

Post-medieval glass manufacture at Hopton Street in Southwark

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with a contribution by J. Butler

Introduction

PRE-CONSTRUCT Archaeology was commissioned by the Manhattan Loft Corporation Ltd to undertake a variety of archaeological work on land at 47-67 Hopton Street. The work was carried out in various phases between November 1994 and March 1997, according to the construction program. Following evaluation works six areas, including a series of eight pad foundation trenches and one test pit (area 3), were archaeologically excavated. The location of the areas is set out in Fig. 1.

Evidence for prehistoric occupation formed the basis of an article in the previous issue¹

During the early post-medieval period the land was reclaimed and this area of Southwark became notorious for theatres, such as the *Swan* and *Globe*, and more licentious forms of entertainment. From the late 17th century, glassworks and other industries such as potteries and clay-pipe kilns, occupied the surrounding area. By 1746 buildings occupied the central area of site, centred on Jackson's Court; they may have been the Falcon Glasshouse of Francis Jackson and John Straw, glassworkers established in the area by 1693. By 1803 the Falcon Glassworks had been taken over by Pellatt & Green and remained as a working glass-house until 1878, when the company moved to Pomeroy Street, off the Old Kent Road². Domestic residences and a school, established by 1713, occupied the area to the south.

Construction of a tidal mill pond and land drainage

Excavation at the far north of the site, in area 1 (Fig. 1) revealed a layer of very sticky dark clay silt containing frequent sand lenses and mollusc shells. This waterlain deposit has been interpreted as being associated with the historically documented mill pond known to have been on the site by the

mid 16th century (see Fig. 2). The southern edge of the pond was located; it appeared to have been re-cut several times, probably by natural agencies, and laminations within the deposit may indicate frequent attempts at dredging followed by silting up. A group of timber posts observed close to the southern edge of the pond possibly represent the remains of revetments.

A substantial watercourse was observed at various locations running north-south through the site. It was filled with bluish grey and orange brown clays with some sand in the lower deposits. Extrapolating the known eastern and western edges of this feature suggests an overall width of around 6.8m. Two parallel lines of timber posts found in the base of this channel, aligned south-west to north-east, may have supported some form of bridge or walkway crossing the channel, or else a sluice gate or similar structure. Root activity was noted, preserved by iron panning, in the clays and sands to the east, increasing in density towards its edge and may indicate an open, though perhaps overgrown area, possibly marshland. A further east-west watercourse apparently drained into the north-south channel from the east. Both channels would have drained into the tidal millpond located at the northern end of the development site. Pottery from the initial silting of these watercourses has been dated to the late medieval to early post-medieval periods³.

Although the excavations only revealed a small area of the pond, the cartographic evidence shows that it occupied most of the northern end of the development site from at least the mid 16th century. Indeed the present curve visible at the north end of Hopton Street and Holland Street reflects the curving edge of this pond. It seems likely that the watercourses represent historically documented ditches associated with the millpond.

1. Victoria Ridgeway 'Prehistoric finds at Hopton Street in Southwark' *London Archaeol* 9, no. 3 (1999) 72-6.

2. Roy G Bendrey, *A History of the Falcon Glasshouse at Hopton Street, Parish of Christ Church, Southwark, c. 1814-1878* unpub.

report (1994)

3. Frank Meddens *The Post-Medieval Pottery Report, Hopton Street* Pre-Construct Archaeology unpub. report (1998).

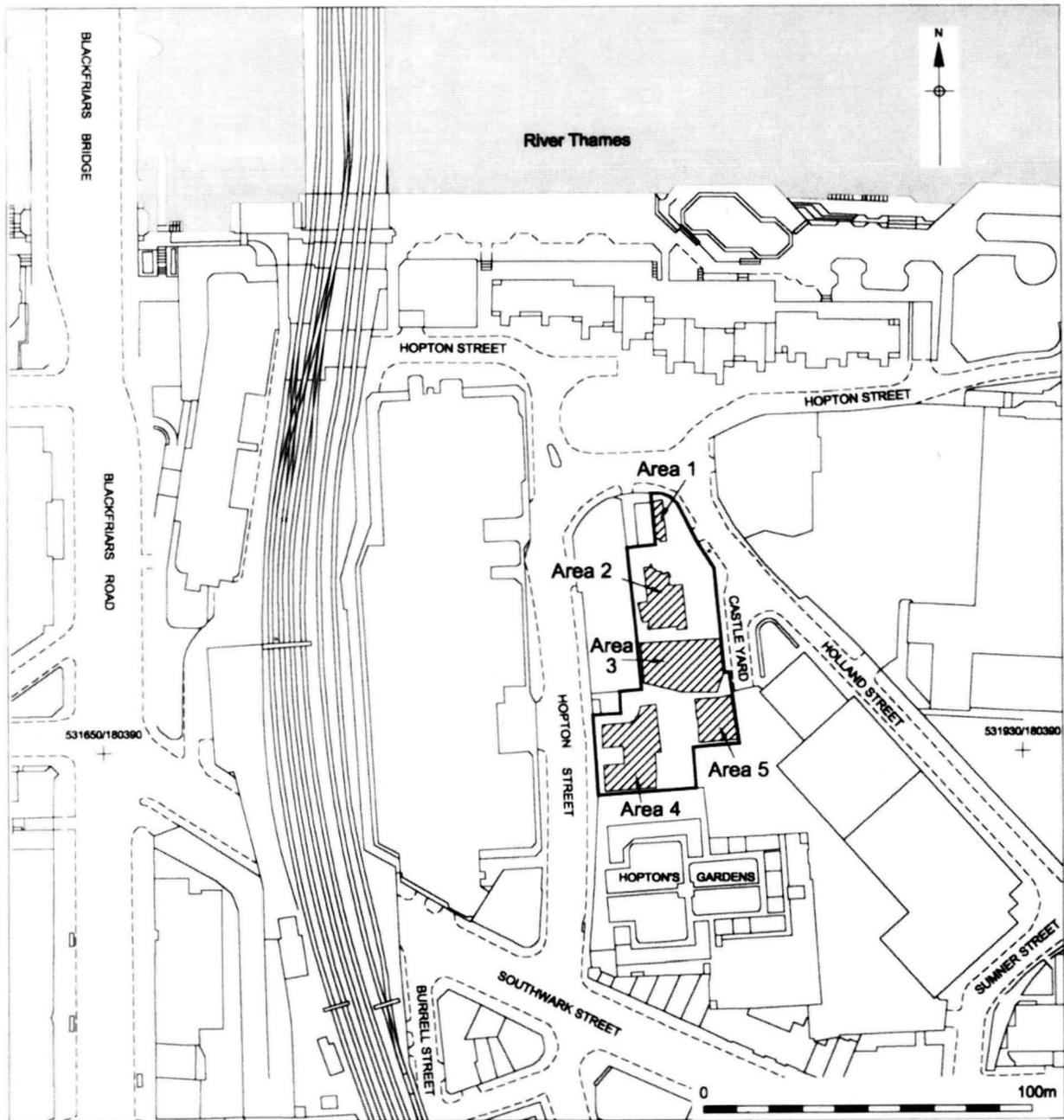


Fig. 1: site and trench location

The mill would have exploited the natural low-lying marshland environment, drawing on the tidal forces of the river. The mill relied on water flowing through lock gates and a culvert into the pond, and up through a system of ditches extending for more than half a mile to the south. Here the water would be held till low tide, when it

would be released to flow back forcefully into the Thames, thus powering the water mill, which was located to the north of the development site, between the mill pond and the river. Streams and drainage ditches would have traversed the site and hinterland during this period, draining into the ditches and the millpond.

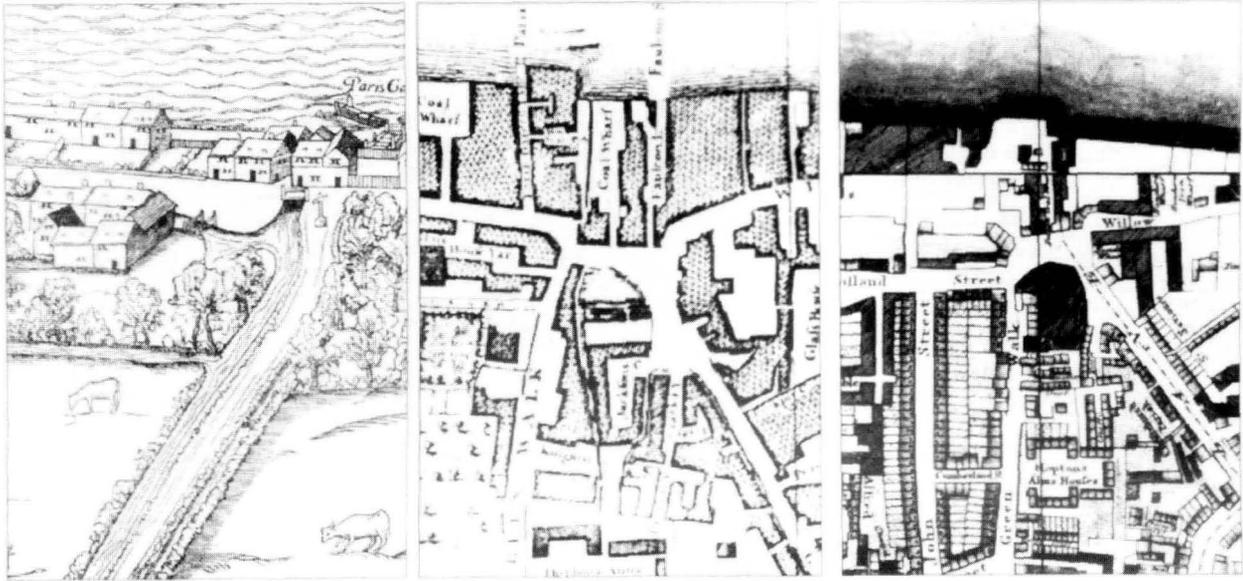


Fig. 2: the 'Agas' map, 1561-1570 The 'Rocque' map, 1746 The 'Horwood' map, 1799

No structures were found associated with this phase of activity, although as already mentioned the mill itself would have been located beyond the areas of investigation. The archaeological record provides no indication of the mill's function and historically its original purpose remains obscure; early references are to Wideflete Mill, the site being located towards the eastern boundaries of the manor of Wideflete, known to have been held by Bermondsey Priory and the Knights Templar in the 12th and 13th centuries⁴. In the later medieval period the manor changed its name to Parish or Paris Gardens and by the early 18th century the pond was referred to as "Pudding Mill Pond", the main watercourse being "Pudding Mill Stream". This name has been interpreted as deriving from puddling and refers to the mixing and tempering of clay in a mill for use by potters and glassmakers⁵, and thus may indicate a connection with early glasshouses in the vicinity.

Post-medieval land reclamation

The observed watercourses were deliberately filled in and a series of mixed dumps containing brick rubble, mortar, pottery, clay pipe and oyster shell were deposited over the infilled features and alluvial clays. These dumps raised the ground level by up to 1.1m to overcome the marshy conditions prevalent during the medieval period and prepared

the ground for subsequent building. The pottery recovered from these dumps infer deposition over an extended period of time, beginning in the 17th and continuing into the first half of the 18th century. Interspersed with the dump layers were various pits, suggesting that as the land was reclaimed it was used for the dumping of rubbish, including materials better buried than openly dumped. It is also possible that some of the earliest pits were primarily used for the extraction of alluvial clays for use in nearby industries.

The millpond and a substantial watercourse, apparently to the west of that seen during excavations, survived until at least 1746 (according to Roque's map of that date) but had been infilled by the time of the production of Horwood's map, in 1799 (Fig. 2).

The early glasshouse and contemporary structures

Cutting through the land reclamation dumps and built over them were the remains of a glasshouse. It comprised a brick built glassworking kiln with a central furnace area 0.70m wide and c. 3m long, between two opposing "sieges", semi-circular brick platforms to either side of the furnace upon which stood pots for the melting of glass. Extending to the north and south were large subterranean flues,

4. Christopher Philpotts *Hopton Street Documentary Research Assessment* Pre-Construct Archaeology unpub. report (1998)

5. Roy G Bendrey, *op. cit.* fn 2.

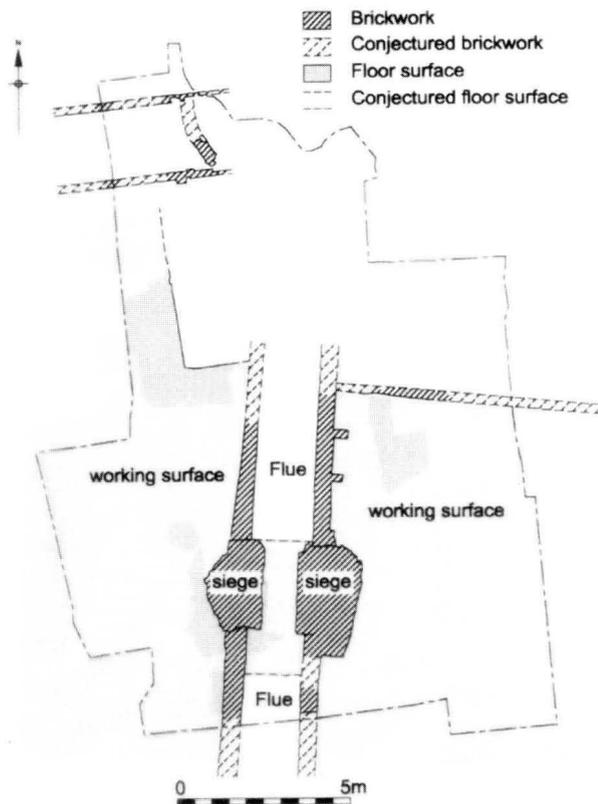


Fig. 3: the early glasshouse, area 1

1.70m wide internally, into which the sieges had been set (Figs. 3 and 4). Air would have been drawn into the furnace from the outside by means of the subterranean flues, and the fire would have been built above the flues on a metal grate set between the sieges (see Fig. 5 for a contemporary representation of a similar type of furnace). The structure, sieges and flues appeared to have undergone several rebuilds, some major, some representing only minor repair work and patching up. The sieges, in particular, showed evidence of having been completely replaced as they were the elements of the structure closest to the fire itself, thus the most prone to burning and damage, and therefore likely to need replacing before the flue walls. The sieges themselves would have extended further into the flue, but had been truncated, initially only slightly at the base for the replacement of floors, but subsequently and more drastically for the building of a later wall. Brick dating suggests that the largely rebuilt structure dated from the mid 18th century with modifications and repairs taking place towards the end of the century⁶.

The base of the northern flue element was heavily pitted with many small depressions of an irregular,

6. Ken Sabel *Building Materials Assessment, Hopton Street* Pre-Construct Archaeology unpub. report (1998).



Fig. 4: the early glasshouse, under excavation, looking south
amorphous nature, containing industrial waste such as glass, slag, coke and charcoal. These appeared to have resulted from a continuous process

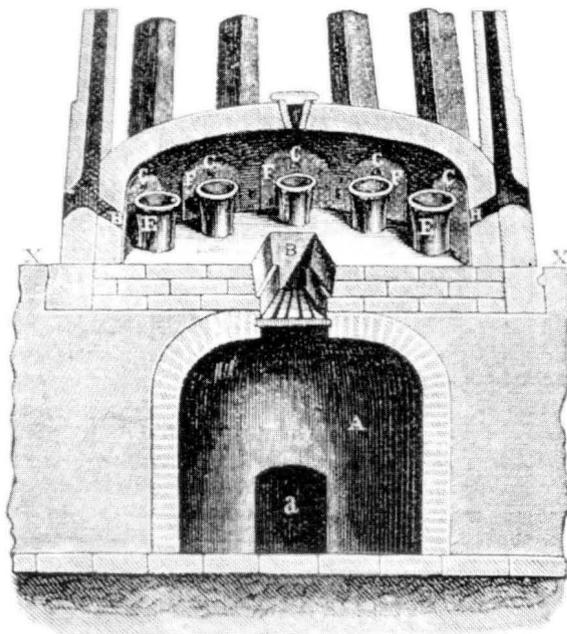


Fig. 5: early 19th-century illustration of a section through a glass furnace, taken from Diderot and D'Alembert

of raking-out hot coals from the base of the flue, and suggest that the original structure had a simple clay floor, and that the raking-out took place from the north. The flue base was later strengthened by the insertion of a brick and limestone floor. The intense heat and continual raking-out process finally destroyed this floor, which was repaired by a circular and two rectangular iron plates, surrounded by flagstones (visible in the base of the flue on Fig. 4). The plates did not appear purpose made for the flue base and may well have been re-used "marvers", polished iron plates originally set on wooden tables and used in the glass making process for rolling of glass to smooth and shape it prior to blowing.

Three internal floor surfaces constructed of mortar and tile and the fragmentary remains of partition and foundation walls to the east of the furnace, together with a more substantial cobbled surface to the west indicate different working areas to either side of the sieges. To the north were the remains of associated glasshouse structures focused on an 'L' shaped cobbled and tiled surface with a central drain. These were later added to and modified by the construction of east-west walls to the north and south of the cobbled surface which appeared to be internal divisions, possibly dwarf walls that supported timber superstructures. It appears that glass working was taking place to the east and probably to the west of the kiln, in part of the same building, whilst the ancillary structures to the north were used for other, but related, activities.

The kiln structure and wall elements to the north have been dated to the latter half of the 18th century, with evidence of continuity into the early 19th but there are some indications of earlier building. The glass working area, ancillary structures and the flue and furnace themselves showed evidence of modification, repair and replacement over time, and the mid eighteenth century date given for the brickwork may well represent a substantially modified structure which had been in existence for some time.

Various heavily truncated building elements survived, in area 4 to the south-west of the site. These included the remains of a basemented building along the Hopton Street frontage (formerly Green Walk, see Horwood map, Fig. 2). Similarities in

construction design, as well as subsequent rebuilding and alterations, taken in conjunction with the available dating evidence, suggest that this may have been contemporary with the so-called "Nell Gwynn's House", a 17th-century domestic residence, extant and adjacent to the north. Other building remains in area 4 probably represented the remains of a school founded in 1713, later documented as the Christ Church Parochial School. A quantity of pins in various stages of manufacture, found in the silting of a culvert, suggest a pin manufactory on the site⁷.

Glasshouses were recorded in the area from as early as 1688 when a petition was sent to James II requesting that His Majesty "would put a stop to the erection of such glasshouses till they be heard". Glasshouses were known to be located on the west side of Hopton Street and to the north-east in the vicinity of the present Bankside Power Station, Rocque's map of 1746 shows a "Glasshouse Yard" in both these locations. In 1803 Pellatt & Green took over the business of A T & J Cox of the Falcon glasshouse on the site, and this is probably the Falcon Glasshouse owned by Francis Jackson and his partner John Straw established before 1693⁸. Rocque indicates "Jackson's Court" in this location by 1746 (Fig. 2).

There are intrinsic problems with analysing waste glass from a production site, as material was often imported for use as cullett, and it can be difficult to differentiate between this, those vessels used by staff in the workplace and the products being manufactured⁹. Nevertheless combining documentary evidence (which is certainly in abundance for later phases of glass working at Hopton Street) and analysis of waste retrieved from site can help build a picture of the range of vessel types manufactured and the date range represented. The earliest waste glass retrieved from the site dates from the late 17th century and consists primarily of fine drinking vessels, with a preponderance of pharmaceutical phials from the mid 18th century onwards, though the waste indicates the continued production of fine wares¹⁰.

It has been argued that the furnace would have been set within a cone¹¹, though no evidence of the foundations or walls, which would be anticipated in association with such a structure, were found. Comparison with known mid-18th-century cone

7. Ian Riddler *The Small Finds from Hopton Street* Pre-Construct Archaeology unpublished report (1998).

8. Colin Brain, *pers. comm.*

9. John D Shepherd *The Glassworking debris and vessels: an*

assessment and preliminary catalogue Pre-Construct Archaeology unpublished report (1998).

10. John D Shepherd, *op. cit.* fn 9.

11. Roy G Bendrey, *op. cit.* fn 2.

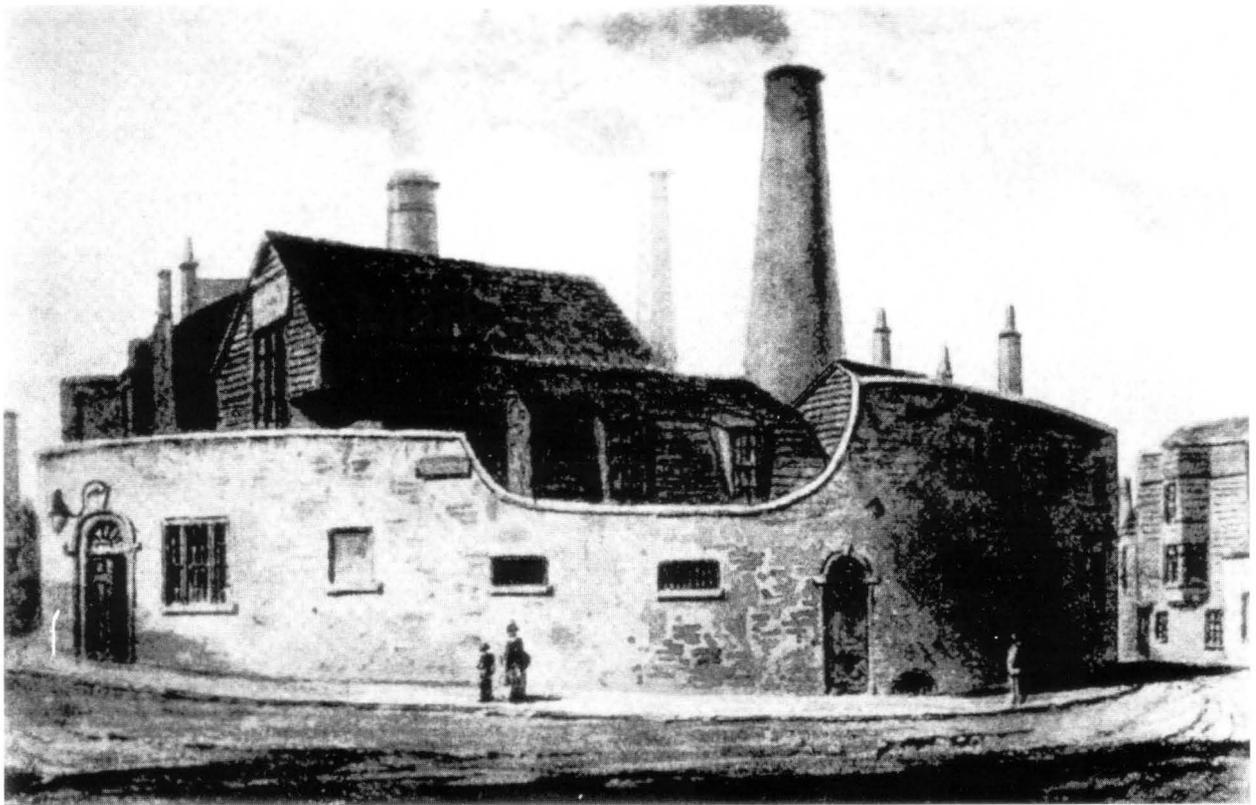


Fig. 6: 1827 view of Hopton Street exterior from the north

glasshouses suggests that any surviving cone remains would be likely to have been truncated within the area of excavation, except in the area immediately north of the furnace, where a suite of ancillary rooms with cobbled floors were encountered. It has been suggested that the glasshouse was more likely to have been housed within a rectangular building¹², as early drinking glass manufactories were housed within rectangular buildings whilst, until at least the mid 18th century, cone-type glass houses were used specifically for the manufacture of bottle glass. This suggestion correlates well with the cartographic evidence; Rocque's map shows a rectangular building in the location of the excavated furnace.

In addition, the map shows that the millpond, and perhaps therefore the mill, remained, possibly being used to puddle the clay for manufacturing the pots and crucibles necessary for the glasshouse.

The Apsley Pellatt Glasshouse

Two substantial parallel, brick built, stepped wall foundations, orientated north-south, cut through elements of the earlier glasshouse. The western foundation was built into the base of the earlier

flue, on a slightly different alignment, and partially demolished the western flue wall and the sieges. Parallel to this, 4.7m to the east, was a foundation of identical build, though resting on a timber raft, as it was constructed over the soft deposits filling the large north-south watercourse beneath. Similar wall foundations were observed to the east and north-west in association with dumps of cullett and what appeared to be frit (a salmon-coloured compound comprising a combination of sand, lead oxide, red lead, carbonate of potash and saltpetre, used for the manufacture of flint glass). The walls were dated to the late 18th to early 19th centuries.

These remains were presumably part of the well-documented glasshouse of Pellatt and Green, known to have been built by at least 1814. It seems likely that after moving to the site, some time before 1803, Pellatt and Green at first made use of the existing structures and some of the later modifications to the early glasshouse may have been carried out by their partnership. However, this phase of construction represents a major redesigning and rebuilding of the glassworks and an illustration of 1827 shows at least two high chimneys on site (Fig. 6). Associated glass waste recovered

12. Colin Brain, *pers. comm.*



Fig. 7: interior view Falcon Glasshouse, c. 1840, from Brayley's *History of Surrey*, Vol. V

from the excavations contained some good quality table wares including a stem fragment comparable to one illustrated in a trade catalogue produced by Apsley Pellatt in 1840. The importance of the Falcon Glasshouse was founded on the quality of the glass produced, especially cut glass. According to an Excise Inquiry of 1835 it was “decidedly the largest in London”, but in national terms of size and output it was a modest concern. Unfortunately no evidence of a furnace associated with this phase (Fig. 7) was seen, suggesting that such a structure may have been located in an area subsequently heavily truncated.

Additions and modifications to standing buildings

The western wall of Pellatt's glasshouse was rebuilt as a far more substantial foundation, possibly necessitated by the collapse of the earlier wall, as a result of it being built over the soft deposits filling the underlying watercourse. Another modification was the construction of large ovoid brick culvert at least 4.2m long by 1.4m wide and 1.9m deep, providing drainage for the glassworks. A far greater range of glass waste was associated with

13. John D Shepherd, *op. cit.* fn 9.

this phase of activity and included flint vessels (especially wineglasses) and pharmaceutical phials. Flint glass is a type of colourless glass with a high lead content resulting in exceptional brilliance. It has been suggested that this major rebuilding phase coincided with Apsley Pellatt's decision to give up glass making entirely for a period in the 1830s in response to a high glass excise¹³. It may be no coincidence that he decided to close down his operations at a time that his glass house required rebuilding¹⁴.

Modifications and additions were made to the buildings to the south throughout this and the preceding phase. The school had expanded considerably from its early foundation, for 26 “Poor Housekeepers' Boys” in 1713, to catering for 130 boys and 80 Girls by 1821 as demonstrated on a plan of Christ Church Parish of that date.

Later 19th- and 20th-century development

Across the entire site was evidence of a change of use. This took the form of robber trenches associated with collapse, deliberate demolition and levelling, which marked the demise of the glassworks in the north and the school to the south. The

14. John D Shepherd, *pers. comm.*

Ordnance Survey map for 1894-6 shows both the glassworks and school to have been replaced by new buildings.

Pellatt and Green are known to have left the site in 1878 and the Steam Cocoa Mills of James Epps and Co replaced the glassworks. This building has been largely retained and refurbished to form new residential apartments. Inky residues within a basement towards the centre of site probably represent the remains of commercial premises, indicated as print works on the Ordnance Survey map of 1919.

Conclusions

The site is of particular significance for two periods in its history; the prehistoric¹⁵ and the post-medieval.

The study of the post-medieval industrial history of Southwark was, until recently, a neglected subject. The glassworks at Hopton Street, which during the first half of the 19th century grew to become the largest in London, is of both local and national importance. This indeed is the first glasshouse to be extensively excavated in the capital and its evidence for the manufacturing processes involved should be a major source for future

15. Victoria Ridgeway, *op cit* fn. 1.

study. The study of the 19th century Pellatt glasshouse is all the more interesting when taken in conjunction with the wealth of attendant historical documentation including Pellatt's own treatise on glass manufacture¹⁶.

Acknowledgements

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16. Apsley Pellatt *Curiosities of Glassmaking* (1849).

Excavations and post-excavation work

City of London. Museum of London Archaeology Service, Walker House, 87 Queen Victoria Street, London EC4V 4AB (020-7410 2200).

Croydon & District, processing and cataloguing of excavated and museum collections every Tuesday throughout the year. Archaeological reference collection of fabric types, domestic animal bones, clay tobacco pipes and glass ware also available for comparative work. Enquiries to Jim Davison, 28 Blenheim Park Road, South Croydon, CR2 6BB.

Greater London (except north-east and south-east London), by Museum of London Archaeology Service. Excavations and processing in all areas. General enquiries to MOLAS, Walker House, 87 Queen Victoria Street, London EC4V 4AB (020-7410 2200).

Borough of Greenwich. Cataloguing of excavated and other archaeological material, the majority from sites in the borough. For further information contact Greenwich Borough Museum, 232 Plumstead High Street, SE18 1JT (020-8855 3240).

Hammersmith & Fulham, by Fulham Archaeological Rescue

Group. Processing of material from Fulham Palace. Tuesdays, 7.45 p.m.-10 p.m. at Fulham Palace, Bishop's Avenue, Fulham Palace Road, SW6. Contact Keith Whitehouse, 86 Clancarty Road, SW6 (020-7731 4498).

Kingston, by Kingston upon Thames Archaeological Society (KUTAS). Processing and cataloguing of excavated and museum collections every Thursday (10 a.m.) at the North Kingston Centre, Richmond Road, Kingston upon Thames KT2 5PE. Enquiries 020-8546 5386.

Surrey, by Surrey County Archaeological Unit. Enquiries to Rob Poulton, Archaeological Unit Manager, Old Library Headquarters, 25 West Street, Dorking, RH4 1DE (01306-886 466).

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