Dublin (15E0272)

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## Introduction

During archaeological excavations ahead of infrastructure works between Stephen's Green and O'Connell Bridge in the southern part of central Dublin, just under 3kg of waste from both glass- and metalworking. The glassworking debris is likely associated with a glass house operating between 1734 and 1741 on Fleet Street while the material related to metalworking (iron smithing, iron and copper-alloy casting) could have been produced in a number of nearby foundries and forges during the 18<sup>th</sup> and early 19<sup>th</sup> centuries.

## Description of the remains

### *Glassworking*<sup>1</sup>

At the eastern end of College Street, fragments of glass production waste were recovered from rubble infill C117. The material consists of a chunk of blue glass (Fig. 1) and threads of dark green glass (Fig.2).

Broadly halfway College Street, stone-lined drain C058 yielded a fragment of light green glass waste (Fig. 3) and a dark green glass thread with a probable tool mark (Fig. 4).

About 5m to the west, more dark green glass threads were found in compact clay layer C333 and in mortar rich layer C330. The latter layer also contained a small fragment of dark green likely glass waste with frequent air cavities.

### *Ironworking*

Close to the junction of College Street and Westmoreland Street, a fragment of dark green glassy foundry slag (Fig. 5) was found within a rubble surface (C008) while a similar piece was recovered from clay deposit (C007) towards the northern end of Westmoreland Street. Broadly halfway Westmoreland Street, three fragments of blue slag (Fig. 6) and a fragment

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<sup>1</sup> I would like to sincerely thank Justine Bayley for her assistance with identifying the glassworking waste.

of black glassy slag were recovered from a cobbled surface (C022) while ten pieces of blue and green glassy slag (Fig. 7) were found in cobbled layer C003.

A double smithing hearth cake (Fig. 8) and other smithing debris was recovered from metalled surface C025 located to the north of the junction of Westmoreland Street and Fleet Street. The material includes likely smithing pan and pieces of iron-rich waste with a flat surface, possibly where it adhered to the hearth wall.

A small fragment of possible iron smithing slag was recovered at Stephen's Green from fill C126 of ditch C127.

### *Copperworking*

The metalled surface (C025) uncovered on Westmoreland Street which yielded iron smithing waste also contained fragments of heat-affected clay with inclusions and adhering copper-alloy material (Fig. 9). Some pieces have a smoothed surface. Most likely these are fragments of a large crucible or perhaps more likely a mould for the casting of a large copper-alloy object such as a bell.

## **Discussion**

### *Glass*

Glass production in central Dublin took place from around 1675, when a glass house was erected in St. Michan's parish, and shortly after 1784, when the founding of new houses was made illegal (Westropp 1920: 37, 47). All the glassworking waste currently under study was found along College Street and the only glass house known to have been active in the area was established around 1734 in Fleet Street, nearly opposite Price's Lane (ibid.: 47-49). Production is likely to have stopped at this glass house in 1741.

The larger fragments of glass waste were probably raw glass, used to charge the furnace, or possibly material which had solidified at the base of the furnace while the threads formed

as the liquid glass was dripped from an iron bar to assess its readiness to blow (Dungworth and Cromwell 2018: 43). One of the threads has a tool mark.

### *Iron- and copperworking*

In the 18<sup>th</sup> and 19<sup>th</sup> centuries, iron would have reached Dublin in several forms: as finished objects of both steel, cast and wrought iron<sup>2</sup>, as wrought iron bars for further forging or as cast iron ingots. Until 1780, iron was still produced from its ores in Ireland, at Mountrath, Co. Laois and Enniscorthy, Co. Wicklow, but after that all iron was imported.

Green to blue glassy slag is the typical waste of either the blast furnace, which produces cast iron from iron ore, or from the foundry, which makes cast iron objects from cast iron ingots ('pig iron'), and can be very hard to distinguish (Young 2011:18). As there was no iron smelting carried out in recent times in or near Dublin, the slag is the waste from a foundry.

Smithing hearth cakes are the characteristic waste of smithing and consists of the vitrified mix of ash, iron lost in the process, fluxes and hearth materials. Double cakes form when the hearth is not cleared and the cake from the previous smithing session left in place. Smithing pan is the layer of iron-rich debris which had accumulated around the smithing hearth. The smithing waste would have been produced in a forge where bars of wrought iron were converted in objects.

The metalworking waste was recovered from Westmoreland Street with both the smithing and copper-alloy working remains being concentrated in the middle of that street.

The copper-alloy crucible or mould fragment could have either been made and used in-situ, for the casting of a large copper-alloy piece, or have been part of a bronze or brass foundry.

Iron foundries are known to have been active at College Green between 1766 and 1786 and at Aston Quay between 1804 and 1834 (Goodbody 2014: 54).

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<sup>2</sup> Wrought iron can be forged whereas cast iron, which has a higher carbon content, cannot. Steel has an intermediate content which needs to be evenly distributed within the iron.

Forges close by are recorded on Aston Quay 1823, possibly associated with the foundry mentioned above, and on Fleet Street in 1828 (ibid.: 56-57). An unlocated Anchor Smith's Yard in the nearby Temple Bar area (1729) (Lennon 2008: 10).

Further away, at Luke Street, a foundry was active from the 1750s till at least the 1780s (Goodbody 2014: 54). While the production of cast iron objects was the main activity, both brass casting (Dublin Journal 1 December 1774) and iron forging (Dublin Journal 8 July 1777) took place at this establishment.

## **Conclusions**

The material from South City (15E0272) consists of waste from four distinct processes: glassworking, blacksmithing and iron and copper-alloy casting work.

The remains of the production of glass is likely dated to between 1734 and 1741 when a glass house was active on nearby Fleet Street.

The waste from metalworking could belong to several foundries and forges working in the immediate area in the 18<sup>th</sup> and early 19<sup>th</sup> centuries.

## **Recommendation for future research**

As the ingredients in glass production changed significantly over time, chemical analyses of the glass waste can provide indications of the period within which it was produced (Painter S. and Dungworth D. 2018: 53). However, the time windows are rather large, one covering the 18<sup>th</sup> to early 19<sup>th</sup> centuries, during which kelp was generally used in glass manufacture. As this is broadly the period within which glass was made in central Dublin, the likely production date of 1734 to 1741 would not be confirmed nor contested.

Analyses of the copper-alloy associated with the crucible/mould fragments would show which type of metal was used. This could give indications of the date of production and the possible types of objects made.

### **Recommendation for retention**

The following retention categories should be applied:

**Highly Significant:** The glassworking waste: as it is likely dated very precisely (1734 to 1741) the glassworking waste should be retained as reference material for future analytical and typological studies. Sample numbers 8, 9, 10 and 12.

**Moderate Significance:** The copperworking and foundry waste: although potentially of interest for further analytical and typological studies, the fact that the material is not closely dated means it has limited value. Sample numbers 7, 18, 22, 23 and 29.

**Low Significance:** The iron smithing waste: this assemblage has limited value due to the lack of dating evidence and the limited information to be gained by analyses. Sample numbers 24, 25, 26, 27 and 28.

### **Bibliography**

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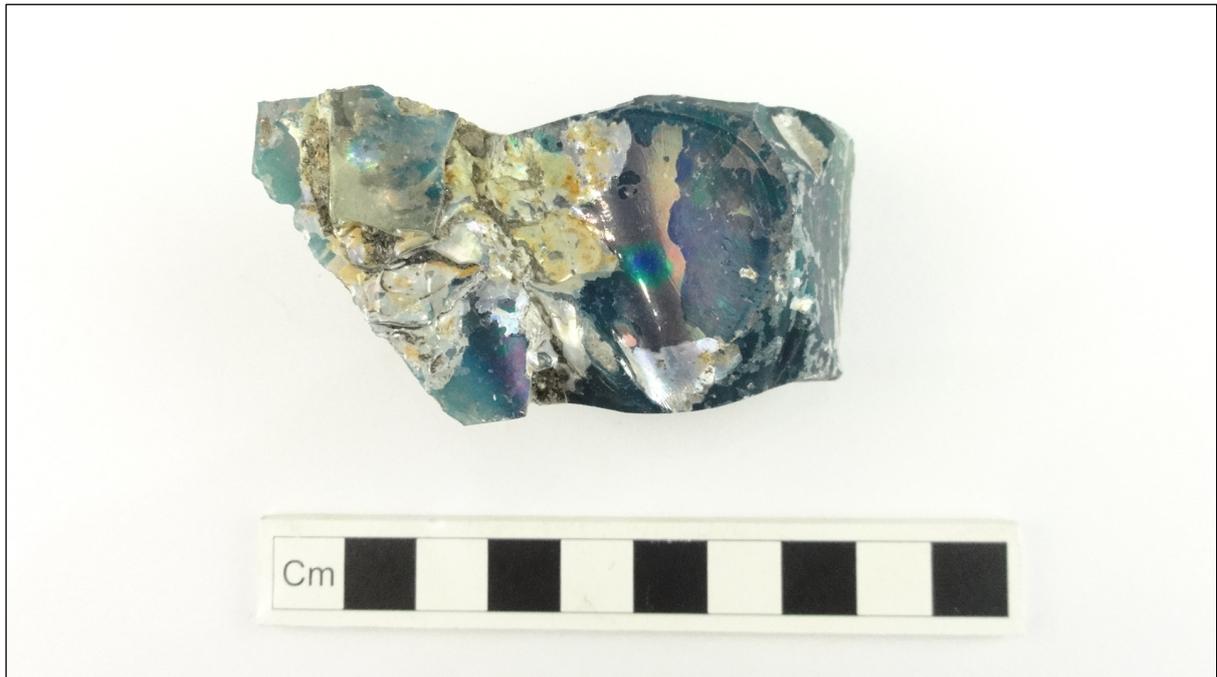
## Catalogue

SG = Stephen's Green, GS = Grafton Street, CS = College Street, WM = Westmoreland Street

Section	Context #	Feature description	Sample #	Material description	Weight (g)
SG	126	Fill of ditch C127	24	Small fragment of rather dense slag	4
CS	008	Rubble surface	22	Fragment of a lump dark of green glassy slag with frequent air cavities	57
CS	058	Stone-lined drain	8	Fragment of a lump of light green glass with frequent air cavities	66
CS	058	Stone-lined drain	8	Fragment of a dark green glass thread with tool mark	2
CS	117	Rubble infill	12	Chunk of blue glass production waste	91
CS	117	Rubble infill	12	Fragment of dark green glass, possibly part of a vessel	17
CS	117	Rubble infill	12	Five fragments of dark green glass threads, two folded over	6
CS	330	Mortar-rich layer	10	Small fragment of dark green glass waste with frequent air cavities	5
CS	330	Mortar-rich layer	10	Two pieces of dark green glass threads	3
CS	333	Compact clay	9	Four dark green glass threads	9
WM	003	Cobbled surface	18	Four fragments of blue glassy slag, some with frequent air cavities	227
WM	003	Cobbled surface	18	Six fragments of dark green glassy slag, frequent air cavities	80
WM	007	Clay deposit	23	Fragment of dark of green glassy slag with frequent air cavities	63
WM	022	Cobbled surface	7	Three pieces of light blue slag	318
WM	022	Cobbled surface	7	Fragment of rather light black glassy slag. Some light blue parts also	90
WM	025	Metalled surface	25	Rather dense, double iron-rich SHC with coal inclusions	873
WM	025	Metalled surface	25	Non-magnetic fine grained material. Not	2

				related to industrial activity	
WM	025	Metalled surface	26	Three pieces of rather light to rather dense smithing slag	83
WM	025	Metalled surface	26	Three fragments of iron-rich slaggy waste with stone inclusions. Each piece has a flat edge, possibly where the material was adhering to a hearth wall	84
WM	025	Metalled surface	26	Irregular piece of waste iron	55
WM	025	Metalled surface	26	Multiple small to medium-sized pieces of iron-rich waste, some appear to be smithing pan	95
WM	025	Metalled surface	27	Multiple fragments of waste iron and iron-rich debris	129
WM	025	Metalled surface	27	Fragment of heat-affected clay with a layer of green copper-alloy on its interior. Likely crucible/mould fragment.	6
WM	025	Metalled surface	28	Five pieces of rather dense iron-rich slag some with coal inclusions	321
WM	025	Metalled surface	28	Bag with small to medium grained material. Mainly slag and iron fragments	24
WM	025	Metalled surface	29	Six fragments (3 fitting) of heat-affected clay with both inclusions and adhering copper-rich material. A dark adhering crust has inclusions of coal. Fragment of large crucible or mould	263

**Figures**



*Fig. 1. Chunk of blue glass from rubble fill C117, College Street*



*Fig. 2. Dark green glass threads from rubble fill C117, College Street*



*Fig. 3. Light green glass waste from stone drain C058, College Street*



*Fig. 4. Dark green glass thread with toll mark from stone drain C058, College Street*



*Fig. 5. Fragment of green foundry slag from rubble surface C008*



*Fig. 6. Fragment of blue foundry slag from cobbled surface C022*



*Fig. 7. Blue foundry slag from cobbled layer C003*



*Fig. 8. Double smithing hearth cake from metallised surface C025*



*Fig. 9. Likely crucible/mould fragments from metallised surface C025*